OGMCOAL - Fwd: Kinney # 2 MRP Update Serchabale Text PDF

From: Daron Haddock
To: April Abate; James Owen; Jim Smith; Joe Helfrich; OGMCOAL; Priscill...
Date: 11/3/2010 3:05 PM
Subject: Fwd: Kinney # 2 MRP Update Serchabale Text PDF
Attachments: Kinney 2 MRP Application update 11-1-20 TEXT.zip

Forwarding this for your reviewing pleasure.

>>> Gregory Hunt <geohuntllc@gmail.com> 11/3/2010 2:27 PM >>>
Hi Daren;
Glad you received the Fed Ex C1-C2 Update to the MRP.
Attached please find a searchable PDF of the Text portion of that same MRP update.
We will see if your email can handle this large of a file.
Greg

--
Gregory L. Hunt
16577 Columbine Lane
Cedaredge, CO
Land 970-856-9478
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Chapter 1

R645-301-100 General Contents

Kinney No 2 Mine

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R645-301-100 General Contents

This permit application has been prepared to provide all required information consistent with applicable regulatory provisions of the Utah Coal Mining Rules. In order to facilitate both initial agency review and future use and revision of this permit application document, CR met with UDOGM representatives early in the permit preparation process. The permit format is designed to provide a clearly organized comprehensive permit document for initial review and approval which can, subsequent to initial review, be broken into; 1) An active working document containing all ownership and compliance information, and operation, reclamation, and monitoring plans and designs; and 2) An archival document containing baseline information, supporting exhibits, and other materials which will not be utilized or referenced on a regular ongoing basis. This permit application has been organized consistent with the accepted format and presents required permitting information.

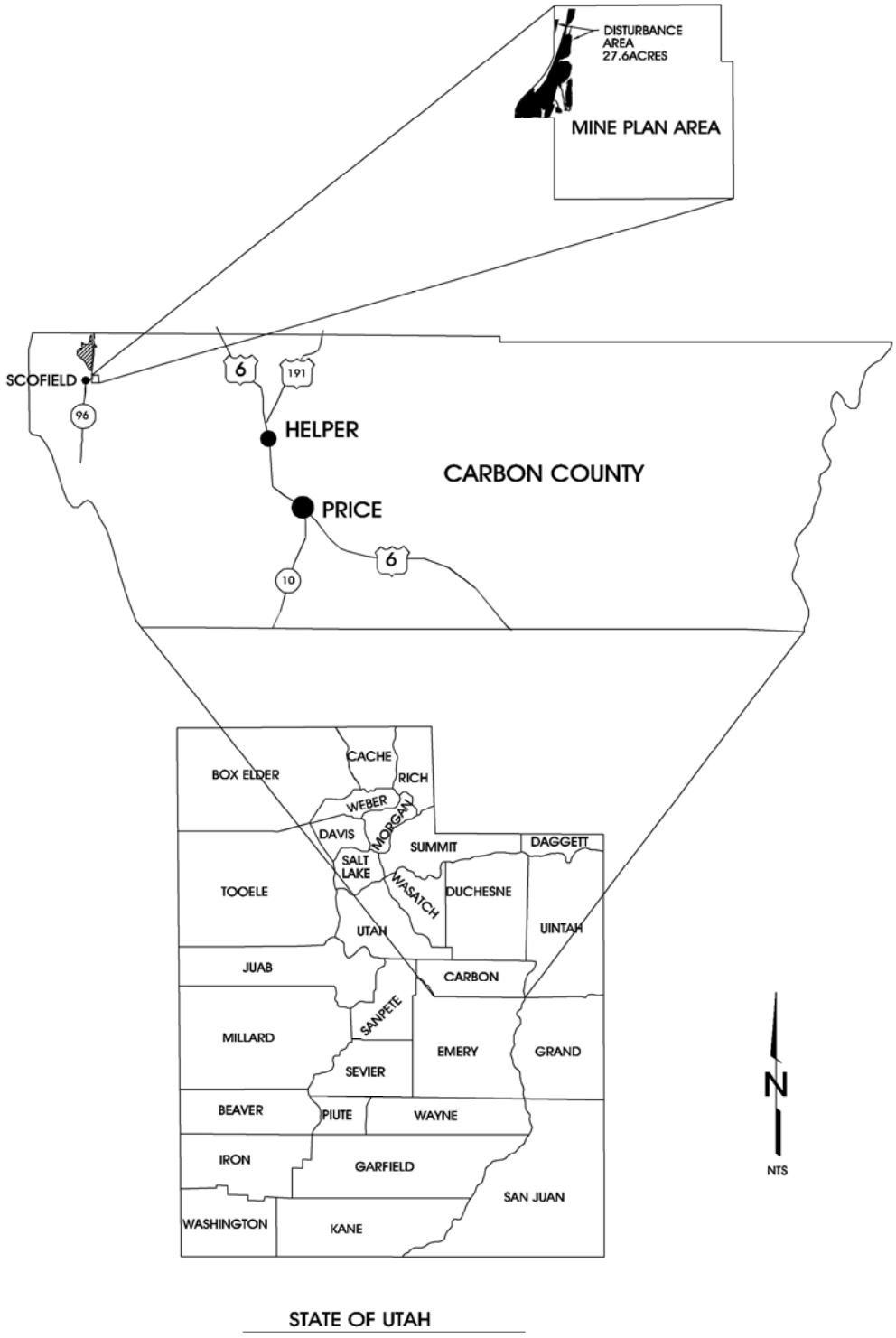
The proposed Kinney No. 2 Mine is located one half mile north of Scofield, Utah and east of Utah State Highway 96. Surface facilities will be located at the coal outcrop, and adjacent to the highway. The Kinney Mine permit area covers an area of approximately 452 acres as shown on Figure 1, General Location Map. Mining is planned in the Hiawatha coal seam from the outcrop at the edge of Pleasant Valley.

Entry will be achieved via an approximately 600 foot wide corridor between old abandoned mine workings and extract coal from multiple fault bounded reserve blocks. Maximum currently anticipated production is 800,000 tons annually utilizing continuous mining methods. Surface facilities are proposed to be located at the site of past mining in Sections 32 and 33 of Township 12 South, Range 7 East northeast of Scofield, Carbon County, Utah.

The Kinney Mine is located just north and east of the Town of Scofield, Utah, on the east side of Utah State Highway 96. The area is part of the Wasatch Plateau in Pleasant Valley, and is characterized by high plateaus to the east and Pleasant Valley to the west. Scofield Reservoir is located to the north and west of the permit area. The mine surface facilities are located on semi-arid mountainous land that is dry and sparsely populated by quaking aspen, a few fir trees, and brush. Within the permit area, topographic relief ranges from 7,650 feet, near the highway to over 8,800 feet on the ridge top east of the portal area.

The area is drained by small unnamed ephemeral channels near the portal area, Eagles Canyon over the ridge to the east of the mine site, and Long Canyon east of Eagles Canyon. All drainages eventually lead to Scofield Reservoir. Eagles Canyon is ephemeral, and Long Canyon contains a perennial stream. Several other very small unnamed ephemeral channels drain the permit area. The climate of the area is semi-arid and, with the exception of the noted perennial drainage, most area drainages flow only in response to spring snowmelt or major thunderstorm events. Ground water occurrence and use in the area is limited by low infiltration and recharge, and the relatively low permeability of most units of the geologic sequence. Soils are generally thin and poorly developed except in drainage valleys, where soil depths can reach 5 feet or more. Area vegetation is typical of semi-arid areas in the west and reflects the wide range of topographic conditions within the proposed permit and adjacent areas. Dominant vegetation types include sagebrush-grass, mountain brush, and aspen in the surface facilities area.

The underground mining operations are planned to recover coal reserves contained in the Hiawatha Coal Seam. Mining methods will include room development using continuous mining techniques, with no pillar recovery planed at this time. Mining will be restricted to blocks of coal lying between faults. Numerous faults will need to be crossed during development of the mine and recovery of the reserves. The mine is being designed for a nominal annual production rate



Carbon Resources
Coal For Carbon County

CARBON RESOURCES - KINNEY NO. 2 MINE

GENERAL LOCATION MAP

FIGURE 1

of 800,000 tons of coal, based on an operating schedule of 250 days per year, 2 shifts per day, 8 hour shifts, with a base production of 500 tons per hour. The projected life of the Kinney No. 2 Mine within the Portal Block Permit Boundary is approximately three years, with the potential to extend the mine life significantly with a combination of permitting other coal controlled by CR and acquisition of additional coal reserves which exist to the south and east of the currently planned operation.

Following completion of the initial planning, design, and permitting work and on receipt of required permit approvals, CR will initiate site development. Required development activities will include:

- Installation of required drainage and sediment control structures
- Removal of topsoil during the following activities
- Construction of required access roads and culverts
- General site grading and compaction for the mine facilities area
- Ecavation of portals area and construction of portal facilities
- Construction of required foundation structures
- Installation of conveyor systems
- Installation of required ventilation equipment
- Development of mine portal and underground support facilities
- Required underground development work
- Erection of buildings and other structures

In order to support underground coal mining operations, CR plans to develop, construct, and install surface facilities in the vicinity of the underground mine portals on the east face of Pleasant Valley. The mine facilities area has been extensively disturbed by previous historical mine development activities, highway construction, and Abandoned Mine Reclamation (AMR) projects completed in the 1980's. The surface facilities area is located on relatively flat areas near the portal and adjacent to Utah Highway 96. Constraints imposed by the topographic configuration of the facilities area have generally dictated the location and configuration of the proposed surface facilities. To the extent possible, facilities siteing reflects CR's efforts to minimize additional disturbance, avoid disturbance or potential future impacts to Scofield Reservoir.
Facility construction will generally proceed in parallel with site development activities. The proposed facilities will include the following:

- Mine portal structures (5-entry system)
- Mine ventilation fan structure.
- Conveyor coal haulage system consisting of the following components (all conveyors to be installed with half covers for weather protection and to minimize dust emissions, transfer points to either be enclosed or have BACT dust controls);
  - Conveyor SB-1(640' long, from portals to run-of-mine stockpile)
  - Spec Coal pile)
  - Conveyor SB-2 (185' long, from the Non-Spec Coal pile to the Spec Coal Pile, the conveyor gallery belt)
  - Conveyor SB-3 (485' long, from the Reclaim Tunnel to the Screening & Crushing Building).
  - Conveyor SB-4 (90' long, from the Screening & Crushing Building to the Truck Loadout)
  - Transfer Tower 1 (at mine portal area)
  - Non-Spec Coal pile stacking tube
  - Spec-Coal pile stacking tube
  - Coal piles reclaim tunnel
  - Screening and Crushing Building

- 17,000 ton Non-Spec Coal Stockpile including a stacking tube and sub-grade feeders.
- 6,000 ton Spec-Coal Stockpile including stacking tube and sub-grade feeders.
- Mine Office/Bathhouse Building
- Shop/Warehouse Building
- Parking area
- Water storage tank
- Electrical substation & distribution equipment
- Drainage and sediment control structures
- Access road
- Other service roads and minor ancillary support facilities

Development and operation of the proposed Kinney No. 2 Mine offers a number of important benefits specifically including the following:

- Assures continued availability of a valuable energy resource used to generate electricity and as an industrial heating fuel
- Provides for efficient development and consequent conservation of known coal reserves
- Facilitates effective reclamation, through a comprehensive reclamation program, of both new disturbance and previously disturbed areas
- Provides stable, high-paying jobs for approximately 100 to 140 employees with an annual payroll and benefits of $6,000,000 or more.
- Supports Federal, State, and local governments through payments of property, sales, excise, fuel, and other taxes estimated at $1,000,000 or more annually.
- Supports the National, State, and local economies through direct purchases of equipment, materials, supplies, and services (estimated at $4 Million or more annually); royalty payment of fee lands (estimated at $2 Annually); and indirect turn-over of these expenditures in the economy (multiplier of approximately 3.00 in total economic benefits for every dollar spent in wages, benefits, and purchases of goods and services)
- Supports local communities through charitable contributions

Since the proposed mine is located near the Town of Scofield, which has a limited availability of jobs, the mine will be a substantial benefit to the town.

As well as the noted benefits, the proposed mining and reclamation operations and related activities have the potential to result in possible environmental and socio-economic impacts. Based on available information on existing environmental resources and the proposed mining and reclamation plans, potential impacts could occur in the following areas:

- Disturbance of existing soils, vegetation, and wildlife resources
- Impacts on existing land uses
- Air quality impacts
- Surface and ground water impacts
- Subsidence impacts
- Socio-economic impacts

The following sections briefly describe potential impacts for each of the general impact categories. More detailed information on existing environmental resources, proposed mining and reclamation plans, potential mining related impacts, and planned control and mitigation measures is presented in the various sections of the permit application.

Disturbance of Existing Soils, Vegetation, and Wildlife

The only direct surface disturbance which will result from the Kinney No. 2 Mine will be that

associated with development and construction of the required mine surface facilities. As a result of previous historic mining, reclamation, and other development activities, approximately 73% of the mine surface facilities disturbance area has already been extensively disturbed. Existing site soils, vegetation, and wildlife resource values reflect and are limited by the previous disturbance. Due to the relatively small affected area and the limitations resulting from the previous disturbance, re-disturbance of the mine facilities area will not result in significant adverse impacts on soils, vegetation, or wildlife resources.

Evaluation of the soils in the proposed mine area was conducted in 1981 prior to the Abandoned Mine Reclamation project conducted at the mine site in the mid-1980's. This evaluation program found the soils to be adequate for reclamation. The AMR project was very successful as evidenced by the vegetation in the area, and further verifies the soils to be adequate for final reclamation. The alternative reclamation materials used by the AMR program for reclamation will be available for final reclamation for the Kinney No. 2 Mine project. These materials will be treated as topsoil for the purposes of this application. The only mining related vegetation impacts anticipated in conjunction with the proposed operations would be temporary elimination of existing vegetation from surface disturbance areas. Of this area, only a very small portion will occur in pre-mining areas where no historic mining was conducted.

Wildlife habitat and use in the surface disturbance area is limited by both the previous disturbance and the level of existing development in the immediate area. Since the area is in very close proximity to the Town of Scofield, large wildlife species use is somewhat limited because of the presence of human activity in the town and also due to the presence of Highway 96 which is adjacent to and parallels the mine site area. Contemporary reclamation including seeding the slopes of facilities pads and roads will to some degree offset the vegetation lost from disturbance during the life of the mine.

Impacts on Existing Land Uses

The mining operations will result in a temporary change in land use for the affected surface disturbance area. Minor impacts on areas which may fall under the definition of renewable resource lands, dependent on interpretation may occur. Potential mining related land use and related impacts are not expected to be significant due to the limited area of proposed surface disturbance, the fact that this area has already been extensively disturbed by previous historical mining, and grazing activities, and specific proposed protection and mitigation measures. Development, operation, and reclamation of the Kinney No. 2 Mine will not result in any long-term or permanent changes in land use, will not affect any areas designated unsuitable for mining, and will not impact any recreational facilities. The closest recreational facilities are at Scofield Reservoir, located north of the mine site, with the Scofield State Recreation Area being more than 4 miles north of the mine site. The Huntington and Eccles Canyons Scenic Byways are accessed from the north by Utah State Highway 96, which passes by the mine site, however, the Scenic Byways starts at the mouth of Eccles Canyon where it meets Highway 96 approximately 3.5 miles south of the mine site. One of the attractions promoted on the Scenic Byway is the Skyline Mine in Eccles Canyon. The Kinney Mine will be another possible attraction in the area of the Scenic Byway, along with the historic Scofield Cemetery, which lies less than a half mile south of the proposed mine site.

Lands within the mine facilities surface disturbance area are currently lands used for grazing, wildlife habitat, and for water shed. With construction of the surface facilities the new land use will be surface support for the Kinney No. 2 Mine with construction of the facilites listed in other sections.

As mentioned, the area has been extensively disturbed historically by mining activities ; the old

mining operations were reclaimed in the mid-1980's. The Kinney No. 2 Mine development and operations activities will result in a temporary change for this area to a mining use in compliance with both Scofield Town, and Carbon County zoning ordinances. Following completion of mining, associated surface disturbance areas will be reclaimed and restored to the premining land uses of wildlife habitat, grazing, and water shed.

A baseline cultural resource survey has been conducted covering the mine permit area. Since the surface facilities area was extensively disturbed by mining, and because the portal area is steep, the cultural inventory conclusion is that no cultural resources were found that would require further investigation or documentation. Based on the findings of the cultural survey, archeological clearance was recommended.

Under the Utah Coal Mining Rules, renewable resource lands are defined as:

> "...geographic areas which contribute significantly to the long-range productivity of water supply or of food or fiber products, such as lands to include aquifers and aquifer recharge areas."

The definition is so broad as to potentially include any areas where an aquifer exists, recharge occurs, or any type of grazing or other agricultural activity is conducted. The clause "which contribute significantly" is the only limiting factor which would prevent this definition from applying to virtually any potentially affected lands. Given this limitation, the following are the only areas which would reasonably be considered renewable resource lands:

- Areas which support agricultural activities (cultivation, grazing, or timber) as the sole or primary and use
- Areas where a productive regional aquifer exists which is utilized as a ground water supply source
- Areas which provide a significant portion of the total recharge for any productive regional aquifer

There have been no regional aquifers identified in the vicinity of the mine, however a semi-regional piezometric surface has been identified approximately 150 feet below the seam to be mined at the portal. Some small localized perched aquifers may exist, but limited recharge area, and narrow, steep ridges preclude the formation of extensive aquifers above, or in the strata associated with the coal seams. Since the area has been extensively mined in the past, any aquifers in the area have likely been impacted previously. Some of the old mine works may be sinks for water as discussed in R645-301-700. Given these considerations, lands within the proposed permit area which could reasonably be characterized as renewable resource lands will be limited, and regardless of designation, potential mining related impacts are expected to be negligible.

Air Quality Impacts

Development of the Kinney No. 2 Mine will result in a minimal localized increase in air emissions, however BACT controls will help mitigate those impacts, and emissions will be held within Utah Division of Air Quality limits. The mine area is currently designated by the Utah Division of Air Quality (UDAQ) as an "attainment" area indicating no significant existing pollution problems. In cooperation with the UDAQ and in order to comply with all applicable regulatory requirements, CR has incorporated air emission control considerations in the mine design and planning phases and will implement specific operational control measures under a Notice of Intent with UDAQ. Given existing air quality conditions, consideration of natural air movements in the area, and CR's planned control measures under the provisions of the required UDAQ permit, no significant

adverse mine related air quality impacts are anticipated. Due to the nature of the proposed operations, vehicular emissions will be negligible. During site development, active operations, and site reclamation CR will control fugitive dust emissions by implementing the following control measures:

- Minimizing surface disturbance
- Surface watering in active operating areas as needed
- Use of suitable surfacing materials and surfactants, if necessary, on unpaved roads
- Paving of high traffic areas as needed
- Posted speed limits on all roads
- Regular road maintenance
- Use of natural windbreaks to minimize wind exposure where possible
- Use of covered conveyors
- Use of a sub-grade reclaim system for the coal stockpiles
- Full enclosures for crushing and screening equipment and transfer points with BACT controls

Surface and Ground Water Impacts

Construction of mine related surface facilities and development and production of coal from underground mine working will result in localized changes in surface runoff characteristics and potential increases in runoff, erosion, and sediment loss; minor reduction in surface flows corresponding to operational water supply requirements; possible increases in infiltration and ground water recharge. Some drainage of very small, localized perched aquifers due to mining as mine inflows and resultant increases in the volume and areal occurrence of stored mine water; and minor changes in surface and ground water chemistry and quality. Generally, potential surface water impacts will be confined to the mine facilities surface disturbance area. Potential indirect mining related ground water impacts due to mining are addressed in the following section as a separate topic. Direct mining related ground water impacts will be limited by the lack of significant ground water aquifers, low overall permeability of the effected geologic sequence, relatively slow rate of ground water movement, and the absence of any significant quantities of acid or toxic forming materials. While some temporary, localized surface and ground water impacts may be unavoidable, the combination of natural limiting factors and specific control and mitigation measures, as proposed in the operation and reclamation plans, will effectively prevent any significant long-term adverse hydrologic impacts.

Re-disturbance of the mine surface facilities area is required for site grading and facility construction, and will result in removal of existing vegetative cover and exposure and disturbance of surficial and near-surface overburden materials. Soils and other surficial materials which may be suitable as revegetation media will be removed and stockpiled for future use in reclaiming mining disturbance areas. Removal of vegetation and exposure of surficial materials may result in increased runoff, erosion, and sediment loss. These potential impacts will be addressed by minimizing the total disturbance area, diverting runoff from upgradient undisturbed areas around the area of disturbance, grading and surfacing disturbed areas to minimize erosion and sediment loss, intercepting and routing disturbed area drainage to a sedimentation pond to allow settlement of suspended sediments prior to discharge to natural drainages, and reclaiming the disturbed areas as soon as operationally feasible following completion of mining and related activities.

Mine water supply requirements for sanitary use will be provided by Scofield Town through a long term agreement with CR. Scofield Town has excess capacity in their culinary water system, having a 160 thousand gallon water tank perched on the mountain side west of town. The water

tank elevation is sufficient to provide at least 40 psi to the bath-house and warehouse. Mine water supply for surface dust control, fire fighting reserve, and operational mine water will also be provided by Scofield Town through a long term agreement with CR. Scofield Town has significant water rights on Mud Creek with a point of diversion suitable for pumping non-potable water to CR.

In the permit area, no significant aquifers have been identified. Perched water may occur in the formations above the coal beds, but a limited to small, perched, localized areas. The regional ground water table (piezometric surface) is clearly below the proposed mine as evidenced by the absence of a static water level in any of the four monitor wells located near the portal and first two years of production area (CR-06-01, CR-06-01BLW, CR-06-02, CR-06-02-ABV). Ground water occurrence is limited to the few geologic units which have sufficient permeability to contain and transmit ground water flows. Where mine workings intercept any of these more permeable units, discharge to the mine workings will occur. Discharge rates and mine inflow quantities will be limited by generally low permeabilities and limited head as resulting from the extensive historic mining in the area. During active mining operations, mine inflows will be collected and routed to centralized underground sumps which will serve as collection points for mine water. Mine water will be used for dust control in active underground working areas and, to the extent operationally feasible, the water will be recycled and reused.

Based on existing available information, mine water inflows will not exceed operational mine water requirements and underground storage capacity, consequently it is not anticipated that there will be any need to discharge mine water to the surface. Following completion of active mining in any given area, any mine inflows to the area will result in very slow, gradual flooding of the excavated mine workings and any downgradient areas. Given the proposed mining depth and development sequence, flooding of the underground workings will not result in any anticipated surface discharge since mine openings will be above the water table and outcrop areas will de upgradient from the mine workings. Gradual flooding may result in accumulation and storage of mine water in the abandoned mine workings, with inflows continuing until the water level in the mine workings reaches equilibrium with the natural ground water system. However, due to there not being any significant aquifers in the mine area and overlying formations, very little mine water accumulation. Mine water storage and restoration of hydraulic equilibrium following the completion of mining will minimize any long-term hydrologic impacts with the overall result being no significant mining related impact on the ground water system.

Increased surface runoff and sedimentation resulting from surface disturbance may result in minor changes in surface water chemistry and may increase the levels of certain chemical constituents due to exposure of partially weathered or unweathered overburden materials. These changes are not expected to be significant based on chemical characterization of the overburden materials and any potential changes will be monitored and evaluated under the proposed comprehensive hydrologic monitoring program. Similar changes are anticipated for ground water resources due to exposure of geologic strata in the underground mine workings to oxidizing conditions. However, the changes are not expected to be significant due to relatively low rates of ground water movement and the absence in the overburden sequence of any significant quantities of potentially acid or toxic forming materials.

Subsidence Effects

CR has no plans to conduct full extraction mining within the permit boundary at this time.

Socio-Economic and Transportation Impacts

Construction and operation of the proposed Kinney No. 2 Mine may result in various potential direct and indirect socio-economic and transportation impacts to the general Carbon County

area, and especially to the Town of Scofield including:

- A temporary increase in the local workforce of approximately 20 to 50 contractor employees during the 1 year mine construction and development phase
- Increased short-term demands on temporary housing, schools, utilities, and health and social services
- A potential long-term increase in overall employment of approximately 50 to 100 employees
- Increased long-term demand for housing, schools, utilities, health and social services, and retail goods and services
- Increases in traffic levels on Utah Highway 96, and on US Highway 6 and 50 in the Price Canyon area between Price and Scofield junction.

The potential socio-economic impacts will be mitigated to a degree by the fact that the mine will be phased in over a 1 to 3 year period. Temporary construction is projected to be completed by local companies in the Price and Scofield areas, and thus will not likely have a significant impact. Since the mine production is planned to be in the range of 300,000 to 800,000 tons per year, and the workforce requirements are relative low, no significant socio-economic impacts are expected. As has been experienced in Carbon and Emery Counties, mining employment tends to fluctuate with the price of coal, and due to mine reserves depletion and other factors. At any given time, up to hundreds of coal miners can lose their jobs instantaneously, creating a glut of employees. Availability of employees to fill the needs of CR is not expected to be a problem, with many trained and miners living in the Price area and likely will not have a significant impact on Carbon County or Scofield Town. The Town of Scofield is likely to experience a boon with the mine, which will provide valuable income for a town that has experienced severe ups and downs in its' economy. Given these considerations, no significant long-term mining related socio-economic impacts are anticipated. Anticipated increases in traffic levels are well within the design capacities for the effected roadways and traffic impacts will be mitigated to some extent by an organized program to encourage employee carpooling and by multiple shift operations.

R645-301-112 Identification of Interests

112.100 Statement of Corporation

Western Reserve Coal Company, Incorporated is the managing member of WRCCLLC which is the managing member of Carbon Resources LLC. Carbon Resources LLC prepared this Mining and Reclamation Permit application for the Kinney No. 2 Mine, a proposed new underground mine complex. This permit application has been developed to effect full compliance with applicable permitting requirements under the State of Utah Coal Mining Rules and is being submitted for review and approval of the mining and reclamation plans contained herein by the Utah Division of Oil, Gas and Mining (UDOGM), and other jurisdictional agencies. CR operates under corporate registration with the Utah Division of Commerce Entity Number 7201220-0161, active as of 12/01/2008, renewed on 4/05/2010.

112.200 Name and Address of Operator

This application for a Mining and Reclamation Permit for the Kinney No. 2 Mine is submitted by Carbon Resources, LLC (CR) as the permit applicant. The following is the business address, phone number, and employer identification numbers and Tax ID No. for Carbon Resources LLC., WRCC LLC, and Western Reserve Coal Company, Inc., WRCC, Inc.,

Carbon Resources, LLC
P.O. Box 954
Sandia Park, New Mexico 87047
Phone: (505) 980-1841
Tax ID No. 20-3819816

WRCC, LLC
P.O. Box 954
Sandia Park, New Mexico 87047
Phone: (505) 980-1841

Western Reserve Coal Company, Inc.
P.O. Box 954
Sandia Park, New Mexico 87047
Phone: (505) 980-1841

Correspondence regarding the Kinney No. 2 Mine Permit and related operations should be directed to:

Carbon Resources, LLC
P.O. Box 954
Sandia Park, New Mexico 87047

Attention: Clay Wisdom

CR, as the mine operator, will be responsible for payment of the Abandoned Mine Land Reclamation Fee. CR's Resident Agent is:

Ronald C. Barker
2870 S. State Street
Salt Lake City, UT 84225-3624
(801) 486-9636

112.320 Name of Operated Coal Mines

The proposed **Kinney No. 2 Mine** will be operated by Carbon Resources, LLC (CR). CR's offices are currently located at P.O. Box 954, Sandia Park, New Mexico 87047. Upon start of operations, temporary office space will be located in Scofield, with permanent offices to be located at the mine site.

The Kinney No. 2 Mine permit area encompasses a block of approximately 448.14 acres. Of this surface acreage, 15.33 acres are owned in fee by Carbon Resources, the remaining 432.84 acres are owned by Evangelos George Telonis, ETAL., of this, 22.8 acres are held by Carbon Resources as a long term lease agreement with from George Telonis, ETAL.

The area of surface disturbance is confined within the 38.13 acres (combined Fee and Leased) owned or controlled by Carbon Resources. Only 27.6 acres of the 38.13 acres will be disturbed for surface facilities. The coal to be mined lies beneath the George Telonis, ETAL. fee surface land and is owned by Carbon County which in turn has leased it to Western Reserve Coal Company Inc, Managing Member of Carbon Resources.

112.330 Title of Officers

The following summarizes Corporate Information, provides the name, business address, telephone number, and employer identification number and list of officers and directors, with their titles, social security numbers and the date that they assumed position of responsibility.

Chief Executive Officer
William J.H.W. Reeves
Box 954 Sandia Park
New Mexico 87047
Social Security Number 539-28-9322
(505) 980-1841
Assumed position October 28, 2005

Chief Financial Officer
Clay Wisdom
P.O. Box 950 Sandia Park
New Mexico 87047
Social Security Number 450-70-5671
(505)-980-1842
Assumed position October 28, 2005

Resident Agent
Ronald C. Barker
2870 S. State Street
Salt Lake City, UT 84115
(801) 486-9636
Social Security Number 528-28-9932
Assumed position October 28, 2005

Mr. William J.H.W. Reeves controls 85% of the Corporation, with three other individuals owning less than 10% each.

112.340 Company Name

Western Reserve Coal Company, Incorporated is the managing member of WRCC LLC which is the managing member of Carbon Resources LLC. Carbon Resources LLC prepared this Mining and Reclamation Permit application for the Kinney No. 2 Mine, a proposed new underground mine complex. This permit application has been developed to effect full compliance with applicable permitting requirements under the State of Utah Coal Mining Rules and is being submitted for review and approval of the mining and reclamation plans contained herein by the Utah Division of Oil, Gas and Mining (UDOGM), and other jurisdictional agencies.

112.350 Other Coal Mines

The individuals and entities listed in R645-301-112 - 230, Applicant Information have no current or past ownership or control of any coal mining and reclamation operations in the United States.

There are no coal mining operations associated with either of these individuals or entities that are included in the Applicant Violator System.

112.400 Operating Permit

The following permits and approvals will be required to initiate and conduct mining and related operations for the Kinney No. 2 Mine:

Federal Permits and Approvals

USDI – Office of Surface Mining Reclamation and Enforcement (OSMRE), Review, approval, and oversight of the UDOGM Mining and Reclamation Permit.

USDL – Mine Safety and Health Administration (MSHA), Issuance of an MSHA I.D. number, approval of mine ventilation and roof control plans, and oversight and enforcement of applicable health and safety provisions under the Coal Mine Health and Safety Act of 1966. This permit will be obtained prior to start of mining and will be timed to coincide with approval of the SMCRA (Surface Mining Control and Reclamation Act of 1977) permit.

U.S. Commerce Department – Bureau of Alcohol, Tobacco, and Firearms, Approval of Federal permits for transportation, storage, and handling of explosives. Powder and cap magazines are depicted on Map 13, Surface Facilities Map. This permit will be obtained prior to start of mining and in conjunction with approval of the MSHA permit.

State Permits and Approvals

Utah Division of Oil, Gas and Mining (UDOGM) – Approval of Mining and Reclamation Permit and enforcement of applicable provisions under SMCRA the Surface Mining Control and Reclamation Act of 1977.

Utah Division of Water Quality (UDWQ) – Approval of Surface Water Discharge Permits and enforcement of applicable provisions under the Utah Pollution discharge Elimination Program (UPDES) in compliance with the Federal Water Pollution Control Act of 1977. UPDES General Permit Coverage No. UTG040028 was approved on June 15, 2010, with an effective date of July 1, 2010, and with an expiration date of April 30, 2013. A copy of the permit it included in Exhibit 4, Other Permits.

Utah Division of Air Quality (UDAQ) – Approval of Air Emission Permits and enforcement of applicable provisions under the Utah Air Pollution Control Program in compliance with the Federal Clean Air Act of 1970. Approval Order Number DAQE-AN0141180001-08 was issued December 11, 2008 for the Kinney No. 2 Mine. A copy of the permit approval can be found in Exhibit 4, Other Permits.

Utah State Engineer – Approval of Pond Construction and Water Well Construction Permits and surface and ground water appropriations. An application for a pond permit was submitted to the Utah State Department of Natural Resources, Division of Water Rights, State Engineers Office. A letter dated August 31, 2010 was received including the following statement, "According to the application and attached drawings, the reservoir will be dug into the natural ground with no water storage above the natural grade. As such, the facility will not be considered to be a dam and Dam Safety approval is not necessary." A copy of this letter is included in Exhibit 4, Other Permits. Water well permit approvals are also included in Exhibit 4, Other Permits.

Water Rights – CR holds water rights Number 91-5152 for 2 acre-feet of water that will be applied to the sediment pond storage if necessary. CR has obtained an agreement from Scofield Town to supply culinary, fire suppression, and dust control water, and thus Scofield Town's water rights will cover the mines water needs.

Sanitary Sewer Service – CR has an agreement from Scofield Town to provide sewer service for the Kinney No. 2 Mine.

County and Local Permits and Approvals

Carbon County – Conditional Use Permit for mining operations
Scofield Town – Building Permit

CR applied for and received a Conditional Use Permit from Carbon County; a copy of the approved permit is included in Exhibit 4, Other Permits.

The Mine will operate under the name "Carbon Resources LLC - Kinney No. 2 Mine". The MSHA identification number for the mine will be obtained prior to commencement of mining operations. A copy of the approved MSHA permit will be submitted to UDOGM, and included in Exhibit 4, Other Permits.

CR will obtain building permits from both Carbon County and Scofield Town prior to starting construction on any facilities.

Utah Department of Transportation (UDOT) Highway Access

Application for a highway access permit has been submitted to UDOT. Preliminary approval of access was received from UDOT in 2007. A detailed design has been submitted to UDOT. Upon approval, a copy of the permit will be provided to UDOGM, and included in Exhibit 4, Other Permits.

112.410 Federal and State Permits

The UDOGM Mining and Reclamation Plan approval under applicable provisions of the Utah Coal Mining Rules for Coal Mining will be the primary operating permit required to initiate construction, development, and mining operations for the Kinney No. 2 Mine. In addition, the following permit approvals may be required under other applicable regulatory provisions and requirements:

- Surface Water Discharge Permit (UDWQ)
- Air Emissions Notice of Intent (UDAQ)
- Pond Construction Permit (Utah State Engineer) (Negative Determination – no permit required)
- Pond Approvals (MSHA – for any ponds meeting criteria of 30CFR 77.216) – none needed
- Highway Access Permits (UDOT)
- Mine ID Number (MSHA)
- Archeological Clearance (SHPO)
- Carbon County Building Permit
- Carbon County Conditional Use Permit
- Building Permit (Scofield Town)

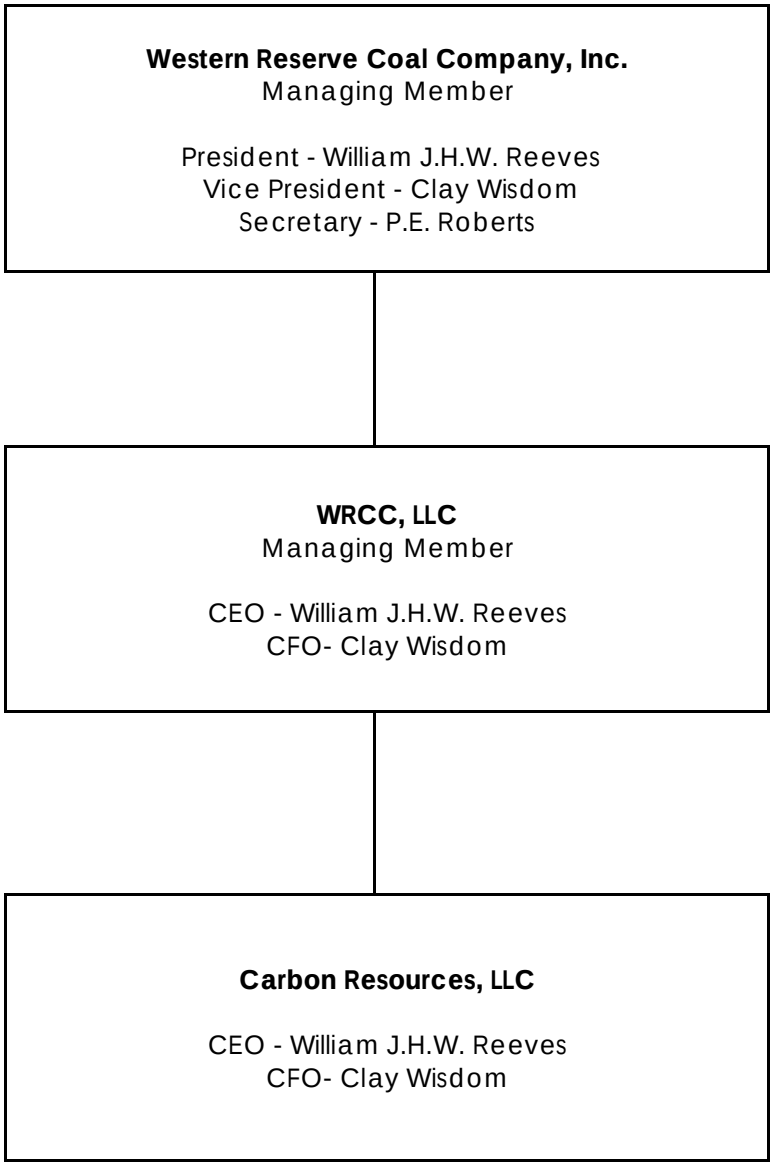
112.420 Control Relationship to Applicant

The Kinney No. 2 Mine permit surface area encompasses a block of approximately 448.14 acres. Of this surface acreage, 15.33 acres are owned in fee by Carbon Resources, the remaining 432.84 acres are owned by Evangelos George Telonis, ETAL., of this, 22.8 acres are held by Carbon Resources as an Easement from George Telonis, ETAL.

The area of surface disturbance is confined within the 38.1 acres (combined Fee and Easement) owned or controlled by Carbon Resources, of which only 27.6 acres are planned to be disturbed by mining operations. The coal to be mined lies beneath the George Telonis, ETAL. Fee surface land and is owned by Carbon County which in turn has leased it to Western Reserve Coal, Inc,

Lands adjoining the permit boundary are owned by private owners, and the Utah Department of Transportation.

Figure 38
Organization Chart



112.500 – 600 Owners of Surface and Minerals

The legal and equitable owners of record of surface lands associated with those areas to be mined by underground coal mining activities or of surface lands to be affected by surface operations and facilities incidental thereto (lands within the permit area) are shown on the Regional Surface Ownership Map, Map 11, and are listed below:

Carbon Resources, LLC
P.O. Box 954
Sandia Park, New Mexico 87047

Evangelos George Telonis Trust
c/o Nick Sampinos
190 North Carbon Ave.
Price, Utah 84501

In addition to the designated owners of lands within the permit area identified above, the owners of record of all surface areas contiguous to the permit area are shown on the Regional Surface Ownership Map 11, and are listed below:

Evangelos George Telonis Trust
c/o Nick Sampinos
190 North Carbon Ave.
Price, Utah 84501

Hilda M. Hammond
2912 Redwood Ave.
Costa Mesa California 92626-3719

Utahna Pace Jones, Trust
HC 35 Box 510
Helper, Utah 84526-0000

LH2 Enterprises, Inc.
6338 South Happiness Circle
West Jordan, Utah 84084-0000

Utah Department of Transportation
4501 South 2700 West
Salt Lake City, Utah 84114-1200

The legal and equitable owners of record of the coal to be mined within the permit area are shown on the Regional Coal Ownership Map, Map 12, and are listed below:

Carbon County
120 East Main Street
Price, Utah 84501

(Lease from Carbon County dated March 7, 1997, as amended December 31, 2002)
Carbon Resources, LLC
P.O. Box 11789
Albuquerque, New Mexico 87192

Peabody Natural Resources
701 Market Street
St. Louis MO 63101

In addition to the designated owners of minerals within the permit area identified above, the

owners of record of minerals contiguous to the permit area are shown on the Regional Coal Ownership Map, MAP 12, and are listed below:

Pit-Min, Inc.,
an Ohio Corporation, of Cincinnati, Hamilton County, State of Ohio
Address Unknown

Hilda M. Hammond
2912 Redwood Ave.
Costa Mesa California 92626-3719

Utahna Pace Jones, Trust
HC 35 Box 510
Helper, Utah 84526-0000

112.700 MSHA Numbers

The Mine will operate under the name "Carbon Resources LLC - Kinney No. 2 Mine". Carbon Resources will obtain from MSHA and provide to UDOGM a MSHA MINE ID number for mining operations. Carbon Resources plans to time the issuance of the MSHA mine number with UDOGM's schedule to issue the mine permit conditional on bond posting. Carbon Resources does not anticipate the need for more than one MSHA Mine ID number at this time, and will obtain additional MSHA numbers for structures etc. as MSHA deems necessary. No coal processing waste pile is planned so no MSHA number is needed.

112.800 Interest in Land

Coal ownership for the permit area is held by Carbon County and is leased to Western Reserve Coal Company, Inc. effective March 6, 1997, (lease document recorded in the Carbon County Recorder's Office in Book 385, Page 396), as amended December 31, 2002, (recorded in the Carbon County Recorder's Office in Book 523, Page 522). The coal is subleased from Western Reserve Coal Company to WRCC, LLC, (which sublease is recorded in the Carbon County Recorder's Office in Book 607, Page 768) the owner of Carbon Resources, LLC, and subleased from WRCC, LLC to Carbon Resources, LLC (which sublease is recorded in the Carbon County Recorder's Office in Book 607, Page 771).

The Kinney No. 2 Mine permit surface area encompasses a block of approximately 448.14 acres. Of this surface acreage, 15.33 acres are owned in fee by Carbon Resources, the remaining 432.5 acres are owned by Evangelos George Telonis, ETAL., of this, 22.8 acres are held by Carbon Resources as an Easement from George Telonis, ETAL.

The area of surface disturbance is confined within the 38.1 acres (combined Fee and Easement) owned or controlled by Carbon Resources, of which only 27.6 acres are planned to be disturbed by mining operations. The coal to be mined lies beneath the George Telonis, ETAL. Fee surface land and is owned by Carbon County which in turn has leased it to Western Reserve Coal, Inc,

Lands adjoining the permit boundary are owned by private owners, and the Utah Department of Transportation. CR controls a coal lease from Carbon County as shown on Map 12, Regional Coal Ownership Map, a portion of which lies within the permit boundary included in this application. This County lease also extends east and south of the permit boundary as shown on Map 12, Regional Coal Ownership Map, and it is the intent of CR to ultimately modify this permit to include this lease.

Table 24, Pertinent Acreages, Land Ownership & Control includes land ownership with the acreages of those lands.

Table 24 Pertinent Acreages, Land Ownership & Control

AREA	ACRES	OWNER
Permit Area	15.33	Fee
Permit Area Leased Private	22.8	E.G. Telonis et. al.
Right to Mine	410.01	E.G. Telonis et. al.
Total Permit Area	448.14	See above
Disturbed Area	27.6	Fee and E.G. Telonis et.al.
U.S. Government	0	U.S. Government
Utah State Government	0	Utah State Government
Local Governments	0	Local Governments
Other Private Land	0	Other Private Land

R645-301-113 Violation Information

The Kinney No. 2 Mine will be a new operation, therefore, no notices of violation (NOV), cessation orders (CO), or air or water quality violation notices have been issued in conjunction with this operation.

113.110 Revocation of Federal or State Permits

Neither the applicant, affiliate nor persons controlled by or under common control with the applicant has had a Federal or State mining permit suspended or revoked in the five (5) years previous to the date of this application. Likewise, no mining bond or similar security deposited in lieu of bond has been forfeited by any affiliated entities or persons.

113.120 Forfeiture of Bond

No mining bond or similar security deposited in lieu of bond has been forfeited by any affiliated entities or persons associated with Carbon Resources.

113.300 List of Violation Notices for Past 3 Years

The Kinney No. 2 Mine will be a new operation, therefore, no notices of violation (NOV), cessation orders (CO), or air or water quality violation notices have been issued in conjunction with this operation.

R645-301-114 Right of Entry Information

CR's right of entry for surface lands and coal extraction is based on it's ownership of part of the surface and on an agreement with the major property owner, Evangelos George Telonis, ETAL, and on ownership of the Carbon County Coal Lease covering the permit area.

114.100 Documentation of Ownership

The following describes fee surface, leased surface, and lease coal, held by CR and coal leases held by CR:

Fee Surface

Title to 15.33 acres of surface lands adjacent to the highway.
Title recorded in the Carbon County Court House Book 657 Page 128.

Located in Section 32, T 12 S, R 7 E, SLB&M as follows:

Beginning at a point which lies North, a distance of 1320.00 feet from the southeast corner of Section 32, Township 12 South, Range 7 East, Salt Lake Base & Meridian, thence S 89°59'00" W a distance of 920.00 feet, more or less to the intersection of the East right-of-way line of the State Road 96; thence in a Northerly direction along said east right-of-way line a distance of 270.00 feet; thence in a Northeasterly direction along said highway line a distance of 317.10 feet; thence N 45°32' E along said highway line a distance of 465.40 feet; thence in a Northeasterly direction along said highway line a distance of 733.00 feet, more or less to the intersection of said highway right-of-way line, and the East boundary of Section 32; thence South a distance of 1475.00 feet, more or less to the point of beginning. Containing 16.33 acres, more or less.

Excepting a parcel more particularly described as follows:

Commencing at the Southeast quarter of said Northeast quarter of the Southeast quarter of said Section 32, running thence North along the section line 330 feet, more or less to a point 50 feet North of the railway track of the Union Pacific Railway running across said land; thence in a Southwesterly direction parallel with and 50 feet distance from center line of said track, 412.5 feet, more or less to the South line of said Northeast quarter of the Southeast quarter; thence East 132 feet, more or less to the point of beginning. Containing 1 acre, more or less.

Total acreage of the fee surface parcel is 15.33 acres.

Leased Surface

Lease Agreement with Evangelos George Telonis, ETAL for 22.88 acres of surface land.
Recorded in the Carbon County Court House Book 666, Page 106, dated 2/15/08.

Located in Section 33, T 12 S, R 7 E, SLB&M as follows:

Beginning at a point on the east Right-Of-Way line of the Utah State Highway 96, said point being further described as being S00°14'01"E, 1652.62 feet along the west section line of Section 33, Township 12 South, Range 7 East, Salt Lake Base & Meridian in Carbon County, Utah and N90°00'00"E, 235.93 feet from said west line of Section 33; thence along said east right-of-way line the following three courses, N11°02'21"E, 75.98 feet; thence N18°41'18"E, 180.40 feet; thence N10°47'24"E, 82.52 feet; thence along the Telonis north property line N90°00'00"E, 285.41 feet; thence S01°17'17"W, 175.81 feet; thence S26°57'44"W, 450.28 feet; thence S0°14'01"E, 1947.79 feet; thence S90°00'00"W, 400 feet to the west line of the Telonis property, which is the west line of said Section 33; thence N0°14'01"W, 2200.00 feet along said section line being also the west line of the Telonis property; thence N90°00'00"E, 235.93 feet to the point of beginning. Containing 22.88 acres.

Leased Coal

Coal ownership for the permit area is held by Carbon County and is leased to Western Reserve Coal, Inc. effective March 6, 1997, (lease document recorded in the Carbon County Recorder's Office in Book 385, Page 396), as amended December 31, 2002, (recorded in the Carbon County Recorder's Office in Book 523, Page 522). The coal is subleased from Western Reserve Coal to WRCC, LLC, (which sublease is recorded in the Carbon County Recorder's Office in Book 607, Page 768) the owner of Carbon Resources, LLC, and subleased from WRCC, LLC to Carbon Resources, LLC (which sublease is recorded in the Carbon County Recorder's Office in Book 607, Page 771). The lands listed below include all of the Carbon County Coal Lease to be included in this permit application as can be seen on Map 12, Regional Coal Ownership Map within the permit boundary. CR holds additional coal in the Carbon County Coal Lease adjacent to the permit boundary to the south and east, which is excluded from this permit application, although it is shown on the referenced map for informational purposes only.

Township 12 South, Range 7 East, SLB&M

Section 32: SW1/4NW1/4; W1/2SW1/4
Section 33: S1/2NW1/4; SW1/4NE1/4; N1/2S1/2; S1/2SE1/4; S1/2SW1/4
Section 34: All
Section 35: All
Section 36: All

Township 13 South, Range 7 East, SLB&M

Section 3: NW1/4
Section 4: All
Section 5: E1/2E1/2
Section 9: N1/2NW1/4

Permit Boundary Description

The permit boundary includes land owned by Evangelos George Telonis, ET. AL. and fee land owned by Carbon Resources LLC. A portion of the Evangelos George Telinis ET. AL. property is held by lease by Carbon Resources, LLC, which is where a portion of the surface facilities will be located. A legal description of the permit boundary including portions of existing legal description boundaries where applicable is included as follows:

Beginning at the Northwest corner of the Southwest Quarter of the Northwest Quarter of Section 33, Township 12 South, Range 7 East, Salt Lake Base & Meridian; thence East 1320 feet, more or less along the North line of the South half of the Northwest Quarter of said Section 33, which is the South line of Parcel 2A-226 in the Carbon County records; thence 1320 feet, more or less to the North-South center line of said Section 33; thence along the North line of the Southwest Quarter of the Northeast Quarter of said Section 33 1320 feet, more or less to the Northeast corner of said Southwest Quarter of the Northeast Quarter; thence along the East line of said Southwest Quarter of the Northeast Quarter 1320 feet more or less, which line is the West property line of Parcel 2A-226 in the Carbon County records, to the Southeast corner of said Southwest Quarter of the Northeast Quarter; thence East 223.47 feet along the North line of the Northeast Quarter of the Southeast Quarter, which is the South line of Parcel 2A-226 in the Carbon County records; thence South 2640 feet, more or less to the South line of the Southeast Quarter of said Section 33; thence South 617 feet, more or less; thence West 223.47 feet more or

less to the West line of Lot 1 of Section 4, Township 13 South, Range 7 East, Salt Lake Base & Meridian; thence West 4183.47 feet, more or less along the South line of said Lot 1, and the South lines of Lots 2, 3 and 4 of said Section 4 to the West line of said Section 4; thence North 617 feet, more or less to the Southwest corner of said Section 33, Township 12 South, Range 7 East, Salt Lake Base & Meridian; thence North 1320 feet, more less to the Northwest corner of the Southwest Quarter of the Southwest Quarter of said Section 33; thence S89°59'00"W 920.00 feet, more or less along the South line of the Northeast Quarter of the Southeast Quarter of Section 32, Township 12 South, Range 7 East, Salt Lake Base & Meridian, which is the North line of Parcel 1B-485 in the Carbon County records to the intersection of the east right-of-way line of Utah State Road 96; thence in a Northerly direction along said east right-of-way line a distance of 270.00 feet; thence in a Northeasterly direction along said highway right-of-way line 317.10 feet; thence N45°32'00"E along said highway right-of-way line 465.40 feet; thence in a Northeasterly direction along said highway right-of-way line 733.00 feet, more or less to the intersection of said highway right-of-way line, and the East boundary of Section 32, which is the West boundary of Section 33; thence N 00°14"11"W 1258.08 feet along the east line of said Section 32, which is the East boundary of Parcel 2A-224 and the West boundary of Parcel 2A-227 in the Carbon County records to the point of beginning.

Excepting a parcel more particularly described as follows:

Commencing at the Southeast quarter of said Northeast quarter of the Southeast quarter of said Section 32, running thence North along the section line 330 feet, more or less to a point 50 feet North of the railway track of the Union Pacific Railway running across said land; thence in a Southwesterly direction parallel with and 50 feet distance from center line of said track, 412.5 feet, more or less to the South line of said Northeast quarter of the Southeast quarter; thence East 132 feet, more or less to the point of beginning. Containing 1 acre, more or less.

Total acreage of the parcel is 448.14 acres.

R645-301-115 Status of Unsuitability Claims

115.100 Information of Unsuitable Areas

Based on available information and to the best of the applicant's knowledge, the permit area is not within and does not include any area designated or under current study for designation as unsuitable for mining.

115.300 Owners of Nearby Buildings and Operating Within 100 Feet of a Public Road

Mining operations will be conducted within 100 feet of Utah State Highway 96, which is a public road. In compliance with the applicable regulatory provisions of Rules R645-103-234.100 through 400, CR has contacted and obtained approval from the Utah Department of Transportation (UDOT) for access to Highway 96. The final design of the mine entrance from Highway 96 will be approved by UDOT and a copy of the approval will be inserted in Exhibit 4, Other Permits. In compliance with R645-103-234.200 opportunity for a public hearing was provided in two public notices for the Kinney No. 2 Mine operation within 100 feet of a public road. The notices were published for two weeks in the local news paper of general circulation and opportunity was provided for the public to request a hearing and any affected owners to present information relating to protection of their interests. No requests for hearing were sent to the UDOGM. Copies of the public notices can be found in Exhibit 5, Public Notice and Proof of Publication, Hearing Notices and Documentation.

One occupied structure exists within 300 feet horizontally of the mine permit area; this structure is a convenience store operated by L2H Enterprises, Carbon County Parcel No. 1B-433-2. Mr. Jim Levanger, VP of L2H by letter dated Feburary 9, 2009 has waived any and all objections to Carbon Resources LLC conducting coal mining operations with 300 feet of his property. A copy of Mr. Levanger's letter can be found in Exhibit 4, Other Permits.

This permit application provides general information relative to the location, sequence, timing, and affected areas for all anticipated mining and reclamation operations over the life of the mine. The proposed timetable for each phase of mining and reclamation is discussed in R645-301-500, Engineering Design and Operation Plans, Reclamation of Mining Disturbance, and illustrated by the Mine Plan Layout & Production Schedule Map, (Map 15).

R645-301-116 Permit Term Information

116.100 Starting and Termination Dates for Mining Operations

The permit term requested for the Kinney No. 2 Mine is 5 years. This permit application provides general information relative to the location, sequence, timing, and affected areas for all anticipated mining and reclamation operations over the life of the mine. The proposed timetable for each phase of mining and reclamation is discussed in R645-301-500, Engineering Design and Operation and Reclamation Plans.

116.200 Request for Permit Term in Excess of Five Years

Although the initial permit term is for 5 years, additional coal reserves are held by CR. These coal reserves are intended to be mined, and are necessary to justify a long term mining plan economically. Additional coal reserves are adjacent to the CR coal reserves and may provide continuation of the Kinney No. 2 Mine if and when those reserves are acquired.

R645-301-117 Insurance and Proof of Publication

117.100 Proof of Liability Insurance

CR will obtain and provide UDOGM with the certificate of insurance prior to initiation of development and mining activities. On receipt, a copy of the certificate of insurance will be submitted to UDOGM for insertion in Exhibit 18, Bonding and Insurance Information, as evidence that CR has a public liability insurance policy in force for the Kinney No. 2 Mine and related operations. The insurance policy will meet all applicable regulatory requirements for minimum coverage, will be maintained in full force during the permit term and all subsequent renewals, and will include a rider providing for notification to UDOGM of any termination or substantive changes in the policy.

117.200 Proof of Publication

Upon receipt of notification that UDOGM determined the permit application to be administratively complete, CR placed the public notice advertisement in the Sun Advocate for publication once per week for a period of four weeks on June 24, July 1, 8 and 15, 2008. A second public notice was placed in the same newspaper as per UDOGM direction on June 10, 17, 24 and July 1, 2010. Copies of the proofs of publication for the public notices can be found

in Exhibit 5, Public Notice and Proof of Publication, Hearing Notices and Documentation. Any public notices and proof of publication documentation for future permit revisions will also be inserted in Exhibit 5.

117.300 Facilities Shared With Other Operations

No facilities are shared with other operations at the Kinney No. 2 Mine.

R645-301-120 Permit Application Format and Content

The information presented in this permit document represents a compilation of relevant historic information and recent site environmental and planning information developed specifically for the Kinney No. 2 Mine. Within the constraints of applicable regulatory information requirements, CR has endeavored to present permit information in a clear and concise manner.

Permit information has been formatted to address applicable regulatory information requirement in a logical organized manner, and in the regulatory format. Permit format and organization is also designed to facilitate both initial agency review and future use and revision of the permit documents a reference for permit commitments and requirements and as the plan basis for ongoing mining and reclamation operations.

Any references or assumptions which serve to clarify or qualify the information provided are presented and discussed and any technical data utilized as the basis for permit discussions has been reviewed and validated to verify that any conclusions presented have a sound technical basis. The descriptions of legal, financial, compliance, and related Information and environmental resources and the discussions of operation and reclamation plans are supported by relevant tables, figures, maps and exhibits which are included as part of the permit application document. Other information which is either readily available or is too voluminous for inclusion in the permit document has been referenced, as appropriate.

The required notarized verification by a responsible CR official that the information presented in this permit application is true and correct to the best of that individual's information and belief is included on the transmittal which accompanied the permit application submittal.

R645-301-130 Reporting of Technical Data

CR has reviewed sampling, testing, and analysis information developed in conjunction with this permit application and has confirmed that the information was collected, developed, and analyzed by or under the supervision of a competent qualified professional in the discipline under consideration. All laboratory analyses were performed by experienced laboratory personnel using accepted standardized analysis methods.

In order to assure appropriate documentation, technical data presented in this application includes the name(s) of the persons or organizations directly responsible for its collection and analysis, dates of collection and analysis, and a description of collection and analysis methodologies where appropriate.

This application reflects the efforts of numerous individuals and organizations. Considerable time, expense, and many man-hours have been devoted to the collection, analysis, and presentation of technical data and other information contained in this permit application.

Those individuals are identified and listed by organization as follows:

Carbon Resources LLC

J.H.W. Reeves	CEO
M. Clay Wisdom	CFO

Geo-Hunt Consulting LLC

Gregory L. Hunt, M.S.	Geologist
Eric Robeck, M.S.	Geologist

Rock Logic LLC

Brad Lindsey, B.S.	Geologist

Hansen, Allen & Luce, Inc, Engineers

David Hansen, PhD, P.E.	Hydrology, Engineering
Tyler Shelley, P.E.	Hydrology
David Bruse	Land Technologist
Ben Grimes, P.L.S.	Surveying, Permitting Specialist

Mt Nebo Scientific

Patrick D. Collins, PhD	Botanist

Bruce Chesler BA Soil Science	Soils Scientist

Rollins, Brown & Gunnell Engineers

Brad Price, P.E.	Geotechnical Engineering

Randall Peterson, P.E.	Mining Engineering

Risun Technologies

William Simmons, P.E.	Facilities Engineer
Bill Whitney. P.E.	Facilities Engineer

Gault Group, Inc.

Major N. Kindsfater, B.S.	Environmental Engineer, Air Quality
Ben Grimes, P.L.S.	Permitting Specialist, Professional Land Surveyor

R645-301-140 Maps and Plans

All maps included in the permit application document are based on either U.S. Geological Survey Mapping or site specific mapping developed using surveyed aerial control and accepted aerial photogrammetry methods. Maps showing overall permit area and regional information are presented at an AutoCAD scale of 1:1, with produced maps at a general scale of 1" = 1,000', or 1"=2,000' for larger areas, and smaller areas down to 1"=100'. The maps also clearly designate the limits of anticipated surface disturbance under this permit application. Rule R645-301-512 and a number of other regulatory provisions specify that certain designated maps and cross-sections be completed under the direction of and certified by a qualified, registered professional engineer, or land surveyor. Those permit maps which have been certified in compliance with applicable regulatory provisions are identified in Chapter 5, R645-301-512, Certification, Inspection, Reporting, and Emergency Procedures.

R645-301-150 Completeness

The information provided in this permit is designed to adequately address and effect compliance with all applicable regulatory provisions. The summaries of applicable regulatory sections addressed included at the beginning of each permit section provide documentation that all regulatory provisions have been addressed and also serve as a ready reference to verify the completeness of the permit application.

Chapter 2

R645-301-200 Soils

Kinney No 2 Mine

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R645-301-200 Soils

R645-301-221 Prime Farmland Investigation

Prime farmland is addressed in the Soil Survey Results in Exhibit 6, Soils Information. In addition, a formal request to the U.S.D.A., Natural Resources Conservation Service (NRCS) for a determination on prime farmland for the permit area. Documentation of the response from the NRCS can be found in Exhibit 2, Prime Farmland Determination.

The NRCS determined that the soils in the area do not meet the criteria for prime, state important, or unique farmlands.

R645-301-222 Soil Survey

The information presented in this section was obtained from various published studies and mine permit related evaluations which have previously been conducted in the area corresponding to the permit and adjacent areas. A soils report was prepared in 1981 by Patrick D. Collins, Botanist/Reclamation Specialist for Western Reserve Coal Company, Inc. for a Mining and Reclamation Permit application for the Kinney No. 2 Mine. In that report, the soils description was taken from the then current United States Department of Agriculture, Soil Conservation Service Soil Survey (USDA-SCS). The soils investigation for the Kinney No. 2 Mine did not use the 1981 report by Dr. Collins because the mine site was extensively modified in 1985-1986 by the Utah Abandoned Mine Reclamation program (AML). That work by AML extensively disturbed the soils in the area, and made the earlier work by Dr. Collins unusable.

A soil survey performed by Bruce Chesler completed in 2006 and updated in 2007 identified 27.3 acres in a total of 28 individual units (areas) containing approximately 68,092 Cubic Yards of Topsoil anticipated to be disturbed during construction of surface facilities. For the complete report of investigation and findings refer to Exhibit 6 for the following:

- Presentation of methods
- Lab analysis and data interpretation
- Potential soil management alternatives discussion
- Soil Survey results
- Soil salvage discussion
- Primary grown medium discussion

Exhibit 6 also includes the following Appendices to the soils survey:

1. ACZ Soil Analysis Data Summary as Spread Sheet Prints, and as individual ACZ Soil Analysis Lab Report Sheets
2. IML Soil Analyses Lab Report Sheets
3. Soil Pedons for 36 Profiles
4. Color Photographs of 36 Soil Pits
5. Color Photographs of Micromonolith Box Samples
6. Official Soil Series Descriptions
7. Reclaimed Coal SGS Lab Sheets

Per the Divisions suggestion, two small topsoil piles have been added west of highway 96, discussed in detail below. These new topsoil piles occupy 0.4 acres of disturbance containing 989 cubic yards of topsoil. This increases the total planned disturbance area to 27.6 acres and the total volume of topsoil to be removed to 68,845 Cubic Yards. Map

34, Topsoil to Be Disturbed - with embedded table, shows the type, distribution, and volume of 30 individual units of planned disturbed topsoil.

222.100 Soil Maps

Refer to Figure 1 in Exhibit 6, Soils Survey. Figure 1 of the Bruce Chesler "Soil Survey Report" has been updated and enlarged for clarity and is presented herein as Map 34 and named (Topsoil To Be Disturbed – with embedded table).

222.200 Soil Identification

Refer to page 3 in Exhibit 6, Soils Survey.

222.300 Soil Description

Refer to page 9 of Exhibit 6, Soils Survey.

222.400 Soil Productivity

Refer to Exhibit 6, Soils Survey.

Productivity at the Kinney No. 2 Mine is an estimate of the annual biomass production of the plant communities at the site as shown in Table 25, Annual Biomass Production of the Plant Communities At the Kinney No. 2 Mine Site.

Table 25
Annual Biomass Production of the Plant Communities
At the Kinney No. 2 Mine Site (Patric Collins PhD)

COMMUNITY TYPE	ANNUAL PRODUCTION (LBS/ACRE)
Sagebrush/Grass (Proposed Disturbance)	1200
Sagebrush/Grass (Reference Area)	1200
Rabbitbrush/Grass	500
Aspen	1100

R645-301-223 Soil Characterization

Refer to page 9 of Exhibit 6, Soils Survey.

R645-301-224 Substitute Topsoil

Refer to page 12 of Exhibit 6, Soils Survey.

"Previously Disturbed" Topsoil will be salvaged and stored separately from the Prime A-Horizon Topsoil, and will serve as substitute topsoil to augment the volume of A-Horizon Topsoil.

R645-301-230 Operation Plan

R645-301-231 General Requirements

The mine facility area will be the only area where direct surface disturbance will occur as a result of the mining and related activities. As described in R645-301-200, Soils Information, the majority of the mine facilities area has been extensively disturbed by previous mining and related activities. No soil salvage occurred at the historic

disturbance activities. In addition, the existing surficial materials over much of the area represent disturbed soils which are intermixed with overburden and coal fines materials. Potential disturbance areas where natural undisturbed soils remain will generally be small, occurring in the southwest corner, in the southeast area at the proposed mine portal area, and a small area in the northeast corner of the proposed mine disturbance area Map 36, Planned Salvage Area Soils Map.

For those limited areas where natural soils remain, if the individual separate area is sufficiently large to allow recovery with conventional mobile equipment, available soils will be recovered and stockpiled for future reclamation use. Given the combined factors of the limited amounts of soil available from new disturbance areas, and the relatively favorable suitability characteristics of existing disturbed soils, disturbed soils will also be recovered and stored from proposed facilities areas prior to facilities construction activities.

Soil materials will be recovered and placed in stockpiles for temporary storage in such a manner as to minimize loss, erosion, or further contamination of these materials. To the extent practicable, stockpiles will be located and oriented to minimize exposure to wind and water erosion and avoid active operating areas, and any stockpile which will remain in-place for over 6 months will be seeded to provide a temporary protective vegetative cover.

231.100 Topsoil Removing and Storage

Soil materials will be recovered from any disturbance area where natural soils exist and the area is large enough to permit soil recovery using conventional mobile equipment and from previously disturbed areas where suitable disturbed soils exist. Soil material will not be recovered from very limited disturbance areas such as power pole locations, steep hill slope areas defined as in excess of 30% slope, or areas where soil recovery is limited by the practical considerations of limited depth or high rock content.

The initial step in recovering available soil materials will be removal of any trees, large bushes or large rocks and boulders which could interfere with recovery operations. These materials will be removed prior to soil recovery using the same equipment used for soil recovery operations; typically a tracked dozed or wheel loader, and placed in one or more debris piles on the margins of the disturbance area. Smaller brush and other vegetative materials will not be removed and will be incorporated into the soil materials during soil recovery operations. Incorporation of vegetative material with the soil provides an effective mulch to stabilize the soil material and increases natural re-establishment of indigenous species through roots, seeds, plant fragments and other plant propagules in the soil material.

Soil recovery operations may take place at any time during the period from early spring through late fall when ground conditions are favorable but will occur prior to any other site disturbance activities. CR will generally utilize tractor scrapers or a combination of tracked dozers, wheel loaders, and rear dump trucks to recover, transport, and place available soil and substitute materials. Soil materials will be removed in horizontal layers by either a tractor scraper or tracked dozer. Where tractor scrapers are utilized, they will load, haul, and place the salvaged soil material in the temporary storage stockpiles directly. Where tracked dozers are utilized for material removal, the soil material will be pushed into temporary piles. A wheel loader will then either load from the temporary pile, transport, and place the material in stockpile if the stockpile is located in close proximity to the recovery area, or will load the material into rear dump trucks which will then transport and place the material in stockpiles.

Given existing limitations on the availability of suitable soil materials, where recoverable undisturbed soils exist, soil recovery operations will focus on removal and salvage of all reasonably recoverable soils. In these areas, available soil material will be recovered to a reasonable depth, or until highly consolidated, coarse fragment content or clayey materials are encountered, if these limiting conditions occur at a shallower depth. In any area where suitable materials exist at depths greater than 3 feet, those materials will be salvaged to a reasonable depth in an effort to provide as much usable material for final reclamation as possible. The soils investigation presented in R645-301-200 found very limited areas where topsoil, or substitute topsoil depths were greater than 3 feet. Considering the high percentage of the proposed disturbance area that has been previously disturbed by pre-SMCRA mining (approximately 74%), it is unlikely that large areas of topsoil exist. Given relatively poor soil development, high rock content, and limited salvage areas, no effort will be made to segregate individual soil horizons since segregation may not be operationally feasible and doing so would not result in any appreciable revegetation benefit.

Generally, maximum recovery depths will be achieved on relatively flat or gently sloping areas where rock content, presence of coaly materials, or natural obstacles are not limiting factors relative to full recovery. To the extent operationally feasible, zones or areas with any significant coal or coal refuse content will be avoided during soil material recovery operations and any coaly significant deposits or accumulation will be excavated and removed to avoid intermixing with topsoil, or topsoil substitute materials. As indicated previously, it is not practicable or possible to totally separate coal fines materials from topsoil or substitute topsoil where the coal is less that about 6 inches thick. A large portion of the proposed disturbance area has been previously disturbed causing the coal fines to be extensively mixed with the soils materials. Where the coaly materials are thicker that about 6 inches, It will be treated as "Reclaimed Coal" and will be removed separately from the soils and sold as a fuel source.

231.200 Suitability of Topsoil Substitute

As documented in Exhibit 6, Soil Survey Report, based on available sampling and testing data, that the disturbed soils are suitable as soil material and that they represent the best available material to support revegetation efforts, CR plans to sample these materials prior to revegetation as described in R645-301-240, Soil Replacement Plans.

As documented in the soils report in Exhibit 6 the results of the soil sample analyses and the field survey of the soils resources, the salvageable soils within the 27.6 acres for the proposed mine facilities are adequate for use as plant growth material. The pre-SMCRA disturbed soil materials are an equivalent vegetative growth media in this area based on the UDOGM suitability criteria. The only parameters of concern relative to suitability of the soils are water holding capacity of soils containing greater than 50% rock content, soil materials with sandy textures, and an accurate determination of the quantity of coal found within the mixture of alternative reclamation materials in disturbed land Map Units DA and DB. While these may be considered limiting factors under the UDOGM Guidelines and may in fact limit maximum vegetation potentials, they do not appear to have had a significant adverse impact on vegetation establishment in the area nor on the natural reinvasion of previously disturbed areas which have not been intentionally revegetated by the Utah AML Program. The available soil materials have been mixed by historic mining activities and by reclamation work completed by the Utah AML Program. This mixing has not greatly affected the ability of the materials to support vegetation, and there is little reason to doubt the same effect for final reclamation of the Kinney No. 2 Mine. The available soil materials will be salvaged, stockpiled, and used for final

reclamation.

231.300 Soil Testing Plan

Given the lack of available natural soils and CR's resultant plans to recover disturbed soils for use as soil material, CR is relying primarily on the baseline soil sampling information presented in Exhibit 6, Soils Survey Information, to establish the relative suitability of disturbed soils as the best material available in the proposed disturbance area to support revegetation efforts. This is based on the available soils sampling and testing information, which included undisturbed and disturbed soil.

Prior to final reclamation Carbon Resources will sample the topsoil storage piles per the UDOGM Topsoil/Overburden Guidelines.

231.400 Construction, Modification and Maintenance

The topsoil stockpiles will be located in stable, protected areas away from active operations, natural water-courses, and coal handling activities to avoid disturbance, loss or contamination of the stored soil resources. To the extent operationally practicable, the stockpile will be located and oriented to minimize exposure to wind and water erosion, utilizing the natural topography or grading to divert drainage away from stockpile area. The stockpile locations have been selected to avoid potential future operations so that once the stockpile is established the soil material will not have to be moved until it is utilized for reclamation. The proposed stockpile locations are shown on Maps 13, Surface Facilities Map, and on Map 38, Topsoil Storage. The largest stockpile is adjacent to Highway 96 at the southwest corner of the permit area, and is as far away and upwind of the coal handling facilities. The small stockpiles are located west of Highway 96, which will provide a barrier from operations. Since the large stockpile location is adjacent to Highway 96, where winter road salting occurs, a six (6) foot thick base (see Map 16, Mine Surface Facilities Area, Pre-Mining, & Post Mining Cross Sections. Also "Volume A" on Map 38, Topsoil Storage, of clean excavated material will be placed to provide a buffer for the topsoil material. Salt migration from the Highway will be isolated from the toe of the topsoil by the highway-side ditch, the berm as shown on Map 24, Drainage and Sediment Control Plan, and the six foot clean excavated material base. The small stockpiles on the West side of Highway 92 are farther away from the highway than the large stockpile and it is believed that road salt will not be a contaminating factor for the small stockpiles.

The topsoil stockpiles will be constructed by placing soil materials in successive horizontal layers with stockpile side slopes at 2H: 1V or less. Stockpile construction activities will be designed to minimize compaction of the soil resource to the extent operationally feasible. Where necessary to prevent erosion of stockpiled material by up gradient drainage, temporary berms or diversion ditches will be used to intercept and route drainage around the stockpiles. The large topsoil stockpile lies on the outside fill slope if the Office Pad, and will be isolated from pad by a berm as shown on Map 16, Mine Surface Facilities Area, Pre-Mining, Mining & Post Mining Cross Sections – Section A-A'. Drainage from the stockpile areas will be controlled by the proposed surface drainage and sediment control system as described in R645-301-730, Hydrologic Resource Protection. In order to stabilize and minimize erosion of the stockpiled material the surface of the soil stockpile will be left in a roughened condition to minimize erosion and runoff. Any long-term stockpile which will remain in-place for over 6 months will be seeded with a rapid-germinating temporary seed mixture as described in R645-301-340, Habitat Restoration Plan, to provide a protective vegetative cover. Seeding will normally occur as soon as reasonably feasible once active soil stockpiling operations cease for a given stockpile area. In addition, each soil and substitute stockpile will be identified by

durable signs placed so as to be readily visible from the closest point of access. Stockpile areas will be inspected on a regular basis and any significant erosion or other problems will be noted and repaired.

R645-301-232 Topsoil and Subsoil Removal

232.100 Topsoil Removal Prior to Disturbance

Soil material recovery areas and volumes for proposed mining and related surface disturbance are summarized on Figure 1, Soil Map Unit ID Legend with Sampled Soil Profile Locations, found in the Soil Survey Report, Kinney No. 2 Mine, Carbon County, Utah located in Exhibit 6, Soils Information. This information is also displayed on Maps 36, Planned Salvage Area Soil Map, and Map 37, Planned Topsoil Cut Design, which are enlarged versions of Figure 1.

The soil removal thicknesses and volumes are estimates based on extensive field sampling of both disturbed and undisturbed soils in the proposed surface disturbance area. Actual recovery depths, and therefore volumes, may vary dependent on site-specific conditions and practical operating limitations. In order to assure that all operationally recoverable soil material is removed and stockpiled for later reclamation use, soil recovery operations will be supervised and monitored by a qualified and experienced reclamation specialist/soil scientist. Actual soil recovery depths and volumes will be documented and any site-specific limitations on soil recovery will be noted and described. Following completion of soil removal operations, a narrative description of soil recovery operations along with appropriate supporting documentation will be prepared and incorporated into the next Annual Reclamation Monitoring Report for submittal to UDOGM and forms C1-C2 will also be provided for update of the MRP. Any variations between actual and projected soil recovery depths and volumes (as outlined on Figure 1 of the soils report referenced above) will be identified and explained.

CR will remove all available soil material to a maximum depth of 3 feet in areas where good topsoil exists, or until highly consolidated, excessive coarse fragment content, or clayey materials are encountered. Recognizing that the soil volumes calculated are based on limited soil pits and other investigation means, and that volumes could vary, CR will make every effort to salvage good soil materials where they are encountered up to the total volume available in the topsoil stockpile. Soil removal operations will be dependent on the topographic configuration of the recovery area and site specific conditions encountered. In order, therefore, to assure compliance with this permit commitment, CR will commit to supervision of all topsoil salvage operations by an experienced reclamation specialist/soil scientist who will assure that all available soil materials are removed prior to any mining-related disturbance. The results of the soil removal operations will then be reported in the Annual Reclamation Monitoring Report which will contain a written narrative documenting actual soil recovery thicknesses and volumes and comparing actual recovery versus projected recovery (as outlined on Figure 1 of the soils report in Exhibit 6). For any areas where either less or more soil material is recovered than originally projected, the narrative will address the reasons for any soil recovery limitations and associated soil losses or increases in recoverable soil depths.

Areas where site conditions would preclude soil salvage include rock outcrop areas, areas where large boulders occurred, where coaly materials preclude soil salvage, where very thin topsoil occurs on >30% slopes and cannot be retrieved without mixing with subsoils, and in areas where the safety factor for equipment and operators precludes operating safely.

Based on the field measurements, soil volumes for each soil map unit can be found on Table 8 of the soils report found in Exhibit 6, Soils Information, for a total volume of 68,092.4 cubic yards for the proposed disturbance on 27.3 acres as shown on Map 13, Surface Facilities Map, labeled Disturbance Boundary and Map 34, Topsoil To Be Disturbed. The topsoil volume estimate of 68,092 .4 cubic yards included in R645-301-200 has been estimated from the 36 soils backhoe pits, hand dug pits, and road cut excavations (see Figure 1 in the soils report in Exhibit 6.

Per the Divisions suggestion, two small topsoil piles have been added west of highway 96, discussed in detail below. These new topsoil piles occupy 0.4 acres of disturbance containing 989 cubic yards of topsoil. This increases the total planned disturbance area to 27.6 acres and the total volume of topsoil to be removed to 68,744 Cubic Yards as shown on Map 34, (Topsoil To Be Disturbed), and in Table 23, Topsoil Balance. The topsoil stockpile maximum volume is 54,966, therefore this amount is the total that can be salvaged for final reclamation. This will provide 1.24 feet, or 14.8 inches of topsoil available for reclamation as follows:

Total Salvaged Topsoil (A-Horizon + B-Horizon + Previously Disturbed) =

$$\frac{\frac{54{,}966 \text{ CY X } 27 \text{ CF/CY}}{27.6 \text{ ACRES}}}{43{,}560 \text{ SF/ACRE}} = 1.23 \text{ FT or } 14.8 \text{ INCHES}$$

As shown in Table 23, and discussed below, the 20,271 cubic yards of A-Horizon Topsoil is sufficient to cover the entire 27.6 acres of planned disturbed area with a 5.5 inches thick covering as shown in the following calculation.

$$\text{A-Horizon} = \frac{\frac{20{,}271 \text{ CY X } 27 \text{ CF/CY}}{27.6 \text{ ACRES}}}{43{,}560 \text{ SF/ACRE}} = 0.45 \text{ FT or } 5.5 \text{ INCHES}$$

Nearly 30% of the total planed disturbed area is on a slope exceeding 30% which is deemed too steep to effectively salvage topsoil and separate it from the underlying subsoil Map 33, Slope Analysis Map - with embedded table. Therefore, of the total 68,744 Cubic Yards of Topsoil anticipated to be disturbed, total salvageable topsoil is calculated at 54,966 cubic yards leaving 13,778 cubic yards (from >30% slope)of planned disturbed topsoil to be mixed with the fill material. Of the 54,966 cubic yards of topsoil to be salvaged 20,271 cubic yards consist of prime A-horizon topsoil. The 34,695 cubic yards balance of salvaged topsoil consists of 1,520 cubic yards of B-horizon topsoil and 33,175 cubic yards of previously disturbed topsoil shown on Map 36, Planned Salvage Area Soil Map - with embedded table, and on TABLE 23, Top Soil Balance, below.

TABLE 23

TOPSOIL BALANCE			
CUT- TOPSOIL DISTURBED		**FILL - TOPSOIL STORAGE PILES**	
Planned Disturbance Total	68,744		
Planned Salvageable			
A-Horizon	20,271	SW of Parking Lot TS Pile	18,223
		West of Highway N	612
		West of Highway S	1,436
B-Horizon	1,520	Beneath Parking Lot TS Pile	1,520
Previously Disturbed	33,175	Beneath Parking Lot TS Pile	33,175
Planned Salvable Total	54,966	Planned Storage Pile Total	54,966

(All Values in Cubic Yards)

The following sections describe these specific soil and substitute salvage, handling, and storage practices.

Within the ability of equipment operators, to vary the recovery depth, and considering safety factors when operating on steep slopes, topsoil will be recovered per the cut plan shown on Map 37, Planned Topsoil Cut Design, which shows depth of topsoil removal for all the salvageable topsoil.

Salvaged topsoil will be placed in a combination of four topsoil piles, explained in detail below. The prime A-Horizon topsoil will be placed in a combination of three topsoil piles that are covered with vegetation for stabilization. The salvaged B-horizon topsoil and the salvaged "Previously Disturbed Topsoil" will be stored in a topsoil pile as part of the fill located beneath the asphalt covered bathhouse parking lot Map 38, Topsoil Storage - with x-section).

Essential Steps in the plan for removal, salvage and storage of topsoil are:

1. Clean the operations pad area of all debris, metal objects and junk that were not properly buried during the previous (AML) reclamation effort.
2. Remove the topsoil from the bathhouse area including the bathhouse parking lot area which totals 18,153 cubic yards of prime A-horizon topsoil (3,147 cubic yards from unit 2A1 and 15,000 cubic yards from unit 2A2), and 1,650 cubic yards of previously disturbed topsoil from combined units DA-1 and DA-2, Map 34,Toposoil to be disturbed – with embedded table .
3. The 18,153 cubic yards of A-horizon topsoil removed from the bathhouse area will be distributed in storage piles thus:
    a. 2,047 cubic yards will be placed in the two topsoil piles west of the highway (North 612 cubic yards and South 1,436 cubic yards).
    b. 16,106 cubic yards, which is the balance of the 18,153 cubic yards of A-horizon topsoil, will be placed in a temporary topsoil stockpile on the operations pad Map 38 Topsoil Storage, with x-section.
4. The 1,650 cubic yards of previously disturbed topsoil (DA-1 and DA-2) removed from the bathhouse area will also be placed in a temporary topsoil stockpile on

the operations pad separated from the A-horizon temporary topsoil pad Map 38, Topsoil Storage - with x-section.

5. The remaining 1,226 cubic yards of A-Horizon topsoil removed from, 2A-3, 2A-4, 2A-5, and 2A-7, will be removed and also stored in the temporary A-horizon stockpile on the operations pad Map 38, Topsoil Storage - with x-section.
6. The bathhouse area that includes the future parking lot will be re-shaped to accommodate the future A-Horizon Topsoil Stockpile as well as the previously disturbed topsoil stockpile by:
    a. Placing sterile sub-soil fill as "Volume A" shown on Map 38, Topsoil Storage - with x-section, and Map 39, Top Soil 3D Sequence, which is an underlayment for "Volume B" Map 38, Topsoil Storage - with x-section), and Map 39, Top Soil 3D Sequence. "Volume B" is the main A-horizon topsoil pile; Volume A (fill) is used to elevate Volume B topsoil above level of the highway and prevent Volume B topsoil pile from being contaminated by salt and other debris from the nearby Highway 96.
    b. Next haul temporary topsoil stockpile of previously disturbed topsoil (DA-1 and DA-2) as the first fill forming the 2-1 layback "batter" which is the headwall (east side) of the Volume B space Map 39, Top Soil 3D Sequence.
    c. The base of Volume B and the east end headwall "batter" will be carefully surveyed and plastic fabric "marking strips" will be laid down to mark the boundary between Volume B the A-Horizon topsoil from the underlying Volume A composed of sterile fill and previously disturbed topsoil. This will enable crews to clearly identify the extent of the A-Horizon topsoil, Volume B, during final reclamation.
7. Salvage the remaining topsoil from all the remaining units, except that underlying the temporary A-Horizon topsoil pile on the future operations pad, and place the 1,226.3 cubic yards of remaining A-Horizon (Units; 2A-3, 2A-4, 2A-5, 2A, 7) on that temporary A-horizon topsoil pile and the approximately 33,175 cy of previously disturbed topsoil in the bathhouse area south-west end, beneath the future paved parking lot to complete the "batter" for Volume B Map 39, Top Soil 3D Sequence. This space, "Volume D" Map 38, Topsoil Storage - with x-section, has ample capacity (exceeds 88,000 cubic yards) to accept all of the remaining previously disturbed topsoil.
8. The bathhouse area will then be filled with cut material, from the portal pad and access roads construction, up to final grade leaving enough room to accept the previously disturbed topsoil remaining beneath the temporary A-horizon topsoil pile.
9. Topsoil from the temporary A-horizon topsoil pile will next be placed into the Volume B space prepared to accept it on the west side of the bathhouse parking lot Map 38, Topsoil Storage - with x-section, and Map 39, Top Soil 3D Sequence.
10. Should there be more A-horizon topsoil encountered during excavation than presently contemplated there is excess storage capacity available both in the temporary A-horizon topsoil pile and in the permanent A-horizon topsoil pile on the south west side of the bathhouse area. This excess storage capacity is labeled Volume C which is an upward extension of Volume B, Map 38, Topsoil Storage, - with x-section, and Map 39, Top Soil 3D Sequence. Volume C would create a "berm" along the southwest side of the bathhouse parking lot which would have utility as a visual and audio screen between Scofield Town and the bathhouse parking lot in addition to providing topsoil storage.
11. The topsoil storage piles, described above, excepting Volume D (beneath the Bathhouse Parking Lot), and the small Temporary Previously Disturbed Top Soil Pile on the future operations pad, have been modeled in 3D and detail designs for construction are presented in the following series of Maps. Map 40, A-Horizon

Topsoil Temporary Storage Design, Map 41, Volume A Fill Design, Map 42, Volume B Topsoil Pile Design, Map 43, West Side Topsoil Piles Design, and Map 44, Volume C Topsoil Pile Design.

12. The small amount of previously disturbed topsoil beneath the temporary A-horizon topsoil pile will next be placed onto the large capacity bathhouse parking lot topsoil pile Volume D.
13. The approximately 12,000 cubic yards of "RECLAIMED COAL", buried on the old Columbine Mine surface pads Map 45, Reclaimed Coal thickness – with embedded table, will next be scraped together and transported to the Savage/Arch wash plant on Ridge Road south of Price UT under a written agreement with Arch Minerals. There are two tables embedded in Map 45, Reclaimed Coal Thickness – with embedded table, one displays the available analysis of this coal and the second summarizes the volume of this reclaimed coal.
14. Stabilize topsoil stockpiles by reseeding, mulching, and erosion controls.
15. Completion of the cut and fills needed to site the surface infrastructure.

232.200 Insufficient Topsoil

Given the lack of available natural soils and CR's resultant plans to recover disturbed soils for use as soil material, CR is relying primarily on the baseline soil sampling information presented in Exhibit 6, Soils Survey Information, to establish the relative suitability of disturbed soils as the best material available in the proposed disturbance area to support revegetation efforts. Based on the available soils sampling and testing information, which included undisturbed and disturbed soil, the following summarizes the overall suitability of disturbed soils and topsoil as soil material based on the UDOGM Topsoil/Overburden Guidelines:

As documented in the soils report in Exhibit 6 the results of the soil sample analyses and the field survey of the soils resources, the salvageable soils within the 27.6 acres for the proposed mine facilities are adequate for use as plant growth material. The pre-SMCRA disturbed soil materials are an equivalent vegetative growth media in this area based on the UDOGM suitability criteria. The only parameters of concern relative to suitability of the soils are water holding capacity of soils containing greater than 50% rock content, slope gradients of over 30% affecting use of soil salvage machinery, soil materials with sandy textures, and an accurate determination of the quantity of coal found within the mixture of alternative reclamation materials in disturbed land Map Units DA and DB. While these may be considered limiting factors under the UDOGM Guidelines and may in fact limit maximum vegetation potentials, they do not appear to have had a significant adverse impact on vegetation establishment in the area nor on the natural reinvasion of previously disturbed areas which have not been intentionally revegetated by the Utah AML Program. The available soil materials have been mixed by historic mining activities and by reclamation work completed by the Utah AML Program. This mixing has not greatly affected the ability of the materials to support vegetation, and there is little reason to doubt the same effect for final reclamation of the Kinney No. 2 Mine. The available soil materials will be salvaged, stockpiled, and used for final reclamation.

While it is documented in Exhibit 6, Soil Survey Report, based on available sampling and testing data, that the disturbed soils are suitable as soil material and that they represent the best available material to support revegetation efforts, CR plans to sample these materials prior revegetation as described in R645-301-200, Soil Replacement Plans.

232.300 Topsoil Material Less Than 6" Thick

The mine facility area will be the only area where direct surface disturbance will occur as a result of the mining and related activities. As described in R645-301-200, Soils Information, the majority of the mine facilities area has been extensively disturbed by previous mining and related activities. No soil salvage occurred at the historic disturbance activities. In addition, the existing surficial materials over much of the area represent disturbed soils which are intermixed with overburden and coal fines materials. Potential disturbance areas where natural undisturbed soils remain will generally be small, occurring in the southwest corner, in the southeast area at the proposed mine portal area, and a small area in the northeast corner of the proposed mine disturbance area.

For those limited areas where natural soils remain, if the area is sufficiently large to allow recovery with conventional mobile equipment, available soils will be recovered and stockpiled for future reclamation use. Given the combined factors of the limited amounts of soil available from new disturbance areas, and the relatively favorable suitability characteristics of existing disturbed soils, disturbed soils will also be recovered from proposed facilities areas prior to redisturbance.

Soil materials will be recovered and placed in stockpiles for temporary storage in such a manner as to minimize loss, erosion, or further contamination of these materials. To the extent practicable, stockpiles will be located and oriented to minimize exposure to wind and water erosion and avoid active operating areas, and any stockpile which will remain in-place for over 6 months will be seeded to provide a temporary protective vegetative cover.

232.400 Area Where Topsoil Will Not Be Recovered

In areas where extensive coal fines and other unsuitable materials exist, no materials will be salvaged. These materials will be removed separately from topsoil and substitute materials, and will be disposed of as discussed in other sections of this permit application.

In areas where slopes exceed 30% no topsoil will be recovered but will be taken together with the cut material and not segregated. Topsoil will not be salvaged from areas where site conditions would preclude soil salvage include rock outcrop areas, areas where large boulders occurred, or where coaly materials preclude soil salvage.

232.500 Subsoil Segregation

Given existing limitations on the availability of suitable soil materials, where recoverable undisturbed soils exist, soil recovery operations will focus on removal and salvage of all reasonably recoverable soils. In these areas, available soil material will be recovered to a reasonable depth, or until highly consolidated, coarse fragment content or clayey materials are encountered, if these limiting conditions occur at a shallower depth. In any area where suitable materials exist at depths greater than 3 feet, those materials will be salvaged to a reasonable depth in an effort to provide as much usable material for final reclamation as possible. The soils investigation presented in R645-301-200 found very limited areas where topsoil, or substitute topsoil depths were greater than 3 feet.

Generally, maximum recovery depths will be achieved on relatively flat or gently sloping areas where rock content, presence of coaly materials, or natural obstacles are not limiting factors relative to full recovery. To the extent operationally feasible, zones or areas with any significant coal or coal refuse content will be avoided during soil material recovery operations and any coaly significant deposits or accumulation will be excavated and removed to avoid intermixing with topsoil, or topsoil substitute materials. As indicated previously, it is not practicable or possible to totally separate coal fines materials from topsoil or substitute topsoil where the coal is less that about 6 inches thick.

A large portion of the proposed disturbance area has been previously disturbed causing the coal fines to be extensively mixed with the soils materials. Where the coaly materials are thicker that about 6 inches, It will be treated as "Reclaimed Coal" and will be removed separately from the soils and sold as a fuel source. Map 45, Reclaimed Coal Thickness – with embedded table, depicts the area where coal fines greater than 6 inches thick are anticipated.

Soil material recovery areas and volumes for proposed mining and related surface disturbance are summarized on Figure 1, Soil Map Unit ID Legend with Sampled Soil Profile Locations, found in the Soil Survey Report, Kinney No. 2 Mine, Carbon County, Utah located in Exhibit 6, Soils Information. The soil removal thicknesses and volumes are estimates based on extensive field sampling in the proposed surface disturbance area. Actual recovery depths, and therefore volumes, may vary dependent on site-specific conditions and practical operating limitations. In order to assure that all operationally recoverable soil material is removed and stockpiled for later reclamation use, soil recovery operations will be supervised and monitored by a qualified and experienced reclamation specialist/soil scientist. Actual soil recovery depths and volumes will be documented and any site-specific limitations on soil recovery will be noted and described. Following completion of soil removal operations, a narrative description of soil recovery operations along with appropriate supporting documentation will be prepared and incorporated into the next Annual Reclamation Monitoring Report for submittal to UDOGM and forms C1-C2 will also be provided for update of the MRP. Any variations between actual and projected soil recovery depths and volumes (as outlined on Figure 1 of the soils report referenced above) will be identified and explained.

CR will remove all available soil material to a maximum depth of 3 feet in areas where good topsoil exists, or until highly consolidated, excessive coarse fragment content, or clayey materials are encountered. Recognizing that the soil volumes calculated are based on limited soil pits and other investigation means, and that volumes could vary, CR will make every effort to salvage good soil materials as encountered up to the total volume available in the topsoil stockpile. Soil removal operations will be dependent on the topographic configuration of the recovery area and site specific conditions encountered. In order to assure compliance with this permit commitment, CR will commit to supervision of all topsoil salvage operations by an experienced reclamation specialist/soil scientist who will assure that all available soil materials are removed prior to any mining-related disturbance. The results of the soil removal operations will then be reported in the Annual Reclamation Monitoring Report which will contain a written narrative documenting actual soil recovery thicknesses and volumes and comparing actual recovery versus projected recovery (as outlined on Figure 1 of the soils report in Exhibit 6). For any areas where either less or more soil material is recovered than originally projected, the narrative will address the reasons for any soil recovery limitations and associated soil losses or increases in recoverable soil depths.

232.600 Timing

The initial step in recovering available soil materials will be removal of any trees, large bushes or large rocks and boulders which could interfere with recovery operations. These materials will be removed prior to soil recovery using the same equipment used for soil recovery operations; typically a tracked dozed or wheel loader, and placed in one or more debris piles on the margins of the disturbance area. Smaller brush and other vegetative materials will not be removed and will be incorporated into the soil materials during soil recovery operations. Incorporation of vegetative material with the soil provides an effective mulch to stabilize the soil material and increases natural re-establishment of indigenous species through roots, seeds, plant fragments and other plant propagules in the soil material.

Soil recovery operations may take place at any time during the period from early spring through late fall when ground conditions are favorable but will occur prior to any other site disturbance activities.

Detailed sequence and timing of topsoil salvage and storage are addressed in Section 232 above.

R645-301-233 Topsoil Substitutes and Supplements

Refer to the discussion of topsoil substitutes above.

For those limited areas where natural soils remain, if the area is sufficiently large to allow recovery with conventional mobile equipment, available soils will be recovered and stockpiled for future reclamation use. Given the combined factors of the limited amounts of soil available from new disturbance areas, and the relatively favorable suitability characteristics of existing disturbed soils, disturbed soils will also be recovered from proposed facilities areas prior to redisturbance.

Soil materials will be recovered from any disturbance area where natural soils exist and the area is large enough to permit soil recovery using conventional mobile equipment and from previously disturbed areas where suitable disturbed soils exist. Soil material will not be recovered from very limited disturbance areas such as power pole locations, steep hill slope areas, or areas where soil recovery is limited by the practical considerations of limited depth or high rock content.

R645-301-234 Topsoil Storage

234.100 Stockpile of Topsoil

Addressed in Section 232 above.

234.210 Topsoil Placement

Addressed in Section 232 above.

234.220 & 234.230 Topsoil Protection

The topsoil stockpiles will be located in stable, protected areas well away from active operations, natural water-courses, and coal handling activities to avoid disturbance, loss or contamination of the stored soil resources. To the extent operationally practicable, the stockpiles will be located and oriented to minimize exposure to wind and water erosion, utilizing the natural topography or grading to divert drainage away from stockpile area. The stockpile locations have been selected to avoid potential future operations so that once the stockpile is established the soil material will not have to be moved until it is utilized for reclamation. The proposed stockpile locations are shown on Map, 13 Surface Facilities Map. The location of the large stockpile is adjacent to Highway 96 at the southwest corner of the permit area, and is as far away and upwind of the coal handling facilities. Since the location of the large stockpile is adjacent to Highway 96, where winter road salting occurs, a six (6) foot thick base (see Map 16, Mine Surface Facilities Area, Pre-Mining, Mining & Post Mining Cross Sections) of clean excavated material will be placed to provide a buffer for the topsoil material. Salt migration from the Highway will be isolated from the toe of the topsoil by the highway-side ditch, the berm as shown on Map 24, Drainage and Sediment Control Plan, and the

six foot clean excavated material base; Volume A, Map 39, Top Soil 3D Sequence. The small stockpiles west of the highway are farther away from the highway than the large stockpile and it is believed that road salt will not be a contaminating factor.

The topsoil stockpiles will be constructed by placing soil materials in successive horizontal layers with stockpile side slopes at 2H: 1V or less. Highly visible plastic strips (thick ribbons) and or geosynthetic fabric will be laid down under the stockpiles prior to placing topsoil on the site to enable easy identification of the topsoil pile – non topsoil pile interface during reclamation. Stockpile construction activities will be designed to minimize compaction of the soil resource to the extent operationally feasible. Where necessary to prevent erosion of stockpiled material by upgradient drainage, temporary berms or diversion ditches will be used to intercept and route drainage around the stockpiles. The large topsoil stockpile lies on the outside fill slope if the Office Pad, and will be isolated from pad by a berm as shown on Map 16, Mine Surface Facilities Area, Pre-Mining, Mining & Post Mining Cross Sections. Drainage from the stockpile area will be controlled by the proposed surface drainage and sediment control system as described in R645-301-700, Hydrologic Resource Protection. In order to stabilize and minimize erosion of the stockpiled material the surface of the soil stockpiles will be left in a roughened condition to minimize erosion and runoff. Any long-term stockpile which will remain in-place for over 6 months will be seeded with a rapid-germinating temporary seed mixture as described in R645-301-300, Habitat Restoration Plan, to provide a protective vegetative cover. Seeding will normally occur as soon as reasonably feasible once active soil stockpiling operations cease for a given stockpile area. In addition, each soil and substitute stockpile will be identified by durable signs placed so as to be readily visible from the closest point of access. Stockpile areas will be inspected on a regular basis and any significant erosion or other problems will be noted and repaired.

234.240 Reclamation Plan

This section of the Kinney No. 2 Mine Permit Application provides both general and specific information relative to the plans and practices which will be utilized to reclaim and restore surface disturbance areas resulting from mining and related operations to condition and productivity comparable to or better than their condition prior to the Kinney No. 2 Mine disturbance consistent with a postmining land use of wildlife habitat, and watershed, which is a Carbon County Zoning designation for the permit area east of the Scofield Town boundary, and for the Scofield Town Commercial Zone designation of the western portion of the surface facilities area. Information sources utilized in developing the reclamation plans presented in this section include the baseline environmental investigations, detailed mining plans, conceptual and detailed facility layouts and designs, detailed drainage and sediment control plans, and specific plans for control, monitoring, and mitigation of mining related impacts, and zoning designations criteria for both Carbon County zones and the Scofield Town zone . The reclamation design information and discussions of reclamation practices presented in this section have been prepared in compliance with applicable provisions of the State of Utah Coal Mining Rules and are intended to provide a reasonable description of the nature, timing, and anticipated results of planned reclamation activities. The reclamation plans presented in this section reflect consideration of the environmental resource information presented in Chapters 3, 4, and 7, Environmental Information, and the mining plans presented in Chapter 5, R645-301-500, Engineering Design and Operations Plans, and are designed to effectively mitigate to the extent operationally practicable the potential effects of mining.

R654-301-241 General Requirements

This section presents and describes soil material replacement plans and practices to be

used in reclaiming disturbed areas resulting from mining and related activities. Information in this section was developed in accordance with applicable regulatory requirements for coal mine permitting in the State of Utah.

The Kinney No. 2 Mine surface facilities area will be the only new surface disturbance area resulting from the planned mining and related activities. During mine construction and development, all available soil and substitute material will be recovered from this area and stockpiled for use in future reclamation. A description of proposed soil recovery and stockpiling plans for this area is presented in R645-301-230 Soil Handling Plans.

Consistent with applicable regulatory requirements, CR will utilize all of the available stockpiled reserves of soil material to establish a relatively uniform thickness of soil material on all reclaimed areas. Soil replacement will follow final backfilling, grading, and drainage reestablishment and replacement plans are designed to provide both suitable growth media and favorable surface conditions for vegetative reestablishment on the reclaimed areas. Soil materials will be placed and handled to protect the soil/substitute resource and minimize loss or degradation to the extent operationally feasible. Following placement soil materials will be sampled and tested according to UDOGM regulations and guidelines to verify suitability for reclamation, any appropriate mitigation measures based on the testing will be implemented, and appropriate surface treatments will be utilized to stabilize and protect the replaced soil materials.

R645-301-242 Soil Redistribution

Generally, soil replacement practices will be essentially the same for all surface disturbance areas and will not vary between soil replacement and soil substitute replacement. Typical soil replacement activities will involve:

- Preparation of the regraded surface
- Establishment of drainages
- Soil recovery from stockpile, placement, and grading
- Soil sampling, testing, and evaluation
- Mitigation of any suitability concerns and application of soil amendments, if required
- Soil stabilization measures
- Reseeding

The following sections describe these specific soil and substitute replacement, testing, and stabilization practices.

Generally, soil replacement and revegetation efforts will be coordinated so that soil materials are revegetated as soon as practically possible following placement. Normally this will involve placement of soil and immediate reseeding.

Following completion of final backfilling, grading, and drainage reestablishment for surface disturbance areas, soil materials will be recovered from the previously established stockpiles and will be hauled, placed, and spread on the regraded areas. Two different methods of soil placement will be utilized based on the slope of the surface. Where slopes are steeper than 30% as shown on Map 33, Slope Analysis Map, soil materials will be placed with track hoes, dozers, and similar equipment due to safety requirements. Areas where the slope is less than 30% as shown on Map 33, Slope Analysis Map, soil materials will be placed with scrapers, dozers and similar equipment where safety requirements dictate. As noted in R645-301-500, Reclamation Practices, the regraded

surface will be left in a roughened condition to control runoff, provide a good bond with the replaced soil/substitute material, and promote moisture infiltration. Prior to soil replacement, regraded surfaces will be deep ripped in the less than 30% slope areas to alleviate compaction and enhance soil bonding. In the areas where the slope is greater than 30% as shown on Map 33, Slope Analysis Map, the regarded surface will be roughened and loosened to provide a good bond with the replaced soil/substitute material and promote moisture infiltration.

Typically either tractor-scrapers, trackhoes, or wheel loaders will be utilized to recover and load the materials from stockpile and either scrapers or trucks will be utilized to haul and place the material. Where tractor scrapers are utilized for recovery, haulage, and placement, the soil material will be spread in thin horizontal lifts as it is placed. If trucks are used for haulage, a tracked dozer, track hoes, or motor graders will be used to spread and distribute the soil material at a relatively uniform thickness. Replacement thickness will generally be controlled visually by the equipment operators but will also be checked and monitored for general consistency by the CR operations supervisor responsible for reclamation activities. Based on the available existing soil stockpile volumes and the soil recovery plans as outlined in R645-301-200, Soil Handling Plans, the following summarizes approximate soil replacement thicknesses for the general disturbance areas:

As described in section 232.100 the salvage volume will result in a covering of 14.8 inches of topsoil as shown below.

Total Salvaged Topsoil (A-Horizon + B-Horizon + Previously Disturbed) =

$$\frac{\dfrac{54{,}966 \text{ CY} \times 27 \text{ CF/CY}}{27.6 \text{ ACRES}}}{43{,}560 \text{ SF/ACRE}} = 1.23 \text{ FT or } 14.8 \text{ INCHES}$$

As shown in Table 23, and discussed below, the 20,271 cubic yards of A-Horizon Topsoil is sufficient to cover the entire 27.6 acres of planned disturbed area with a 5.5 inches thick covering as shown in the following calculation.

$$\text{A-Horizon} = \frac{\dfrac{20{,}271 \text{ CY} \times 27 \text{ CF/CY}}{27.6 \text{ ACRES}}}{43{,}560 \text{ SF/ACRE}} = 0.45 \text{ FT or } 5.5 \text{ INCHES}$$

Soil placement thickness will vary somewhat dependent on terrain and practical operating constraints, however, every effort will be made to establish a uniform, stable soil layer on all regraded areas. To the extent operationally feasible, efforts will be made during placement to limit equipment traffic in order to minimize compaction. On gently sloping areas soil will be replaced parallel to the natural land contour to establish linear contour line features which help to minimize erosion potential

R645-301-243 Soil Nutrients and Amendments

To replace soil biota and promote moisture holding capacity finely chopped native hay at a rate of 3 tons per acre from the current year's crop will be applied to the topsoil after placement to help increase organic content. Topsoil stockpiled for an extended period of time can lose biota and organic content breaks down. This effort has been shown to significantly increase reclamation success.

As described in R645-301-231, Soil Suitability and Testing, both natural soils and the disturbed soils which will be utilized as soil material are generally considered to be suitable materials for use as a revegetation growth medium for the purposes of site reclamation. The primary limitations are the available water holding capacity of soils containing greater than 50% rock content, soil materials with sandy textures, and an accurate determination of the quantity of coal found within the mixture of alternative reclamation materials located in Disturbed Lands Map Units DA and DB. While noted as a concern relative to the UDOGM Topsoil/Overburden Suitability Parameters, these limitations do not seem to be a deterrent to the existing natural vegetation which exists on these soils in the mine area.

In order to optimize overall reclamation success with the materials available, CR will, immediately following soil replacement, collect soil samples from the resoiled areas, complete suitability analysis of the samples, and evaluate the analysis results to assess the need for any corrective measures or soil amendments. Soil samples will be collected at a sampling density of 1 sample for every four acres with sampling grids established to fit the configuration of the reclaimed area. A soil auger or shovel will be used to obtain samples to a depth of approximately 6 to 12 inches, dependent on soil replacement depth. Samples will be analyzed for the suitability parameters included in current UDOGM regulations and guidelines.

If soil analyses result in an indication of potential suitability concerns for any given area, confirmation sampling will be completed at an increased sampling density of one sample for every two to three acres. If confirmation sampling verifies a potential suitability concern, CR will in consultation with UDOGM develop and implement specific remediation plans for the area of concern. Remediation may include the application of soil modifiers or amendments, capping of potentially unsuitable materials with other suitable material, removal and burial of the suspect materials and replacement with known suitable materials, or combinations of these or other measures as appropriate.

In addition to the soil suitability evaluation, CR will utilize the fertility parameters data to determine the need for any soil amendments to promote effective revegetation. One of the problems with long-term storage of soil materials in stockpile is that soil organic material and beneficial mycorrhizal fungi are lost. In order to address this problem, CR proposes to deep rip (up to 3 feet) along the contour the regraded surface in areas where the slope is 30% or less as shown on Map 33, Slope Analysis Map prior to soil replacement and follow ripping with application of finely chopped native hay at a rate of 3 tons per acre from the current years hay crop. In areas where the slope is greater than 30% as shown on Map 33, Slope Analysis Map the surface will be roughened by track hoe thus allowing the application of finely chopped native hay to infiltrate the topsoil or substitute material. Based on mine reclamation experience in the area, this technique has proven very effective in increasing organic content, providing soil biota, and enhancing moisture infiltration and retention with noticeable benefits relative to

vegetative reestablishment and overall reclamation success. Based on the results of soil fertility analysis, CR will also develop site specific recommendations addressing the type and application rates for any indicated soil amendments. These recommendations will be reviewed with UDOGM prior to implementation of any soil amendment programs.

R645-301-244 Soil Stabilization

244.100 Exposed Surface

Areas reclaimed that are too steep to disc (greater than 30%) as shown on Map 33, Slope Analysis Map will be seeded either by hand followed by spaying the seeded areas with an organic mulch with a tackifier approved the Division to stabilize the area, or by spraying on the seed mixture and then an organic mulch with a tackifier approved by the Division to stabilize the area. Seeding and soil stabilization will take place immediately after the topsoil has been placed to prevent erosion.

244.200 Soil Stabilization

Soil materials will be left in a roughened condition to control runoff, limit erosion and soil loss, and promote moisture infiltration. CR will also selectively apply alternative sediment control measures as described in R645-301-730, Hydrologic Resource Protection Plan. Revegetation seeding will occur immediately following soil material placement so additional stabilization measures will not be required prior to seeding. In conjunction with seeding operations, the soil material will be deep ripped, plowed or disked to prepare the seedbed in areas where the slopes are 3.33:1 (30%) or flatter as shown on Map 33 Slope Analysis Map. Where the slopes are steeper than 3.33:1 (30%), gouging, or plowing along the contour will done to prepare the seedbed as dictated by safety standards.

The reclaimed ground surface will be very similar in topography to the pre-mining surface as shown on Map 29, Mine Surface Facilities Area – Postmining Topography and Interim Drainage Control Map. Reclaimed ground gradients can be seen on Map 33, Slope Analysis Map. Deep gouging is the preferred method, with plowing along the contour as an alternative where slope angle allows. In all cases, UGOGM will be consulted prior to seedbed preparation to insure that the reclamation plan is being followed. Following seeding, the reseeded areas with less than 30% slopes as shown on Map 33, Slope Analysis Map will be mulched with straw or native hay at a rate of two tons per acre and the mulch will be crimped into the soil to minimize wind loss. Another method of soil stabilization that may be used in areas with slopes greater than 30% as shown on Map 33, Slope Analysis Map is spray on organic mulch at a rate of 2 tons per acre with a tackifier to stabilize the mulch and seeds. Again, UDOGM will be consulted prior to seeding and soil stabilization to insure the reclamation techniques used are the best for the particular slope, soil type and surface aspect, and that the application rates are appropriate for the slope and time of season when reclamation is done.

244.300 Rills and Gullies

Rills and gullies in excess of 6 inches deep will be regraded and stabilized as soon as practicable on the topsoil stockpile, and in regraded and reclaimed areas if they are deemed to be problematic, and in consultation with UDOGM. Reseeding of these re-treated areas will follow the approved plan including seeding, replanting, mulching, and soil stabilization methods discussed previously.

Chapter 3

R645-301-300 Biology

Kinney No 2 Mine

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R645-301.312 POTENTIAL MINING RELATED IMPACTS TO BIOLOGICAL RESOURCES

Most of the land proposed for new disturbance to construct and operate the Kinney No. 2 Mine has already been disturbed by historical mining and other activities. To the extent reasonably feasible, Carbon Resources (CR) plans to prevent or minimize potential mining related impacts on biological resources by minimizing new surface disturbance to native, undisturbed plant communities and wildlife habitat. Implementation of the following specific control and mitigation measures for those limited areas which represent re-disturbance or new disturbance will effectively minimize potential impacts for these areas. For more information refer to the OPERATION PLAN below (R645-301.330).

R645-301-321 Vegetation Information

Habitat Values, and Vegetation Communities

Comparison of the mining related surface disturbance with previous surface disturbance due to historic mining and related activities and more recent disturbances associated with construction of transportation and electric transmission facilities indicates that there is little potential for any significant vegetation impacts. This conclusion is based on the fact that most potentially significant terrestrial biological impacts have already occurred given the extent and nature of previous development in the surface disturbance areas. In addition, while Utah AML reclamation has been successful in re-establishing vegetative cover and some habitat values, the limited age of reclaimed vegetation and proximity to human activity continue to limit wildlife use. Most of the anticipated surface disturbance for mining and related activities will involve previously disturbed areas. Mining related disturbance of previously undisturbed areas will be negligible. The potential for aquatic impacts is very limited since there are no water sources in the immediate area of the proposed mining surface facilities area. The following s provide additional details relative to potential mining related impacts on individual biological resource values.

Potential Effects on Terrestrial Vegetation, (Includes Sensitive Species and Associated Habitat Values)

Potential impacts on terrestrial vegetation habitat values resulting from the mining and related operations may include:

- Redisturbance of approximately 20.7 acres of disturbed vegetation and habitat occurring on previously disturbed areas
- Temporary loss of approximately 6.9 acres of previously undisturbed vegetation and habitat
- Localized reduction or elimination of certain vegetation types

With regard to sensitive species of vegetation or terrestrial wildlife, no known threatened, endangered, or sensitive vegetation or wildlife species existing within or occupy or utilize surface disturbance areas for their basic life requisites. The potential, therefore, for any significant adverse mining related impacts would be limited to the unlikely situation of an accident involving a transitory animal.

The potential for significant adverse impacts due to redisturbance of previously disturbed areas is low due to existing vegetation and habitat conditions in the proposed disturbance areas. The Utah AML reclamation efforts have resulted in effective reestablishment of vegetation on portions of the previously disturbed areas. While these areas currently provide some cover and forage values, the area is close to Highway 96, and Scofield Town, with their noise, highway traffic, and human presence. These proximity factors and resulting level of human activity in the area are also important factors which tend to preclude significant long-term use by large mammals, raptors, and many other terrestrial wildlife species with current use being limited to opportunistic or seasonal migratory use. The temporary mining related impacts will be effectively mitigated by the comprehensive reclamation program including all surface disturbance areas which will be implemented when the mine facilities are no longer needed to support ongoing operations.

The potential impact of losses of existing vegetation and habitat in previously undisturbed areas will be minimized by the limited areal extent (approximately 6.9 acres) of any new disturbance. Areas of potential new disturbance are immediately adjacent to previously disturbed areas, and as such exhibit some inherent limitations relative to their value as wildlife habitat. Field surveys of potential new disturbance areas did not result in identification of any unique habitat characteristics. Minor vegetation and habitat impacts for any new disturbance areas will be a temporary result of the mining and related operations, however, proposed site reclamation measures will result in effective mitigation of any temporary impacts and in most cases offer the potential for overall enhancement of vegetation and habitat conditions.

321.100 Plant Communities

Refer to Exhibit 6, Vegetation Information

321.200 Productivity of Land

Productivity at the Kinney No. 2 Mine is an estimate of the annual biomass production of the plant communities at the site as follows:

Annual Biomass Production of the Plant Communities
At the Kinney No. 2 Mine Site

COMMUNITY TYPE	ANNUAL PRODUCTION (LBS/ACRE)
Sagebrush/Grass (Proposed Disturbance)	1200
Sagebrush/Grass (Reference Area)	1200
Rabbitbrush/Grass	500
Aspen	1100

R645-301-322 FISH & WILDLIFE INFORMATION

This chapter generally describes existing habitat conditions and potential fish and wildlife resources within the Kinney No. 2 permit and adjacent areas that could be affected or impacted by the mining and reclamation activities. Information presented in this chapter was developed in accordance with applicable regulatory requirements for coal mine permitting in the State of Utah.

R645-301-322.100 Sources of Information

Fish and wildlife resources and habitat values in the permit area and adjacent areas have been characterized in this using information from previous and ongoing baseline characterization and monitoring activities, principally by the State of Utah, Division of Wildlife Resources (UDWR). Existing available information was utilized to the extent possible. UDWR's Utah Conservation Data Center (UCDC) is the central repository for Utah's biodiversity information and has been used extensively to prepare this permit application . In addition, Utah's Sensitive Species List, as well as federally listed threatened (T), endangered (E), and candidate (C) species lists from the U.S. Fish & Wildlife Service (USFWS) have also been consulted. The information resources utilized are summarized below:

- County Lists of Utah's Federally Listed Threatened (T), Endangered (E), and Candidate (C) Plant Species – June 24, 2010.
- Dalton, L.B., J.S. Price, and L.A. Romin. 1990. Fauna of Southeastern Utah and Life Requisites Regarding Their Ecosystems. Publication No. 90-11. Utah Dept. of Nat. Res. Div. of Wildlife Resources. 326 pp.
- Falk, J.A. 1990, Landscape Level Raptor Habitat Association in Northwest Connecticut. M.S. Thesis, Virginia Polytechnic Inst. 127 pp
- Bosakowski, T. and R. Speiser. 1994. Macrohabitat selection by nesting northern goshawks: implications for managing eastern forests. Studies in Avian Biology (16): 46-49.
- Bosakowski. T. and D.G. Smith. 1997. Distribution and species richness of a forest raptor community in relation to urbanization. J. Raptor Res. 31(1):26-33.
- Ellsworth, E. and T. D. Reynolds. 2006. Snowshoe hare (*Lepus americanus*): A technical conservation assessment. USDA Forest Service, Rocky Mountain Region.
- Foresman, K. R. 2001. The wild mammals of Montana. American Society of Mammalogists, Special Publication No. 12. 278 pp. Parks Home Page.
- Hendricks, P., D. L. Genter, and S. Martinez. 2000. Bats of Azure Cave and the Little Rocky Mountains, Montana. Canadian Field-Naturalist 114 :89-97.
- Hendricks, P., and D. Kampwerth. 2001. Roost environments for bats using abandoned mines in southwestern Montana : a preliminary assessment. Report to the U.S. Bureau of Land Management. Montana Natural Heritage Program,

Helena, Montana. 19 pp.

- Hendricks, P. 2000. Preliminary bat inventory of caves and abandoned mines on BLM lands, Judith Mountains, Montana. Montana Natural Heritage Program, Helena, Montana. 21 pp.

- Musclow, H.J. and L.B. Dalton. 1990. Wildlife Mitigation Technologies for Man-Made Impacts. Publication No. 90-3. Utah Dept. of Nat. Res. Div. of Wildlife Resources. 141 pp.

- Multiple historic site-specific investigations, principally by the UDWR. The latest available GIS data and information available from the UDWR has been included in this application.

- Occasional site-specific investigations, observations, and/or notes which have occurred intermittently over the previous two decades.

- Pekins, P.J., F. G. Lindzey, and J.A. Gessaman. 1991. Physical characteristics of blue grouse winter use-trees and roost sites. Great Basin Naturalist 51(3), 1991, pp. 244-248.

- Pelton, M.R. Alex B. Coley, Thomas H. Eason, Diana L. Doan Martinez, Joel A. Pederson, Frank T. van Manen, and Keith M. Weaver. American Black Bear Conservation Action Plan. IUCN Conservation Plans. URL: www.iucn.org/themes/ssc/actionplans/bears/bearsAPchapter8.pdf

- Personal Communications with UDWR Biologists, Wood, C. (Regional Habitat Manager), Beagley, K. (Regional Oil & Gas Biologist), Mead, L. (Regional Biologist) from June, 2007 - Sept., 2007.

- Speiser, R. and T. Bosakowski. 1987. Nest site selection by northern goshawks in northern New Jersey and southeastern New York. Condor 89:387-394

- Squires, J.R and R.T. Reynolds. 1997. Northern Goshawk, No. 298 in Birds of North America series. c/o Academy of Natural Sciences, 1900 Benjamin Franklin Parkway, Philidelphia, Pa. 31 pp.

- UDWR. 2000. Utah black bear management plan. Utah Division of Wildlife Resources. Salt Lake City, UT.

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R645-301-322.200 Site Description of the Proposed Permit & Adjacent Areas

The Kinney No. 2 Mine and permit area are located in Pleasant Valley in central Utah, immediately northeast of the town of Scofield. Primary surface facilities will be located on the west-facing slope of Pleasant Valley within sight of the town, and adjacent to Utah Highway 96. Pleasant Valley contains Mud Creek to the west and approximately one-quarter mile from the closest point of the permit area boundary; it also contains Scofield Reservoir to the northwest, or approximately one-half mile at its closest point (at high water mark). Mud Creek is a tributary to Scofield Reservoir, which in turn flows to the Price River, ultimately reaching the Colorado River.

More than eighty percent of the surface disturbances related to mine development will be in areas which have already been disturbed by previous mining related activities, some of which were reclaimed by the State of Utah, Utah Division of Oil, Gas & Mining's (UDOGMs), Abandoned Mine Reclamation (AMR) program in the 1980's. This percentage may be higher since mining has been conducted in the area since the early 1900's. Historically, there were four mines in the area of the proposed surface facilities of the Kinney No. 2 Mine (Kinney Mine, Columbine Mine, Jones Mine, and the UP Mine). These four mines disturbed approximately 74% of the area estimated to be disturbed by the proposed Kinney No. 2 Mine.

The west-facing slopes of Pleasant Valley contain small, very shallow intermittent drainage channels and moderate pediments that slope gradually toward the bottom of the valley from the ridges to the east of the valley. Elevations in the proposed permit area range between 7,750 feet near the lower end of the facilities area up to about 8,800 feet at the ridge top at the south-central portion of the permit area. The proposed permit area encompasses a portion of the west-facing slope of Pleasant Valley and drains into Mud Creek.

Soils are generally shallow and skeletal in the steeper portions of the proposed permit area. Sandstone is the predominant parent material. As mentioned above, soils in approximately 74% of the surface facilities area have been disturbed by previous mining activities prior to the *Surface Mining Control and Reclamation Act* of 1977 (SMCRA) , and no topsoil salvage for reclamation was conducted. There are very limited areas of deeper and more well developed soils.

The vegetation of the region consists of predominantly sagebrush and rabbitbrush communities with small stands of quaking aspen. In descending order, these communities are encompassed by the montane (6,500 – 12,721 feet elevation), and submontane (5,500 – 8,500 feet elevation) zones.

Other than coal exploration and mining, the predominant land uses of the area include wildlife habitat, livestock rangeland and watershed. A wide variety of wildlife species may potentially utilize habitats within and adjacent to the mine plan area. Species of public interest or species which can also be economically important include moose, mule deer, elk, black bear, blue grouse, sage-grouse, snowshoe hare and several raptor species.

As a reflection of the arid climate and rugged topography of the region, runoff in the surface facilities area are characterized by narrow, high-gradient channels with very little evidence of erosion from the runoff events. Because these drainages receive runoff flows from limited surface areas, ephemeral flows fluctuate significantly, especially in response to spring thaw and major summer thunderstorms. Only one major drainage exists on the proposed permit area; it is located at the extreme east side of the permit block. This drainage, called Eagles Canyon, is a tributary to Scofield Reservoir, and is shown by USGS maps to be generally ephemeral in nature, with no significant flows with the exception of snowmelt runoff and where small springs and seeps surface near the bottom of the canyon. These seeps and springs generally flow in the springtime and early summer in response to snowmelt followed by a significant drop in flows as dry weather begins to predominate. The flows in the bottom of Eagles Canyon, a consequence of seeps and springs, disappear into the canyon alluvium after flowing a short distance.

R645-301-322.210 Threatened, Endangered and Sensitive Species

The Endangered Species Act of 1973 (ESA) requires federal agencies to "*insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species*." 4 of the ESA (Determination of Endangered Species or Threatened Species) grants the Secretary of the Interior power to determine whether any species is considered threatened or endangered. While 7 of the Act (Interagency Cooperation) specifies that all other federal departments and agencies shall take such action necessary to insure that actions authorized, funded, or carried out by them (federal departments and agencies) do not jeopardize the continued existence of any listed species (pursuant to 4) or result in the destruction or modification of critical habitat of such species. It should be noted that all of the permit area is on private property and the coal reserves are either private or are controlled by Carbon County and therefore the only federal action in the Kinney No. 2 Mine operation is concurrence by the Office of Surface Mining and Reclamation, with primacy held by UDOGM.

The consultation process is designed to assist federal agencies when complying with the ESA, and authority of consultation has been delegated by the Secretary of the Interior to the Director

of the USFWS. The consultation process involves several phases. First, a general description of the proposed action and a formal request for a listing of proposed and listed endangered and threatened species potentially affected by the proposed action is submitted to the USFWS by the affected agency (or entity). The USFWS responds with a list of proposed, candidate, and listed species within the proposed permit area. When the project is a construction project, the agency (or entity) then prepares a Biological Assessment (BA) which identifies the project, details the biology of the species on the list submitted by the USFWS, analyzes the cumulative effects of the project, and determines if there is likely to be an effect (either beneficial or adverse) on any listed or proposed species.

If a "may affect" determination is made, the responsible federal agency must request formal consultation with the USFWS.

Formal consultation involves USFWS consideration of the proposed project and how it may affect the biology of any listed threatened or endangered species, including the magnitude of such effects and potential cumulative effects. Based on this information, a Biological Opinion is issued by the USFWS which states one of three possible conclusions: the proposed action (1) may promote the continued existence of the species, (2) is not likely to jeopardize the continued existence of the species, or (3) is likely to jeopardize the continued existence of the species. Reasonable and prudent alternatives must be addressed by the USFWS as part of the Biological Opinion when a determination is made that the proposed project is likely to jeopardize the continued existence of the species.

The following table shows the most recent federally listed plant and animal species) for Carbon County, Utah (updated June 24, 2010).

Table 1: Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts to them as a result of the proposed Kinney No. 2 Mine.

Common Name	Scientific Name	Status*	Site-Specific Notes
Humpback chub	*Gila cypha*	E	Humpback chub in Utah are now confined to a few white-water areas in the Colorado, Green, and White Rivers. These rivers do not occur in the study area. The drainage control measures of the site limit impacts to the downstream drainage of the Colorado River system. There should be no impacts to this species as a result of construction and operation the proposed new mine.

Table 1: Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts to them as a result of the proposed Kinney No. 2 Mine.

Bonytail	*Gila elegans*	E	The bonytail is a very rare minnow originally native to the Colorado River system. These rivers do not occur in the study areas. The drainage control measures of the site limit impacts to the downstream drainage of the Colorado River system. There should be no impacts to this species as a result of construction and operation of the proposed new mine.
Black-footed ferret	*Mustela nigripes*	Ex	Black-footed ferret habitat is primarily prairie grasslands. The ferret has a diet consisting of almost 90% prairie dogs. This habitat and food source does not occur in the study areas. There should be no impacts to this species as a result of construction and operation the proposed new mine.
Clay phacelia	*Phacelia argillacea*	E	The habitats of clay phacelia are usually found in pinyon-juniper and mountain brush plant communities, and typically in clay soils of the Green River formation. Although the mountain brush community occurs near the study area, the geologic formations of the study area were below the Green River formation in geologic strata. Additionally, soil types usually associated with this species were not present in the study areas. There should be no impacts to this species as a result of construction and operation the proposed new mine.

Table 1: Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts to them as a result of the proposed Kinney No. 2 Mine.

Colorado pikeminnow	*Ptychocheilus lucius*	E	The Colorado pikeminnow is a fish that prefers medium to large rivers. With the loss of habitat they are now restricted to the upper Colorado River system. These rivers do not occur in the study area. The drainage control measures of the site limit impacts to the downstream drainage of the Colorado River system. There should be no impacts to this species as a result of construction and operation the proposed new mine.
Uinta Basin hookless cactus	*Sclerocactus wetlandicus*	T	*Sclerocactus wetlandicus* generally occurs on cobblely, gravelly, or rocky surfaces on river terrace deposits along the White and Green Rivers of Utah. *S. wetlandicus* occurs on varying exposures, but is more abundant on south facing exposures, and on slopes to about 30 percent grade; it is most abundant at the point where terrace deposits break from level tops to steeper side slopes. Plant communities and species associated with this species are bud sage, shadscale, black sagebrush and horsebrush. These plant communities nor habitats associated with them occur in the study areas, therefore, there should be no impacts to this species as a result of construction and operation the proposed new mine.

Table 1: Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts to them as a result of the proposed Kinney No. 2 Mine.			
Razorback sucker	*Xyrauchen texanus*	E	This species prefers slow backwater habitats and impoundments in the Colorado River system. UDWR distribution maps of this species for Carbon County shows to occur near the Green River in extreme eastern portion of the county. These rivers do not occur in the study areas. The drainage control measures of the site limit impacts to the downstream drainage of the Colorado River system. There should be no impacts to this species as a result of construction and operation the proposed new mine.
Greater sage-grouse	*Centrocerus urophasianus*	C	*Centrocercus urophasianus* habitat has been documented in and around the project area. UDWR biologists have mapped much of the area to be crucial brooding habitat as well as crucial winter habitat for this species (see Map 2F)

* Status

C = Candidate
E = Endangered
T = Threatened
Ex = Extirpated

Utah Administrative Rule R657-48, Implementation of the Wildlife Species of Concern and Habitat Designation Advisory Committee, specifies designation of certain species categories including, Conservation Species, State Sensitive Species, Wildlife Species of Concern, and creation of the Utah Sensitive Species List. These categories and the Utah Sensitive Species List will be addressed in the following sections.

Conservation Agreement Species
The follow is the only species listed by the State of Utah as a "Conservation Agreement Species" that has the potential to be present within or adjacent to the Kinney No. 2 Mine permit area.

- Northern goshawk (*Accipiter gentilis)*

Species of Concern
The following species have been listed by the State of Utah as "Species of Concern" and have the potential to be present in the general area. These species along with the relevance to their presence in the Kinney No. 2 Mine permit and adjacent areas are discussed later in this .

- Western toad (*Bufo boreas)*
- Smooth greensnake (*Opheodrys vernalis)*
- *Bald eagle (Halianetus leucocephalus)*
- Burrowing owl (*Athene cunicularia)*
- Ferruginous hawk (*Buteo regalis)*
- Black swift (*Cypseloides niger)*
- Long-billed curlew (*Numenius americanus)*
- American white pelican (*Pelecanus erythrorhynchos)*
- Three-toed woodpecker *(Picoides tridactylus)*
- Townsend's big-eared bat (*Corynorhinus townsendii)*
- Spotted bat (*Euderma maculatum)*
- Fringed myotis_(*Myotis thysanodes)*
- White-tailed prairie-dog_(*Cynomys leucurus)*
- Kit fox (*Vulpes macrotis)*

R645-301-220 High-Value Habitats

In 2006, DWR updated their habitat value definitions as described below.

Crucial Value was defined as "habitat on which the local population of wildlife species depends for survival because there are no alternative ranges of habitats available. Crucial Value habitat is essential for the life history requirements of a wildlife species".

Substantial Value was defined as "habitat that is used by a wildlife species but is not crucial for population survival. Degradation or unavailability of substantial value habitat will not lead to significant declines in carrying capacity and/or numbers of the wildlife species in question".

The following species have been described by UDWR geographic information system (GIS) database as having high value habitats. Information and maps about these species have been presented in the following s.

- Black Bear
- Blue Grouse
- Moose
- Mule Deer
- Rocky Mountain Elk
- Sage-Grouse

- Snowshoe Hare

The UDWR GIS database was consulted by project biologists in June 2007 and again in August 2010. The following critical or otherwise important habitats from the database were mapped for the Kinney No. 2 Mine project area.

First, substantial year-long habitat for **black bear** (*Ursus americanus*) has been mapped within and adjacent to the permit area. Additionally, critical year-long habitat has been designated within the project area by the UDWR database (Map 2A).

Next, year-long crucial habitat for **blue grouse** (*Dendragapus obscures*) has also been mapped within and adjacent to the project area (Map 2B).

Blue grouse, as year-long residents of the Wasatch Plateau, prefer open stands of conifers which serve as the principal source of forage. In the warmer months, blue grouse are found in the lower elevation sagebrush, pinyon-juniper, and mixed brush habitats where they can obtain newly developing buds and other tender vegetation. At various times during the breeding and brooding seasons, insects and berries become an important dietary component and habitats which supply these requisites are classified as high-priority. During the colder months, young needles and buds from Douglas-fir and spruce trees at higher elevations provide the necessary forage for survival. Therefore, high elevation coniferous stands rank as critical habitat during the months of December through February for blue grouse. Even though there are no conifer stands in the mine surface disturbance area, the UDWR database shows the permit and adjacent areas to be crucial year-long habitat for blue grouse.

Crucial winter habitat for **moose** (*Alces alces*) has also been designated within and outside the permit area. Additionally, crucial year-long habitat has been mapped within some of the riparian zones just outside the permit area (Map 2C).

Moose are listed by the UDWR as an uncommon inhabitant of the Wasatch Plateau. Moose have a strong affinity for riparian habitats, especially during the late spring through fall periods, and prefer aquatic vegetation. During the winter, moose will browse on twigs and bark of conifers in all areas of their habitat. Because they are strongly associated with riparian habitats during most of the year, they would be primarily found in the Mud Creek riparian area, and in the other riparian areas. Since the mine site is located very near the town of Scofield and Highway 96, moose presence is unlikely in the area. However, there is the possibility of the occasional moose passing through the area.

Mule deer (*Odocoileus hemionus*) habitat has been mapped in the area by UDWR biologists. Mule deer (Herd Unit 17) are common year-long inhabitants of the Wasatch Plateau with crucial summer fawning habitat found in the mine and adjacent areas (Map 2D). Some vertical migration of mule deer occurs in response to seasonal changes, resulting in concentration of populations in lowland areas during winter months. These concentration areas, known as winter range, are variably utilized depending on the severity of the winter. In all cases, this winter range is defined as crucial for mule deer. During more severe winters and certain times of any given winter, the most concentrated use defines the most critical winter range for the general maintenance of the mule deer population. There is no critical winter range in the mine permit area, but there is crucial summer fawning habitat there. Although no specific areas are known, fawning grounds for this herd unit likely occur within the permit area. Use of fawning grounds

during critical periods (June), would be considered to be of crucial value to the mule deer population. The mining operations area is in close proximity to the town of Scofield and Highway 96, and therefore may have less impact on mule deer than would otherwise.

Rocky Mountain elk (*Cervus canadensis*) habitat has been mapped in the area. Crucial summer habitat was mapped throughout the entire area including the permit area (Map 2E).

Rocky mountain elk are inhabitants of the Wasatch Plateau with habitat spanning from the submontane through the montane regions. The local elk population does not exhibit as strong a vertical migration as mule deer; however, such a migration does exist resulting in some concentration during the winter months. These concentration areas, known as winter range, are variably utilized depending on the severity of the winter. In all cases, the summer range is defined as crucial for elk. Although no specific areas are known, calving grounds for this herd unit could possibly occur within the permit area. Use of calving grounds during critical periods (June), would be considered to be of critical value to the elk population. Since the mine operations area lies within close proximity to both the town of Scofield and Highway 96, it is unlikely that elk would use the area for calving due to current human activity.

Sage-grouse (*Centrocercus urophasianus*) habitat has been documented in and around the project area. UDWR biologists have mapped much of the area to be crucial brooding habitat as well as crucial winter habitat for this species (Map 2F).

Sage-grouse are listed on the Utah Sensitive Species List as a species of concern, and are year-round residents of the high plateau and adjacent portions of the permit area which lie east of the mine site. However, within their crucial winter habitat at the site it is also crucial brooding habitat. Sage-grouse only occur in sagebrush dominated vegetation types or communities in close proximity to sagebrush types within the submontane life zone. Open areas (e.g., wet meadows) surrounded by sagebrush are often utilized as strutting grounds during the critical breeding period from March 15 through June 15. Sagebrush stands within a two-mile radius of such sites are also classified as crucial value areas due to their use as brooding habitat following nesting. Following the brooding period, the sage-grouse disperse over the entire substantial use area until about mid-November. No leks have been identified in the mine area.

Finally, the **snowshoe hare** (*Lepus americanus*) also has year-long crucial habitat in a portion of the permit area as well as adjacent to it (Map 2F).

For more information about other species on the Wasatch Plateau, refer to “General Wildlife Occurrence and Use” (Table 2).

Two vegetation maps have been created for the Kinney No. 2 Mine and adjacent area. Map 1A, “Facilities Area Vegetation Map”, is a contour map that shows the native plant communities as well as those areas that have been previously disturbed by historical mining and other activities. Map 1B is a general vegetation map shown on an aerial photograph. Both maps provide information about the habitat types for the wildlife species in the area.

R645-301-230 Other Wildlife Species & Habitat Information of the Permit & Adjacent Areas

There are a number of accepted approaches for habitat definition and evaluation, however, with respect to the proposed permit area and evaluation of potential mining related impacts, two basic approaches are of particular relevance. First, plant communities and physiognomic attributes of a given area can be described relative to habitat value as most species have particular affinities for certain features and conditions of their environment. Second, habitat values for certain geographical areas which correspond to a unique combination of plant community associations and other environmental variables can be described with respect to the necessary life requisites they provide for particular species of wildlife, especially during critical periods of their life cycles.

With respect to the first approach to habitat classification, the major plant communities have been described in R645-301-300, "Vegetation Information", for the permit area. The location and extent of these associations within the proposed permit area are illustrated by the "Regional Vegetation Map", (Map 1A) in the Vegetation Report included in Exhibit 7, Vegetation Information. As indicated in R645-301-300, three plant community types in the permit boundary have been described including Sagebrush/Grasslands Rabbitbrush/Grass (previously disturbed) and Aspen. In addition, there was also a riparian complex associated with Mud Creek. The riparian area was located within one mile of the permit boundary, as can be seen on the Regional & Site Vegetation Map, (Map 1A) in the Vegetation Report included in Exhibit 7, Vegetation Information. Between the permit area and the Mud Creek riparian complex lies an expanse of pastureland.

As mentioned, Scofield Reservoir is located approximately one-half mile from the closest point of the permit boundary. Scofield Reservoir with its associated riparian zone is an important habitat for numerous species of fishes, birds, mammals and amphibians. Relative utility of these habitats is dependent on each species of wildlife, but in general, the riparian bottomlands offer the highest level and greatest diversity of habitat values.

While the permit area occupies only a very small portion of the Wasatch Plateau, it has some of the same plant communities and wildlife habitats that are typical of the montane regions in central Utah. However, the proposed mine facilities area is located in an area that has been impacted by historical and recent mining activities, as well as residential development, commercial development, transportation corridor, and electrical power transmission facilities and operations. It should be noted that generally only three plant communities exist in the permit boundary, the Aspen, Sagebrush/Grass and Rabbitbrush/Grass (previously disturbed). In the general area of the mine site, and within a one mile radius around the permit boundary, there are other communities including a riparian complex along Mud Creek. Given the characteristics of these vegetation types, the permit area could provide potential habitat for approximately 329 species of vertebrate wildlife, including: 7 fish species, 8 amphibians, 17 reptile species, 231 birds, and 66 mammals. Table 2, Potential Wildlife Species of the Wasatch Plateau, identifies those species known to occur in this general area as well as the likelihood of occurrence in the permit area. Of the 329 species identified as occurring in the general area, 92 are known, have potential, or are likely inhabitants of the permit area, and 237 are considered unlikely, or not inhabitants based on known range or habitat preference. Included on this list are several species of wildlife considered to be of high interest to the State of Utah. High interest wildlife are defined as all game species, any economically important species, and any species of special aesthetic, scientific, or educational significance, and those species listed on the Utah

Sensitive Species List. Included in this category are those species of wildlife that are federally listed as endangered or threatened or candidates for these designations.

Given the significant extent of previous and existing disturbance in the proposed surface facilities area and the very limited aerial extent of the new surface disturbance, initial site-specific wildlife baseline studies have been limited to review of available documentation on wildlife occurrence and habitat in the area, ground surveys and aerial raptor surveys. Any supplemental wildlife information requirements will be determined by UDOGM in consultation with state and federal wildlife agencies. In order to address potential mining related wildlife impacts, the following discussion addresses important and/or typical species which may occur as inhabitants or transients in the permit area. An evaluation of the potential for impact is detailed in R645-301-312 and 313 of this application. Only those species of high interest as listed in the Utah Sensitive Species List will be specifically addressed in the following s of this application.

The following Table 2 shows a list of species that are present on the Wasatch Plateau of central Utah of which the Kinney No. 2 Mine is located. Also included about each species listed on the table is the occurrence status in the Wasatch Plateau and legal status.

Follow up information about the sensitive or special status species on the table specific to the project area has been described in another table.

TABLE 2
POTENTIAL WILDLIFE SPECIES OF THE WASATCH PLATEAU

(From Dalton et. Al., 1990, Fauna of Southeastern Utah and Life Requisites Regarding Their Ecosystems. UDWR Publication No.90-11).

* Status in Wasatch Plateau; K = Unknown; C = Common; U = Uncommon; R = Rare; O = Occasional; A = Accidental; L = Limited; P = Protected; N = Unprotected
** Likelihood in Mine Plan Area; K = Known; L = Likely; P = Potential; U = Unlikely; N = None

Federal Status(updated to 2010 status); E = Endangered; EXP = Experimental; T = Threatened; C = Candidate;
Utah Status; C2 = Conservation Agreement; C3 = Species of Concern; EXT = Extirpated

Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
Fishes - *42 species total in Price River, Scofield Reservoir and their tributaries (7 species). *Only those species in the Scofield Reservoir and its tributaries included in table (montane ecological associations).					
1	Cutthroat trout	Oncorhynchus	C	N	
2	Rainbow trout	Oncorhynchus my kiss	C	N	
3	Carp	Cyprinus carpio	C	N	
4	Utah chub	Gila atraria	L	N	
5	Red side shiner	Richardsonius balteatus	C	N	
6	Mountain sucker	Catostomus platyrhynchus	C	N	
7	Waleye	Stizostedion vitreum	O	N	
Reptiles - *17 species total in mine biogeographic area					
1	Leopard lizard	Crotaphytus wislizenii	C	U	
2	Eastern fence lizard	Sceloporus undulates	C	L	
3	Sagebrush lizard	Sceloporus graciosus	C	L	
4	Tree lizard	Urosaurus ornatus	C	U	
5	Side-blotched lizard	Uta stansburiana	C	P	
6	Short-horned lizard	Phrynosoma douglassi	C	P	
7	Rubber boa	Charina bottae	U	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
8	Ring-necked snake	Diadophis punctatus	U	U	
9	Striped whipsnake	Masticophis taeniatus	C	U	
10	Sanoran mountain king	Lampropeltis pyromelana	R	U	
11	Racer	Coluber constrictor	U	U	
12	Smooth greensnake	Opheodrys vernalis	U	U	C3
13	Pine snake	Pituophis melanoleucus	C	P	
14	Milk snake	Lampropeltis triangulum	R	U	
15	Western terrestrial garter snake	Thamnophis elegans	C	U	
16	Common garter snake	*Thamnophis sirtalis*	C	U	
17	Night snake	*Hypsiglena torquata*	C	U	
Amphibians - * 8 species total in mine biogeographic area					
1	Tiger salamander	*Ambystoma tigrinum*	C	U	
2	Great Basin spadefoot toad	*Scaphiopus intermontanus*	C	P	
3	Western toad	*Bufo boreas*	U	U	C3
4	Woodhouse's toad	*Bufo woodhousei*	C	U	
5	Great Plains toad	*Bufo cognatus*	C	U	

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Utah Status; C2 = Conservation Agreement; C3 = Species of Concern; EXT = Extirpated

Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
6	Chorus frog	*Pseudacris triseriata*	C	U	
7	Spotted frog	*Rana pretiosa*	R	U	
8	Leopard frog	*Rana pipiens*	C	U	
Birds – * 231 species total in mine biogeographic area					
1	Common loon	*Gavia immer*	U	U	
2	Horned grebe	*Podiceps auritus*	C	U	
3	Eared grebe	*Podiceps nigricollis*	C	U	
4	Western grebe	*Aechmophorus occidentalis*	C	U	
5	Pied-billed grebe	*Pdoilymbus podiceps*	C	U	
6	White pelican	*Pelecanus erythrorhynchos*	C	U	C3
7	Double-crested cormorant	*Phalacrocorax auritus*	C	U	
8	Great blue heron	*Ardea herodias*	K	U	
9	Black-crowned night heron	*Nycticorax nycticorax*	U	U	
10	Snowy egret	*Egretta thula*	O	U	
11	White-faced ibis	*Plegadis chihi*	T	U	
12	Canada goose	*Branta Canadensis*	C	P	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
13	Snow goose	*Chen caerulescens*	O	P	
14	Mallard	*Anas platyrhynchos*	C	P	
15	Wood duck	*Aix sponsa*	O	U	
16	Gadwall	*Anas strepera*	C	U	
17	Northern pintail	*Anas acuta*	C	P	
18	Green-winged teal	*Anas crecca*	C	P	
19	Blue-winged teal	*Anas discors*	U	P	
20	Cinnamon teal	*Anas cyanoptera*	C	P	
21	American wigeon	*Anas Americana*	C	P	
22	Northern shoveler	*Anas clypeata*	C	P	
23	Redhead	*Aythya mericana*	C	U	
24	Ring-necked duck	*Aythya collaris*	O	U	
25	Canvasback	*Aythya yallisineria*	O	U	
26	Greater scaup	*Aythya marila*	O	U	
27	Lesser scaup	*Aythya affinis*	O	U	
28	Common goldeneye	*Bucciphala clangula*	O	U	
29	Bufflehead	*Bucephala albeola*	U	U	
30	Hooded merganser	*Mergus cucullatus*	O	U	
31	Common merganser	*Mergus merganser*	O	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
32	Red-breasted merganser	*Mergus serrator*	O	U	
33	Turkey vulture	*Cathartes aura*	C	K	
34	Northern goshawk	*Accipiter gentiles*	U	U	C2
35	Sharp-shinned hawk	*Accipiter striatus*	U	U	
36	Cooper's hawk	*Accipiter cooperii*	C	P	
37	Red-tailed hawk	*Buteo jamaicensis*	C	K	
38	Swainson's hawk	*Buteo swainsoni*	R	U	
39	Rough-legged hawk	*Buteau lagopus*	C	U	
40	Ferruginous hawk	*Buteo regalis*	R	U	C3
41	Golden eagle	*Aquila chrysaetos*	C	K	
42	Bald eagle	*Haliaeetus leucocephalus*	U	P	C3
43	Northern harrier	*Circus cvaneus*	C	U	
44	Osprey	*Pandion haliaetus*	U	U	
45	Prairie falcon	*Falco mexicanus*	C	U	
46	Peregrine falcon	*Falco peregrinus*	U	U	
47	American kestrel	*Falco sparverius*	C	U	
48	Blue grouse	*Dendragapus obscurus*	C	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
49	Ruffed grouse	*Bonasa umbellus*	C	U	
50	Sage grouse	*Centrocercus urophasianus*	C	L	C
51	California quail	*Lophortyx californicus*	L	U	
52	Chukar	*Alectoris chukar*	C	U	
53	Common moorhen	*Gallinula chloropus*	A	U	
54	Sora	*Porzana Carolina*	U	U	
55	Virginia rail	*Rallus limicola*	C	U	
56	Whooping crane	*Grus Americana*	E	U	EXT
57	Sandhill crane	*Crus Canadensis*	U	U	
58	American coot	*Fulica Americana*	L	U	
59	Semipalmated plover	*Charadrius semipalmatus*	U	U	
60	Snowy plover	*Charadrius alexandrinus*	R	U	
61	Killdeer	*Charadrius vociferous*	C	U	
62	Mountain plover	*Charadrius montanus*	R	U	
63	Lesser golden plover	*Pluvialis dominica*	U	U	
64	Black-billed plover	*Pluvialis squatarola*	C	U	
65	Common snipe	*Capella gallinago*	C	U	
66	Long-billed curlew	*Numenius americanus*	R	U	C3

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
67	Willet	*Catoptrophorus semipalmatus*	U	U	
68	Spotted sandpiper	*Actitis macularia*	C	U	
69	Solitary sandpiper	*Tringa solitaria*	U	U	
70	Greater yellowlegs	*Tringa melanoleuca*	U	U	
71	Lesser yellowlegs	*Tringa flavipes*	C	U	
72	Pectoral sandpiper	*Calidris melanotos*	U	U	
73	Baird's sandpiper	*Calidris bairdii*	U	U	
74	Least sandpiper	*Calidris minutilloa*	C	U	
75	Western sandpiper	*Calidris mauri*	C	U	
76	Sanderling	*Calidris alba*	U	U	
77	Short-billed dowitcher	*Limnodromus griseus*	U	U	
78	Long-billed dowitcher	*Limnodromus scolopaceus*	C	U	
79	Marbled godwit	*Limosa fedoa*	C	U	
80	American avocet	*Recurvirostra Americana*	C	U	
81	Black-necked stilt	*Himantopus mexicanus*	U	U	
82	Red-necked phalarope	*Phalaropus labatus*	C	U	
83	Wilson's phalarope	*Phalaropus tricolor*	C	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
84	Herring gull	*Larus argentuatus*	U	U	
85	California gull	*Larus californicus*	C	U	
86	Ring-billed gull	*Larus delawarensis*	C	U	
87	Franklin's gull	*Larus pipixcan*	C	U	
88	Bonaparte's gull	*Larus philidelphia*	U	U	
89	Foster's tern	*Sterna foresteri*	C	U	
90	Common tern	*Sterna hirundo*	U	U	
91	Black tern	*Childonias niger*	C	U	
92	Caspian tern	*Hydropprogne caspia*	R	U	
93	Bandtailed pigeon	*Columba fasciata*	O	P	
94	Rock dove	*Columba livia*	C	U	
95	Mourning dove	*Zeniada macroura*	C	L	
96	Yellow-billed cuckoo	*Coccyzus americanus*	R	U	C
97	Common barn-owl	*Tyto alba*	U	U	
98	Great-horned owl	*Bubo virginianus*	C	L	
99	Northern Pygmy owl	*Glaucidium gnoma*	C	P	
100	Burrowing owl	*Athene cunicularia*	L	U	C3
101	Long-eared owl	*Asio otus*	C	P	
102	Northern saw-whet	*Aegolius acadicus*	U	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
	owl				
103	Common nighthawk	*Chordeiles minor*	C	P	
104	Common poorwill	*Phalaehoptilus nuttallii*	C	U	
105	Black swift	*Cypseloides niger*	U	U	C3
106	Black-chinned hummingbird	*Archilochus alexandri*	C	P	
107	Broad-tailed hummingbird	*Selasphorus platycercus*	C	P	
108	Rufous hummingbird	*Selasphorus rufus*	C	P	
109	Calliope hummingbird	*Seellula calliope*	U	U	
110	Belted kingfisher	*Ceryle alcyon*	U	U	
111	Northern flicker	*Colaptes auratus*	C	P	
112	Red-headed woodpecker	*Melanerpes erythrocephalus*	U	U	
113	Williamson's sapsucker	*Sphryapicus thyroids*	R	N	
114	Yellow-bellied sapsucker	*Sphryapicus varius*	C	P	
115	Hairy woodpecker	*Picoides villosus*	C	P	
116	Downy woodpecker	*Picoides pubescens*	C	P	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
117	Three-toed woodpecker	*Picoides tridactylus*	U	U	C3
118	Western kingbird	*Tyrannus verticalis*	C	U	
119	Cassin's kingbird	*Tyrannus vociferans*	U	U	
120	Eastern kingbird	*Tyrannus tyrannus*	C	U	
121	Ash-throated flycatcher	*Mylarchus cinerascens*	C	U	
122	Say's phoebe	*Savornis sava*	C	P	
123	Willow flycatcher	*Empidonax traillii*	C	U	
124	Hammond's flycatcher	*Empidonax hammondii*	U	U	
125	Dusky flycatcher	*Empidonax oberholderi*	C	P	
126	Gray flycatcher	*Empidonax wrightii*	U	U	
127	Olive-sided flycatcher	*Contopus borealis*	U	P	
128	Horned lark	*Eremophila alpestris*	C	U	
129	Cliff swallow	*Hirundo pyrrhonota*	C	U	
130	Barn swallow	*Hirundo rustica*	C	U	
131	Violet-green swallow	*Tachycineta thalassina*	C	P	
132	Tree swallow	*Tachycineta biocolor*	C	U	
133	Bank swallow	*Riparia riparia*	C	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
134	Purple martin	*Progne subis*	R	U	
135	Northern rough-winged swallow	*Stelgidopteryx serripennis*	C	U	
136	Steller's jay	*Cyanocitta stelleri*	C	L	
137	Scrub jay	*Aphelocoma coerulescens*	C	U	
138	Gray jay	*Perisoreus Canadensis*	U	U	
139	Black-billed magpie	*Pica pica*	C	K	
140	Common raven	*Corvus corax*	C	K	
141	American crow	*Corvus brachyrhyncos*	O	U	
142	Pinyon jay	*Gymnorhinus cyanocephala*	C	U	
143	Clark's nutcracker	*Nucifraga Columbiana*	C	U	
144	Black-capped chickadee	*Parus atricapillus*	C	L	
145	Mountain chickadee	*Parus gambelli*	C	L	
146	Plain titmouse	*Parus lnorntus*	U	U	
147	Bushtit	*Psaltriparus minimus*	C	P	
148	White-breasted nuthatch	*Sitta carolinensis*	C	P	
149	Red-breasted	*Sitta Canadensis*	C	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
	nuthatch				
150	Pygmy nuthatch	*Sitta pygmaea*	C	P	
151	Brown creeper	*Certhia Americana*	C	U	
152	American dipper	*Cinclus mexicana*	C	N	
153	House wren	*Troglodytes aedon*	C	P	
154	Rock wren	*Salpinctes obsoletus*	C	U	
155	Canyon wren	*Catherpes mexicanus*	C	U	
156	Marsh wren	*Cistothorus palustris*	L	U	
157	Bewick's wren	*Thryomanes bewickii*	C	U	
158	Blue-gray gnatcatcher	*Polioptila caerulea*	C	U	
159	Sage thrasher	*Oreoscoptes montanus*	C	U	
160	American robin	*Turdus migratorius*	C	L	
161	Hermit thrush	*Catharus gattatus*	C	P	
162	Swainson's thrush	*Catharus ustulatus*	C	P	
163	Western bluebird	*Sialia mexicana*	R	U	
164	Mountain bluebird	*Sialia currucoides*	C	K	
165	Townsend's solitaire	*Myadestes townsendi*	C	P	
166	Golden-crowned	*Regulus satrapa*	U	P	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
	kinglet				
167	Ruby-crowned kinglet	*Regulus calendula*	C	P	
168	Veery	*Catharus fuscoscens*	U	U	
169	American robin	*Turdus migratorius*	C	L	
170	Gray catbird	*Dumetella carolinensis*	U	U	
171	Northern mockingbird	*Mimus polyglottos*	U	U	
172	Water pipet	*Anthus spinoletta*	C	U	
173	Cedar waxwing	*Bombycilla cedrorum*	C	U	
174	Bohemian waxwing	*Bombycilla garrulous*	U	U	
175	Northern shrike	*Lanius excubitor*	U	U	
176	Loggerhead shrike	*Lanius ludovicianus*	C	U	
177	European starling	*Sturnus vulgaris*	C	U	
178	Solitary vireo	*Vireo solitarius*	C	P	
179	Warbling vireo	*Vireo gilvus*	C	L	
180	Orange-crowned warbler	*Vermivora celata*	C	P	
181	Nashville warbler	*Vermivora ruficapilla*	U	U	
182	Yellow warbler	*Dendrioca petechia*	C	L	
183	Magnolia warbler	*Dendrocia magnolia*	R	N	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
184	Yellow-rumped warbler	*Dendrocia coronata*	C	U	
185	Townsend's warbler	*Dendrocia townsendi*	U	U	
186	Black-throated gray warbler	*Dendroica nigrenscens*	C	U	
187	MacGilivray's warbler	*Oporomis tolmiei*	C	P	
188	Virginia's warbler	*Vermivora virginiae*	C	U	
189	Common yellowthroat	*Geothlypis trichas*	L	U	
190	American redstart	*Setophaga ruticilla*	C	U	
191	Yellow-breasted chat	*Lcteria virens*	R	U	
192	Wilson's warbler	*Wilsonia pusilla*	C	U	
193	House sparrow	*Passer domestious*	C	U	
194	Brown-headed cowbird	*Molothrus ater*	C	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
195	Western tanager	*Piranga ludoviciana*	C	P	
196	Black-headed grosbeak	*Pheucticus melanocephalus*	C	P	
197	Rose-breasted grosbeak	*Pheucticus ludovicianus*	O	U	
198	Red-winged blackbird	*Agelaius hoeniceus*	C	U	
199	Rusty blackbird	*Euphagus carolinus*	O	U	
200	Brewer's blackbird	*Euphaqus cyanocephalus*	C	U	
201	Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	C	U	
202	Northern oriole	*Icterus galbula*	C	U	
203	Lazuli bunting	*Passerian amoena*	C	U	
204	Indigo bunting	*Passerina cyanea*	U	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
205	Lark bunting	*Calamospiza melanocorys*	O	U	
206	Green-tailed towhee	*Pipilo chlorurus*	C	L	
207	Rufous-sided townee	*Pipilo erythrophthalamus*	C	U	
208	Vesper sparrow	*Pooecetes gramineus*	C	P	
209	Dark-eyed junco	*Junco hyemalis*	C	L	
210	Tree sparrow	*Spizella arborea*	U	U	
211	Chipping sparrow	*Spizella passerine*	C	L	
212	White-crowned sparrow	*Zonotrichia leucophrys*	C	L	
213	Fox sparrow	*Passerella iliaca*	U	U	
214	Song sparrow	*Melospiza melodia*	C	U	
215	Sage sparrow	*Amphispiza belli*	U	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
216	Black-throated sparrow	*Amphispiza bilineata*	U	U	
217	American tree sparrow	*Spizella arborea*	U	U	
218	Harris' sparrow	*Zonotrichia querula*	U	U	
219	Common grackle	*Ouiscalus quiscula*	A	U	
220	Evening grosbeak	*Coccothraustes vespertinus*	C	P	
221	Lincoln's sparrow	*Melosoiza lincolnii*	U	U	
222	Lesser goldfinch	*Cardvelis Psaltria*	C	U	
223	American goldfinch	*Cardvelis tristis*	C	U	
224	Cassin's finch	*Carpodacus cassinii*	C	U	
225	House finch	*Carpodacus mexicanus*	C	U	
226	Pine grosbeak	*Pinicola enucleator*	U	U	

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** Likelihood in Mine Plan Area; K = Known; L = Likely; P = Potential; U = Unlikely; N = None

Federal Status(updated to 2010 status); E = Endangered; EXP = Experimental; T = Threatened; C = Candidate;
Utah Status; C2 = Conservation Agreement; C3 = Species of Concern; EXT = Extirpated

Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
227	Evening grosbeak	*Coccothraustes vespertinus*	C	U	
228	Rosy finch	*Leucosticte arctoa*	U	U	
229	Common redpoll	*Carduelis fl' ammea*	C	U	
230	Pine siskin	*Carduelis pinus*	C	U	
231	Red crossbill	*Loxia curvirostra*	U	N	
Mammals – * 66 species total in mine biogeographic area					
1	Dwarf shrew	*Sorex nanus*	L	P	
2	Water shrew	*Sorex palustris*	C	U	
3	Merriam's shrew	*Sorex merriami*	U	U	
4	Vagrant shrew	*Sorex vagrans*	U	U	
5	Masked shrew	*Sorex cinereus*	C	U	
6	Little brown myotis	*Myotis lucifugus*	C	P	

TABLE 2
POTENTIAL WILDLIFE SPECIES OF THE WASATCH PLATEAU

(From Dalton et. Al., 1990, Fauna of Southeastern Utah and Life Requisites Regarding Their Ecosystems. UDWR Publication No.90-11).

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Utah Status; C2 = Conservation Agreement; C3 = Species of Concern; EXT = Extirpated

Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
7	Fringed myotis	*Myotis thysanodes*	U	U	C3
8	Long-eared myotis	*Myotis evotis*	C	U	
9	Long-eared myotis	*Myotis volans*	C	U	
10	Yuma myotis	*Myotis yumanensis*	R	U	
11	Silver-haired bat	*Lasioncteris noctivagans*	C	P	
12	Big brown bat	*Eptesicus fuscus*	C	P	
13	Hoary bat	*Lasiurus cinereus*	C	P	
14	Townsend's big-eared bat	*Plecotus townsendii*	C	U	C3
15	Spotted bat	*Euderma maculatum*	U	U	C3
16	Pallid bat	*Antorozous pallidus*	U	U	
17	Pika	*Ochotona princes*	R	N	
18	White-tailed	*Lepus townsendii*	C	L	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
	jackrabbit				
19	Snowshoe hare	*Lepus americanus*	C	P	
20	Black-tailed jackrabbit	*Lepus californicus*	U	U	
21	Nuttall's cottontail	*Sylvilagus nuttallii*	C	P	
22	White-tailed prairie dog	*Cynomys leucurus*	C	N	C3
23	Red squirrel	*Tamiasciurus hudsonicus*	C	U	
24	Rock squirrel	*Spermophilus variegates*	C	U	
25	Uintah ground squirrel	*Spermophilus armatus*	C	U	
26	Golden-mantled ground squirrel	*Spermophilus lateralis*	C	L	
27	Whitetail antelope squirrel	*Ammospermophilus leucurus*	U	N	
28	Yellow-bellied	*Marmota flaviventris*	C	L	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
	marmot				
29	Northern flying squirrel	*Glaucomys sabrinus*	R	N	
30	Least chipmunk	*Tamias minimus*	C	K	
31	Uinta chipmunk	*Tamias umbrinus*	C	U	
32	Cliff chipmunk	*Eutamius dorsalis*	C	U	
33	Northern pocket gopher	*Thomomys talpoides*	C	L	
34	Botta pocket gopher	*Thomomys bottae*	U	U	
35	Ord kangaroo rat	*Dipodomys ordii*	U	U	
36	Beaver	*Castor Canadensis*	C	P	
37	Western harvest mouse	*Reithrodontomys megolotis*	C	P	
38	Canyon mouse	*Peromyscus crinitus*	U	U	

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Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
39	Deer mouse	*Peromyscus maniculatus*	C	L	
40	Brush mouse	*Peromyscus boylei*	C	L	
41	Piñon mouse	*Promyscus truei*	C	U	
42	Brushy-tailed woodrat	*Meotoma cinerei*	C	L	
43	Muskrat	*Ondatra zibethicus*	C	U	
44	Montane vole	*Microtus montanus*	C	L	
45	Long-tailed vole	*Microtus longicaudus*	C	L	
46	Porcupine	*Erethizon dorsatum*	C	P	
47	Coyote	*Canis latrans*	C	L	
48	Red fox	*Vulpes vulpes*	C	L	
49	Kit fox	*Vulpes macrotis*	R	U	C3
50	Black bear	*Ursus americanus*	C	L	

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Utah Status; C2 = Conservation Agreement; C3 = Species of Concern; EXT = Extirpated

Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
51	Ring-tailed cat	*Bassariscus astutus*	U	U	
52	Raccoon	*Procyon lotor*	K	U	
53	Short-tailed weasel	*Mustela erminea*	K	U	
54	Long-tailed weasel	*Mustela frenata*	C	L	
55	Mink	*Mustela vison*	L	U	
56	Black-footed ferret	*Mustela nigripes*	U	U	E – EXP
57	Marten	*Martes Americana*	R	U	
58	Badger	*Taxidea taxus*	C	L	
59	Striped skunk	*Mephitus mephitus*	C	L	
60	Bobcat	*Felis rufus*	U	P	
61	Canada lynx	*Felis lynx canadensis*	R	U	T
62	Mountain lion	*Felis concolor*	C	L	

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Federal Status(updated to 2010 status); E = Endangered; EXP = Experimental; T = Threatened; C = Candidate;
Utah Status; C2 = Conservation Agreement; C3 = Species of Concern; EXT = Extirpated

Life Form	Common Name	Scientific Name	Status in Wasatch Plateau *	Likelihood In Mine Plan Area **	T & E Status
63	Mule deer	*Odocoileus hemionus*	C	K	
64	Rocky mountain elk	*Cervus elaphus*	C	K	
65	Moose	*Alces alces*	U	U	
66	Northern river otter	*Lutra canadensis*	R	U	

Amphibians

Eight species of amphibians, as listed on Table 2, "Potential Wildlife Species of the Wasatch Plateau", are believed to be potential inhabitants of the biogeographic area in which the permit and adjacent areas are located. However, only one amphibious species is categorized as possible, or a likely inhabitant of the permit area. The western toad is the only species listed on the Utah Sensitive Species List that has the potential to inhabit the mine permit area. Refer to Table 2A for more detail about this species.

Fishes

Seven (7) species of fishes, as listed on Table 2, "Potential Wildlife Species of the Wasatch Plateau", are believed to be potential inhabitants of the biogeographic area in which the permit area is located. There are 42 species of freshwater fish inhabiting southeastern Utah's streams and lakes, however, only the seven potential species listed in the UDWR database are included in this permit application. Since Pleasant Valley and its tributaries in the proposed

mine's geographic area all drain into Scofield Reservoir, only those species in the UDWR database included for the Scofield Reservoir and its tributaries are included in Table 2. There are no species on the Utah Sensitive Species List that inhabit the mine permit area, or the Scofield drainage area. Because there are no streams or lakes within the permit boundary there is no potential for fish species to exist in the permit boundary.

Reptiles

Seventeen (17) species of reptiles, as listed on Table 2, "Potential Wildlife Species of the Wasatch Plateau", are believed to be potential inhabitants of the biogeographic area in which the permit area is located. Only 5 reptile species are categorized as likely or possible inhabitants of the permit area. The other 12 species are considered unlikely to inhabit the permit area due to their affinity for riparian areas. The only species listed on the Utah Sensitive Species List that may inhabit the area is the smooth greensnake (*Opheodrys vernalis*), but it is considered uncommon to the area. This species prefers meadows and riparian areas and thus is unlikely to inhabit the mine operations area east of Highway 96. For more details about this species, refer to Table 3.

Birds

Two hundred thirty one (231) species of birds, as listed by Table 2, "Potential Wildlife Species of the Wasatch Plateau", are believed to be potential inhabitants of the biogeographic area in which the permit area is located. However, only 92 bird species are categorized as potential, likely, or known inhabitants of the permit area. Of these 92 species, 11 are on the Utah Sensitive Species List, and have been discussed in Table 2A.

Waterfowl (ducks and geese), all of which are considered to be of high interest to the State of Utah due to their status as "gamebirds", are represented by 21 species that may, on occasion or seasonally, occur as minor inhabitants or transients in the general permit area. Of these, only nine (9) species could reasonably be expected to occur in the permit area, other than on an occasional basis. In general, the limited riparian and wetland vegetation types encompassed by the proposed permit area and adjacent areas provide marginally suitable habitat values for these nine (9) and possibly other waterfowl species. Each species has different life prerequisites. The nature and frequency of use of the riparian and wetland habitats found in the area may vary significantly. The importance, however, of these habitats for breeding purposes results in their being ranked as high-priority if utilized during the breeding period though such use is not expected.

The mine plan area provides substantial potential habitat for a variety of raptor species including the: turkey vulture, golden eagle, bald eagle, osprey, prairie falcon, peregrine falcon, American kestrel, northern goshawk, sharp-shinned hawk, Cooper's hawk, red-tailed hawk, Swainson's hawk, rough-legged hawk, ferruginous hawk, northern harrier, barn owl, great-horned owl, northern pygmy owl, long-eared owl, burrowing owl and northern saw-whet owl. Many of these species are of high federal interest pursuant to 43 CFR, 3461.1 (n-1), and all are considered of high interest to the State of Utah. There is some potential, though minimal, for incidental use of the permit area by bald eagles, which is considered a sensitive species in Utah. High-priority and/or critical habitat for certain raptor species exists within the permit area during the nesting/breeding period (February - July). For these species, construction activities within one-half mile of a nest site during the species specific ing/breeding period should be avoided.

Because certain raptor species may be sensitive to disturbance during their active nesting periods, surveys of those portions of the permit area where surface disturbance has or is anticipated to occur have been implemented intermittently during the period from 2005 through 2007. As a result of these efforts several nest sites have been located in and near the permit area. Locations for these sites are provided on Map 2, Raptor Map. A table on the map shows the determination of species for each nest, and nesting activity if known. As indicted on Map 2, one nest (No 1541) was observed south of the proposed disturbed area in the southwest quarter of 33, T12S, R7E. This nest was categorized during the 2005 helicopter survey as being either goshawk or red-tailed hawk. As discussed further in this Chapter, goshawks prefer conifer stands for nesting and therefore nest No. 1541 is more likely a red-tailed hawk nest. No nesting activity was observed at this nest site during the 2007 nesting period.

For more information about raptor species of special status including the ferruginous hawk, bald eagle and northern goshawks, refer to Table 2A.

The long-billed curlew is listed by the UDWR as a species of concern, and is rare to the Wasatch Plateau. This species has a strong affinity for riparian and shoreline areas. For more information about this species, refer to Table 2A.

The whooping crane is listed by the UDWR as exterminated in the Wasatch Plateau. For more information about this species, refer to Table 2A.

The yellow-billed cuckoo is a federally listed Candidate species. It has also been described as rare in the Wasatch Plateau. This species prefers woodland areas, and is thought to nest primarily in the eastern United States. For more information about this species, refer to Table 3.

The burrowing owl is listed by the UDWR as limited in the Wasatch Plateau, sensitive and a Species of Concern. This species prefers open, dry grasslands, agricultural and range lands associated with burrowing animals, particularly prairie dogs, ground squirrels and badgers. For more information about this species, refer to the above (R645-301.220) and also Table 2A.

The black swift is listed by the UDWR as a Species ofConcern, and as uncommon in the Wasatch Plateau. For more information about this species and its presence in the project area, refer to Table 2A.

The three-toed woodpecker is listed by the UDWR as a Species of Concern, and as uncommon on the Wasatch Plateau. This species exhibits a strong preference for the bark insects of spruce trees, and inhabits coniferous forests at submontane and montane elevations, and therefore is considered to be uncommon to the mine plan area. For more information about this species and its presence in the project area, refer to Table 2A.

White pelicans can be found in and near Scofield Reservoir to the north of the mine site, however, due to this birds requirement to be very near water bodies, it is unlikely that they would be found in the mine area. For more information about this species and its presence in the project area, refer to Table 2A.

Mammals

Sixty six (66) species of mammals, as listed by Table 2, "Potential Wildlife Species of the Wasatch Plateau", are believed to be potential inhabitants of the biogeographic area in which the permit area is located. However, only 32 mammal species are classified as known, likely, or potential residents of the permit area. Of the 32 potential state high-interest species possible in the region, the occurrence of 17 are either known, likely, or possible in the permit area. Seven (7) species are listed by the UDWR on the Utah Sensitive Species List include: fringed myotis, Townsend's big-eared bat, spotted bat, white-tailed prairie-dog, kit fox, black-footed ferret, and Canada lynx. These species have been addressed in the above and also Table 2A.

Although not listed by the UDWR as sensitive species, mule deer, elk, and moose are very important species in the State of Utah and have been discussed above in "High-Value Habitats" (R645-301.220).

Special Status Wildlife Species of the Wasatch Plateau

Table 2 shows the species of the Wasatch Plateau and the likelihood of encountering these species in the Kinney No. 2 Mine project and adjacent areas. The table also lists the special status of these species, or whether they are threatened, endangered or otherwise sensitive by federal and state law. Finally, Table 2 shows potential habitat for fourteen (14) species that have been listed as "Wildlife Species of Concern" (C3), one (1) species listed as a "Conservation Agreement Species" (C2), two (2) as "Candidate" species (C), two (2) listed as extirpated (EXT) and one (1) listed as "threatened" (T) according to UDWR records and based on current listings. The following Table 2A lists these sensitive wildlife species and describes their relevance to the Kinney No. 2 Mine permit and adjacent areas.

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

Common Name	Scientific Name	Status*	Site-Specific Notes
Smooth greensnake	Opheodrys vernalis	C3	Seventeen (17) species of reptiles, as listed on Table 2, "Potential Wildlife Species of the Wasatch Plateau", are believed to be potential inhabitants of the biogeographic area in which the permit area is located. Only 5 reptile species are categorized as likely or possible inhabitants of the permit area. The other 12 species are considered unlikely to inhabit the permit area due to their affinity for riparian areas. The only species listed on the Utah Sensitive Species List that may inhabit the area is the smooth greensnake (*Opheodrys vernalis*), but it is considered uncommon to the area. This species prefers meadows and riparian areas and thus is unlikely to inhabit the mine operations area east of Highway 96.
Western toad	*Bufo boreas*	C3	Eight species of amphibians, as listed on Table 2, "Potential Wildlife Species of the Wasatch Plateau", are believed to be potential inhabitants of the biogeographic area in which the permit and adjacent areas are located. However, only one amphibious species is categorized as possible, or a likely inhabitant of the permit area. The western toad is the only species listed on the Utah Sensitive Species List that has the potential to inhabit the mine permit area. The UDWR considers the western toad as uncommon in the Wasatch Plateau and it is unlikely to inhabit the mine permit area because of its affinity for riparian habitats. Since the mine site disturbance area is dry, with no permanent, or intermittent water areas, and no perennial or intermittent streams, the likelihood of significant numbers of amphibians inhabiting the area is low. The other amphibians included in Table 2 are potential residents of the mine site, however, these species are not considered to be of high interest and the limited size of the disturbed area reduces the potential for substantial impact from mining disturbance.

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

White pelican	*Pelecanus erythrorhynchos*	C3	White pelicans can be found in and near Scofield Reservoir to the north of the mine site, however, due to this birds requirement to be very near water bodies, it is unlikely that they would be found in the mine area. This bird only visits the area during the open-water seasons, and is not found in the area during the winter.

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

Northern goshawk	*Accipiter gentiles*	C2	The UDWR lists the northern goshawk as an uncommon species in the Wasatch Plateau, and is listed on the Utah Sensitive Species List as a Conservation Agreement Species. Because this bird prefers the interiors of extensive, remote, mature and old-growth forests dominated by large trees, high canopy closure, on moderate slopes, with an open understory (Falk 1990, Speiser and Bosakowski 1987, Squires and Reynolds 1997) it is unlikely that nesting occurs in the mine disturbed area, or near it. According to Speiser and Bosakowski 1987, Basakowski and Speiser 1994, Bosakowski and Smith 1997 and Falk 1990, goshawks nest further from areas of human habitation than would be expected by chance. They found that the average distance to human habitation in New Jersey sites was about 1050 m or (3,445 feet), with a distance to the nearest paved road of about 1170 m (3,839 feet). The following Northern Goshawk Habitat Model is presented in the USFWS web site at http://www.fws.gov/r5gomp/gom/habitatstudy/metadata/northern_goshawk_model.htm: Several models were developed and the resulting habitat maps were compared to known goshawk occurrences in the study area. The best fit was achieved by regarding goshawk habitat as patches of forest, of adequate size, and which include areas likely to be suitable for nesting. Goshawk nesting areas were identified as: 1) having suitable forest cover; 2) situated at least 460 m (1,509 ft) from developed (based on Bosakowski and Speiser, 1994) average distance of nests from roads and dwellings of 1,100 m (3,609 ft), 1 s.d. of 640 m (2,099 ft); 3) situated within 500 m (1,640 ft) of a pond or shrub swamp, and; 4) having north, northeast, northwest, or flat aspect. These areas were scored 1.0. Other contiguous forest within 500 m, or (1,640 ft) of the nesting habitat was scored 0.5. The sizes of the habitat patches then was computed, and only clusters having at least some nesting habitat and an area of 8 ha (19.77 acres) or larger were retained. This model and the other factors

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

Ferruginous hawk	*Buteo regalis*	C3	The ferruginous hawk is listed by the UDWR as rare in the Wasatch Plateau. This species may use the area in the summer, and inhabit submontane and desert elevations and therefore the mine area may be on the extreme upper end of their affinity area. They rarely nest in Utah and prefer open country, primarily prairies, plains and badlands. Because of the above factors, the ferruginous hawk is unlikely to be found in the mine plan area.
Bald eagle	*Haliaeetus leucocephalus*	C3	The bald eagle is listed sensitive by the UDWR and is uncommon in the Wasatch Plateau, however Scofield Reservoir is a favorite gathering place for this bird primarily during their southern migration during the winter. Many bald eagles can be seen near the reservoir during the winter, and may spend the entire winter in the area. It is unlikely that this species would spend a lot of time in the mine permit area, however, road killed deer and other large mammals may lure them to this food source along Highway 96 in the vicinity of the mine site. Although there are a few nesting pairs in Utah, there are no known bald eagle nest sites in the area of the mine site.

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

Sage-grouse	*Centrocercus urophasianus*	C	Sage-grouse are listed on the Utah Sensitive Species List as a species of concern, and are year-round residents of the high plateau and adjacent portions of the permit area which lie east of the mine site. However, within their crucial winter habitat at the site is also crucial brooding habitat. Sage-grouse only occur in sagebrush dominated vegetation types or communities in close proximity to sagebrush types within the submontane life zone. Open areas (e.g., wet meadows) surrounded by sagebrush are often utilized as strutting grounds during the critical breeding period from March 15 through June 15. Sagebrush stands within a two-mile radius of such sites are also classified as crucial value areas due to their use as brooding habitat following nesting. Following the brooding period, the sage-grouse disperse over the entire substantial use area until about mid-November. No leks have been identified in the mine area.
Whooping crane	*Grus americana*	EXT	The whooping crane is listed by the USFWS as extirpated, but formerly passed through eastern Utah. It is highly unlikely that this species would be found in the mine plan area.
Long-billed curlew	*Numenius americanus*	C3	The long-billed curlew is listed by the UDWR as a species of concern, and as rare to the Wasatch Plateau. This species has a strong affinity for riparian and shoreline areas, but may forage in pastureland, and may nest in pastureland habitats. Because of these factors, this species is unlikely to inhabit the mine plan area.

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

Yellow-billed cuckoo	*Coccyzus americanus*	C	The yellow-billed cuckoo is a federally listed candidate species. It has also been described as rare in the Wasatch Plateau (Table 2), but it is not on the current Carbon County list of threatened, endangered and candidate species. This species prefers woodland areas, and is thought to nest primarily in the eastern United States. Due to the above factors, it is unlikely that this species can be found in the mine plan area.
Burrowing owl	*Athene cunicularia*	C3	The burrowing owl is listed by the UDWR as limited in the Wasatch Plateau, sensitive and a Species of Concern. This species prefers open, dry grasslands, agricultural and range lands associated with burrowing animals, particularly prairie dogs, ground squirrels and badgers. Because of these factors, this species is considered as unlikely to inhabit the mine plan area.
Black swift	*Cypseloides niger*	C3	The black swift is listed by the UDWR as a Species of Concern, and as uncommon in the Wasatch Plateau. The Audubon Society states that the "black swift is considered primarily a mountainous species, occurring over a range of highland habitats, particularly over rugged terrain and coastal cliffs. Nests on canyon walls near water and sheltered by overhanging rock or moss, preferably near waterfalls or on sea cliffs. It occasionally occurs in lowlands during migration or in bad weather conditions. It breeds in California from May to September. Autumn migration from northern portions of the breeding range begins as early as late August. The species' wintering grounds are not definitively known. The nests are shallow cups made of moss bound with mud. Lays one to two eggs. Feeds on flying insects." Due to the above information, and the fact that no cliffs exist in the mine plan area, it is thought that this species in unlikely to inhabit the mine plan area.

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

Three-toed woodpecker	*Picoides tridactylus*	C3	The three-toed woodpecker is listed by the UDWR as a Species of Concern, and as uncommon on the Wasatch Plateau. This species exhibits a strong preference for the bark insects of spruce trees, and inhabits coniferous forests at submontane and montane elevations, and therefore is considered to be uncommon to the mine plan area. There is very limited conifier habitat in the mine plan area, with only a few isolated conifer trees interspersed within the aspen communities. For these reasons, it is very unlikely that this species can be found in the mine plan area.
Fringed myotis	*Myotis thysanodes*	C3	A small bat called the fringed myotis is listed by the UDWR as a Species of Concern on the Utah Sensitive Species List, and as uncommon on the Wasatch Plateau. This species prefers oak, pinyon, juniper forests and desert scrublands. It roosts in caves, mines, buildings, and other protected locations, and therefore is thought not to inhabit the mine plan area.
Townsend's big-eared bat	*Plecotus townsendii*	C3	The Townsend's big-eared bat is also listed by the UDWR as a Species of Concern on the Utah Sensitive Species List, and as common to the Wasatch Plateau. Habitat use has not been evaluated in detail, but seems to be similar to other localities in the western United States. Caves and abandoned mines are used for maternity roosts and hibernacula (Worthington 1991, Hendricks et al. 1996, Hendricks 2000, Hendricks et al. 2000, Foresman 2001, Hendricks and Kampwerth 2001); use of buildings in late summer has also been reported (Swenson and Shanks 1979). Habitats in the vicinity of roosts include Douglas-fir and lodgepole pine forests, ponderosa pine woodlands, Utah juniper-sagebrush scrub, and cottonwood bottomland. Due to the preceding factors, this species is considered as unlikely to inhabit the mine plan area.

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

Spotted bat	*Euderma maculatum*	C3	The spotted bat is another species listed by the UDWR as a Species of Concern on the Utah Sensitive Species List, and as uncommon on the Wasatch Plateau. Spotted bats may be found in a variety of habitats, ranging from deserts to forested mountains; they roost and hibernate in caves and rock crevices. Spotted bats occur state-wide in Utah, but have probably never been abundant in any particular location. Current data suggest that the species may be becoming even more rare in Utah than it was in the past. Due to these factors, it is thought that this species is unlikely to inhabit the mine plan area.
White-tailed prairie dog	*Cynomys leucurus*	C3	The white-tailed prairie-dog is listed by the UDWR as a Species of Concern on the Utah Sensitive Species List, and as common to the Wasatch Plateau. According to the UDWR publication, Species on the Edge, the white-tailed prairie-dog inhabits mountain valleys, semi-desert grasslands, agricultural areas, and open shrublands, but the map included in the publication does not show any populations in Pleasant Valley. There are no observed prairie dog populations in the mine plan area, and therefore it is thought that they do not inhabit the mine plan area.
Kit fox	*Vulpes macrotis*	C3	The kit fox is listed by the UDWR as a Sensitive Species on the Utah Sensitive Species List, and as rare on the Wasatch Plateau. The species most often occurs in open prairie, plains, and desert habitats, and therefore is thought to be uncommon in the mine plan area.

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

Black-footed ferret	*Mustela nigripes*	E-EXT	The black-footed ferret, a federally listed endangered species, is listed by the UDWR as endangered and extirpated, and is primarily dependent upon prairie-dogs as a prey source, therefore, crucial value use area for this species is restricted to prairie dog colonies which do not occur within the permit area. The re-introduced populations have been classified as "nonessential-experimental" by the U.S. Fish and Wildlife Service. In addition to Utah's re-introduced black-footed ferret population, unconfirmed sightings of naturally occurring ferrets persist throughout eastern Utah. Because there are no known prairie-dog populations in the mine plan area, it is highly unlikely that the Black-footed ferret is found in the area.
Canada lynx	*Felis lynx canadensis*	T	The Canada lynx, is listed as a threatened species by the UDWR and the U.S. Fish and Wildlife Service. The range of the lynx extends from Canada and Alaska south to Maine, the Rocky Mountains, and the Great Lakes region. Although sightings of the Canada lynx in Utah over the past twenty years are exceedingly rare, the U.S.D.A. Forest Service recently announced that Canada lynx hair was found in the Manti-La Sal National Forest during 2002. Although sightings of the Canada lynx in Utah over the past twenty years are exceedingly rare, the U.S.D.A. Forest Service recently announced that Canada lynx hair was found in the Mani-La Sal National Forest during 2002. The preferred habitat of the Canada lynx is montane coniferous forest. The Canada lynx is listed by the UDWR as rare in the Wasatch Plateau, and therefore it is highly unlikely that it can be found in the mine plan area. it can be found in the mine plan area.

Table 2A: Utah sensitive wildlife species of the Wasatch Plateau with notes regarding potential presence and impacts as a result of the proposed Kinney No. 2 Mine.

	* STATUS
	E = Endangered
	C = Candidate
	C3 = Species of Concern
	T = Threatened
	C2 = Conservation Agreement
	EXT = Extirpated

R645-301.322.300 Fish & Wildlife Service Review

Project biologists have conducted onsite field studies on the vegetation and wildlife habitats of the Kinney No. 2 Mine. Additionally, the biologists have consulted with the State of Utah, Division of Oil, Gas & Mining (UDOGM) and the Utah Natural Heritage Program (UNHP) regarding the plants, wildlife and habitat of the Kinney No. 2 Mine. Upon request by the UDOGM the project biologist will also provide the resource information required under R645-301-322 and the protection and enhancement plan required under R645-301-333 to the U.S. Fish & Wildlife Service Regional or Field Office for their review. This information will be provided herein and can be provided to the USFWS within 10 days of receipt of the request from them.
For this document, UDOGM did, however request protection and enhancement plans as required under R645-301-333. These plans have been provided in that below.

Utah Division of Wildlife Resources Review
On August 9, 2007 a request was made to the UDWR for a list of T&E species for the mine plan area (See Exhibit 8, Fish, and Wildlife Information for this request and UDWR's response).
The UDWR responded by letter dated August 13, 2007 with the following:

> *The Utah Division of Wildlife Resources (UDWR) has records for sandhill cranes and bald eagles within the project area noted above. In addition, in the vicinity there are records of occurrence for northern flying squirrels and northern river otters.*
>
> *The only species noted by the UDWR in this letter that is on the Utah Sensitive Species List is the bald eagle, which has been addressed previously. Since the UDWR indicated that records show occurrence of sandhill cranes, northern flying squirrels and northern river otters, they will be discussed below as species of high interest.*
>
> *The sandhill crane is listed by the UDWR as uncommon on the Wasatch Plateau. According to UDWR information:*
>
> *The sandhill crane breeds primarily in Alaska, northern Canada, and in the Great Lakes, but small, scattered breeding populations are also found in the*

northwestern United States (including northeastern Utah), the southeastern United States, and Cuba. With the exception of populations in the southeastern United States and Cuba, breeding populations migrate south to wintering grounds in the southern United States and northern Mexico.

The sandhill crane is usually found foraging in open grasslands, meadows, and marshy portions of lakes, ponds, and rivers. Its diet is diverse, consisting of roots, tubers, seeds, grain, berries, small vertebrates, and invertebrates. At night, flocks roost in open expanses of shallow water.

The sandhill crane is migratory bird and occurs primarily seasonally in Utah and as noted by the UDWR is usually found foraging in open grasslands, meadows and marshy areas. Occurances of sandhill cranes in the mine operations area would be very rare, and therefore no impact from mining is anticipated.

The northern flying squirrel is a year-long resident of the Wasatch Plateau, however, its relative abundance is unknown, and listed as rare by the UDWR. Its substantial use area is restricted to spruce-fir or mixed conifer habitats of the montane ecological association. Critical use periods occur during the bi-modal breeding season, from April through May and from August to September. Since this species prefers mature conifer habitats it is not expected to occur in the mine operations area, or the mine general geographic area since there are no conifer stands in the area.

The northern river otter is listed by the UDWR as being rare on the Wasatch Plateau. Since this species habitat is associated very closely with rivers, streams and water bodies, it is very unlikely that it would be found in the mine disturbed area, or the general mine area. It may be found along Mud Creek west of the mine area, and in or near Scofield Reservoir north and west of the mine permit area.

Utah Natural Heritage Review

On August 12, 2010 a response to a request by the Utah Natural Heritage Program (UNHP) for an updated list of threatened, endangered or otherwise sensitive (TES) plant and animal species for the mine plan area. GIS shape files for the following species were provided. The shape files show general locality data that were masked to within one square mile of the Kinney No. 2 Mine permit area. No plant species were within this range. The following wildlife species were within the one square mile area:

- Northern River Otter (*Lontra canadensis*)
- Bald Eagle (*Haliaeetus leucocephalus*)
- Sandhill Crane (*Grus canadensis*)
- Northern River Otter (*Lontra canadensis*)
- Osprey (*Pandion haliaetus*)
- Purple Martin (*Progne subis*)
- Northern Flying Squirrel (*Glaucomys sabrinus*)

With the exception of the purple martin, the potential of the species above to be present in the study area have been described previously.

The purple martin breeds throughout eastern North America, as well as on the Pacific coast and in parts of interior western North America and Mexico (UDWR). It winters in South America.

Although many populations now inhabit cities and towns, it is possible that this bird could be found within the permit area because its current breeding habitat in Utah are natural habitats such as aspen and coniferous forests near mountain lakes. As mentioned, the permit and adjacent areas have aspen communities (though very few conifer stands) and Scofield Reservoir is nearby.

Wildlife Summary

A review of the high interest wildlife species and their habitats that have been mapped by UDWR biologists was accomplished for the Kinney No. 2 Mine permit area. Seven (7) maps were created showing the following species' habitats:

- Black Bear
- Blue Grouse
- Moose
- Mule Deer
- Rocky Mountain Elk
- Sage-Grouse
- Snowshoe Hare

Additionally, a review of all species known to exist on the Wasatch Plateau was reviewed. A summary of those species that have the potential to occur within or adjacent to the Kinney No. 2 Mine site was also made. The permit area provides potential habitat for approximately 329 species of vertebrate wildlife, including; 7 fish species, 8 amphibians, 17 reptile species, 231 birds, and 66 mammals. Table 2, "Potential Wildlife Species of the Wasatch Plateau", identifies those species known to occur in this general area as well as the likelihood of occurrence in the permit area. Included on this list are several species of wildlife considered to be of high interest to the State of Utah, and/or are listed on the Utah Sensitive Species List. High interest wildlife are defined as all game species; any economically important species; and any species of special aesthetic, scientific, or educational significance. Included in this category are those species of wildlife listed as Federally Endangered or Threatened.

Although wildlife occurrence and habitat values in the general permit area may be typical for this part of Utah, the surface disturbance areas (main facilities area) have generally been extensively disturbed by previous mining and other related activities. Therefore, the value and utility of these areas to indigenous wildlife has already been somewhat reduced. Because the mine operations area is in very close proximity to both the town of Scofield and Highway 96, use of the area is likely affected and probably reduces to some degree. In effect, the potential for any adverse impacts to wildlife habitats in the previously disturbed areas has already been largely realized and re-disturbance of these areas is not expected to result in any significant incremental impacts.

R645-301.323 MAPS & AERIAL PHOTOGRAPHS

Maps or aerial photographs of the permit area and adjacent areas have been provided that delineate:

- The location and boundary of any proposed reference area for determining the success of revegetation;

- Elevations and locations of monitoring stations used to gather data for fish and wildlife, and any special habitat features;
- Each facility to be used to protect and enhance fish and wildlife and related environmental values; and
- Each vegetative type and plant community, including sample locations. Sufficient adjacent areas have been included to allow evaluation of vegetation as important habitat for fish and wildlife for those species identified under R645-301-322.

R645-301.330 OPERATION PLAN

Provisions to Minimize Total Disturbance

Development and production of the minable coal reserves by underground methods will effectively limit the area of required surface disturbance. Recognizing the environmental benefits of keeping surface disturbance to an absolute minimum, CR has designed the required surface facilities to maximize utilization of the available space and will place the surface facilities where possible in areas which have been previously disturbed. Specific design and operational measures which will limit surface disturbance include the use of a conveyor system; and consolidation of all required new surface facilities in one area near existing transportation routes which avoids the need for both multiple surface disturbance areas and the disturbance which would be associated with required connecting roads, powerlines, and other necessary infrastructure.

General Biological Resource Protection Requirements

The mine facilities area will be the only area where direct surface disturbance will occur as a result of the mining and related activities. In addition, the potential exists for indirect impacts on vegetation, fish, and wildlife due to equipment operations, noise and human activity associated with mining operations, mine related traffic, and electrical equipment.

As previously noted, the majority of the mine facilities area has been extensively disturbed by previous historical mining and related activities. This disturbance has resulted in the elimination or significant modification of natural vegetation communities and fish and wildlife habitat values within the disturbed area.

General control and mitigation measures, addressing both potential direct and indirect mining related biological impacts will include the following:

- Minimizing the total area of disturbance
- Limiting disturbance, and operations of any important resource areas
- Design, construction, and operation of mine facilities to minimize biological impacts including barriers to wildlife movements
- Control and monitoring of surface and related effects
- Design and installation of electrical equipment to minimize electrocution hazards
- Control and monitoring of surface discharges and water quality
- Exclusion of wildlife from potentially hazardous areas
- Reclamation of disturbed areas when they are no longer needed to support ongoing mining and related activities
- Site specific wildlife enhancement measures

Detailed discussions of specific potential impacts and proposed control and mitigation measures are presented in the following s.

Avoidance and/or Enhancement of Wetlands, Riparian Areas and Aquatic Habitat

No areas were identified as potential jurisdictional wetland areas (regulated by the U.S. Army Corps of Engineers) during the baseline field surveys of surface disturbance areas, therefore, the mining and related operations are not expected to impact any jurisdictional wetlands. Disturbance of riparian areas and aquatic habitat will not occur since none exist in the proposed mine disturbance area.

Impact to Vegetation, Wildlife Habitats & Sensitive Species

Comparisons of the mining related surface disturbance with previous surface disturbance due to historic mining and related activities and more recent disturbances associated with construction of transportation and electric transmission facilities indicates that there is little potential for any significant new fish, wildlife, habitat, or vegetation impacts. This conclusion is based on the fact that most potentially significant terrestrial biological impacts have already occurred given the extent and nature of previous development in the surface disturbance areas. In addition, while Utah AML reclamation has been successful in re-establishing vegetative cover and some habitat values, the limited age of reclaimed vegetation and proximity to human activity continue to limit wildlife use. Most of the anticipated surface disturbance for mining and related activities will involve previously disturbed areas. Mining related disturbance of previously undisturbed areas will be negligible. The potential for aquatic impacts is very limited since there are no water sources in the immediate area of the proposed mining surface facilities area. The following s provide additional details relative to potential mining related impacts on individual biological resource values.

Potential impacts on terrestrial vegetation, wildlife, and habitat values resulting from the mining and related operations may include:

- Redisturbance of approximately 20.7 acres of disturbed vegetation and habitat occurring on previously disturbed areas
- Temporary loss of approximately 6.9 acres of previously undisturbed vegetation and habitat
- Displacement of mobile resident wildlife to nearby areas providing similar habitat and adequate carrying capacity
- Direct mortality of non-mobile wildlife
- Increases in indirect wildlife disturbance due to increased human activity in the area
- Increased potential for accidental wildlife losses through electrocution or traffic related mortality. Localized reduction or elimination of certain vegetation types

With regard to sensitive species of vegetation or terrestrial wildlife, the only known species that have the potential to exist within or adjacent to the Kinney No. 2 Mine are the greater sage-grouse and bald eagle, both of which have been designated as “species of concern” by UDWR. No other known threatened, endangered, or otherwise sensitive plant or wildlife species exist within the study area.

Other species of high interest have been identified and described for the study area [see “Fish & Wildlife Information” above (R645-301.322)]. The potential for specific species that may have any adverse mining related impacts has been explained in that.

The potential for significant adverse impacts due to redisturbance of previously disturbed areas

is low due to existing vegetation and habitat conditions in the proposed disturbance areas. The Utah AML reclamation efforts have resulted in effective reestablishment of vegetation on portions of the previously disturbed areas. While these areas currently provide some cover and forage values, the area is close to Highway 96, and the town of Scofield with their noise, highway traffic, and human presence. These proximity factors and resulting level of human activity in the area are also important factors which tend to preclude significant long-term use by large mammals, raptors, and many other terrestrial wildlife species with current use being limited to opportunistic or seasonal migratory use. The temporary mining related impacts will be effectively mitigated by the comprehensive reclamation program including all surface disturbance areas which will be implemented when the mine facilities are no longer needed to support ongoing operations.

The potential impact of losses of existing vegetation and habitat in previously undisturbed areas will be minimized by the limited aerial extent (approximately 6.9 acres) of any new disturbance. Areas of potential new disturbance are immediately adjacent to previously disturbed areas, and as such exhibit some inherent limitations relative to their value as wildlife habitat. Field surveys of potential new disturbance areas did not result in identification of any unique habitat characteristics (e.g., nests, wetland pockets, bat roosts, etc.) within these areas, although one raptor nest (No. 1541) was identified approximately 650 feet southeast of the proposed disturbed area. This nest is likely a red-tailed hawk nest as discussed earlier in this chapter, and should not be adversely impacted by mining operations as red-tailed hawks are very adaptable to human activity. Minor vegetation and habitat impacts for any new disturbance areas will be a temporary result of the mining and related operations, however, proposed site reclamation measures will result in effective mitigation of any temporary impacts and in most cases offer the potential for overall enhancement of vegetation and habitat conditions.

Displacement of mobile wildlife due to mining related surface disturbance will largely affect only those species and individual animals which utilize the limited area encompassed by the mine surface facilities area. At this time, terrestrial wildlife use of this area appears to be limited to rodent species and a number of bird and bat species with occasional opportunistic and migration use by mule deer and occasionally elk, although very few elk droppings were observed in the area. Most other terrestrial wildlife have already been displaced by prior disturbance and do not appear to have reestablished in the area due to reduced habitat values and existing levels of human activity. Given that the numbers of potentially displaced wildlife will be small due to limited populations and the small total surface disturbance area, the ability of the surrounding habitats to absorb these immigrants should be more than adequate. The greatest potential for significant impacts of this type would be associated with the displacement of any small mammals and birds utilizing the area. Disruption of raptor species is not considered significant due to the close proximity of Highway 96 and the town of Scofield , with their associated noise, and other human activity.

During initial site earthwork and subsequent facility construction, non-mobile wildlife which occupies previously disturbed and adjacent undisturbed habitats affected by the surface disturbance activities may be lost. Affected wildlife could include species groups such as lizards, snakes, small rodents, and younger or older individuals of other small mammal groups whose mobility may be limited by age. The loss, however, of a few individual animals within the much larger animal populations and distribution does not represent a significant impact since none of the affected species are known sensitive species and any resultant impacts will be compensated over the short and long term by normal animal reproduction.

Increased levels of human activity may result in indirect wildlife impacts including some alteration of diurnal and seasonal animal movements. Another impact frequently associated with mine development activities is the increased potential for illegal harvest of game animals due to localized population increases. This impact is not anticipated for the proposed operations since the required workforce will be composed primarily of local employees who already live in the Scofield/Price/Helper area. There may be some increase in wildlife disturbance due to the noise, lights, and human activity levels required for surface support activities. Use of existing ancillary roads to access environmental monitoring sites may also result in minor localized wildlife disturbance.

Another potential mining related impact would be the direct mortality of individual wildlife due to contact with live electrical lines or other electrical equipment and traffic related mortality in either mine areas or due to mine related traffic on public roads. Both types of accidental occurrence are a potential impact of any large-scale development activity but the effectiveness of specific protective measures and a low overall incidence rate render any related impacts inconsequential.

Generally, the basic biological resource protection measures which will be implemented in conjunction with all mining and related activities outlined in this chapter will provide the necessary level of protection to achieve full compliance of state and federal regulations for the Kinney No. 2 Mine site.

Potential Effects on Aquatic, Riparian Resources & Sensitive Species

The primary potential impact on fish and aquatic species, aquatic habitat, and riparian vegetation which may result from the mining and related activities would be from drainage from the proposed sedimentation pond, or from alternative sediment controls used where drainage from small areas does not report to the sedimentation pond.

Prior to reclamation, stormwater runoff from disturbed areas would be a potential source of additional sediment contributions to Mud Creek. Sediment contributions will, however, be effectively controlled by construction, operation, and maintenance of an integrated drainage and sediment control system including diversion and collection ditches, sedimentation ponds, and alternative sediment control measures. Implementation of drainage and sediment control measures as described in R645-301-731, “Hydrologic Resource Protection”, will limit any increase in suspended sediments to levels corresponding to general background concentrations. Mining related sediment contributions would, therefore, result in little or no significant incremental impacts on fish and macroinvertebrate communities or aquatic habitat values in and near Mud Creek, and Scofield Reservoir.

Coal stockpiling and conveyor transport of coal will result in minor contributions of coal dust to both the atmosphere and area surface drainage which could potentially be transported to Mud Creek and Scofield Reservoir. Wind-blown dust from coal stockpiles could result in deposition of small amounts of coal dust near the mine site. Operating practices for stockpile areas including material placement in coal stockpiles and coal recovery have been designed to minimize dust generation. These practices, as described in R645-301421, “Air Emission Controls”, include controlled discharge to or placement in stockpiles (coal stacker tubes), the use of surfactants where necessary to control fugitive dust, and enclosed draw points and BACT dust controls on coal reclaim systems.

The conveyor system will be covered to minimize exposure and dispersion of coal fines during

transport; all transfer points will be partially or fully enclosed and will incorporate BACT emission controls. Small amounts of coal dust or fines may escape from the conveyor system and minor spillage may occur in the area immediately adjacent to the conveyor. The Kinney No. 2 Mine has received Approval Order DAQE-AN0141180001-08 from the Utah Department of Environmental Quality to operate the Kinney No. 2 Mine and thus meets all applicable air regulations.

Mine water supply requirements for sanitary use, surface dust control, fire fighting reserve, and operational mine water will be obtained from the town of Scofield , and collection and recycling of both mine water and mine inflows where they may exist. Recycled water encountered within the mine would remove a negligible amount of water from the system. For this reason, it is anticipated that the incremental mining related withdrawals will have no measurable effect relative to potential downstream surface water depletion in the Price or Green River drainages.

A 7 consultation process under applicable USFWS regulations will be conducted as part of the inter-agency review of the UDOGM permit application. In the unlikely event that consultation results in a determination that the proposed water use represents a new depletion, a biological assessment of potential effects on endangered fish species and associated critical habitat designations in the Green and Colorado Rivers would be completed. Three federal candidate Category 2 species (roundtail chub, leatherside chub, and flannelmouth sucker) for which the Price River may provide potential habitat would also be included in any biological assessment. However, since the mine area is a tributary to Mud Creek and then Scofield Reservoir, no incremental impact can be experienced in the Price, Green, and Colorado Rivers, because of the water retention in Scofield Reservoir. There are no T&E species in Mud Creek or Scofield Reservoir.

Measures to Stabilize and Minimize Erosion from Mine Disturbance Areas

All construction and operation activities will require the application of drainage and sediment control measures to minimize erosion, control surface runoff, and limit additional contributions of suspended solids to Mud Creek and Scofield Reservoir. Specific proposed drainage and sediment control methods and practices are discussed in detail in R645-301-731 , "Hydrologic Resource Protection". Temporary controls for construction activities will include the use of protective berms, silt fences, sediment traps, straw bales, and other suitable control measures. It should be noted that the designed operational drainage and sediment control systems and structures will be established prior to most surface disturbance and construction activities. These systems and structures will include diversions to route drainage from undisturbed areas around disturbance areas, collection ditches to intercept and route disturbed area drainage to the sedimentation pond, culverts, and sediment traps, , which will retain disturbed area runoff allowing settlement of suspended solids prior to discharge to area drainages. Drainage and sediment control structures will be operated and maintained until effective revegetation has occurred and surface drainage quality is restored to a condition comparable to baseline conditions. To assure the continuing effectiveness of the drainage and sediment control measures, water quality monitoring will be conducted during active operations, site reclamation, and the reclamation liability period.

Other erosion control and stabilization measures to be utilized for selected disturbance areas will include asphalt surfacing of the main access road and parking areas, surfacing of other roads and operation areas with gravel or similar material, and temporary revegetation or the use of synthetic erosion control materials on exposed cut/fill slopes. All active operating areas will be inspected on a periodic basis for evidence of erosion or instability and any significant problems

will be addressed in a timely manner by modifying or repairing the area to eliminate or control the problem.

Subsidence Potential and Related Impacts on Renewable Resource Lands

Carbon Resources' (CR's) mining operations will use conventional room development mining, with no pillar extraction and thus no subsidence will occur. Coal outcrop barriers will prevent subsidence of near-surface shallow cover areas. Mine portals and entries have been designed to be stable, and to prevent subsidence. Portal and entries near the surface will be designed with steel, and concrete face-up materials, and tunnel support structures that will support the roof and near-surface overburden.

Baseline hydrologic field investigations during 2005 through 2010 included ground surveys designed to locate and characterize all existing surface and ground water resources. Prior to the field surveys, available topographic mapping and the Utah State Engineer's water rights records for the area were reviewed and water right locations plotted on the topographic maps. The surveys included site specific inspections of all areas shown on the topographic maps where either recorded water rights or surface or ground water occurrences were believed to exist. The surface and ground water resources identified as a result of the baseline field investigations are shown on the Map 7, Regional Hydrology Map. No material damage or diminution of values are anticipated due to the proposed mining activities.

Provisions to Minimize Raptor Electrocution Hazards

CR will design and construct any mine related power transmission lines as shown on Figure 22, "Typical Raptor Proof Power Pole Configuration" (or equivalent) for protection of raptors from potential electrocution hazards in accordance with the guidelines set forth in "Environmental Criteria for Electric Transmission Systems" (USDI, USDA, 1970) and/or REA Bulletin 61-10 "Powerline Contacts by Eagles and Other Large Birds". These guidelines specify pole and transmission line configurations which isolate the ground wire minimizing the potential for simultaneous contact with a live and ground wire by a raptor or other bird approaching or landing on the support poles or cross beams. An existing powerline traverses from south to north immediately east of the proposed mine facilities and belongs to Rocky Mountain Power.

Fish and Wildlife Monitoring

Terrestrial Wildlife

During the period of active operations, CR will work closely with UDWR biologists from the local Price office to develop and maintain a program for reporting any significant wildlife observations in the proposed permit area. As part of an ongoing employee training and communication program, CR employees will be instructed to report any incidents of accidental wildlife mortality or eagle sightings to the Kinney No. 2 Mine Environmental personnel. CR will also coordinate with UDWR and private sector biologists to perform periodic raptor monitoring surveys if it is determined that mining and related activities have significant potential to adversely affect raptor breeding in the area.

Aquatic Resources

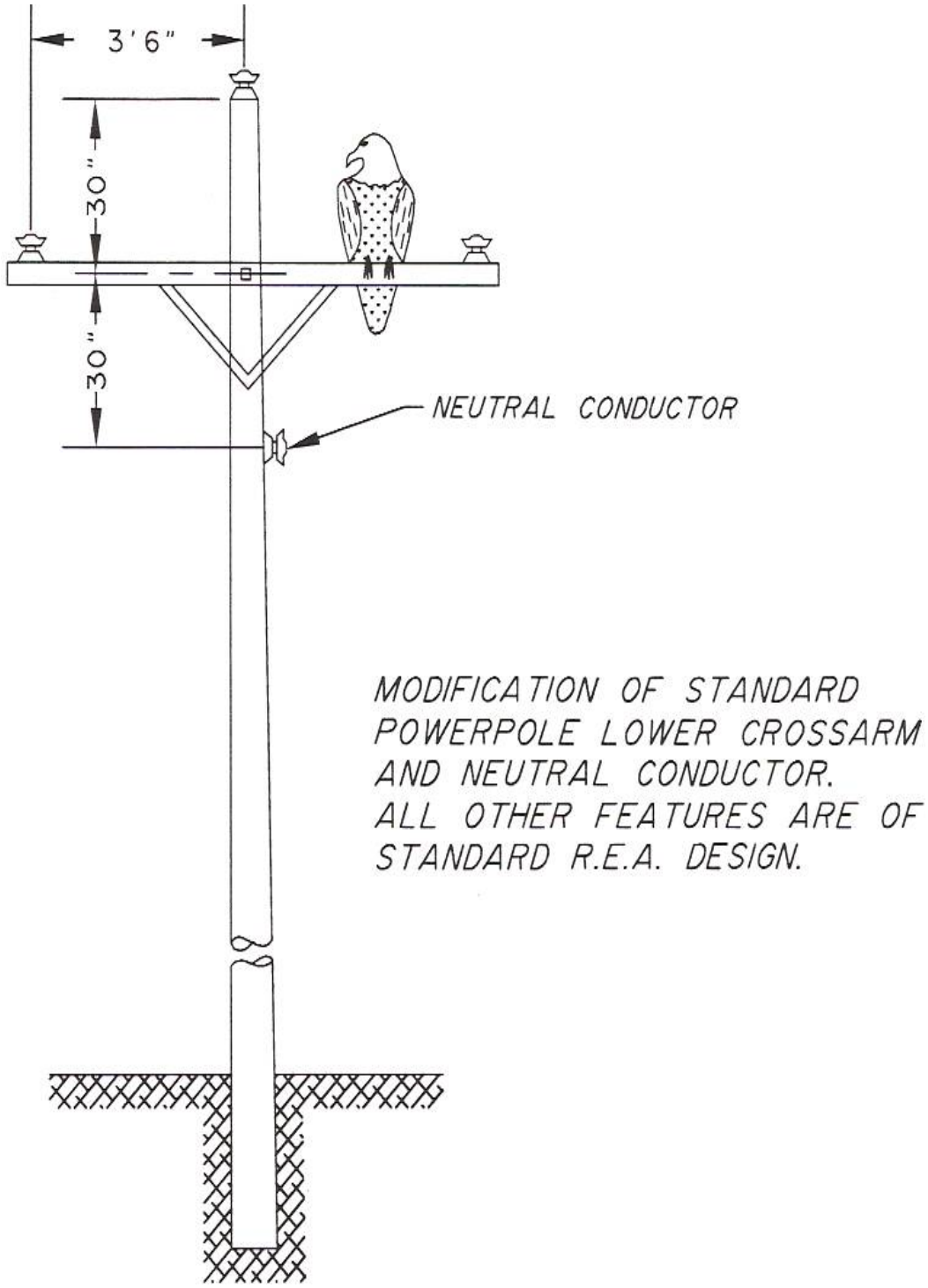
Since no aquatic species have been found in the permit area, and since there is no riparian habitat, or standing water sources within the permit area, no aquatic resources will be impacted by mining operations.

Measures to Minimize Barriers to Large Mammal Movements

Site-specific evaluation of the facilities area resulted in the conclusion that the proposed

conveyor location parallel to the base of the natural valley slope would not represent a significant barrier to large mammal movements. An additional important consideration relative to potential animal movements is the existence of Highway 96 and the city of Scofield which have probably already eliminated most large mammal movements in the mine facilities area. Although the likelihood of large mammal movements through the facilities area is small, CR has made provision for any potential movements by designing conveyor structures to provide a minimum clearance of approximately 40 inches and will establish a maximum speed limit for mine roads of 15 miles per hour. Several s of the conveyors will have clearances well over 40 inches where the conveyors are elevated for mechanical reasons or for vehicular underpasses as shown on the Map 13, Surface Facilities Map. These elevated s provide crossing areas for larger animals. In addition, the relatively short length of the overland conveyor system would allow animals to go around the site if they feel threatened.

Figure 22 Typical Raptor Proof Power Pole Configuration



minimum clearance of approximately 40 inches and will establish a maximum speed limit for mine roads of 15 miles per hour. Several s of the conveyors will have clearances well over 40 inches where the conveyors are elevated for mechanical reasons or for vehicular underpasses as shown on the Map 13, Surface Facilities Map. These elevated s provide crossing areas for larger animals. In addition, the relatively short length of the overland conveyor system would allow animals to go around the site if they feel threatened.

Protective Measures for the Facilities Area and Any Open Ponds Containing Potentially Hazardous or Toxic Materials

CR has no plans to store, utilize, or generate any materials or wastes classified as hazardous or toxic in conjunction with the proposed operations. The surface facilities have been designed and will be operated in such a way that any materials such as petroleum products which would represent a potential hazard to wildlife will be contained within closed areas or containers. There will be no open ponds which would contain any potentially hazardous substances.

Potential petroleum related risks will be limited by operation of the drainage and sediment control system. The sedimentation pond has been designed with a decant structure which incorporates an oil skimmer to minimize the potential for discharge of any petroleum products which might accidentally enter the drainage control system. Regular pond and discharge monitoring will include visual inspection for any oil sheen. CR has designed the mine water handling system as a closed-loop system with recycled or underground storage of mine water and no discharge to surface systems or drainages. In the unlikely event that it becomes necessary to discharge excess mine water to the surface, the water will be sampled prior to discharge and will be routed through the sedimentation control system to assure that it will meet all applicable effluent limitations and standards. All construction activities, as well as future operational activities, will be managed and monitored consistent with an approved Spill Prevention, Control, and Countermeasures (SPCC) Plan to address the potential for accidental petroleum spills and petroleum-related contamination of surface waters.

Provisions for Protection of Threatened, Endangered or Sensitive Species

As discussed in previously, Threatened, Endangered, and Sensitive Species of this permit application to UDOGM will result in review of appropriate species by UDWR and the USFWS and issuance of a current listing of proposed and listed threatened and endangered species potentially affected by the proposed mining and related activities. These actions, which are part of the 7 consultation process of the Endangered Species Act of 1973, will be followed by a determination by the agencies of whether or not a biological assessment will be required to identify and evaluate the potential effects of the proposed action on threatened and endangered species. Given the nature and scope of the information presented in this permit application, the very limited amount of associated surface disturbance, and the absence of any known threatened, endangered, or sensitive species in the permit area, preparation of a biological assessment may not be necessary. Completion of the required procedural steps, as described above, and preparation of a biological assessment, if required, will assure full compliance under applicable provisions of the Endangered Species Act.

Compliance with the Bald Eagle Protection Act

The permit area provides minimal potential for wintering bald eagle roosts since there are no conifer trees, or typical roost trees that would be utilized by eagles in the area of the mine facilities. Summer eagle utilization in the immediate area of the mine facilities is unlikely since Scofield Reservoir, and Mud Creek would be preferred feeding habitat for bald eagles. There is little or no potential for nesting by golden eagles within the permit area since there are no cliffs, and very few large conifers in the area. Under applicable provisions of the Bald Eagle

Protection Act, CR will either not initiate new activities including surface disturbance or exploration drilling within one-half mile of any active golden eagle nest during the spring breeding season or will, in consultation with UDOGM and UDWR, initiate appropriate mitigation measures. In addition, if golden eagle nesting activity is observed anywhere within the permit area but especially in close proximity to any mining related surface disturbance such activity will immediately be reported to the local UDWR office. If it is determined that the proposed mining activities have significant potential to adversely affect raptor breeding, CR as part of a cooperative program with the UDWR, will conduct periodic raptor surveys of any specific areas of concern.

Reporting and Consultation Procedures

Reporting procedures in conjunction with the consultation process under applicable state and federal wildlife protection laws and regulations will involve documentation of all contacts and correspondence regarding threatened, endangered or sensitive (TES) species. All telephone conversations and meetings regarding TES species will be documented in written form. If it is determined that preparation of a biological assessment is necessary, an outline will be developed and reviewed with the UDWR and the USFWS in order to establish the required organization and content of the report. The outline will incorporate any specific applicable requirements identified in the Endangered Species Act.

R645-301.322.333 Protection & Enhancement Plan

The **Protection Plan** for the current biological resources is part of the OPERATION PLAN above (R645-301.330). The **Enhancement Plan** will be implemented at the time of final RECLAMATION & REVEGETATION of the site.

The proposed mine facilities area is located in an area that has been impacted by historical and recent mining activities, as well as residential development, commercial development, transportation corridor, and electrical power transmission facilities and operations. Of the 27.6 acres proposed for disturbance by mine related activities, 20.6 acres (74%) has been disturbed previously. That means there will only be 6.9 acres (25%) of new disturbance by the proposed new mine. With 74% of the mine area currently disturbed, the vegetation and wildlife habitat have a great deal of potential for enhancement and improvement at the time of final reclamation. Thus, revegetation will be accomplished by establishing vegetative cover that is native to the area, diverse, effective and permanent. This will greatly improve the current wildlife habitat in the area. Below is a summary of specific habitat that will be improved by successful revegetation.

Specific Resources Requiring Special Protection Measures

Within the general permit area, several areas have been designated by the UDWR as crucial or substantial habitat for black bear, blue grouse, moose, mule deer, Rocky Mountain elk, sage-grouse, snowshoe hare, and bald eagle. Eagles and certain other raptors are known to inhabit or utilize portions of the permit area at various times of the year. High priority habitat areas and golden eagle or certain other raptor nesting sites may require special protection in compliance with applicable State and Federal laws and regulations. Generally, the basic biological resource protection measures which will be implemented in conjunction with the mining and related activities will provide the necessary level of protection to achieve full compliance.

Below is a description of some of the conservation and mitigation plans for the wildlife species that have been described as occupying crucial or substantial habitat within and adjacent to the Kinney No. 2 permit area.

Black Bear

Substantial year-long habitat for black bear (*Ursus americanus*) has been mapped within and adjacent to the permit area. Additionally, critical year-long habitat has been designated within the project area by the UDWR database (Map 2A).

Understanding black bear biology, habitat and food requirements along with being cognizant of problems that may occur with their interactions with humans will be instrumental for construction and operation of the Kinney No. 2 Mine. The black bear is considered to be an omnivore and, depending on the season, food sources can be as diverse as grasses, forbs, insects, fruits, berries, carrion, aspen buds, pine seeds, acorns, rodents and new-born deer.

The proposed new Kenny No. 2 Mine will disturb very little land that has not already been disturbed by previous mining or other activities. Even though the previous disturbed area is shown to be substantial year-long habitat for black bear, the habitat is marginal at best. The area within the permit that has been outlined as critical year-long habitat has, for the most part, not been disturbed previously nor will it be disturbed by the current mine operation plan. Therefore, habitat protection of the critical area will be to disturb very little of it. Mitigation will be to restore those areas that have previously been disturbed and are currently planned for new disturbance to habitat that existed prior to disturbance. Plant species used for revegetation will include native grasses and forbs as well as woody species that provide hard and fleshy fruits to augment food source for the black bear.

Blue Grouse

Year-long crucial habitat for blue grouse (*Dendragapus obscures*) has also been mapped within and adjacent to the project area (Map 2B). Blue grouse are native to Utah and prefer stands of aspen and conifer for their habitat. Very few conifer stands are present in the permit area, but aspens are common. Winters are often spent in upper elevations in conifer stands, whereas in spring and summer they spend more time at lower elevations in meadows, brushlands and open timber stands for mating.

Mating of blue grouse in Utah occurs in April and nesting is in May and June. Food sources range from herbaceous vegetation, seeds, berries, buds and insects in the summertime to needles and buds of conifers in the winter.

The entire region including the permit area has been mapped as year-long habitat for this species. Most of the proposed new mine has already been disturbed by previous mining or other activities. Final revegetation will then enhance habitat for blue grouse by restoring native plant communities that were supported there before the area was disturbed. Plant species used for revegetation will include native grasses and forbs as well as woody species that will provide better more diverse forage for the blue grouse. This should also increase the amount and diversity of insects available as food for blue grouse.

Moose

Crucial winter habitat for moose (*Alces alces*) has also been designated within and outside the permit area. Additionally, crucial year-long habitat has been mapped within some of the riparian zones of Mud Creek and Woods Canyon just outside the permit area (Map 2C).

Moose are primarily browsers and depend often on woody vegetation such as shrubs and deciduous trees for their dietary needs. Moose in Utah are often associated with riparian plant communities, but have also done well in drier habitats such as those dominated by mountain mahogany, Gambel oak, serviceberry, quaking aspen and burned over coniferous forests (Utah Moose Management Plan, 2009, UDWR).

The breeding season or rut for moose begins in early September and peaks near the end of that month. The gestation period is about eight months and calving reaches its high point in late May.

The crucial riparian habitat mentioned above will not be disturbed by the Kinney No. 2 Coal Mine development and little, if any, impact will occur to them by subsequent coal mining activities and operations. Moreover, because habitat improvement projects favor early seral stages and increased shrub growth, which can be very beneficial to moose habitat, revegetation with native plants and restoration of favorable habitat on the currently disturbed areas at the site will increase and enhance the habitat for moose in the study area.

Mule Deer

The subspecies Rocky Mountain mule deer (*Odocoileus hemionus hemionus*) is the largest and only subspecies found in Utah. Its habitat has also been mapped within the permit and adjacent areas by UDWR biologists. The habitat has been classified as crucial summer fawning habitat. This designation included the entire permit area as well as those areas adjacent to it (Map 2D).

Deer are browsers, and rely on many different plant species in their diet. Woody plants such as sagebrush, bitterbrush, mountain mahogany, cliffrose, rabbitbrush, scrub oak and willow make up a major part of their diet, mule deer will eat a variety plants. Researchers have documented Rocky Mountain mule deer feeding on close to 800 different plant species (UDWR, Wildlife Notebook Series No. 13, 1999). The same source states that of these, over 60% are forbs, 25% are shrubs or trees, and 12% are grasses.

In Utah, the mule deer breeding season is during the months of November and December. The fawning period is from late spring to early summer. The does (females) often produce one or two fawns.

Operations of the proposed Kinney No. 2 Mine may impact some fawning activities by moving them further from noise caused by the mining activity, but is not likely to have an overall negative impact on the resident deer populations. Like the species mentioned above, mitigation of the mule deer habitat will be realized once following final reclamation of the mine site by restoration of those plant communities that are currently in poor condition due to past mining and other activities. Plant species used for revegetation will include native grasses and forbs as well as woody species that provide important browse and fawning cover for the mule deer in the area.

Rocky Mountain Elk

Rocky Mountain elk (*Cervus canadensis*) habitat has been mapped in the area. Crucial summer habitat was mapped throughout the entire area including the permit area (Map 2E).

Elk are ungulates but are "generalist" and have a diverse diet that consists of woody plants, forbs and grasses. Their flexible diet allows them to live in a variety of habitats but seem to prefer summers at higher elevations in aspen and coniferous forests and winter in lower elevations in plant communities such as mountain shrub and sagebrush. Elk in Utah are most closely tied to aspen communities than any other habitat type where they are provided forage and cover in the summer and are used for calving in the spring (Utah Elk Statewide Management Plan, UDWR,

2010). Relatively close proximity to a permanent water source is also an important component to elk habitat (e.g. within 0.33 miles). Although no permanent water source is available within the permit area, Mud Creek, Winter Quarters Creek, Wood's Canyon Creek and Scofield Reservoir are close by.

In Utah, the breeding season of elk begins in early September and continues through the middle of October. Calving usually occurs from mid May until early June, or after a gestation period of 8 or 8½ months. Calves are usually born in singles; twins are very rare.

Aspen is an important component within the Kinney No. 2 Mine permit area. Very little aspen stands will be disturbed associated with construction and operation of the mine. Noise and close proximity of the mining activities may impact calving activities in the nearby aspen stands, but elk will probably move during mining operations. The mining activities are not likely to have an overall negative impact on the elk population in the area. Like the species mentioned above, mitigation of the elk habitat enhancement and mitigation will be accomplished following final reclamation of the mine site by restoring of those plant communities that are currently in poor condition due to past mining and other activities. Plant species used for revegetation will include native grasses and forbs as well as woody species that provide important browse and fawning cover for the Rocky Mountain elk in the area.

Sage-Grouse

Greater sage-grouse (*Centrocercus urophasianus*) are native to Utah and have been listed as a sensitive species by the UDWR and are federally listed as a "candidate" species. Sage-grouse populations have been declining in western U.S. over the last 100 years as a result to loss of habitat, mainly the sagebrush steppe.

Sage-grouse habitat has been documented in and around the project area. UDWR biologists have mapped much of the area to be crucial brooding habitat as well as crucial winter habitat for this species (Map 2F). No leks are known to occur within a one mile radius.

Leks are areas where sage-grouse congregate to conduct courtship rituals and mating activities where the birds return to each year. It is common for sage-grouse to revisit the same leks for many decades. The mating activities are usually conducted from mid- March through late-April. For a few weeks prior to nesting and after mating, the birds move away from the lek and concentrate on foraging. Food sources during this time period are dominated by sagebrush leaves.

Nests are then selected, often within 2 miles of the lek. Female birds show a high fidelity rate for nest location relative to their leks (Utah Greater Sage-Grouse Management Plan, UDWR, 2009). Nesting primarily occurs under the cover of sagebrush plants and may occur until the first part of June. Clutch sizes are extremely variable, but the average size is 6.0 – 9.5 (Utah Greater Sage-Grouse Management Plan, UDWR, 2009). To survive, sage-grouse chicks must consume insects for at least 3 weeks following hatching, but their diet later consists of forbs, grasses, and shrub leaves.

The sagebrush community necessary for successful sage-grouse habitat is the most important plant community by extent within the Kinney No. 2 Mine permit and adjacent areas. That which has been described above as "previously disturbed by mining or other activities" was mostly within this community type. That said, most of revegetation for all disturbances (past and future) will occur within this community type. In other words, when the mine site is reclaimed, it will primarily be re-seeded to restore sagebrush communities with a good component of forbs and grasses also in the seed mixture. This will ultimately mitigate, enhance and increase habitat for

the greater sage-grouse of the area. This should also increase the amount and diversity of insects available as food for sage-grouse.

Snowshoe Hare

Not a threatened, endangered or sensitive species, the snowshoe hare (*Lepus americanus*) is included here because of public interest and its relevance as a primary food source for the federally listed threatened Canada lynx (*Lynx canadensis*). This species has year-long crucial habitat in a portion of the permit area as well as adjacent to it (Map 2G).

The snowshoe hares often occur in coniferous forests (there are very few stands in the permit area), but also occur in aspens (which is important in the permit area) and other woody plants such as alder, willow and other species.

No nests are built by snowshoe hares because the young are born with fur with their eyes open. Usually litter sizes are from two to four with three to four litters common from April through August. With very little disturbance planned in the existing aspen stands of the Kinney No. 2 Mine permit area, little or no impact is expected to occur to the resident snowshoe hare population.

R645-301.331 INTERIM RECLAMATION PLAN

To stabilize disturbed areas after initial construction, including stabilization during the life of the mine, all areas will be seeded with the temporary seed mixture included in Table 21 Temporary Seed Mixture. All temporary areas including cut slopes, fill slopes, and any other disturbed areas will generally be steeper than 3:1 and therefore will be seeded by hand or by spraying on the seed mixture with a hydroseeder, followed by spraying on an approved organic mulch at the rate of 1.5 tons per acre with an organic tackifier to stabilize the mulch. Any areas that have poor germination or that do not revegetate in the first year will be reseeded and mulched. The topsoil stockpiles will be seeded in the same manner, and in addition, alternative sediment controls as discussed in Chapter 7 will be implemented as necessary. These topsoil stockpile treatments may include, toe ditches, silt fences, straw bales, and additional silt fence rows along the contour at intervals up the topsoil stockpile slopes as may be warranted to control topsoil loss from the piles.

The interim reclamation will also provide browse, food, and habitat for wildlife during the life of the mine and will help offset the impacts of the mining operation on wildlife and birds.

R645-301.340 RECLAMATION PLAN

This section of the Kinney No. 2 Mine Permit Application provides both general and specific information relative to the plans and practices which will be utilized to reclaim and restore surface disturbance areas resulting from mining and related operations to a condition and productivity comparable to or better than their condition prior to the Kinney No. 2 Mine disturbance consistent with a postmining land use of wildlife habitat, and the Carbon County Land Use Zone designated "Watershed". *Although this chapter address specifically coal exploration as it relates to wildlife and vegetation, the basic principles and practices of reclamation presented apply to general mining disturbances which are also addressed in*

Chapter 5, Engineering under R645-301-540, and in Chapter 200, Soils under R645-301-234.240. Revegetation of the Kinney No. 2 Mine site will focus on re-establishing plant communities that were native to the area prior to disturbance by historical mining, future mining and other related activities. Simply stated, the revegetation plan will reestablish sagebrush and aspen communities that will include plant species that enhance and mitigate for high-interest wildlife species as well as those other wildlife species that are associated with these plant communities. The high-interest wildlife habitat as described by findings from the State of Utah, Division of Wildlife Resource (UDWR) geographical information system (GIS) include:

- Black Bear (Crucial, Year-Long & Substantial Year-Long Habitat)
- Blue Grouse (Crucial, Year-Long Habitat)
- Moose (Crucial, Winter)
- Mule Deer (Crucial, Summer and Crucial Fawning Habitat)
- Rocky Mountain Elk (Crucial, Summer Habitat)
- Sage-Grouse (Crucial Brooding & Crucial Winter Habitat)
- Snowshoe Hare (Crucial, Year-Long Habitat)

Information sources utilized in developing the reclamation plans presented in this chapter include the baseline environmental investigations, detailed mining plans, conceptual and detailed facility layouts and designs, detailed drainage and sediment control plans, and any specific plans for control, monitoring, and mitigation of mining related impacts. The reclamation design information and discussions of reclamation practices presented in this chapter have been prepared in compliance with applicable provisions of the State of Utah Coal Mining Rules and are intended to provide a reasonable description of the nature, timing, and anticipated results of planned reclamation activities. The reclamation plans presented in this chapter reflect consideration of the environmental resource information presented in R645-301-200, 300, 400 and 700, Environmental Information, and the mining plans presented in R645-301-500, "Engineering Design and Operations Plans", and are designed to effectively mitigate to the extent operationally practicable the potential effects of mining.
The various information categories addressed in the subsections which make up the Reclamation Plans are consistent with the information categories outlined in the State of Utah Coal Mining Rules. The following are the sub titles and designations included in this section:

- Reclamation of Exploration Disturbance
- Soil Replacement Plans
- Habitat Restoration Plans
- Reclamation of Mining Disturbance
- Hydrologic Restoration

Each subsection identifies the applicable regulatory provisions addressed and sources for the information presented and includes related supporting tables and figures. Other supporting documentation, including maps and exhibits, is referenced in the text and provided in the separate map and exhibit volumes.

Reclamation will be an integral part of any exploration and related activities. Reclamation of surface disturbance areas resulting from exploration activities will occur as soon as reasonably feasible following the completion of exploration drilling and other related activities.

Objectives of the planned reclamation activities will include stabilization of disturbed areas, minimizing erosion, limited potential surface water impacts, and restoring disturbed areas to a safe, stable condition. Plans for reclamation of exploration disturbance have been designed to successfully meet these objectives and will result in effective stabilization, and a reclaimed configuration which blends with the surrounding terrain and provides for effective surface and erosion control.

Reclamation will involve a logical sequence of activities designed to achieve the overall reclamation objectives in an organized progressive manner. The following represents the general steps for reclamation of any exploration disturbance areas:

- Completion of the borehole as a monitoring well or plugging and sealing the borehole
- Drainage and backfilling of any mud pits
- Collection and removal of any trash or debris
- Grading of pad areas to establish the final configuration
- Drainage reestablishment
- Road removal
- Soil replacement and stabilization
- Revegetation

These activities are discussed in detail in the following sections.

Reclamation Plans and Practices

The specific reclamation plans developed for exploration areas and the proposed reclamation practices reflect the overall reclamation objectives, site specific conditions and constraints, and the best current reclamation techniques and methods. The following sections describe the timing and sequencing of reclamation activities, general reclamation requirements, and specific reclamation practices.

Reclamation Timing and Sequencing

CR will reclaim exploration related surface disturbance areas as soon as operationally practicable following completion of exploration activities. Typically, reclamation will be initiated immediately on completion of all exploration activities under a given exploration program to accommodate effective mobilization and use of reclamation equipment or an independent reclamation contractor. CR will normally schedule all exploration activities under a given exploration program during the same field season and reclamation would occur on completion of the program or at the end of the field season and no later than the next normal field season (typically May through October). It is anticipated that final reclamation of exploration areas would be completed within 3 to 6 months from the time exploration activities at any given site are completed.

Final reclamation will involve removal of all exploration equipment and materials, closure and sealing of any boreholes not completed as monitoring wells, backfilling and grading of pad areas and roads, drainage reestablishment, road removal, placement of soil materials, and revegetation. Generally, soil replacement and revegetation efforts will be coordinated so that soil materials are revegetated as soon as practically possible following placement. Normally this will involve placement of soil and immediate reseeding at the end of the exploration project or field season in late fall. This approach allows the seed to "winter over" with germination in the spring when soil moisture conditions are elevated due to winter snow accumulations and spring melt.

Reclamation Plans and Practices

The reclamation plans and practices described in this chapter reflect consideration of site reclamation potential and any important limitations, and application of the best current reclamation technology and both CR's and other coal operators extensive operating experience in this area. The following sections describe the specific reclamation practices proposed for exploration surface disturbance areas.

Completion as a Monitoring Well or Plugging and Sealing Boreholes

As described in R645-301-631, Casing and Sealing Exploration Holes and Boreholes, a determination will be made either prior to or during completion of any exploration holes or boreholes of whether or not the hole will be utilized for ground water monitoring purposes. If the hole is to be utilized for monitoring it will be cased, completed, and developed as a monitoring well consistent with Figure 21 Typical Well Completion Diagram, and as described in R645-301-225, 323.200, 325, 202-235, and 236, Completion as Ground Water Monitoring Wells. If the hole is not to be utilized as a monitoring well or when an existing well is no longer required for ongoing monitoring, it will be sealed by filling the borehole or casing with cement to form a plug from the bottom of the hole to at least 20 feet above any zone of completion or water-bearing zone; filling the remainder of the hole to within 20 feet of the ground surface; and filling the remainder of the hole to the ground surface with cement to form a surface plug. A steel fence post will be placed in the center of the surface plug before the cement sets-up to provide a permanent marker for the hole location.

Drainage and Backfilling of any Mud Pits

If mud pits were utilized during Drilling, they will be allowed to dry out and will be backfilled with drill cuttings and/or the material originally excavated from the pits. Fill material will be placed and compacted by normal equipment traffic to minimize voids and provide and limit any potential future settlement. Any remaining excess drill cuttings will be spread over the drill pad surface.

Collection and Removal of any Trash or Debris

Any trash or debris resulting from drilling operations including used drill bits, mud or additive bags, core boxes and other materials will be collected and removed from the drill site for disposal in the local municipal landfill. In addition, all exploration equipment and related materials and supplies will be removed from the site.

Grading of pad areas to establish the final configuration

Drill pad surface areas will be regraded to their approximate original configuration. Grading will involve the use of a tracked dozer, wheel loader, or backhoe to move, place, and grade fill materials. Generally, the material utilized in constructing the pad will be pulled back onto the cut bench from downslope fill areas and the fill will be graded and contoured to blend with the surrounding terrain and provide for effective drainage. On completion of grading the regraded surface will be ripped along the contour to control drainage and provide a good bond with the replaced soil material. Fill slopes will be limited to a maximum slope of approximately 3H: I V and graded slopes in native material will vary dependent on material from less than 5H: I V to as much as O.5H: 1 V in competent rock.

Drainage Reestablishment

In conjunction with grading activities, CR will establish a drainage configuration which is compatible with the natural drainage pattern of the surrounding terrain. If upgradient drainage

would pose a potential erosion hazard for the regraded area, drainage will be routed around the regraded surface or erosion control materials will be utilized as appropriate.

Road Removal

Where existing roads are utilized for exploration access, water bars will be constructed where appropriate to minimize erosion and natural drainage patterns will be reestablished. Any new road segments constructed specifically for exploration access will be reclaimed by ripping the road surface and grading to reestablish the approximate original configuration and drainage pattern. Cut/fill areas will be reclaimed by pulling the fill material upslope into the cut and grading any remaining cut slope, the fill material, and disturbed downslope areas to a stable configuration consistent with natural drainage patterns and blending with the surrounding terrain.

Soil Replacement

Following completion of backfilling, grading, and drainage reestablishment, available soil material will be replaced on the regraded areas as a growth medium for subsequent revegetation. Soil will be replaced as soon as operationally practicable following completion of the other necessary activities in the reclamation sequence, however, the timing of soil placement will also reflect the need to reestablish vegetation as soon as possible to stabilize and prevent loss or erosion of the soil. Soil bladed off the pad area and roads during construction will typically be windrowed along the perimeter of the disturbance areas. This material will be recovered and spread across the regraded areas to establish a relatively uniform thickness of growth medium.

As the final step in the reclamation process, all exploration surface disturbance areas will be revegetated. Typically revegetation seeding will occur immediately. Seeding may occur at other times where appropriate to minimize erosion due to location, aspect, or other site specific factors. Any required shrub or woody species transplanting will occur in late spring to minimize the potential for frost-kill.

Seedbed preparation will involve ripping, or deep gouging the resoiled surface to prepare the surface to receive seed. Seed may be placed using either a rangeland seed drill or broadcast methods. Following seed placement, weed free straw or native hay mulch or other erosion control materials will be placed and crimped or anchored to protect the soil, minimize erosion, prevent seed loss and help trap and retain moisture. Exploration areas will be seeded with the permanent seed mixture as discussed in R645-301-340, Habitat Restoration Plans.

General Habitat Restoration Requirements

The Kinney No. 2 Mine surface facilities area will be the only surface disturbance area resulting from the planned mining and related activities. As described in R645-301-312 and 313, General Biological Resource Protection Requirements, the majority of the mine facilities area has been extensively disturbed by previous mining related activities resulting in destruction, elimination, or significant modification of vegetation and habitat values. Beyond the practical limitations on habitat value and use relating to the previous disturbance, wildlife use of both existing and proposed surface disturbance areas is also limited by current levels of human activity in the immediate area due to the proximity of Highway 96, and Scofield Town.

From a practical standpoint, the mine surface facilities area because of the extensive previous disturbance and their proximity to other development activities are not particularly well suited for many uses other than mining. Given, however, that these areas and the surrounding lands

were in all probability undeveloped lands utilized for wildlife habitat, CR will reclaim surface disturbance areas to a postmining land use of wildlife habitat and watershed, which is a Carobn County Zoning designation. Consistent with the proposed postmining use, backfilling and grading will focus on restoration of a land configuration consistent with applicable provisions for remining of previously disturbed areas with a preexisting highwall (R645-301-553.500 through 524) and the general configuration which existed prior to mine development, soil and substitute materials will be replaced to provide a vegetative growth media similar to the natural soils existing in the area, and planned revegetation efforts are designed to provide a self-sustaining postmining vegetation community which will effectively stabilize disturbed areas and provide suitable wildlife forage and browse. In addition to site revegetation measures, CR will also implement specific habitat mitigation and enhancement measures, as further described in this chapter, to effectively address potential mining related impacts and provide some long-term mining related benefits.

R645-301-341 Revegetation

CR's planned revegetation practices are specifically designed to provide or promote:

- Rapid vegetative reestablishment following completion of soil/substitute replacement
- Establishment of adequate plant density and cover to effectively control runoff and erosion
- Establishment of a reclaimed plant community consisting primarily of indigenous plant species with any introduced species having proven adaptability for site conditions
- Adequate plant species diversity and vigor to assure effective ongoing vegetative propagation and a self-sustaining vegetation community
- Palatable wildlife browse and forage species consistent with the postmining land use

Revegetation seed mixtures, and stabilization/management practices have all been selected and designed to achieve these objectives. Generally, revegetation methods will be similar for all surface disturbance areas and will typically include the following specific activities:

- Seedbed preparation
- Seeding
- Mulching and surface stabilization
- Management and revegetation success monitoring

Timing of Revegetation Activities

Interim revegetation has been addressed previously in this chapter. Generally, seeding of areas where soil/substitute materials have been replaced will occur as soon as practically possible following the cessation of mining activities in order to minimize the potential for both soil/substitute loss and erosion. Normally this will involve placement of soil/substitute and immediate reseeding, and soil stabilization.

Revegetation Practices

As previously described, revegetation of surface disturbance areas will involve a logical sequence of activities including seedbed preparation, seeding, woody species transplanting, mulching and surface stabilization, and management and revegetation success monitoring. Localized adaptations of specific revegetation practices will be utilized where appropriate to address any limiting site conditions and constraints such as steep slopes, rocky soils, increased erosion potential, and other factors.

Seedbed Preparation

Prior to seeding, CR will prepare regraded and resoiled areas to provide a firm but uncompacted seedbed. As described in R645-301-243, Soil Suitability and Testing, and in R645-301-542.300 through 800, 550 through 553.900, and 560, Reclamation Practices, under the sub-headings of Backfilling and Grading to Establish Final Configuration, Soil/Substitute Replacement, and Revegetation; backfilling, grading, and soil/substitute replacement activities will be conducted so as to minimize compaction.

Soil materials will be left in a roughened condition to control runoff, limit erosion and soil loss, and promote moisture infiltration. CR will also selectively apply alternative sediment control measures as described in R645-301-730, Hydrologic Resource Protection Plan. Revegetation seeding will occur immediately following soil material placement so additional stabilization measures will not be required prior to seeding. In conjunction with seeding operations, the soil material will be deep ripped (up to 3 feet deep), plowed or disked to prepare the seedbed in areas where the slopes are 3:1 or flatter. Where the slopes are steeper than 3:1, deep gouging, or plowing along the contour will done to prepare the seedbed. The reclaimed ground surface will be very similar in topography to the pre-mining surface as shown on Map 29, Mine Surface Facilities Area – Postmining Topography and Interim Drainage Control Map.

Reclaimed ground gradients can be seen on Map 29, Mine Surface Facilities Area – Postmining Topography and Interim Drainage Control Map. Deep gouging is the preferred method, with plowing along the contour as an alternative where slope angle allows. In all cases, UGOGM will be consulted prior to seedbed preparation to insure that the reclamation plan is being followed. Following seeding, the reseeded areas will be mulched with straw or native hay at a rate of two tons per acre and the mulch will be crimped, plowed, or disked into the soil on slopes at 3:1 or steeper to minimize wind loss. Another method of soil stabilization that may be used on areas with slopes steeper than 3:1 is spray on organic mulch at a rate of 2 tons per acre with a tackifier to stabilize the mulch and seeds. Again, UDOGM will be consulted prior to seeding and soil stabilization to insure the reclamation techniques used are the best for the particular slope, soil type and surface aspect, and that the application rates are appropriate for the slope and time of season when reclamation is done.

Hay purchases will be based on specifications which minimize the potential for introduction of any noxious weed species. While this treatment is intended primarily to increase soil organic content and provide soil biota, it will also be effective in alleviating compaction and promoting moisture infiltration and retention.

Given that seeding will normally follow soil/substitute replacement within a very short time period and that the soil/substitute surface will be left in a roughened condition, seedbed preparation requirements will be minimal. In order to limit mixing of soil/substitute and underlying backfilled

materials, surface manipulations will be minimized and will generally be limited to appropriate gouging/roughening techniques.

Seeding

CR will generally use one of three seeding methods, either drill seeding, broadcast seeding, or hydromulching dependent on the nature and aspect of the area to be revegetated. Broadcast seeding using a conventional rangeland seed drill will be utilized for reseeding of most areas. For construction disturbance, roadcuts, ditches, sedimentation pond embankments, soil/substitute stockpiles and other areas which require temporary vegetation to stabilize the disturbed surface and control runoff, erosion, and sedimentation, the temporary seed mixture will be drill seeded at a rate of 20.4 pounds of pure live seed (PLS) per acre or broadcast seeded at twice this rate (40.8 lbs. PLS/acre). Similarly, for all areas to be revegetated on a permanent basis, the permanent seed mixture will be drill seeded at a rate of 46.33 pounds of PLS/acre or broadcast seeded at twice this rate (92.66 lbs. PLS/acre). To the extent operationally feasible, CR will drill seed along the contour on sloping areas.

Following deep gouging or other roughening process, the resoiled areas will be seeded with the appropriate seed mixture and rates. Shortly after the seeding, an additional 1 to 1.5 tons per acre of certified noxious weed free straw will be spread over the seeded growth media by mechanical blowers or hand spreading. This mulch will be sprayed with a tackifier and mulch mixture at a rate of 0.25 tons per acre or crimped with the track hoe bucket or shovel following spreading to retain it on the reseeded slopes. Commercial seed purchases will be based on specifications which minimize the potential for introduction of noxious weed species.

Woody Species

The proposed permanent seed mixture for the Kinney No. 2 Mine surface facilities area includes several woody plant species which can be effectively established from seed including Utah serviceberry, mountain big sagebrush, winterfat, antelope bitterbrush, and mountain snowberry.

Mulching and Surface Stabilization

Surface stabilization measures have been incorporated as an integral part of CR's specific reclamation procedures for backfilling and grading, drainage reestablishment, soil/substitute replacement, seedbed preparation, and revegetation seeding activities. In addition to specific surface stabilization measures, CR will also selectively apply alternative sediment control measures as appropriate to control erosion and apply weed-free straw or native hay mulch to most re-seeded surface disturbance areas and will utilize other surface protection/stabilization measures in conjunction with or as an alternative to mulching for any areas having increased erosion potential. A detailed description of specific surface stabilization and mulching practices is presented in R645-301-341, Mulching and Stabilization Practices.

Management and Revegetation Success Monitoring

Re-seeded areas will be managed to achieve the revegetation objectives previously noted in this chapter. Management practices will include regular periodic inspection of reseeded areas;

appropriate erosion control or repair activities; weed/pest control operations; re-seeding, if required; and revegetation success sampling and evaluations.

As part of the postmining management program, reclaimed areas will be qualitatively inspected on a regular quarterly basis at a minimum for any indications of significant erosion, siltation, surface instability, drainage problems, seeding failure, weed infestations, or other conditions which could adversely impact reclamation success. Inspections will continue throughout the extended liability period to assure effective reclamation. Any problems identified as a result of these regular inspections will be addressed in a timely manner consistent with overall reclamation plans and practices.

The reclamation plan for the Kinney No. 2 Mine has been designed to prevent or minimize erosion and restore disturbed areas to a stable and productive condition. If despite CR's best efforts, inspection of the reclaimed areas indicates that natural erosional processes are creating significant rills or gullies, CR will implement appropriate remedial/protective measures. In order to minimize any associated surface disturbance, the proposed erosion mitigation measures reflect consideration of the nature and extent of erosional damage and are designed to be implemented in phases dependent on the severity of or potential for damage. Specific erosion mitigation measures are described in R645-301-542.300 through 800, 550 through 553.900, and 560, Reclamation Practices, under the sub-heading of Post-Reclamation Management and Monitoring.

Any seeding failures or weed infestations identified by the post-reclamation management inspections will be addressed during appropriate time periods to achieve optimal mitigation. Any areas where partial or complete seeding failure is indicated by limited vegetative reestablishment or excessive dominance of one or more species will be addressed by reseeding the effected areas during either the early spring or late fall. Essentially the same seeding methods will be utilized as for initial seeding with the exception of seedbed preparation. Any significant weed infestations will be addressed through consultation with UDOGM to determine appropriate control measures. A detailed description of specific weed and pest control measures is presented in R645-301-341.240 and 357.300, Irrigation and Pest Control.

In addition to regular periodic inspections of re-seeded areas, CR will also implement a revegetation success monitoring program to quantify and document the progression of vegetative reestablishment for all reclaimed areas. The ultimate objectives of the revegetation success monitoring program will be to allow timely identification and remediation of any vegetative reestablishment problems and to provide the verification required for a revegetation success determination and final bond release. A detailed discussion of the revegetation success monitoring program is provided in R645-301-341.250, 300, 353.100 through 300, 356100 through 400, and 357.100 through 300, Revegetation Success - Criteria and Evaluation Methods.

Revegetation Species and Amounts

CR will use two separate revegetation seed mixtures for the new Kinney No. 2 Mine surface facilities disturbance areas; one for temporary vegetative establishment on construction disturbance areas, roadcuts, ditches, sedimentation pond embankments, soil/substitute stockpiles and other areas requiring interim erosion control and stabilization, and one for permanent revegetation of reclaimed upland areas. The species selected for inclusion in both the temporary and permanent revegetation seed mixtures are native and adapted species which occur within the surface disturbance and adjacent areas and which have a proven

adaptability and compatibility to site conditions. Selection of specific plant species for inclusion in the revegetation seed mixtures involve consideration of natural occurrence as documented by vegetative baseline studies, ease of establishment from seed, seed availability, adaptability and vigor, contribution to vegetative diversity, and forage and browse value for various wildlife species.

The proposed temporary seed mixture presented as Table 22, Temporary Seed Mixture, consists of adapted species which germinate rapidly, are effective sod formers, and so are well suited to establish an effective temporary vegetative cover. The temporary seed mixture will be used for those disturbed areas which will not be utilized on an ongoing basis as active operating areas but will be disturbed prior to or in conjunction with final site reclamation. The temporary seed mixture may also be used as a stubble mulch to stabilize areas which are particularly subject to potential erosion.

The proposed permanent seed mixture for the Sagebrush/Grass and Rabbitbrush/Grass Plant Communities is presented in Table 22, Final Revegetation Seed Misture for Sagebrush/Grass and Rabbitbrush/Grass Plant Communities. The permanent seed mixture consists of a variety of predominantly native grasses, forbs, and shrubs with proven site adaptability and good hardiness which have been specifically selected for their value as browse and forage species consistent with the postmining land use of wildlife habitat as recommended by the UDWR. The permanent mixture will be utilized for revegetation of all surface disturbance areas and includes a variety of species found in both the grass-sage and rabbitbrush-grass vegetation communities. Based on their occurrence in natural plant communities in the area, available agronomic and wildlife research, and actual operating experience at coal mines in the Price, Utah area, the selected species included in the permanent reclamation seed mixture will provide an effective self-sustaining vegetative cover which will control surface runoff and erosion, provide sufficient diversity to assure the long-term stability of the revegetated community, and is compatible with CR's wildlife habitat mitigation, restoration, and enhancement objectives.

To the extent reasonably feasible consistent with both site stabilization and reclamation objectives, CR has selected revegetation species which are native species. CR will assure acceptable purity and germination standards for all seed mixtures and will require that suppliers certify seed shipments as meeting the standard specifications and being free of noxious weed seed.

In order to assure that seeding and planting stocks are of suitable quality for effective revegetation, CR will attempt to obtain native seed material from those sources which most closely approximate site conditions and will deal only with established reputable seed suppliers. CR will assure acceptable purity and germination standards for all seed mixtures and will require that supplies certify seed shipments as meeting the standard specifications and being free of noxious weed seed.

TABLE 21

TEMPORARY SEED MIXTURE

Group/Species	PLS (Drill) lbs/acre*	Number of Seeds/FT2
Grasses Thickspike Wheatgrass (Elymus lanceolatus)	4.0	14.14
Western Wheatgrass (Elymus smithii)	5.0	14.46
Bluebunch Wheatgrass (Elymus spicatus)	6.0	19.28
Kentucky Bluegrass (Poa pratensis)	0.40	19.99
Forbs Utah Sweetvetch (Hedysarum boreale)	5.0	3.86
TOTALS TOTAL	20.40	71.74
* Based on drill seeding methods. Rates should be doubled in areas that are broadcast seeded.		

TABLE 22

FINAL REVEGETATION SEED MIXTURE FOR SAGEBRUSH/GRASS AND RABBITBRUSH/GRASS PLANT COMMUNITIES

Species	**PLS (Drill) lbs/acre***	**Number of Seeds/FT2**
Grasses Bluebunch Wheatgrass (Elymus spicatus)	1.50	4.82
Kentucky Bluegrass (Poa pratensis)	2.00	4.0
Sandberg Bluegrass (Poa secunda)	0.20	4.25
Needle-and-thread (Stipa comata)	1.00	2.64
Forbs Common Yarrow (Achillea millefolium)	0.03	1.91
Utah Sweetvetch (Hedysarum boreale)	5.00	3.86
Lewis Flax (Linum lewisii)	0.70	4.47
Silky Lupine (Lupinus sericeus)	8.00	4.51
Meadow Penstemon (Penstemon rydbergii)	1.50	4.54

TABLE 22 FINAL REVEGETATION SEED MIXTURE FOR SAGEBRUSH/GRASS AND RABBITBRUSH/GRASS PLANT COMMUNITIES		
Goldeneye (Viguiera multiflora)	0.20	4.84
Shrubs Utah Serviceberry (Amelanchier utahensis)	6.00	3.55
Mountain Big Sagebrush (Artemisia tridentate vaseyana)	0.10	5.74
Winterfat (Ceratoides lanata)	4.00	5.05
Antelope Bitter Brush (Purshia tridentate)	15.00	5.17
Mountain Snowberry (Symphoricarpos oreophilus)	3.00	5.17
TOTALS	46.33	65.51
* Based on drill seeding methods. Rates should be doubled in areas that are broadcast seeded.		

In addition to the specific stabilization practices, following reclamation seeding, straw or native hay mulch will be applied to most re-seeded areas at a rate of approximately 2 tons per acre and crimped or anchored using a disk or similar agricultural implement to protect the soil, minimize erosion, prevent seed loss, and help trap and retain moisture. In certain areas where there may be increased potential for erosion and soil loss due to steep slopes or localized drainage conditions, other suitable stabilization materials and methods including alternative sediment control measures may be substituted for or combined with mulching.

Such methods may include dozer tracking, application of geotextiles, hydromulching (at a rate of approximately 1.5 tons per acre), or other suitable stabilization and erosion control measures.

341.230 Mulching Techniques

As described in R645-301-542.300 through 800, 550 through 553.900, and 560, Reclamation Practices, under the sub-heading of Backfilling and Grading to Establish Final Configuration, and Drainage Reestablishment; and in this chapter under R645-301-341 under the sub-heading of Seedbed Preparation; reclaimed areas will be graded to a stable configuration with reestablishment of effective surface drainage patterns. Prior to seeding, CR will prepare regraded and resoiled areas to provide a firm but uncompacted seedbed. Soil materials will be left in a roughened condition to control runoff, limit erosion and soil loss, and promote moisture infiltration. CR will also selectively apply alternative sediment control measures as described in R645-301-730, Hydrologic Resource Protection Plan. Revegetation seeding will occur immediately following soil material placement so additional stabilization measures will not be required prior to seeding. In conjunction with seeding operations, the soil material will be deep ripped (up to 3 feet deep), plowed or disked to prepare the seedbed in areas where the slopes are 3:1 or flatter. Where the slopes are steeper than 3:1, deep gouging, or plowing along the contour will be done to prepare the seedbed. The reclaimed ground surface will be very similar in topography to the pre-mining surface as shown on Map 29. Reclaimed ground gradients can be seen on Map 33, Slope Analysis Map. Deep gouging is the preferred method, with plowing along the contour as an alternative where slope angle allows. In all cases, UGOGM will be consulted prior to seedbed preparation to insure that the reclamation plan is being followed. Following seeding, the reseeded areas will be mulched with straw or native hay at a rate of two tons per acre and the mulch will be crimped, plowed, or disked into the soil on slopes at 3:1 or steeper to minimize wind loss. Another method of soil stabilization that may be used on areas with slopes steeper than 3:1 is spray on organic mulch at a rate of 2 tons per acre with a tackifier to stabilize the mulch and seeds. Again, UDOGM will be consulted prior to seeding and soil stabilization to insure the reclamation techniques used are the best for the particular slope, soil type and surface aspect, and that the application rates are appropriate for the slope and time of season when reclamation is done.

Hay purchases will be based on specifications which minimize the potential for introduction of any noxious weed species. While this treatment is intended primarily to increase soil organic content and provide soil biota, it will also be effective in alleviating compaction and promoting moisture infiltration and retention.

All of these reclamation practices contribute to effective stabilization of the reclaimed surface.

341.240 Irrigation

While irrigation can potentially facilitate initial vegetative establishment it is not a practical long-term management practice and may actually reduce long-term revegetation success. For these reasons, and because irrigation is incompatible with both the postmining land use of wildlife habitat and the objective of a self-sustaining vegetation community, CR does not to propose to utilize irrigation in conjunction with site revegetation efforts.

341.250 Determination of Revegetation Success Criteria and Evaluation Methods

In order to accurately and objectively evaluate the effectiveness of revegetation efforts and provide a quantitative determination of ultimate revegetation success, CR will conduct field revegetation success sampling and will evaluate the resulting field data. The following discussion outlines revegetation success monitoring practices and evaluation criteria for those new disturbance areas associated with the Kinney No. 2 Mine surface facilities area.

Sampling of revegetated areas will be conducted at intervals of four, eight, nine, and ten years following initial permanent revegetation seeding. Consistent with the baseline and reference area approaches for evaluation of revegetation success as outlined in the UDOGM Vegetation Information Guidelines, and the baseline vegetation sampling program as discussed in R645-301-321.100, Vegetation Parameters, CR will sample cover and productivity for all permanently revegetated areas and will evaluate revegetation success on the basis of these two primary parameters.

Revegetation success sampling and evaluation methods for ground cover and productivity will be essentially the same as previously utilized for baseline data collection. These methods, as described in R645-301-321.100, and 200, Sources of Vegetation Information, will include the use of randomly located sampling transects, measurement of cover using an inclined ten-point frame, and measurement of productivity by clipping randomly located sample plots. For revegetation success evaluations, woody plant density will be measured by counting all woody plants rooted within one meter on either side of the 50 meter random transects utilized for cover sampling and extrapolating the corresponding woody plant density to determine density on a "stems per acre" basis. Sample adequacy for all revegetation success sampling will be evaluated using the formulae presented in Appendix A of the UDOGM Vegetation Information Guidelines and will be based on the objective of achieving a 90 percent confidence interval within 10 percent of the mean.

The purpose of revegetation sampling efforts during years three and seven of the extended liability period will be to determine and evaluate the effectiveness of site revegetation efforts and to determine trends for vegetative reestablishment. The resulting data and evaluation results will be utilized as appropriate to identify any potential areas of concern and to guide post-reclamation management efforts in order to meet specific requirements for a revegetation success determination and ultimately achieve the overall reclamation objectives. Revegetation success monitoring during years nine and ten of the extended liability period will focus on data collection and development of the necessary documentation to allow for effective comparison of reclaimed and baseline conditions as the basis for a revegetation success determination.

The original baseline sampling involved collection of cover and production data for two distinct vegetation types: 1) Previously Disturbed AMR (now Rabbitbrush/grass; 2) Native Sagebrush/grass. All reclaimed areas will be revegetated using essentially the same methods and seed mixture. In order to evaluate revegetation success for reclaimed areas, areas identified as Disturbed or Reclaimed and native Sagebrush/grass types will be sampled together as a unit.

Cover and production values resulting from the revegetation success monitoring for the areas will be compared with weighted average values based on the reference area values. Weighting will be based on the corresponding acreages of each of the vegetation type. The statistical comparison utilized to evaluate revegetation success will be based on the “t-test comparison” method. If the absolute values for cover and production for the reclaimed areas are greater than or equal to the calculated 90 percent confidence interval for the baseline data then the mean values for the designated revegetation success parameters can be

considered to be statistically equivalent and it can be concluded that the applicable revegetation success criteria have been achieved.

For woody plant density, revegetation success monitoring data will be compared with a reclamation standard of 1,700 plants per acre for areas identified in the baseline sampling. Consistent with cover and production sampling, if the absolute values for woody plant density for the reclaimed areas are greater than or equal to the calculated 90 percent confidence interval for the numeric standards then the mean values for the designated revegetation success parameters can be considered to be statistically equivalent and it can be concluded that the applicable revegetation success criteria have been achieved.

General revegetation requirements under applicable UDOGM regulations include consideration of erosion control, and vegetative diversity, seasonality, and permanence. In order to address these secondary considerations relative to revegetation success, CR proposes the following secondary success standards:

> Erosion Control - Formation of rills and gullies on reclaimed areas will be limited to a maximum of 0.75 feet in depth. General erosion will be evaluated using Mark H. Humphrey's Erosion Condition Classification System (Draft 12/5/90) as adapted from BLM's Erosion Condition Classification System (BLM Technical Note - Number 346)
>
> Vegetative Diversity and Permanence - Premining and postmining values will be compared using Sorenson's Similarity Index as outlined in the UDOGM Vegetation Guidelines
>
> Seasonality - Seasonality of reclaimed plant communities relative to premining conditions will be evaluated by comparing percent composition of warm season plant species

Success evaluations for these secondary criteria will be based on the same weighting approach as previously discussed for the evaluation of the primary parameters of vegetative cover and production.

R645.301-342 Fish and Wildlife Reclamation Plan

Given the proposed postmining land use of wildlife habitat, watershed, and commercial and the extent of existing site disturbance with the related constraints on wildlife habitat values, CR as part of their overall reclamation plans will restore and enhance where reasonably possible site conditions and habitat values which will support and benefit wildlife use, watershed and commercial uses. In addition to the general reclamation measures and practices which will be implemented on completion of mining as described in the preceding s, CR will implement supplemental wildlife habitat enhancement measures as discussed in the following s.

Restoration of surface disturbance areas will ultimately be achieved by backfilling, grading, drainage reestablishment, soil/substitute replacement, and revegetation to a configuration and condition consistent with the postmining land uses. Plans for reclamation and revegetation activities are discussed in the preceding .

R645.301-350 Performance Standards

R645.301-351 General Requirements

The UDWR has developed a variety of seed mixes and seeding recommendations for various areas, conditions, and wildlife habitat restoration objectives. These recommendations were reviewed in developing the proposed permanent reclamation seed mixture and a number of the species selected for the proposed seed mix were included because of their value for habitat restoration as outlined by the UDWR recommendations.

Placement of Rock Piles - Piles of rocks and large boulders would be randomly placed on the reclaimed surface to serve as shelter for reptiles and small mammals and temporary perches for raptors and other birds.

R645.301-352 Contemporaneous Reclamation

The Kinney No. 2 Mine is an underground mine and the surface facilities areas are anticipated to be active through the duration of mining activities and as such there will be little need for contemporaneous reclamation. Any coal exploration sites will be reclaimed as discussed in other sections of this chapter when the drill sites are not longer in use, and in the case where a coal exploration hole is converted to a ground water monitoring well, the site will be prepared as discussed under R645-301-340 earlier in this chapter.

In the event any surface areas are no longer needed for continued operation of the mine, CR will reclaim those areas contemporaneously as discussed in this chapter.

R645.301-353 Revegetation General Requirements

Reclamation will be an integral part of the Kinney No. 2 Mine mining and related activities, however, because the mine will be an underground mine and the surface facilities and related surface disturbance areas will remain in place until the end of the mine life, mining and reclamation will not occur concurrently or, in the case of progressive mining activities, sequentially. Reclamation of surface disturbance areas will generally occur following the cessation of mining operations to complete the mining and reclamation cycle although CR will implement temporary stabilization measures in certain areas following initial construction or during ongoing operations.

Objectives of the planned reclamation activities will be twofold; 1) For construction disturbance, temporary stabilization and contemporaneous reclamation will serve to stabilize disturbance areas, minimize erosion, and limit potential surface water impacts; 2) For long-term use areas, final reclamation is designed to restore disturbed areas to a safe, stable condition and to reestablish the productivity of the land consistent with the postmining land use(s). The proposed postmining land uses of wildlife habitat, water shed, and commercial use reflects the predisturbance use of this and adjacent areas, existing land use plans and policies, the desires

of affected surface landowners, and practical constraints relative to land use capability and condition. Specific land use considerations and constraints are discussed in R645-301-400, Land Use Information. The Kinney No. 2 Mine reclamation plan has been designed to successfully meet these objectives and will result in effective temporary stabilization, and a postmining configuration which blends with the surrounding terrain and provides environmental values consistent with or superior to those which existed prior to mining.

The Kinney No. 2 Mine reclamation plan has been developed utilizing available information on the existing environmental resources as described in R645-301-200, 300, 400, 600, and 700, Environmental Information. In addition, CR has incorporated both available information on current successful reclamation technology and practices and their extensive operating experience in the area. While the plans presented in this permit represent what CR feels to be the most effective reclamation practices for this site, it is important to note that successful reclamation must be a dynamic process, incorporating new information to optimize overall effectiveness. In order to meet the reclamation objectives these plans may be modified as appropriate to reflect changing conditions, revised regulatory requirements, advances in reclamation technology, and the results on ongoing research and experience relative to the long-term effectiveness of various reclamation practices. Any future plan modifications will be submitted for approval to the UDOGM through the normal permitting process.

Reclamation will involve a logical sequence of activities designed to achieve the overall reclamation objectives in an organized progressive manner. The following represent the general steps for reclamation of any mine or mine related surface disturbance areas:

- Facility Demolition and Removal
- Stabilization and Sealing of Mine Openings
- Disposal of Non-Coal Wastes, and Mine Waste Materials
- Backfilling and Grading to Establish the Final Design Configuration
- Drainage Reestablishment
- Road Removal
- Soil/Substitute Replacement
- Revegetation
- Post-Reclamation Management, Maintenance, and Monitoring
- Removal and Reclamation of Sedimentation Ponds and Associated Structures
- These activities are discussed in detail in this chapter, in Chapters 2, 3 and 5.

353.250 Noxious Weeds

Regular periodic inspections of revegetated areas will include inspection for any noxious weed infestations or insect damage. If noxious weed infestations or insect problems are identified which have the potential to adversely impact revegetation success, CR will consult with both UDOGM and Carbon County Weed Control to develop and implement appropriate control measures. If the controls determined through this consultation process involve the application of herbicides or insecticides, only those chemicals approved for use by the appropriate State and Federal agencies will be considered and control practices will be limited to spot application at the appropriate time period for best control of the problem species.

R645.301-354 Revegetation: Timing

Generally, seeding of areas where soil/substitute materials have been replaced will occur immediately after seedbed preparation. In areas where the slope is greater than 3:1 where deep gouging, or plowing along the contour is done, seeding, mulching, or other soil stabilization methods will immediately follow seedbed preparation.

While late fall plantings represent the preferred schedule for revegetation and will be implemented in most situations, there may be occasions where prompt revegetation of small construction or other disturbance areas may be desirable to minimize erosion and sedimentation potential. Cases where this exception may apply could include newly established soil/substitute stockpiles, road cuts, newly constructed diversion and collection ditches, and small areas where erosion or other repairs have occurred, and as discussed above. In such cases, revegetation activities may occur at any time provided that site and climatic conditions offer a reasonable potential for successful vegetative reestablishment.

R645.301-355 Revegetation: Mulching and Soil Stabilizing

Prior to seeding, CR will prepare regraded and resoiled areas to provide a firm but uncompacted seedbed. As described in R645-301-243, Soil Suitability and Testing, and in R645-301-542.300 through 800, 550 through 553.900, and 560, Reclamation Practices, under the sub-headings of Backfilling and Grading to Establish Final Configuration, Soil/Substitute Replacement, and Revegetation; backfilling, grading, and soil/substitute replacement activities will be conducted so as to minimize compaction. Soil materials will be left in a roughened condition to control runoff, limit erosion and soil loss, and promote moisture infiltration. CR will also selectively apply alternative sediment control measures as described in R645-301-730, Hydrologic Resource Protection Plan. Revegetation seeding will occur immediately following soil material placement so additional stabilization measures will not be required prior to seeding. In conjunction with seeding operations, the soil material will be deep ripped (up to 3 feet deep), plowed or disked to prepare the seedbed in areas where the slopes are 3:1 or flatter. Where the slopes are steeper than 3:1, deep gouging, or plowing along the contour will done to prepare the seedbed. The reclaimed ground surface will be very similar in topography to the pre-mining surface as shown on Map 29. Reclaimed ground gradients can be seen on Map 33, Slope Analysis Map. Deep gouging is the preferred method, with plowing along the contour as an alternative where slope angle allows. In all cases, UGOGM will be consulted prior to seedbed preparation to insure that the reclamation plan is being followed. Following seeding, the reseeded areas will be mulched with straw or native hay at a rate of two tons per acre and the mulch will be crimped, plowed, or disked into the soil on slopes at 3:1 or steeper to minimize wind loss. Another method of soil stabilization that may be used on areas with slopes steeper than 3:1 is spray on organic mulch at a rate of 2 tons per acre with a tackifier to stabilize the mulch and seeds. Again, UDOGM will be consulted prior to seeding and soil stabilization to insure the reclamation techniques used are the best for the particular slope, soil type and surface aspect, and that the application rates are appropriate for the slope and time of season when reclamation is done.

Incorporation of the mulch will occur either by plowing along the contour, deep gouging/roughening, or a combination of those methods. Hay purchases will be based on specifications which minimize the potential for introduction of any noxious weed species. While this treatment is intended primarily to increase soil organic content and provide soil biota, it will also be effective in alleviating compaction and promoting moisture infiltration and retention.

R645.301-356 Revegetation: Standards For Success

In order to accurately and objectively evaluate the effectiveness of revegetation efforts and provide a quantitative determination of ultimate revegetation success, CR will conduct field revegetation success sampling and will evaluate the resulting field data. The following discussion outlines revegetation success monitoring practices and evaluation criteria for those new disturbance areas associated with the Kinney No. 2 Mine surface facilities area.

Sampling of revegetated areas will be conducted at intervals of four, eight, nine, and ten years following initial permanent revegetation seeding. Consistent with the baseline and reference area approaches for evaluation of revegetation success as outlined in the UDOGM Vegetation Information Guidelines, and the baseline vegetation sampling program as discussed in R645-301-321, Vegetation Parameters, CR will sample cover and productivity for all permanently revegetated areas and will evaluate revegetation success on the basis of these two primary parameters.

Revegetation success sampling and evaluation methods for ground cover and productivity will be essentially the same as previously utilized for baseline data collection. These methods, as described in R645-301-320, Sources of Vegetation Information, will include the use of randomly located sampling transects, measurement of cover using an inclined ten-point frame, and measurement of productivity by clipping randomly located sample plots. For revegetation success evaluations, woody plant density will be measured by counting all woody plants rooted within one meter on either side of the 50 meter random transects utilized for cover sampling and extrapolating the corresponding woody plant density to determine density on a "stems per acre" basis. Sample adequacy for all revegetation success sampling will be evaluated using the formulae presented in Appendix A of the UDOGM Vegetation Information Guidelines and will be based on the objective of achieving a 90 percent confidence interval within 10 percent of the mean.

The purpose of revegetation sampling efforts during years three and seven of the extended liability period will be to determine and evaluate the effectiveness of site revegetation efforts and to determine trends for vegetative reestablishment. The resulting data and evaluation results will be utilized as appropriate to identify any potential areas of concern and to guide post-reclamation management efforts in order to meet specific requirements for a revegetation success determination and ultimately achieve the overall reclamation objectives. Revegetation success monitoring during years nine and ten of the extended liability period will focus on data collection and development of the necessary documentation to allow for effective comparison of reclaimed and baseline conditions as the basis for a revegetation success determination.

The original baseline sampling involved collection of cover and production data for two distinct vegetation types: 1) Previously Disturbed AMR (now Rabbitbrush/grass; 2) Native Sagebrush/grass. All reclaimed areas will be revegetated using essentially the same methods and seed mixture. In order to evaluate revegetation success for reclaimed areas, areas identified as Disturbed or Reclaimed and native Sagebrush/grass types will be sampled together as a unit.

Cover and production values resulting from the revegetation success monitoring for the areas will be compared with weighted average values based on the reference area values. Weighting will be based on the corresponding acreages of each of the vegetation type. The statistical comparison utilized to evaluate revegetation success will be based on the “t-test

comparison" method. If the absolute values for cover and production for the reclaimed areas are greater than or equal to the calculated 90 percent confidence interval for the baseline data then the mean values for the designated revegetation success parameters can be considered to be statistically equivalent and it can be concluded that the applicable revegetation success criteria have been achieved.

For woody plant density, revegetation success monitoring data will be compared with a reclamation standard of 1,700 plants per acre for areas identified in the baseline sampling. Consistent with cover and production sampling, if the absolute values for woody plant density for the reclaimed areas are greater than or equal to the calculated 90 percent confidence interval for the numeric standards then the mean values for the designated revegetation success parameters can be considered to be statistically equivalent and it can be concluded that the applicable revegetation success criteria have been achieved.

General revegetation requirements under applicable UDOGM regulations include consideration of erosion control, and vegetative diversity, seasonality, and permanence. In order to address these secondary considerations relative to revegetation success, CR proposes the following sec

Erosion Control - Formation of rills and gullies on reclaimed areas will be limited to a maximum of 0.75 feet in depth. General erosion will be evaluated using Mark H. Humphrey's Erosion Condition Classification System (Draft 12/5/90) as adapted from BLM's Erosion Condition Classification System (BLM Technical Note - Number 346)

Vegetative Diversity and Permanence - Premining and postmining values will be compared using Sorenson's Similarity Index as outlined in the UDOGM Vegetation Guidelines

Seasonality - Seasonality of reclaimed plant communities relative to premining conditions will be evaluated by comparing percent composition of warm season plant species

Success evaluations for these secondary criteria will be based on the same weighting approach as previously discussed for the evaluation of the primary parameters of vegetative cover and production.

R645.301-357 Revegetation: Extended Responsibility Period

No extended responsibility period is anticipated, however, if an extended period is necessary, all of the requirements of the regulations will be complied with as set forth.

Chapter 4

R645-301-400 Land Use and Air Quality

Kinney No 2 Mine

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R645-301-400Land Use and Air Quality

Sources for Land Use Information

Land use history, designations, capabilities, and values in the permit and adjacent areas have been characterized in this section using information from local land use records, studies and reports, existing environmental documents, and previous and ongoing baseline characterization efforts. Available land use information and relevance to this site are summarized below.

Carbon County Assessor's Office, Zoning and Land Ownership Records, Recorders Office, and Information – The County records provided zoning designations for the proposed permit area and surrounding areas as well as documentation of both present and historical ownership.

Scofield Town Zoning information – Town records providing zoning designations for the proposed permit area and surrounding area within Scofield Town.

The wildlife documentation describes wildlife use and habitat values in the Project and adjacent areas. Rather than create both a baseline report and the related permit section, all wildlife baseline information was prepared and formatted for inclusion in the permit.

R645-301-410 Land Use

General Land Use Patterns of Permit Area and Adjacent Areas

Land uses in the permit area and adjacent areas are presently and have historically been constrained by location, topography, climate, and availability of important resource values. Rugged terrain, limited soil resources, low precipitation, high elevation, and seasonally harsh weather conditions, limited water resources, and existence of significant high quality coal reserves are the primary factors which determine land use capabilities in this area. Generally, these factors limit land use options to mining, scattered oil and gas production, low-intensity grazing, wildlife habitat, limited timber production at the higher elevations, and dispersed recreational uses including hunting, fishing, hiking and similar activities. The Scofield Reservoir, located north and west of the permit area, represents a unique land use which is indirectly tied to the surface water and the coal resources available in the area. With the exceptions of the Scofield Reservoir, historic and current mining activities, and limited grazing, there are no significant residential, commercial, or agricultural land uses in the permit area. A portion of the permit area has been annexed into the boundaries of Scofield Town.

R645-301-411 Environmental Description

411.100 Pre-Mining Land Use Information

Land uses and capabilities in the permit and adjacent areas have been determined through historical records and evaluation of baseline soils, vegetation, wildlife, and hydrology information.

411.110 Use of Land Existing at Time of Filing

Mapping of Land Use Information

Information presented on the Regional Land Use Map (Map 4), and the Previous Mining Activities Map, (Map 5), includes:

- Current land use designations and areas
- Locations of identified cultural, historic, and paleontological resource values
- Boundaries of any public parks, or units of the National System of Trails or Wild and scenic Rivers System
- Any cemetery located within 100' of the permit area
- Locations of existing mining related surface disturbance and mine structures and facilities, and location and extent of known underground mine workings

Consistent with applicable provisions of R645-301-512, information on previous mining activities has been prepared under the direction of, and certified by a qualified, registered professional engineer or land surveyor with assistance form experts in the related field.

411.120 Capability of Land to Support a Variety of Uses

Land Use Capability and Condition

The primary constraints relative to the condition and capability of lands within the permit and adjacent areas to support various land uses are the rugged terrain of the area, high elevation, short spring and summer seasons, and long winters. The rugged natural topography of the area may generally be characterized as a small, high elevation valley, with high plateaus to the east and west, narrow ridgelines cut by deep drainages with steep, narrow drainage valleys over most of the proposed permit and adjacent area. The area is semi-arid with mean annual precipitation of only 14.56 (Scofield Dam) inches. Most of the precipitation occurs as either snowfall during the winter months or as brief high-intensity thunderstorms during late summer and early fall. Generally, mining and other development in the area has been limited to valley bottoms and the adjacent lower valley slopes with little or no significant development of high plateau and steep ridge and valley areas. In recent years, summer home construction has become a major development on the ridges west and north of Scofield Reservoir.

Upper plateaus on the east and west of the permit area receive slightly greater amounts of precipitation and because they are typically higher in elevation. Access problems due to the rugged surrounding terrain and harsh climatic conditions during portions of the year have limited both disturbance and use of these areas. The land east of the mine site is private property and has historically been heavily used for sheep and cattle grazing. Generally, potential land uses for the high plateaus in this area are limited by topography and resource constraints to wildlife habitat, low intensity grazing, recreational uses, and scattered timber production. The mining and related activities will not directly affect upper plateau areas since no surface disturbance is proposed or anticipated in these areas.

Land use capability and condition for the permit area is a direct reflection of the rugged terrain. Because the rugged natural terrain makes access and development so difficult and most of the area remains in a natural, undisturbed condition, except for cattle and sheep grazing as mentioned previously. The potential for alternative land uses in these areas is also affected by shallow, poorly developed soils with low water holding capacity and high erosion potential, and by a general lack of adequate surface or ground water resources. The mining and related activities will not directly affect steep ridge and valley areas since no surface disturbance is proposed or anticipated in these areas.

Most existing and historical development in the general area has occurred in the valley bottoms and adjacent lower valley slopes. These areas offer the benefits of practical access, proximity to surface water sources, and more extensive and fertile soil resources. Extensive historical mining and related activities have occurred in the Pleasant Valley within the permit area. Generally these activities have resulted in extensive surface disturbance and alteration of natural conditions in the effected areas. Existing and potential uses in the valley bottom areas include mining, transportation, wildlife habitat, low intensity grazing, and undeveloped and developed recreational uses, as well as development of private property in and around the Town of Scofield. While areas do exist outside of the permit boundary where valley bottom soil resources are adequate to support limited agricultural activities, these areas are limited to the Mud Creek (Pleasant Valley), in the flatter valley bottom. Due to the high elevation of Pleasant Valley, this agricultural use is limited to grass-type pasture use. The short warm season limits crops to grass and grass-hay production, and therefore row crops are not possible.

Production of the valley bottom adjacent to the permit area is discussed in detail in Chapter 9, where an alluvial valley floor may exist. Although there is adequate irrigation water, the climatic conditions and elevation of the valley as discussed above severely limits crops to very short season types. Only grass and grass hay are produced in the valley, with an estimated tonnage of 3500 tons per year in a good year. The area can support 1 AM U per acre according to the Utah State University Extension Service in Price, Utah. Range land, or grazing land higher in elevation than the valley floor can be expected to produce less vegetation for livestock due to steepness of the terrain, generally thinner soils, and more competition by trees and brushy species of plants with plants that are palatable to grazing animals. In turn, less AMU's would also be expected.

The area of the mine is all private property, which limits use by the general public. Private property owners use the lands for a variety of uses including cattle grazing, sheep grazing, hunting, and recreation. Carbon County zoning ordinances and Scofield Town zoning ordinances place restrictions on the type of land use possible in the area. There are no private property developments such as cabin sites or private recreation areas in the mine permit area.

The Town of Scofield is located adjacent to the mine site, and there are a number of homes and cabins in Scofield that are used as vacation or summer homes. The town has a small park that is used for town functions and is available to the public. This park is located at the northern entrance to town and is approximately 500 feet south of the permit boundary.

411.130 Land Use Classification Under Local Law

Description of Existing Land Uses

Existing land use zones and land designations in the proposed permit area and adjacent areas, are illustrated on the Regional Land Use Map, (Map 4), including the following classified under specific land use categories as defined by Rule 645-100-200, and are discussed below.

LEGISLATED ZONES:

Carbon County Zoning Regulations 4.1.1 Zone Designations - From Carbon County Zoning Ordinance, Section 4, Zoning and Regulations Within Zones

4.2.16 Carbon County Water Shed Zone (WS) #16

"The WS Water Shed Zone (formally CD-1 Zone) covers the canyons, mountains, and other lands above 7,000 feet in elevation, and of environmental concern in the County. Because of limitations imposed by topography, climate, soil conditions and other natural features, use of the land within this zone has been limited primarily to livestock grazing and related uses, wildlife habitat, certain outdoor recreation activities and facilities, and limited mineral extraction."

There are no planned facilities associated with the Kinney No. 2 Mine within the WS Zone. The coal reserves controlled by CR are located beneath this zone.

4.2.17 Carbon County Mountain Range Zone (MR) #17

"The Mountain Range Zone (formerly CE-2 Zone) covers the mountain lands of the County generally which, because of the presence of less severe physical conditions, have experienced historic settlement and are of less critical water shed concern than the WS Zone, and are suitable for limited levels of development activity. These lands are situated over the elevation of 7,000 feet."

A 22.88 acre portion of the surface facilities for the Kinney No. 2 Mine are located on lands within this zone. As shown on Map 4, Regional Land Use Map, the eastern portion of the facilities are located in Carbon County, and in this zone. This area allows major underground and surface mine developments (4.2.17.C.6.). The mine portals, coal loadout, coal stockpiles, and sediment pond are in this zone.

4.2.18 Carbon County Scofield Lakeshore Zone (SL) #18

"The primary purpose of the County Commission in providing for the SL Scofield Lakeshore Zone (formally S-1 Zone) is to promote and protect the water quality of the lakeshore and prevent the degredation of the natural and social environmental in the Scofield Reservoir area."

The Kinney No. 2 Mine surface facilities are located approximately 1 mile south of the high water line of Scofield Reservoir, with the closest point of the permit boundary being 0.6 miles south of the high water line. The Kinney No. 2 Mine permit boundary, or adjacent area does not include any of the SL zone.

4.2.19 Carbon County Pleasant Valley Zone (PV) #19

"It is the intent of The County Commission in establishing the PV Pleasant Valley Zone formerly S-2 Zone) to protect the water quality of Scofield Reservoir and surrounding watersheds of Pleasant Valley, and to protect the private property rights and natural values of the Scofield reservoir areas."

Because the Kinney No. 2 Mine will comply with the requirements of SMCRA and the Utah Coal rules, there will be insignificant impact to the Pleasant Valley Zone. Air controls mandated by the UDAQ air permit will protect this zone from air borne contaminants and dust. Water quality discharge limitations mandated by the UPDES permit will prevent surface water impacts from the mine. Mining is a compatible activity within the zone and will not affect the zone. All other environmental requirements of the various permit approvals will ensure protection of the values of this zone.

Scofield Town Zoning Regulations Chapter IV, 4-1 Zone Designations

5-2.2 Scofield Residential Zone (R-1)

"The Residential (R-1) Zone has been created to provide suitable areas within Scofield Town for the development of residential neighborhoods."

None of the Kinney No. 2 Mine permit area lies within this zone. A small neck of this zone approaches the southwest corner of the permit area but does not connect with the permit boundary.

5-3.1 Scofield Commercial Zone (C)

"The Commercial (C) Zone has been created to provide a suitable areas within Scofield Town for the establishment of retail commercial and service uses, light industrial uses. The C Zone is characterized by a mixture of dwellings and commercial uses such as retail stores, banks, restaurants, office structures, a wide variety of specialty ships, light industrial facilities, located in surroundings which are aesthetically pleasing and conveniently and safely accessible. In general, this zone should be located adjacent to collector or arterial roadways. The specific regulations necessary for the accomplishment of the intent of the zone are hereinafter set forth."

Permitted uses are shown in Table 2 in the code. Number 131 of the permitted uses is "Loading and Storage of Sand, Gravel, Earth, Stone, Gas, Minerals, Petroleum or Similar Resources." The Kinney No. 2 Mine facilities located within this zone are comprised of the mine operating facilities, including bath house, shop/warehouse, storage sheds, and the fueling facility. The mine portals, coal piles, loadout facility and sediment pond are located in the Carbon County Mountain Range Zone (MR).

Scofield Agricultural Zone (A)

"The Agricultural Zone (A) has been created for the purpose of providing suitable areas within Scofield town for the establishment of uses that involve the tilling of soil and raising of crops, or keeping or raising domestic animals, for the purpose of commercial food production. The A Zone shall have the further purpose of providing suitable sites for the placement of dwellings and other uses consistent with a rural lifestyle."

This zone abuts the permit boundary on the west side as can be seen on Map 4, Regional Land Use Map, however, there is not A zone within the permit boundary.

CARBON COUNTY PLEASANT VALLEY PLANNING AREA – GENERAL PLAN

Carbon County has adopted the Pleasant Valley Planning Area – General Plan, with the stated purpose of, "Carbon County adopts this General Plan for the Pleasant Valley Planning Area, and as also described by the map materials, and all other necessary maps and other illustrative materials, consistent with purposes of the State of Utah's County Land Use, Development, and management Act, Section 17-27a et. seq. Utah Code Annotated, 1953, as amended. Carbon County also adopts this Pleasant Valley General Plan to achieve the additional purposes of the County including the protection of the various qualities of the Planning Area, including the appropriate development of existing resources, the provision of necessary services in a coordinated and efficient manner, protection of the Planning Area's environmental qualities and the promotion of recreation and tourist activities."

Resource Development

The Resources Development section states the following:

"Carbon County will support appropriate natural resource development within the Planning Area, including the exploration and development of natural gas, coal and other resources, consistent with best management practices to protect the natural environment and physical qualities and features of the Planning Area."

and,

"Carbon County will require and work with all natural resource development operators to achieve necessary site rehabilitation and reclamation actions necessary to protect the water resources of the planning area."

Discussion

The Kinney No. 2 Mine is consistent with the Pleasant Valley Planning Area General Plan as can be determined from the first Resource Development value stated above. In addition, all of the coal in the initial mining plan is owned by Carbon County, which collects a yearly lease fee, and will collect a tonnage fee upon sale of the coal. Carbon County defers regulatory authority for environmental protections to the Utah Division of Oil, Gas and Mining, and accepts the Mining and Reclamation Permit as the definitive plan for environmental protection and reclamation of the site. The County requires a Conditional Use Permit (CUP) for the mining operation. The permit application for the CUP includes some of the information from the DOGM permit application, and states that the operator commits to adhering to the DOGM permit for environmental protections and for final reclamation. The CUP from Carbon County has been approved, a copy of which can be found in Exhibit 4, Other Permits.

Runoff from the Kinney No. 2 Mine operation will be routed through a sedimentation pond, which will protect the environment from degradation, and will meet the requirements of the Carbon County Pleasant Valley Plan. In addition, culinary water, mine dust suppression water, and sewer services will be provided by Scofield Town through an agreement, which has been approved.

LAND DESIGNATIONS:

Pre-SMCRA Mining Disturbance

The Kinney No. 2 Mine permit area, and the general area has an extensive coal mining history. The mine site to be developed by CR has been used by at least three mines in the past, the Kinney Mine, the Jones Mine and the Columbine mine. All of these mines were closed before 1980, and the area was reclaimed by the Utah Division of Oil Gas and Mining Abandoned Mine Reclamation program in the early 1980's. Very little is left of the historic mining, and since the area is private property, there has been little public interest, or visitorship of the site. Approximately 74% of the area to be disturbed by CR has previously been disturbed and reclaimed.

BOR – Bureau of Reclamation Property Scofield Reservoir

The Bureau of Reclamation (BOR) is responsible for the Scofield Dam and oversees maintenance of the dam. Regulation of the lake level is done in a joint effort by the BOR and the irrigation water users. The BOR does not own any land adjacent to the reservoir near the Kinney No. 2 Mine permit boundary. The BOR does not conduct or maintain any other facilities in the area.

The State of Utah maintains the Scofield Lake State Park, which is located near the dam and at the northern end of the reservoir, but there are no facilities at the southern end of the reservoir.

BLM Property

According to the Carbon County records, the Bureau of Land Management owns a small area of land (80 acres) at the south end of Scofield Reservoir as can be seen on Map 4, Regional Land Use Map. This area is small, adjoins the high water line of the reservoir, and is of little use other than for wildlife habitat. The land is surrounded by private property so it cannot be developed for other uses, nor would it be possible since the land is subject to lake flooding in very high precipitation years.

Kinney Mine Proposed Disturbance Footprint

The Kinney No. 2 Mine facilities have been designed to be very efficient, and will occupy a small footprint. The disturbance area will be comprised of 27.6 acres on fee land, and on land leased from a private property owner. There is no public land involved with the mine.

Industrial/Commercial Uses

- Underground Coal Mining
- Scattered Oil and Gas Production
- Transportation and Utilities

Undeveloped Lands

- Low-Intensity Grazing
- Fish and Wildlife Habitat
- Dispersed Recreation
- Limited Timber Production
- Watershed

Developed Lands

- Residential – (Within Scofield Town)
- Mountain Homes & Lake Front Homes – Several developments are located on the east and west sides of the Scofield Reservoir. These developments consist of cabins and homes developed near the lakeshore north of the dam on the east side; on the lakeshore on the west side of the reservoir about one third of the way north from the south end of the reservoir; in the mountains on the west side of the reservoir. The closest developments to the Kinney No. 2 Mine other than in Scofield Town are on the west side of the reservoir approximately 2.2 miles, and 2.7 miles from the mine site. The developments on the east side of the reservoir are located approximately 4.4, 4.9 and 5.5 miles north of the mine site.

Of these multiple uses, watershed, grazing, and wildlife habitat are the dominant use for undeveloped lands and mining constitutes the primary developed land use in the immediate area. Residential and a few commercial uses are located within Scofield Town. The following descriptions characterize the nature of and areas associated with each of these land use categories.

Underground Coal Mining - Extraction of reserves of high quality coal using underground mining methods has resulted in extensive historical mining related development and use within the permit boundary and adjacent areas. Generally, mining related surface disturbance has been limited to that disturbance associated with mine openings, surface facilities, coal processing facilities, transportation systems, and housing for miners and their families. While locally extensive, the underground mine workings have not resulted in significant surface disturbance or other impacts on overlying surface areas or associated land uses. There are some relatively minor subsided areas in the permit boundary resulting from historic mining near the outcrop. Several sink-holes and areas of mine portal areas that collapsed due to very thin overburden, and apparently inadequate roof support. Previous mining activities are discussed in greater detail in R645-301-411. Given the configuration of the coal seams and access constraints imposed by the relatively rugged terrain of the area, most mining related development has been limited to valley bottoms and adjacent lower valley slopes.

The period of active mine development and operation in this area extended from the late 1880's through the early 1970's. At the present time there are no active mining operations in or near the proposed permit boundary. Within the proposed permit planned disturbance area, approximately 74% has been previously disturbed by historic mining activities. The State of Utah AMR Program completed extensive work involving the removal of multiple piles of coal fines and coal material in disturbed areas paralleling Highway 96 in the area planned to be used for the Kinney Mine facilities. This coaly material was placed in areas of the previously disturbed areas, covered with soil, graded, and revegetated. Extensive remaining coal reserves offer the potential for future mining related development and use.

Scattered Oil and Gas Production - Oil and gas production activity in the general permit area and adjacent areas is very limited with no active wells in the permit area. Based on available information, there are no known plans for development of oil and gas wells in the proposed permit area vicinity and the potential for future oil and gas development is limited.

Transportation and Utilities - The rugged terrain of the area limits routing options for major roads and utility transmission lines, consequently roads and utility lines typically follow the existing natural drainage valleys. Within the general permit area, State Highway 96 follows the Pleasant Valley from it's northern head, starting at Highway 6 junction, and running west and south to the old mining community of Clear Creek. A north-south rail line follows generally the eastern toe of

Pleasant Valley from the Scofield dam southward to the Skyline Mine load out. Due to access considerations and practical construction constraints, transportation and utility related development is also concentrated in the valley bottom and adjacent lower valley slope areas. The narrow configuration of area drainage valleys and existing developed transportation and utility infrastructures generally preclude any significant additional development or use for this land use category.

Low-Intensity Grazing - Effective grazing use of portions of the permit area and adjacent areas is limited by the rugged terrain and lack of adequate water sources. Small cattle ranching and sheep grazing operations do, however, utilize some of the high plateau areas on a seasonal basis. Since the property in the permit boundary and adjacent areas is privately owned, no formal animal number limits are imposed, and the area is heavily grazed. Grazing use will not be significantly impacted by proposed mining operations since very little surface disturbance will occur in potential grazing areas and underground development will not significantly impact overlying areas or uses. The potential for future expansion of grazing use is generally constrained by topography, and vegetation and water availability.

Fish and Wildlife Habitat - As described in R645-301-300 of this permit application, the permit area and adjacent areas provide habitat for a wide variety of fish and wildlife species. Generally, any areas not utilized for other designated uses are considered to be undeveloped lands, which are utilized to varying degrees, dependent on the availability of other resource, values as wildlife habitat. Given this consideration, wildlife habitat is one of the two primary land uses for the permit and adjacent areas and these areas are subject to low-intensity management for wildlife use by the responsible wildlife management agency. Various species are associated with one or more of the habitat zones which occur throughout the area. Portions of the permit area have been designated by the UDWR as critical and high-priority habitat for mule deer and elk, and sage grouse as shown on the wildlife maps, (Maps 2A through 2G). Species occurrence and habitat values have been impacted to some degree in those areas affected by previous mining related surface disturbance. Historic mining disturbances typically remain in a partial state with varying levels of plant reestablishment and resultant restoration of habitat values. In those limited areas where more recent mining activity has occurred, full-scale reclamation efforts have resulted in effective vegetative reestablishment and general restoration of many of the premining habitat values.

Historic mining operations resulted in disturbance of relatively limited surface areas generally, although much of the disturbance was near the valley bottom areas associated with high-value habitat. Generally, surface disturbance for the Kinney Mine mining and related activities will be in previously disturbed areas (20.7 acres previously disturbed = 74% of total Kinney No. 2 Mine disturbancd) so incremental disturbance (6.9 acres) and associated wildlife habitat impacts will be negligible. Although, the reclaimed areas of historic mining by the Utah AML project in the 1980's have provided some habitat for local wildlife species. On completion of the Kinney Mine proposed mining and related activities, affected surface disturbance areas will be reclaimed, resulting in restoration of the premining habitat values.

Dispersed Recreation - Generally, these activities occur on a seasonal basis primarily on public lands in the area, such as the Scofield Reservoir area. Since all of the permit boundary area, and adjacent areas are privately owned, recreation activities are limited to those private land owners and their guests. The recreational activities associated with Scofield Reservoir are limited to the lake itself and a narrow band along the shore of the lake where the general public has access. These activities will not be affected by mining at the Kinney Mine. Availability of and proximity to much more desirable recreational areas along the Wasatch Front and in the canyonlands to the south are also limiting factors. Given existing low use levels and the various

limiting factors, the potential for expanded recreational use of the mine area is small, and limited to developments on private property.

Limited Timber Production - The scattered coniferous forest growth in the general area supports limited logging on private property in the general area. Limited public lands available for logging and access constraints generally make large-scale logging activities economically infeasible. The permit area, and adjacent areas north, south and east of the mine area do not contain significant stands of conifers that would support timber production. Given the limited importance of logging use in this area and the practical operational and economic constraints, there is little potential for expanded future logging use.

Watershed – A majority of the general area is zoned by Carbon County as Watershed Zone (WS). The entire permit area is tributary to Scofield Reservoir, a Bureau of Reclamation project that serves water users in the Price and Carbon County areas. The main source of irrigation and one of the main sources for culinary water for Carbon County, and Price City is Scofield Reservoir. Impacts from livestock grazing adjacent to Scofield Reservoir has been a problem to water quality in the reservoir, as well as human uses in the area. These water impacts are well known and well documented in the literature and are not presented in this application other than a general reference. Also refer to a discussion of the Carbon County Pleasant Valley Planning Area – General Plan presented previously in this Chapter.

Land Use Constraints Due to Other Environmental Values

As previously noted, topography and climate are the primary environmental constraints on potential land uses in the permit and adjacent areas. In addition, the following specific environmental constraints may limit potential land uses either generally or in specific areas:

Soils - Potential soil constraints correspond to three general soil groupings; 1) Upland soils; 2) lowland and riparian soils; and 3) Disturbed soils. Upland soils are commonly shallow, poorly developed, and have moderate to high erosion potential and low to moderate water holding capability. Given these considerations combined with the rugged terrain, upland soils are generally not suitable for intensive agricultural uses or commercial/industrial/residential development and may be a limiting factor for grazing, logging, and wildlife habitat. The areal extent of lowland and riparian soils is typically limited by high drainage gradients and narrow stream valleys. Limited occurrence and a high proportion of coarse fragments are limiting factors for lowland soils relative to any intensive agricultural uses. Given poor soil development in many areas, soil disturbance may not significantly impact overall soil productivity. Disturbed soils in the permit area, do, however, frequently contain coal materials and coarse fragments which may affect soil handling activities and soil productivity relative to any intensive agricultural uses. A more thorough discussion of soils in the mine area can be found in Chapter 2, Soils, and in Chapter 9, Special Categories, specifically in the AVF area west of the mine development site.

Vegetation - Site vegetation is generally a reflection of soils, water availability, elevation, and topographic configuration and aspect. Vegetation type and occurrence are natural constraints relative to potential grazing and wildlife habitat uses. No threatened, endangered, or sensitive plant occurrences have been identified in mining and related activities surface disturbance areas.

Wildlife - Wildlife is a constraining land use factor only to the extent that certain development activities may be precluded or otherwise limited in areas identified as critical habitat for certain species of high interest. These areas would include breeding and rearing areas, animal

migration routes, and areas in close proximity to active raptor nests. Significant habitat areas for most wildlife species do not exist in the planned permit disturbed area. There have been no identified eagle nests in the area. Since prime nesting habitat for eagles does not exist in the mine plan area, no specific habitat mitigation measures are proposed for eagle nests in close proximity to active surface disturbance or operating areas. There are no riparian habitat areas within the proposed disturbance area or the immediate adjacent area.

Hydrology - As a critical component of both intensive agricultural practices and grazing activities, and an important element relative to fish and wildlife uses, water availability may limit these uses in most portions of the permit area. The only identified riparian habitat in the general area of the mine is a narrow band of riparian vegetation along Mud Creek, which is approximately one quarter mile west of the permit area. There are no identified riparian habitat areas within the permit boundary.

Restricted Use Areas

With the exception of the existing public right-of-way for Highway 96 that borders the permit area on the west, and the watershed area tributary to Scofield Reservoir there are no public parks, components of either National river or trail systems, renewable resource lands, areas designated unsuitable for mining, or other restricted use areas within the proposed permit area or immediately adjacent areas. The mining and related activities have been planned and designed to maintain a minimum distance 300 feet from any occupied dwelling. There are Identified cultural/historic resource sites within or adjacent to the mine permit area that are addressed in other sections of this application, however, none of these sites are significant and should not preclude mining. The mining activities will occur within 100 feet of the outside right-of-way line of Highway 96 and CR has complied with applicable public notification and comment requirements as described in R645-300-100.

Land Use Classifications and Zoning Restrictions

The majority of the eastern portion of the permit area in Section 33, T12S, R7E, and Section 4 T13S, R7E, Salt Lake Base & Meridian as shown on the Regional Land Use Map, (Map 4) is zoned by Carbon County as Watershed, which does not allow coal mining surface facilities. A small area encompassing the proposed disturbed area as shown on Map 4 has been rezoned by Carbon County to Mountain Land, effective October 17, 2007, which does allow surface facilities associated to coal mining. The area shown on Map 4 in Section 32, T12S, R7E lying within Scofield Town boundaries has been rezoned to Commercial, effective January 2008, which allows coal mining facilities. The designated land use classifications and any related zoning restrictions are consistent with both existing land use activities and those activities proposed in conjunction with the Kinney No. 2 Mine mining and related activities operation and reclamation plans.

411.140 Cultural and Historic Research Information

Cultural and Historic Resources

This section describes existing cultural, historic, and paleontological resource values identified within the permit and adjacent areas which could potentially be impacted by mining and related operations. Cultural/historic/paleontological resource values in the permit and adjacent areas have been identified and characterized through review of previous studies and reports, conversations with individuals familiar with the history of the area, and site specific field

investigations of surface disturbance areas. The Regional Land Use Map (Map 4) shows the area included within the detailed study area boundary.

Site specific field inventories of the proposed surface disturbance areas were conducted during the month of May 2007. Field inventory work followed extensive research and review of previous studies of the area, and historical accounts. Field surveys involved coverage of an area of approximately 395 acres by a qualified archaeologist using parallel pedestrian transects spaced at intervals of up to 10 meters to search for any evidence of cultural, or historic values. Detailed discussion of site specific field inventories and descriptions of any resources identified as a result of the field investigations are presented in Exhibit 3, Cultural Resource Information (included in the confidential information section).

Cultural Context

Although human habitation of the area may have occurred as early as the Clovis Period (12000 to 9000 B.C.), the majority of prehistoric cultural resource sites identified in this part of Utah date from the Black Rock (4000 B.C. to A.D. 500) or more recent periods. The dominant prehistoric cultures known to have inhabited the general area are the Fremont and Numic/Shoshonean Cultures. The Fremont Culture (A.D. 400 to 1300) was characterized by a settled horticultural lifestyle with well developed construction practices (laid masonry), distinctive ceramics, and advanced farming methods. The Fremont Culture appears to have been supplanted by semi-nomadic Numic/Shoshonean speaking Indians which migrated into Utah from the northern Great Basin of Nevada and Idaho. These Numic/Shoshonean peoples are probably the ancestors of the Northern and Western Utes which now inhabit the Uintah-Ouray Indian Reservation located to the northeast of the proposed permit area. The Numic/Shoshonean habitation extended from approximately A.D. 1200 to 1400 with individual family groups or larger multi-family bands migrating seasonally within semi-fixed territories in response to the availability of various food sources.

The Ute descendants of the Numic/Shoshonean peoples continued to reside in the general proposed permit area vicinity until shortly after the arrival and initial settlement of the area by Mormon settlers in 1847. At that time the Timpanogots, a subgroup of the Western Ute, were displaced from the Utah Valley and Spanish Fork Canyon and resettled on a reservation at the south end of Utah Lake. They subsequently abandoned this reservation in favor of a larger reservation established in the Uintah Basin, although they continued to return to their original lands through the early 1900's to fish during the spawning season. While the proposed permit area and adjacent areas are not known to have been primary settlement areas for either prehistoric or historic native peoples they were probably utilized on an occasional or intermittent basis for migrational food gathering activities.

Historic Context

The first non-native exploration of this general area occurred in approximately 1776 when members of the Dominguez-Escalante expedition passed through Spanish Fork Canyon to the north on their way to California. While exploration and fur trapping in the 1820's and 1830's covered large areas to both the north and south, John C. Fremont's exploration of this general area in 1844 is the only other known occurrence of non-native exploration or use of the area prior to the arrival of Mormon pioneers in 1847.

Following initial settlement of Salt Lake City by the Mormons, Mormon settlement began expanding southward to the Utah Valley and adjacent areas. The settlements of Palmyra and

Spanish Fork were founded at the mouth of the canyon adjacent to the Spanish Fork River in 1852. Settlement of the very desirable rich open farmlands of the Utah Valley delayed settlement of other nearby areas until much later. The early settlers did, however, utilize the natural resources of the nearby mountains, establishing a rough road up Spanish Fork Canyon prior to 1869 which was apparently used to access logging areas and by settlers to move their herds to summer range areas near Colton and Soldier Summit.

The more modern history of the Scofield/upper Pleasant Valley area is diverse and dramatic, despite the fact that Europeans did not firmly establish themselves until the early 1870's (Madsen 1947). The earliest settlers in Pleasant Valley came not for coal, but the abundant grasses that covered the valley floor, with which they grazed herds of cattle. Timber was another early resource found in the area, and b the early 1880's numerous mills were in operation. However, neither of these industries brought as many people to the valley, however, as coal mining. Coal deposits in the region were recognized by the Beckwith-Gunnison Expedition a early as the mid-1870's. Near Scofield, at least one mine was in operation as early as 1877 and several others began operations during the first few years of the 1880's (Madsesn 1947).

A narrow-guage railroad between Pleasant Valley and Springville, started in 1877, was completed in 1879; the Utah and Pleasant Valley Railway made the transportation of coal much more cost-effective than hauling the material by wagon (Carr and Edwards 1989). In 1881 the Denver and Rio Grande Western purchased the Utah and Pleasant Valley Railway, which helped to break Union Pacific's monopoly on railroad transportation to and within Utah (Watt 1997). In 1877, Peter Morgan located the Winter Quarters Mine near Scofield. Until 1900, coal mining was extremely prosperous in the Scofield area and the small town prospered. The coal mining industry's demand for labor required the recruitment of men from outside the state and resulted in the emigration of varied nationalities including Italians, Greeks, Chinese, Finns, Japanese, Mexicans, and Yugoslavians (Watt 1997). Labor conflicts and strikes were recurrent after the turn of the century, with the largest occurring in 1901, 1902-1903, 1922, and1933. Unionization attempts and strikes during this period attracted the attention and support of Charles DeMolli and Mother Mary Jones, prominent American labor and community organizers (Watt 1997). A recurrent labor demand was for safer working conditions.

The most deadly mining accident in Carbon County occurred at the Winter Quarters Mine. On May 1, 1900 a coal mine explosion commonly referred to as the Scofield Mine Disaster occurred. In Number 4 Mine of the Winter Quarters Mine, a spark ignited coal dust, ultimately resulting in the death of 200 miners (Madsen 1947, O'Neil 1981, Watt 1997). After the May 1 mine accident, coal mining began a series of boom and bust cycles resulting from political and economic factors in an ever-shrinking world market. Boom cycles occurred in conjunction with World War 1, World War II, and to a smaller degree the Korean War. Coal production has fallen dramatically since the 1950's as natural gas and oil began to fulfill the nation's energy needs.

Paleontological Context

Within the permit area, the Upper Cretaceous Blackhawk Formation of the Mesa Verde Group is the only geologic formation which is exposed at the surface within the existing or proposed surface disturbance areas. The Blackhawk Formation has been characterized as a representing a wave dominated delta system (Chan et. al., 1991) with a broad, flat marshy belt along a shoreline coastal plain. Vegetation included marginal coniferous forests, scattered deciduous trees such as gum, walnut, fig, and cottonwood, and numerous grass and sedge species. Dinosaurs roamed the marshy areas as evidenced by numerous dinosaur tracks. Generally, known fossils occurring in the Blackhawk Formation include plants, palynomorphs (pollen), occasional mollusks, dinosaur tracks, animal tracks, and other trace fossils. Actual bone or

skeletal fossils are rare and most of the known fossils are found in association with the coal seams. A listing of paleontological Sensitive Formations in Utah (Madsen, 1985) ranks the Blackhawk Formation as second for trace fossils, third for fossil plants, twenty-seventh for vertebrate fossils, and does not present a ranking for this formation for invertebrate fossils. Generally, trace fossils, and specifically dinosaur tracks, are the most common fossils associated with the Blackhawk Formation in this area.

Cultural, Historic, and Paleontological Resources

As previous described in R645-301-400, cultural, historic, and paleontological investigations for the permit area included research and review of previous studies and records, conversations with individuals familiar with the area, and site specific field investigations for surface disturbance areas which generally corresponds to the mine facilities and permit boundary area. Generally, the research and review phase established the context of the area as discussed in the preceding sections and provided some insight relative to the locations and types of resources which might be present. Cultural, and historical, investigations for the proposed permit area resulted in identification of one previously documented site, the documentation of three previously recorded sites, and the documentation of five new sites.

The complete Cultural Resource Inventory report is located in Exhibit 3, Cultural Resource Information and considered to be confidential. The locations of all inventoried sites can be found in Figure 1 of the report, and normally would not be found on any other map in the permit application due to the sensitive nature of cultural, historical information, however due to a requirement by the UDOGM, the sites in the surface facilities area have been added to Map 14, Mine Surface Facilities, Pre-Mining Topography Map.

The Conclusion and Recommendations from the Cultural Resource Inventory Report states:

> "The inventory of Carbon Resources LLC's proposed Kinney No. 2 Mine resulted in the location of one previously documented site, the documentation of three previously recorded sites, and the documentation of five new sites. Three of these sites are recommended as eligible to the NRHP and the remaining six sites are recommended as not eligible to the NRHP. Sites 42Cb477 (Jones Mine), 42Cb479 (Kinney Mine) and 42Cb1032 (Utah & Pleasant Valley Railway) are evaluated as eligible to the NRHP under Criterion A (associated with significant events in regional history). Therefore, the proposed undertaking will not diminish the integrity of these properties which deems them eligible under Criterion A. Based on the findings archeological clearance is recommended for this project."

Resolution of the Cultural Historical issues with the sites involved will be forthcoming. Copies of correspondence, permits, or any other documentation will be added to Exhibit 21, Permit Documentation as they become available.

411.141 Cultural and Historic Resources Maps

A map showing the inventory of cultural resources is included in Exhibit 3, Confidential Information, Cultural Resource Inventory of Carbon Resources Kinney 2 Mine. The locations of all inventoried sites can be found in Figure 1 of the report, and normally would not be found on any

other map in the permit application due to the sensitive nature of cultural, historical information, however due to a requirement by the UDOGM, the sites in the surface facilities area have been added to Map 14, Mine Surface Facilities, Pre-Mining Topography Map.

There are no cemeteries located within 100 feet of the permit area. The Scofield Cemetery is located approximately 950 feet south and 685 feet west of the permit boundary.

There are no National System of Trails or Wild or Scenic Rivers System resources in the area of the permit boundary.

411.142 Coordination with State Historic Preservation Officer

As a component of the initial site investigations the State Historical Preservation Office (SHPO) was contacted to obtain information on existing identified cultural resource sites in the permit area. Following the site specific field investigations, official site listing forms for any new cultural resource sites identified have been prepared and submitted to the SHPO for review and determination of eligibility. Consultation and concurrence with the SHPO has been initiated. When the issues are resolved, documentation will be included in Exhibit 21, Permit Documentation.

411.143 Identification of Historic and Archeological Resources

Site specific field inventories of the proposed surface disturbance areas were conducted during the month of May 2007. Field inventory work followed extensive research and review of previous studies of the area, and historical accounts. Field surveys involved coverage of an area of approximately 395 acres by a qualified archaeologist and a paleontologist using parallel pedestrian transects spaced at intervals of up to 10 meters to search for any evidence of cultural, or historic values. In addition, accessible rock outcrop exposures around the perimeter of the survey area were examined for any evidence of paleontological values. Detailed discussion of site specific field inventories and descriptions of any resources identified as a result of the field investigations are presented in Exhibit 3, Cultural Resource Information (included in the confidential information section).

411.144 Protection of Historic and Archeological Properties

Consultation and concurrence with the SHPO has been initiated. When the issues are resolved, documentation will be included in Exhibit 21, Permit Documentation.

411.200 Previous Mining Activities

Previous mining activities within the permit area and adjacent areas are important because they directly impact the coal resource available to support further mining operations and are associated with existing site disturbance and environmental impacts as reflected by baseline environmental characterizations. The nature and extent of previous mining and related activities in the permit area and adjacent areas have been identified and characterized through review of historical mine maps, records, publications, and reports and conversations with individuals familiar with the history of the area. Old mine maps have been obtained from the Utah Geological Survey Office in Salt Lake City, and from other sources.

History of Previous Mining Activity

As previously described in R645-301-411, Historical Context, the earliest recorded mining activity in the area was the development of the Winter Quarters Mine in 1877. Extensive mine development and operations continued throughout the area through World War II. After the war, mining in the area experienced a gradual decline due primarily to the shift from coal fired to diesel locomotives. In the proposed permit area and adjacent areas numerous mines operated through the 1970's. The UP (Union Pacific) Mine, with portals located south of the proposed mine permit area mined from 1877 through about 1936. Underground workings from this mine extended well into the area where the Kinney No. 2 Mine is planned. Four other mines operated in the area of the proposed Kinney No. 2 Mine, from north to south in the following order; 1) the Blue Seal Mine, located approximately 1 mile north of Scofield Town, and approximately 500 feet north of the proposed permit boundary operated from 1921 to the 1940's, 2) the Kinney Coal Company operated the Kinney Mine from 1918 to 1956, and was known from 1946 through 1956 as the Monay Mine; 3) the Columbine Mine was operated from 1960 through early 1971; and 4) the Jones Mine was operated by the Spring Creek Coal Company from 1960 to about 1970 (Cunningham 1990).

Description of Known Historic Mining Operations

All of the previous historical mining operations in the area have been conventional underground room and pillar coal mines extracting coal reserves from one or more of the known coal seams in the Blackhawk Formation. These mines operated in the Hiawatha, UP Upper Split, and UP Lower Split coal seams. Map 5, Previous Mining Activity shows the aerial extent of historic mining in the various coal seams in the area of the proposed Kinney No. 2 mine. This same map shows the locations of the portals for these mines. There is some confusion as to which of these portals actually belong to each mine in some cases because the mines were partially interconnected.

R645-301-412 Reclamation Plan

This section presents and describes reclamation plans and practices to be used to restore disturbed areas resulting from mining and related activities to productive self-sustaining use. Information in this section was developed in accordance with applicable regulatory requirements (R645-301-500) for coal mine permitting in the State of Utah.

The specific reclamation plans developed for the Kinney No. 2 Mine area and the proposed reclamation practices reflect the overall reclamation objectives, site specific conditions and constraints, and the best current reclamation techniques and methods. The following sections describe the timing and sequencing of reclamation activities, general reclamation requirements, and specific reclamation practices.

General Reclamation Objectives and Activities

Reclamation will be an integral part of the Kinney No. 2 Mine mining and related activities, however, because the mine will be an underground mine and the surface facilities and related

surface disturbance areas will remain in place until the end of the mine life, mining and reclamation will not occur concurrently or, in the case of progressive mining activities, sequentially. Reclamation of surface disturbance areas will generally occur following the cessation of mining operations to complete the mining and reclamation cycle although CR will implement temporary stabilization measures in certain areas following initial construction or during ongoing operations.

Objectives of the planned reclamation activities will be twofold; 1) For construction disturbance, temporary stabilization and contemporaneous reclamation will serve to stabilize disturbance areas, minimize erosion, and limit potential surface water impacts; 2) For long-term use areas, final reclamation is designed to restore disturbed areas to a safe, stable condition and to reestablish the productivity of the land consistent with the postmining land use(s). The proposed postmining land uses of wildlife habitat, water shed, and commercial use reflects the predisturbance use of this and adjacent areas, existing land use plans and policies, the desires of affected surface landowners, and practical constraints relative to land use capability and condition. Specific land use considerations and constraints are discussed in R645-301-400, Land Use Information. The Kinney No. 2 Mine reclamation plan has been designed to successfully meet these objectives and will result in effective temporary stabilization, and a postmining configuration which blends with the surrounding terrain and provides environmental values consistent with or superior to those which existed prior to mining.

The Kinney No. 2 Mine reclamation plan has been developed utilizing available information on the existing environmental resources as described in R645-301-200, 300, 400600, and 700, Environmental Information. In addition, CR has incorporated both available information on current successful reclamation technology and practices and their extensive operating experience in the area. While the plans presented in this permit represent what CR feels to be the most effective reclamation practices for this site, it is important to note that successful reclamation must be a dynamic process, incorporating new information to optimize overall effectiveness. In order to meet the reclamation objectives these plans may be modified as appropriate to reflect changing conditions, revised regulatory requirements, advances in reclamation technology, and the results on ongoing research and experience relative to the long-term effectiveness of various reclamation practices. Any future plan modifications will be submitted as permit modifications through the normal regulatory process. Reclamation will involve a logical sequence of activities designed to achieve the overall reclamation objectives in an organized progressive manner. The following represent the general steps for reclamation of any mine or mine related surface disturbance areas:

- Facility Demolition and Removal
- Stabilization and Sealing of Mine Openings
- Disposal of Non-Coal Wastes, and Mine Waste Materials
- Removal and temporary storage of topsoil/substitute materials from long term storage (necessary because of segregation of better quality topsoil on top of substitute topsoil materials in stockpile)
- Backfilling and Grading to Establish the Final Design Configuration
- Drainage Reestablishment
- Road Removal
- Soil/Substitute Replacement
- Revegetation
- Post-Reclamation Management, Maintenance, and Monitoring
- Removal and Reclamation of Sedimentation Ponds and Associated Structures
- These activities are discussed in detail in the following sections.

412.100 Post-Mining Land Use Plan

The postmining land use for the mine area is the same as the current land uses, which are Mountain Range, Water Shed, wildlife habitat and Commercial within the Scofield Town boundary. Beyond the general reclamation objectives of restoring disturbed areas to a safe, stable condition and reestablishing the productivity of the land consistent with the postmining land use(s), this reclamation plan is designed to achieve the following specific operational and environmental objectives:

- Removal of Mining Related Structures and Facilities
- Eliminate Potential Hazards
- Establish a Stable Postmining Configuration
- Restore Effective Drainage
- Establish a Productive Self-Sustaining Vegetation Community

412.110 Methods for Achieving Post-Mining Land Use

Reclamation Timing and Sequencing

CR will reclaim mining related surface disturbance areas as soon as operationally practicable following completion of mining and related activities. For construction related disturbance, this commitment translates into regrading, establishment of effective drainage and sediment control, and temporary vegetation of the disturbed areas to stabilize these areas and prevent erosion or uncontrolled runoff.

With the exceptions of temporary stabilization of construction disturbance, other mining related disturbance areas are expected to remain in a disturbed condition until after the completion of mining and related activities. Reclamation of mine surface facilities areas following completion of mining will be initiated as soon as operationally feasible after mining ceases and no later than the next normal field season (typically May through October). It is anticipated that final reclamation would be completed within 24 months from the time the last coal is either produced or shipped from the property, whichever is later. Figure 36, Reclamation Timetable - Mine Facilities Area, outlines the specific sequence and anticipated timing of final site reclamation activities.

Final reclamation will involve removal of all mine related structures and facilities, closure and sealing of portals and mine openings, disposal of waste materials, temporary stockpiling of topsoil materials, backfilling and grading, drainage reestablishment, road removal, placement of soil or substitute materials, and revegetation. Generally, soil/substitute replacement and revegetation efforts will be coordinated so that soil materials are revegetated as soon as practically possible following placement. Normally this will involve placement of soil/substitute and immediate reseeding at the end of the field season in late fall. This approach allows the seed to "winter over" with germination in the spring when soil moisture conditions are elevated due to winter snow accumulations and spring melt. Because the main topsoil/substitute stockpile is configured to place the best material on top of lower quality topsoil/substitute, some of the better topsoil may have to be double handled to get to lesser quality material or backfill material beneath the topsoil. If this is the case, the better material will be temporarily stockpiled in a stable location and protected from erosion until it is finally spread. A detailed plan for this topsoil handling plan will be coordinated with the DOGM during reclamation.

Following final reclamation of mine facilities areas, the facilities to remain for postmining land use include the roads shown on Map 29, Mine Surface Facilities Area - Postmining Topography and

Interim Drainage Control Map. Also remaining will be some permanent drainage structures shown on Map 29. These structures will remain in place to provide protection from erosion and degredation of the reclaimed areas and to provide long term protections for the postmining land uses in the area as discussed in this Chapter. The proposed interim drainage and sediment control plan includes four areas where CR proposes to utilize alternative sediment control methods as the primary means of controlling erosion and sediment contributions. The Mine Surface Area - Postmining Topography and Interim Drainage Control Map (Map 29), shows the drainage and sediment control features which will be retained during the reclamation liability period, and for post mining land uses. Components of the interim drainage and sediment control plan are identified and discussed in detail in R645-301-730 Hydrologic Resource Protection and PHC. CR proposes to control sediment contributions during reclamation of the site using a combination of silt fences, straw bales, and other appropriate alternative sediment control measures. These temporary controls will be installed prior to any reclamation activities and serve as a protective barrier between the reclamation areas. The alternative sediment controls will remain in place during backfill/regrading operations, placement of soil material, reseeding, and re-establishment of vegetation, and will be removed following vegetative re-establishment. CR anticipates that reclamation of these features will be completed within 6 to 9 months following receipt of a reclamation success determination, dependent on the time of year that the determination is issued.

Mapping of Reclamation Information

Information presented on the reclamation maps and cross-sections includes:

- Anticipated final surface configuration – Map 29
- Postmining drainage features – Map 29
- Location of any structures and facilities which will be retained as permanent structures following the completion of mining – Map 29
- Any roads to be retained in conjunction with the postmining land use – Map 29

412.130 Alternative Post-Mining Land Use

No alternative post-mining landuses are proposed for the Kinney No. 2 Mine area.

412.140 Consideration of Surface Owners & Local Land Use Plans

The post-mining land use plan considers the use of the land consistent with the current land owners and the post-mining land use designations. A portion of the land is privately owned and leased to CR, with the intent of operating a coal mine. The land owner therefore approves of mining as an acceptable land use, and final reclamation for the proposed land uses for post mining. The land owner will construct the bypass road shown just east of the proposed surface facilities area on Map 13, Surface Facilities Map and Map 29, Mine Surface Area – Postmining Topography and Interim Drainage Control Map. This road will replace the existing road running through the mine site that will be destroyed by mine construction. This road and ditch will necessarily serve as an undisturbed area diversion for runoff water from the area upslope from the mine facilities as shown on Map 24, Drainage and Sediment Control Plan – Disturbed Areas.

412.200 Land Owner Comments

Chapter 1 addresses land ownership and references the agreement with George Telonis ETAL, which gives CR the right to use the land for coal mining. Only one landowner comment was received during the two public comment periods conducted for this permit application. A formal request was received by DOGM during the initial comment period. This comment was a request for a hearing, which was held and the Division made a finding that the commentor did not make their case.

412.300 Suitability and Compatibility

The reclamation plan addresses the suitability of soils materials for reclamation, refer to Exhibit 6, Soils Information.

413 Performance Standards

413.100 Postmining Land Use

The disturbed areas will be reclaimed in a timely manner to conditions that are capable of supporting the uses they were capable of supporting before mining, or to a better use. The reclaimed area will be compatible with all of the land uses in place prior to mine development, and will be compatible with all zoning ordinances and designations.

413.200 Premining Uses of Land

The land in the permit boundary has historically been used as grazing land by the private property owners. No dwellings or other structures exist at the time of this permit application submittal. The planned surface facilities area has historically been used for coal mining by several mining companies, notably, The Kinney Mine, Columbine Mine, and the Jones Mine. The planned surface disturbance area for the Kinney No. 2 Mine comprises 27.6 acres, of which only 6.9 (25%) acres have not been previously disturbed.

The permit area is also wildlife habitat, and falls within the Carbon County Water Shed (WS) zone, the Carbon County Pleasant Valley Zone (PV), the Carbon County Mountain Range Zone (MR), and the Scofield Town Commercial Zone (C) as previously discussed in this Chapter. The land will be returned to the pre-mining condition and will be compatible with both water shed, wildlife, Carbon County Zones, and Scofield Town Zone values.

413.210 Premining Uses of Land

The eastern portion of the disturbance area lies within Carbon County and is zoned by Carbon County as Mountain Range (MR) Zone which allows coal mining operations. The western portion of the disturbance area lies within Scofield Town and is zoned by Scofield Town as Commercial (C), which allows coal mining operations. These areas will be returned to the pre-mining condition, or better, and will be compatible with requirements of the regulations.

413.300 Alternative Postmining Land Uses

No alternative postmining land uses are planned for the area.

414 Alternative Postmining Land Uses

No alternative postmining land uses are planned for the area.

R645-301-420 Air Quality

R645-301-421 Compliance with Clean Air Act

R645-301-422 Coordination and Compliance with Utah Bureau of Air Quality

Sources of Air Quality Information

Air quality conditions in the proposed permit area and adjacent areas have been characterized in this section using information from studies and reports, previous and ongoing monitoring activities, and existing air emission permit application. Available air quality information and relevance to this site are summarized below.

> Gault Group, Inc. Draft Notice of Intent for Kinney No. 2 Mine Project, February, 2008. Draft notice outlines proposed development plans, describes potential emissions and controls, and provides documentation for calculated emissions projections.

No site specific emission studies or monitoring were conducted given the classification of this area as an "attainment" area and the lack of site-specific monitoring requirements under applicable regulatory provisions.

Regional Air Quality Conditions

The permit and adjacent areas lie within the central area of the Upper Colorado River Air Basin. The central area has been divided into smaller sub-basins, each of which is characterized by meteorological conditions and related dispersion characteristics which are relatively homogeneous. The sub-basin concept, which assumes contained airflow within the basin, is generally applicable for normal air flow conditions but breaks down under storm conditions or other situations where strong regional air movements result in greater air turbulence and mixing between sub-basins and even major air basins.

Air movements in this area are strongly affected by natural drainage patterns and daily temperature variations. As local air masses cool at night, the denser, cool air flows down valleys and other natural drainage channels. Generally, the winds associated with downslope

movements are low to moderate, however, if the drainage alignment parallels the prevailing wind direction or if topographic features concentrate natural air flows, moderate to strong downslope winds and high intensity gusts may result. As natural warming occurs during the morning and early afternoon, warm air masses begin to move up-valley. Differential heating and upper level winds tend to have a greater impact on the upward air movements resulting in greater mixing and instability with resultant variable winds and greater potential for gusty conditions. Normally, prevailing winds in the area are from the west and northwest, however, during the winter persistent high pressure cells which settle above the Wasatch Mountains to the north can shift the prevailing winds to the northeast for extended periods.

The Federal Clean Air Act establishes acceptable levels of air quality based primarily on human health related exposure levels. Quantitatively, air quality exposure levels are defined by the National Ambient Air Quality Standards (NAAQS) as maximum allowable primary and secondary concentration levels for the following specific pollutants:

- Nitrogen Dioxide (NO_2)
- Sulfur Dioxide (SO_2)
- Carbon Monoxide (CO)
- Particulate matter smaller than 10 microns in size (PM_{10})
- Ozone (O_3)
- Lead (Pb)

Based on the standards and available regional air quality monitoring data, specific areas are then evaluated and classified relative to compliance with the NAAQS. Areas where monitoring data indicate exceedances of the standards for one or more of the designated pollutants are designated as "non-attainment areas" for those specific pollutants. Carbon County, which encompasses most of the proposed permit area and adjacent areas, has been designated as an attainment area for all NAAQS primary pollutant levels indicating no significant existing air pollution problems in this area. Available monitoring data does indicate spot exceedances of secondary standards for total suspended particulates (TSP) for the areas of Price, Huntington, and Cedar Mountain, however, these exceedances are generally due to natural conditions of blowing dust and are not related to any specific development or operating activities.

There are specific areas designated by Federal regulation where potential air emission sources are not allowed to result in any significant deterioration of existing air quality. These areas, which include National Parks and designated Wilderness areas, are classified as "Prevention of Significant Deterioration - Class I Areas" (PSD). The only Class I PSD area in the general vicinity of the proposed permit area is Capital Reef National Park, which is located approximately 90 miles southwest of the proposed permit area. Given the combined factors of very limited potential from air emissions, mining and related activities, distance, and prevailing wind direction, the mining and related activities have negligible potential to adversely affect air quality in this area. Other areas under consideration for Class I designation in the general vicinity include Desolation Canyon, the San Rafael Reef, Lower Green River, Mexican Mountain, and Sids Mountain. The closest proposed Class I area is over 45 miles from the permit area and the same limiting factors would apply relative to potential mining related air quality impacts. With the exception of these specific areas, all other areas within and in the immediate vicinity of the permit area are classified as PSD Class II areas.

Coordination With Applicable Federal and State Air Emission Requirements

Given that the permit and adjacent areas fall within a designated attainment area, the only applicable Federal air emission requirements are those provisions providing for State

responsibility for protection of air quality within the State and applicable provisions providing for application of the best available control technology (BACT) for potential emission sources. Applicable State air emission requirements include provisions for air emissions permitting, application of BACT, submission of an annual air emissions inventory, stack height limitations, a 20 percent opacity limitation at all emission points, evaluation of visible emissions, reporting unavoidable control equipment breakdowns, and emergency episode requirements.

Coordination and Compliance With UDAQ

All applicable State air emission requirements will be addressed through maintenance of an air permit with the UDAQ. CR submited a Notice of Intent application for mining and related activities to UDAQ in early 2008. The application was approved by the Utah Department of Environmental Quality, Division of Air Quality on December 11, 2008. A copy of the Approval Order is included in Exhibit 4, Other Permits.

Chapter 5

R645-301-500 ENGINEERING

Kinney No 2 Mine

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R645-301-511 General Requirements

This section describes and presents engineering designs and operating plans for the proposed mining and related operations and associated structures and facilities. It also provides detailed information and designs for the environmental control and mitigation measures which will be utilized to prevent or minimize potential mining related environmental impacts. Information in this section was developed in accordance with applicable regulatory requirements (R645-301-500) for coal mine permitting in the State of Utah.

R645-301-512 Certification

Certification, Inspection, Reporting, and Emergency Procedures

Rule R645-301-512 specifies that certain designated cross-sections, maps, and plans be prepared by or under the direction of a qualified Registered Professional Engineer (PE) and that certain maps and design plans be certified by a PE or Registered Land Surveyor. Consistent with this requirement, the following components of this permit application meet the regulatory supervision and certification requirements:

- Previous Mining Activities Map, (Map 5)
- Mine Surface Facilities Map, (Map 13)
- Regional Hydrology Map, (Map 7)
- Drainage and Sediment Control Plan - (Map 24)
- Regional Geology (Figure 4)
- Hiawatha Overburden Isopachs & Mining Blocks (Figure 10)
- Geologic W-E X-Section A-A' (Figure 6)
- Geologic W-E X-Section B-B' (Figure 7)
- Geologic N-S X-Section C-C' (Figure 8)
- Geologic N-S X-Section D-D' (Figure 9)
- Mine Plan Layout & Production Schedule (Maps 15)Dainage and Sediment Control Plan, Map 24
- Sedimentation Pond No. 1, (Map 25)
- Mine Surface Facilities Area, Pre-Mining Topography Map, (Map 14)
- Mine Surface Facilities Area – Pre Mining, Mining & Post Mining Cross-Sections, (Maps 16 – 19)
- Exhibit 14, Geotechnical Investigations

In order to assure that designed structures are constructed according to the design plans and to verify that designed structures and facilities continue to function as designed, Rule R645-301-514 specifies that the following structures and facilities be inspected by a qualified Registered Professional Engineer or a qualified professional specialist under a professional engineer's direction and outlines specific inspection requirements:

- Excess spoil fills
- Coal refuse piles
- Impoundments

No excess spoil fill, or coal refuse pile is planned for the Kinney No. 2 Mine. Specific inspection and reporting practices for the proposed sediment pond is described in detail in the following sections of this operations plan.

Certain situations involving accidents, emergencies, or unforeseen circumstances may require immediate or timely reporting to provide for appropriate coordination of required control and mitigation measures. Under applicable regulatory requirements, these situations are specifically identified as including the following:

- Slides which may have potential adverse effects on public health and safety, property, or the environment
- Excess spoil fills
- Impoundment hazards
- Accidental releases of potentially hazardous or toxic materials including petroleum products
- Temporary cessation of mining operations

Reporting and emergency measures for potential slides are specifically addressed in R6456-301-600 Geologic Protection; for impoundment hazards and accidental releases of potentially hazardous or toxic materials in R645-301-731.300 Hydrologic Resource Protection; and for temporary cessation of mining operations in R645-301-731.500 - 522 Cessation.

R645-301-513 Compliance with MSHA Regulations

The proposed mining and related operations have been designed and will be operated and maintained to effect full compliance with all applicable Federal, State, and local laws and regulations. Specifically, CR will comply with applicable regulatory requirements relating to the following designated activities/structures under the authority of the noted jurisdictional agencies:

Federal Agencies

Mine Safety and Health Administration (MSHA) – Compliance with applicable requirements relating to coal processing waste dams; impoundments and sedimentation ponds; plans for underground disposal of development waste, coal processing waste, or excess spoil; refuse piles; reclamation and closure of mine openings; any discharges into underground mines; mining within 500 feet of an active underground mine; and plans for extinguishing coal mine waste fires.

CR will work with MSHA and the state of Utah to devise plans to precisely locate old mine workings prior to approaching them that will safeguard all persons. This may involve drilling ahead with an in-mine drill, possibly injecting concrete into old workings to pre-stabilize them and other measures to prevent inundation and/or the introduction of gob gas to the active mine atmosphere should the drilling reveal the old mine workings will be unavoidably encountered in the planned mains.

Development rock backfill will be placed into designated panel areas and will further serve to encapsulate pillars. This will passively stabilize pillars in those areas with some confinement. Development rock backfill areas will be ventilated until they are filled and have been monitored for products of combustion for a period of 1 year after backfill operations are complete. If no significant products of combustion have been found the area will be sealed and monitored according to an approved ventilation plan.

R645-301-514 Inspections

In order to assure that designed structures are constructed according to the design plans and to verify that designed structures and facilities continue to function as designed, Rule R645-301-514 specifies that the following structures and facilities be inspected by a qualified Registered Professional Engineer or a qualified professional specialist under a professional engineer's direction and outlines specific inspection requirements:

- Excess spoil fills
- Coal refuse piles
- Impoundments

No excess spoil fill, or coal refuse pile is planned for the Kinney No. 2 Mine. Specific inspection and reporting practices for the proposed sediment pond is described in detail in the following sections of this operations plan.

R645-301-515 Reporting and Emergency Procedures

Reporting and emergency measures for potential slides are specifically addressed in R645-301-631 - 632 Geologic Protection; for impoundment hazards and accidental releases of potentially hazardous or toxic materials in R645-301-730, Hydrologic Resource Protection; and for temporary cessation of mining operations in R645-301-515.399, Temporary Cessation.

515.100 Slides

See discussion on reporting slides under R645-301-512 below.

515.200 Impoundment Hazards

Certain situations involving accidents, emergencies, or unforeseen circumstances may require immediate or timely reporting to provide for appropriate coordination of required control and mitigation measures. Under applicable regulatory requirements, these situations are specifically identified as including the following:

- Slides which may have potential adverse effects on public health and safety, property, or the environment
- Excess spoil fills
- Impoundment hazards
- Accidental releases of potentially hazardous or toxic materials including petroleum products
- Temporary cessation of mining operations

515.300 Temporary Cessation of Operation

Designs and plans for the proposed mining and related operations are based not only on geologic, environmental, and engineering information but also on existing coal contracts and conservative projections of future coal market demand. Given this consideration, CR does not anticipate any temporary cessation of the proposed mining operations prior to the end of the projected mine life. In the unlikely event that temporary cessation of operations becomes

necessary, the mine surface facilities would be secured to minimize potential public health and safety hazards and to prevent or minimize potential related adverse impacts on the environment. Specifically, entrances to the mine, mine facilities, and loadout facilities would be barricaded and locked, buildings, equipment, fuel storage facilities and other support facilities would be locked and the site would be put on extended maintenance and care status until operations could be reactivated or a decision is made to permanently close the operation. In order to prevent unauthorized access to underground mine workings during any period of temporary cessation, mine openings including the mine portals and ventilation shaft will be secured by locked barricades. Dependent on the anticipated period of temporary closure, access to mine portals would be restricted by either temporary concrete block walls or fabricated locking metal gates. Maintenance and care status would involve the use of mine or contract security personnel to control site access, regularly inspect the site to identify any hazardous conditions, and conduct routine maintenance and repair to prevent significant deterioration or damage to the existing structures and facilities.

If temporary cessation of mining and/or reclamation operations for a period of 30 days or more becomes necessary, CR will submit a notice of intention to UDOGM. The notice will include a statement of the exact number of acres which have been disturbed prior to cessation, the nature and extent of any reclamation completed, and any reclamation, environmental monitoring, water treatment, or other activities which will continue during the period of temporary cessation. Monitoring will include taking one composite sample of the temporary waste rock storage pile should there be waste rock in the temporary pile at time of cessation.

The mine site provides access to private property to the north and east, therefore, the private property owners involved will have keys to the site gates to access their property during any cessation period, and during the reclamation bond period. Roads have been designed into the reclamation plan for post mining land use to allow the private property owners access.

R645-301-520 Operation Plan

In developing the engineering designs and operating plans for the mining and related operations, CR has reviewed and evaluated all existing available information on site geology, coal occurrence and characteristics, and environmental resource values. This information along with sound engineering principals has been combined to develop designs and plans which will provide for safe, efficient, and effective mining operations while minimizing potential related environmental impacts and effecting full compliance with all applicable regulatory requirements. The following sections describe the specific design methods, operating measures, and associated control and mitigation practices which will be utilized to accomplish these objectives.

521.100 Cross Sections and Maps

Maps presenting all of the information required by R645-521.100 are included in this permit document, including Maps 1 through end of maps. Each chapter of this document refers to particular maps that present and represent information required. A complete list of maps can be found as the List of Maps at the beginning of the document. Map scales have been chosen to represent the information contained on each map and according to R645-301-141.

In order to assure that designed structures are constructed according to the design plans and to verify that designed structures and facilities continue to function as designed, Rule R645-301-514 specifies that excess spoil fills, coal refuse piles and impoundments be inspected by a qualified Registered Professional Engineer or a qualified professional specialist under a professional engineer's direction and outlines specific inspection requirements:

- Excess spoil fills
- Coal refuse piles
- Impoundments

No excess spoil fills, or coal refuse piles are planned for the Kinney No. 2 Mine. Specific inspection and reporting practices for the proposed sediment pond is described in detail in the following sections of this operations plan. The only impoundment planned is a sedimentation pond for which the water holding capacity is totally incised.

Engineering and Mine Planning Information

Information presented on the regional and mine area engineering and planning maps includes:

- Proposed mine permit and disturbance boundaries
- Existing land configuration
- Existing and proposed surface structures and facilities
- Location, extent, and sequencing of proposed underground mine development
- Drainage and sediment control plans and designs for associated structures
- Existing and proposed roads and utility installations

The pre-mining topography of the mine site and area can be seen on Map 14, Pre-Mining Topography.

521.110 Previous Mine Areas

As described in R645-301-521.152, Previous Mining Activity, extensive historic mining activity has occurred throughout the proposed permit area with resulting development of underground mine workings in many areas and disturbance of limited surface areas for mine portals; coal stockpiles; coal handling, processing, and loadout facilities; and mine support facilities. Mining related underground workings are shown and labeled on Map 5, Previous Mining Activity Map. The surface disturbance area from the various historic mines is shown on Map 5, Previous Mining Activity, and on Map 4, Regional Land Use Map.

Some of the previous historical mining related disturbance is of particular significance with respect to its relationship to the proposed mining operations. The most obvious area of significance is the previous underground mine development and production which has resulted in depletion of discrete coal reserve blocks in the targeted mineable coal seam. CR has utilized available maps of the previous underground workings to eliminate the previously mined reserves from consideration under the proposed mining plans and to establish the proposed mining layout and sequence. Extensive previous surface disturbance was also a factor in selecting the proposed mine surface facilities area. By utilizing an area which has been previously substantially disturbed, CR can effectively avoid much of the disturbance and related environmental impacts associated with any new surface disturbance.

Site 42Cb477, although included in the archeology inventory and in the report is outside of any actual dusturbance from mining, but the SHPO requires it to be included in the mitigation ("Treatment Plan"). The Treatment Plan is considered to be confidential and is or will be included in Exhibit 4, Other Permits when approved by the SHPO.

521.120 Existing Surface and Subsurface Facilities

As discussed in R645-301-410 Land Use Information, the rugged natural topography of the area may generally be characterized as a small, high elevation valley, with high plateaus to the east and west, narrow ridgelines cut by deep drainages with steep, narrow drainage valleys over most of the proposed permit and adjacent area. Existing site topography, structures, and facilities, are shown on Map 4, Regional Land Use Map.

Most of the structures and facilities associated with previous historic mining have been removed and most of the previously disturbed areas have been reclaimed. Those structures which remain include an old fan house, a small, one-room concrete structure, and several foundations and other minor mining related remnants. All of these features are documented in Exhibit 3, Confidential Information, Archeology report. In addition, the features have been added to Map 14, Pre-Mining Topography Map. None of the features or structures, either surface or subsurface, will be used for the Kinney No. 2 Mine, as they are old, dilapidated, and of no value to mining activities. There is only one of the sites included in the Archeology report that will be impacted by mining activities, Site 42Cb479; all of the features within this site will be impacted under permit from the Utah State Historic Preservation Office. A mitigation ("Treatment Plan") is being developed for approval to offset the impact. Documentation of this approval is either in Exhibit 4, Other Permits, or will be inserted as soon as the approval has been received.

521.130 Land Ownership and Right of Entry Maps

See discussion on land ownership in R645-301-521.132 below.

521.131 Land Ownership Maps

See discussion on land ownership in R645-301-521-132 below, and Map 11, Surface Ownership Map.

521.132 Boundaries of Land CR Mining has Rights to Enter

The Surface Ownership Map and Coal Ownership Map. (Maps 11 and 12, respectively) show ownership blocks and boundaries. The Kinney No. 2 Mine permit area encompasses an area of approximately 448.14 acres, of which 15.33 is fee surface, 22.8 (less UDOT R-O-W) is leased, and the remaining 410.04 acres are private land.

The proposed Kinney No. 2 Mine will be operated by Carbon Resources, LLC (CR). CR's offices are currently located at P.O. Box 954, Sandia Park, New Mexico 87047. Upon start of operations, temporary office space will be located in Scofield, with permanent offices to be located at the mine site.

The area of surface disturbance is confined within the 38.13 acres (combined Fee and Easement) owned or controlled by Carbon Resources. Only 27.6 acres of the 38.13 acres will be disturbed for surface facilities. The coal to be mined lies beneath the George Telonis, ETAL. fee surface land and is owned by Carbon County which in turn has been leased it to Western Reserve Coal, Inc, parent company of Carbon Resources.

521.133 Protection of Public Interest

Mining operations will be conducted within 100 feet of Utah State Highway 96, which is a public road. In compliance with the applicable regulatory provisions of Rules R645-103-234.100 through 400, CR has contacted and obtained approval from the Utah Department of Transportation (UDOT) for access to Highway 96, and will initiate a formal request for public hearing with UDOGM. A notice of public hearing will be published at least two weeks in advance of the hearing in a local paper of general circulation and opportunity was provided in the hearing for the public and any affected owners to present information relating to protection of their interests. Copies of the public notice and hearing documentation and written findings relative to mining within 100 feet of a public road, will be submitted to UDOGM on receipt for insertion in Exhibit 5, Public Notice and Proof of Publication, Hearing Notices and Documentation.

521.140 Mine Maps and Permit Area Maps

See discussion on mine maps and permit area maps under R645-301-521.142, and R645-301-160 below.

521.141 Disturbed Boundary and Timing of Mining

See discussion on disturbed boundary and timing of mining under R645-301-142, 160, 522, and 523 below.

521.142 Underground Working and Subsidence Areas

The disturbed area boundary can be seen on Map 13, Surface Facilities, and the underground mining plan layout and timing can be seen on Map 15, Mine Plan Layout and Production Schedule.

No subsidence is planned for the Kinney No. 2 Mine since no second mining is planned. No pillars will be extracted, therefore no collapse of the strata above the coal seam will occur which creates subsidence.

521.143 Mine Waste Disposal Sites

Development rock from underground mining operations activities may be temporarily stockpiled in the portal area and will be periodically loaded into rear dump trucks and hauled to temporary stockpile areas until it can be returned to the mine, where it will be placed in areas specifically designated for this purpose.

Mine development waste consisting of a mixture of rock and coal materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned, however this material may not be saleable as regular coal product due to a high content of rock. The area designated is capable of containing approximately 3,900 tons of material. This material will be sold as a low quality coal product to local coal preparation facilities, or will be deposited in other facilities permitted by the UDOGM.

Development Waste Temporary Storage Area (Underground Development Waste)

Mine development waste consisting of rock with no coally materials will be temporarily stored at

an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned. The area designated is capable of containing approximately 3,900 tons of material. This material will be placed into designated panel areas inside the mine and will serve to encapsulate pillars. This will passively stabilize pillars in those areas with some confinement. Development rock backfill areas will be ventilated until they are filled and have been monitored for products of combustion for a period of 1 year after backfill operations are complete. If no significant products of combustion have been found the area will be sealed and monitored according to an approved ventilation plan.

521.150 Land Configuration Maps

See maps discussion under R645-301-521.152 below including Map 14, Mine Surface Facilities Area Pre-Mining Topography, Maps 16 through 19, Mine Surface Facilities Area Pre-Mining , & Post Mining Cross Sections, Map 23, Drainage and Sediment Control Plan Undisturbed Drainage Areas, and Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control.

521.151 Cross Sections and Slope Measurements

See maps discussion under R645-301-521.160 below.

521.152 Previously Mined Area

See maps discussion under R645-301-521.160 below.

521.160 Maps and Cross Sections of Features of Permit Area

Information presented on the regional and mine area engineering and planning maps includes:

- Proposed mine permit and disturbance boundary – Map 13, Surface Facilities Map
- Existing land configuration – Map 14, Mine Surface Area Pre-Mining Topography, Maps 16 through 19, Mine Surface Facilities Area Pre-Mining & Post Mining Cross Sections
- Existing and proposed surface structures and facilities – Map 13, Surface Facilities Map
- Location, extent, and sequencing of proposed underground mine development – Map 15, Mine Plan Layout and Production Schedule
- Drainage and sediment control plans and designs for associated structures – Map 23, Drainage and Sediment Control Plan Undisturbed Drainage Areas; Map 24, Drainage and Sediment Control Plan Disturbed Drainage Areas; Map 25, Sedimentation Pond 1 Sections & Details; Map 26, Drainage and Sediment Control Plan Disturbed Drainage Sub-Basins; and Map 27, Runoff Control Details
- Existing and proposed roads and utility installations – Map 13, Surface Facilities Map, and Map 14, Mine Surface Facilities Area Pre-Mining Topography
- Previously mined area – Map 5, Previous Mining Activity

The pre-mining topography of the mine site and area can be seen on Map 14, Mine Surface Facilities, Pre-Mining Topography.

Some of the previous historical mining related disturbance is of particular significance with respect to its relationship to the proposed mining operations. The most obvious area of significance is the previous underground mine development and production which has resulted in depletion of discrete coal reserve blocks in the targeted mineable coal seam. CR has utilized available maps of the previous underground workings to eliminate the previously mined reserves from consideration under the proposed mining plans and to establish the proposed mining

layout and sequence. Extensive previous surface disturbance was also a factor in selecting the proposed mine surface facilities area. By utilizing an area which has been previously substantially disturbed, CR can effectively avoid much of the disturbance and related environmental impacts associated with any new surface disturbance.

As discussed in R645-301-410, Land Use Information, the rugged natural topography of the area may generally be characterized as a small, high elevation valley, with high plateaus to the east and west, narrow ridgelines cut by deep drainages with steep, narrow drainage valleys over most of the proposed permit and adjacent area. Existing site topography, structures, and facilities, are shown on Map 4, Regional Land Use Map.

Most of the structures and facilities associated with previous historic mining have been removed and some of the previously disturbed areas have been reclaimed. Those structures which remain include an old fan house, a small, one-room concrete structure, and several foundations. The remaining historic structures are identified and described in R645-301-411.140, Cultural and Historic Resources.

521.170 Transportation Facilities Maps

In conjunction with the proposed mining and related operations CR will construct, operate and maintain a number of new roads and will operate and maintain several existing roads. Both new and existing roads will be utilized to access existing and proposed facilities and for transportation of personnel, equipment, and supplies. All roads are classified as primary roads. The primary road classification includes any road used for transporting coal or spoil, roads which are used frequently for periods exceeding 6 months, and roads which will be retained to support the postmining land use. All roads will be utilized on a frequent, long-term basis to support the proposed mining and related operations. Proposed roads which will be used in conjunction with the proposed mining and related operations include the following:

Proposed Roads in Kinney No. 2 Mine Facilities Area

PR-1 Primary mine access road for the proposed surface facilities area
PR-2 Primary mine access road to Mine Office Pad
PR-3 Primary mine access road to the Portal Pad
PR-4 Primary mine access road to the Storage Area Pad
PR-5 Primary mine access road to the Loadout Pad
PR-6 Primary mine access road to Sedimentation Pond No. 1
PR-7 Primary mine access road to the North Access Road

All proposed roads are shown on, Map 13, Mine Surface Facilities Map. Road profiles can be seen on Maps 20 through 22, Mine Surface Facilities Road Profiles.

521.180 Support Facilities

General Description of Mine Construction and Development Activities

The new mine facilities access road will generally follow the alignment of the undeveloped dirt road which begins near the south end of the proposed operations on Highway 96, and Mine construction and development will involve those activities necessary to complete the surface facilities and systems and to develop mine portals, main entries, and the entire underground infra-structure which will be required to support the proposed underground mining operations.

From an environmental standpoint, the mine construction and development phase will be important due to the fact that essentially all direct mining related surface disturbance will occur during this phase. Mine construction and development activities will be conducted in a manner that prevents or controls erosion and siltation, water pollution, and damage to public or private property; and to the extent possible using the best technology currently available, minimizes damage to fish, wildlife, and related environmental values, and minimizes additional contributions of suspended solids to streamflow or runoff outside the permit area. Any contributions of suspended solids from mine disturbance areas will not exceed applicable effluent limitations under Utah or Federal law.

Construction/Development Schedule - Required highway modifications will occur prior to mine development and entirely within the existing Highway 96 right of way and will be conducted under approved plans developed in consultation with the Utah Department of Transportation (UDOT). All other proposed construction and development activities will proceed as soon as operationally feasible following receipt of required permit approvals. Construction and development activities proceeding immediately and continuing over the next 18 to 24 months.

Construction/Development Activities and Associated Control and Mitigation Measures - Required mine construction and development activities will proceed in a logical sequence to assure effective environmental protection and engineering control of these activities. The following general sequence of activities will be applicable for all proposed mine construction and development activities:

- Establish preliminary access
- Construct required drainage and sediment control structures
- Recover and stockpile available soil or substitute materials
- Construct required roads
- Proceed with required site grading, excavation, and cut/fill operations
- Complete required foundation preparation work
- Construct required structures and facilities
- Complete required utility installations
- Develop mine portals, and main entries
- Complete infra-structure for underground operations (includes electrical systems, water distribution, communications, ventilation, mine drainage systems, and conveyors)
- Systems testing and commissioning

The following sections describe each of these construction/development activities and the associated control and mitigation measures which will be utilized to minimize potential related environmental impacts and assure that each activity is conducted in conformance with approved designs and plans.

Establish Preliminary Access - Preliminary access for the proposed construction and development activities will be made at the location of the pre-mining dirt road to the site, and utilizing the other existing roads on the site. Preliminary access routes will only be utilized for a very brief period to facilitate initial drainage construction and soil removal activities, consequently, associated environmental control and mitigation measures will be limited to alternative sediment control such as silt fences, straw bales, sediment traps, berms and watering on an as needed basis.

Construct Required Drainage and Sediment Control Structures - Due to the importance of effective water quality protection, required drainage and sediment control structures will be constructed prior to any other significant site disturbance. Drainage construction will be a

phased process with construction of the sedimentation pond, and principal undisturbed drainage diversion ditches and disturbed area collection ditches all of which are temporary ditches occurring as the first activities in the construction phase. Temporary sediment controls to be utilized during initial construction will include the use of silt fence, straw bales, berms, temporary ditches and sediment traps. Temporary controls will be utilized to effectively control runoff and sedimentation until designated structures can be completed. As progressive construction activities are extended to other areas, the associated drainage structures will be developed and connected to the existing drainage system prior to other area disturbance. Detailed descriptions of drainage design and construction procedures are presented in R645-301-526, Mine Structures and Facilities, and the proposed drainage control system is shown on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas. These structures have been designed and will be constructed, operated, and maintained to provide effective drainage and sediment control during both construction/development activities and subsequent mining and related operations. Construction of all drainage and sediment control structures will be monitored by qualified individuals under the supervision of a Registered Professional Engineer and specific designed structures including the sedimentation pond will be inspected according to design plans certified as required by applicable regulatory provisions.

Recover and Stockpile Available Soil and Substitute Materials - Once the required drainage structures are in place to effectively control surface runoff and minimize additional sediment contributions, construction will proceed with recovery of available soil and substitute materials from the proposed surface disturbance areas. Soil and substitute recovery will involve removal of existing materials which will be utilized as vegetative growth media during future site reclamation activities. These materials will be removed using either tractor scrapers or an equipment team composed of a tracked dozer, wheel loader, and rear dump truck, and will be transported and placed in temporary stockpiles for future reclamation use. The coal fines identified during the soils investigation will be removed and sold as discussed previously. The previously constructed drainage and sediment control structures will provide effective water quality control for soil removal operations and periodic watering of soil removal areas and haulage roads will be utilized to control dust emissions. A detailed discussion of soil and substitute recovery and stockpiling practices is presented in R645-301-230, Soil Handling Plans, and proposed soil/substitute stockpile locations are shown on Map 13, Mine Surface Facilities Map.

Construct Required Roads - Construction of required roads will be included in a phased manner as the site is developed. Seven primary access roads will be required in conjunction with the proposed mining and related activities as follows:

- Main Access Road – P1 - From Highway 96 to the Operations Pad
- Office Access Road – P2 – From P1 to the Mine Office Pad
- Portal Access Road – P3 – From P1 to the Portal Pad
- Storage Access Road – P4 – From P3 to Storage Area Pad
- Loadout Access Road – P5 – From the Operations Pad to the Loadout Pad
- Sediment Pond Access Road – P6 – From the Loadout Pad to the Sediment Pond
- North Access Road – P7 – From the Loadout Pad to the Private Property to the North

Primary roads which will be utilized in conjunction with the proposed mining and related operations as well as existing roads which are not related and will not be utilized in conjunction with the proposed activities are shown on Map 4, Regional Land Use Map, and Map 13, Surface Facilities Map. Roads existing prior to mining, and roads to be left for post mining land use are shown on Map 14, Mine Surface Facilities, Pre-Mining Topography Map. All roads have been designed and will be constructed and maintained to prevent or control damage to property; erosion, siltation, and air pollution; and minimize disturbance and impacts to fish, wildlife, and related environmental values. Construction of primary roads will be monitored and construction

according to the design plans certified consistent with applicable regulatory provisions. Detailed discussions of road design, construction, and maintenance practices are presented in R645-301-526, Mine Structures and Facilities, and R645-301-531, Design Standards and Requirements.

Proceed With Required Site Grading, Excavation, and Cut/Fill Activities - Cut/fill operations and grading will be required to establish final design grades for the proposed mine surface facilities. Design grades for the proposed mine facilities area reflect an overall cut/fill balance so that no excess spoil disposal will be required. Cut/fill slopes have been designed at grades of approximately 0.8H:1V to 3.0H:1V dependent on material to minimize erosion potential and provide for effective long-term stability as recommended by Rollins, Brown and Gunnel Geotechnical Engineers in their geotechnical investigations report, Exhibit 14, Geotechnical Investigations. Required site construction earthwork will involve the use of tracked dozers, tractor scrapers, wheel loaders, backhoes, and trucks to establish final design grades and all earthwork operations will be supervised and monitored by a qualified individual familiar with construction earthwork. Consistency with design plans will be monitored and checked using conventional engineering survey methods. Drainage from areas disturbed or otherwise affected by site grading activities will be controlled by either temporary controls or the previously constructed drainage and sediment control system and watering will be utilized to minimize potential fugitive dust emissions.

Complete Required Foundation Preparation Work - Once design grades have been established through completion of site earthwork and grading, work will proceed with preparation and installation of foundations for all proposed major structures and facilities. CR has completed geotechnical investigations to evaluate site foundation conditions as a basis for foundation and facility design. Foundation investigations, as described in Exhibit 14, Geotechnical Investigations, included completion of 6 borings, and 14 test pits at the locations of proposed major facilities, penetration tests, and collection, laboratory analysis, and evaluation of the representative material types encountered by the test borings and pits. Findings and recommendations are presented in the final report found in Exhibit 14. Proposed mine facilities, structures, roads and the sedimentation pond have been designed according to these findings and recommendations.

Foundation preparation activities will generally involve excavation and removal of any potentially deleterious material including but not limited to organic material, debris, coal or carbonaceous materials, and wet or frozen materials and compaction of the upper three feet in the foundation area. In any areas where the surficial materials have been identified as having any limitations relative to use as foundation materials, appropriate remedial measures including over excavation and recompaction or replacement with more suitable materials will be implemented. Foundations will generally be spread footings with floating slabs, which will be used for most of the major buildings and structures, concrete pier type footings for the conveyor support structures, or slab type foundations for the electrical substation and other minor structures. Foundation construction will be monitored under a construction quality assurance program implemented under the CR facility construction contract to assure compliance with design plans and specifications. Specific foundation designs are discussed for individual facilities in R645-301-526, Mine Structures and Facilities.

Construct Required Structures and Facilities - Construction of the major required structures and facilities will involve fabrication and erection of the following designed structures:

- Maintenance shop and warehouse building
- Administration/Bathhouse facility

- Coal handling system (includes coal conveyors and transfer points, stacking tubes, coal stockpiles, coal reclaim system, usher building and truck loadout building)
- Miscellaneous structures

All mine support buildings will be constructed with fixed concrete foundations, a structural steel framework, and pre-fabricated sheet steel siding and roofs or will be concrete precast structures. Internal design and construction will vary for each facility dependent on use. Conveyor structures and supports will be pre-fabricated steel frames supported by steel trusses which will be anchored by concrete piers. Conveyor transfer points will consist of a steel framework supporting conveyor head and tail pulleys, drive units, and any required chutework and dust control equipment. The coal stacking tubes will be steel tubes set on heavy reinforced concrete slab foundations. The coal reclaim system will consist of several steel chutes and vibratory feeders supported by reinforced concrete foundation structures feeding to a heavy steel tunnel structure which will house the coal reclaim conveyor and associated support equipment. Facility construction will be monitored under a construction quality assurance program implemented under the CR facility construction contract to assure compliance with design plans and specifications. All proposed mine structures and facilities are shown on Map 13, Surface Facilities Map, and detailed facility descriptions and operating/maintenance plans are presented in R645-301-526, Mine Structures and Facilities.

Complete Required Utility Installations - Concurrently with construction of the major structures and facilities, CR will complete required utility installations including electrical power distribution, raw and potable water systems, and the sanitary sewer system. The mine electrical power distribution system will consist of a substation located near the mine portal area; transmission lines running from the substation to each of the major facilities, the mine fan installation, the major conveyor drive installations, and connecting to the underground mine electrical system; and related electrical transformers and switchgear.

Water systems will provide both raw and potable water for sanitary use in the mine facilities, fire-fighting reserve, mine water requirements, and dust control sprays in coal handling areas. A 50,000 gallon raw water storage tank along with associated piping, control valves, and control/monitoring systems will be constructed on the north end of the mine portal area and will connect to a distribution network running through the mine facilities area and connecting to the underground mine water system. Water for this tank and the mine water system will be provided by Scofield Town. The potable water system will connect to the existing Scofield Town water system and will supply potable water to the maintenance shop, warehouse, and administration building/bathhouse facility. All facilities served by the potable water system will also be connected to a main sewer line running from the mine facilities area to the Scofield Town sewer system near the southwest corner of the mine site. The location of all existing and proposed utility installations are shown on Map 13, Surface Facilities Map, and utilities are described in greater detail in R645-301-526, Mine Structures and Facilities.

Develop Mine Portals, and Main Entries - Portal development can be initiated following completion of required drainage and sediment control structures, access roads, and the portal pad area. In order to initiate portal development as early as possible in the construction/development process, temporary electrical connections, a temporary water supply, and temporary ventilation measures may be employed. Portal development will be initiated with erection of pre-fabricated steel portal structures to protect workers from any rocks falling off the steep slope above the face-up area. To the extent operationally feasible, portal and mine development will occur in the Hiawatha Seam from the point where it outcrops in the face-up area. In the event the coal seam does not exist at the face-up area, rock slopes will be constructed to access the coal seam. Portal development will involve development using conventional methods of a five entry system. One or more continuous miners will be utilized to drive the development entries and conventional roof bolters will be utilized to provide roof

control during development operations. Blasting may be necessary for development of the portals and will be conducted according to the blasting plan addressed in Exhibit 15, Kinney No. 2 Mine Blasting Plan. Development rock from these activities will be temporarily stockpiled in the portal area and will be periodically loaded into rear dump tracks and hauled to temporary stockpile areas until it can be returned to the mine, where it will be placed in areas specifically designated for this purpose.

Mine development waste consisting of a mixture of rock and coal materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned, however this material may not be saleable as regular coal product due to a high content of rock. The area designated is capable of containing approximately 3,900 tons of material. This material will be sold as a low quality coal product to local coal preparaion facilities, or will be deposited in other facilities permitted by the UDOGM.

Entry No. 2 will be a Temporary Portal entry and will be used for the installation of a temporary auxiliary fan. This temporary configuration will initially consist of up to 2 - 100 HP auxiliary exhausting fans and ductwork to provide adequate airflow for initial portal face development operations and to sustain mains development until the main mine fan is installed. Intake air will be heated by MSHA approved propane heaters as needed. All MSHA rules and regulations will be complied with as well as prudent safe operating practice. As lower cost natural gas becomes available to the local area intake air heaters may be converted according to improve the cost economics of the operation.

It is anticipated that these auxiliary fans will be required for an interim period of time while setting up the main mine fan installation and establishing the initial airways of the mine. Once progress has developed airways to the point and construction is complete so that the permanent fan can be placed in service the auxiliary fans will be taken out of service or will be used at the face in series or parallel with the mine fan to assist with face ventilation there.

The main mine fan will be installed on the northern-most portal entry to replace the temporary system (the auxiliary fans) and construction and installation will begin as soon as possible. The mine fan is shown on Map 13, Surface Facilities Map. This fan will be adequate for the duration of mining and will provide statutory fresh air volumes to working areas of the mine within the permit application as shown in Map 15, Mine Plan Layout and Production Schedule. The fans together with full or temporary stoppings and/or curtains will provide adequate ventilation volume and control for all initial portal and main entry development work and draw fresh air to the working places of the mine to places where coal and/or rock is cut mined and loaded.

Upon the completion of all five portal entries, development of the main entries will proceed with extension of the portal entries to the Southeast on an approximate bearing of South 102 Degrees East i.e., “S102E Portal Mains”.

At some point during development of the main entries, the main mine fan installation will be completed, ventilation will switch over to the permanent ventilation system, and the temporary mine fan will be removed. All mine development and mine operations activities will be conducted in full compliance with all applicable state and federal regulatory requirements for health, safety, and environmental protection at all times.

Portal No. 5, the southernmost portal, is positioned such that it is not possible to construct the portal pad to include the portal as can be seen on Map 13, Surface Facilities and Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas. Mine entry (No 5) will be constructed from inside the main by cutting back toward the outcrop. At the appropriate location, a short air shaft will be driven to the surface for intake air. The air shaft will be lined with

a steel structure to support the walls of the shaft, and the steel structure will be covered with solid steel from approximately 15 feet below the ground surface to approximately 5 feet above the ground surface, and then grouted between the steel and the ground adjacent to seal the annulus from surface water infiltration. Runoff from the very small runoff area covered by the air shaft will be contained by a total containment berm as shown on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas.

Once development of all five portal entries is completed, development of the main entries will proceed with extension of the portal entries to the east. At some point during development of the main entries, the main mine fan installation will be completed, ventilation will switch over to the permanent ventilation system, and the temporary mine fan will be removed. All mine development activities will be conducted in full compliance with applicable regulatory requirements for health, safety, and environmental protection. CR will monitor all mine development activities to assure compliance with both applicable regulatory provisions and mine plans. The location and configuration of the mine portals, and main entries are shown on Map 13, Mine Surface Facilities Map, and ,Map 15, Mine Plan Layout and Production Schedule Map, and additional discussion of development and mining methods and practices is provided in R645-301-522, General Description of Mine Plans, Mining Methods, and Related Design Requirements.

Complete Infra-Structure for Underground Operations - Installation of required mine utility systems, as previously described, will occur during development of the mine portals and main entries. Once these utilities are in place, CR will complete and connect the infra-structure required to support underground mining operations. This infra-structure will include the underground electrical power and mine water distribution systems, required communications systems, the mine ventilation system, mine drainage systems, and the underground coal handling system. The systems are identified and discussed in R645-301-526, Mine Structures and Facilities

Systems Testing and Commissioning - As the specific components of the overall mine operations and support system are completed, they will be inspected and tested to assure consistency with design plans and safe and effective operation consistent with both the design plans and their intended purpose. Testing will include both no-load testing to identify any problems and allow repair or modification to address the problems and load testing to verify system reliability and performance under design operating conditions. Where systems rely on or are integrated with other operating systems, progressive testing will be completed to verify that all systems work together as an integrated whole. Final testing and commissioning of all mining and support systems will occur prior to initiation of full-scale mining operations.

521.190 Other Relevant Information Required by the Division

Historic mine maps included in this application were obtained from the Utah Geological Survey Office in Salt Lake City, and from other sources.

Table 24, Pertinent Acreages, Land Ownership & Control includes land ownership with the acreages of those lands.

521.200 Signs and Marker Specifications

See discussion of signs and markers under R645-301-521.270 below.

521.240 Mine and Permit Identification Signs

See discussion of signs and markers under R645-301-521.270 below.

521.250 Perimeter Markers

See discussion of signs and markers under R645-301-521.270 below.

521.260 Buffer Zone Markers

See discussion of signs and markers under R645-301-521.270 below. There are no streams in the permit area that require buffer zone markers.

521.270 Topsoil Markers

CR will post and maintain all required signs and markers in compliance with applicable regulatory provisions of Rule R645-301-521.200. Signs and markers will be constructed of durable materials and will be posted so as to be clearly visible. Mine identification signs listing the name, business address, and telephone number of the permittee and the permit number for the permanent program permit authorizing mining and reclamation operations will be posted at each point of access to the permit area from a public road. Perimeter markers will be posted outlining all areas affected by surface operations or facilities prior to initiation of mining, and soil/substitute stockpiles will be clearly marked for identification and to limit access and potential disturbance. Signs reading "Blasting Area" will be posted along the edge of any blasting area which comes within 100 feet of any public road right-of-way and at the point where any other road(s) provides access to the blasting area. All required signs and markers will be maintained or replaced during the period of active operations, site reclamation, and until final bond release is approved for all areas within the permit boundaries.

R645-301-522 Coal Recovery

The mine plans and proposed mining methods described in this section reflect CR's detailed review and evaluation of all existing available geologic and coal quality data, consideration of related environmental factors such as hydrologic considerations. This broad base of relevant information was utilized to develop a number of conceptual mine plan alternatives which were then evaluated relative to consistency with CR's overall project objectives. These objectives include the following:

- Maximize recovery and utilization of the available coal resource
- Optimize coal production efficiency and economics
- Facilitate potential future development of nearby coal reserves
- Provide a safe, healthy, secure working environment
- Minimize potential adverse environmental impacts

Based on CR's detailed review and evaluation of possible alternative mining scenarios, the plans presented in this section were selected as the best combination of mine layout, mining method,

and mine sequencing in order to achieve the noted objectives and provide for organized sequential mining operations.

Areas and Sequencing of Mine Development

The proposed mining operations will target recovery of remaining minable coal reserves contained in the Hiawatha coal seam. This coal seam and other seams in the area have been previously mined in the area with access to the seams from portals at the coal outcrop. Previous mining areas are delineated for each seam on both Map 5, Previous Mining Activities Map, and Map 15, Mine Plan Layout & Production Schedule Map. Target minable coal reserves identified in this plan reflect consideration of practical mineral ownership, geologic, environmental, and mining constraints which may limit access to and recovery of coal reserves which otherwise might be considered as recoverable reserves. Generally, the proposed coal extraction limits are shown on Map 15, Mine Plan Layout & Production Schedule Map exclude all previously mined areas, any areas where CR does not have existing rights to mine the coal. Proposed mining limits and the alignment of mine entries reflect consideration of those areas where historic mining removed the reserves and geological features that dictate mine layout and design. As indicated, considerable minable coal reserves remain in the area which can be effectively recovered while avoiding the existing abandoned mine workings. A maximum effective cover of approximately 1,000 feet exists in the permit boundary area and therefore there is no limit to coal recovery due to cover depth.

The proposed mine development and production sequence, as illustrated by Map 15, Mine Plan Layout & Production Schedule Map reflects orderly sequential development of available minable reserve areas, and the development/production requirements necessary to meet CR's current overall annual coal production targets. It should be noted that coal production requirements as outlined by Table 17, Projected Annual Coal Production, are based on current marketing projections for the first permit term. Additional coal reserves east and south of the proposed permit boundary are controlled by CR as shown on Map 12, Regional Coal Ownership Map. These reserves are planned to be mined at a future date under a major permit revision completed as soon after the first permit approval as possible. The projected mine life is anticipated to be 20 years including the eastern and southern reserves controlled by CR. Unanticipated fluctuations in coal market demand and other factors may result in some variance between projected and actual annual and total production rates. At the time of the permit mid-term review and permit renewal, CR will re-evaluate coal production projections and make appropriate adjustments as necessary.

Proposed coal development and production is expected to occur as shown on Map 15, Mine Plan Layout & Production Schedule Map, and Table 17, and as outlined by the following general sequence:

2008 – Complete permitting and approval.

2009 - Development of the main mine portals in the Hiawatha Seam
Complete MSHA mine and ventilation plans

2009 - 2010 - Development of Hiawatha Seam S102E Portal Mains entries

2010 – Development of N13E Panel A entries
Set-up N13E Panel A
Mine N13E Panel A
Set-up N13E Panel
Mine N13E Panel B
Develop First Fault crossing FC1 Rock Slope Raises and slopes construction
Mine S79W Mains A
N11W Panel A

Ongoing engineering (mine and site design), permitting (permit revision work) for adjacent coal blocks and completion of any remaining backfill work in N13E Panels A and Panel B;

In simplified terms, mining will begin with the Hiawatha Seam (2009 through 2210).

Use and Conservation of Coal Resources

Maximum resource recovery has always been and will continue to be one of CR's primary objectives as a matter of sound resource management and efficient mining and economic practice. Conservation and maximum utilization of the available coal resource will involve mining to the minimum practical seam thickness and maximizing overall coal recovery consistent with sound engineering and mining practices.

Proposed mining methods will result in extraction of minable coal reserves down to a minimum practical mining thickness of 5 feet which is below the lower limit for the continuous mining equipment which will be utilized. The average mining height in the permit area is expected to be 8 ft. in the Hiawatha seam which is the only targeted mineable seam in the permit area. At the current time, the quality, market price, and effective cost of mining the type of coal that occurs in this area at thicknesses less than 5 feet renders such operations economically infeasible. If, however, future changes in mining technology or market conditions make it feasible to mine seams below the present 5 foot cut-off, mining plans may be modified to accommodate the resulting expanded mining operations.

R645-301-523 Mining Method

The mine plans and proposed mining methods described in this section reflect CR's detailed review and evaluation of all existing available geologic and coal quality data, consideration of related environmental factors such as hydrologic considerations. This broad base of relevant information was utilized to develop a number of conceptual mine plan alternatives which were then evaluated relative to consistency with CR's overall project objectives. These objectives include the following:

- Maximize recovery and utilization of the available coal resource
- Optimize coal production efficiency and economics
- Facilitate potential future development of nearby coal reserves
- Provide a safe, healthy, secure working environment
- Minimize potential adverse environmental impacts

Based on CR's detailed review and evaluation of possible alternative mining scenarios, the plans presented in this section were selected as the best combination of mine layout, mining method, and mine sequencing in order to achieve the noted objectives and provide for organized sequential mining operations.

Areas and Sequencing of Mine Development

The proposed mining operations will target recovery of remaining minable coal reserves contained in the Hiawatha coal seam. This coal seam and other seams in the area have been previously mined in the area with access to the seams from portals at the coal outcrop. Previous mining areas are delineated for each seam on both Map 5, Previous Mining Activities Map, and Map 15, Mine Plan Layout & Production Schedule Map. Target minable coal reserves identified in this plan reflect consideration of practical mineral ownership, geologic, environmental, and mining constraints which may limit access to and recovery of coal reserves which otherwise might be considered as recoverable reserves. Generally, the proposed coal extraction limits are

shown on Map 15, Mine Plan Layout & Production Schedule Map exclude all previously mined areas, any areas where CR does not have existing rights to mine the coal. Proposed mining limits and the alignment of mine entries reflect consideration of those areas where historic mining removed the reserves and geological features that dictate mine layout and design. As indicated, considerable minable coal reserves remain in the area which can be effectively recovered while avoiding the existing abandoned mine workings. A maximum effective cover of approximately 1,000 feet exists in the permit boundary area and therefore there is no limit to coal recovery due to cover depth.

The proposed mine development and production sequence, as illustrated by Map 15, Mine Plan Layout & Production Schedule Map reflects orderly sequential development of available minable reserve areas, and the development/production requirements necessary to meet CR's current overall annual coal production targets. It should be noted that coal production requirements as outlined by Table 17, Projected Annual Coal Production, are based on current marketing projections for the first permit term. Additional coal reserves east and south of the proposed permit boundary are controlled by CR as shown on Map 12, Regional Coal Ownership Map. These reserves are planned to be mined at a future date under a major permit revision completed as soon after the first permit approval as possible. The projected mine life is anticipated to be 20 years including the eastern and southern reserves controlled by CR. Unanticipated fluctuations in coal market demand and other factors may result in some variance between projected and actual annual and total production rates. At the time of the permit mid-term review and permit renewal, CR will re-evaluate coal production projections and make appropriate adjustments as necessary.

Proposed coal development and production is expected to occur as shown on Map 15, Mine Plan Layout & Production Schedule Map, and Table 17, and as outlined by the following general sequence:

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2009 - 2010 - Development of Hiawatha Seam S102E Portal Mains entries

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Set-up N13E Panel A
Mine N13E Panel A
Set-up N13E Panel
Mine N13E Panel B
Develop First Fault crossing FC1 Rock Slope Raises and slopes construction
Mine S79W Mains A
N11W Panel A

Ongoing engineering (mine and site design), permitting (permit revision work) for adjacent coal blocks and completion of any remaining backfill work in N13E Panels A and Panel B;

In simplified terms, mining will begin with the Hiawatha Seam (2009 through 2210).

Use and Conservation of Coal Resources

Maximum resource recovery has always been and will continue to be one of CR's primary objectives as a matter of sound resource management and efficient mining and economic

practice. Conservation and maximum utilization of the available coal resource will involve mining to the minimum practical seam thickness and maximizing overall coal recovery consistent with sound engineering and mining practices.

Proposed mining methods will result in extraction of minable coal reserves down to a minimum practical mining thickness of 5 feet which is below the lower limit for the continuous mining equipment which will be utilized. The average mining height in the permit area is expected to be 8 ft. in the Hiawatha seam which is the only targeted mineable seam in the permit area. At the current time, the quality, market price, and effective cost of mining the type of coal that occurs in this area at thicknesses less than 5 feet renders such operations economically infeasible. If, however, future changes in mining technology or market conditions make it feasible to mine seams below the present 5 foot cut-off, mining plans may be modified to accommodate the resulting expanded mining operations.

Mining Methods and Equipment

The Kinney No. 2 Mine will be an underground mine utilizing development mining methods for primary coal. No pillar extraction is planned for the first 5 year permit term. Both mine plans and the proposed mining methods are designed to maximize recovery of the minable coal resource while limiting dilution of the coal by unmarketable waste, and to optimize mining operations to achieve maximum operational efficiency while assuring safe operating conditions. CR has and will continue to use sound engineering judgment and proven mining techniques in designing the overall mine layout; selecting appropriate pillar sizing, entry widths, and entry height; and in selecting suitable mining and support equipment and systems.

The following criteria listed in order of importance have been used to design the mine openings, select the mining methods and to layout the mine workings:

Maximum Overall Ultimate Safe Recovery of Coal to determine the extraction rate and the width of the openings;
Provisions for expedient development and for the use of large shuttle cars (25 ton) for hauling coal (60 deg chevrons);
Provisions for handling, stowage and backfill of development rock and provisions for wrap-around bleeder to ventilate fill areas and to allow monitoring them for spontaneous combustion until they can be completely sealed from the mine atmosphere;
Provisions for the drainage and collection of insitu mine water and for reuse for dust suppression;
Provisions for the future expansion of the mine into adjacent reserves blocks;
Provisions for the development of Rock Development at Fault crossings; and
Provisions to accommodate future long-term best extraction methods (i.e., shortwall or longwall mining methods in adjacent coal reserves) that will maximize the ultimate safe life of mine recovery rates.

CR currently projects an annual production rate of 0.18 to 0.49 million tons of coal per year for the first permit term from the Kinney No. 2 Mine. The long term goal is to revise the permit to include all coal reserves held by CR, and possibly additional unleased Federal reserves to increase production and sustain the mine over a 20 year mine life. Annual production may fluctuate dependent on changes in coal market conditions and other factors. Coal production for the first 5 year permit term is shown on Table 17, Projected Annual Coal Production.

TABLE 17
PROJECTED ANNUAL COAL PRODUCTION (Note 1)

TABLE 17
PROJECTED ANNUAL COAL PRODUCTION (Note 1)

YEAR	COAL (TONS)
2011	180,349
2012	491,514
2013	Additional reserves under revised permit
2014	Additional reserves under revised permit
2015	Additional reserves under revised permit

Note 1. See Map 12, Regional Coal Ownership for additional reserves controlled by CR.

Underground mining is a relatively complex process involving a number of inter-related activities which are designed to optimize coal production and handling, minimize environmental damage, and assure safe and healthy working conditions for the miners. The proposed mining operations will involve the following activities:

Mining Activities

- Mine development
- Coal extraction
- Coal haulage
- Development rock handling

Support Activities

- Ground control
- Mine ventilation
- Mine drainage
- Maintenance and miscellaneous support activities

The mining activities are discussed in the following sections. Ground control is an integral part of mining and is addressed in the discussion of mining activities. Other associated support activities are discussed separately under individual sub- headings.

Mine Development - Mine development involves excavation and construction of the underground openings, or entries, required to access the minable coal reserves, provide for efficient production of those reserves, facilitate haulage of both coal and mine development rock, and provide for effective ventilation of the mine workings. Development activities will include development of mine portals, main entries, and sub-mains. All mine development activities including both development methods and actual physical dimensions of development entries have been designed to provide for long-term stability during active mining operations and to effect full compliance with all applicable regulatory provisions. CR will generally complete most development in the minable coal seam to minimize mine development rock generation and provide some economic offset of development costs through production of marketable coal.

Mine development will involve the use of continuous miners to advance the development

entries, electric or diesel shuttle cars to remove the excavated coal or waste rock, and electric roof bolters to provide required roof support. Fault crossings may require blasting to develop the crossing entries.

Development of slopes and raises may take advantage of modern raise boring technology which involves drilling a pilot hole using conventional surface or underground long-hole drilling equipment, connecting a rotary cutterhead on the lower level to a drive unit on the upper level, and progressively boring the required mine opening by advancing the rotating cutter-head toward the drive unit.

The main entries will be the primary mine access and supply routes for the minable coal seam, providing access and ventilation for all other underground mine workings and carrying the principal coal haulage conveyor. Typical main entry development may vary from a three to a seven entry configuration, however, most main entry development will consist of five parallel entries with crosscuts at regular intervals. Typical sub-main development may vary from a three to a seven entry configuration, however sub-main development in general will consist of five entries with crosscuts at regular intervals. Development of bleeder entries, which will be used to bleed off naturally occurring methane gas prior to mining and to route any continuing methane drainage to exhaust entries during and following mining, may consist of three to five entries. Figures 23 and 24, Typical Mine Entry Development Configuration, illustrate the normal anticipated development configuration along with typical design dimensions and Map 15, Mine Plan Layout & Production Schedule Map shows anticipated development requirements for the minable coal seam.

Coal Extraction - CR plans to utilize the room development (first mining) mining method as the primary coal extraction and production technique. In these areas, conventional room development mining methods will be utilized with continuous miners, shuttle cars, and roof bolters as the primary production equipment. The following sections describe the two proposed coal extraction methods.

Conventional room development mining, using continuous miners, is one of the primary underground coal mining method utilized in many mines and offers the benefits of low capital cost for the required mining equipment and considerable flexibility. Continuous miners can negotiate technically disturbed areas of the mine and adapt to seam variations and uneven reserve blocks. Continuous mining equipment is also relatively mobile and can easily be moved to different locations within the mine allowing relatively quick adjustments and continued production if ground control, water or other problems prevent further mining in an active mining area. Room development mining involves development of underground mine openings (entries and cross-cuts) with intermediate pillars to support the mine roof during active mine advance. Each mining area developed using this method then becomes a "room" with a grid of supporting pillars.

Conventional room development mining (first mining) methods will be used for essentially all mine development work except slopes and fault crossings. Room development mining involves the use of a continuous miner to cut the coal and progressively advance each entry and cross-cut in a pre-determined development sequence. The cut coal is collected by the gathering pan on the continuous miner and discharged from the miner tailpiece by conveyor to a waiting electric shuttle car. The shuttle car will transport the coal to a feeder-breaker which will be centrally located in each continuous miner section or development area. The feeder-breaker will then feed the coal to a section belt for transport to the mine coal haulage conveyor system. As a safety consideration consistent with applicable MSHA regulations, the continuous miner is not allowed to advance under unsupported roof so following each cut an electrically powered roof bolter will install roof bolts and any other support required under the an MSHA approved roof control plan in preparation for the next cut. During bolting operations, the continuous miner

will move to a nearby face and take a full cut and miner and bolting operations will proceed in staggered sequence as development progresses. The following primary equipment required to support room and pillar mining operations:

- Continuous miner
- Shuttle cars
- Roof Bolter
- Feeder Breaker
- Section power center
- Mantrip vehicle
- LHD scoop
- Portable rock duster
- Section conveyor
- Miscellaneous support equipment

Coal Haulage - Marketable coal resulting from either underground mine production or mine development activities must be transported from the underground mine workings to the surface where it will be transfer to the surface coal handling system and be routed to the coal loadout. The mine coal haulage system will consist of several interconnected components to transport the coal to the surface. In conventional room development areas or production sections coal will be transported by electric or diesel shuttle car to a feeder-breaker which will feed a 42 inch section conveyor belt. From the active mining or development areas the section or panel belts will transfer the coal to either secondary haulage belts in the sub-mains or the primary coal haulage belts in the main entries. Secondary belts from the sub-mains will feed to the primary main haulage belt which will carry the coal to the surface. The section belts will move with progressive mining advance and will be 42 inch conveyors with modular components, take-ups, and drives capable of handling 1200 TPH. The secondary conveyor belts will remain in place for an extended time and will typically be 42 inch roof hung conveyors with modular tail section and intermediate booster drives capable of handling 1200 TPH. Coal haulage between the various mining levels (between faults) will involve the use of main haulage belts on the intermediate access slopes which will transfer the coal to the main haulage belt on the next level above, or below. These belts will typically be 42 inch roof hung conveyors with modular tail sections and intermediate booster drives as needed capable of handling 1200 TPH. All coal transfer points will be partially or fully enclosed to minimize coal breakage and dust generation, and contain both the coal stream and any associated coal dust. Consistent with safety considerations and applicable MSHA regulations, all underground coal haulage belts will be located in separate entries where they are isolated from both intake and return airways (refer to Figures 23 and 24, Typical Mine Entry Development Configuration).

Mine Development Rock Handling - Several mining and related activities may result in production of significant quantities of mine development rock materials potentially including rock, carbonaceous shale, floor clay, and parting material. Operations which may result in generation of mine development rock will include general mine development, slope/raise development, room development mining operations, and development of overcasts for ventilation or coal haulage. Where mine development rock materials are encountered in mining operations or where the rock materials are integral to the coal seam in development areas or room development mining sections they will be recovered and handled with the coal during mining and coal haulage and will later be removed in the coal handling process. Where it is operationally feasible to separate these materials they will be removed and handled separately using the same equipment and haulage systems that will be utilized for conventional room development operations.

Disposal of Coal Mine Development Rock in Designated Areas Underground - Two special areas

have been designated underground as mine development rock disposal sites for the emplacement of mining generated rock (see Map 15, Mine Plan Layout & Production Schedule Map,). Both areas are within practical operating proximity of the rock slope development area and also close to the Surface portal area where Mine Development waste may be temporarily stored as "off-spec" product coal. Disposal Area 1 is the area known as "N13E Panel A" and it is located on the North side of the Portal Mains. It is separated from the adjacent Disposal Area "N13E Panel B" with a 140 ft wide Barrier Pillar which adds to the long-term integrity of the backfill area stability. Both of these disposal areas are strategically located, life of mine fill emplacement areas designed for the emplacement of all types of mine development rock containing or not containing coal. Both areas will be ventilated before, during and after backfill emplacement operations and at all times according to MSHA standards and according to MSHA approved ventilation and roof control plans for the mine.

As discussed previously, mine development waste consisting of a mixture of rock and coal materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned, however this material may not be saleable as regular coal product due to a high content of rock. The area designated is capable of containing approximately 3,900 tons of material. This material will be sold as a low quality coal product to local coal preparaion facilities, or will be deposited in other facilities permitted by the UDOGM.

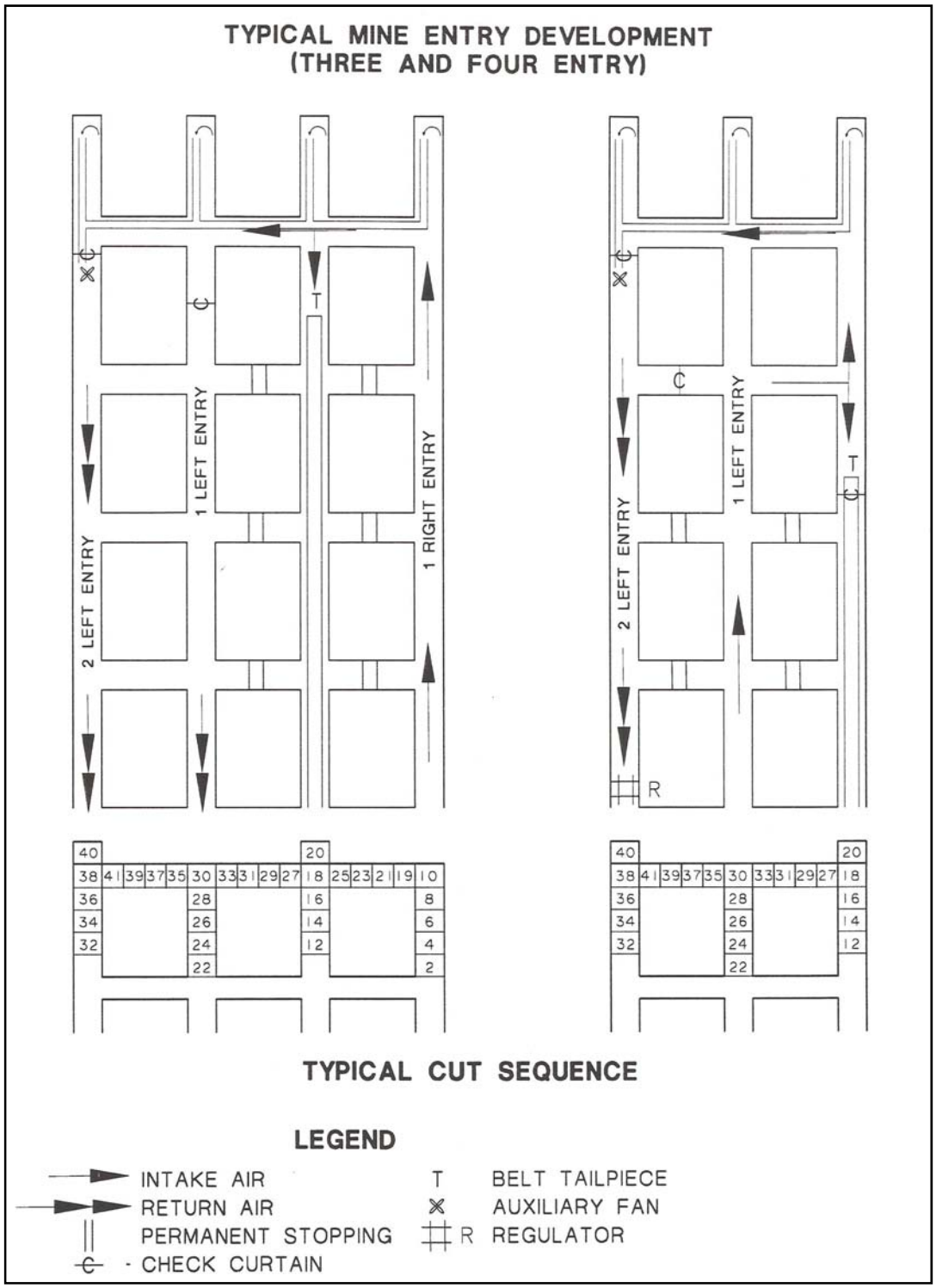
Mine Ventilation - The mine ventilation system has been designed to provide sufficient quantities of air and airflow rates in active working areas to sufficiently dilute any coal dust or methane gas present so that potentially explosive dust/gas/air mixtures do not develop and to provide sufficient fresh air flow to assure safe and healthy working conditions for the miners.

During portal development small auxiliary fans will be used to ventilate the working places. These fans will be used for primary ventilation only for a short time period during initial development. Once portal development progresses to the point where full ventilation crosscuts have been established, a temporary mine fan will be installed on the northernmost portal entry and this fan along with conventional full or temporary stoppings will provide adequate ventilation volume and control for the initial portal and main entry development. This fan will be used for approximately one year, or until development has progressed to the point where a second continuous miner can be placed in service. Use of the temporary mine fan will allow Carbon Resources the time to complete the permanent main mine ventilation fan installation and associated structures.

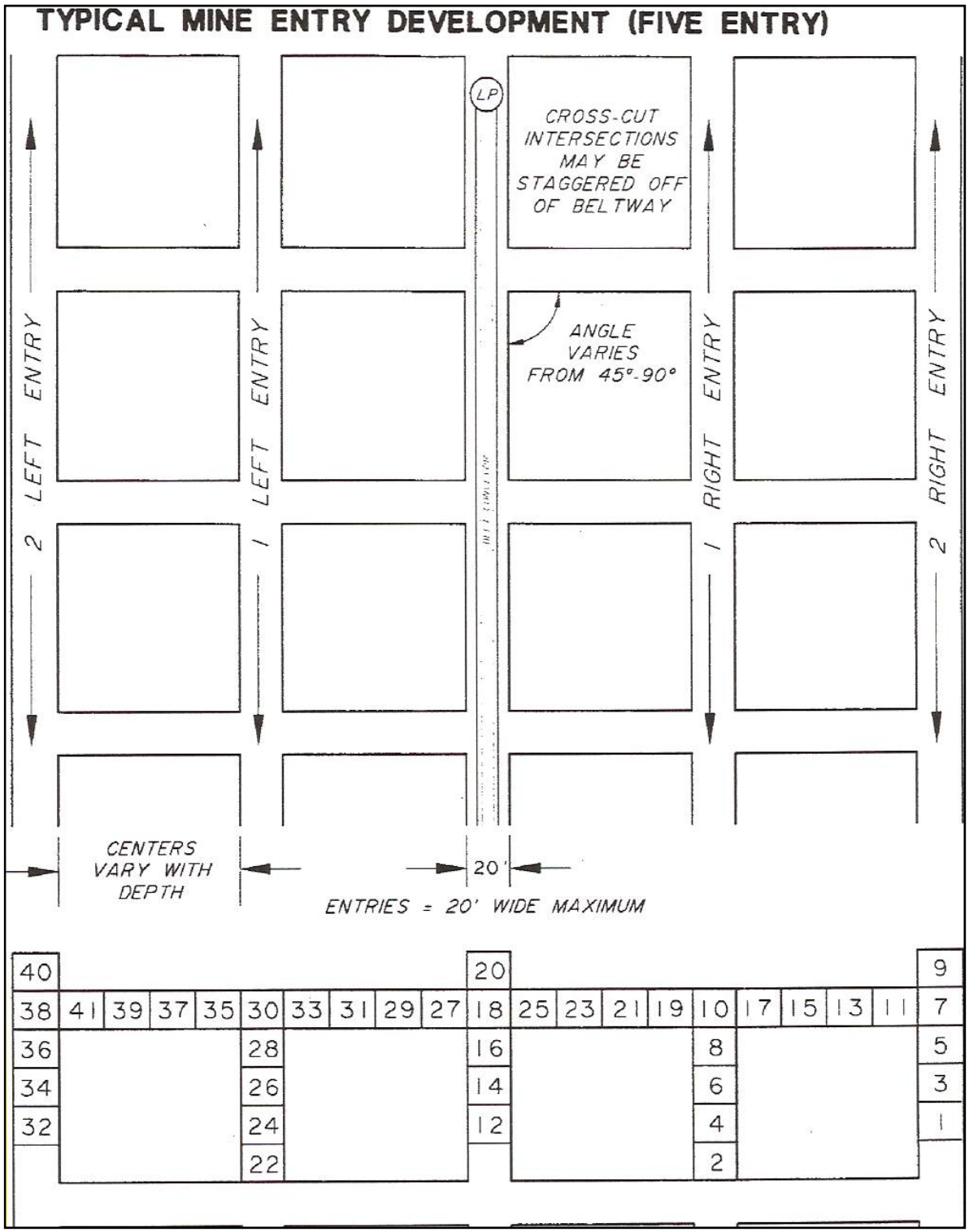
Permanent ventilation for the permit area will be provided by a 6 ft diameter exhausting axial vane fan with a 300 HP motor operating at 1160 rpm (or equivalent). Temporary or auxiliary fans will be used in either blowing or exhausting mode with vet tubing to assist mining while setting up airways for the permanent ventilation system.

The main mine fan installation will include fan drive units, fan shroud structures, blow-out doors, heaters, and fan control systems located on Portal No. 1, as shown on Map 13, Surface Facilities Map. The main mine fan will provide adequate ventilation for all development and mine workings planned during the first five years of mining.

Figure 23, Typical Mine Entry Development Configuration



Figures 24, Typical Mine Entry Development Configuration



Effective ventilation of mine workings will involve control of airflow within the mine workings to provide adequate airflow volumes and flow rates in all active working areas. Airflow will be controlled, under mine ventilation plans submitted to and approved by MSHA, by maintaining a pressure differential which will force the air to follow a pre-determined path through the mine workings. The pressure differential and desired airflow will be maintained by isolating intake and return airways with air-tight stoppings and utilizing the network of mine entryways to effectively route both clean (intake) and used (return) air through the mine.

The mine fan is not intended to be a life of mine fan per se. However, it is sufficient for all of the needs for this permit application and from this standpoint it is deemed to be permanent. From the longer-term viewpoint with respect to the life of the reserves it is more or less a temporary installation and will need to be replaced at some future date as the permit is revised and the mine is extended.

As shown, mine intake air from this fan will enter through the underground mine workings through the Intakes Portal Openings No. 4 and No. 5 Entries. Intake air will be drawn through the mine to the working places and mining faces by the network of main, sub-main, and bleeder entries the negative pressures exerted by the exhausting fan. Air will be coursed through the mine and controlled by both permanent and temporary stoppings, curtains and regulators. From mine working areas, exhaust airflow will be carried by bleeder, sub-main, and main entry exhaust airways discharging from the Mine Portal No. 1 entry through the fan.

The mine ventilation system will meet all applicable MSHA requirements and according to an MSHA approved Ventilation Plan. The Ventilation plan will provide continuous effective ventilation of the active mine workings at all times. The Ventilation plan will also provide for regular inspections as required by CFR 30 Part 75 regarding pre-shift and on shift inspections and fire-boss inspections of outby workings.

Based on the planned extent of the mine workings, anticipated methane liberation and dust generation rates, and probable mining conditions the primary ventilation fan will provide adequate ventilation capacity for at least the first five years of mine development and production. It is expected that subsequent mine expansion will require development of additional ventilation facilities to assure continued effective airflow and ventilation of the underground workings. These will be addressed in future revisions of the permit as needed.

Dewatering and Mine Drainage Control - Given the relatively low overall permeability of the geologic sequence, limited recharge, extensive historic mining in the area both north and south of the proposed Kinney No. 2 Mine in multiple seams, and consequent lack of a significant ground water aquifer in the area to be mined, ground water inflow to the active mine workings is expected to be limited. Ground water accumulations in abandoned underground workings in the area may result in localized increases in the amount and availability of ground water, particularly in down-dip areas to the north and east. CR is not expecting any significant amounts of water to be encountered during the permit term, other than possible minor amounts of perched localized water.

Any significant ground water inflows to the active mine workings will be controlled by intercepting the water near the point of inflow with either shallow ditches or sumps and transferring the water to either abandoned mine areas or temporary holding areas. Minor ground water inflows will not be addressed unless they interfere with mine operations or pose a potential safety hazard. Mine drainage will be transferred within the mine utilizing a series of ditches in combination with intermediate sumps and submersible pumps and pipelines. If adequate quantities of mine drainage are available to justify use of mine drainage as a supply source for operational mine water requirements, temporary holding areas within the mine may be developed and utilized as mine drainage storage areas and clarification basins.

Maintenance and Miscellaneous Support Activities - A number of support activities including rock dusting; extension of mine electrical, communications, and water systems; equipment maintenance and repair; and material and equipment supply and storage are necessary to maintain safe, efficient underground operations, to prevent or minimize potential mining related environmental impacts, and to effect ongoing compliance with applicable regulatory provisions and requirements. Generally, mining support activities will occur either concurrently and as a part of ongoing mining operations or on a scheduled or as needed basis. Many of the necessary mining support functions including electrical distribution, mine ventilation, underground communications, and health and safety considerations are governed and monitored by MSHA under applicable provisions of the Coal Mine Health and Safety Act of 1969, and will be conducted under specific MSHA plan approvals. The following briefly describe planned support activities which CR will undertake in conjunction with the proposed Kinney No. 2 Mine mining activities:

Rock dusting - Rock dusting will occur in all applicable development areas and mining sections and will involve mechanical or pneumatic distribution of powdered limestone to cover exposed coal surfaces to limit generation distribution of potentially explosive mixtures of coal dust in the mine environment.

Extension of mine utilities - Recognizing that mining advance will be a continuous ongoing process, mine utilities including electrical, communications, and water systems have been designed and will be installed to facilitate extension with mining advance. Typically, these systems will consist of modular components which will permit progressive connection of additional segments either in a series or parallel configuration.

Equipment maintenance and repair - Normally, equipment maintenance will occur in the working area during scheduled maintenance shifts. Minor repairs will occur in the working area either in conjunction with scheduled maintenance or, if immediate repairs are required, during temporary shut-down periods on scheduled operating shifts. If major repairs or equipment overhauls are required, the equipment may be transported to either centralized underground or surface shop areas. All underground maintenance and repair activities will be conducted in compliance with applicable health and safety requirements.

Material and Equipment Supply and Storage - Materials and equipment required in conjunction with underground mining operations will generally be supplied from the surface warehouse and storage facilities. Limited quantities of certain consumable supplies including roof bolts, timbers, hydraulic fluid, rock dust, electrical cable, and similar materials may be stored in temporary underground storage areas near active working areas.

In addition to the specific production equipment previously listed for development mining, or first mining, a variety of maintenance and support equipment and systems will be required in conjunction with the proposed underground mining operations including the following:

- Personnel carriers
- Supply tractors and trailers
- Lubrication trailers
- Rock dust distribution system
- Electrical distribution system
- Underground communications systems
- Personnel first aid and safety equipment
- Miscellaneous equipment

Pillar Sizes

The primary means of support for any underground mine plan is the pillar itself and the Kinney No. 2 Mine is no exception. CR has taken special care and precaution to ensure that all of the pillars within the permit application area are sized with dimensions to provide sufficient stiffness to withstand post mining vertical stresses and deterioration for the prescribed duty intended to so that they will stand for the long-term full life of the mine with a high degree of integrity and confidence in safety against mining bumps.

Based on comparison with the empirical data from mine maps of historic production at this location and based on experience at other mines in the area[1], CR has selected a conservative rate of extraction and pillar configuration for the given the depth of cover[2], geotechnical considerations of the coal and overburden, and other conditions[3] present.

Planimetric extraction rates are limited to less than 45% with-in the permit application area by design with a view toward long term stability, safety and utility service for the Kinney No. 2 Mine.

Pillars dimensions in the mains are set at 65 ft wide by 100 ft long (i.e. 75 by 120 ft entry and cross centers with 20 ft. wide openings). This will ensure a stable opening and permit productive place change mining operations with mining and bolting.

Pillars in the 2 adjacent panels are 55 ft wide by 100 ft long (i.e. 65 ft by 120 ft entry and crosscut centers respectively). W/h ratio for mains pillars is 65/8 = 8.125. Pillars of this shape are stronger than the "intermediate range" of the empirical pillar classification and, considering that it is not adjacent to any active retreat pillaring or caving activity and that it is under relatively shallow cover it is expected to provide ample support serve the duty intended for the five entries throughout the duration of the life of the mine.

W/h ratio for pillars in the two designated backfill panels is 65/8 = 6.88. This ratio is well within the "Intermediate range" of empirical classification. The 60 degree chevron called for in the back-fill panels is not expected to result in failure of the pillar corners at the intersections until after backfill has taken place. However, if failure should occur, secondary support will be installed to decrease the effective roof span and support the pillar where it is needed.

Adequate and ample barrier pillars will be left between new workings and mined-out workings as shown and as otherwise needed.

Approach of Old Workings

CR has obtained the maps of old mine workings in the Hiawatha Seam in the Permit application area. However, these maps may or may not be accurate and reliable and the workings are abandonded and sealed and so can not be accessed to verify their reliability.
In areas where new mining activities are likely to approach within 500 ft of abandoned, sealed or unventilated mined out workings MSHA rules CFR 30 Part 75 will be strictly followed concerning the approach of old workings.

CR will work with MSHA and the state of Utah to devise plans to precisely locate old mine workings prior to approaching them that will safeguard all persons. This may involve drilling ahead with an in-mine drill, possibly injecting cocrete into old workings to pre-stabilize them and

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[1] RE: Columbine Mine and Skyline Mine maps; See also Empirical Methods for Coal Pillar Design – Christopher Mark PhD.

[2] The maximum depth of cover in the permit application area above the Hiawatha Seam is 1000 ft. The average depth of cover is about 700 ft for most of the workings and for the mains. The minimum depth is zero at the outop portal location.

[3] Other conditions include dynamic conditions present with the structural complexities of the area (i.e. faulting).

other measures to prevent inundation and/or the introduction of gob gas to the active mine atmosphere should the drilling reveal the old mine workings will be unavoidably encountered in the planned mains.

Development rock backfill will be placed into designated panel areas and will further serve to encapsulate pillars. This will passively stabilize pillars in those areas with some confinement. Development rock backfill areas will be ventilated until they are filled and have been monitored for products of combustion for a period of 1 year after backfill operations are complete. If no significant products of combustion have been found the area will be sealed and monitored according to an approved ventilation plan.

If products of combustion are found in the area, the area will be promptly sealed and injected with an inert heavy gas such as Carbon Dioxide CO_2 specific gravity = 1.53. Once sealed and injected with CO_2 , no mining will be planned down dip that may breach into these sealed areas. Monitoring of gas in the area will be a continuing part of an approved ventilation plan.

Finally, CR will commit the professional resources necessary to actively examine actual pillar and rib conditions in areas adjacent to old workings and evaluate the need for additional roof or pillar support and other geo-mechanical needs on a periodic and as needed basis. Carbon Resources is dedicated to effectively addressing any need for design changes in pillar size or changes required for the safe operation of the Kinney No. 2Mine.

Maintenance of mine openings will involve regular inspections of the openings and surrounding surface areas, removal of any material or debris from the immediate area of the openings, and repair or replacement of ground control, protective structures, or other structures associated with the mine openings. Mine openings and the immediate surrounding areas will be kept clear of equipment, materials, and supplies, and no coal, mine waste, or potentially flammable materials will be placed or stored in the immediate vicinity.

R645-301-524 Blasting and Explosives

Due to the potential explosion hazards related to both methane and coal dust blasting, any underground blasting activities will be limited and will be conducted in full compliance with applicable MSHA requirements. Limited surface blasting will be necessary in conjunction with the proposed construction activities and on an occasional basis during operations. Construction related blasting requirements may include the drilling and blasting activities necessary to construct the various pads, and for the proposed surface conveyor system, and limited blasting to fragment resistant rock in order to establish the design facilities area configuration, and small-scale blasting to fracture any large rocks so that they can be moved during the construction/development phase. Occasional operational blasting requirements may include small-scale surface blasting to fracture large rocks that may fall or roll from the adjacent steep slopes into operating areas or onto roads, clear clogged chutes, or address potentially hazardous rock or slope conditions. Because of the nature of the required blasting, construction related blasting activities may require the use of more than 5 pounds of explosive, however, it is anticipated that operational blasting will generally not require more than 5 pounds of explosive.

Any surface blasting required in conjunction with the underground mining operation will be conducted in compliance with applicable provisions of Rule R645-301-524. All blasting will be conducted by a certified blaster and the responsible blaster will either carry documentation of blaster certification or the appropriate certificates will be retained on file at the mine or construction office. The responsible blaster and at least one other person will be present for all

blasts and the responsible blaster or an individual under his direct supervision will load, connect, and initiate all blasts. Because the proposed Kinney No. 2 Mine surface facilities, where any required surface blasting would occur, are located within 1,000 feet of State Highway 96, and within 500 feet of abandoned coal mines in the areas, a general blasting plan is included in this permit application (Exhibit 15, Kinney No. 2 Mine Blasting Plan). Given the general nature of the blasting plan, it provides a framework for all anticipated blasting activities, however, if a blast will require more than five pounds of explosives, CR will submit specific blast design information to UDOGM prior to the blast. Persons responsible for blasting operations will be familiar with site conditions and the explosive handling and blasting procedures as outlined by Exhibit 15, Kinney No. 2 Mine Blasting Plan.

Explosives and detonating caps will be stored separately in secure locked structures and explosive storage and handling will be conducted in accordance with all applicable State and Federal standards under current valid Bureau of Alcohol, Tobacco, and Firearms permits. It is anticipated that portable skid-mounted explosive magazines will be utilized and that any required explosives may be supplied and handled by an independent explosives contractor. Given this consideration and very limited anticipated operational blasting requirements, explosives may not be maintained on site at all times. For construction related blasting operations and any temporary or long term explosive storage during the operations phase, the designated explosive storage area will be located as shown on Map 13, Surface Facilities Map providing adequate distances from surface structures. Blasting during initial mine facilities construction will be the responsibility of the construction contractor, but will be conducted in compliance with all DOGM regulations; the contractor will have certified blasters, or will sub-contract with certified blasters.

R645-301-525 Subsidence Control Plan

525.300 Subsidence Control

Coal extraction by underground mining typically results in a void where the coal has been removed, and possibly partial collapse of the immediate overlying units, deformation of the units above the mined area, and potential deformation or settlement of the overlying ground surface, termed subsidence. Subsidence typically only occurs at the surface where pillars are extracted, or where longwall mining methods remove substantial blocks of coal. No second mining, or pillar extraction, or longwall mining that would result in subsidence is planned for the Kinney No. 2 Mine, therefore no subsidence is anticipated. Portals have been designed to be stable indefinitely, with a combination of steel, wood, and concrete support structures that will prevent subsidence of the shallow cover over the mine entries near the surface.

R645-301-526 Mine Facilities

The proposed underground mining and related activities will require limited surface support facilities. The facilities to be utilized in conjunction with the proposed operations will include new facilities to be constructed in the proposed Kinney No. 2 Mine surface facilities area. These facilities will provide the necessary infrastructure for effective management and handling of personnel, equipment, materials and supplies, and both coal and mine development rock materials, and will include a number of structures specifically designed to control or mitigate potential mining related impacts.
Construction of required surface structures and facilities has previously been discussed in R645-301-522, General Description of Mine Plans, Mining Methods, and Related Design Requirements.

The surface structures and facilities will be operated, maintained, and ultimately reclaimed in a manner that prevents or controls erosion and siltation, water pollution, and damage to public or private property; and to the extent possible using the best technology currently available, minimizes damage to fish, wildlife, and related environmental values, and minimizes additional contributions of suspended solids to streamflow or runoff outside the permit area. Any contributions of suspended solids from mine disturbance areas will not exceed applicable effluent limitations under Utah or Federal law.

Required surface facilities are shown and identified on Map 13, Surface Facilities Map, and include the following:

- Conveyor SB-1
- Conveyor Transfer Tower
- Conveyor SB-2
- Non-Spec Coal Pile & Stacking Tube
- Conveyor SB-3
- Spec Coal Pile & Stacking Tube
- Conveyor SB-4
- Screening & Crushing Building
- Sediment Pond Road – Primary P6
- Truck Loadout Building
- Lodout Road – Primary P5
- Storage Sheds – 5 each
- Shop – Warehouse
- Fueling Facility
- Main Access Road – Primary P1
- Office Road – Primary P2
- Portal Access Road Primary P3
- Storage Area Access Road P4
- Mine Office – Bathouse
- Topsoil Stockplie
- Water Tank
- Electrical Substation
- Sedimentation Pond
- North Access Road – Primary P7
- Explosives Magazine
- Explosives Cap Magazine
- Development Waste Temporary Storage Area

The following sections describe design and construction details and operation and maintenance plans for the identified structures.

Soil Stockpiles

Soil stockpiles will be utilized for temporary storage of those materials which will be used as vegetative growth media in reclaiming mining related disturbance. Stockpile location and construction will, to the extent operationally feasible, minimize exposure to wind and water erosion and protect the soil resource from loss, contamination, or further disturbance prior to final use for site reclamation. Two new soil/substitute stockpiles will be constructed using available material from the proposed Kinney No. 2 Mine surface facilities area. The large soil stockpile will be located at the southwest corner of the mine permit area adjacent to Highway 96 as shown on Map 13, Mine Surface Facilities Map. Detailed discussions of the topsoil stockpiles and topsoil recovery, storage, protection and redistribution are included in Chapter 2.

Basic soil handling and stockpile construction practices are desibed in R645-301-231.100, Topsoil Removal and Storage. The stockpiled material will be protected from erosion, contamination, and loss by placement in a controlled manner with sideslopes at 2H:1V or less, seeding with a temporary vegetative cover, posting with durable signs reading "Soil Stockpile - Keep Off", and the use of appropriate drainage control measures as discussed previously.

Excavated Slopes

Site grading and excavation for the mine facilities and road construction activities will require some slope excavation work. Slope excavation areas stand out on Map 13, Surface Facilities Map due to the closely spaced contours. In some areas, required slope excavations will occur in weathered rock or other competent material where the potential for any consequent upslope stability problems is minimal. Cut slopes have been designed at gradients varying from 2H:1V to 0.8H:1V, dependent on rock type and construction requirements. Slope excavation will involve removal of material using tracked dozers, tractor scrapers, or backhoes to achieve the design slope configuration. In most cases, it is anticipated that required excavation can be accomplished without the need for blasting to loosen the material, however if blasting is required, any blasting operations will be conducted in accordance with the blasting plans previously described in R645-301-522, General Description of Mine Plans, Mining Methods, and Related Design Requirements.

During progressive excavation activities, the excavated slopes will be graded or scaled to establish a stable configuration and remove any loose material which could pose a potential hazard. Where slope excavation occurs in material which can be revegetated, the finished slopes will be seeded with the temporary seed mixture as outlined in R645-301-340, Revegetation and Habitat Restoration Plans, to stabilize the graded surface and minimize runoff and potential erosion. In the portal face-up area, where a potential rock fall hazard exists, wire mesh, or chain link fencing material may be anchored to the steep rock wall with roof bolts and concrete-steel portal structures will provide additional protection for both personnel and equipment. Maintenance of excavated slope will include periodic inspection of slope areas and removal of loose rocks or other potential hazards.

Excess Spoil Material

As an underground mining operation, the proposed mining and related activities will not result in generation of spoil materials. In addition, all related surface disturbance required for construction of the necessary surface support facilities has been carefully planned to balance material cuts and fills so that no excess material is generated. Since no excess spoil will be generated as a result of the proposed construction or operations activities, regulatory provisions relating to handling and disposal of excess spoil are not applicable.

Mine Openings

The proposed underground mining operations will require several mine openings which will provide underground access for personnel, equipment, and supplies; be utilized for conveyor haulage of both coal and limited quantities of mine development rock; and will serve as mine intake and return airways for ventilation of the underground mine workings. Mine openings required in conjunction with the currently proposed and anticipated future operations will include a 5 entry system.

Because the mine openings will provide long-term access for the proposed operations, they have been located and designed to facilitate effective access and assure long-term stability. As described in R645-301-520, General Description of Mine Construction and Development Activities, the mine portals will be developed in the Hiawatha Coal Seam using continuous miners and conventional room development (first mining) methods. The portal entries will be approximately 20 to 25 feet wide and 6 to 10 feet high. Appropriate sizing of the support pillars along with supplemental roof control, including roof bolts and other roof support systems, will provide for effective ground control and long-term stability of mine entries in the portal area.

The portal entries will be protected from potential rock fall hazards by steel portal structures on concrete foundations which will provide a full protective canopy on the manway and belt entry portals.

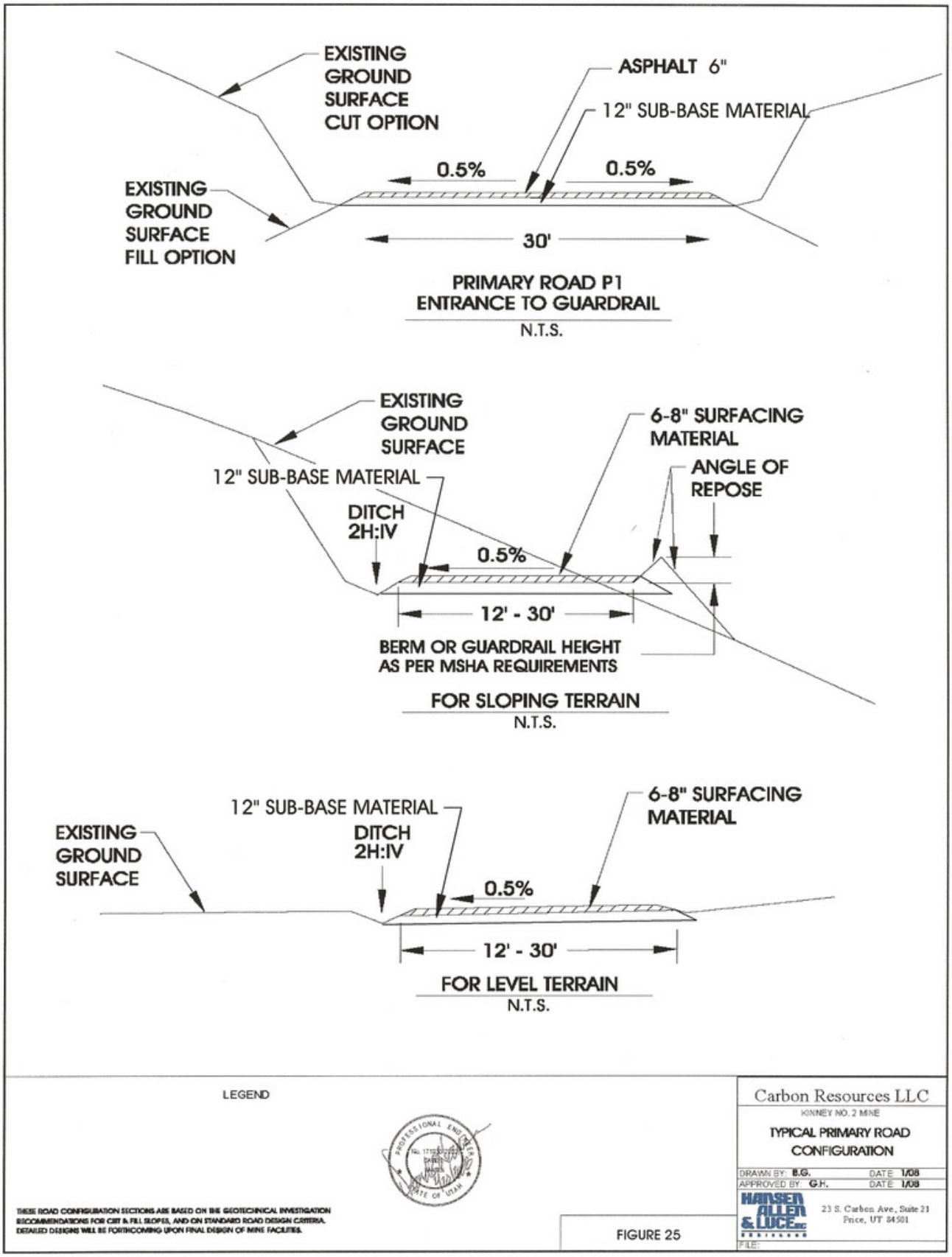
Maintenance of mine openings will involve regular inspections of the openings and surrounding surface areas, removal of any material or debris from the immediate area of the openings, and repair or replacement of ground control, protective structures, or other structures associated with the mine openings. Mine openings and the immediate surrounding areas will be kept clear of equipment, materials, and supplies, and no coal, mine waste, or potentially flammable materials will be placed or stored in the immediate vicinity.

Mine Development Rock

Mine development, ongoing mining operations, and ancillary operations such as development of overcasts for mine ventilation and coal haulage will result in production of mine development rock including carbonaceous shale, weathered coal, floor clay, and parting material. Where it is operationally feasible to separate these material from the coal during development and mining, the mine development rock will be removed and handled separately from the coal. Where separation is not operationally feasible, mine development rock will be handled with the coal and will be removed in the surface facilities, separated from the coal product and temporarily stockpiled until it can be returned to the mine as discussed previously.

As discussed previously, mine development waste consisting of a mixture of rock and coal materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned, however this material may not be saleable as regular coal product due to a high content of rock. The area designated is capable of containing approximately 3,900 tons of material. This material will be sold as a low quality coal product to local coal preparaion facilities, or will be deposited in other facilities permitted by the UDOGM.

Figure 25 Typical Primary Road Configuration



Generally, the same mining equipment and haulage systems used for coal production will be used to remove and handle mine development rock. Continuous miners, electric shuttle cars, and LHD scoops may be used to load and haul mine waste to the mine conveyor system. Normally mine development rock haulage will occur on a scheduled rock handling shift when the conveyor belt system will be cleared of coal. Typically, any development rock produced during periods other than on a scheduled development rock handling shift will be temporarily stockpiled in an inactive area underground for later handling and haulage from the mine. Once the mine rock is placed on a belt at the loading point, it will be transferred to the main haulage belt running from the mine. From the main haulage belt, the mine rock will transfer to the surface coal haulage system which will carry the rock to the primary usher building.

The surface coal haulage system has been designed to facilitate mine development rock handling in two ways:

One; The stacking tube at the off spec coal stockpile can be emptied by a direct feed chute in its base allowing rock to bypass the coal stockpile and feed directly to Conveyor SB-3. In the primary crusher building a flop-gate and diversion chute will allow mine development rock to bypass the primary crusher and feed directly to the truck loadout where it can be transported to a segregated location on the off speck coal pile prior to returning the rock to the mine.

Two; Development rock may simply be dumped onto the off spec coal pile, via the flop gate atop the stacking tube, if circumstances are favourable. That is, if there is sufficient rock volume to warrant temporarily converting the entire off spec coal pile to a temporary development rock storage pile prior to returning the rock to the mine.

Mine Ventilation

The primary mine ventilation fan will be large diameter blowing axial vane fans capable of delivering over 600,000 cubic feet per minute of fresh air to the underground mine workings. From mine working areas, exhaust airflow will be carried by bleeder, sub-main, and main entry exhaust airways discharging from the mine portals. The mine ventilation system has been designed using accepted mine ventilation design and engineering practices to meet all applicable MSHA requirements and provide for continuous effective ventilation of the active mine workings. Based on the planned extent of the mine workings, anticipated methane liberation and dust generation rates, and probable mining conditions the primary ventilation fan should provide adequate ventilation capacity for at least the first five years of mine development and production. Subsequent mine advance and expansion may require development of additional ventilation facilities to assure continued effective airflow and ventilation of the underground workings.

Mine ventilation facilities will include steel fan doors, the primary ventilation fan and electric drives, fan control and monitoring systems, fan shroud structure with pressure relief panels, dual propane-fired fan heaters, the mine fan electrical substation, and propane storage tanks. The location and configuration of these structures are shown on Map 13, Surface Facilities Map. Operation and maintenance of the mine ventilation system will involve regular inspection and monitoring of the ventilation fans and associated systems and structures to assure that they continue to operate at all times as designed and in compliance with applicable MSHA requirements. The mine fans will be controlled and monitored by automated systems which will provide a warning of any fan malfunctions.

Mine Drainage Control and Dewatering

As described in both R645-301-724, Ground Water Information, and R645-301-522, General Description of Mine Plans, Mining Methods, and Related Design Requirements, potential mine inflows are expected to be minimal and there will be sufficient storage capacity in both the existing abandoned underground mine workings and in inactive working areas that transfer of mine drainage to the surface water system is unlikely.

526.100 Existing Mine Structures and Facilities

The only existing mine structures consist of a small stone, concrete and railroad tie mine fan building, a small concrete building used as a powder magazine, and several foundation structures. None of these structures will be used by the Kinney No. 2 Mine. These structures can be seen on Map 14, Mine Surface Facilities, Pre-Mining Topography Topography Map.

526.116.1 Public Roads

One public road passes through the permit boundary. Utah Highway SR 96 passes through the northwest corner of the permit boundary and is adjacent to the operations area as can be seen on Map 13, Surface Facilities Map. This highway is within 100 feet of operations and public notice was offered during two public notice and comment periods. No comments were received regarding the highway and Kinney No. 2 Mine operations.

Discussions with the Utah Department of Transportation (UDOT) have been held and a preliminary plan for access to the mine has been presented to UDOT. UDOT requires a standard intersection design that provides turn lanes into the mine site from both directions as well as through lanes and acceleration and deceleration lanes. Final modification plans will be approved by UDOT prior to any work on the intersection. Before any highway work is done, DOGM will be presented with the UDOT approval.

526.210 Utility Installation and Support Facilities

The proposed mining and related operations will utilize new utility installations including electrical distribution, telephone, potable and raw water, and sewer systems. The proposed underground mining and related surface disturbance activities have been planned, designed, and will be conducted in a manner which minimizes the potential for damage or destruction of utility installations, or disruption of services provided by those utilities existing within the permit area unless otherwise approved by the owner of the utility.

Heat for the buildings will initially be provided by propane, and may be converted to more cost efficient natural gas if it becomes available.

All existing and proposed utility installations are shown on Map 13, Surface Facilities Map. It should be noted that all utilities either are or will be owned, constructed, operated, and maintained by the respective utility companies up to the actual point of service which in the case of electricity will be the main mine substation and in the case of telephone, potable water, and sewer service will be to the metering point which will be located at the mine permit boundary line.

Electrical Systems

Electrical power for the mining operation will come from an existing power line running north-south immediately east of the portal area; this power line is shown on Map 11, Regional Surface Ownership Map, and on Map 4, Regional Land Use Map. Electrical voltage will be reduced from the existing power line at a substation located at the Portal Pad as shown on Map 13, Surface Facilities Map. The new substation to be owned, constructed, and operated by PacifiCorp. The mine substation will, in turn, feed the mine fan, the surface coal handling system, the underground mine electrical system, and the other surface facilities.

All proposed electrical components have been designed and will be constructed and operated in accordance with accepted engineering practice and in full compliance with all applicable regulatory provisions. Any new powerlines will be constructed with "raptor-proof" power poles as shown by Figure 22, Typical Raptor-Proof Power Pole Configuration, to minimize the potential for electrocution of raptors and other large birds. All substations, electrical transformers, switchgear, and electrical control components will either be located so that it is not readily accessible to either wildlife or the public or appropriate fences with locked gates or other enclosures will be utilized to limit access to authorized personnel. Where appropriate, signage identifying and warning of electrical hazards will be posted and maintained.

Telephone Lines - Buried or overhead telephone lines will be extended by US West from Highway 96 to provide telephone service for the mine facilities.

Water and Sewer Systems - Potable water, raw water, and sewer connections will be provided by Scofield Town. The connection points for water and sewer to the mine site are shown on Map 13, Surface Facilities Map, and are located at the south side of the permit boundary just south of the Mine Office building.

Mine water and a reserve water storage supply for emergency fire-fighting purposes will be stored in a 50,000 gallon mine water storage tank located near the north end of the Portal pad. Water supply, use levels, and water rights consideration are addressed in greater detail in R645-301-730, General Description of Hydrologic Protection Plans.

Water requirements for the Kinney # 2 Mine is calculated to be a maximum of 4.7 acre feet per year potable water for bathhouse and shop, and 61 acre feet per year non-potable water for dust suppression at full production. The full water requirement will not be realized the first year of operation but will ramp up over an estimated three year period.

Scofield Town has signed a letter of intent to provide sewer and water services to Carbon Resources. Scofield town is anticipating that providing these services to the Kinney #2 mine will generate revenue to support town public works. Scofield Town constructed the municipal sewer system large enough to serve the Valley Camp Mine, now closed, and has that excess capacity to offer to the Kinney # 2 Mine. The Scofield sewer system has excess sewer system capacity also according to the agreement.

526.300 Water Pollution Control Facilities

Drainage and Sediment Control Structures

The drainage and sediment control structures which will be constructed and utilized in conjunction with the proposed mining and related activities will effectively route natural drainage through the mine surface disturbance area, intercept and route undisturbed drainage from upslope areas around surface disturbance areas, and collect and route disturbed area

drainage to sedimentation structures to allow settlement of suspended solids prior to discharge to the natural drainages. Drainage and sediment control structures required under the proposed plans will include Sedimentation Pond 1, a number of undisturbed drainage diversion ditches, disturbed area collection ditches, drainage culverts, containment berms, and various alternative drainage and sediment control measures including small sediment basins, silt fences, straw bales, and other localized control measures as appropriate. The proposed drainage and sediment control structures are shown on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas Map, and design information and calculations are discussed R645-301-730, Hydrologic Resource Protection and PHC, and the background information and calculations are included in Exhibit 16, Runoff Control Design Details.

Design - The design and location of all required drainage and sediment control structures is based on maximum anticipated storm runoff flows, site topographic conditions, and standard hydrologic design practices and addresses full compliance with all applicable regulatory provisions. Recognizing that the area is subject to relatively high-intensity, short-duration storm events and that due to the rugged terrain and limited vegetation runoff is frequently rapid and concentrated, essentially all structures have been over-designed to provide an additional margin of safety.

The applicable UDOGM regulatory provisions specify that all impoundments must be designed to contain or treat the runoff resulting from the 10-year, 24-hour storm event and that spillways for MSHA ponds must be capable of discharging runoff flows from the 100-year, 6-hour event and non-MSHA ponds must have designed principal and emergency spillways with a combined capability of discharging the 25-year, 6-hour storm event. However these spillways were designed to safely discharge the 100-year, 6-hour event to provide additional safety due to the close proximity of the sedimentation pond to the highway. The applicable regulations also specify that temporary and permanent diversions of miscellaneous flows be designed for the 2-year and 10-year, 6-hour events, respectively and that temporary and permanent diversions of perennial and intermittent streams be designed for the 10-year and 100-year, 6-hour storm events, respectively.

Hansen Allen and Luce, Engineers (HAL) completed a runoff evaluation for representative watershed areas using the Army Corps of Engineers Hydrologic Modeling System (HEC-HMS) Version 3.1.0 computer modeling software to determine conditions for design of the proposed Kinney No. 2 Mine drainage and sediment control structures. Sedimentation Pond 1 has been designed to contain or treat the runoff from the 10-year, 24-hour storm event and total design capacity includes storage for at least five years accumulation of sediment. The pond spillway structures have been designed to safely pass the runoff from the 100-year, 6-hour storm event.

Temporary diversion ditches in disturbed areas are designed to safely pass the peak discharge from the 10-year, 6-hour storm event. All diversions have been designed and will be constructed to remain stable under design flow conditions. The two permanent collection ditches conveying runoff from undisturbed upslope areas (including UDD-1 and UDD-2) have been sized to carry peak runoff flows from the 100-year, 6-hour storm event. The 100-year storm has been used for these two ditches since they will remain as permanent post mining land use roads upon mine reclamation. In order to assure effective collection and routing of disturbed drainage flows and minimize both erosion and sedimentation, required culverts have been sized to safely pass the peak flow from the contributing inlet ditches with a significant factor of safety and culvert inlets, outlets, diversion channels, and those areas where one or more channels intersect have been designed and will be constructed using properly sized and placed riprap or other erosion control materials, as required.

In all cases, ditch designs also included an evaluation of the need for channel protection to prevent or minimize erosion. The general criteria for channel protection was any flows greater than or equal to 4 feet per second would require channel protection in the form of riprap or grouted riprap to maintain adequate safety factors. Appropriate riprap sizing was determined using riprap design calculation spreadsheet prepared by HAL. Designs for all required ponds and ditches include adequate freeboard to provide a reasonable margin of safety. Designs for the permanent Kinney No. 2 Mine drainage structures and facilities have been prepared by or under the direction of and certified by a qualified Registered Professional Engineer in accordance with Rules R645-301-742.324. Culvert sizing is consistent with the ditch design basis (i.e., 10-year, 6-hour and 100-year, 6-hour storm flows, respectively for temporary and permanent diversions), the minimum culvert size to be used is 18 inch diameter due to potential clogging and maintenance considerations, however all have been over-designed to provide an additional measure of safety, and culvert installations will include a pre-fabricated inlet structure and riprap protection at both the headwall and discharge points.

In order to assure effective conveyance of undisturbed drainage flows and minimize both erosion and sedimentation, required culverts have been sized to safely pass the peak flow from the contributing inlet ditches with a significant factor of safety and culvert inlets, outlets, diversion channels, and those areas where one or more channels intersect have been designed and will be constructed using properly sized and placed riprap or other erosion control materials, as required. Specific information on culvert design and erosion protection measures is also provided in Exhibit 16, Runoff Control Design Details.

Sedimentation Pond 1 has been designed and will be constructed to meet the following regulatory design criteria:

- Located as close as possible to the disturbed area and out of perennial streams unless approved by the Division
- Provide adequate sediment storage
- Provide adequate detention time to meet applicable effluent standards
- Provide a non-clogging dewatering device
- Minimize short circuiting
- Facilitate periodic sediment removal
- Foundation structures will be stable under all conditions of construction and operation

In addition, Sedimentation Pond 1 design has been prepared by or under the direction of and certified by a qualified Registered Professional Engineer in accordance with Rules R645-301-512.200 and 240.

In all cases, the design basis for the proposed drainage and sediment control structures meets or exceeds the applicable regulatory design requirements. Designs for drainage and sediment control structures, along with a discussion of design assumptions, methodology, and design calculations are presented in R645-301-730, Hydrologic Resource Protection and PHC, and the background information and calculations are included in Exhibit 16, Runoff Control Design Details.

Construction - As previously noted in R645-301-521, General Description of Mine Construction and Development Activities, the required drainage and sediment control structures will be constructed prior to any other significant site disturbance, and as soon as possible in the overall site construction plan. As a first step to construction, a silt fence will be placed at the extreme western edge of all site construction running from the southwest corner of the site adjacent to the highway and adjacent to the old railroad bed from the pre-existing access road into the site running northward to the northwest corner of the site. Construction of required undisturbed runoff diversion ditches and disturbed area collection ditches will involve removal and

placement in stockpile of soil or clean soils materials, excavation of the design ditch configuration, placement of riprap and bedding material or geotextile where required, and seeding of ditch sideslopes with the temporary revegetation seed mix. The constructed ditch configuration is illustrated by the typical design configuration figures included on Map 27, Runoff Control Details. Culvert installation will involve excavation and grading of the culvert foundation area, placement and compaction of gravel or similar bedding materials, placement and adjustment of the culvert and inlet structure to the design grade and alignment, placement and compaction of suitable fill materials around and over the culvert, placement of rock protection in the culvert headwall and discharge areas, and installation of debris fences upgradient of culverts where required. Culvert installation practices are illustrated by the typical design configuration figures included on Map 27, Runoff Control Details.

Construction of sedimentation pond impoundments will involve recovery and placement in stockpile of soil or substitute materials, preparation of embankment foundation areas, excavation of impoundment basin areas and construction of embankment structures, installation of principal and emergency discharge structures; grading of embankment outslopes, and seeding of outslopes with the temporary revegetation seed mix to minimize erosion. Impoundments will be inspected at regular intervals during construction and on completion of construction by a professional engineer or specialist experienced in impoundment construction. An impoundment inspection report certified by a Registered Professional Engineer will be provided to UDOGM promptly following each inspection. The report will verify construction in accordance with design plans and will note and discuss any apparent instability, structural weakness, or other hazardous conditions. A copy of the report will be retained on file at the minesite for inspection by authorized agency representatives.

Required foundation preparation will include removal of any vegetative material, coal, potentially acid-forming coal waste, frozen material, or other deleterious materials from embankment foundation areas and excavation of any keyways specified in the design. Embankment construction will involve controlled placement and compaction in horizontally continuous lifts no greater than 12 inches in thickness of suitable embankment fill material. Fill material will not contain any significant quantities of coal, vegetative material, frozen material, or other deleterious materials. Fill will be placed and spread using either tractor scrapers or rear dump trucks and tracked dozers and design compaction of 95 percent of maximum dry density will be achieved by compacting each successive lift with a sheepsfoot or vibratory roller. Compaction will be periodically checked during construction using standard compaction testing procedures and if testing reveals inadequate compaction, the lift or lifts in question will be ripped and reworked until adequate compaction is achieved. During compaction, water trucks may be utilized as necessary to achieve optimal moisture content for effective compaction. The actual construction height for all pond embankments will be 5 percent greater than the design height to provide for long-term consolidation and settling of the embankment.

Installation of principal and emergency discharge structures will occur at appropriate stages in the embankment construction process. Installation of vertical riser structures will include compaction of an adequate base area for the foot of the riser and installation, alignment, and placement and compaction of fill material around the lower portion of the riser structure. Installation of horizontal discharge structures will involve basically the same construction procedures previously described for culvert installations, including preparation of a base area, placement and compaction of bedding material, placement and alignment of the discharge pipe, and placement and compaction of fill material around the pipe.

Operation and Maintenance - Operation and maintenance of drainage and sedimentation control structures will involve periodic inspection of all ditches and culverts, quarterly inspection and annual certification of impoundments and related structures, ongoing discharge monitoring

for all impoundments, and any necessary maintenance or repair of problems noted during the inspections.

Ditches have been designed and will be constructed to provide an adequate cross-sectional flow area to pass runoff flows from the design storm event. During active operations, normal siltation and minor erosion may result in changes in ditch configuration. As discussed previously, all temporary ditches have been designed for the 10-year event. Ditches will be maintained to ensure that minor siltation does not affect the capacity of the ditches to perform as designed. CR's ditch inspection and maintenance procedures will focus on identification and repair of any significant ditch erosion, removal of any trash or debris from ditches, and maintenance of an adequate cross-sectional flow area, regardless of actual ditch configuration, to pass the design flows. In practice this will mean that CR will not modify, recut, or clean out a ditch simply because the physical ditch dimensions are not the same as the original design or originally constructed configuration so long as the actual ditch configuration is adequate to pass the design flow. Culvert maintenance will involve removal of trash or debris from culvert inlets and any upgradient debris fences, repair of any significant erosion at culvert inlets, outlets, or of the cover material, and repair or replacement of any damaged culverts.

Sedimentation pond maintenance and operation procedures will include ongoing sampling and discharge monitoring under applicable provisions of a UDWQ permit; quarterly inspections of pond embankments, impoundment areas, discharge structures, and inlet/outlet structures and areas and reporting; notification of any hazardous conditions and development of emergency remedial control measures; maintenance or repair of any problems noted during the inspections; and periodic removal of accumulated sediment. The sedimentation pond has been designed and will be operated and maintained to effectively retain storm runoff to allow settlement of suspended solids prior to discharge. Control of potential water quality impacts from pond discharge is monitored through compliance with applicable effluent standards under a UDWQ discharge permit. Effluent sampling and reporting will occur as outlined in R645-301-730, Hydrologic Resource Protection and PHC, and under the provisions of the UPDES permit which will be included in Exhibit 4, Other Permits when it is received.

The sedimentation pond will be inspected quarterly by a qualified person for any indication of structural weakness or other hazardous condition, instability, and any erosion or other problems; the depth and elevation of any impounded water will be measured; based on the depth measurements storage capacity will be estimated; and any required structural monitoring will be performed. Copies of the quarterly inspection reports discussing each of the noted inspection categories and verifying that the pond has been constructed and maintained as designed will be prepared, certified by a qualified Registered Professional Engineer, and submitted promptly to UDOGM. Copies of the inspection reports will also be maintained on file at the minesite. Any minor problems noted during the inspection will be addressed in a timely manner. This may involve repair of any minor localized erosion, clean-out or minor repair of discharge structures, reseeding of embankment slopes, mowing weeds which may interfere with pond inspection, or other minor maintenance and repair as necessary. If the inspection identifies any structural weakness or other conditions which could pose a hazard to the public, the person who conducted the inspection will notify UDOGM promptly of the hazardous condition and any emergency procedures which may be appropriate to protect the public and address the hazardous condition. In consultation with and with approval from UDOGM, appropriate remedial measures will be implemented as soon as is reasonably practicable to address any hazardous condition.

The pond has been designed to provide adequate capacity for at least five years accumulation of sediments, however, the pond will periodically need to be cleaned out to removed the accumulated sediment in order to maintain adequate stormwater storage capacity consistent with design requirements. A fixed staff gauge in the pond will be used to monitor sediment

accumulation. Generally, it is anticipated that the sedimentation pond will be essentially dry during late summer or early fall each year and the gauges will be checked during the corresponding pond inspections. In the unlikely event that the staff gauges cannot be checked during a dry period, an alternative means of monitoring sediment accumulation levels will be utilized.

Before sediment accumulations reach the point where they would encroach on stormwater storage capacity, CR will schedule and implement measures to remove the accumulated sediments. The pond has been designed to facilitate access for pond clean-out with a concrete ramp for equipment access to the pond bottom. The pond will have a reinforced concrete bottom to facilitate cleaning by equipment without damaging the pond integrity. Generally, clean-out would be scheduled during a relatively dry period when any pond water levels would be low. Any water remaining in the pond would be pumped into water trucks for use in minesite dust control. The sediments would be allowed to dry so that they could be readily removed and they would then be removed and transported to a temporary storage area located on one of the mine pad areas until dry, then would be transported into the mine and placed in the areas designated for mine development rock as discussed in R645-301-520, General Description of Mine Plans, Mining Methods, and Related Design Requirements.
Description of Individual Structures - The following sections provide more detailed information for specific drainage and sediment control structures:

Sedimentation Pond 1 - Sedimentation Pond 1, which will be located at the northern end of the mine site, as shown on both Map 24, Drainage and Sediment Control Plan Map, and Map 13, Surface Facilities Map, will be the only sedimentation pond for the proposed mine surface facilities area. The vast majority of disturbed area runoff and minor amounts of undisturbed area runoff from those facilities and areas upgradient from the pond location will be routed to Pond 1. The total contributing drainage area for Pond 1 is approximately 28 acres. The pond has been designed to provide adequate total retention capacity at an elevation of 7686.90 feet of 3.15 acre-feet which includes a 5.3 year accumulation of sediment (1.12 acre-feet) based on sediment discharge modeling for the contributing drainage areas and the 10-year, 24-hour storm runoff (2.06 acre-feet) from the contributing drainage areas.

Pond 1 is designed with vertical risers (primary spillway and emergency spillway) connected to a horizontal discharge culvert running through the pond embankment and discharging to a culvert crossing beneath Highway 96 and thus to the area west of the highway. As shown on Map 25 the designs of both the Principal and Emergency spillways are the same as can be seen on the cross-section and as noted in Detail 1. One orifice in the primary spillway vertical riser at an elevation of 7683.80 feet, will be used to dewater the pond and discharge stormwater inflows. The top of the riser will be at an elevation of 7686.90 feet, at the invert of the emergency spillway. The orifice outlet will be fitted with gooseneck pipe extension to act as oil skimmer to prevent discharge of any minor amounts of oil or other petroleum products which may enter the pond and the top of the riser will be fitted with a trash rack. The Pond 1 emergency spillway will be a 24 inch diameter pipe, with a crest elevation of 7686.90 feet. The invert elevation of the emergency spillway and pond embankment are designed to provide a minimum freeboard of 2.0 feet. In order to provide access for clean-out and haulage of accumulated pond sediments a primary road (P6) will be constructed from the Loadout Pad to the pond.

Map 25, Sedimentation Pond 1 Sections & Details shows the proposed Pond 1 layout and provides specific pond design information including the primary discharge, sediment storage volume, 10-yr 24-hr runoff volume, 100-tr 6-hr runoff volume, primary and emergency spillways, and pond embankment, and design details for the discharge structures. Figure 35, Pond 1 Stage-Volume Curve shows the stage storage curve; storage capacity information; design elevations for the pond bottom, sediment storage elevation. A detailed description of pond design assumptions and methodology, actual pond design calculations, and additional design

information are provided in R645-301-730, Hydrologic Resource Protection and PHC, and the background information and calculations are included in Exhibit 16, Runoff Control Design Details. Pond construction, operation, and maintenance practices will be consistent with the previous descriptions presented in this section. Sedimentation Pond 1 will be a new pond and pond construction will involve both excavation of a portion of the pond basin and construction of a compacted fill embankment.

Alternative Drainage and Sediment Control Measures - Alternative drainage and sediment control measures will be utilized for initial construction activities as discussed in R645-301-520, General Description of Mine Construction and Development Activities, and in areas where the isolated nature of the area or specific site conditions would result in excessive disturbance for full scale drainage and sediment control or where full-scale controls are infeasible. Alternative drainage and sediment controls will be utilized in the following specific areas:

- Initial Construction Areas
- The Topsoil Stockpile area
- south of the Main Access Road along Highway 96
- The small areas adjacent to Highway 96 on both sides of the main access road to the mine site
- Small topsoil stockpile areas west of Highway 96 adjacent to highway culvert CP-2

Detailed descriptions of these areas, discussion of the alternative sediment control measures to be implemented, and requests for individual small area exemptions, as appropriate, are included below. It should be noted that alternative sediment controls for road fill and embankment outslope areas will consist of silt fencing and will only be required as a interim control measure until temporary vegetative cover is established.

Initial Construction Areas – Initial construction will be done before runoff controls are possible, therefore alternative controls will be used to control sedimentation off of the site. Controls to be used may include one or more of the controls discussed in R645-301-730, including, silt fencing, straw bales, berms, sediment traps, vegetative filters, mulch, and other effective appropriate drainage controls. Before construction begins, a silt fence will be placed at the extreme western edge of the site running parallel to the old railroad grade and including the area from the existing access road to the site and then running south to the southwest corner of the mine permit area adjacent to Highway 96.

Topsoil Alternative Materials Stockpile – The main topsoil/alternative materials stockpile is located adjacent to Highway 96 at the south end of the mine site (see Map 24), where the runoff from the site cannot be routed to the sedimentation pond. Since the stockpile will be vegetated with interim vegetation and should stabilize within a two to three year period, there should be little sediment loss. Runoff from the stockpile will be controlled by a berm at it's western edge as can be seen on Map 24, Drainage and Sediment Control Plan. This berm will catch runoff and sediment from the face of the stockpile and direct it to the silt fence outlet as shown. The silt fence outlet from the lowest point of the berm near the highway culvert will filter any runoff from the pile prior to leaving the site and entering the highway culvert.

The other stockpile areas near Culvert CP-2 will be small and will use silt fencing to control erosion (see Map 24). A single silt fence is planned for the entire perimeter of each stockpile. If installed silt fencing is shown to be inadequate to contain erosion, then additional silt fencing will be installed at even contours up the slope of the stockpile.

Main Access Road - Primary Road P1 – The short section of the access road approximately 115 feet long from it's intersection with Highway 96 eastward to a cattle guard cannot be routed to

the Sedimentation Pond 1. Runoff from this small road section will be controlled through small ditches and sediment traps located on each side of the road as shown on Map 24. Drainage and Sediment Control Plan. A silt fence, or straw bale outlet from the sediment trap will catch any overflow from the trap prior to discharge into the highway side ditches.

526.400 Air Pollution Control Facilities

N/A – Applies to Surface Coal Mining Only

R645-201-527 Transportation Facilities

Roads

In conjunction with the proposed mining and related operations CR will construct, operate and maintain a number of new roads and will operate and maintain several existing roads. Both new and existing roads will be utilized to access existing and proposed facilities and for transportation of personnel, equipment, and supplies. All roads are classified as primary roads. The primary road classification includes any road used for transporting coal or spoil, roads which are used frequently for periods exceeding 6 months, and roads which will be retained to support the postmining land use. All roads will be utilized on a frequent, long-term basis to support the proposed mining and related operations. Proposed roads which will be used in conjunction with the proposed mining and related operations include the following:

Proposed Roads in Kinney No. 2 Mine Facilities Area

PR-1 Primary mine access road for the proposed surface facilities area
PR-2 Primary mine access road to Mine Office Pad
PR-3 Primary mine access road to the Portal Pad
PR-4 Primary mine access road to the Storage Area Pad
PR-5 Primary mine access road to the Loadout Pad
PR-6 Primary mine access road to Sedimentation Pond No. 1
PR-7 Primary mine access road to the North Access Road

All proposed roads are shown on, Map 13, Mine Surface Facilities Map. Road profiles can be seen on Maps 20 through 22, Mine Road Profiles.

Design and Construction - All roads have been or will be located and constructed to the extent operationally feasible in the most stable areas available and outside of the channel of intermittent or perennial streams. Road design and construction plans will prevent damage to public or private property; minimize the potential for downstream flooding or sedimentation; reflect consideration of the size of vehicles which will be using the road, traffic volume, and normal speeds; and to the extent possible, using the best technology currently available, minimize adverse impacts on fish, wildlife and related environmental values.

All roads have been designed to provide for effective drainage, long-term stability, and safe vehicle operations under varying weather conditions. Design and construction of all primary roads will be certified by a qualified Registered Professional Engineer as meeting these criteria. All roads will meet MSHA safety requirements including either a berm or guard rail on the outside edges where the slope is downward.

Design and construction practices for specific roads will be dependent primarily on site conditions and the nature and frequency of anticipated use. The primary mine access road (PR-1) will provide access to the mine surface facilities and will be utilized for transportation of personnel, equipment, coal, and supplies. Because it will handle a relatively heavy traffic volume and must provide safe operating conditions year-round, Road PR-1 will be a paved asphalt road with all-weather travel surface from Highway 96 to the Shop-warehouse building. Primary Road P2 will also be paved to the Mine Office building; in addition, the Mine Office Pad will be paved. The other primary roads will also be utilized on a year-round basis but the associated traffic levels will be significantly lower so these roads have been designed and will be constructed with an adequate compacted road base and gravel or similar durable granular surfacing.

Road construction will involve cut and fill earthwork operations using tractor sapers, tracked dozers, and motor graders. No potential acid or toxic-forming materials will be utilized in road construction or as road surfacing materials. Cut and fill slopes will be established at maximum grades up to 0.8H:1V, with the steepest grades in rock dependent on the characteristics of the rock in conjunction with the geotechnical recommendations found in Exhibit 14, Geotechnical Investigations. Typical road construction practices, road configuration, and dimensions are illustrated by Figure 25, Typical Primary Road Configuration. Road gradients will vary from flat to a maximum of approximately 14.5% percent for the main roads and any required road embankments will be constructed and compacted in a controlled manner to provide a minimum static factor of safety of 1.3. Only one road (P6), which accesses Sediment Pond 1 has a gradient above 14.5%, at 18.8%. This road will be used on a limited basis to access and clean out the sediment pone. All road cut and fill slopes will be revegetated as soon as reasonably practical following construction using the temporary revegetation seed mixture to stabilize the slopes and minimize erosion potential. Road surfaces will be graded or owned to prevent accumulations of water on the road surface and adequately sized ditches and culverts will be installed and maintained to effectively carry road and other disturbed area drainage. Adequate cover will be provided over all culvert crossings to prevent damage or collapse of the culverts and culverts have been designed and will be installed to prevent plugging, erosion at the culvert inlet or outlet, and any drainage over the road surface. The locations of all proposed ditches are shown on Map 24, Drainage and Sediment Control Plan Map, and ditch designs are included in R645-301-730, and in Exhibit 16, Runoff Control Design Details.

Operation and Maintenance - Operation and maintenance procedures for all mine roads are designed to provide a smooth operating surface, assure safety, and minimize dust emissions. Road maintenance will involve periodic grading to provide a smooth surface, remove rocks or debris, and maintain effective drainage; repair and resurfacing as necessary; inspection, clean-out, and repair of ditches and drainage structures; and watering or application of surfactants to control dust during dry periods. Generally, speeds on roads and in active operating areas will be limited to 15 miles per hour by posted speed limits both as a safety consideration and to minimize dust emissions from unpaved roads. In the unlikely event that any road is damaged by a catastrophic event such as an earthquake or flood, CR will make appropriate repairs as soon as reasonably practicable and will limit the use of the road or provide an alternate access if unsafe conditions exist.

Description of Individual Structures - The following sections provide more detailed information for specific roads and associated structures:

Primary Road P1 will receive the most traffic, therefore it will be paved. From Highway 96 to the cattle guard as shown on Map 13, Surface Facilities Map, and on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas, the road will be crowned in the center with drainage flowing to the sides in both directions. The purpose of the cattle guard is not to control cattle, but to provide a drainage trench to catch runoff containing fines from the road,

preventing them from being washed downgradient on the road and bypassing Sedimentation Pond 1. Below the cattle guard, drainage from the road will flow to sediment traps on both sides of the road as shown on Map 24, Drainage and Sediment Control Plan – disturbed Drainage Areas. For the remainder of Primary Road P1, the design will be as shown on Figure 25, Typical Primary Road Configurations for sloping terrain and level terrain.

All other roads will be constructed as shown on Figure 25, Typical Primary Road Configurations for sloping terrain and level terrain.

R645-301-528 Handling and Disposal of Coal, Overburden Excess Spoil, and Coal Mine Waste

528.100 Coal Removal, Handling, Storage, Cleaning and Transportation Areas and Structures

The proposed underground mining and related activities will require limited surface support facilities. The facilities to be utilized in conjunction with the proposed operations will include new facilities to be constructed in the proposed Kinney No. 2 Mine surface facilities area. These facilities will provide the necessary infrastructure for effective management and handling of personnel, equipment, materials and supplies, and both coal and mine development rock materials, and will include a number of structures specifically designed to control or mitigate potential mining related impacts.

Construction of required surface structures and facilities has previously been discussed in R645-301-520, General Description of Mine Plans, Mining Methods, and Related Design Requirements. The surface structures and facilities will be operated, maintained, and ultimately reclaimed in a manner that prevents or controls erosion and siltation, water pollution, and damage to public or private property; and to the extent possible using the best technology currently available, minimizes damage to fish, wildlife, and related environmental values, and minimizes additional contributions of suspended solids to streamflow or runoff outside the permit area. Any contributions of suspended solids from mine disturbance areas will not exceed applicable effluent limitations under Utah or Federal law.

Required surface facilities are shown and identified on Map 13, Surface Facilities Map, and include the following:

- Conveyor SB-1
- Conveyor Transfer Tower
- Conveyor SB-2
- Non-Spec Coal Pile & Stacking Tube
- Conveyor SB-3
- Spec Coal Pile & Stacking Tube
- Conveyor SB-4
- Screening & Crushing Building
- Sediment Pond Road – Primary P6
- Truck Loadout Building
- Lodout Road – Primary P5
- Storage Sheds – 5 each
- Shop – Warehouse
- Fueling Facility
- Main Access Road – Primary P1
- Office Road – Primary P2
- Portal Access Road Primary P3
- Storage Area Access Road P4

- Mine Office – Bathouse
- Topsoil Stockplie
- Water Tank
- Electrical Substation
- Sedimentation Pond
- North Access Road – Primary P7
- Explosives Magazine
- Explosives Cap Magazine
- Development Waste Temporary Storage Area

The following sections describe design and construction details and operation and maintenance plans for the identified structures.

Coal Handling Systems and Facilities

The coal handling system will consist of both the underground coal haulage system and the surface coal handling components which will transfer the coal from the mine to the truck loadout. Components of the surface portion of the coal handling system are shown on Map 13, Surface Facilities Map and include the following:

- Conveyor SB-1
- Conveyor Transfer Tower
- Conveyor SB-2
- Non-Spec Coal Pile & Stacking Tube
- Conveyor SB-3
- Spec Coal Pile & Stacking Tube
- Conveyor SB-4
- Screening & crushing Building
- Sediment Pond Road – Primary P6
- Truck Loadout Building
- Development Waste Temporary Storage Area

Design - The coal handling system has been designed using the best current technology and accepted engineering practices to provide the coal and mine development rock carrying capacity to readily handle the maximum projected mine production volumes with sufficient excess carrying capacity to handle potential surges in system feed rates. System design also provides the storage capacity to address any normal fluctuations in coal production, shipping schedules, or market demand and reflects the design and construction considerations necessary to minimize potential adverse environmental impacts, including but not limited to minimizing erosion and additional contributions of sediment to surface runoff.

<u>The Surface Coal Haulage System which consists of:</u>

The MB-1 conveyor discharge onto the tail loading section of SB-1 located in the transfer tower. MB-1 will be elevated to accommodate mine vehicle and equipment traffic to pass beneath it where MB-1 it exits the mine and will be enclosed to mitigate airborne dust and spillage onto the roadway. From MB-1 coal will be transferred to a series of 42” overland surface conveyors beginning with SB-1. At the transfer building, a coal sampling system will be installed between the head pulley of MB-1 coming from the mine and the tail pulley of SB-1 that will transfer coal overland to conveyor SB-2 located in the enclosed Conveyor Gallery atop the two stacking tubes. Depending on whether ROM product is determined to be spec coal or non-spec coal Overland Conveyor SB-1 will divert discharge ROM coal through a flop-gate to direct the segregation to the appropriate stockpile stacking tube (i.e., spec or off-spec).

ROM Coal will be reclaimed using programmable vibrating apron pan feeders via Reclaim Conveyor SB-3. The design capacity of the non-spec coal stockpile is 17,000 tons and is separated from the spec coal pile with a 10 ft high concrete wall. Similarly, design capacity for the spec coal stockpile is also 17,000 tons total capacity with a practical 12,000 tons live capacity with equipment. The off spec pile will accommodate classification and sorting of 6,000 tons on either side of a dividing wall using a front end loader or dozer to sort coal from rock into the feed area for either of the two apron feeders that reclaim from the off-spec pile.

The off-spec pile will be managed and reclaimed so that rock and coal is kept segregated by size and type in the pile as much as practicable for product blending through ratio feeding at the apron feeder and/or rock disposal using dozers, front end loaders, grizzlies for classification and sorting, with common surface coal handling equipment.

Coal will feed to Reclaim Conveyor SB-3 from vibrating pan feeders located in a reclaim tunnel beneath the ROM stockpiles. Spec coal and non-spec coal will be delivered by conveyor SB-3 to a primary double deck vibrating screen that will screen oversize material of 8" – 2" to a primary crusher that will reduce coal to a nominal 2" minus size. Coal from the crusher will pass to conveyor SB-4. Coal that passes the screen at 2" minus will be diverted from the crusher by a chute to conveyor SB-4. Conveyor SB-4 will transport 2" minus coal to the truck load out structure.

Construction - Construction of the coal handling system will involve excavation and grading to establish the conveyor alignment; excavation and grading of the spec coal, and non-spec stockpile area; construction of conveyor support structure, stacking tubes, and reclaim tunnel foundations; erection and installation of modular conveyor support structures, idler support frames, feeders and chutes, and transfer points; and installation of conveyor drives, take-ups, idlers, belting, covers, control systems, and dust control equipment. The conveyor alignment , and other facilities will be as shown on Map 13, Surface Facilities Map.

The conveyor components including support structures, idlers, take-ups, drives, belting, covers, transfer points, and dust control components will be standard off-the-shelf components supplied by major conveyor manufacturers. Support structures, take-ups, drives, and transfer points will be mounted on either poured concrete footing or spread footings as appropriate based on the nature of the installation and site conditions. Conveyor covers will be conventional half-shell covers which bolt onto the conveyor framework and are removable for maintenance access and all transfer points will be partially or fully enclosed and will incorporate water sprays or surfactant applicators to control fugitive dust emissions. All conveyors have been designed and will be installed to provide adequate clearance for passage of big game animals under the conveyor support structures.

Operation - The underground coal handling system will transport the coal from the working sections to the coal stacking tubes. The underground coal haulage system will consist of 42 inch section and panel conveyors with a capacity of 1,200 tons per hour. The main haulage conveyor will carry the coal to the surface where it makes one transfer to Conveyor SB-1 which will then transfer the coal to the coal stacking tubes. Depending on if the ROM product is spec coal or non-spec coal Overland Conveyor SB-2 will discharge ROM coal through a flop gate directly to the non-spec coal stockpile stacking tube or onto conveyor SB-3 that will discharge spec coal into the spec coal stockpile stacking tube. The coal stacking tubes will be pre-fabricated structural steel or reinforced concrete mounted on reinforced concrete foundations directly adjacent to the reclaim tunnel. Openings in the sides of the stacking tubes will have flexible covers and discharge coal to create a conical ROM coal stockpile surrounding the stacking tubes. The ROM coal reclaim tunnel will be constructed of cast in place reinforced concrete with a 48" diameter buried culvert which daylights from the rear of the tunnel for emergency egress to the outside and as well as for ventilation to the reclaim tunnel. The reclaim

tunnel will be equipped with vibrating apron-type pan feeders to discharge ROM coal from the stockpiles to the reclaim conveyor belt SB-3. A coal sampling system between MB-1 and SB-1 will be provided at the transfer structure to verify spec and non-spec coal. Spec and non-spec coal will be stored in separate stockpiles.

Four vibrating apron feeders in the reclaim tunnel directly under the coal stockpiles will serve as the blending mechanism for the mine whereby spec coal and non-spec coal will be drawn from the spec coal stockpile and the non-spec stockpile in proportioned quantities as specified by a Programmable Logic Control System (PLC) designed for this operation. At times ROM coal blending will not be utilized whereas the vibrating pan feeders under the non-spec coal stockpile will not be operated. With the versatility of feed rates from these feeders coupled with the PLC any combination of spec and non-spec coal can be delivered to screening, crushing and truck load out.

At times mine development rock from the mine will be hauled from the workings using the conveying system. Development rock material would be directed to a portion of the non-spec coal stockpile using the coal conveying system where it will be culled from the stockpile into haul trucks using a front end loader. The coal haulage system will direct ROM coal to the spec coal and non spec coal stockpiles where it will be reclaimed using programmable vibrating pan feeders and Reclaim Conveyor SB-4. The design capacity of the non-spec coal stockpile will be 17,000 tons. Design capacity for the spec coal stockpile will be 17,000 tons.

The surface coal handling system will transport the coal from the stacking tubes to the crushing and screening building using conveyor belt SB-3 where the coal will be sized to product size, generally ¾" minus. This system will also provide for the handling of mine development rock material resulting from ongoing mine development and production operations. Coal will feed to Conveyor SB-4 from vibrating feeders located in a reclaim tunnel beneath the coal stockpiles. Conveyor SB-4 will carry the coal to the truck loadout, which will in turn load the coal into trucks. All surface coal handling conveyors will be 36 inch conveyors with a capacity of 1,000 tons per hour. Operation of the surface coal handling system is graphically illustrated by Figure 26, Coal Handling Flow Sheet.

Maintenance - Maintenance of the coal handling system will include regular inspect and repair of conveyor belts, support structures, transfer points, drive components, and dust control systems; lubrication of idlers and drive components; adjustment of belt take-ups to maintain proper belt tensions; periodic replacement of critical conveyor components under a regular preventative maintenance program; and periodic cleanup of any coal or waste spillage at feed points, transfer points, and under the conveyors.

Coal Stockpiles - Two separate coal stockpiles will be utilized in conjunction with the proposed mining and related operations; the 12,500 ton spec coal stockpile , and the non-spec coal pile which is designed to be 9,500 tons. The coal stockpiles have been designed to provide storage and surge capacity to accommodate anticipated normal fluctuations in coal production, coal blending, shipment schedules, minor market fluctuations, and any unanticipated temporary shutdowns of components of the coal production, handling, and processing systems. The coal stockpiles have been located and designed to minimize potential adverse environmental impacts including but not limited to fugitive dust emissions, and sedimentation due to drainage from the piles or pile areas. Both coal stockpiles reflect similar design with the coal delivered to the pile by Conveyor SB-1 and SB-2.

The adjacent cut slope east of the spec coal, and non-spec coal stockpiles will not be vegetated so that coal can be pushed back against the slope to provide additional storage capacity when necessary. The coal stacking tubes will be pre-fabricated concrete or reinforced steel tube mounted on a reinforced concrete foundation with a direct discharge

chute in its base. Openings in the sides of the stacking tubes with flexible covers will create conical coal stockpiles surrounding the tubes. The coal reclaim tunnel under the stacking tubes will be a sub-grade reinforced concrete structure supporting vibratory feeders which will draw coal from the base of the piles and feed it through gaged feed chutes to Conveyor SB-3.

Operation and maintenance of the coal stockpiles will involve controlled discharge to the piles and movement of coal within the pile using tracked dozers or wheel loaders to keep the coal within the defined pile limits, maximize storage capacity when necessary, and provide for effective feed to the reclaim points. Coal piles will be periodically inspected for any excessive oxidation or burning coal and if any is found it will be separated from the main stockpile and extinguished either by burying the coal with dirt or by using a mine water truck to spray the coal with water.

Coal Crushing - Spec coal and non-spec coal will be delivered by conveyor SB-3 to a primary double deck vibrating seen in the crushing and screening building that will seen oversize material of 8" – 2" to a primary usher that will reduce coal to a nominal 2" minus size. Coal from the usher will pass to conveyor SB-4. Coal that passes the seen at 2" minus will be diverted from the usher by a chute to conveyor SB-4. Conveyor SB-4 will transport 2" minus coal to the truck load out structure. Planned operation of the surface coal handling system from the mine portal to the truck load out is graphically shown on Figure 26, Coal Handling Flowsheet, and Figure 27, Schematic Elevation Looking East.

Maintenance - The coal crushing and screening process is controlled and monitored by an automated process system which adjusts and maintains flow rates and monitors each component of the system to assure maximum coal recovery and identify any system malfunctions in a timely manner. In addition to the automated control and monitoring system, CR will have a regular inspection and preventative maintenance program for the crushing and screening facilities and equipment which will include regular inspection, clean-up, lubrication, repair, and periodic replacement of critical operating components. Potential fugitive dust emissions from crushing, stockpiling, and conveying will be controlled by partial or full enclosures on all transfer points and at the usher, by baghouses, or water sprays or surfactant applicators, sub-grade coal reclaim systems, and the use of stacking tubes in stockpile areas.

Loadout Facilities

The coal product from the coal crushing and screening building will be transferred to the truck loadout facility which will weigh the coal and load it into trucks for delivery to utility, industrial, and other coal users. The truck loadout facility is designed to load on road coal trucks for transport to market. Conveyor SB-4 transfers 2" minus coal from the screening and crushing building where it is discharged through a flop gate chute to (2) 50 ton coal silos. The truck loading facility is designed to allow the loading of double tandem coal trailers. Coal will be discharged directly to the trailers. Operation of the coal loading facility will be connected to the surface facilities Control Instrumentation and PLC that will include load cells at the coal silos to regulate surge capacities at the loading facility. Discharge and loading of the coal will be provided by the drivers of the coal haul trucks. Coal will discharge from the silos to the trucks through a regulated discharge telescoping chute that will extend to the top of the truck trailer to provide controlled loading and contain fugitive dust. The truck loading facility will allow for truck traffic to pass around and under the load out silos for loading.

Support Structures and Facilities

A number of structures and facilities will be required to support the proposed mining and related operations. These structures and facilities will generally be used to provide storage, maintenance, and support services for mine personnel, equipment, and materials and supplies and will specifically include the following:

- Storage Sheds – 5 each
- Shop – Warehouse
- Fueling Facility
- Mine Office – Bathouse
- Water Tank
- Electrical Substation
- Explosives Magazine
- Explosives Cap Magazine

These structures and facilities are shown on Map 13, Surface Facilities Map, and are described in the following sections.

Design and Construction - All support facilit1ies are located within or in close proximity to the associate operations areas. Mine support buildings are steel frame buildings with concrete footers, spread footings, or slab foundations and metal exterior walls. These buildings have been designed for ease of erection, long-term structural integrity, and minimal maintenance. To the extent possible, building locations, configuration, and exterior colors have been selected to minimize visual contrasts with surrounding natural areas.

Building construction will generally involve grading and preparation of foundation areas, excavation and installation of foundations, building erection, interior and exterior finish work, and connection of utilities. Storage areas will generally be open graded areas providing outside storage for miscellaneous large parts and supplies. Both building sites and storage areas will be graded to assure effective drainage, with drainage from these areas flowing to the designed disturbed area collection ditches previously described in the sub-section titled Drainage and Sediment Control Structures. Due to the anticipated level and frequency of use, employee parking areas adjacent to the Administration/Bathhouse building will be surfaced with asphalt paving materials and other frequent use areas including the area around the maintenance shop and warehouse facilities will be surface with gravel or similar durable granular material.

Operation and Maintenance - General operation and maintenance of support structures and facilities will involve regular grading of facility areas and inspection, cleaning, and repairs as required. In addition to the equipment required for mine production operations the following equipment will be utilized for surface support, maintenance and general utility use:

- Tracked dozers
- Wheel loaders
- Rear dump trucks
- Motor grader
- Water truck
- Street Sweeper
- Fork lifts
- Skid steer loaders
- Mobile cranes
- Bucket truck
- Fuel/Lube truck
- Air compressors

- Welders
- Generators

Specific operation and maintenance requirements for individual facilities are described in the following descriptions of individual facilities.

Description of Individual Structures - The following sections provide more detailed information for specific support structures and facilities:

Office-Bathhouse Building - The Office-Bathhouse building will provide office space for mine management, accounting/payroll, engineering, environmental, production, and safety staff; meeting and training rooms; and shower and changing facilities for mine employees. The Office-Bathhouse facility will be a two-story steel frame building approximately 60 feet wide by 160 feet long and 30 feet high at the peak of the roof with concrete slab floor and steel siding and roof. An asphalt paved parking area will be provided on the pad for the building. The configuration and layout of the Office-Bathhouse facility is illustrated by Figures 28 through 31, Office-Bathhouse Building.

Maintenance Shop Facility - The Maintenance Shop facility will be located immediately adjacent to the mine portals in the portal area and will provide cleaning and repair facilities for both underground production and surface support equipment. The Maintenance Shop will be a steel frame building with reinforced spread footing foundation and heavy reinforced slab floor, and steel siding and roof. The main shop building will be approximately 75 feet wide by 175 feet long and 32 to 42 feet high at the roof peak. The configuration and layout of the Maintenance Shop is illustrated by Figures 32 through 34, Warehouse & Shop Facility. The Maintenance Shop will include the following service and support areas:

- Drive-in equipment wash bay and clean-out sump
- A split bay for light vehicle and small equipment maintenance
- Welding bay
- Electrical repair bay
- Belt repair bay
- Machine shop
- Battery charging area
- Maintenance office, computer area, and restrooms
- Waste oil heating boiler
- Compressor room
- Storage area for waste oil, fuel oil, and mixing tanks
- Bulk oil and lubricant storage area
- Metal storage area
- Equipment fueling station

Equipment coming into the shop for periodic preventative maintenance, repair, or rebuild will first be washed in the wash bay. The wash bay may have both fixed spray heads and flexible high pressure hoses to clean coal, dirt, grease and oil from the equipment prior to equipment inspection, maintenance, and repair. Drainage from the wash bay will go to collection sump which has been designed to collect oil and grease. A float operated pump will transfer water from the decant sump to the portal area collection sump which will also be equipped with an oil skimmer.

Figure 26 Coal Handling Flow Sheet

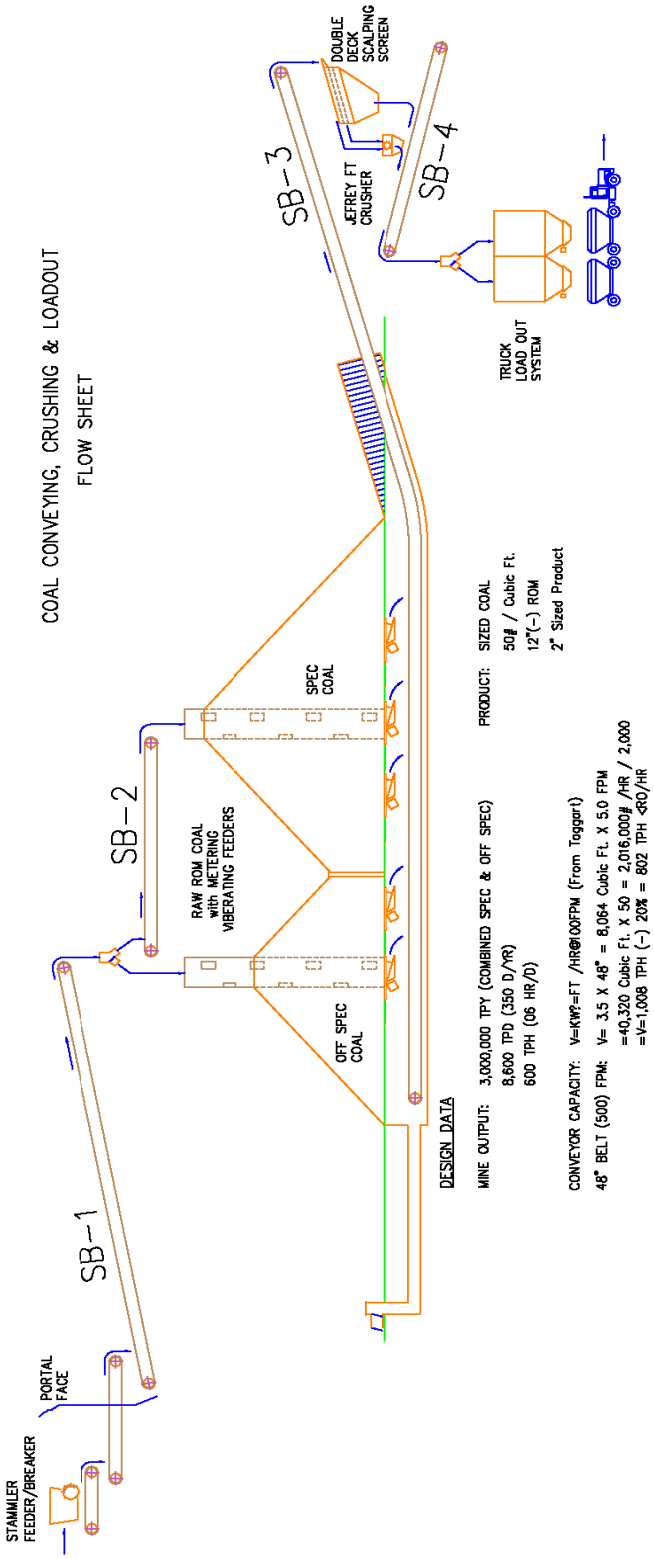
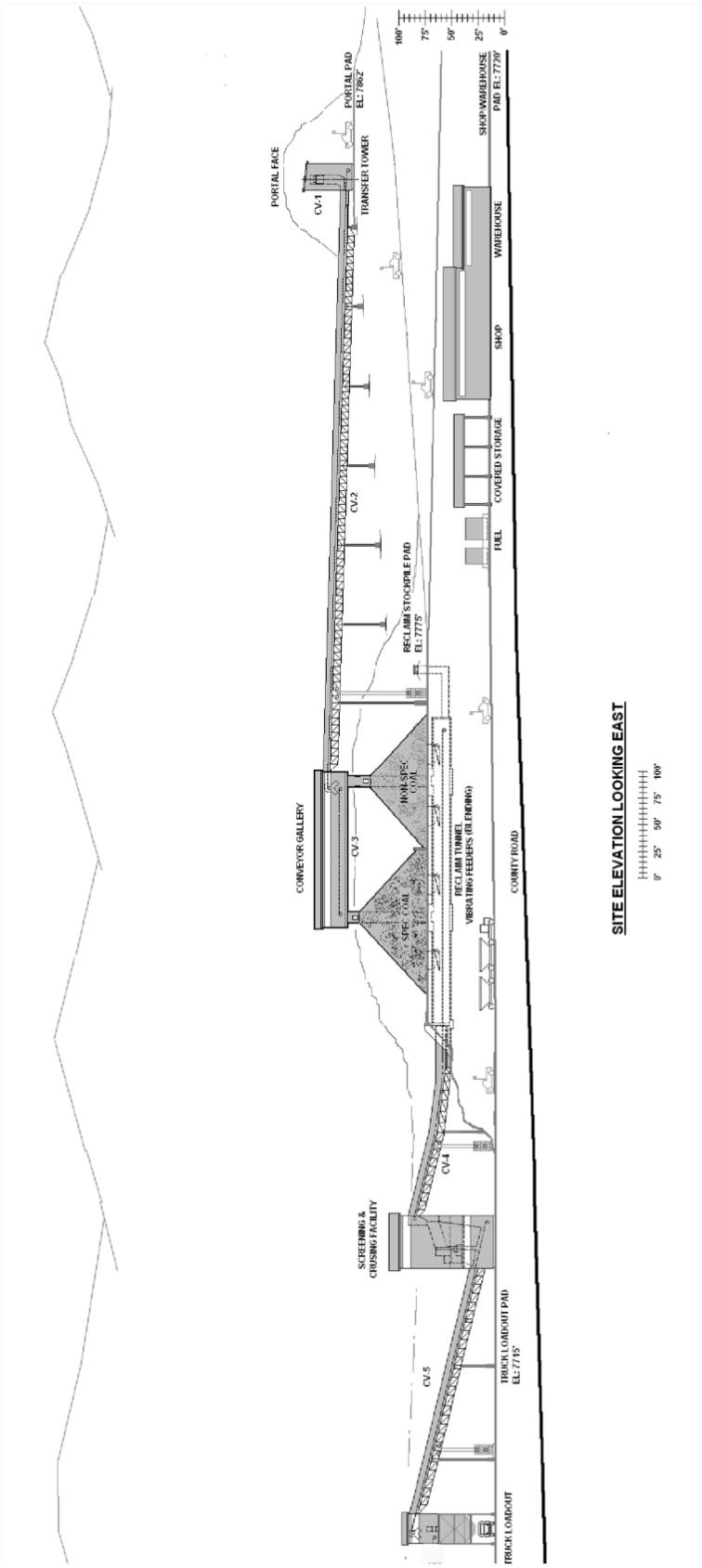


Figure 27 Schematic Elevation Looking East



Within the Maintenance Shop, all petroleum products including oil, hydraulic fluid, grease and other lubricants, and used oil will be handled by a pressurized collection/distribution system running through the shop facility. Oil, hydraulic fluid, and lubricants will be stored in bulk in large tanks within storage containment areas and will be distributed to hose reel systems in each repair/maintenance bay area. Any parts washing stations will use non-toxic citrus-based solvents and uses only propylene glycol based anti-freeze so handling and disposal of these materials is not a concern. Used oil will also be collected in each bay by a negative pressure hose system with the used oil being transferred to used oil storage tanks in a storage containment area and then handled and disposed of according to Utah and EPA requirements. There will be two separate used oil storage and feed tanks with all used oil from the shop going to one designated tank. Once the storage tank reaches capacity it will be sampled and tested for compliance with applicable EPA standards for waste oil. Any used oil which does not meet used oil specifications will be collected by a license contract disposal firm and hauled off-site for recycling or proper disposal. All petroleum storage tanks will be located within curbed concrete containment areas providing sufficient containment capacity for the entire contents of the largest storage tank within the containment area. Storage tanks, associated piping, and containment areas will be inspected on a regular schedule for any deterioration, damage, leakage, spills, or water accumulations. Any problems will be promptly addressed with repairs, replacement, recovery of spilled product, and removal of any accumulated water. Any water accumulations which contain petroleum residues will either be recovered and transferred to the wash bay sump or will be recovered by a licensed disposal contractor.

Warehouse Facility - The Warehouse facility will provide storage for small equipment parts and operating supplies. The warehouse will be in conjuction with the Shop building. The configuration and layout of the Warehouse is illustrated by Figure 32 through 34, Warehouse & Shop Facility. Larger equipment parts and supplies such as mine timbers, cable, culvert, and roof bolts will be stored in the equipment storage areas and drum lubricants and tires will be stored in a covered storage area near the Maintenance Shop.

Utilities

The proposed mining and related operations will utilize new utility installations including electrical distribution, telephone, potable and raw water, and sewer systems. The proposed underground mining and related surface disturbance activities have been planned, designed, and will be conducted in a manner which minimizes the potential for damage or destruction of utility installations, or disruption of services provided by those utilities existing within the permit area unless otherwise approved by the owner of the utility.

Heat for the buildings will initially be provided by propane, and may be converted to more cost efficient natural gas if it becomes available.

All existing and proposed utility installations are shown on Map 13, Surface Facilities Map. It should be noted that all utilities either are or will be owned, constructed, operated, and maintained by the respective utility companies up to the actual point of service which in the case of electricity will be the main mine substation and in the case of telephone, potable water, and sewer service will be to the metering point which will be located at the mine permit boundary line.

Figure 28 Office - Bathhouse Configuration

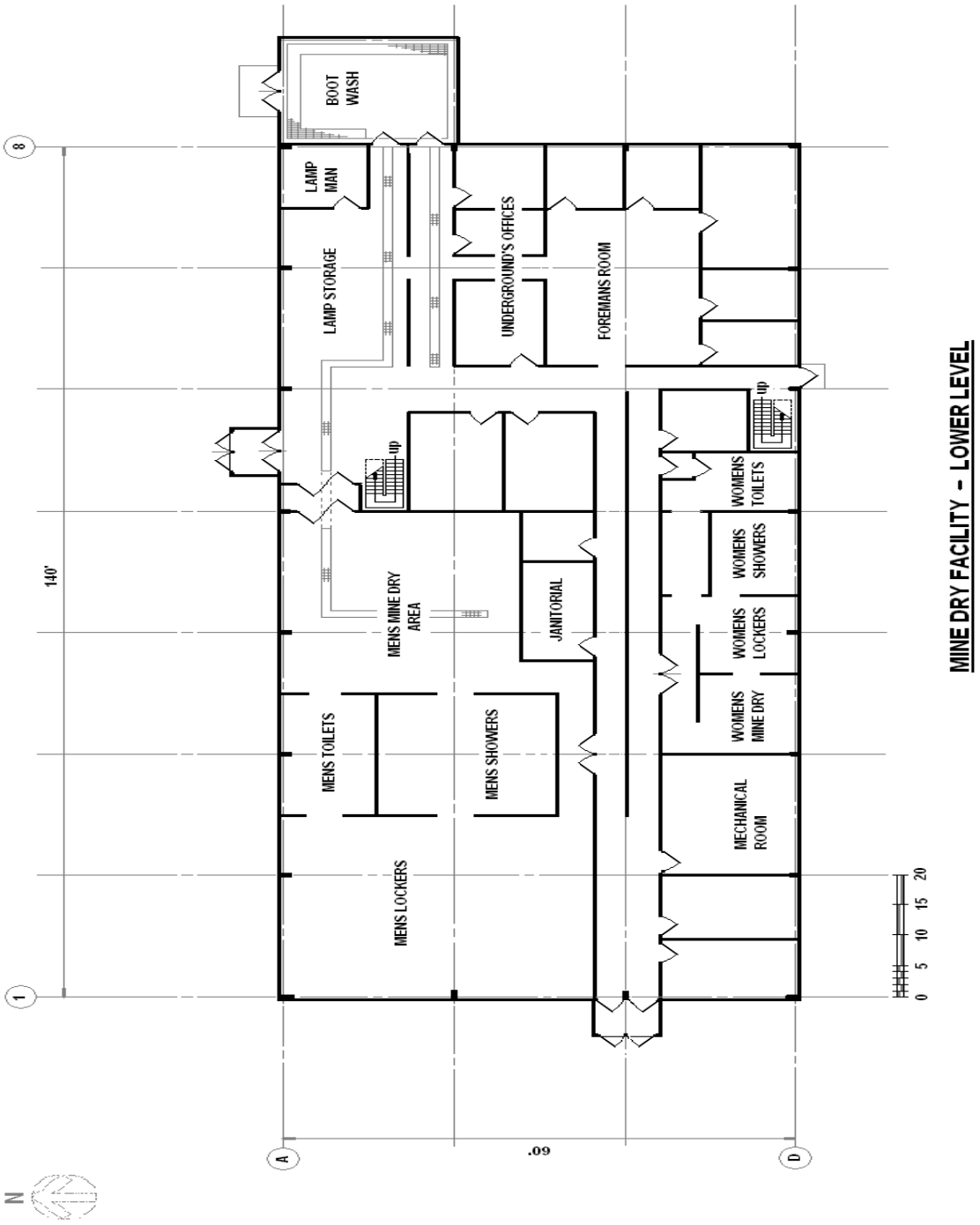


Figure 29 Office - Bathhouse Configuration

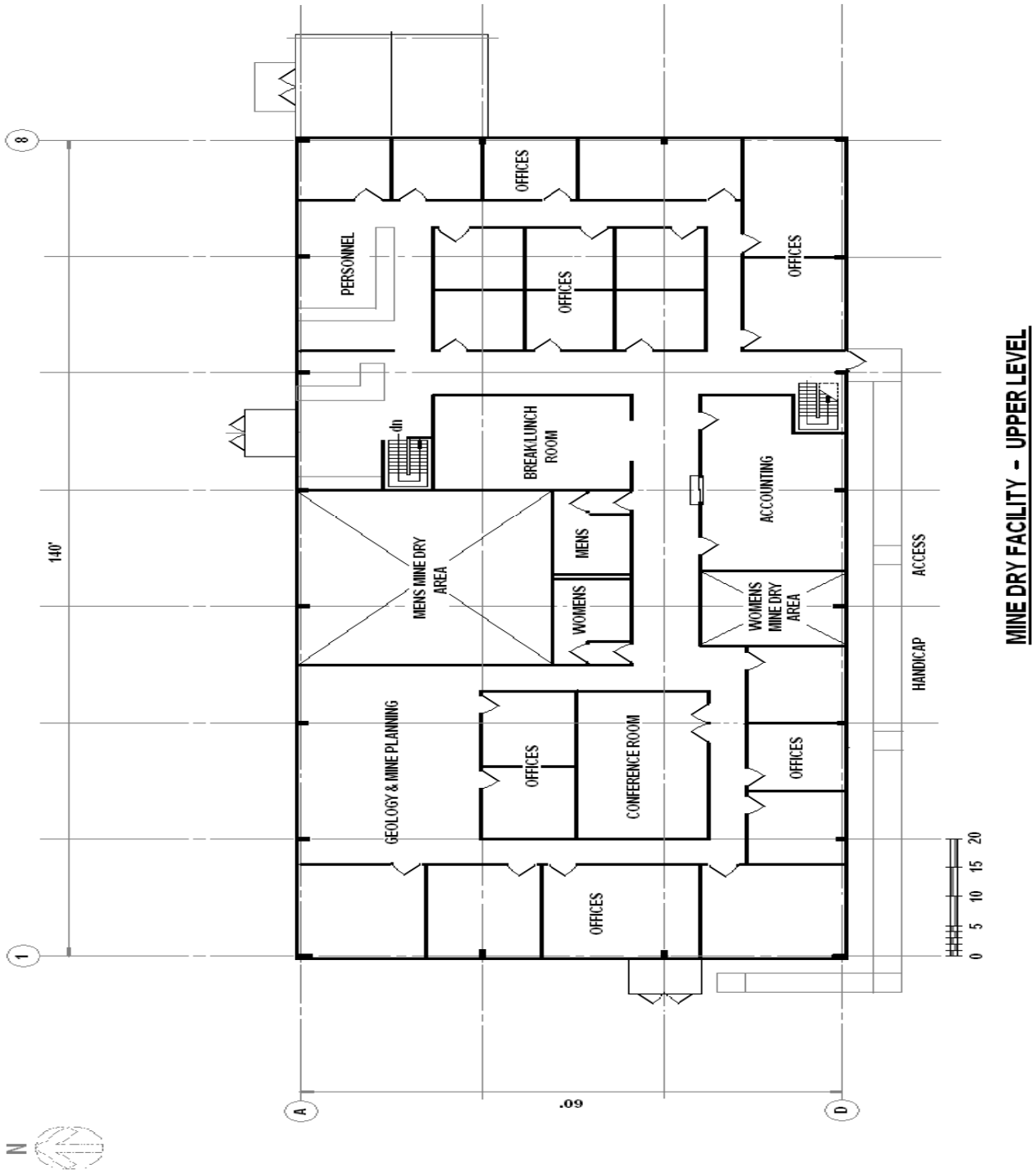
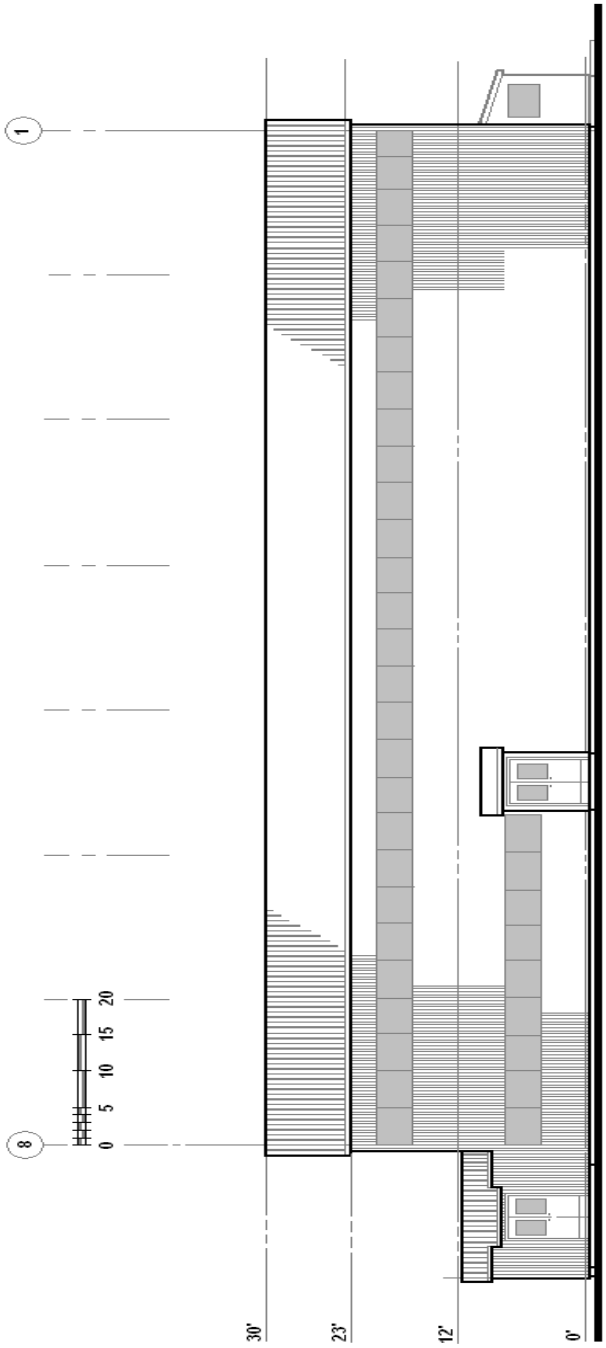
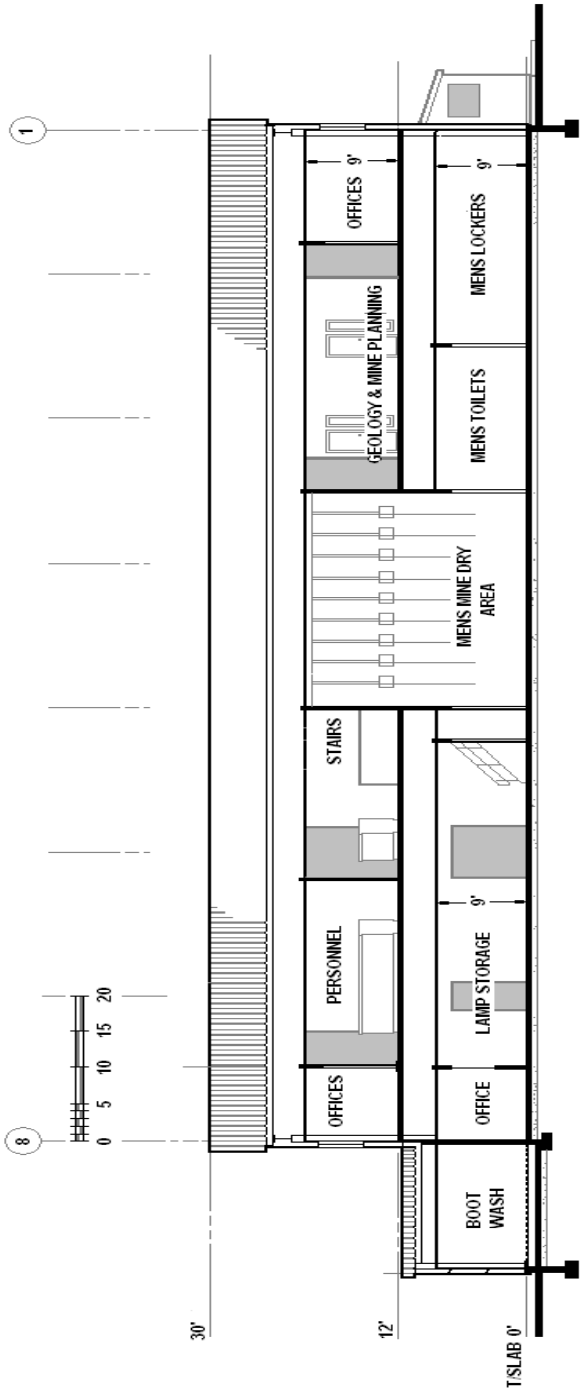


Figure 30 Office - Bathhouse Configuration



MINE DRY FACILITY - NORTH EXTERIOR ELEVATION

Figure 31 Office - Bathhouse Configuration



MINE DRY FACILITY – BUILDING SECTION

Electrical Systems – Electrical power for the mining operation will come from an existing power line running north-south immediately east of the portal area; this power line is shown on Map 11, Regional Surface Ownership Map, and on Map 4, Regional Land Use Map. Electrical voltage will be reduced from the existing power line at a substation located at the Portal Pad as shown on Map 13, Surface Facilities Map. The new substation to be owned, constructed, and operated by PacifiCorp. The mine substation will, in turn, feed the mine fan, the surface coal handling system, the underground mine electrical system, and the other surface facilities.

All proposed electrical components have been designed and will be constructed and operated in accordance with accepted engineering practice and in full compliance with all applicable regulatory provisions. Any new powerlines will be constructed with "raptor-proof" power poles as shown by Figure 22, Typical Raptor-Proof Power Pole Configuration, to minimize the potential for electrocution of raptors and other large birds. All substations, electrical transformers, switchgear, and electrical control components will either be located so that it is not readily accessible to either wildlife or the public or appropriate fences with locked gates or other enclosures will be utilized to limit access to authorized personnel. Where appropriate, signage identifying and warning of electrical hazards will be posted and maintained.

Telephone Lines - Buried or overhead telephone lines will be extended by US West from Highway 96 to provide telephone service for the mine facilities.

Water and Sewer Systems - Potable water, raw water, and sewer connections will be provided by Scofield Town. The connection points for water and sewer to the mine site are shown on Map 13, Surface Facilities Map, and are located at the south side of the permit boundary just south of the Mine Office building.

Mine water and a reserve water storage supply for emergency fire-fighting purposes will be stored in a 50,000 gallon mine water storage tank located near the north end of the Portal pad. This tank and the associated water system will be supplied by Scofield Town. Water supply, use levels, and water rights consideration are addressed in greater detail in R645-301-730, General Description of Hydrologic Protection Plans.

Signs and Markers

CR will post and maintain all required signs and markers in compliance with applicable regulatory provisions of Rule R645-301-521.200. Signs and markers will be constructed of durable materials and will be posted so as to be clearly visible. Mine identification signs listing the name, business address, and telephone number of the permittee and the permit number for the permanent program permit authorizing mining and reclamation operations will be posted at each point of access to the permit area from a public road. Perimeter markers will be posted outlining all areas affected by surface operations or facilities prior to initiation of mining, and soil/substitute stockpiles will be clearly marked for identification and to limit access and potential disturbance. Signs reading "Blasting Area" will be posted along the edge of any blasting area which comes within 100 feet of any public road right-of-way and at the point where any other road(s) provides access to the blasting area. All required signs and markers will be maintained or replaced during the period of active operations, site reclamation, and until final bond release is approved for all areas within the permit boundaries.

Figure 32 Warehouse & Shop Configuration

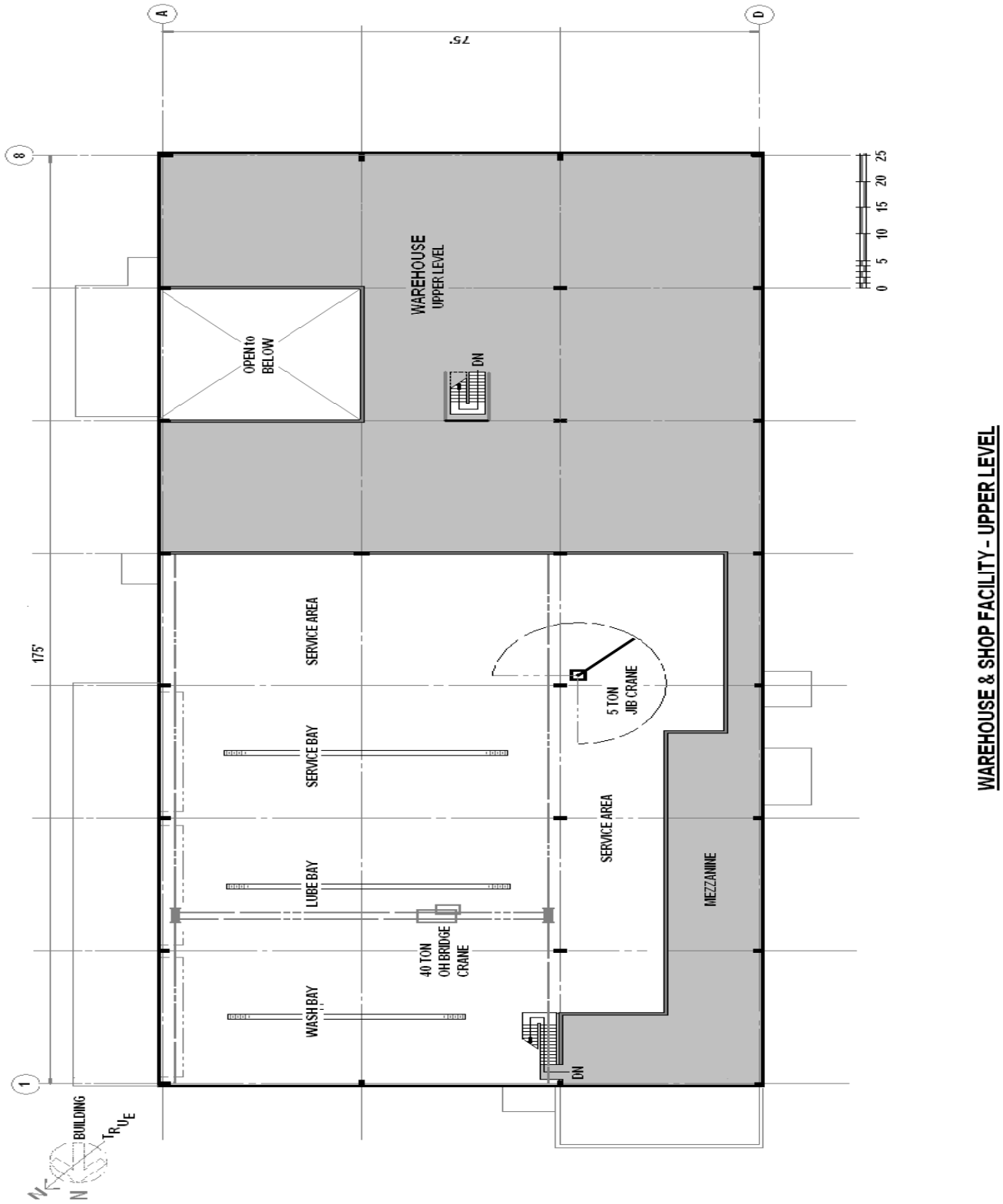


Figure 33 Warehouse & Shop Configuration

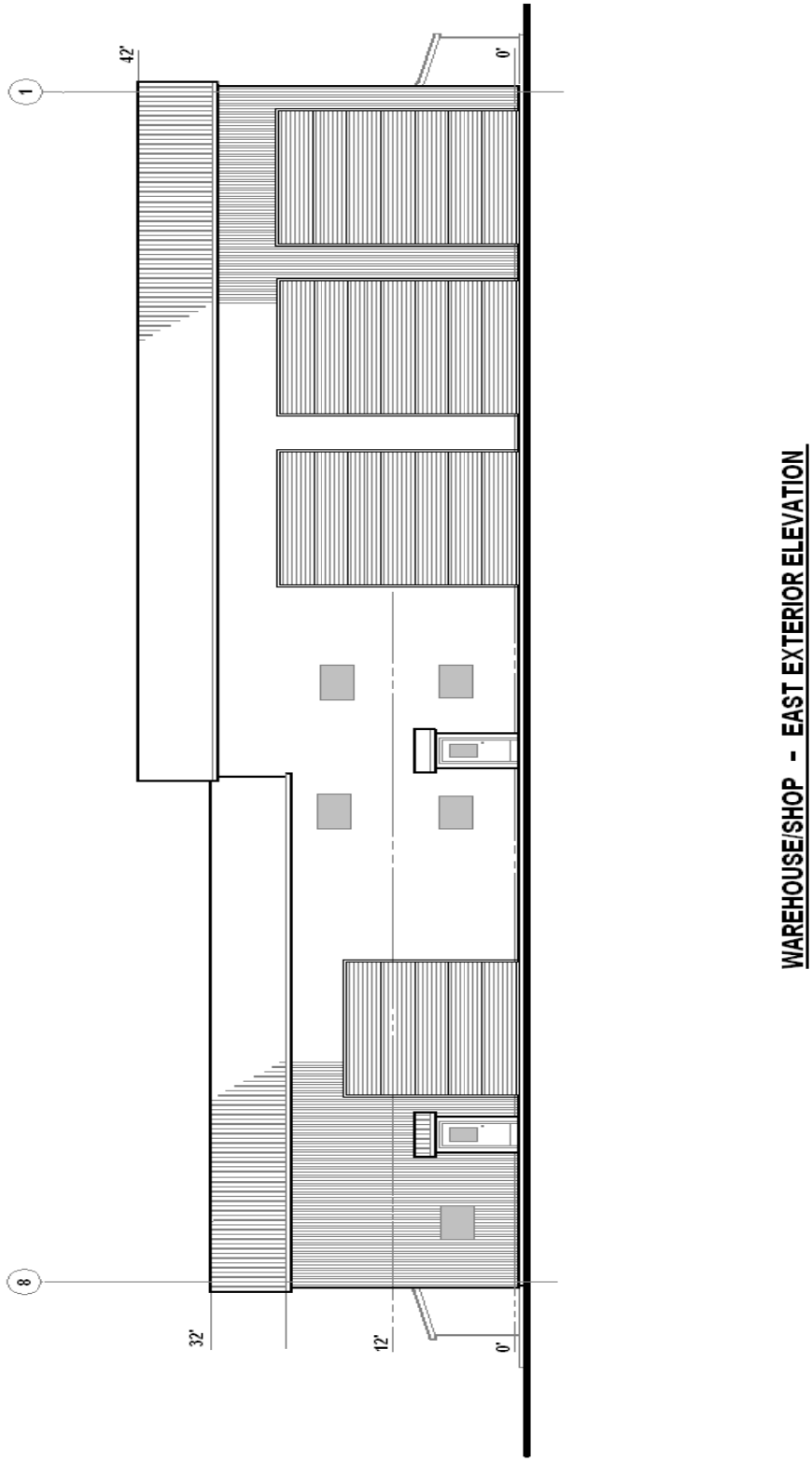
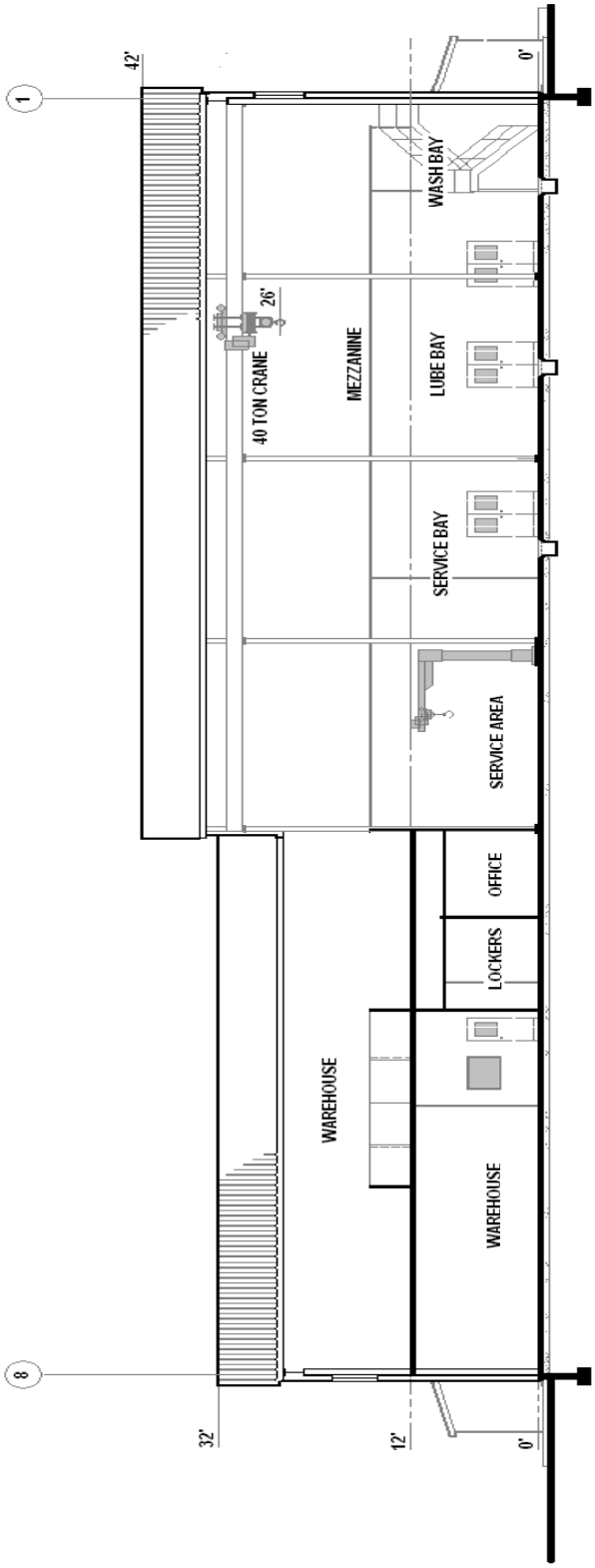


Figure 34 Warehouse & Shop Configuration



528.200 Overburden

See discussion below under 528.321.

528.301 Excess Spoil

See discussion below under 528.321.

528.320 Coal Mine Waste

See discussion below under 528.321.

528.321 Return of Coal Processing Waste to Abandoned Underground Mines

Development rock from underground mining operations activities may be temporarily stockpiled in the portal area and will be periodically loaded into rear dump trucks and hauled to temporary stockpile areas until it can be returned to the mine, where it will be placed in areas specifically designated for this purpose.

Mine development waste consisting of a mixture of rock and coal materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned, however this material may not be saleable as regular coal product due to a high content of rock. The area designated is capable of containing approximately 3,900 tons of material. This material will be sold as a low quality coal product to local coal preparation facilities, or will be deposited in other facilities permitted by the UDOGM.

Development Waste Temporary Storage Area (Underground Development Waste)

Mine development waste consisting of rock with no coally materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned. The area designated is capable of containing approximately 3,900 tons of material. This material will be placed into designated panel areas inside the mine and will serve to encapsulate pillars. This will passively stabilize pillars in those areas with some confinement. Development rock backfill areas will be ventilated until they are filled and have been monitored for products of combustion for a period of 1 year after backfill operations are complete. If no significant products of combustion have been found the area will be sealed and monitored according to an approved ventilation plan.

Mine Development Rock Handling - Several mining and related activities may result in production of significant quantities of mine development rock materials potentially including rock, carbonaceous shale, floor clay, and parting material. Operations which may result in generation of mine development rock will include general mine development, slope/raise development, room development mining operations, and development of overcasts for ventilation or coal haulage. Where mine development rock materials are encountered in mining operations or where the rock materials are integral to the coal seam in development areas or room development mining sections they will be recovered and handled with the coal during mining and coal haulage and will later be removed in the coal handling process. Where it is operationally feasible to separate these materials they will be removed and handled separately using the same equipment and haulage systems that will be utilized for conventional room development operations.

Disposal of Coal Mine Development Rock in Designated Areas Underground - Two special areas have been designated underground as mine development rock disposal sites for the emplacement of mining generated rock (see Map 15, Mine Plan Layout & Production Schedule Map,). Both areas are within practical operating proximity of the rock slope development area and also close to the Surface portal area where Mine Development waste may be temporarily stored as "off-spec" product coal. Disposal Area 1 is the area known as "N13E Panel A" and it is located on the North side of the Portal Mains. It is separated from the adjacent Disposal Area "N13E Panel B" with a 140 ft wide Barrier Pillar which adds to the long-term integrity of the backfill area stability. Both of these disposal areas are strategically located, life of mine fill emplacement areas designed for the emplacement of all types of mine development rock containing or not containing coal. Both areas will be ventilated before, during and after backfill emplacement operations and at all times according to MSHA standards and according to MSHA approved ventilation and roof control plans for the mine.

As discussed previously, mine development waste consisting of a mixture of rock and coal materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned, however this material may not be saleable as regular coal product due to a high content of rock. The area designated is capable of containing approximately 3,900 tons of material. This material will be sold as a low quality coal product to local coal preparaion facilities, or will be deposited in other facilities permitted by the UDOGM.

Mine development, ongoing mining operations, and ancillary operations such as development of overcasts for mine ventilation and coal haulage will result in production of mine development rock including carbonaceous shale, weathered coal, floor clay, and parting material. Where it is operationally feasible to separate these material from the coal during development and mining, the mine development rock will be removed and handled separately from the coal. Where separation is not operationally feasible, mine development rock will be handled with the coal and will be removed in the surface facilities, separated from the coal product and temporarily stockpiled until it can be returned to the mine as discussed previously.

Generally, the same mining equipment and haulage systems used for coal production will be used to remove and handle mine development rock. Continuous miners, electric shuttle cars, and LHD scoops may be used to load and haul mine waste to the mine conveyor system. Normally mine development rock haulage will occur on a scheduled rock handling shift when the conveyor belt system will be cleared of coal. Typically, any development rock produced during periods other than on a scheduled development rock handling shift will be temporarily stockpiled in an inactive area underground for later handling and haulage from the mine. Once the mine rock is placed on a belt at the loading point, it will be transferred to the main haulage belt running from the mine. From the main haulage belt, the mine rock will transfer to the surface coal haulage system which will carry the rock to the primary usher building.

The surface coal haulage system has been designed to facilitate mine development rock handling in two ways:
One; The stacking tube at the off spec coal stockpile can be emptied by a direct feed chute in its base allowing rock to bypass the coal stockpile and feed directly to Conveyor SB-3. In the primary crusher building a flop-gate and diversion chute will allow mine development rock to bypass the primary crusher and feed directly to the truck loadout where it can be transported to a segregated location on the off speck coal pile prior to returning the rock to the mine.
Two; Development rock may simply be dumped onto the off spec coal pile, via the flop gate atop the stacking tube, if circumstances are favourable. That is, if there is sufficient rock volume to warrant temporarily converting the entire off spec coal pile to a temporary development rock storage pile prior to returning the rock to the mine.

528.322 Refuse Piles

No refuse pile is planned for the Kinney No. 2 Mine since no coal preparation plat is planned.

528.323 Burning and Burned Coal Mine Waste

No burned coal is planned to be encountered, however, if any is encountered, a plan for removal will be prepared and approved by the UDOGM and MSHA prior to removal. A plan for extinguishing mine fires will also be approved by the UDOGM and MSHA prior to conducting any mine fire fighting. Only those persons authorized by CR, who have an understanding of the procedures to be used, and are properly trained will be involved in the extinguishing operations.

528.330 Non Coal Mine Waste

Noncoal wastes generated in conjunction with mining and related activities will including but not limited to used oil and lubricants, garbage, paper waste, machinery parts, tires, cable, wood waste, and other miscellaneous debris. All smaller noncoal solid wastes will be collected and stored in dumpsters or similar closed containers. Larger solid waste materials including such items as used equipment, machinery parts, tires, and cable will be temporarily stored in designated sap yards located in areas as shown on Map 13, Surface Facilities Map. Dumpsters will be located primarily near buildings during mine operations, however, during construction they may be located throughout the disturbed area. Used oil will be handled according to Utah State and EPA requirements. Any waste other used oil and lubricants and any used oil not meeting the applicable EPA requirements will be collected and stored in either closed drums or in the waste oil storage tank located in the maintenance shop building. Temporary storage areas for used oil and lubricants will provide full containment to prevent accidental release of petroleum products to the surface drainage system.

CR does not currently plan or anticipate that any materials classified as “hazardous waste” will be utilized or generated in conjunction with the proposed mining and related operations. In the unlikely event that hazardous materials storage or disposal become necessary, CR will comply with all applicable storage, labelling, and documentation requirements, and disposal will occur off-site at a licensed hazardous waste disposal facility.

A contract disposal service will regularly collect and haul the noncoal solid wastes from the dumpsters to the permitted Carbon County municipal landfill, or to the East Carbon Development Corporation (ECDC) facility. Dependent on the market for sap materials, the larger noncoal solid waste and sap will be collected periodically either by a salvage contractor for salvage and recycling or by a contract disposal firm which will haul these material off-site and dispose of it in a suitable disposal site. Any used oil, lubricants, or other potentially combustible materials will be collected and either recycled or disposed of by a licensed disposal contractor in accordance with all applicable Utah and EPA regulations. No noncoal wastes will be disposed of on site during active operations.

528.340 Underground Development Waste

Development rock from underground mining operations activities may be temporarily stockpiled in the portal area and will be periodically loaded into rear dump trucks and hauled to temporary stockpile areas until it can be returned to the mine, where it will be placed in areas specifically designated for this purpose.

Mine development waste consisting of a mixture of rock and coal materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned, however this material may not be saleable as regular coal product due to a high content of rock. The area designated is capable of containing approximately 3,900 tons of material. This material will be sold as a low quality coal product to local coal preparation facilities, or will be deposited in other facilities permitted by the UDOGM.

Development Waste Temporary Storage Area (Underground Development Waste)

Mine development waste consisting of rock with no coally materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned. The area designated is capable of containing approximately 3,900 tons of material. This material will be placed into designated panel areas inside the mine and will serve to encapsulate pillars. This will passively stabilize pillars in those areas with some confinement. Development rock backfill areas will be ventilated until they are filled and have been monitored for products of combustion for a period of 1 year after backfill operations are complete. If no significant products of combustion have been found the area will be sealed and monitored according to an approved ventilation plan.

Mine Development Rock Handling - Several mining and related activities may result in production of significant quantities of mine development rock materials potentially including rock, carbonaceous shale, floor clay, and parting material. Operations which may result in generation of mine development rock will include general mine development, slope/raise development, room development mining operations, and development of overcasts for ventilation or coal haulage. Where mine development rock materials are encountered in mining operations or where the rock materials are integral to the coal seam in development areas or room development mining sections they will be recovered and handled with the coal during mining and coal haulage and will later be removed in the coal handling process. Where it is operationally feasible to separate these materials they will be removed and handled separately using the same equipment and haulage systems that will be utilized for conventional room development operations.

Disposal of Coal Mine Development Rock in Designated Areas Underground - Two special areas have been designated underground as mine development rock disposal sites for the emplacement of mining generated rock (see Map 15, Mine Plan Layout & Production Schedule Map,). Both areas are within practical operating proximity of the rock slope development area and also close to the Surface portal area where Mine Development waste may be temporarily stored as “off-spec” product coal. Disposal Area 1 is the area known as “N13E Panel A” and it is located on the North side of the Portal Mains. It is separated from the adjacent Disposal Area “N13E Panel B” with a 140 ft wide Barrier Pillar which adds to the long-term integrity of the backfill area stability. Both of these disposal areas are strategically located, life of mine fill emplacement areas designed for the emplacement of all types of mine development rock containing or not containing coal. Both areas will be ventilated before, during and after backfill emplacement operations and at all times according to MSHA standards and according to MSHA approved ventilation and roof control plans for the mine.

As discussed previously, mine development waste consisting of a mixture of rock and coal materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned, however this material may not be saleable as regular coal product due to a high content of rock. The area designated is capable of containing approximately 3,900 tons of material. This material will be sold as a low quality coal product to local coal preparaion

facilities, or will be deposited in other facilities permitted by the UDOGM.

Mine development, ongoing mining operations, and ancillary operations such as development of overcasts for mine ventilation and coal haulage will result in production of mine development rock including carbonaceous shale, weathered coal, floor clay, and parting material. Where it is operationally feasible to separate these material from the coal during development and mining, the mine development rock will be removed and handled separately from the coal. Where separation is not operationally feasible, mine development rock will be handled with the coal and will be removed in the surface facilities, separated from the coal product and temporarily stockpiled until it can be returned to the mine as discussed previously.

Generally, the same mining equipment and haulage systems used for coal production will be used to remove and handle mine development rock. Continuous miners, electric shuttle cars, and LHD scoops may be used to load and haul mine waste to the mine conveyor system. Normally mine development rock haulage will occur on a scheduled rock handling shift when the conveyor belt system will be cleared of coal. Typically, any development rock produced during periods other than on a scheduled development rock handling shift will be temporarily stockpiled in an inactive area underground for later handling and haulage from the mine. Once the mine rock is placed on a belt at the loading point, it will be transferred to the main haulage belt running from the mine. From the main haulage belt, the mine rock will transfer to the surface coal haulage system which will carry the rock to the primary usher building.

The surface coal haulage system has been designed to facilitate mine development rock handling in two ways:

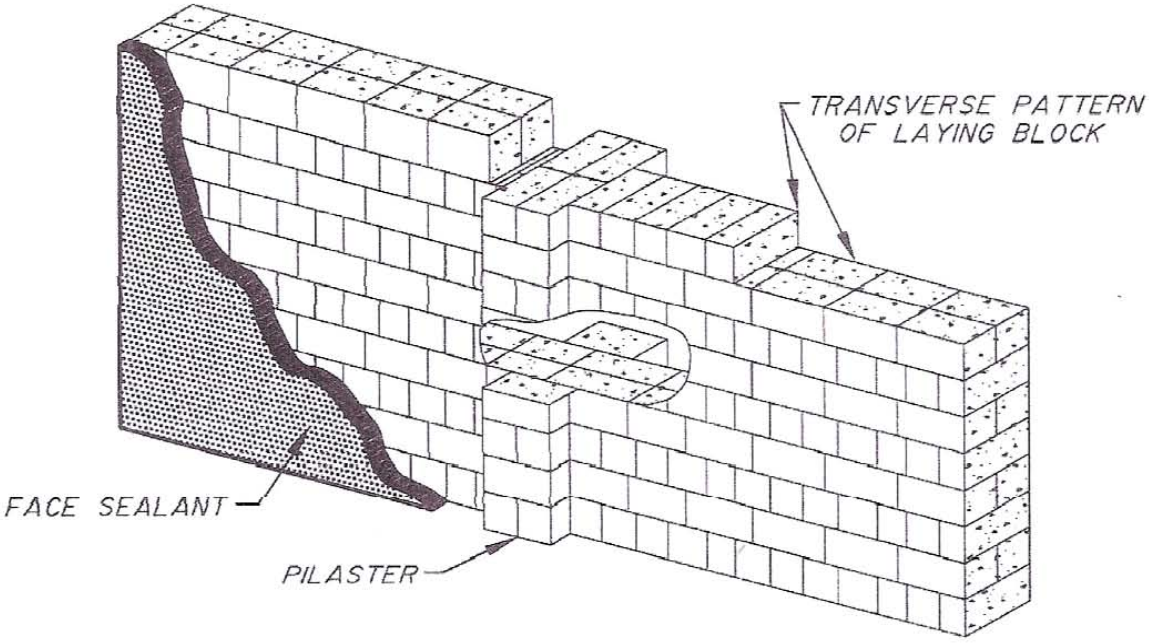
One; The stacking tube at the off spec coal stockpile can be emptied by a direct feed chute in its base allowing rock to bypass the coal stockpile and feed directly to Conveyor SB-3. In the primary crusher building a flop-gate and diversion chute will allow mine development rock to bypass the primary crusher and feed directly to the truck loadout where it can be transported to a segregated location on the off speck coal pile prior to returning the rock to the mine.

Two; Development rock may simply be dumped onto the off spec coal pile, via the flop gate atop the stacking tube, if circumstances are favourable. That is, if there is sufficient rock volume to warrant temporarily converting the entire off spec coal pile to a temporary development rock storage pile prior to returning the rock to the mine.

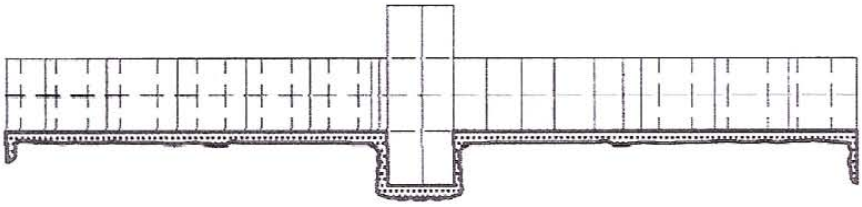
R645-301-529 Management of Mine Openings

On completion of mining and related activities, all mine openings including portals, shafts, raises, boreholes, and wells will be stabilized if required and sealed unless they are to be utilized for ongoing monitoring or in conjunction with the postmining land use. Methods and requirements for sealing wells and boreholes are presented and described in R645-301-630, Geologic Protection Plans.

Current plans call for five underground mine openings (the five main portals). These openings will be permanently sealed on completion of mining to prevent access to the underground workings and, in the case of the mine openings, to provide an effective hydraulic seal to prevent surface drainage and infiltration through the backfill from entering the underground mine workings. Portals will be sealed and stabilized by constructing a concrete block wall approximately 10 to 25 feet in by the portal openings. The two layer thick solid block wall, which will be constructed as illustrated by Figure 37, Typical Portal Seal, will be keyed into the mine



SECTIONAL ELEVATION VIEW



TOP VIEW

NOTES:

1 - 16" X 8" X 8" CONCRETE BLOCKS TO BE USED IN CONSTRUCATION.

2 - PILASTER TO BE USED IF NECESSARY FOR SOLID CONSTRUCATION.

Carbon Resources LLC

KINNEY NO. 2 MINE

TYPICAL PORTAL SEAL

DRAWN BY:	B.G.	DATE: 12/07
APPROVED BY:	G.H.	DATE: 12/07

HANSEN ALLEN & LUCE INC. ENGINEERS

23 S. Carbon Ave., Suite 21
Price, UT 84501

FIGURE 37

entry at least 6 inches on all sides and, for the mine portals, an MSHA approved sealant will be applied to the outer surface of the barrier to provide a positive water seal.

In order to assure the long-term integrity of the mine portal seals, CR, as part of the MSHA roof control plan, will maintain adequate barrier pillars and will utilize appropriate roof support including timber or concrete cribs, posts, roof bolts, trusses, or other supports to minimize subsidence and collapse or caving of the mine workings in the vicinity of the portal seals. Once the portals seals are in place, the remaining void space between the seals and the portal opening will be backfilled using a LHD or small backhoe to assure proper backfill placement.

Portals will be sealed and stabilized by constructing a concrete block wall approximately 10 to 25 feet in by the portal openings. The two layer thick solid block wall, which will be constructed as illustrated by Figure 37, Typical Portal Seal, will be keyed into the mine entry at least 6 inches on all sides and, for the mine portals, an MSHA approved sealant will be applied to the outer surface of the barrier to provide a positive water seal.

In order to assure the long-term integrity of the mine portal seals, CR, as part of the MSHA roof control plan, will maintain adequate barrier pillars and will utilize appropriate roof support including timber or concrete cribs, posts, roof bolts, trusses, or other supports to minimize subsidence and collapse or caving of the mine workings in the vicinity of the portal seals. Once the portals seals are in place, the remaining void space between the seals and the portal opening will be backfilled using a LHD or small backhoe to assure proper backfill placement.

Any old mine portals encountered during construction of the Kinney No. 2 Mine facilities will be sealed using the same plan as discussed above. If any of the portals interfere with planned facilities for the Kinney No. 2 Mine, they will be mitigated using the best technology available. If they interfere to a degree that planned facilities must be modified or relocated, CR will contact the Division and MSHA and develop a mitigation plan, or modify the planned facilities to prevent any hazards, or problems based on approved plans with both agencies as required.

R645-301-530 Operation Design Criteria and Plans for Surface Runoff Controls

531 General

In developing the engineering designs and operating plans for the mining and related operations, CR has reviewed and evaluated all existing available information on site geology, coal occurrence and characteristics, and environmental resource values. This information along with sound engineering principals has been combined to develop designs and plans which will provide for safe, efficient, and effective mining operations while minimizing potential related environmental impacts and effecting full compliance with all applicable regulatory requirements. The following sections describe the specific design methods, operating measures, and associated control and mitigation practices which will be utilized to accomplish these objectives.

532 Sediment Control

Due to the importance of effective water quality protection, required drainage and sediment control structures will be constructed prior to any other significant site disturbance. Drainage construction will be a phased process with construction of the sedimentation pond, and principal undisturbed drainage diversion ditches and disturbed area collection ditches occurring as the first activities in the construction phase. Temporary sediment controls to be utilized during initial construction will include the use of silt fence, straw bales, berms, temporary ditches and sediment traps. Temporary controls will be utilized to effectively control runoff and

sedimentation until designated structures can be completed. As progressive construction activities are extended to other areas, the associated drainage structures will be developed and connected to the existing drainage system prior to other area disturbance.

Detailed descriptions of drainage design and construction procedures are presented in R645-301-526, Mine Structures and Facilities, and the proposed drainage control system is shown on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas. These structures have been designed and will be constructed, operated, and maintained to provide effective drainage and sediment control during both construction/development activities and subsequent mining and related operations. Construction of all drainage and sediment control structures will be monitored by qualified individuals under the supervision of a Registered Professional Engineer and specific designed structures including the sedimentation pond will be inspected according to design plans certified as required by applicable regulatory provisions.

Drainage and Sediment Control Structures

The drainage and sediment control structures which will be constructed and utilized in conjunction with the proposed mining and related activities will effectively route natural drainage through the mine surface disturbance area, intercept and route undisturbed drainage from upslope areas around surface disturbance areas, and collect and route disturbed area drainage to sedimentation structures to allow settlement of suspended solids prior to discharge to the natural drainages. Drainage and sediment control structures required under the proposed plans will include Sedimentation Pond 1, a number of undisturbed drainage diversion ditches, disturbed area collection ditches, drainage culverts, containment berms, and various alternative drainage and sediment control measures including small sediment basins, silt fences, straw bales, and other localized control measures as appropriate. The proposed drainage and sediment control structures are shown on Map 24, Drainage and Sediment Control Plan – Disturbed Areas Map, and design information and calculations are discussed in R645-301-730, Hydrologic Resource Protection and PHC, and the background information and calculations are included in Exhibit 16, Runoff Control Design Details.

Design - The design and location of all required drainage and sediment control structures is based on maximum anticipated storm runoff flows, site topographic conditions, and standard hydrologic design practices and addresses full compliance with all applicable regulatory provisions. Recognizing that the area is subject to relatively high-intensity, short-duration storm events and that due to the rugged terrain and limited vegetation runoff is frequently rapid and concentrated, essentially all structures have been over-designed to provide an additional margin of safety.

The applicable UDOGM regulatory provisions specify that all impoundments must be designed to contain or treat the runoff resulting from the 10-year, 24-hour storm event and that spillways for MSHA ponds must be capable of discharging runoff flows from the 100-year, 6-hour event and non-MSHA ponds must have designed principal and emergency spillways with a combined capability of discharging the 25-year, 6-hour storm event. However these spillways were designed to safely discharge the 100-year, 6-hour event to provide additional safety due to the close proximity of the sedimentation pond to the highway. The applicable regulations also specify that temporary and permanent diversions of miscellaneous flows be designed for the 2-year and 10-year, 6-hour events, respectively and that temporary and permanent diversions of perennial and intermittent streams be designed for the 10-year and 100-year, 6-hour storm events, respectively.

Hansen Allen and Luce, Engineers (HAL) completed a runoff evaluation for representative watershed areas using the Army Corps of Engineers Hydrologic Modeling System (HEC-HMS)

Version 3.1.0 computer modeling software to determine conditions for design of the proposed Kinney No. 2 Mine drainage and sediment control structures. Sedimentation Pond 1 has been designed to contain or treat the runoff from the 10-year, 24-hour storm event and total design capacity includes storage for at least five years accumulation of sediment. The pond spillway structures have been designed to safely pass the runoff from the 100-year, 6-hour storm event. Temporary diversion ditches in disturbed areas are designed to safely pass the peak discharge from the 10-year, 6-hour storm event. All diversions have been designed and will be constructed to remain stable under design flow conditions. All collection ditches have been conservatively sized to carry the peak runoff flows from the 25-year, 24-hour storm event in order to provide a significant margin of safety and accommodate the brief, high-intensity storms common to this area. In order to assure effective collection and routing of disturbed drainage flows and minimize both erosion and sedimentation, required culverts have been sized to safely pass the peak flow from the contributing inlet ditches with a significant factor of safety and culvert inlets, outlets, diversion channels, and those areas where one or more channels intersect have been designed and will be constructed using properly sized and placed riprap or other erosion control materials, as required. In all cases, ditch designs also included an evaluation of the need for channel protection to prevent or minimize erosion. The general criteria for channel protection was any flows greater than or equal to 4 feet per second would require channel protection in the form of riprap or grouted riprap to maintain adequate safety factors. Appropriate riprap sizing was determined using riprap design calculation spreadsheet prepared by HAL. Designs for all required ponds and ditches include adequate freeboard to provide a reasonable margin of safety. Designs for the permanent Kinney No. 2 Mine drainage structures and facilities have been prepared by or under the direction of and certified by a qualified Registered Professional Engineer in accordance with Rules R645-301-742.324. Culvert sizing is consistent with the ditch design basis (i.e., 10-year, 6-hour and 100-year, 6-hour storm flows, respectively for temporary and permanent diversions), the minimum culvert size to be used is 18 inch diameter due to potential clogging and maintenance considerations, however all have been over-designed to provide an additional measure of safety, and culvert installations will include a pre-fabricated inlet structure and riprap protection at both the headwall and discharge points.

In order to assure effective conveyance of undisturbed drainage flows and minimize both erosion and sedimentation, required culverts have been sized to safely pass the peak flow from the contributing inlet ditches with a significant factor of safety and culvert inlets, outlets, diversion channels, and those areas where one or more channels intersect have been designed and will be constructed using properly sized and placed riprap or other erosion control materials, as required. Specific information on culvert design and erosion protection measures is also provided in Exhibit 16, Runoff Control Design Details.

Sedimentation Pond 1 has been designed and will be constructed to meet the following regulatory design criteria:

- Located as close as possible to the disturbed area and out of perennial streams unless approved by the Division
- Provide adequate sediment storage
- Provide adequate detention time to meet applicable effluent standards
- Provide a non-clogging dewatering device
- Minimize short circuiting
- Facilitate periodic sediment removal
- Foundation structures will be stable under all conditions of construction and operation

In addition, Sedimentation Pond 1 design has been prepared by or under the direction of and certified by a qualified Registered Professional Engineer in accordance with Rules R645-301-512.200 and 240.

In all cases, the design basis for the proposed drainage and sediment control structures meets or exceeds the applicable regulatory design requirements. Designs for drainage and sediment control structures, along with a discussion of design assumptions, methodology, and design calculations are presented in R645-301-730, Hydrologic Resource Protection and PHC, and the background information and calculations are included in Exhibit 16, Runoff Control Design Details.

Construction - As previously noted in R645-301-520, General Description of Mine Construction and Development Activities, the required drainage and sediment control structures will be constructed prior to any other significant site disturbance, and as soon as possible in the overall site construction plan. As a first step to construction, a silt fence will be placed at the extreme western edge of all site construction running from the southwest corner of the site adjacent to the highway and adjacent to the old railroad bed from the pre-existing access road into the site running northward to the northwest corner of the site. Construction of required undisturbed runoff diversion ditches and disturbed area collection ditches will involve removal and placement in stockpile of soil or clean soils materials, excavation of the design ditch configuration, placement of riprap and bedding material or geotextile where required, and seeding of ditch sideslopes with the temporary revegetation seed mix. The constructed ditch configuration is illustrated by the typical design configuration figures included on Map 27, Runoff Control Details. Culvert installation will involve excavation and grading of the culvert foundation area, placement and compaction of gravel or similar bedding materials, placement and adjustment of the culvert and inlet structure to the design grade and alignment, placement and compaction of suitable fill materials around and over the culvert, placement of rock protection in the culvert headwall and discharge areas, and installation of debris fences upgradient of culverts where required. Culvert installation practices are illustrated by the typical design configuration figures included in Exhibit 16, Runoff Control Details.

Construction of sedimentation pond impoundments will involve recovery and placement in stockpile of soil or substitute materials, preparation of embankment foundation areas, excavation of impoundment basin areas and construction of embankment structures, installation of principal and emergency discharge structures; grading of embankment outslopes, and seeding of outslopes with the temporary revegetation seed mix to minimize erosion. Impoundments will be inspected at regular intervals during construction and on completion of construction by a professional engineer or specialist experienced in impoundment construction. An impoundment inspection report certified by a Registered Professional Engineer will be provided to UDOGM promptly following each inspection. The report will verify construction in accordance with design plans and will note and discuss any apparent instability, structural weakness, or other hazardous conditions. A copy of the report will be retained on file at the minesite for inspection by authorized agency representatives.

Required foundation preparation will include removal of any vegetative material, coal, potentially acid-forming coal waste, frozen material, or other deleterious materials from embankment foundation areas and excavation of any keyways specified in the design. Embankment construction will involve controlled placement and compaction in horizontally continuous lifts no greater than 12 inches in thickness of suitable embankment fill material. Fill material will not contain any significant quantities of coal, vegetative material, frozen material, or other deleterious materials. Fill will be placed and spread using either tractor scrapers or rear dump trucks and tracked dozers and design compaction of 95 percent of maximum dry density will be achieved by compacting each successive lift with a sheepsfoot or vibratory roller. Compaction will be periodically checked during construction using standard compaction testing procedures and if testing reveals inadequate compaction, the lift or lifts in question will be ripped and reworked until adequate compaction is achieved. During compaction, water trucks may be utilized as necessary to achieve optimal moisture content for effective compaction. The actual construction height for all pond embankments will be 5 percent

greater than the design height to provide for long-term consolidation and settling of the embankment.

Installation of principal and emergency discharge structures will occur at appropriate stages in the embankment construction process. Installation of vertical riser structures will include compaction of an adequate base area for the foot of the riser and installation, alignment, and placement and compaction of fill material around the lower portion of the riser structure. Installation of horizontal discharge structures will involve basically the same construction procedures previously described for culvert installations, including preparation of a base area, placement and compaction of bedding material, placement and alignment of the discharge pipe, and placement and compaction of fill material around the pipe.

Operation and Maintenance - Operation and maintenance of drainage and sedimentation control structures will involve periodic inspection of all ditches and culverts, quarterly inspection and annual certification of impoundments and related structures, ongoing discharge monitoring for all impoundments, and any necessary maintenance or repair of problems noted during the inspections.

Ditches have been designed and will be constructed to provide an adequate cross-sectional flow area to pass runoff flows from the design storm event. During active operations, normal siltation and minor erosion may result in changes in ditch configuration. As discussed previously, however, all ditches have been designed for the 25-year, 24-hour storm event rather than the 2-year or 10-year, 6-hour event as required, therefore, minor siltation will not affect the capacity of the ditches to perform as designed. CR's ditch inspection and maintenance procedures will focus on identification and repair of any significant ditch erosion, removal of any trash or debris from ditches, and maintenance of an adequate cross-sectional flow area, regardless of actual ditch configuration, to pass the design flows. In practice this will mean that CR will not modify, recut, or clean out a ditch simply because the physical ditch dimensions are not the same as the original design or originally constructed configuration so long as the actual ditch configuration is adequate to pass the design flow. Culvert maintenance will involve removal of trash or debris from culvert inlets and any upgradient debris fences, repair of any significant erosion at culvert inlets, outlets, or of the cover material, and repair or replacement of any damaged culverts.

Sedimentation pond maintenance and operation procedures will include ongoing sampling and discharge monitoring under applicable provisions of a UDWQ permit; quarterly inspections of pond embankments, impoundment areas, discharge structures, and inlet/outlet structures and areas and reporting; notification of any hazardous conditions and development of emergency remedial control measures; maintenance or repair of any problems noted during the inspections; and periodic removal of accumulated sediment. The sedimentation pond has been designed and will be operated and maintained to effectively retain storm runoff to allow settlement of suspended solids prior to discharge. Control of potential water quality impacts from pond discharge is monitored through compliance with applicable effluent standards under a UDWQ discharge permit. Effluent sampling and reporting will occur as outlined in R645-301-730, Hydrologic Resource Protection and PHC, and under the provisions of the UPDES permit, a copy of which is included in Exhibit 4, Other Permits.
The sedimentation pond will be inspected quarterly by a qualified person for any indication of structural weakness or other hazardous condition, instability, and any erosion or other problems; the depth and elevation of any impounded water will be measured; based on the depth measurements storage capacity will be estimated; and any required structural monitoring will be performed. Copies of the quarterly inspection reports discussing each of the noted inspection categories and verifying that the pond has been constructed and maintained as designed will be prepared, certified by a qualified Registered Professional Engineer, and submitted promptly to UDOGM. Copies of the inspection reports will also be maintained on file at the minesite. Any

minor problems noted during the inspection will be addressed in a timely manner. This may involve repair of any minor localized erosion, clean-out or minor repair of discharge structures, reseeding of embankment slopes, mowing weeds which may interfere with pond inspection, or other minor maintenance and repair as necessary. If the inspection identifies any structural weakness or other conditions which could pose a hazard to the public, the person who conducted the inspection will notify UDOGM promptly of the hazardous condition and any emergency procedures which may be appropriate to protect the public and address the hazardous condition. In consultation with and with approval from UDOGM, appropriate remedial measures will be implemented as soon as is reasonably practicable to address any hazardous condition.

The pond has been designed to provide adequate capacity for at least three years accumulation of sediments, however, the pond will periodically need to be cleaned out to removed the accumulated sediment in order to maintain adequate stormwater storage capacity consistent with design requirements. A fixed staff gauge in the pond will be used to monitor sediment accumulation. Generally, it is anticipated that the sedimentation pond will be essentially dry during late summer or early fall each year and the gauges will be checked during the corresponding pond inspections. In the unlikely event that the staff gauges cannot be checked during a dry period, an alternative means of monitoring sediment accumulation levels will be utilized.

Before sediment accumulations reach the point where they would encroach on stormwater storage capacity, CR will schedule and implement measures to remove the accumulated sediments. The pond has been designed to facilitate access for pond clean-out with a concrete ramp for equipment access to the pond bottom. The pond will have a reinforced concrete bottom to facilitate cleaning by equipment without damaging the pond integrity. Generally, clean-out would be scheduled during a relatively dry period when any pond water levels would be low. Any water remaining in the pond would be pumped into water trucks for use in minesite dust control. The sediments would be allowed to dry so that they could be readily removed and they would then be removed and transported to a temporary storage area located on one of the mine pad areas until dry, then would be transported into the mine and placed in the areas designated for mine development rock as discussed in R645-301-520, General Description of Mine Plans, Mining Methods, and Related Design Requirements.
Description of Individual Structures - The following sections provide more detailed information for specific drainage and sediment control structures:

Sedimentation Pond 1 - Sedimentation Pond 1, which will be located at the northern end of the mine site, as shown on both Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas, and Map 13, Mine Surface Facilities Map, will be the only sedimentation pond for the proposed mine surface facilities area. The vast majority of disturbed area runoff and minor amounts of undisturbed area runoff from those facilities and areas upgradient from the pond location will be routed to Pond 1. The total contributing drainage area for Pond 1 is approximately 28 acres. The pond has been designed to provide adequate total retention capacity at an elevation of 7686.90 feet of 3.15 acre-feet which includes a 5.3 year accumulation of sediment (1.12 acre-feet) based on sediment discharge modeling for the contributing drainage areas and the 10-year, 24-hour storm runoff (2.06 acre-feet) from the contributing drainage areas. The pond is totally incised and will have only a minimal fill on the west side to even out the surface and provide room for vehicular access around the pond.

Pond 1 is designed with vertical risers (primary spillway and emergency spillway) connected to a horizontal discharge culvert running through the pond embankment and discharging to a culvert crossing beneath Highway 96 and thus to the area west of the highway. One orifice in the primary spillway vertical riser at an elevation of 7683.80 feet, will be used to dewater the pond and discharge stormwater inflows. The top of the riser will be at an elevation of 7686.90

feet, at the invert of the emergency spillway. The orifice outlet will be fitted with gooseneck pipe extension to act as oil skimmer to prevent discharge of any minor amounts of oil or other petroleum products which may enter the pond and the top of the riser will be fitted with a trash rack. The Pond 1 emergency spillway will be a 24 inch diameter pipe, with a crest elevation of 7686.90 feet. The invert elevation of the emergency spillway and pond embankment are designed to provide a minimum freeboard of 2.0 feet. In order to provide access for clean-out and haulage of accumulated pond sediments a primary road (P6) will be constructed from the Loadout Pad to the pond.

Map 25, Sedimentation Pond 1 Sections & Details shows the proposed Pond 1 layout and provides specific pond design information including the primary discharge, sediment storage volume, 10-yr 24-hr runoff volume, 100-tr 6-hr runoff volume, primary and emergency spillways, and pond embankment, and design details for the discharge structures. Figure 35, Pond 1 Stage-Volume Curve shows the stage storage curve; storage capacity information; design elevations for the pond bottom, sediment storage elevation. A detailed description of pond design assumptions and methodology, actual pond design calculations, and additional design information are provided in R645-301-730 Hydrologic Resource Protection and PHC, and the background information and calculations are included in Exhibit 16, Runoff Control Design Details. Pond construction, operation, and maintenance practices will be consistent with the previous descriptions presented in this section. Sedimentation Pond 1 will be a new pond and pond construction will involve both excavation of a portion of the pond basin and construction of a very small compacted fill embankment along the west side to provide vehicular access around the pond.

Alternative Drainage and Sediment Control Measures - Alternative drainage and sediment control measures will be utilized for initial construction activities as discussed in R645-301-520, General Description of Mine Construction and Development Activities, and in areas where the isolated nature of the area or specific site conditions would result in excessive disturbance for full scale drainage and sediment control or where full-scale controls are infeasible. Alternative drainage and sediment controls will be utilized in the following specific areas:

- Initial Construction Areas
- Topsoil Stockpile
- Main Access Road (Primary Road P1), a short section at the entrance from Highway 96

Detailed descriptions of these areas, discussion of the alternative sediment control measures to be implemented, and requests for individual small area exemptions, as appropriate, are included below. It should be noted that alternative sediment controls for road fill and embankment outslope areas will consist of silt fencing and will only be required as a interim control measure until temporary vegetative cover is established.

Initial Construction Areas – Initial construction will be done before runoff controls are possible, therefore alternative controls will be used to control sedimentation off of the site. Controls to be used may include one or more of the controls discussed in R645-301-730, including, silt fencing, straw bales, berms, sediment traps, vegetative filters, mulch, and other effective appropriate drainage controls. Before construction begins, a silt fence will be placed at the extreme western edge of the site running parallel to the old railroad grade and including the area from the existing access road to the site and then running south to the southwest corner of the mine permit area adjacent to Highway 96.

Topsoil Alternative Materials Stockpile - The topsoil/alternative materials stockpile is located adjacent to Highway 96 at the south end of the mine site, where the runoff from the site cannot be routed to the sedimentation pond. Since the stockpile will be vegetated with interim vegetation and should stabilize within a two to three year period, there should be little sediment

loss. Runoff from the stockpile will be controlled by a berm and ditch at it's western edge as can be seen on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas. This ditch and berm will catch runoff and sediment from the face of the stockpile. A sediment trap, with silt fence, or straw bale outlet from the lowest point of the berm near the highway culvert will filter any runoff from the pile prior to flowing into the end of the highway culvert.

Main Access Road - Primary Road P1 – A short section of the access road approximately 115 feet long from it's intersection with Highway 96 eastward to a cattle guard cannot be routed to the Sedimentation Pond 1. Runoff from this small road section will be controlled by ditches and sediment traps on each side of the road as shown on Map 24. Drainage and Sediment Control Plan – Disturbed Drainage Areas. A silt fence, or straw bale outlet from the sediment traps will catch any overflow from the traps prior to discharge into the highway side ditches.

533 Impoundments

As discussed above Sediment Pond 1 will contain all runoff from the mine site. It has been designed to meet a minimum 1.3 static safety factor and all other provisions of this regulation. Since the pond is totally incised, with no dam, or embankment, it does not meet either the NRCS TR-60, or the MSHA 30 CFR criteria of being a major dam or impoundment. The small water storage capacity of the pond also disqualifies it from meeting both criteria.

533.110 Static Safety Factor

RB&G Engineering, Inc conducted a safety factor analysis of the sediment pond. The following is included in Adendum No. 1 to the Geotechnical Investigation dated November 26, 2007:

"Stability analyses were performed for the proposed Detention Pond for both Steady State and Sudden Drawdown conditions. The below ground pond was modeled with cut slopes of 3 horizontal to 1 vertical, extending 15 feet below the existing ground surface. It was assumed that the foundation soils will consist of native lean sandy clay. If fill is encountered in the excavation, it has been assumed that the cut will be over-excavated a distance of at least 10 feet into the side slope, and that this zone will be replaced with engineered fill as recommended in Section V.I. – Detention Pond. For the sudden drawdown condition, the phreatic surface was modeled to be within one foot of the slope surface 10 feet down-slope of the crest, exiting at the toe of the slope after full drawdown."

"A factor of safety of 3.37 was obtained for the Steady State condition. For the Sudden Drawdown condition, the factor of safety reduces to 2.3."

Refer to Exhibit 14, Geotechnical Investigations for a complete copy of the Geotechnical Investigation and Adendum No. 1 dated September 28, 2010.

534 Roads

In conjunction with the proposed mining and related operations CR will construct, operate and maintain a number of new roads and will operate and maintain several existing roads. Both new and existing roads will be utilized to access existing and proposed facilities and for transportation of personnel, equipment, and supplies. All roads are classified as primary roads. The primary road classification includes any road used for transporting coal or spoil, roads which are used frequently for periods exceeding 6 months, and roads which will be retained to support the postmining land use. All roads will be utilized on a frequent, long-term basis to support the

proposed mining and related operations. Proposed roads which will be used in conjunction with the proposed mining and related operations include the following:

Proposed Roads in Kinney No. 2 Mine Facilities Area

PR-1 Primary mine access road for the proposed surface facilities area
PR-2 Primary mine access road to Mine Office Pad
PR-3 Primary mine access road to the Portal Pad
PR-4 Primary mine access road to the Storage Area Pad
PR-5 Primary mine access road to the Loadout Pad
PR-6 Primary mine access road to Sedimentation Pond No. 1
PR-7 Primary mine access road to the North Access Road

All proposed roads are shown on, Map 13, Surface Facilities Map. Road profiles can be seen on Maps 20 through 22, Mine Surface Facilities Road Profiles.

Design and Construction - All roads have been or will be located and constructed to the extent operationally feasible in the most stable areas available and outside of the channel of intermittent or perennial streams. Road design and construction plans will prevent damage to public or private property; minimize the potential for downstream flooding or sedimentation; reflect consideration of the size of vehicles which will be using the road, traffic volume, and normal speeds; and to the extent possible, using the best technology currently available, minimize adverse impacts on fish, wildlife and related environmental values.

All roads have been designed to provide for effective drainage, long-term stability, and safe vehicle operations under varying weather conditions. Design and construction of all primary roads will be certified by a qualified Registered Professional Engineer as meeting these criteria. All roads will meet MSHA safety requirements including either a berm or guard rail on the outside edges where the slope is downward.

Design and construction practices for specific roads will be dependent primarily on site conditions and the nature and frequency of anticipated use. The primary mine access road (PR-1) will provide access to the mine surface facilities and will be utilized for transportation of personnel, equipment, coal, and supplies. Because it will handle a relatively heavy traffic volume and must provide safe operating conditions year-round, Road PR-1 will be a paved asphalt road with all-weather travel surface from Highway 96 to the Shop-warehouse building. Primary Road P2 will also be paved to the Mine Office building; in addition, the Mine Office Pad will be paved. The other primary roads will also be utilized on a year-round basis but the associated traffic levels will be significantly lower so these roads have been designed and will be constructed with an adequate compacted road base and gravel or similar durable granular surfacing.

Road construction will involve cut and fill earthwork operations using tractor scapers, trackhoes, tracked dozers, and motor graders. No potential acid or toxic-forming materials will be utilized in road construction or as road surfacing materials. Cut and fill slopes will be established at maximum grades up to 0.8H:1V, with the steepest grades in rock dependent on the characteristics of the rock in conjunction with the geotechnical recommendations found in Exhibit 14, Geotechnical Investigations. Typical road construction practices, road configuration, and dimensions are illustrated by Figure 25, Typical Primary Road Configuration. Road gradients will vary from flat to a maximum of approximately 14.5% percent for the main roads and any required road embankments will be constructed and compacted in a controlled manner to provide a minimum static factor of safety of 1.3. Only one road (P6), which accesses Sediment Pond 1 has a gradient above 14.5%, at 18.8%. This road will be used on a limited basis to access and clean out the sediment pone. All road cut and fill slopes will be revegetated as soon as

reasonably practical following construction using the temporary revegetation seed mixture to stabilize the slopes and minimize erosion potential. Road surfaces will be graded or owned to prevent accumulations of water on the road surface and adequately sized ditches and culverts will be installed and maintained to effectively carry road and other disturbed area drainage. Adequate cover will be provided over all culvert crossings to prevent damage or collapse of the culverts and culverts have been designed and will be installed to prevent plugging, erosion at the culvert inlet or outlet, and any drainage over the road surface. The locations of all proposed ditches are shown on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas Map, and ditch designs are included in R645-301-730, and in Exhibit 16, Runoff Control Design Details.

Operation and Maintenance - Operation and maintenance procedures for all mine roads are designed to provide a smooth operating surface, assure safety, and minimize dust emissions. Road maintenance will involve periodic grading to provide a smooth surface, remove rocks or debris, and maintain effective drainage; repair and resurfacing as necessary; inspection, clean-out, and repair of ditches and drainage structures; and watering or application of surfactants to control dust during dry periods. Generally, speeds on roads and in active operating areas will be limited to 15 miles per hour by posted speed limits both as a safety consideration and to minimize dust emissions from unpaved roads. In the unlikely event that any road is damaged by a catastrophic event such as an earthquake or flood, CR will make appropriate repairs as soon as reasonably practicable and will limit the use of the road or provide an alternate access if unsafe conditions exist.

Description of Individual Structures - The following sections provide more detailed information for specific roads and associated structures:

Primary Road P1 will receive the most traffic, therefore it will be paved. The road will be crowned in the center with drainage flowing to the sides in both directions. The purpose of the cattle guard is not to control cattle, but to provide a drainage trench to catch runoff containing fines from the road, preventing them from being washed downgradient on the road and bypassing Sedimentation Pond 1. Below the cattle guard, drainage from the road will flow to ditches and sediment traps on both sides of the road as shown on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas. For the remainder of Primary Road P1, the design will be as shown on Figure 25, Typical Primary Road Configurations for sloping terrain and level terrain.

All other roads will be constructed as shown on Figure 25, Typical Primary Road Configurations for sloping terrain and level terrain.

534.130 Static Safety Factor for Roads

The Geotechnical Investigation, dated November 26, 2007 states on page 17 of 17,

"It is anticipated that fill slopes will be created with on-site materials. If this material is placed and compacted in accordance with recommendations provided in Section IV, fill slopes as steep as 1.5H:1V will have a factor of safety of at least 1.3 if constructed of the native clayey soils. Fill slopes shown on Sections A-A, B-B, and F-F will likely be constructed of this clayey on-site fill. Test pits in the vicinity of the fill areas shown on Sections C-C, D-D, and E-E encountered significant amounts of medium-dense silty sand. Fill slopes as steep as 1.8H:1V constructed of this silty sand material have a computed factor of safety of at least 1.3. Plots of stability analyses for typical fill slopes are included in the appendix."

In Addendum No. 1 to the Geotechnical Investigation, dated September 28, 2010, RB&G Engineers, Inc states,

"Note that the Direct Shear test on the sample of sandy lean clay which had a friction angle of 20 degrees also had cohesion of 15 psi. Two Triaxial Shear tests performed on samples of the lean clay had total stress friction angles of 29.6 and 32.5 degrees with 2 psi cohesion and effective stress friction angles of 36.0 and 36.7 egrees with 2 psi cohesion."

536 Coal Mine Waste

No coal preparation plant is planned for the Kinney No. 2 Mine, and therefore there will be no coal processing waste generated requiring disposal or storage.

Development rock from underground mining operations activities may be temporarily stockpiled in the portal area and will be periodically loaded into rear dump trucks and hauled to temporary stockpile areas until it can be returned to the mine, where it will be placed in areas specifically designated for this purpose.

Mine development waste consisting of a mixture of rock and coal materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned, however this material may not be saleable as regular coal product due to a high content of rock. The area designated is capable of containing approximately 3,900 tons of material. This material will be sold as a low quality coal product to local coal preparaion facilities, or will be deposited in other facilities permitted by the UDOGM.

Development Waste Temporary Storage Area (Underground Development Waste)

Mine development waste consisting of rock with no coally materials will be temporarily stored at an area on the loadout pad as shown on Map 13, Surface Facilities Map. This material is not coal processing waste since no coal preparation plant is planned. The area designated is capable of containing approximately 3,900 tons of material. This material will be placed into designated panel areas inside the mine and will serve to encapsulate pillars. This will passively stabilize pillars in those areas with some confinement. Development rock backfill areas will be ventilated until they are filled and have been monitored for products of combustion for a period of 1 year after backfill operations are complete. If no significant products of combustion have been found the area will be sealed and monitored according to an approved ventilation plan.

537 Regraded Slopes

Slopes have been designed according to the recommendations contained in Exhibit 14, Geotechnical Investigations.

537.100 Geotechnical Analysis

A geotechnical analysis was performed and the results are included in Exhibit 14, Geotechnical Investigations

537.200 Settled and Revegetated Fills

N/A – No spoil, or development waste will be used for fills.

R645-301-540 Reclamation Plan

R645-301-541 General

This section presents and describes reclamation plans and practices to be used to restore disturbed areas resulting from mining and related activities to productive self-sustaining use. Information in this section was developed in accordance with applicable regulatory requirements (R645-301-500) for coal mine permitting in the State of Utah.

541.100 – 300 Reclamation of All Areas

Reclamation will be an integral part of the Kinney No. 2 Mine mining and related activities, however, because the mine will be an underground mine and the surface facilities and related surface disturbance areas will remain in place until the end of the mine life, mining and reclamation will not occur concurrently or, in the case of progressive mining activities, sequentially. Reclamation of surface disturbance areas will generally occur following the cessation of mining operations to complete the mining and reclamation cycle although CR will implement temporary stabilization measures in certain areas following initial construction or during ongoing operations.

Objectives of the planned reclamation activities will be twofold; 1) For construction disturbance, temporary stabilization and contemporaneous reclamation will serve to stabilize disturbance areas, minimize erosion, and limit potential surface water impacts; 2) For long-term use areas, final reclamation is designed to restore disturbed areas to a safe, stable condition and to reestablish the productivity of the land consistent with the postmining land uses. The proposed postmining land uses of wildlife habitat, Carbon County Zone "Water Shed", and Commercial use on the Scofield Town portioon reflects the predisturbance use of this and adjacent areas, existing land use plans and policies, the desires of affected surface landowners, and practical constraints relative to land use capability and condition. Specific land use considerations and constraints are discussed in R645-301-410, Land Use Information. The Kinney No. 2 Mine reclamation plan has been designed to successfully meet these objectives and will result in effective temporary stabilization, and a postmining configuration which blends with the surrounding terrain and provides environmental values consistent with or superior to those which existed prior to mining.

The Kinney No. 2 Mine reclamation plan has been developed utilizing available information on the existing environmental resources as described in R645-301-200, 300, 400, 600, and 700 Environmental Information. In addition, CR has incorporated both available information on current successful reclamation technology and practices and their extensive operating experience in the area. While the plans presented in this permit represent what CR feels to be the most effective reclamation practices for this site, it is important to note that successful reclamation must be a dynamic process, incorporating new information to optimize overall effectiveness. In order to meet the reclamation objectives these plans may be modified as appropriate to reflect changing conditions, revised regulatory requirements, advances in reclamation technology, and the results on ongoing research and experience relative to the long-term effectiveness of various reclamation practices. Any modification of the plan will be submitted to the UDOGM for approval and will be changed in the permit as required. Any future plan modifications will involve a logical sequence of activities designed to achieve the overall reclamation objectives in an organized progressive manner. The following represent the general steps for reclamation of any mine or mine related surface disturbance areas:

- Facility Demolition and Removal
- Stabilization and Sealing of Mine Openings

- Disposal of Non-Coal Wastes, and Mine Waste Materials
- Backfilling and Grading to Establish the Final Design Configuration
- Drainage Reestablishment
- Road Removal
- Removal and Reclamation of Sedimentation Ponds and Associated Structures
- Soil/Substitute Replacement
- Revegetation
- Soil and seed stabilization
- Post-Reclamation Management, Maintenance, and Monitoring
- These activities are discussed in detail in the following sections.

R645-301-542 Narrative, Maps, and Plans

This section describes the reclamation plans and maps.

542.100 Timetable

The specific reclamation plans developed for the Kinney No. 2 Mine area and the proposed reclamation practices reflect the overall reclamation objectives, site specific conditions and constraints, and the best current reclamation techniques and methods. The following sections describe the timing and sequencing of reclamation activities, general reclamation requirements, and specific reclamation practices.

CR will reclaim mining related surface disturbance areas as soon as operationally practicable following completion of mining and related activities. For construction related disturbance, this commitment translates into regrading, establishment of effective drainage and sediment control, and temporary vegetation of the disturbed areas to stabilize these areas and prevent erosion or uncontrolled runoff.

With the exceptions of temporary stabilization of construction disturbance, other mining related disturbance areas are expected to remain in a disturbed condition until after the completion of mining and related activities. Reclamation of mine surface facilities areas following completion of mining will be initiated as soon as operationally feasible after mining ceases and no later than the next normal field season (typically May through October). It is anticipated that final reclamation would be completed within 24 months from the time the last coal is either produced or shipped from the property, whichever is later. Figure 36, Reclamation Timetable - Mine Facilities Area, outlines the specific sequence and anticipated timing of final site reclamation activities.

From a hydrologic standpoint reclamation must be completed in phases which include initial, interim and final reclamation. Initial reclamation will include the removal of all temporary surface runoff control facilities as illustrated on Map 24, with the exception of the following specific structures which will be utilized and or removed during interim and final reclamation.

Interim Reclamation

Ditches UDD-1 & UDD-2 Remain
Ditches DE-3 and DE-4 Remain
Ditch UDC-2 Remains
Culvert CP-2 Remains
Sediment Pond 1 Remains
Sediment Pond 1 Access Road Remains
Post Mining Land Use Road Remains
Road adjacent to Ditch UDD-1 remains as it belongs to private property owner E.G

Telonis ETAL
Re-establish the irrigation ditch

Final Reclamation

Remove Ditches DE-3 and DE-4
Remove Sediment Pond 1
Remove Sediment Pond 1 Access Road
Ditch UDD-1 Remains
Ditch UDD-2 Remains
Ditch UDC-2 Remains
Culvert CP-2 Remains
Riprap Energy Dissipation Fan Remains
Post Mining Land Use Roads Remain as access to private property north and east
Road adjacent to Ditch UDD-1 remains as it belongs to private property owner E.G Telonis ETAL

Final reclamation will involve removal of all mine related structures and facilities, closure and sealing of portals and mine openings, disposal of waste materials, backfilling and grading, drainage reestablishment, road removal, removal of Sediment Pond 1, placement of soil or substitute materials, revegetation, and soil stabilization. Generally, soil/substitute replacement and revegetation efforts will be coordinated so that soil materials are revegetated as soon as practically possible following placement.

Following final reclamation of mine facilities areas, the facilities to remain for postmining land use include the roads, ditches and culverts shown on Map 29, Postmining Topography and Interim Drainage Control Map. Interim drainage and sediment controls during the post-reclamation liability period will include alternative sediment control methods as the primary means of controlling erosion and sediment contributions. The Postmining Topography and Interim Drainage Control Map (Map 29), shows the drainage and sediment control features which will be retained during the reclamation liability period. Components of the interim drainage and sediment control plan are identified and discussed in detail in R645-301-730, Hydrologic Resource Protection and PHC. Upon receipt of a determination of final reclamation success and bond release from UDOGM for vegetation reestablishment and drainage restoration, the alaternative controls will be removed. The alternative sediment controls will be installed prior to any reclamation activities and serve as a protective barrier at the lowest point of the disturbed area. The alternative sediment controls will remain in place during backfill/regrading operations, placement of soil material, reseeding, and re-establishment of vegetation as discussed above.

542.200 Backfilling and Regrading

Information presented on the reclamation maps and cross-sections includes:

- Anticipated final surface configuration
- Postmining drainage features
- Location of any structures and facilities which will be retained as permanent structures following the completion of mining
- Any roads to be retained in conjunction with the postmining land use.

Additional discussions of the reclamation process and work is presented to follow:

542.300 Final Surface Configuration Maps & Cross Sections

542.400 Removal of Temporary Structures

542.500 Timetable for Removal of Water Impoundments

542.600 Roads

542.700 Final Abandonment of Mine Openings & 5-49 Disposal Areas

The above regulations, R645-542.300 through R645-542.700 are addressed as follows:

Beyond the general reclamation objectives of restoring disturbed areas to a safe, stable condition and reestablishing the productivity of the land consistent with the postmining land uses, this reclamation plan is designed to achieve the following specific operational and environmental objectives:

- Removal of Mining Related Structures and Facilities
- Eliminate Potential Hazards
- Establish a Stable Postmining Configuration
- Restore Effective Drainage
- Establish a Productive Self-Sustaining Vegetation Community

The following sections briefly describe important considerations and the rationale behind each of these specific objectives.

Establish a Stable Postmining Configuration

Following removal of mining related structures and facilities and closure and sealing of portals and mine openings the associated surface disturbance areas will be backfilled and regraded to establish a stable postmining configuration which blends with the surrounding terrain, provides for effective drainage, and is consistent with the postmining land use of wildlife habitat. Given that approximately 74% of the proposed disturbance area has been previously disturbed by pre-SMCRA mining, backfilling will be limited to the materials available consistent with applicable remaining provisions of the State of Utah Coal Mining Rules (R645-301-553.500 through 524). To the extent possible using all available material disturbed areas will be backfilled and regraded to blend with the surrounding terrain, and any exposed coal seams will be covered with a minimum of 4 feet of suitable cover material. The highwall remnant remaining at the pre-SMCRA Columbine Mine portal face-up area will be partially disturbed by the Kinney No. 2 Mine operations. This portal area was partially reclaimed by the UDOGM Abandoned Mine Reclamation Program in the 1980's. The south end of the old face-up area will be disturbed by Kinney No. 2 Mine operations but this disturbance will only include a small portion of the old face-up disturbance and will not result in a new highwall. This new disturbance will be reclaimed to the approximate original contour as it exists at the beginning of the Kinney No. 2 Mine construction.

Restore Effective Drainage

In conjunction with final backfilling and regrading activities, permanent drainage features, designed to pass the peak flows from the 100-year, 6-hour event, will be established to effectively pass natural drainage through the reclaimed areas and provide for effective control of runoff from reclaimed areas while minimizing the potential for any significant erosion. The final configuration of the drainages will be essentially the same as the pre-mining condition as can be seen on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control Map.

Establish a Productive Self-Sustaining Vegetation Community

Consistent with the postmining land use of wildlife habitat and Carbon County land use of Watershed, CR will reestablish a self-sustaining vegetation community composed primarily of indigenous native species but also including adaptive introduced species as appropriate to provide for rapid reestablishment, productivity, and species diversity. Activities related to vegetative reestablishment will include replacement of available soil or substitute materials, addition of any necessary soil amendments, seedbed preparation, seeding with the appropriate revegetation seed mixture, and application of mulch or other erosion control materials to minimize erosion and provide an opportunity for initial vegetative establishment.

Hydrologic Monitoring

CR will continue its comprehensive program to monitor surface and groundwater quality and quantity over the duration of the proposed reclamation operations and through the extended liability period. Postmining hydrologic monitoring activities are outlined in R645-301-730, Hydrologic Resource Protection Plan and PHC. The reclamation phase monitoring compliance list is presented in Table 20, Hydrologic Monitoring Schedule.

CR currently maintains, and will continue, a program to monitor surface and groundwater quality and quantity for the duration of the proposed mining, processing, and reclamation operations. The Hydrologic Monitoring Plan consists of monitoring stations identified in Tables 6, Kinney No. 2 Mine Baseline Monitoring Stations, and 3.7-2, Kinney No. 2 Mine Operational Monitoring Stations, according to the parameter sampling schedule shown in Table 20, Hydrologic Monitoring Schedule. Baseline monitoring has been conducted as discussed in Chapter 7. Operational monitoring is planned to be conducted on a quarterly basis as follows.

Samples will be collected quarterly for parameters shown in Table 20, Hydrologic Monitoring Schedule, for all surface and ground water stations when the sites are accessible. At some sampling sites, winter conditions may create inaccessible or unsafe conditions. To help ensure as complete a data set as possible, first and fourth quarter samples will be collected during the time periods wherein there is the greatest likelihood of collecting a valid sample. This is believed to be in March and October respectively. Second and third quarter samples will be collected at a convenient time for the mine operator within the respective quarter.

RECLAMATION TIMETABLE

RECLAMATION ACTIVITY	QUARTERS FOLLOWING COMPLETION OF MINING RELATED ACTIVITIES																																															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Facility Demolition & Removal		■	■	■	■	■	■																																									
Stabilization & Sealing of Mine Openings	■	■	■	■	■																																											
Disposal of Non-Coal Wastes, and Mine Waste Materials				■	■	■																																										
Backfilling & Grading to Establish Final Design Configuration					■	■	■																																									
Drainage Restablishment						■	■	■																																								
Road Removal					■	■	■	■	■																																							
Soil/Substitute Replacement						■	■	■	■																																							
Revegetation							■	■	■	■	■	■	■																																			
Post-Reclamation Management, Maintenance & Monitoring						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■						
Removal of Temporary Controls- silt fences & straw bales																																										■	■	■			

DATE: 12/07	Carbon Resources LLC		FIGURE 36
DRAWN BY: B.G.	KINNEY NO.2 MINE		
APPROVED BY: G.H.	RECLAMATION TIMETABLE		
SCALE: N/A	MINE FACILITIES AREA		

The monitoring program thus instated serves as an integral part of CR's efforts to protect the hydrologic balance by providing an accurate and timely method of identifying and quantifying any possible concerns with respect to surface and ground water resources. The monitoring network is shown on Map 28, Surface and Ground Water Monitoring Sites. Table 6, Kinney No. 2 Mine Baseline Monitoring Stations, and Table 7, Kinney No.2 Mine Operational Monitoring Stations, when combined with Map 28, summarizes the type and location of monitoring sites. The frequency, density and accuracy of monitoring will allow CR to evaluate and determine the success of mine plans, drainage and sediment control facilities, and reclamation for the purpose of minimizing disturbance to the hydrologic balance. The monitoring data and resulting evaluations will be used to identify any potential problems and develop necessary mitigation measures.

Facility Demolition and Removal

All existing structures and facilities and those structures and facilities constructed specifically to support the mining and related activities will be utilized and will remain in place until the mining and related activities which they support have been completed. At that time, all structures and facilities will be demolished or salvaged in order to reclaim the site and establish the postmining land uses.

At the current time the effective mine life is projected at 15 to 20 years, although mine life could be extended significantly with development of additional reserves to the east. Dependent on age and condition, much of the equipment which will be utilized for the mining and related operations, including conveyors and associated coal handling components, the primary crusher, process equipment, maintenance equipment, and some of the smaller prefabricated buildings or building components may be salvageable for continued beneficial use at the end of the mine life. Any equipment which is not salvageable will be dismantled and any buildings or other structures not salvaged will be demolished. Structures and facilities to be salvaged or demolished are identified in R645-301-520, General Description of Mine Plans, Mining Methods, and Related Design Requirements, under the subtitle of Mine Structures and Facilities.

Equipment and facilities to be salvaged will be dismantled and removed from the site by CR, a buyer, or private salvage contractors. Disassembly and demolition of remaining equipment and structures will involve dismantling or cutting equipment, steel structures, and other large components into pieces which can be readily handled by mobile equipment; using heavy equipment, explosives; and cutting torches to break-up structural concrete members, exposed foundations, and masonry structures; ripping and removal of road surfacing materials; and removal of buried foundations and utilities to at least 2 feet below the design reclaimed surface. It is anticipated that all demolition debris except for concrete debris and road surfacing materials will be moved to one or more temporary storage areas from which the steel and other salvageable debris may be reclaimed for salvage and the remaining debris will be loaded into trucks for removal and off-site disposal in a permitted landfill facility.

Concrete debris resulting from facility demolition will be broken up into pieces small enough to be readily handled by mobile equipment and will be placed in deep fill area sites in the mine facilities area, at the toe of the deep cuts where it will be buried deep beneath the final surface, and where it will not be visible. These disposal sites have been selected to provide adequate disposal capacity for anticipated debris volumes at a level well above the normal water table. Proposed solid construction debris disposal sites include the following:

- Mine portal pad
- Office pad
- Operations pad
- Coal pile pad
- Loadout pad

The location of the designated disposal sites is shown on the Surface Facilities Map, (Map 13). Concrete and road surfacing materials will be placed in the designated disposal areas to minimize voids to the extent operationally practicable, a minimum of four feet of fill material will be placed over the disposal sites, and a tracked dozer or other heavy equipment will make multiple passes over the disposal area during cover placement to consolidate the debris.

Disposal of Mine Waste, and Non-Coal Waste

All non-coal wastes generated during the life of the mine will be collected and stored in appropriate containers and will be disposed of off-site by a licensed contract disposal firm as described in R645-301-520, General Description of Mine Plans, Mining Methods, and Related Design Requirements, under the subtitle of Non-Coal Waste Disposal. These disposal plans include any non-coal wastes remaining on completion of mining operations with the exception of concrete demolition debris as previously discussed.

Backfilling and Grading to Establish Final Configuration

Following completion of mining and related operations and subsequent facility removal and sealing of mine openings the associated surface disturbance areas will be backfilled and regraded. As previously noted in 540, Reclamation Plan, approximately 75% of the planned disturbance area has been disturbed by previous mining disturbance.

Backfilling and grading will involve selective placement of all reasonably available spoil material consistent with applicable regulatory provisions for backfilling and grading (R645-301-553 through 553.200), and previously mined areas (R645-301-553.500 through 524), and based on the following priorities:

1) Cover exposed coal seams, sealed mine openings, any coal mine materials, such as coal fines, or coaly materials and any solid waste disposal sites with a minimum of 4 feet of suitable material
2) Backfill and/or regrade disturbed slopes to establish a stable configuration which provides for effective drainage and minimizes erosion potential
3) Backfill and regrade steep cuts and highwall areas to eliminate cut or highwall exposures

The land configuration in the mine facilities area prior to development of the CR Kinney No. 2 Mine operations is illustrated by the Mine Surface Facilities Area, Pre-Mining Topography Map, (Map 14). This map shows that the mine surface facilities area consists of a gently sloped area at the southwest portion of the area transitioning to a steep slope on the eastern and northern portions of the area. The area has an existing road running from the highway up the mountain on the south, and a road running northward through the area to the Smith property on the north. There is also an existing railroad grade along the west side adjacent to, and parallel to the highway. Portions of this railroad grade still has tracks remaining, and portions of the tracks and ties have been removed, but the general railroad grade remains. This railroad grade will not be impacted by Kinney No. 2 Mine operations and will be left as it exists in it's pre-mining configuration except for a short (approximately 100 feet) at the southern end of the tracks. As discussed previously approximately 75% of the area to be used by CR has previously been disturbed by historic coal mining. Of this area a majority of the previsously disturbed area was reclaimed by the UDOGM Abandoned Mine Reclamation program in the 1980's.

The designed postmining configuration for the facilities area is based on utilization of all available spoil material to achieve the stated reclamation objectives within the constraints of site topography, drainage considerations, and the noted backfilling and regrading priorities. The limits of available fill material were determined by identifying from the available mapping, topsoil pits, trenches, and the geotechnical boring logs. Final backfilling and grading of the mine surface facilities area will require the movement of a total of approximately 221,877 cubic yards of material. Comparison of the land configuration prior to site development with the

designed postmining topography based on the Mine Surface Facilities Area Pre-Mining Topography Map, (Map 14), the Postmining Topography & Interim Drainage Control Map, (Map 29), and the Mine Surface Facilities Area Premining and Postmining Cross-Sections, (Map 16), indicates that the design postmining topography will result in stable slopes, reduce cut exposures, provide for more effective drainage, and offer better blending of the area with the surrounding terrain. Reclamation Contours have been prepared to match as closely as possible those that existed prior to disturbance. A considerable volume of pre-SMCRA coal exists in the mine area from historic mining. These coal fines have primarily been removed from their operational locations by the UDOGM AML reclamation project and placed in low lying areas and covered by reclamation soils. Kinney No. 2 Mine soils investigations and geotechnical investigations have identified some of this pre-SMCRA coal material, but identifying all of this material is not possible. Based on calculations from the previously mentioned investigations, it is estimated there are approximately 12,000 tons of coal fines that will be encountered during construction of the mine facilities. This material will be removed and sold as discussed previously, and will not be used for final reclamation. This reduced volume will result in a slightly lower overall land surface upon final reclamation. The final reclamation land surface can be seen on Map 29, Postmining Topography & Interim Drainage Control Map and on Map 16 through 19, Premining, Mining & Postmining Cross-Sections.

During final backfilling and grading operations, drainage and sediment will be controlled by the interim drainage system or by site-specific alternative sediment control practices.

Backfilling and grading will involve the use of tractor scrapers, tracked dozers, trackhoes, wheel loaders, trucks, and motor graders, as necessary to recover, move, place, grade, and compact backfill materials. Generally, backfill material will be placed in relatively uniform lifts and will be compacted by normal equipment traffic. Backfilled areas will be sloped and graded to promote effective drainage and to the extend operationally feasible long unbroken fill slopes will be avoided to minimize sheet flow and potential resultant erosion. Fill slopes will replicate the pre-mining slopes generally, and graded slopes in native material will vary dependent on material from less than 5H:1V to as much as 0.5H:1V in competent rock consistent with slope stability considerations as documented in Exhibit 14, Geotechnical Investigations. Recommended slope limitations for final cut and fill slopes will result in slope configurations having a static factor of safety of at least 1.3. The designed safety factor for any benched slopes is 1.5.

Graded areas will incorporate undulations consistent with the surrounding terrain and the postmining drainage configuration and the surface of graded areas will be left in a roughened condition to minimize runoff and erosion in the interim before soil/substitute replacement, improve bonding between the regraded surface and soil/substitute materials, and increase infiltration to maximize soil moisture levels and promote revegetation. Two different methods of backfill placement will be utilized based on the slope of the surface. Where slopes are steeper than 30% as shown on Map 33, Slope Analysis Map, soil materials will be placed with trackhoes, dozers, and similar equipment due to safety requirements. Areas where the slope is less than 30% as shown on Map 33, Slope Analysis Map, backfill materials will be placed with scrapers, dozers and similar equipment where safety requirements dictate. As noted in R645-301-500, Reclamation Practices, the regraded surface will be left in a roughened condition to control runoff, provide a good bond with the replaced topsoil/substitute material, and promote moisture infiltration. Prior to topsoil replacement, regraded surfaces will be deep ripped in the less than 30% slope areas to alleviate compaction and enhance soil bonding. In the areas where the slope is greater than 30% as shown on Map 33, Slope Analysis Map, the regraded surface will be roughened and loosened to provide a good bond with the replaced topsoil/substitute material and promote moisture infiltration.

Under the applicable regulatory provisions dealing with remining of previously mined areas (R645-301-553.500 through 524), the planned backfilling and grading operations will utilize all available spoil material to eliminate remaining highwall and cut slope exposures to the

maximum extent technically practical. Fill material placed against highwall and cut slope areas will be placed and graded to assure long-term stability and final slopes will provide for effective drainage and be compatible with both natural slopes in the area and the postmining land use of wildlife habitat, and watershed.

Drainage Reestablishment

In conjunction with final backfilling and grading activities, CR will establish a postmining drainage configuration which is compatible with the natural drainage pattern of the surrounding terrain, will effectively route natural drainage from upgradient areas through the reclaimed area with minimal erosion or increase in sediment concentrations, and will effectively control drainage and erosion in the reclaimed areas. The designed postmining drainage configuration is shown by the Postmining Topography & Interim Drainage Control Map, (Map 29). Permanent diversions carrying undisturbed drainage have been designed and will be constructed through the reclaimed area to route undisturbed flow to the west. Additional discussion of postmining drainage reestablishment is provided in R645-301-700, Hydrologic Restoration.

Road Removal

Certain roads within the mine facilities area will continue to provide access to specific areas during both reclamation and the extended liability period, although most roads will be removed and reclaimed during final site reclamation. Generally, the primary access roads will be removed and reclaimed in two phases. The first phase will involve ripping of these roads and removal of the associated road surfacing materials. This phase will occur in conjunction with facility demolition and removal and the surfacing materials removed will be placed in the designated solid waste disposal areas as previously discussed. The second phase of road removal for primary roads will be sequenced to coincide with backfilling and grading of the areas that the roads either provide access to or pass through. When roads are no longer needed, they will be removed and the associated disturbance areas will be regraded and reclaimed. The post mining roads to remain for post mining land use are shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control Map. These roads provide access to private property in the mining area and the area east of the mining area, and to private property north of the mine area.

Road reclamation will generally involve the use of tracked dozers and trackhoes to rip the road surface and grade any surfacing material into piles which will normally be recovered by wheel loader and either hauled directly or loaded into trucks for haulage to one of the designated disposal areas. Road surfaces will then be ripped to alleviate any compaction and the road area will be graded to blend with surrounding reclaimed areas. Steep slope area roads (>30%) will generally be reclaimed with trackhoes. During final grading, any culverts will be removed and transported to a temporary steel debris storage site for either salvage or disposal off-site.

Cut/fill areas will be reclaimed by pulling the fill material upslope into the cut and grading any remaining cut slope, the fill material, and disturbed downslope areas to a stable configuration consistent with natural drainage patterns and blending with the surrounding terrain. Any major road cuts will be reclaimed by partially backfilling the cut and grading any remaining cut slope exposures so that they are stable as described in the backfilling and grading plan discussion. Any major road fills which would interfere with postmining drainage will be removed and the associated disturbance areas regraded in conjunction with overall site grading activities.

Soil/Substitute Replacement

Following completion of backfilling, grading, and drainage reestablishment, available topsoil material will be replaced on the regraded areas as a growth medium for subsequent revegetation. Soil will be replaced as soon as operationally practicable following completion of the other necessary activities in the reclamation sequence, however, the timing of soil placement will also reflect the need to reestablish vegetation as soon as possible to stabilize and

prevent loss or erosion of the topsoil. Two different methods of topsoil placement will be utilized based on the slope of the surface. Where slopes are steeper than 30% as shown on Map 33, Slope Analysis Map, topsoil materials will be placed with trackhoes, dozers, and similar equipment due to safety requirements. Areas where the slope is less than 30% as shown on Map 33, Slope Analysis Map, topsoill materials will be placed with scrapers, dozers and similar equipment where safety requirements dictate. As noted in R645-301-500, Reclamation Practices, the regraded surface will be left in a roughened condition to control runoff, provide a good bond with the replaced topsoil/substitute material, and promote moisture infiltration. Prior to topsoil replacement, regraded surfaces will be deep ripped in the less than 30% slope areas to alleviate compaction and enhance soil bonding. In the areas where the slope is greater than 30% as shown on Map 33, Slope Analysis Map, the regarded surface will be roughened and loosened to provide a good bond with the replaced topsoil/substitute material and promote moisture infiltration. For a complete discussion of topsoil and substitute topsoil removal and replacement refer to Chapter 3, Soils.

542.800 Reclamation Costs

Consistent with applicable regulatory provisions (R645-301-542.800 and R645-301-800) which require that reclamation bonding calculations be based on an approved reclamation plan, CR has developed a detailed reclamation cost estimate based on the preliminary UDOGM determination that the reclamation plan is acceptable. The detailed estimate includes costs for all activities described in the approved plan with specific consideration of the areas to be reclaimed and the nature and difficulty of required reclamation efforts. Additional information on the reclamation cost estimate and related bonding considerations is provided in R645-301-820, Bonding Information, and the detailed bond reclamation cost estimate has been provided for insertion as Exhibit 18, Bonding and Insurance Information.

R645-301-550 Reclamation Design Criteria and Plans

R645-301-551 Casing and Sealing Underground Openings

On completion of mining and related activities, all mine openings including portals, shafts, raises, boreholes, and wells will be stabilized if required and sealed unless they are to be utilized for ongoing monitoring or in conjunction with the postmining land use. Currently, no mine operings are anticipated to be left for post mining use. If any mine openings are needed for post mine use, they will be permitted separately as needed in the future by revising the permit as required by the UDOGM regulations. Methods and requirements for sealing wells and boreholes are presented and described in R645-301-630, Geologic Protection Plans.

Current plans call for five underground mine openings (the five main portals). These openings will be permanently sealed on completion of mining to prevent access to the underground workings and, in the case of the mine openings, to provide an effective hydraulic seal to prevent surface drainage and infiltration through the backfill from entering the underground mine workings. Portals will be sealed and stabilized by constructing a concrete block wall a minimum of 25 feet in-by the portal openings. The two layer thick solid block wall, which will be constructed as illustrated by Figure 37, Typical Portal Seal, will be keyed into the mine entry at least 6 inches on all sides and, for the mine portals, an MSHA approved sealant will be applied to the outer surface of the barrier to provide a positive water seal. The location of the seals can be found on the Typical Portal Cross Section & Detail Looking South on Map 17, Mine Surface Facilities Area Pre-Mining, Mining and Post Mining Cross Sections for a typical detail.

In order to assure the long-term integrity of the mine portal seals, CR, as part of the MSHA roof control plan, will maintain adequate barrier pillars and will utilize appropriate roof support including timber or concrete cribs, posts, roof bolts, trusses, or other supports to minimize subsidence and collapse or caving of the mine workings in the vicinity of the portal seals. Once the portals seals are in place, the remaining void space between the seals and the portal opening will be backfilled using a LHD or small backhoe to assure proper backfill placement.

R645-301-552 Permanent Features

Removal of Mining Related Structures and Facilities

Given that the proposed mining and related surface structures are not generally compatible with the proposed postmining land uses of wildlife habitat and watershed, these structures and facilities will be removed following completion of mining. All, or portions of the surface facilities may be reclaimed at any given time dependent on the location and nature of potential future mining operations in this general area. When surface facilities are no longer required to support ongoing mining and related operations they will be removed and the associated surface disturbance areas reclaimed.

Mine structures will be removed and associated disturbance areas reclaimed, effectively eliminating any potential associated hazards. As part of the final reclamation activities, all portals and other mine openings will be stabilized, sealed, and the associated disturbance areas backfilled, graded, and reclaimed. Similarly, steep slopes and highwall areas will be partially or fully backfilled, regraded, and reclaimed eliminating or minimizing potential related hazards as discussed previosly.

The reclamation practices described in this section reflect CR's detailed review of information on the existing site configuration and environmental values, consideration of site reclamation potential and any important limitations, and application of the best current reclamation technology and both CR's and other coal operators extensive operating experience in this area. The following sections provide a detailed description of the specific reclamation practices proposed for surface disturbance areas associated with the Kinney No. 2 Mine.

R645-301-553 Backfilling and Grading

Refer to discussion in previous sections.
A typical cross section of the portal area is included in on Map 17, Mine Surface Facilities Area, Pre-Mining, Mining & Post Mining Cross Sections B-B".

553.100 Disturbed Area

Refer to discussion in previous sections.

553.120 Elimination of Highwalls

The mine portals will be designed to be stable and to prevent runoff water from entering the mine. Refer to the Typical Portal Cross Section & Detail Looking South on Map 17, Mine Surface Facilities Area Pre-Mining, Mining and Post Mining Cross Sections for a typical detail. The portals will all be similar in design, except the portal used for the ventilation fan may be somewhat different to accommodate the temporary fan that will eventually by moved to a more remote location.

The structural geology "attitude" of the coal seam in the portal block is well established with multiple drill hole intercepts. This is clearly shown on Figure 5, Hiawatha Top Structure and Figure 6, W-E X-Section A-A' (Chapter 6) which show the Hiawatha Seam within the Portal Block dipping East N-East at approximately 4 degrees which mirrors the "regional dip".

Interestingly, the attitude of the very near surface, outcrop, of the Hiawatha Seam and indeed all of the strata have experienced "creep" where the weathered material down to a depth of approximately 20 feet have slid down the hillside through time. That is, the coal outcrop that may be exposed with a shovel only one or two feet beneath the surface has been displaced by as much as ten feet down-hill. A profile cut by track hoe demonstrates that one has to excavate at least ten and in some cases twenty feet to find coal, and the other strata, in-place and demonstrating the attitude of the bedrock.

The fortuitous combination of East North-East bedrock "regional" dip and a near surface "creep" phenomenon causing the dip in that near surface material to reverse and dip west. This causes a "crest" in the profile of the coal seam. It is possible that excavation of the portal bench will cut deep enough into the outcrop to place the portal at the crest which would cause water to run east from the crest, down the regional dip slope and water west of the crest to drain westward. Even if we are not lucky enough to have the crest end up at the optimum location it will be easy to "grade the entry-ways up to the East to create a local crest in each entry that would prevent water from outside the mine draining into the mine and certainly water from inside the mine cannot drain to the outside due to the regional dip.

There are no old mine workings, or portals in the area of the proposed Kinney No. 2 Mine portals. If for any reason, old portals or mine openings are encountered they will be sealed according to the plan presented elsewhere in this permit, and in compliance with MSHA requirements. All cuts and highwalls at the portal area will be reclaimed and the post mining surface will be returned to the approximate original contour. Any exposed coal seam at the outcrop will be covered with a minimum of 4 feet of non-combustible backfill.

As shown on Map, 14, Mine Surface Facilities, Pre-Mining Topography Map, and on Map 33, Slope Analysis Map a remnant highwall remains at the old Columbine Mine portal face-up. This remnant highwall will be partially impacted (approximately 50%) by Kinney No. 2 Mine construction. The portion impacted by the Kinney No. 2 Mine will be reclaimed as discussed in 553.500 of this chapter.

553.130 Reclaimed Area Static Safety Factor

The Geotechnical Investigation, dated November 26, 2007 states on page 17 of 17:

"It is anticipated that fill slopes will be created with on-site materials. If this material is placed and compacted in accordance with recommendations provided in Section IV, fill slopes as steep as 1.5H:1V will have a factor of safety of at least 1.3 if constructed of the native clayey soils. Fill slopes shown on Sections A-A, B-B, and F-F will likely be constructed of this clayey on-site fill. Test pits in the vicinity of the fill areas shown on Sections C-C, D-D, and E-E encountered significant amounts of medium-dense silty sand. Fill slopes as steep as 1.8H:1V constructed of this silty sand material have a computed factor of safety of at least 1.3. Plots of stability analyses for typical fill slopes are included in the appendix."

In Addendum No. 1 to the Geotechnical Investigation, dated September 28, 2010, RB&G Engineers, Inc states,

"Note that the Direct Shear test on the sample of sandy lean clay which had a friction angle of 20 degrees also had cohesion of 15 psi. Two Triaxial Shear tests performed on samples of the lean clay had total stress friction angles of 29.6 and 32.5 degrees with 2 psi cohesion and effective stress friction angles of 36.0 and 36.7 degrees with 2 psi cohesion."

A copy of the Geotechnical Investigation report, and Addendum No. 1 can be found in Exhibit 14.

553.200 Spoil and Waste

Evaluation of coal roof and floor materials and overburden/interburden materials indicates no significant toxicity concerns relative to these materials. As described in R645-301-520, General Description of Mine Plans, Mining Methods, and Related Design Requirements, under the subtitle of Non-Coal Waste Disposal, all non-coal wastes will be collected and stored in appropriate containers and will be disposed of off-site by a licensed contract disposal firm. These disposal plans include any non-coal wastes remaining on completion of mining operations with the exceptions of concrete demolition debris and road surfacing materials resulting from facility removal which will be placed and buried in the deepest cut areas of the reclaimed area. Off-site disposal of most non-coal wastes and the planned disposal measures for demolition debris will effectively eliminate any potential associated hazards.

The portals will be designed to be stable and to prevent runoff water from entering the mine. Refer to the Typical Portal Cross Section & Detail Looking South on Map 17, Mine Surface Facilities Area Pre-Mining, Mining and Post Mining Cross Sections for a typical detail. The portals will all be similar in design, except the portal used for the ventilation fan may be somewhat different to accommodate the temporary fan that will eventually by moved to a more remote location. According to the best information available, the coal seam dips away from the outcrop, which will prevent any in-mine water from flowing out of the mine. The geology of the actual outcrop may be different depending on how much surface slump has occurred, however, CR will take precautions as needed to prevent water from exiting or entering the mine.

There are no old mine workings, or portals in the area of the proposed Kinney No. 2 Mine portals. If for any reason, old portals or mine openings are encountered they will be sealed according to the plan presented elsewhere in this permit, and in compliance with MSHA requirements.

553.250 Refuse Pile & 553.260 Disposal of Coal Processing Waste

Refer to discussion in previous sections. No coal processing waste is planned at the Kinney No. 2 Mine. Any coal mine waste remaining from the UDOGM Abandoned Mine Reclamation work completed in the 1980's that is encountered during reclamation of the Kinney No. 2 Mine will be buried a minimum of four feet deep in deep cuts.

553.300 Exposed Coal Seams

Exposed coal seams will be backfilled completely leaving no exposed coal. Backfill will be placed a minimum of 4 feet above the coal seam, thus preventing spontaneous combustion at the outcrop. See the Typical Portal Cross Section & Detail Looking South on Map 17, Mine Surface Facilities Area Pre-Mining, Mining and Post Mining Cross Sections for a typical detail.

553.400 Cut and Fill Terraces

No cut and fill terraces will be utilized at the Kinney No. 2 Mine.

553.500 Previously Mined Areas & 553.600 Approximate Original Contour

The Kinney No. 2 Mine area was mined by several mining companies as discussed in other sections of this permit application. These mining operations left numerous roads, operations areas and structures in the area, as well as a highwall remnant at the old Columbine Mine portal area. This area was reclaimed by the Utah AML program in the 1980's, however, the highwall remnant was not fully reclaimed, leaving a near vertical face of exposed rock and soils.

Due to previous mining and other disturbance of the area there is not sufficient available spoil to completely backfill this highwall remnant, and the other old mining roads and disturbances. Given that the Kinney No. 2 Mine development activities effectively constitute remining of the previously disturbed areas which included a preexisting highwall remnant, and other roads and disturbances, under the applicable regulatory provisions dealing with remining of previously mined areas (R645-301-553.500 through 524). Since the requirements of Rule R645-301-553.500 apply, a variance from the AOC restoration requirements is not necessary. The disturbed area for the Kinney No. 2 Mine will be reclaimed to the approximate original contour as it exists as of December, 2007, the state it was left in by the Utah AML reclamation project, including the highwall remnant.

553.700 Backfill and Grading Thin Overburden

Not applicable as the Kinney No. 2 Mine is an underground mine.

553.800 Backfill and Grading Thick Overburden

Not applicable as the Kinney No. 2 Mine is an underground mine.

R645-301-560 Performance Standards

The Kinney No. 2 Mine will be operated in accordance with the approved permit and requirements of R645-301-510 through R645-301-553.

Chapter 6

R645-301-600 GEOLOGY

Kinney No 2 Mine

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R645-301-600 Geology

R645-301-610 Introduction

This section describes existing geologic conditions, resources, and features within the permit and adjacent areas that could potentially be affected or impacted by the mining and reclamation activities. Information in this section was developed in accordance with applicable regulatory requirements (R645-301-600) for coal mine permitting in the State of Utah.

R645-301-611 General Requirement

Specifically, this section addresses rules R645-301-100 and R645-301-621 through R645-301-642.

R645-301-612 Cross Sections, Maps and Plans

All cross sections, maps and plans as required by R645-301-622 have been prepared and certified as described under R645-301-512.100.

R645-301-620 Environmental Description

R645-301-621 General Description

The geology of the permit area is dominated by relatively flat-lying, interbedded sedimentary units chopped into Basin and Range style North-South Horst and Grabens which control the N-S elongate valleys and long skinny flat topped ridges (plateaus).

The rather large number of faults has formed a series of mining blocks separated by vertical distances created by the throws on the mostly normal faults. These faults dictated the lateral limits of historic mining. The previous mine operators chose not to cross the larger faults (in excess of 90 feet) instead stopped mining against the faults. In order for Carbon Resources to reach the remaining reserves, a number of large fault crossings will have to be completed.

The Cretaceous Blackhawk Formation is the principal coal-bearing formation. Coal seams include, in ascending order, the Flat Canyon, UP, Columbine, Hiawatha, McKinnon, and Haley. The Hiawatha Seam is the only mineable coal seam within the permit boundary. The other two seams of mineable thickness (UP and Columbine) have already been mined. The Hiawatha Seam has also been mined over a large portion of the permit area. However, a fortuitous East-West elongate corridor of Hiawatha Seam Coal remains unmined. This corridor of unmined coal apparently was not mined because of a rock parting that may have rendered this local area less appealing to historic mine operators because of the high ash content of the coal where this parting is present. The parting appears to be a very small, mid to late swamp, channel that meandered through the swamp and deposited some mud and clay (possibly sand and silt also) in a sinuous East-West trending pattern.

A corridor of unmined coal, between old workings, approximately 600 feet wide is planned to be used as the access point in to the deposit. This corridor is clearly high and dry, relative to ground water. Data from the eleven monitor well completions makes a compelling case and when coupled with the structural data helps explain the position of the water table relative to the seam to be mined.

Based on chemical analysis of coal, roof, and floor samples, overall sulfur content is relatively low, typical of the Hiawatha Seam in this region. However, sulfur in the coal demonstrates a bi-modal distribution. That is, organic sulfur is responsible for the background sulfur values of approximately 0.5% and presence of pyritic sulfur is obviously responsible for driving the sulfur content to over 1% in some local areas. Acid producing potential is considered generally low and the neutralization capacity of the roof and floor rock is relatively high due to the presence of significant quantities of calcium carbonate as the nearly exclusive matrix in the sandstones and mudstones and as a common cleat filling. This results in a relatively high neutralizing capacity and acid-forming potential. Similarly, chemical analysis generally indicates low concentrations of most potentially toxic metals and low alkalinity producing potential. The chemical analysis results and subsequent conclusions are generally consistent with chemical analysis of coal waste materials from previous mining operations involving production from the same coal seams in the area.

R645-301-622 Cross-Sections, Maps and Plans

622.100 – 300

Information presented on the geology maps, cross-sections, and isopachs include:

- Locations and elevations of drill sites and core holes
- Major structural features
- Depth, thickness designations, and outcrop locations of the Hiawatha Coal Seam (the seam to be mined)
- Dip and strike of major formations and Hiawatha Coal Seam
- Areas of coal previously mined out
- Location and depth of groundwater where encountered during exploration drilling

622.400 Oil and Gas Wells

There are no oil and gas wells, and no planned exploration drill holes within the Portal Block Permit Boundary.

Consistent with applicable provisions of R645-301-512, geologic maps and cross-sections have been prepared under the direction of, and certified by a qualified, registered engineer or land surveyor with assistance from experts in the related field.

R645-301-623 Geologic Information

623.100 Chemical Characteristics of Coal and Associated Strata

As part of the 2006 Drilling Program coal core samples were analyzed for a variety of parameters including: Moisture, Ash, BTU, Sulfur, Volatile Matter, Fixed Carbon, Acid Potential (TCaCO3/1000T), Ash Fusion Temperatures. Ash Mineral Analysis includes, Ash Type, Specific Gravity, multiple Trace and major elements and others. Immediate roof and floor rock samples were separated and analyzed for toxic-metals and acid forming materials. The non-confidential portion of these data are located in Exhibit 19, 19(Geologic Information, Roof and Floor Analysis). The confidential portions of said data were submitted previously and reside in the DOGM library as Confidential Information under R645-300-124.

R645-301-624

Table 4 (List of Roof & Floor Samples & w/ Data from Acid Forming and Neutralization Potential Analyses) presents the Acid Potential and the Neutralization Potential in samples taken from the Roof and Floor of the Hiawatha Coal Seam. These data are available to be used in Acid-Base Accounting (ABA) which is a common static test developed to evaluate coal mine waste (Sobek et al. 1978).

The acid production potential (APP) or Acid Potential, as shown on lab analysis from SGS, is determined from the Total sulfur content per the formula 31.25 X Percent Total S = APP. This formula assumes that two moles of acid will be produced for each mole of sulfur. Units for APP are metric tons of CaCO3 required to neutralize the acid potential in 1,000 metric tons of the rock material being tested. This method should be referred to as the MAXIMUM Acid forming potential because all three forms of sulfur present in sedimentary rocks are summed together as Total Sulfur; Organic, Pyritic, and Sulfate. Pyritic Sulfur is the only form clearly demonstrated to contribute to the acid forming potential. Sulfate has already reached its highest oxidation state and should not enter into the calculation. Data are unclear as to the role of organic sulfur, if any. This method, therefore, very conservative and likely overstates the APP.

The Neutralization Potential (NP) is determined by a simple titration where a standard sample (grind and weight) is treated with hydrochloric acid then the sample is boiled until the reaction stops. The resulting solution is back titrated to pH7 with sodium hydroxide to determine the amount of acid consumed in the reaction between hydrochloric acid and the sample. Units for NP are also metric tons of CaCO3 per 1000 metric tons of material.

The net Neutralization Potential (NNP) is arrived at by subtracting the APP from the NP.
Table 4 presents data from core collected in 2006 with 18 of the 24 analysis being completed in 2006. A wide range of analyses were performed on these samples including “Acid Potential”. Six additional samples were retrieved from archived core from the same 2006 drilling program as were the other 18 samples. These six samples were analyzed during August 2010 and included both “Acid Potential” and “Neutralization Potential”. All analyses were performed at SGS Denver laboratories and the lab reports are contained in Exhibit19, Geological Information, Roof and Floor Analyses.

These data do not include "Sulfur Forms" which data is held in confidential section, however, a washability study was performed on coal from drill holes completed in the 1970's and concluded that Pyritic Sulfur accounted for that portion of Total Sulfur when the Total Sulfur values exceed approximately 0.50% in the Hiawatha Coal Seam. It is expected that a similar threshold also exists for Roof and Floor Rock considering the equivalent depositional environment.

TABLE 4

LIST OF ROOF & FLOOR SAMPLES W/ DATA from ACID FORMIING AND NEUTRALIZATION POTENTIAL ANALYSES

			FOOTAGE					Acid Production Potential*	Neutralization Potential	Net
Drill Hole	Seam Site	Sample	From	To	*Saturation %*	*PH su*	*EC mmhos /cm*	Tons CaCO3 /1000Tons Material	Tons CaCO3 /1000Tons Material	Neutralization Potential
CR-06-01	HIA Roof	5B/5	75.6	76.4				4.91		
CR-06-01	HIA Roof	5C/5	76.4	76.9	*42.33*	*6.91*	*6.62*	7.50		
CR-06-01	HIA Roof	6/5	78.5	79.0	*56.45*	*3.74*	*9.37*			
CR-06-01	HIA Roof	1/6	78.2	78.8				9.38		
CR-06-01	HIA Floor	1/7	87.5	89.3		6.1	2.5	19.10	4.00	-15.10
CR-06-02	HIA Roof	1B-17	426.6	427.5				2.19		
CR-06-02	HIA Roof	2/17	427.5	428.2	*35.93*	*7.59*	*7.51*	5.36		
CR-06-02	HIA Floor	3/18	436.7	437.1	*57.68*	*4.08*	*11.56*			
CR-06-05	HIA Floor	2/1	1,043.0	1,043.5	*54.08*	*7.24*	*1.00*	13.44		
CR-06-05A	HIA Roof	6/1	1,031.9	1,033.7		8.1	1.5	2.50	43.00	40.50
CR-06-05A	HIA Roof	8/1	1,034.3	1,035.3	*42.40*	*7.17*	*8.23*	14.69		
CR-06-05A	HIA Roof	1/2	1,036.0	1,036.3	*55.35*	*7.13*	*0.80*	21.25		
CR-06-05A	HIA Floor	11/2	1,045.3	1,045.7				15.63		
CR-06-05A	HIA Floor	12/2	1,045.7	1,046.7		4.1	4.4	11.10	0.05	-11.05
CR-06-09	HIA Roof	3/1	990.7	991.7		6.3	3.6	23.70	38.90	15.20
CR-06-09	HIA Roof	4/1	991.7	992.5		4.4	5.4	40.10	21.10	-19.00
CR-06-09BLW	HIA Roof	8/2	987.8	988.7	*50.65*	*6.67*	*4.68*	25.31		
CR-06-09BLW	HIA Roof	9/2	988.7	989.4				16.56		
CR-06-09BLW	HIA Floor	6/3	1,001.3	101.8	*51.91*	*5.03*	*6.62*	30.00		
CR-06-10	HIA Roof	8/3	1,208.3	1,210.3				3.60	7.70	4.10
CR-06-10	HIA Roof	9A/3	1,210.3	1,210.7	*51.83*	*7.07*	*2.60*	11.56		
CR-06-10	HIA Roof	9B/3	1,210.7	1,211.3				1.25		
CR-06-10	HIA Roof	10/3	1,211.3	1,244.8	*53.14*	*6.64*	*2.45*	13.75		
CR-06-10	HIA Floor	3/4	1,222.5	1,223.0	*42.75*	*5.86*	*5.48*	47.50		
AVERAGE					49.54	6.13	4.96	15.47	19.13	2.44
COUNT	24				12	17	17	22	6	6

Highlighted Samples were taken from archived core analyzed August 2010

* Represents "Maximum" or Ultimate Possible Acid Forming Potential.

Italicized Values, Samples were analyzed in 2008 as paste from pulp of samples previously analysed in 2006 @ SGS Labs

Approximately 12,000 cubic yards (CY) of coal were buried on the property during AML reclamation of the old Columbine Mine surface pad sites Map 45, Reclaimed Coal. This coal is herein referred to as "reclaimed coal" and will be removed from the site before construction of structures begins. Per the Divisions request, characteristics of this reclaimed coal are presented on Table 4A (Reclaimed Coal, October 2007 SGS Lab Analysis). Lab analysis sheets from which this table was formed may be found in Exhibit 6, Soils Information, Reclaimed Coal. Sample locations are shown on Map 34,
Topsoil To Be Disturbed, and Map 45, Reclaimed Coal. This "reclaimed coal" is also

discussed in section 232.100 Chapter 2 Soils.

TABLE 4A						
RECLAIMED COAL, October 2007 SGS Lab Analysis						
		As Received Basis				Acid
Sample ID	Location	Moisture	Ash	Sulfur	Btu/lb	Potential*
4-CP	Old Stack Tube	9.92	7.69	0.52	11266	16.3
5-CP	Old Stack Tube	9.6	9.09	0.57	11071	17.8
6-CP	Old Stack Tube	9.86	9.13	0.56	10803	17.5
7-CP	Old Stack Tube	9.16	8.92	0.57	11124	17.8
8-CP	Old Stack Tube	12.09	8.2	0.51	10584	15.9
9-CP	Old Stack Tube	9.51	8.54	0.51	11071	15.9
10-CP	Old Stack Tube	8.81	8.95	0.6	11181	18.8
11-CP	Old Stack Tube	10.61	11.42	0.46	10486	14.4
12-CP	Old Stack Tube	9.46	8.85	0.5	10941	15.6
13-CP	Old Stack Tube	10.42	8.55	0.52	11018	16.3
15-CS-1	Old Stack Tube	9.22	13.17	0.45	9986	14.1
9-B	North Block	8.48	11.75	0.66	10581	20.6
D-4	North Block	12.47	41.28	0.44	5929	13.8
DA-9-B	North Block	15.19	34.89	0.4	6496	12.5
D9-A Coal	North Block	7.29	34.08	0.55	7726	17.2
D9-A	North Block	6.81	37.09	0.52	7312	16.3
D-11	North Block	11.33	34.95	0.41	7063	12.8

*Acid Potential Calculate from Total Sulfur

The chemical analysis parameters used to evaluate coal, roof, and floor materials are listed on Table 5, (Analysis Parameters - Coal, Roof, and Floor Materials). Full chemical analyses for coal are considered confidential and are held as confidential information at SLC UDOGM library. Analyses of roof and floor materials together with the non-confidential portions of analyses for coal are included in Exhibit 19 (Geologic Information, Roof & Floor Analysis). This information is included for reference only. Carbon Resources has no plans to place roof and floor materials in long term stockpiles on the surface. Roof and floor materials cut during fault crossing, overcast and or under casts will be stored in designated in-mine rock storage areas. Should there arise an emergency need store mine development rock (roof and floor materials) on the surface, this material will be stored in the “mine development rock waste – temporary stockpile Map 13 (Surface Facilities).

If, for any unanticipated reason, temporary cessation of mining and/or reclamation operations for a period of 30 days or more becomes necessary, CR will submit a notice of intention to UDOGM to temporarily cease or abandon operations. The notice will include a statement of the exact number of acres which have been disturbed prior to cessation, the nature and extent of any reclamation completed, and any reclamation, environmental monitoring, water treatment, or other activities which will continue during the period of temporary cessation. Environmental monitoring will include taking one composite sample of the temporary waste rock storage pile should there be waste rock in the temporary waste rock pile at time of cessation.

TABLE 5
ANALYSIS PARAMETERS - COAL, ROOF AND FLOOR MATERIALS

COAL, ROOF AND FLOOR

PROXIMATE ANALYSIS

% Moisture
% Ash
% Volatile
% Fixed Carbon
Btu/lb
% Sulfur
MAF Btu/lb
% MAF Volatile
% MAF Fixed Carbon
lb SO2/mm Btu
% Air Dry Loss
lb Sulfer/mm Btu
As Received Net Sample Wt.

TCLP EXTRACT ELEMENTS

Arsenic, As
Barium, Ba
Cadmium, Cd
Chromium, Cr
Lead, Pb
Mercury, Hg
Selenium, Se
Silver, Ag

MINERAL ASH ANALYSIS

(Rock Forming Elements)

Silicon Dioxide
Aluminum Oxide
Titanium Dioxide
Iron Oxide
Calcium Oxide
Magnesium Oxide
Potassium Oxide
Sodium Oxide
Sulfur Trioxide
Phosphorsus Pentoxide
Strontium Oxide
Barium Oxide
Manganese Oxide
Silica

Base:Acid Ratio
T 250 Temp
Ash TYPE
Fouling Index
Slagging Index

COAL ONLY with ROOF and FLOOR as part of COMPOSITE

TRACE ELEMENTS

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Mercury
Molybdenum
Nickel
Selenium
Thallium
Vanadium
Zinc

SELECTED SAMPLES OF COAL, ROOF AND FLOOR

Acid Forming Potential
Neutralization Potential

Roof and floor rock that is inadvertently taken during mining of the coal seam will be blended into the coal product stream and shipped out with the coal. When an area of high ash coal is encountered, or in areas where roof and or floor rock are difficult to avoid taking with the seam and the presence of this roof and floor rock raises the average ash content of the coal product above contract specifications, that coal will be temporarily stacked in the "off-spec" stacking tube then blended with "spec coal" as immediately as possible and will be shipped out with the coal product.

Should mining encounter such a large volume of high ash or low quality coal that blending with "spec coal" is not feasible, CR will exercise the agreement with Arch Coal to sell the low quality coal, known in the industry as "distressed coal" to Arch Coal who will haul the material to their facility near Price for processing.

R645-301-623.200

Reclamation will be accomplished per discussions in Sections 2, 3, 4, 5, and 7.

R645-301-623.300

As discussed in Chapter 5 and elsewhere; first mining only is planned at this time therefore subsidence monitoring is not required.

R645-301-624 Geologic Description

624.100 Description of Geology

The following discussion, cross sections, maps, and plans address regulations 624.110 and 624.120.

<u>Regional Geology</u>

Topography

The permit area is characterized as incised "Basin and Range style Topography". This topography consists predominately of parallel N-S valleys separated by flat-topped ridges, typical of "graben and horst" physiography. Strata in the area are composed of moderately weak fine-grained units interfingered with thick, resistant sandstone units. These units typically erode to moderate to steep weathered slopes.

Major canyons in and near the permit boundary include Pleasant Valley, Eagles Canyon, and Longs Canyon; all draining northward tributary to Scofield Reservoir. Elevations in the general permit area range from over 9,000 feet above sea level on the tops of the flat-topped ridges to about 7,600 feet above sea-level in Pleasant Valley.

Stratigraphy and General Lithology

The general lithology of the area consists of thick accumulation of Upper Cretaceous and Tertiary strata, exposed in the Book Cliffs and Wasatch Coal Fields.

The Upper Cretaceous sediments of the section were deposited along the western margins of a north-south oriented Cretaceous Interior Seaway. This seaway is defined by the pattern of marine, marginal marine, and coastal plain sediments deposited at that time. A rapidly rising mountain belt to the west supplied clastic material for shoreline construction by wave-dominated delta systems. Throughout Cretaceous time, this seaway underwent a series of transgressive and regressive (advancing and retreating) phases depositing a number of broad sub aerial to submerged delta and prodelta sheet sandstones. These sandstones display landward shoreline pinch outs and seaward thinning and fining of sediment sizes. Major coal deposits found in Utah are usually formed immediately landward of shoreline delta sandstone pinch outs and on top of these regressive delta (foreshore) deposits.

Landward of the thick shoreline coal accumulations, lower coastal plain depositional influences come into play, generally creating a series of splits in the coal section by splays, small channels, and levee deposits. Above the delta sandstones, the coal seams are often thinner and/or split due to the decreased time available for peat deposition and common presence of additional "stacked" transgressive-regressive events which invaded the swamp system with interdeltaic features such as storm wash over fans, tidal inlet deltas, and lagoon mud flats.

Coals formed on delta sandstone sheets are usually very planar and continuous while coal seams found in the lower coastal plain are much more likely to exhibit rolls or undulations, scouring by fluvial channels, and discontinuous or lenticular geometry. A classic model of the Book Cliffs Delta Systems was developed by Balsley, 1980.

The formations are composed of, in ascending order, the Blue Gate Member of the Mancos Shale, the interfingering deltaic members of the Blackhawk Formation, the coal-bearing Blackhawk Formation, the unconformably overlying Castlegate Sandstone, the Price River Formation, and the North Horn Formation.

The Blue Gate Member of the Mancos Shale, which forms the valley floor and lower slopes of the prominent cliffs, is over 4,000 feet thick in the area and consists primarily of interbedded marine shales. The Mancos is a clay-rich unit and is relatively impervious to water.

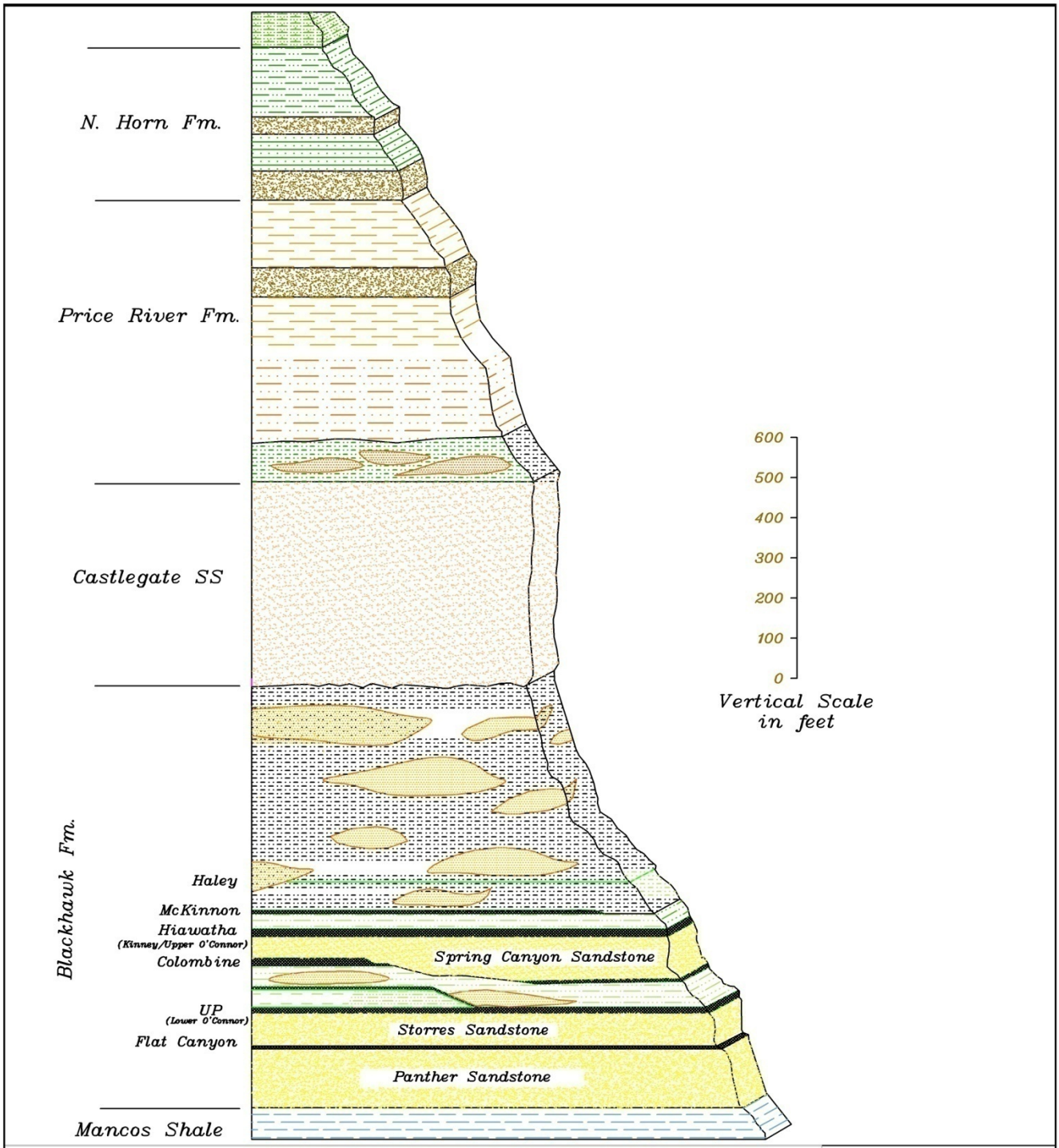
The base of the Blackhawk Formation is locally comprised of five deltaic cliff-forming sandstone members, the Panther, Storrs, Spring Canyon, Aberdeen, and Kenilworth Sandstones, in ascending order. These sandstone units interfinger to the west with the Mancos Shale. Locally the Panther, Storrs, and Spring Canyon Units have been combined under a formational status as the Star Point Sandstone. It is suggested here that these deltaic units be recognized as basal members of the Blackhawk. Lithologies are usually comprised of gradationally sorted sandstones; medium-grained and cross-bedded at the top and fine-grained to silty at their base. Figure 3 (Stratigraphic Column, Kinney Area).

The lower half of the Blackhawk, which contains the major coal seams, consists of

sandstone, shale and coal. The upper part of the Blackhawk contains sandstone and a lesser amount of shale. The Blackhawk is about 900 to 1,300 feet thick in the Pleasant Valley District and is the exposed bedrock of the permit area Figure 4 (Regional Surface Geology & X-Section Lines).

Structure

The Kinney No. 2 Mine Permit area lies near the north end of the Wasatch Plateau structural province, immediately south of the north-west trending Fish Creek Graben which delineates the local northern border of the Castle Valley thrust. The position of the permit area, essentially at the intersection of the compression formed then extended Fish Creek Graben and the extensional Wasatch Plateau province, accounts for the very complex system of faults that chop up the property into relatively small mining blocks. Detailed description of faults is discussed in the following section, Structural Features and Controls.



Generalized

Stratigraphic Column

Kinney & Adjacent Area

Modified After Mercier

Kinney # 2 Mine

Figure 3

Stratigraphic Column
Kinney Area

DRAWN BY: GLH DATE: 9-1-2010
APPROVED BY: BG DATE: 9-15-2010

Carbon Resources
Coal For Carbon County
P.O. Box 954
Sandia Park, NM 87047

File: Map 34 Disturbed TS

Structural Features and Controls

Two and possibly three periods of structural deformation influenced deposition and are responsible for the present position of the strata of the Pleasant Valley District. The Sevier Orogeny, dating from post-Triassic to pre-Oligocene time, is characterized by compressional faulting and folding with the formation of the large Cretaceous clastic wedges west of the district and supplied the sediments that forced the Cretaceous sea eastward. The Laramide Orogeny, which overlaps the Sevier Orogeny in late Cretaceous through the Eocene Epoch, is characterized by vertical uplifts of the Rocky Mountains. The extent of influence of this tectonic event is uncertain in the Pleasant Valley District. Miocene to Recent relative uplift and block faulting is responsible for the present topography and position of the strata.

These structural events have imparted a regional dip of approximately 3 degrees North North-East and generally striking North-West South-East as can be observed on Figure 5 (Hiawatha Top Structure & X-Section Lines).

Local exceptions to the regional dip are numerous with some fault blocks even dipping south due to the complex faulting described below.

Faults

There are two distinct styles of faulting within the district. The oldest system is a conjugate set of strike-slip and or oblique-slip vertical faults. The dominant half of this set is oriented north ~57deg. west. The minor half of the set is oriented north ~60 east. The most prominent faults in this system form the Fish Creek Graben, the UP-South-Saddle-Fault, the UP-North Saddle-Fault, and the G-7 Fault. These structures were first formed in the early compressive episode and then were re-activated by regional uplift Figure 5 (Hiawatha Top Structure & X-Section Lines)

Elsewhere on the Eastern Wasatch Plateau, other faults in this system have been preferentially invaded with maffic dikes. This conjugate set of faults and dikes are cut by a later forming north-northeast set of normal faults. This later N-S fault system is by far the most dominant in terms of number, throw, and influence on the geomorphology. The largest local faults in this system have throws in excess of 600 feet. These faults form a series of “Basin and Range-style” horsts and grabens that are predominantly half grabens with the largest side dipping westerly. The N-S grabens are responsible for the N-S valleys that dominate the physiography.

Many of these N-S faults display characteristics of “curvy crossovers,” some wandering in strike and most displaying “scissor action” or highly variable throw along strike. This is due, in part, to the perturbations to local stress fields caused by interaction between the early E-W compressional structures and the N-S extensional system.

The numerous grabens and interaction between the two types of fault systems has resulted in a complex geometry of N-S elongated fault controlled structural blocks, some large enough to mine and others too small and isolated by elevation differences to be economically mineable.

FIGURE 5 (Hiawatha Top Structure & X-Section Lines)
is considered Confidential Information under R645-300-124
and has been relocated to
Exhibit 3 Confidential Information.

Four major north-south grabens dominate the structural elements within and in near vicinity of the property. From west to east these are; the Pleasant Valley Graben, the Eagles Canyon Graben the Long Canyon Graben, and the Jump Creek Graben. This Basin and Range style structure is clearly viewed in X-Sections Figures 6 through 9. Lines of section are shown on Figures 4, (Regional Geology & X-Section Lines) and 5 (Hiawatha Top Structure & X-Section Lines). Figure 6 (W-E Structure X-Section A-A'), and Figure 8 (N-S Structure X-Section C-C' have the water table peizometric surface plotted while Figure 7 (W-E Structure X-Section B-B'), and Figure 9 (N-S Structure X-Section D-D') do not.

The Scofield area is unique in the Eastern Wasatch Plateau having the northwest-southeast Fish Creek Graben south of Scofield Town. The Fish Creek Graben forms the northern limit of mining in this area. Two other faults, UP-North Saddle Fault, and UP-South Saddle Fault, were formed in the same structural event that formed the Fish Creek Graben. These faults limit the north south length of individual mining blocks in the area.

The horsts, strata remaining standing high between the down-dropped grabens, have not been named, but the mining blocks within the horsts constrained by both the bounding faults and by legal boundaries have been given names Figure 10 (Hiawatha Overburden Isopachs& Mine Blocks). Of these mining blocks only the Portal block and part of the Scofield North blocks are located within the "Portal Block Permit Boundary" and are described below.

Overburden or "cover" covering the Mine Blocks ranges from zero at the outcrop along the west side of the Portal Block Permit Boundary to maximum of 1,000 feet along the east side of the Portal Block Permit Boundary, and of course mimics topography but modified by faulting, Figure 10 (Hiawatha Overburden Isopachs& Mining Blocks).

Mining Blocks

Experience mining throughout the Eastern Wasatch Plateau has shown that mining within most grabens is very problematic for several reasons. The lower relative elevations cause the coal there to be saturated with water, this together with the increased number of small faults and fractures within the grabens, in contrast to the horsts, make mining conditions in the grabens very unfavorable. Therefore planned mining blocks are predominately in the larger horsts within the property Figures 5,(Hiawatha Top Structure & X-Section Lines) 10,(Hiawatha Overburden Isopachs & Mining Blocks) and 11 (Hiawatha Thickness & Mining Blocks.

<u>Portal Mining Block:</u> The Portal Block will be accessed from outcrop via a narrow corridor

of coal left un-mined by previous operators. The Portal block is bounded on the West by outcrop, North and South-West by previous workings, but on the East by the Eagles Canyon Graben and on the South-East by the G-6 fault. From the Portal block mining will ramp southward down across the G-6 fault, approximately 50 vertical feet, to access the Scofield North Block.

Scofield North Mining Block: The Scofield North Block is created by bounding faults; on the North and West by the G-6 Fault; on the East by the Eagles Canyon Graben, on the South by the UP North Saddle Fault. All of the bounding faults display throws of approximately 100 feet except the Eagles Canyon Graben (or the southern extension of it) which has an apparent throw of approximately 20 feet.

Joints

A joint study on the permit property has not been completed, however, Wade Hutchings (1997) completed field mapping on property immediately adjacent to the north of the this property and found joint orientations consistent with those predicted by a model of regional geology (GL Hunt Unpublished data) by understanding of the regional geology and the position occupied by the property within it. This has strong implications relative to joint orientations within the Kinney Property and allows a rather high degree of comfort in predicting the joint patters within the permit boundary to be predominately N-S with fewer numbers of NW and NE joints.

Stratigraphy and Lithology

The predominate lithotype in the Blackhawk Formation is sandstone/siltstone. Above the thick marginal marine sandstones forming the base of the formation, are thick (10 - 50 foot) sequences of lenticular channel deposits interspersed with more moderate (5 - 15 foot) sequences of sheet sandstone deposits. These sandstones are medium to fine-grained with a high percentage of silica and/or calcite cement filling the sand matrix which generally produces a low permeability. An estimated 35 percent of the formation is composed of correlatable sandstones.

About 30 percent of the Blackhawk is formed of thin, dirty, or discontinuous sandstones. Another 35 percent of the unit is composed of siltstones, often interbedded with the thin sandstones, and the remainder of the formation is composed of mudstones, carbonaceous mudstones, or claystones. The finer grained materials, especially the siltstones, have a higher percentage of silica cement and are often very well indurated. The interbedded units range in thickness from a few tenths of a foot to over a hundred feet. Thick sequences of mudstones in the Blackhawk are less common in this area.

The coal seams in the permit area are contained in the bottom half of the Blackhawk Formation and are interbedded with sandstone and shale. They are, in ascending order, the Flat Canyon, U.P. (Union Pacific), Columbine, Hiawatha and Haley seams Figure 3 (Stratigraphic Column, Kinney Area).

The base of the coal-bearing section is a transition between the lower seams deposited on and above the “Panther Sandstone” and the Seams deposited on and above the “Spring Canyon Member of the Starpoint Sandstone". The westward pinchout of the “Spring Canyon Member of the Star Point Sandstone” occurs within the permit boundary, thus the immediate floor of the Hiawatha Seam changes westward from marine

sandstone to shale.

Flat Canyon Seam

The Flat Canyon Seam occurs near the bottom of the Blackhawk Formation a few feet above the Panther Sandstone. It reaches thicknesses of up to four feet locally but is split or absent over the permit area.

U.P. Seam

The U.P. Seam is the thickest seam found in the Pleasant Valley District. In the U.P. Pleasant Valley Mine it attained a thickness of thirty feet and is greater than twenty feet for at least half a mile south and southwest of that mine. To the north and east of the U.P. Pleasant Valley Mine the seam splits into two or more seams ranging from six feet to one foot. It lies 70 to 90 feet above the Flat Canyon zone. It is correlated to the Lower O'Connor Seam south and west of the Western Reserve properties and has been mined in the Clear Creek, U.P., and Winter Quarters mines. It is of mineable thickness in the permit area, as can be seen in cross sections of drill holes and on drill logs.

Colombine Seam

The Colombine Seam occurs in a limited area northeast of Scofield. The Colombine Mine was the only development of this seam where it is five feet thick. The seam thins and splits east of the mine. It lies 30 to 55 feet above the U.P. Seam. Insufficient reserves and lack of access eliminate this seam from mining considerations.

Spring Canyon Member, Starr Point Sandstone

This unit can generally be described as a series of seaward imbricated sheet sandstones locally containing fluvial channels and tidal inlet deposits on its upper surface. The upper portion of the Spring Canyon (upper shore face) is typically composed of silica and dolomite-cemented, medium-grained, well-sorted, coarsening upward, sandstone.

Hiawatha Seam

The Hiawatha Seam is the most laterally persistent seam in the Pleasant Valley District and is the only economically mineable seam within the permit boundary. The Hiawatha Seam directly overlies the Spring Canyon Sandstone throughout all but the western-most 500 feet of the permit area where the sandstone pinches out westward. The Hiawatha Seam overlies the U.P. zone by 80 to 130 feet. It is correlated to the Upper O'Connor Seam to the south and west. It has been mined in the Clear Creek, O'Connor, Belina, Utah No. 1, Utah No. 2, Kinney, Blue Seal and Monay, Blazon mines and is being developed in the Skyline mines. Historically it has been referred to as the Kinney Seam, but only at the Kinney Mine.

The Hiawatha Seam Ranges from 6 to 12 feet in thickness locally, and is the only seam to be mined within the Portal Block Permit Boundary, Figure 11 (Hiawatha Thickness & Mining Blocks).

McKinnon Seam

The McKinnon Seam lies 250-400 feet above the Hiawatha Seam. It reaches a maximum thickness of four feet but is usually much thinner or parted and is not easily identified in drill holes over the permit area.

Haley Seam

The Haley Seam is very inconsistent in stratigraphic position and thickness. The seam is found only in the northeast corner of the study area. It overlies the Hiawatha by about 500 feet. The Haley Seam locally achieves a thickness of five feet but is usually absent or very thin. It was worked to a limited extent at the Haley Mine east of the Scofield Dam but is not considered economic in the permit area.

Immediate Roof and floor of the Hiawatha Seam

Strata enclosing the Hiawatha Seam with the potential of being mined together with the coal vary from marine sandstone, where the Spring Canyon Member of the Star Point Formation underlies the Seam, to fluvial dominated sandstones and overbank mudstones and siltstones.

The immediate roof rock of the Hiawatha Seam is typically composed of a locally thin veneer of clay-rich mudstones grading upwards into muddy to sandy siltstones. Meandering sandstone channels have been picked up by drill holes which intersect the top of the seam. The chemical composition of these strata are discussed in Section 623.100.

Strata from Hiawatha Seam to Top of Blackhawk Formation

Rocks overlying the seam are dominated by fluvial rocks containing an abundance of mudstone often rooted and carbon-rich with some ribbon shaped channel sands. This portion of the Blackhawk Formation above the Hiawatha Seam is extremely variable, being formed in a fluvial dominated system. This system produced numerous fluvial channel deposits and their related over bank deposits of siltstone, mudstone, claystone, and discontinuous inter-channel coals.

624.130 Sources of Geological Information

Geologic conditions in the permit and adjacent areas have been characterized in this section using information from studies and reports and previous and ongoing baseline characterization and monitoring activities. Available geologic information and relevance to this site are summarized below.

Interpretive data available include the following reports:

- Mounir Tawfik Moussa (1965)
- Vard H. Johnson Ph.D. (1977)
- Joel E. Palmer, Sanders Associates, Inc. (1979)

- Steven P. Knowles (1985)
- Wade Hutchings for Geo-Hunt Consulting (1997)
- David E. Pedersen Ph.D. for Geo-Hunt Consulting (1998)

Additional information was obtained from personal communications with Eric Robeck, who refined geologic interpretations together with Gregory Hunt. Additional data was obtained from work performed by W.R. Grace (1974) and Itel Resources (~1977).

FIGURE 11 Hiawatha Thickness & Mining Blocks
is considered Confidential Information under R645-300-124
and has been relocated to
Exhibit 3 Confidential Information.

The Geologic data set includes data from 70 drill holes from several vintages (26 are located within the Permit Boundary) Figure 2 (Drill Hole Locations w/Hiawatha Outcrop).

The data set also includes maps from four old mines that show the location of numerous faults and recorded coal thickness and conditions, limited surface outcrop exposures, and high quality aerial photography.
Drill hole data include:

1. gamma, density, caliper logs and down hole surveys
2. continuous core of the coal horizons and enclosing strata
3. chemical analysis of the coal seams and enclosing strata
4. rock mechanics data from the coal seams and enclosing strata

A comprehensive suite of data from the nine 2006 holes has been submitted and is considered Confidential Information under R645-300-124 and is located in Exhibit 3, Confidential Information).

Nine of the 2006 exploration drill holes, located on four of the drill sites, were completed as groundwater monitor wells with completions in the Hiawatha Seam and enclosing strata. Three of these locations are within the permit boundary. A digital color down-hole camera was lowered into and recorded continuous data from four of the completions to document the presence or non-presence of groundwater soon after the wells were completed. Subsequently, monthly and later quarterly baseline groundwater data have been collected from these monitor wells from 2006 to present with a hiatus during 2009.

Of the nine holes drilled in 2006 significant groundwater was encountered in CR-06-03 and CR-06-03ABV only. Minor amounts were encountered or suspected during drilling in all of the nine wells however it turns out that most of that water was from small perched aquifers as demonstrated by contrasting the data obtained from

CR-06-02 and CR-06-02ABV. CR-06-09 and CR-06-09BLW encountered the water table but the volume of water demonstrated by airlifting during drilling from both of them are small. This suggests rather low permeability.

CR-06-02ABV was completed over 100 feet above the Hiawatha Coal Seam in a perched aquifer and shows minor amounts of water. CR-06-02 is completed in the Hiawatha Coal Seam and is DRY. The completion process "cased-off" the small perched aquifer the CR-06-02ABV is complete in and has a screen isolated in the Hiawatha Coal Seam. This clearly demonstrates the presence of small perched aquifers in the area.

Two additional groundwater monitor wells were complete in July 2010 and both penetrated the regional water table. Data from all monitor wells is presented and discussed in Chapter 7.

Data from all sources have been integrated to form a conceptual geologic model which is here presented as a digital representation of that conceptual model in the form of maps and descriptions.

624.200 Underground Coal Mining and Reclamation Activities

624.210 Lithologic Logs and Material Analyses

Information gathered from previous drilling and exploratory programs varied considerably in completeness, format, and uniformity of the resulting data. Significant data gaps included the lack of geophysical logs, incomplete cutting logs, generalized core descriptions, rare and/or partial coal core analyses, and non-existent geotechnical descriptions for several of the prior exploration programs.

The primary focus of the 2006 exploration program was the development of ground water monitor wells to gather groundwater data for the permitting process. In conjunction with well drilling activities, geologic data was also collected to address existing gaps in the baseline geologic data.

Holes were both rotary drilled and spot cored. Cuttings were collected on ten foot increments and described for lithologic type, color, and significant grain size, mineral and carbon content. Drilling conditions are noted and are summarized by drill logs included in Exhibit 3, (Confidential Information).

Core sample descriptions include sample increments, recovery rates, strength designations, discontinuity descriptions and graphs, lithologic columns, detailed lithologic descriptions, and photographs. Any water, gas, fractures, etc. encountered during drilling were noted. Holes were deepened approximately 20 feet beyond the lowest strata of interest to create a "rat hole" for cuttings prior to geophysical logging or installation of well screen and casing.

Holes were geophysical logged producing curves including but not limited to Natural Gamma, Compensated Density, and Caliper. Geophysical logging information is provided as both hard-copy and in digital format. Four of the groundwater monitor wells were logged with a digital down-hole camera, providing color video of the hole, casing

conditions, water inflow zones and water level. A comprehensive suite of data collected from the 2006 drilling program is included in Confidential Information).

Coal core samples were analyzed for a variety of parameters including: Moisture, Ash, BTU, Sulfur, Volatile Matter, Fixed Carbon, Acid Potential (TCaCO3/1000T), Ash Fusion Temperatures. Ash Mineral Analysis includes, Ash Type, Specific Gravity, multiple Trace and major elements. Immediate roof and floor rock samples were separated and analyzed for acid forming or toxic-forming materials. Coal and roof/floor analysis results are included in Exhibit 19, (Geologic Information, Roof & Floor Analysis), and are discussed in Section 623.100, Chemical Characteristics of Coal and Associated Strata.

Any significant ground water encountered during drilling was reported to UDOGM. Each drill hole collar was surveyed after installation of the well monitoring equipment, and the drill sites reclaimed. All significant drilling parameters, hydrologic, and physical data about the hole is recorded on a Hole Completion Report with detailed backup residing in the accompanying drill hole file folder. Core not taken for laboratory analysis is being held for possible future geotechnical or geochemical testing.

R645-301-624.310

A complete and comprehensive drill hole data set for nine drill holes (CR-06-01, CR-06-02, CR-06-03, CR-06-03-ABV, CR-06-05, CR-06-05A, CR-06-09, CR-06-09BLW, CR-06-10) have been submitted. These data show lithologic characteristics, including physical properties and thickness of each stratum that may be impacted by mining.

Drill Data are considered Confidential Information under R645-300-124 and have been relocated to Confidential Information.

Ground Water Occurrence

Occurrence of groundwater is addressed in Chapter 7, Hydrology. However, detailed geology, particularly that of fault architecture, detail of fault boundary materials and how those features influences groundwater flow is not covered in Chapter 7 but is covered here in Chapter 6.

FAULTS and "VADOS ZONE SPRINGS"

The one spring within the permit boundary (Aspen Spring) and the two in nearest proximity to the permit area (Angle Spring, and Sulfur Spring), are all located within the vados zone, above the water table or above the saturated zone also known as phretic zone, See Figure 12 (Vadose Zone Cartoon) below.

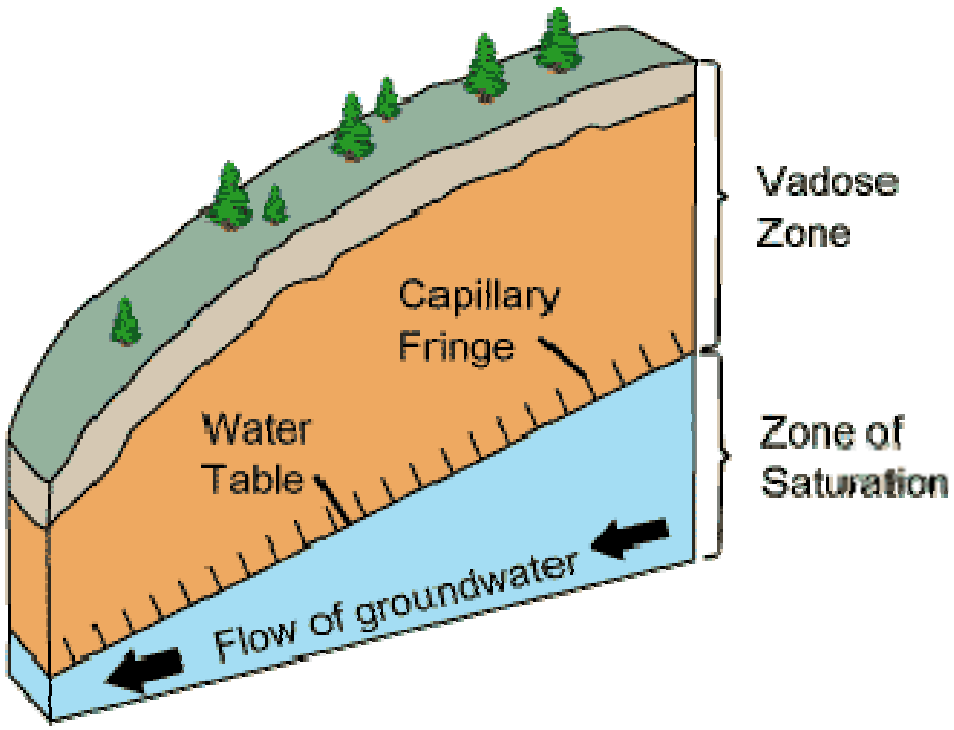


Figure 12: Cartoon depicting Vadose Zone as including all soil and bedrock lying above the Water Table (also known as Zone of Saturation or phretic zone).

As demonstrated on Map 7, Regional Hydrology, Aspen and Angle Springs are located more than one hundred feet above the peizometric surface. Sulfur Spring issues from the vados zone but just barely; it lies less than 30 feet above the peizometric surface at that point.

Anecdotal data from local cattle ranchers, together with personal observations and baseline monitoring data indicate that Aspen and Angle Springs are both intermittent. Angle Spring dries up in late summer – early fall - many years but not every year. Aspen Spring appears to flow in spring and summer only. Sulfur Spring appears to be perennial as it has never been observed to not flow water.

Springs located below the water table, in the zone of saturation, are rather easy to understand. More difficult to explain are springs issuing from the vados zone.
Many "apparent vados zone springs" are actually water table springs with "confined plumbing" connected to the water table (peizometric surface) at a point where elevation of the peizometric surface is higher than where the spring is issuing from.

Years of studying structural geology on the Eastern Wasatch Plateau have provided many examples of a correlation between major faults and springs. In fact, it is hard to find an example of a major spring on the Eastern Wasatch that is not connected to a fault. The study of structural geology includes in-depth study of the architecture of typical faults and how they interact with ground water. The author has personally observed many vados zone fault crossings underground in coal mines where the detailed architecture of fault geometry together with the omnipresent difference in rock moisture

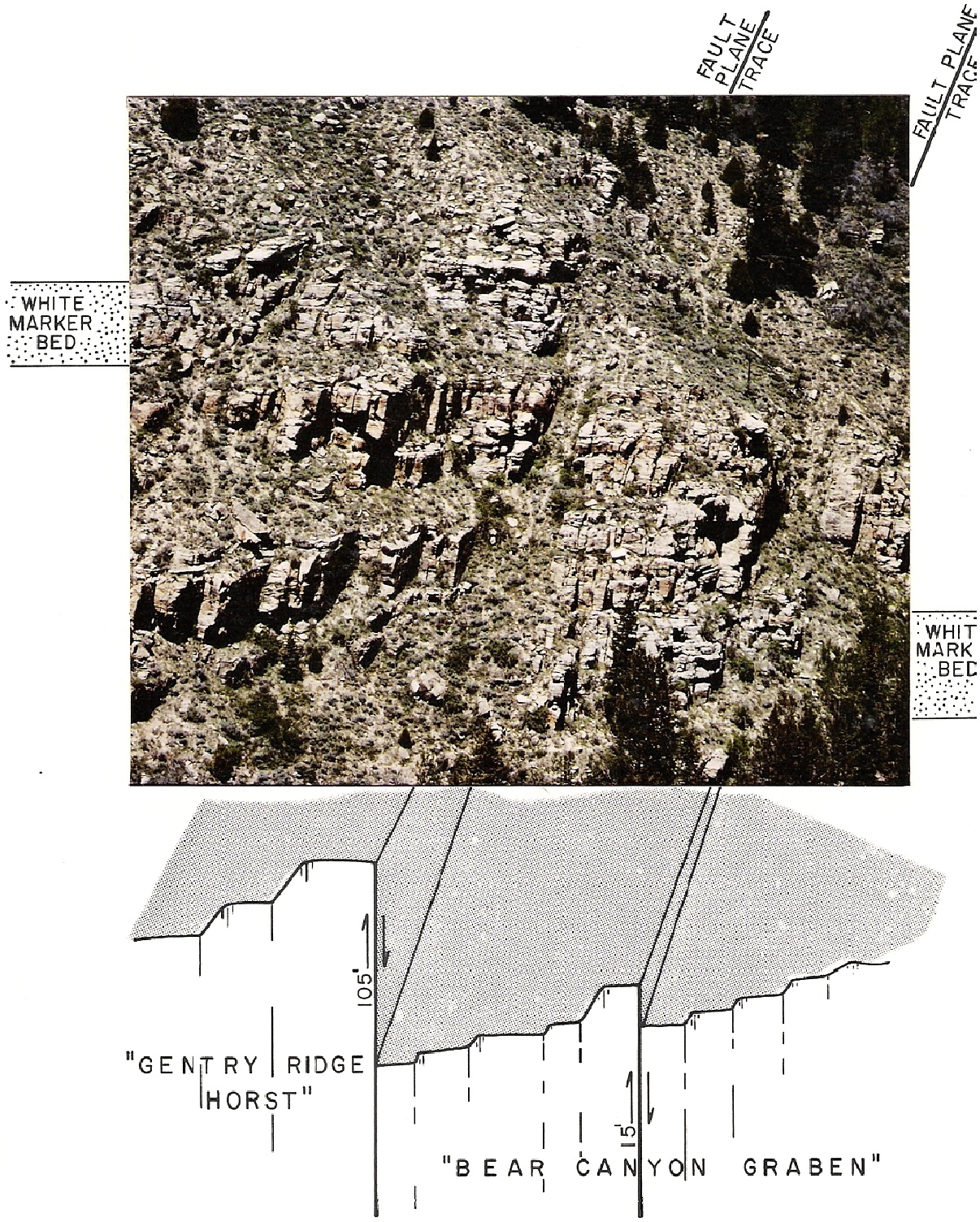
content across the faults and evidence of water migration through the breccia zone on one side of the faults only.

One such example is the Bear Canyon Graben, where rock tunnels in the Plateau Mine penetrated both sides of the graben at right angles in the graben crossing. This allowed careful observation of the fault planes.

The photograph in Figure 13 (Oblique Photo, Western Boundary Fault) below is an oblique aerial view of the west boundary fault of the Bear Canyon Graben as observed in outcrop of north wall of Tie Fork Canyon. This photograph shows two fault planes together with joints in the Castlegate Sandstone, with increased joint density near the westernmost and largest fault. This view shows only the large scale features because weathering on the outcrop obscures the fine detail. This structure was also observed underground in rock tunnels that crossed this graben approximately four thousand feet north of this photo location.

Figure 13A (Fault Detail) below, is a schematic of the detail observed in the rock tunnels and is typical of faults in the vados zone observed throughout the Eastern Wasatch Plateau. In addition to the breccia and gouge zones depicted, the rock west of the gouge zone was more moist than that of the east side. The west side breccia zone also contained limonite and goethite stains (rusty iron stains) indicating historic presence of oxidized water having passing through the conduit formed by this breccia zone.

The moisture difference observed underground accounts for the resistivity anomaly recorded from a surface survey prior to crossing the fault with the rock tunnels. This resistivity anomaly is also typical of those observed in the Eastern Wasatch Plateau suggesting the asymmetry in moisture content is the rule and not the exception. The presence of this moisture is accounted for by downward percolation of terrestrial water on its path to the water table.



CLOSE-UP VIEW OF THE "WESTERN BOUNDARY FAULT"
Of the "Bear Canyon Graben", in the Castlegate Sandstone, along north wall of Tie Fork Canyon.

Figure 13

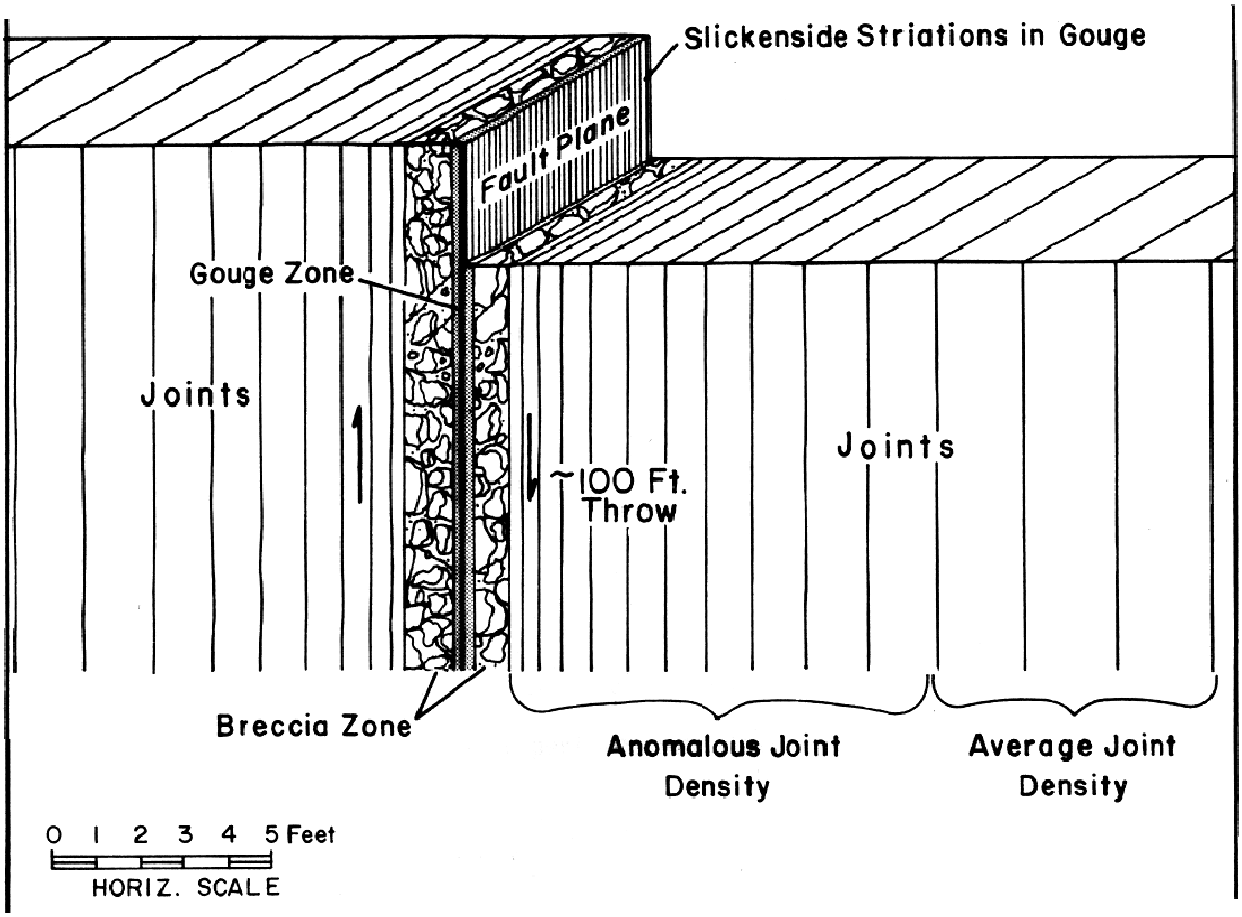


FIGURE 13A: Detail of typical fault plane in Cretaceous Sandstone and Coal of the Eastern Wasatch Plateau observed from in-mine penetrations.

This mechanism is demonstrated in a dramatic manner, approximately one mile west of the Figure 13 (Oblique Photo, Western Boundary Fault) location, where the southern extension of the Pleasant Valley Graben is also exposed along the north wall of Tie Fork Canyon. At this location the Tie Fork Spring issues from along the east side breccia zone of the Pleasant Valley Graben eastern boundary fault. The spring is perennial but the flow changes greatly, flowing in the neighborhood of 30 GPM in spring but reducing to less than 5 GPM in the fall. This flow pattern was traced to an obvious flow path where a large spring/seep complex discharges from the upper Price River Formation then migrates down-dip (westward) where it encounters the Pleasant Valley Graben east boundary fault then percolates along the fault downward and then southward to issue at the spring. This entire flow path is in the vados zone but is controlled by the dual nature of the fault, acting both as a horizontal flow barrier and a vertical and horizontal conduit providing the plumbing for direct recharge of the Tie Fork Spring.

Figure 13B (Excavated Dike) is a photograph of a splinter fault off the Pleasant Valley Graben truncating a dike in the mouth of Short Canyon (approximately five miles north of Tie Fork Canyon and twelve miles south of Kinney Mine). This photo shows graphically a breccia zone that developed between two small pieces of this fault system.

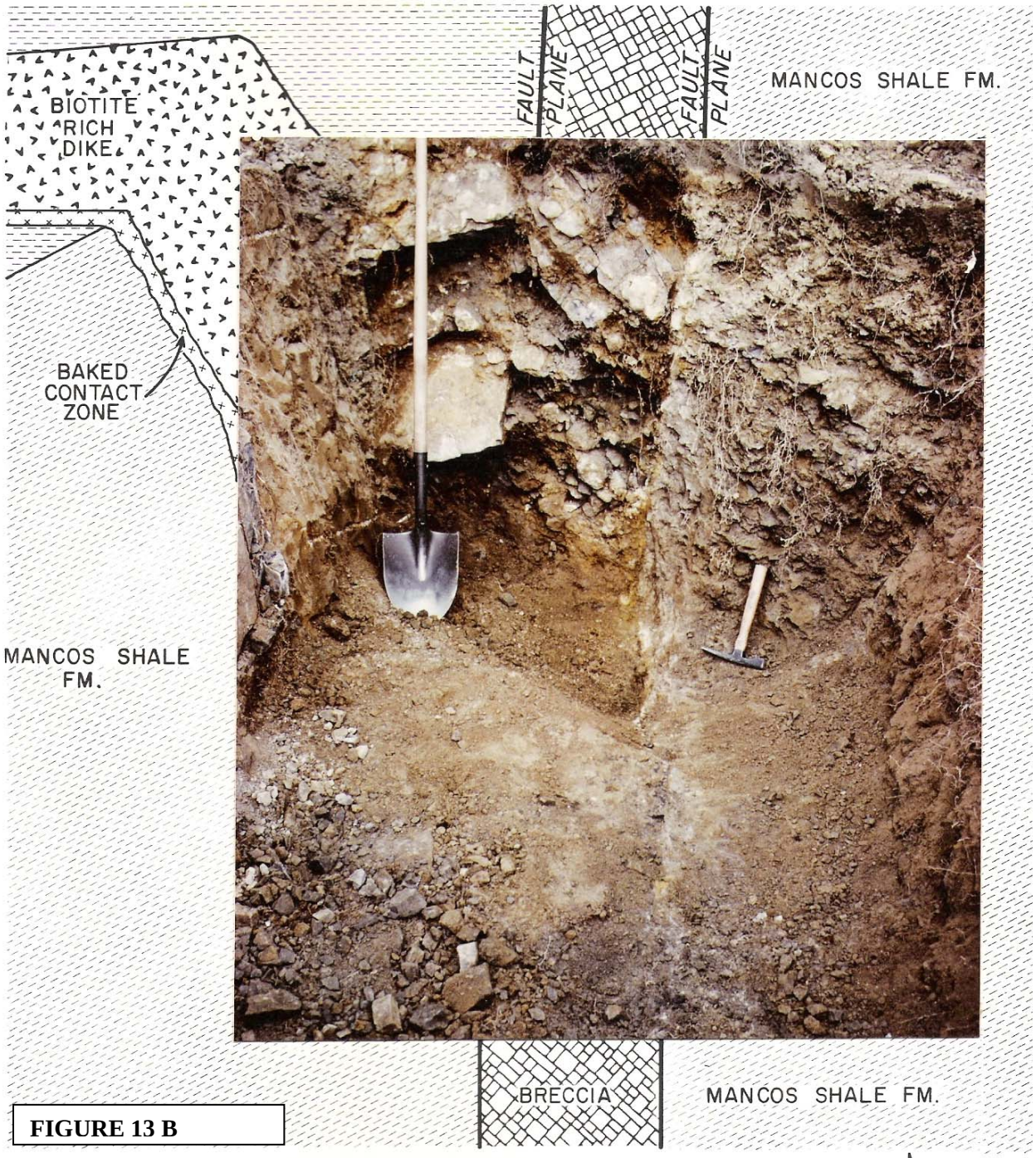


FIGURE 13 B

EXCAVATED N. 80° W. BIOTITE RICH DIKE
Truncated by N-S Normal Fault at the mouth of Short Canyon, in NuckWoodward Canyon.

The gouge zone at this location is approximately five millimeters (less than one quarter on one inch) and does not display the asymmetric moisture content or iron staining present along underground encounters with faults of larger displacement.

The relationship between fault displacement and width of gouge and breccia zones has been observed by many investigators. E.C. Robertson (Mining Engineering, October 1983) describes this relationship observed in many locations throughout the west in underground mine penetrations and outcrops. This investigator has observed the detail of faults with varying displacement and in varying Lithologies on the Eastern Wasatch Plateau in the Skyline and Plateau Mines. These observations have lead to a rule of thumb – faults with displacement of 100 feet or more produce gouge zones up of five inches. Five inches of gouge appears to be thick enough to behave as a barrier to groundwater flow, at least in the vados zone. It is not know to what extent a five inch gouge zone behaves as a groundwater barrier in the saturated zone where a head may exist. Information is not available from saturated zone fault penetrations, however, data presented here from the Kinney Mine area suggests that one; either faults having displacement of 100+ feet do not partition groundwater flow in the saturated zone, or two; the faults are "short" enough to allow groundwater to migrate around their ends in the saturated zone. There are likely ridges and valleys caused by the many faults in the peizometric surface at Kinney that are not reflected in the mapped peizometric surface (Map 7) due to insufficient data. However, the larger picture seems clear that a semi-regional water table exists and at that scale appears rather predictable.

With the understanding that 100+ ft. faults typically have a double role relating to water moving through the vados zone. Faults act as both flow barriers and conduits. That is, as rain water makes its journey from point of impact in a drainage basin, having substantial topography, it flows on an oblique trajectory downward to the zone of saturation. The trajectory is determined by many variables, hillside slopes in the drainage basin, plant cover, soil type, geologic formations with varying permeability's and transmissivities, structural discontinuities including faults, fractures, and joints. The flow trajectory typically tends down-slope, with a large amount being lost to evaporation or evapotransporation in warm months, gradually penetrating into the bedrock. In the case of Eagles Canyon, which is an Influent stream (loosing water to the water table), rainwater migrates downward to the water table via the path of least resistance. Likely much of the water migrates to the water table via encountering the gouge zone of a fault then utilizing the adjacent breccia zone conduit flows down to the water table. This suggests that there should be a very local ridges in the peizometric surface along man faults.

624.220 and 624.230 Please refer to 623.100

624-300 Underground Coal Mining and Reclamation Activities

624-310 Please refer to 624.210.

624-320 and 624-330 Please refer to 623.100

624-340 Please refer to 624.100

R645-301-627 Overburden Thickness and Lithology

Coal and Overburden/Interburden Characteristics

Geologic information from various sources obtained between 1977 and the present were used to evaluate the physical and chemical characteristics of coal and non-coal strata within the proposed lease and adjacent areas. Generally, the historical information is very limited. The 2006 Drilling Program generated the lion's share of the available data that include geophysical logging, and laboratory analyses of coal, roof, and floor samples from the Hiawatha Seam.

During exploration drilling, drilling conditions were recorded and core samples were described. Descriptions included sampling increments, recovery rates, strength designations, discontinuities, and detailed lithology. Occurrences of water, gas, and fractures were also noted. At a minimum, boreholes were logged for natural gamma, compensated density, and caliper.

Geologic logs and core data for the permit area are presented in Exhibit 3 (Confidential Information). Drill Data are considered Confidential Information under R645-300-124. These logs provide valuable information which has been used to characterize the lithologic characteristics of coal reserve areas and define site-specific information on the thickness of coal and other strata within the proposed permit area. The locations of the drillholes in the permit area are shown on the Figure 2 (Drill Hole Locations w/ Hiawatha Outcrop). Geologic information is also graphically illustrated by the Geologic Cross-Sections, Figures 6 through 9.

Physical Properties of Coal/Overburden/Interburden

Regionally and in the permit area, the Spring Canyon Member of the Starr Point Sandstone has historically been considered a regional aquifer. The well sorted, fine to medium-grained nature of the Spring Canyon Member even with moderate cementation, appeared to allow for ground water migration. However, more recent observations throughout the Eastern Wasatch Plateau has shown that the Spring Canyon is quite well cemented restricting the permeability and transmissivity to a degree as to render the Spring Canyon Member only a marginal regional aquifer. The one thing it has going is lateral persistence. The major coal seams having large secondary permeability due to cleating are better aquifers than is the Spring Canyon Member.

Ribbon shaped (plan view) and lenticular (x-section view) fluvial sandstones, occurring in the Blackhawk Formation act as perched aquifers and in some cases as small reservoirs for methane or natural gas. Experience in coal mines throughout the Eastern Wasatch Plateau Coal Field shows that coal units drain quickly when encountered by mining due to their limited thickness and lateral continuity. Interconnection of permeable units by crosscutting joints appears to be rare due to limited jointing and "healing" of most fractures by calcite cement.

Virtually no rock mechanics data were available prior to the 2006 drilling program.

Testing of collected coal core and core of representative rock units above and below the Hiawatha seam provide the available data set.

Uniaxial Compressive Strength for the Hiawatha seam and associated immediate roof and floor found in the proposed permit area are summarized by Table 5A, Strength Characteristics of Coal, Roof, and Floor Materials.

TABLE 5A
STRENGTH CHARACTERISTICS OF COAL, ROOF, AND FLOOR MATERIALS

Specimen No.		Lithologic Description	Failure Load (lb)	UCS* (psi)	Failure Mode
06-CR-06-01_5B/4-U-01	Hiawatha Upper Roof	Sandstone	27,700	3,180	
06-CR-06-01 5B/5-U-02	Hiawatha Upper	Sandstone	49,220	5,951	
06-CR06-05A-5/1-U-13*	Hiawatha Roof	Mudstone	40,850	5,561	45° fracture
06-CR06-05A-6/1-U-14*	Hiawatha Roof	Sandstone	79,850	11,033	Axial fractures
06-CR-06-02_1A/17-U-06	Hiawatha Roof	Silty Sandstone	142,800	17,299	
06-CR06-05A-8/2-U-03	Hiawatha Seam	Sandstone	8,200	1,162	Axial fractures
06-CR06-05-5/1-U-08	Hiawatha Floor	Sandstone	16,530	2,363	45° fracture
06-02-CR-02_5A/18-U-07	Hiawatha Floor	Sandstone	57,930	6,998	

The

* UCS values for samples with L/D<2.0 are corrected as per ASTM D2938-86.

Lab reports supporting Table 5A are found in Exhibit 19 (Geological Information, Rock Strength Data).

R645-301-630 Operation Plan

631 Plans for Casing and Sealing Exploration Holes

Generally, a determination will be made either prior to or during completion of any exploration holes or boreholes whether or not the hole(s) will be utilized for ground water monitoring purposes. If the hole is to be utilized for monitoring it will be cased, completed and developed as a monitoring well consistent with Figure 21 (Typical Well Completion Diagram) and as described in Chapter 7 Section 301-738 Completion as Ground Water Monitoring Wells. If the hole(s) is not to be utilized as a monitoring well or when an existing well is no longer required for ongoing monitoring, it will be sealed by filling the borehole or casing with cement to form a plug from the bottom of the hole to at least 20 feet above any zone of completion or water-bearing zone; filling the remainder of the hole to within 20 feet of the ground surface; and filling the remainder of the hole to the ground surface with cement to form a surface plug. A steel fence post will be placed in the center of the surface plug before the cement sets-up to provide a permanent marker for the hole location.

In the event a water monitoring well is transferred to use as a water well, it will be done under regulation R645-301-731.400.

632 Subsidence Monitoring

No full extraction mining, or pulling of pillars is planned at the Kinney No. 2 Mine, therefore subsidence will not take place. No subsidence monitoring is necessary.

R645-301-640 Performance Standards

Performance will be maintained as in 631 and 632.

Chapter 7

R645-301-700 Hydrology

Kinney No 2 Mine

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R645-301-710 General Contents

This section describes the hydrologic conditions and resources within the permit and adjacent areas that could potentially be affected or impacted by the mining and reclamation activities. Information in this section was developed following applicable regulatory guidelines (R645-301-700) for coal mine permitting in the State of Utah.

Hydrologic conditions in the permit and adjacent areas have been characterized in this section using information from ongoing baseline characterization and monitoring activities. This hydrology description represents a consolidation of monitoring data specific to the Kinney No. 2 Mine permit area (Exhibit 10, Surface and Ground Water Field Measurements, Exhibit 11, Monitor Well Completion Details, Exhibit 12, Surface and Ground Water Quality Data; Spread sheet prints, Lab Analyses). Ongoing baseline monitoring activities are as specified herein, and within R645-301-724 and R645-301-724.100.

This hydrology description represents a consolidation of regional information and recent monitoring data specific to the Kinney No. 2 Mine permit area. Ongoing baseline monitoring activities to be a part of the Baseline Hydrology Monitoring Plan for the Kinney No. 2 Mine are discussed briefly below. The purpose of the plan is to collect and evaluate baseline hydrologic data specific to the Kinney No. 2 Mine. Data collected under the plan is used to characterize existing surface water and ground water in the area and evaluate potential impacts to these resources from mining and reclamation activities. The monitoring plan consists of a comprehensive seep and spring survey completed by Rock Logic Consulting, LLC of Cedaredge, Colorado in 2006 Exhibit 9, Seep and Spring Survey. The survey resulted in the identification of 25 spring/seep locations. One of the springs noted in their report was identified as Miller Spring. Map 7 showing the regional hydrology refers to this as Eagle Spring. For clarity, both referenced names are shown on Map 7. Also as a point of clarification, Eagle Pond 1 as defined in the Seep and Spring survey is referenced herein and shown on Map 7 as Aspen Spring. In addition to the seep and spring survey, well drilling, testing, and monitoring has been completed on 11 wells to evaluate geohydrologic conditions including the occurrence of ground water and hydraulic characteristics of the aquifers. Perennial surface water sources found within or adjacent to the mine permit area, include Mud Creek, Miller Canyon, and Scofield Reservoir.

R645-301-712 Certification

All cross sections, maps and plans required by R645-301-722 as appropriate, and R645-301-731.700 have been prepared and certified according to R645-301-512.

R645-301-721 General Requirements

This permit application document includes a description of the existing, premining hydrologic resources within the proposed permit and adjacent areas that may be affected or impacted by the proposed coal mining and reclamation operation.

All surface and well monitoring stations utilized for baseline monitoring for the Kinney No. 2 Mine permit area are listed in Table, 6 Kinney # 2 Mine Baseline Monitoring Stations. Operational

monitoring stations are shown in Table 7, Kinney No. 2 Mine Operational Monitoring Stations. Surface and ground water monitoring locations are shown on Map 7, Regional Hydrology, and Map 28, Surface and Ground Water Monitoring Sites. During the preparation of the mine permit application it was discovered that some monitoring stations had inadvertently been given different names during data collection. Attempts have been made to rectify this situation including the identification of a preferred monitoring station name. However, the following clarification is provided in the event that old references are located within the permit or its appendices.

Preferred Station Name	**Alternate Documented Names**
CR-06-03-ABV	CR-06-03
Miller Spring, Eagle Springs	Eagle Spring
Miller Outlet	Eagle Outlet, Eagle Outlook
Mud Creek	Muddy Creek
Res-1	Scofield Res. 1
Sulfur Spring	Sulfur Springs, Sulfer Spring, Sulfer Springs

Baseline hydrologic monitoring will be performed for the Kinney No. 2 Mine permit area at the following frequency:

Springs – R645-301-724.100 requires minimum baseline monitoring of TDS or Specific Conductance, pH, total iron and manganese, and the rate of discharge or usage. Springs and seeps identified in Table 6 have or will be monitored for a two year period to establish baseline conditions for aqueous parameters according to the schedule provided in Table 20, Hydrologic Monitoring Schedule.

Stream Stations - R645-301-724.200 requires minimum baseline monitoring of Total Suspended Solids, TDS or Specific Conductance, pH, total iron and manganese, and the rate of discharge or usage. Flow and field water quality parameters have been measured on a monthly basis for the Miller Outlet and Mud Creek surface stations, and for the Scofield "Res-1" site during periods wherein access is not limited due to ice. All stream stations have been monitored for a two year period to establish baseline conditions for aqueous parameters according to the schedule provided in 20, Hydrologic Monitoring Schedule. Flow measurements for Miller Outlet (aka Miller Creek in Miller Canyon) and Sulfur Spring were calculate via the following method. Both water sources flow beneath Highway 96 through culverts who's diameter and length have been measured. At each field outing the depth of water passing through each culvert is measured and a stick is dropped into the flow at one end of the culvert and timed as it passes through the culvert. These data have been used to calculate flow volumes presented on Figure 17, Field Data. Flow volume for Mud Creek is obtained via internet from the USGS real-time monitoring station at the mouth of Winter Quarters Canyon and the Scofield Reservoir Pool Elevation is measured in the field on the staff gauge near the dam and via the internet from the Bureau of Reclamation real-time measuring station also located at the Scofield Dam. Estimates of flow from the springs also utilize standard field techniques. All field data can be found on Figure 17, Field Data.

Monitoring Wells - R645-301-724.100 requires minimum baseline monitoring of TDS or Specific Conductance, pH, total iron and manganese, the rate of discharge or usage (if applicable) and depth to water. Wells shown on Map 28, Surface and Ground Water Monitoring Sites, have or will be sampled on a monthly basis for a one year period, through each of the four seasons (when the well is accessible, and when sufficient water

exists to extract a sample) to establish baseline conditions for aqueous parameters according to the schedule provided in Table 20, Hydrologic Monitoring Schedule.

Table 6 Kinney #2 Mine Baseline Monitoring Stations

Location	Type	5/2005	9/2005	10/2005	11/2005	12/2005	1/2006	2/2006	2/2006	3/2006	4/2006	5/2006	6/2006	7/2006	8/2006	9/2006	10/2006	11/2006	12/2006	1/2007	2/2007	3/2007	4/2007	5/2007	6/2007	7/2007	11/2007	3/2008	6/2008	8/2008	10/2008	11/2008	6/2010	7/2010	8/2010
CR-06-01	Well									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x	x	x		x		
CR-06-01-BLW	Well									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						x	x		x		
CR-06-02	Well									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x											
CR-06-02-ABV	Well									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x	x	x		x		
CR-06-03-ABV	Well																																		
CR-06-05-A	Well															x	x		x	x	x	x	x	x					x	x	x		x		
CR-06-09	Well																																		
CR-06-09-ABV	Well																																		
CR-06-09-BLW	Well																																		
CR-10-11	Well																																		
CR-10-12	Well																																		
Angle Spring	Spr																																		
Aspen Spring (1)	Spr																																		
Eagle Spring (1)	Spr																																		
Miller Outlet (2)	Surf																																		
Mud Creek (3)	Surf																																		
Res–1 (4)	Surf																																		
Sulfur Spring (5)	Spr																																		

1 – Some data herein may also refer to this sources as Miller Spring
2 – Some data herein may also refer to this source as Eagle Outlet or Eagle Outlook
3 – Some data herein may also refer to this source as Muddy Creek`
4 – Some data herein may also refer to this source as Scofield Res-1
5 – Some data herein may also refer to this source as Sulfur Springs, Sulfer Spring, or Sulfer Springs

	Water Quality Data Available
	Water Level Data Available, x = Dry Hole
	Water Level and Quality Data Available

Table 7 - Kinney Mine Operational Monitoring Stations

Location	Type	Water Level	Flow	Water Quality
CR-06-01	Well			
CR-06-01-BLW	Well			
CR-06-02	Well			
CR-06-02-ABV	Well			
CR-06-05-A	Well			
CR-06-09	Well			
CR-06-09-ABV	Well			
CR-06-09-BLW	Well			
CR-10-11	Well			
CR-10-12	Well			
Aspen Spring (1)	Spr			
Eagle Spring (1)	Spr			
Miller Outlet (2)	Surf			
Mud Creek (3)	Surf			
Res–1 (4)	Surf			
Sulfur Spring (5)	Spr			

1 – Some data herein may also refer to this sources as Miller Spring
2 – Some data herein may also refer to this source as Eagle Outlet or Eagle Outlook
3 – Some data herein may also refer to this source as Muddy Creek
4 – Some data herein may also refer to this source as Scofield Res-1
5 – Some data herein may also refer to this source as Sulfur Springs, Sulfer Spring, or Sulfer Springs

Data obtained from the baseline monitoring plan characterizes current surface and ground water flows, water quality conditions, and any seasonal variations in these characteristics. Approximately two years of baseline data are available from the surface monitoring locations and Approximately one year of groundwater baseline hydrologic data is now available for most stations for UDOGM's technical adequacy review of this permit application. Adequate baseline data have been collected, per discussions with UDOGM personnel, and CR has now moved into quarterly sampling. The "two down peizometric slope" monitor wells CR-10-11 and CR-10-12 were added to the group of groundwater monitor wells at the request of the Division.

R645-301-722 Cross Sections and Maps

Hydrologic information is presented in various locations within the permit including:

• Other Permits	Exhibit 4
• Springs and seeps	Exhibit 9 (Map 10)
• Field Measurements , Surface and Groundwater	Exhibit 10
• Monitor Well Completion Details	Exhibit 11
• Surface and Groundwater Quality Data	Exhibit 12
• Water Quality Rights	Exhibit 13
• Runoff Control	Exhibit 16
• CHIA (UDOGM)	Exhibit 17

• Surface water bodies	Map 7
• Boreholes and test wells	Map 7
• X-Section A–A'	Map 7A
• X-Section –C-C'	Map 7B
• Faults and other geologic structures affecting hydrology	Map 8
• Ground Water Level Data	Map 9
• Regional Water Quality	Map 10
• Surface Facilities	Map13
• Drainage and Sediment Pond Controls, Undisturbed Area	Map 23
• Drainage and Sediment Pond Control, Disturbed Area	Map 24
• Sediment Pond 1	Map 25
• Runoff Control	Map 27
• Surface and ground water monitoring locations	Map 28

301-722.400 Water Wells In The Permit and Adjacent Area

Three water wells exist with 1 mile of the permit boundary as shown on Map 30, Ground Water, Water Rights as follows:

Water Right No.
91-3401 – No depth information is available in the Utah Division of Water Rights information.
91-3402 – No depth information is available in the Utah Division of Water Rights information.
91-4889 – The well is listed as 6", with a depth of 100-500 feet.

These water wells are addressed in response to R645-301-724.100 to follow.

R645-301-723 Sampling and Analysis

All water quality samples will be analyzed according to the most current copy of the Standard Methods for the Examination of Water and Wastewater, a joint publication of the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation.

***Table 20 Hydrologic Monitoring Schedule**

Field Measurements	Reported As	Baseline		Operational & Post-Mining	
		Surf	GW	Surf	GW
Water Level or Flow	Depth, Flow				
pH	Std Units				
Specific Conductivity	umhos/cm @ 25 °C				
Temperature	°C				

Laboratory Measurements	Reported As	Baseline		Operational & Post-Mining	
		Surf	GW	Surf	GW
Total Dissolved Solids	mg/l				
Total Suspended Solids	mg/l				
Total Hardness ($CaCO_3$)	mg/l				
Total Alkalinity	mg/l				
Acidity	mg/l				
Aluminum (Dissolved)	mg/l				
Arsenic (Dissolved)	mg/l				
Boron (Dissolved)	mg/l				
Carbonate	mg/l				
Bicarbonate	mg/l				
Cadmium (Dissolved)	mg/l				
Calcium (Dissolved)	mg/l				
Chloride	mg/l				
Copper (Dissolved)	mg/l				
Iron (Dissolved)	mg/l				
Iron (Total)	mg/l				
Lead (Dissolved)	mg/l				
Magnesium (Dissolved)	mg/l				
Manganese (Dissolved)	mg/l				
Manganese (Total)	mg/l				
Molybdenum (Dissolved)	mg/l				
Ammonia	mg/l				
Nitrates	mg/l				
Nitrites	mg/l				
Potassium (Dissolved)	mg/l				
Phosphate (Ortho)	mg/l				
Selenium (Dissolved)	mg/l				
Sodium (Dissolved)	mg/l				
Sulfate	mg/l				
Zinc	mg/l				
Oil & Grease					
Settleable Solids	UPDES				
Cations	meq/l				
Anions	meq/l				

Data submittals will be made to UDOGM on the following Basis:

Quarterly – Lab water quality results will be submitted within 90 days of the end of the quarter.

Annually – Hydrologic review and summary of data will be submitted on or before June 1st.

The topography and general hydrogeology of the mine permit area is typical of central Utah mountain areas, containing both valley and mountain segments. The direct permit area lies within a north south trending mountain range traversed by small east to west drainages as shown in Figure 14, Arial View of Permit Area. The figure, looking to the north-east shows the general topographic nature of the area, Scofield Reservoir to the north, the town of Scofield in the bottom central portions, the railroad which goes through the town of Scofield then bends to the east, then crosses and parallels the highway as it continues northward, a private mountain access road that zig-zags up the mountain side within the southern portions of the permit area, and an un-named ephemeral drainage lying just south of the mountain access road. In general, the permit area includes the area north of the un-named ephemeral drainage, south of the point where the railroad crosses the highway, and within 1,500 feet east of Utah highway 96.

The relatively dry climate and limited up-gradient drainage area limit local ground water recharge and surface water runoff. The majority of seeps and springs identified within the general area were found within the north-south trending drainages lying to the east and south of the permit area including Long Canyon, Merrill Canyon, Eagle Canyon, and UP Canyon.

Semi-arid climatic conditions and precipitation patterns result in a high loss of moisture to runoff, evaporation, and sublimation reducing the amount of water available for recharge or stream flow. Recharge to underlying units is also limited by flat lying units. Downward movement of recharge through the stratigraphic sequence to underlying units is limited by low vertical permeabilities of the units (which are often fine-grained, well cemented, or massive), the presence of relatively impermeability shale units acting as confining layers.

As a result of these controls, ground water has only been noted to occur in limited quantities during well drilling activities. Shallow ground water is present however in the alluvial/colluvial deposits associated with Pleasant Valley located west of the mine site. Very limited ground water is expected to be encountered during mining operations.

The coal mining operations planned for the site will include mine portals, office and maintenance facilities, coal processing, storage, and loadout facilities, roads, and runoff control facilities. The facilities will be constructed on a series of pads interconnected by roads. Runoff control facilities will consist of a series of ditches, culverts, and a single flow/sediment pond located at the extreme north end of the disturbed area.

Five alternate sediment control areas are planned for the mining operation. The first and main area is a topsoil stockpile area planned to be located east of and adjacent to highway 96, and immediately south of the main entrance and access road. This alternate sediment control area will utilize a downhill berm, small drainage channel, and silt fencing and/or straw bales to control sediment runoff. The second and third areas involve small overland flow zones immediately adjacent to the entrance off Highway 96. These small areas will discharge into small sediment traps. The fourth and fifth areas involve additional soil stockpile areas located just north and south of culvert CP-2 within the small triangular permit area west of Highway 96. Details regarding the runoff control plan are provided on Map 24 and within R645-301-731 – 738.

R645-301-724.100 Ground Water Information

Ground water occurrence in the permit and adjacent areas has been quantified by the completion of a seep and spring survey, exploratory well drilling geologic analysis of potential

water-bearing strata, the identification of potential ground water storage in underground mines, and the analysis of water quality and quantity characteristics and by completing a total of eleven groundwater monitor wells located in eight different locations in and around the permit area, and from surface water conditions known to exist within Long Canyon, Miller Canyon, Mud Creek, and Scofield Reservoir. Locations of monitor wells are shown on Map 7, Regional Hydrology. Wells CR-06,01, CR-06-02, CR-06-05A and CR-06-09 all penetrate and are screened within the Hiawatha coal seam. Wells CR-06-02-ABV, CR-06-03-ABV, and CR-06-09-ABV are all screened into potential water bearing zones (perched aquifers) above the Hiawatha coal seam, while wells CR-06-01-BLW and CR-06-09-BLW are completed in zones below the Hiawatha seam. Monitor wells CR-10-11 and CR-10-12 are completed into the regional water table within the pleasant valley graben and as a result are completed far above the Hiawatha Coal Seam because the Seam has been dropped down approximately 600 feet inside of the graben. To maintain nomenclature these two monitor wells should have been given the ABV suffix but were not. Completion details for all monitoring wells are included within Exhibit 11, Monitor Well Completion Details.

It will be noted that a concerted effort was made to complete some of the wells a significant depth beneath the seam to be mined (Hiawatha). As can be seen by on the completion diagram for Monitor Well CR-06-01-BLW, the top of the ten foot well screen is one hundred fifty four (154) feet below the base of the Hiawatha Seam.

Field data collected from the monitoring wells is included within Exhibit 10, Surface and Ground Water Field Measurements and as shown on Table 6, Kinney #2 Mine Baseline Monitoring Stations, four of the eleven monitor wells are "dry". Comparing the Ground Water Field Measurements with the Monitor Well Completion Diagrams reveals that all the water levels recorded in these four dry holes are within the ten foot blank below the base of the screened interval in each of these four wells.

Raw data, referred to above, have been reviewed to develop interpretations and reach the conclusions presented in this section.

As previously noted, only limited ground water exists within the permit and adjacent areas; it is mostly limited to the underlying regional water table, and in alluvial/colluvial deposits that form shallow unconfined water table aquifers associated with small area drainages, Some water may also be found within localized perched ground water system within the stratigraphic sequence, and small vertical aquifers adjacent to faults, and as stored water in adjacent abandoned underground mine workings. These ground water occurrences, especially within the proposed permit area are not significant as water supplies due to the limited regional continuity of the associated units, low overall permeabilities, limited recharge and, in the case of the water table aquifer, relative depth and lack of confinement. Surface water sources, dominated by Mud Creek, provide a much more consistent and reliable water supply source.

While some ground water recharge undoubtedly occurs within the permit and adjacent areas, recharge is limited both by the factors noted above and by the low overall permeability of the stratigraphic sequence which effectively limits significant vertical ground water movement.

Figure 14 Ariel View of Permit Area

The exception to this generality is some of the N-S faults which are suspected of providing vertical conduits for recharge. On a regional basis, recharge is believed to occur through isolated outcrop areas where permeable units are exposed to direct precipitation.

Consistent with applicable provisions of R645-301-512, hydrologic information has been prepared under the direction of, and certified by a qualified registered professional engineer or land surveyor with assistance from experts in the related fields. To aid in the following discussion, Map 8, Works-Wells-Springs-Faults has been created to assist in showing the inter-relationships between important geologic and man-made features.
The regulatory definition for "Renewable Resource Lands" includes geographic areas which are important in supporting and maintaining water supplies and areas which contribute significantly to agricultural production. The water supply component of this definition specifically includes those areas containing ground water aquifers and associated recharge areas.

While there are known, but limited, ground water occurrences within the permit and adjacent areas, none of the identified aquifers are important water supply sources. In general, the sparse vegetation, geologic stratification, and semi-arid climate combine to limit ground water infiltration, with either runoff or evaporation/transpiration accounting for most of the precipitation received. Based on this and test drilling data, we conclude that the area does not provide significant recharge to any regional ground water aquifer. The most important local feature is the areas importance as a watershed for local surface drainages. There are no known significant historical nor recent agricultural activity within the permit or adjacent areas and the USDA-SCS has issued a negative determination for prime farmlands for the area as discussed and documented in R645-301-211, 222, and 223, Prime Farmlands.

Ground Water Environment

The geology of the permit and adjacent areas is described in detail in R645-301-610 - 627, however, the regional hydrostratigraphy of the area is reflective of the following primary formations, listed and described in order beginning with the lowermost stratigraphic unit of interest:

Mancos Shale - A massive grey marine shale. Commonly fine grained, the Mancos Shale is generally interbedded with fine to medium-grained sandstones. While the shale members are characterized by relatively low permeability, any ground water percolating through the more permeable interbedded sandstones may come in contact with associated evaporites such as gypsum resulting in rapid degradation of water quality. The Mancos Shale is laterally continuous in the proposed permit area.

Blackhawk Formation - The principal coal-bearing formation of the Mesa Verde Group, the Blackhawk Formation, is a sequence of alternating sandstone, mudstone, and coal. The coal seams of greatest economic importance occur within the lower portions of the formation. The sandstones are fine to medium-grained and are typically well cemented resulting in relatively low permeabilities. The shale units are similar in character to the Mancos Shale and are relatively tight, acting as aquitards to limit vertical ground water movement.

In ascending order, major units of the Blackhawk Formation include the Panther sandstone, Flat Canyon coal seam, Storres sandstone, Lower UP coal seam, Columbine coal seam, Spring Canyon sandstone, Hiawatha coal seam, McKinnon coal seam, and Haley Coal Seam

Castle Gate Sandstone - A fine to medium-grained, argillaceous to slightly calcareous massive sandstone. The Castle Gate Sandstone grades to shale both along its basal contact with the Blackhawk Formation and, in many locations, near the top of the unit. Due to its massive occurrence and strong cementation, it is highly resistant to weathering forming prominent cliffs throughout the region, and exhibits relatively low permeability. The thickness of this unit typically ranges from 100 to 500 feet.

Price River Formation - Medium-grained sandstone and shaley sandstone grading to a grey to green shale. The Price River Formation is generally characterized by low primary permeability with some localized increases in permeability due to extensive fracturing.

North Horn Formation - A series of shales, sandstones, conglomerates, and freshwater limestone deposits, which throughout the region can be 2,400 feet thick, and laterally discontinuous in rugged topography. The shales are relatively tight, functioning as aquitards to minimize downward ground water movement.

Although ground water can occur in all of the major stratigraphic units identified, all are considered poor to moderate aquifers. Ground water yields are limited within the proposed permit area by small recharge basins, the semi-arid climate of the region which limits recharge to the units, low permeabilities, and the lack of regional lateral continuity resulting from dissection by deep drainage valleys. While many of the minor stratigraphic units (such as sandstones and coal seams) are capable of storing and transmitting ground water, regional

ground water transmission capabilities are limited by the relatively thin and laterally discontinuous nature of these semi-permeable units.

Ground Water Aquifers

Ground water aquifers within the proposed lease and adjacent areas have been characterized on the basis of information obtained from field investigations, well drilling, and ongoing monitoring activities. These activities include borehole drilling and well installation, geologic and geophysical logging, observations of the occurrence of water during exploration drilling, aquifer testing, routine water level monitoring, and routine ground water quality analyses. Ground water occurrence and movement in the proposed permit boundary and adjacent areas can best be characterized by describing the four primary aquifer systems identified through field investigations and monitoring activities to date.

The four aquifer systems include the:

- Alluvial/Colluvial Aquifer System
- Perched / Isolated Ground Water Systems

Includes narrow vertical systems within breccia zones of some faults. •

- Regional Ground Water System
- Stored Mine Water System

These aquifer systems are individually described below.

Alluvial/Colluvial Aquifer System

The alluvial/colluvial aquifer system consists of shallow ground water contained in limited alluvial/colluvial deposits associated with area surface drainages. In the smaller drainages, these alluvial/colluvial deposits are very narrow and may store and transmit relatively minor amounts of ground water. The only alluvial/colluvial aquifers of any significance occur along the channels of the perennial drainages of Mud Creek and Miller

Creek downstream of the permit area and are generally confined to the active stream channel, immediately adjacent areas, and any hydrologicaly connected inactive or abandoned channel segments.

The alluvial/colluvial aquifer system in the area appears to be closely tied to the surface water system with ground water recharge occurring during periods of high flow and ground water discharge occurring near Scofield Reservoir on a relatively continuous basis but becoming more pronounced during periods of low flow when stream levels may drop below the existing potentiometric surface of the alluvial/colluvial aquifer. Some lateral discharge from the shallow ground water aquifer to Mud Creek may also occur from side channel tributaries during late season low flow periods. The regional aquifer system may also be a source of recharge to the alluvial/colluvial system in the lower reaches of Mud and Miller Creeks.

Perched Ground Water System

Perched ground water in the permit area can occur within limited semi-permeable units within the Blackhawk Formation. Typically, perched ground water systems consist of isolated lithologic members which have sufficient permeability to store and transmit ground water and are

connected to a natural source of recharge.

Perched ground water occurrence are typically ribbon shaped sand-rich fluvial paleo-channels that are enclosed in an envelope of rather impervious mudstone and siltstone. These channels become water bearing in two ways. one; much of the water in perched systems is connate as determined from isotope age dating data of water from these ribbon channels from other mines throughout the Eastern Wasatch... Two; because these channels have extremely long lateral extent along he their axis they either daylight as an outcrop in a recharge zone or "sub-crop" against a fault and receive recharge from water that is moving downward within the breccia zone of the fault when structural dip of the fault block in which they reside is favorable.

A second group of perched aquifers consist of coal seams. Coal seams have inherently low permeability and transmissivity but possess rather large secondary permeability and transmissivity due to cleating. The coal seams are also enclosed, generally, with rather impervious mudstone and siltstone but unlike the narrow sinuous shapes of paleo-channels, coal seams have large areal extent. The same two basic recharge mechanisms apply to coal seams as apply to channels.

A third group of perched aquifers are the narrow vertical aquifers adjacent to faults. These small volume perched aquifers appear to be responsible for many of the springs located within the permit boundary and indeed within the Eastern Wasatch Plateau Region. The springs in Eagle Canyon, Angle, and Aspen show strong evidence for being fed by a fault controlled perched aquifer. They both occur above the regional water table and both display very high quality water, (low TDS and dissolved elements etc.) both have short flow periods each year. Flowing in the early spring and drying up in mid summer to early fall on a yearly basis.

The thickness of strata bound perched (unconfined) aquifers vary significantly corresponding to the thickness of the sandstone or other water-bearing units. Many of the perched aquifers in the upper portion of the stratigraphic section are limited in areal extent by the numerous large and small surface drainages which dissect the area and truncate the relatively flat-lying sedimentary units.

The small aquifers in the perched ground water system are recharged almost exclusively by direct precipitation and near-surface ground water infiltration. Principal recharge areas for the perched ground water system include formation outcrops in basins where runoff or snowfall accumulations provide supplemental recharge. The combination of steep terrain and relatively low permeabilities typical of the region, limit infiltration to less than 5 percent of annual precipitation (Price and Arrow, 1974; USGS, 1979), and the limited areal extent of the water-bearing strata result in low discharge rates from the perched ground water system.

Discharge from the perched ground water system occurs primarily in the form of seeps and springs at sandstone-shale interfaces where the water-bearing strata outcrop. Limited discharge from the perched ground water system to the regional ground water system may also occur due to fracture or fault related secondary permeability. It is possible that vertical losses may be occurring locally within faulted and fractured units.

A comprehensive spring and seep inventory of the permit and adjacent areas, conducted in June 2006, identified 6 active seeps and 27 active springs. The locations of known springs and seeps are shown within the report included as Exhibit 9, Seep and Spring Survey. As can be seen in Table 9, Seep and Spring Flow Summary, discharges were reported to typically vary from small or negligible seeps to approximately 10 GPM. Isolated flows in two springs have flows recorded up to 15 to 20 GPM, and one spring (Sulfur spring) has flows up to 80 GPM. As is typical of the

intermountain region, discharges from the perched ground water system, which feed local seeps and springs, will exhibit significant seasonal variation with maximum discharge following spring snowmelt followed by a decline in discharge with many springs and seeps drying up during late summer and early fall. Springs and seeps are discussed further in R645-301-724, Surface Water Information.

Of the springs identified in the survey, Eagle, Sulfur, and Angle are included within the ground water monitoring program, data for which is included within Exhibit 10, Surface and Ground Water Field Measurements. As can be seen from the data, Eagle spring only flows during the April-May time period in response to spring snowmelt events. Sulfur Spring flows year round with the highest flows occurring in the fall and winter periods. During the period of measurement, Angle Spring was found to flow between 0.25 and 1.25 GPM, the highest flows occurring during the print and early summer of 2006. Angle Spring has not been measured since September of 2006.

Stored Mine Water System

Historic coal mining in the area has resulted in well documented underground mine workings. In those areas where the mine workings are below the local ground water table or where subsidence has resulted in fractures connecting to the perched ground water system to a portion of an old mine that lies upon an aquitard, mine inflows may have resulted in the gradual accumulation of stored ground water in the underground workings. Mining planned for this permit will include the extraction of coal from seams overlying abandoned workings, and thus are not anticipated to have any potential impact on the underlying ground water systems resulting from mining activities including subsidence.

The total volume of ground water storage in the old mine workings is unknown since abandoned mine workings in the area have been sealed. Any water accumulations however (if they exist) would occur within down-dip workings. To the applicants knowledge, there are no known mine water discharges reported from old workings.

Regional Aquifer System

The regional aquifer consists of a water table, an aquifer in which all units below the normal water table have sufficient permeability to contain and transmit ground water to some degree. The peizometric surface of the regional aquifer system includes the deeper portions of the Blackhawk Formation and extends into the underlying Star Point and Mancos Formations as shown on Map 7, Regional Hydrology, Map 7A, W-E X Section A-A', and Map 7B, N-S X Section C-C". Because the lower portion of the Blackhawk Formation is the primary coal-bearing sequence in the area, the regional aquifer system is the only ground water system which could be directly affected by the mining operations.

The permit and adjacent areas display classic Basin & Range Style structural geology. With multiple north-south trending fault systems which have created a series of local horsts and grabens. These geologic mountain / valley sections dominate the local geomorphology and to varying degrees create l blocks and impediments to the horizontal movement of ground water, and limit the ability of water to move freely within a consistent and homogeneous aquifer system. Notwistanding the interference to free movement of groundwater , there does appear to be a regional ground water aquifer that shows east to west movement towards Mud Creek and Scofield Reservoir. For a number of reasons, including the fact that the impervious impervious portions of the faults do not extend over great distances N-S thus allowing ground water to flow around the ends of these "short faults." It is expected these faults create local

irregularities in the regional peizometric surface but do not compartmentalize the regional aquifer to great extent.

Information characterizing the ground water flow regime and hydraulic parameters of the regional aquifer comes from eleven wells located in eight different locations in and around the permit area, and from surface water conditions known to exist within Long Canyon, Miller Canyon, Mud Creek, and Scofield Reservoir. The locations of all wells shown on Map 7, Regional Hydrology. Wells CR-06,01, CR-06-02, CR-06-05A and CR-06-09 all penetrate and are screened within the Hiawatha coal seam. Wells CR-06-02-ABV, CR-06-03-ABV, and CR-06-09-ABV all penetrate and are screened into potential water bearing zones above the Hiawatha coal seam, while wells CR-06-01-BLW and CR-06-09-BLW penetrate and are completed in zones below the Hiawatha seam. Well completion details for all monitoring wells are included within Exhibit 11, Monitor Well Completion Details. Field data collected for the monitoring wells is included within Exhibit 10, Surface and Ground Water Field Measurements.

Recharge to the local and regional aquifer systems appears to occur primarily in higher elevation areas where limited outcrop zones are exposed to direct precipitation and near-surface infiltration. This recharge mechanism is, however, limited by steep slopes and relatively small outcrop exposure areas. Similarly, recharge from vertical ground water movement through the overlying sediments is believed to be relatively minor due to the presence of mixed overlying low permeability units. Some recharge of the regional aquifer system may occur where the associated formations are exposed in deep drainage canyons and as a result come into direct contact with either surface drainages or the associated alluvial/colluvial aquifer system, such as Long Canyon, Miller Canyon, and Jump Creek.

A review of available data has lead to the conclusion that a regional aquifer system does underlie the Kinney Mine permit area and flows in a general east to west direction toward Mud Creek and Scofield Reservoir. During the early stages of review it was felt that there was a general lack of data to document the presence of the regional system. Further data review however has revealed that there is additional boundary data that was overlooked during the preliminary evaluation.

As documented by the Seep and Spring Survey included as Exhibit 9, there are many seeps and springs located within Long Canyon, Miller Canyon, and UP Canyon. The report documents in excess of 8 springs and 3 seeps in Long Canyon, 2 springs and 3 seeps in Eagle Canyon, and 1 spring in UP Canyon. Acknowledging that each of these water sources is a surface manifestation of local ground water.

High elevation seeps and springs within Long Canyon were not used as potential ground water points since some of these features are ephemeral in nature. The portions of Long and Miller Canyon however near and downstream of their confluence is perennial, indicative of continued year round connection with the water table. Points along these perennial stream sections were used in the development of the regional water table surface projection. On the downstream side, Mud Creek and Scofield Reservoir also become additional points of contact defining the western boundary of the regional aquifer.

Evaluating these combined well and surface data points using a triangular extrapolation program has resulted in the development of the projected regional ground water table as shown on Map 7. Note that the piezometric contours coincide with perennial portions (lower reaches) of Long Canyon and Miller Creek on the north and northeast, and the surface waters of Mud Creek and Scofield Reservoir on the west. The resulting contours show that flow is generally to the west-northwest.

Seasonal variation of the regional water table is believed to be small as characterized by the general lack of change in well and surface data. Specifically water level data from monitored wells has shown very little to no variation over the period of measurement. Connecting data with the changing surface of Mud Creek 2,000 feet to the west by 3 feet would have virtually no impact on the regional water table within the mine permit area. In fact, when considering the basic hydrogeologic principals of the shallow valley aquifer, it is unlikely that any significant change would be noted in the regional ground water aquifer along the valley margin due to changes in Mud Creek flows.

Through reservoir operations water levels within Scofield reservoir located 1 mile to the north and northwest may change by several feet. It is believed however that these changes would have the greatest impact in the areas immediately adjacent to the shoreline, but have relatively small impact on the regional water table to the east.

In a similar fashion, seasonal variation within the northern areas of Long Canyon and Miller Creek are also believed to be small. Although there is annual variation in perennial flow within the Canyons, water is present throughout the year thus maintaining constant data points. Seasonal recharge to the regional water table is expected to result in a corresponding delayed seasonal fluctuation in the water table, especially to the east in the area of Long and Miler Canyons east of the permit area. Little change will be noted along the west and northern boundaries due to the relatively fixed surface water reference points. Considering the above factors one is lead to the conclusion that with relatively stable water table conditions on the west, north, and northeast, that seasonal regional water table variations are small.

Within and down the peizometric slope of the permit area, potential impacts to the regional aquifer system due to mining are believed to be small to non-existent. Although there is some potential to drain overlying small perched and isolated water bearing zones, there are no plans to discharge the water to the surface environment. The limited amount of water anticipated to be encountered within the mine will be diverted to abandoned mine areas where it will create a storage pool, which over time will contribute to the regional system via horizontal and downward leakage to adjacent units.

Table 9. Seep and Spring Flow Summary

Spring	Location	Est. Flow (GPM)
Sulfur Spring	Adjacent to Highway 96	80 – Yr Round
Miller Spring	1 ¼ mile north of Sulfur Spring, east of Highway 96	1
UP Spring	South Fork, UP Canyon	Seep
Angle Spring	Eagle Canyon	0.5 – Yr Round
Eagle Seep 1		< 0.5
Eagle Seep 1A		< 0.5
Eagle Spring 2		Seep under pond
Eagle Seep 3		< 0.5
Long Canyon Seep 1 & 2	Long Canyon	Seep
Long Canyon Seep 3		
Long Canyon Spring 1		10
Long Canyon Spring 2		0.5
Long Canyon Spring 3		3
Long Canyon Spring 4		< 0.5
Long Canyon Spring 5 & 5A		5
Long Canyon Spring 6		10
Long Canyon Spring 7		7
Long Canyon Spring 8		20
Merrill Spring 1	Merrill Canyon (Tributary to Long Canyon)	10
Luis Spring		10 - 15
Guzman Spring		0.5
Merrill Spring 2		10
Merrill Spring 4		5
Merrill Springs 5 & 5A		10
Merrill Spring 6		< 1
JC Spring 1	Jump Creek	10
JC Spring 2		5
JC Spring 3		< 1
JC Spring 4		< 1
JC Spring 5		< 1

Ground Water Occurrence

The evaluation of the occurrence and movement of ground water is based on ground water characteristics and site-specific information obtained during drilling, testing, and monitoring of wells and springs within the permit area.

It has been observed through data collected that there is a mix of local water resources. Areas to be mined have been shown to have limited water resources through exploratory drilling, while surrounding areas east of planned mining show the presence of more significant seeps and springs, all of which are influenced by local confining geologic strata. The most significant, yet least preferable water source within the general area is Sulfur Spring, located adjacent to Highway 96 along the western slope of the permit area. Although this spring flows year round at an approximate 80 GPM, it's water quality is relatively poor, having a strong sulfur smell. Flows

from this spring are not used directly, but cross the highway and enter the Scofield Reservoir flood plain.

As documented within the 2006 Seep and Spring Survey discussed earlier, no other springs of significance are found along the western slopes, either north or south of the permit area. Flows within Eagle Canyon, the next north-south trending drainage east of the mine portals has limited flows, all less than ½ GPM each. Not until Long Canyon, located 1 ½ miles east of the mine portals, does one encounter flows of any significance. The 2006 Seep and Spring discussed three seeps with only minor flows, and springs with flows ranging between 0.5 and 20 GPM. Combined, flows from these 9 springs at the time of the field investigation averaged 6.8 GPM and totaled 61 GPM.

Seeps and springs located within Jump Creek and Merrill Canyon, located 2 ½ miles east of the mine portals were also relatively significant. Of the 11 springs identified, three had minor flows of less than 1 GPM, four had flows of 5gpm, three of 10 GPM, and one of between 10 and 15 GPM.

On a regional basis, ground water occurrence and movement are believed to be stratigraphic and structurally controlled. Faulting is believed to have impact on ground water movement as is the layered geologic strata. At times, shales in or adjacent to fractured or faulted zones will swell, acting as an aquitard thus limiting vertical ground water movement via the fault, and horizontal movement through the fault. Folding is also limited to low-gradient regional features which may influence the overall direction and rate of regional ground water movement but have limited localized influence.

Although there have been eleven monitoring wells constructed, there use is limited to determine local and regional ground water flow directions due to the presence of many interrupting faults that form localized horst, and graben systems. Generally speaking, it is believed that the general ground water flow direction is to the west-northwest as shown on Map 7, Regional Hydrology. Information that is available to characterize the occurrence and movement of ground water within the permit area comes from the installation, testing, and routine monitoring of the wells installed and used within the Baseline Hydrologic Monitoring Plan, from seeps and springs, and from surface sources including Mud Creek and Scofield Reservoir as discussed above. Two cross-sections of the regional water table were prepared based on information provided on Map 7. The east-west section (A-A') is shown taken through the center of the permit area is shown on Map 7A. The north-south section (C-C') taken through the western portions of the permit area near the mine portals is shown on Map 7B.

Map 7A shows the connection of the regional water table with Mud Creek and Scofield Reservoir on the left with an upward gradient to the east beneath Long Canyon that is expected to continue upward to at least Jump Creek. The regional water table shown is based on a triangular interpolation model using fixed data points at the wells and surface water features. Note through a comparison of Maps 7A and 7B with Map 7 that the piezometric surface appears to not match up directly with wells shown; this is because those having water level data are out of the line of the cross-section. Some wells however are shown in the cross-sections for general reference.

Data showing available water level elevations for all monitoring wells are provided in Exhibit 10, Surface and Ground Water Field Measurements. Data plots and graphs are provided in R645-301-724.

Ground Water Quality

Although water quality data has been collected from surface water and spring sources, ground water quality from wells is limited to three wells, CR-06-03ABV, CR-10-11 and CR-10-12, as shown in Exhibit 10, Surface and Ground Water Field Measurements. Well water quality data is limited by the general lack of water encountered within the wells subsequent to drilling. As discussed previously, water levels within the majority of the wells remains within the lowermost blank casing section indicative of dry holes. Field water quality data collected from well CR-06-03ABV show that the well has moderately variable pH, Dissolved Oxygen, Specific Conductivity and Temperature ranges of 6.87-7.28, 1.1-5.7, 245-689, and 20.7-28.3 respectively. A complete set of field and laboratory water quality data is provided in Exhibit 10, Surface and Ground Water Field Measurements and Exhibit 12, Surface and Ground Water Quality Data, respectively. A summary of water quality data is provided in Table 10, Surface and Ground Water Quality Summary.

A plot of major anions and cations for base water quality data collected during the summer of 2006 (shown on Map 10, Regional Water Quality), shows that although the waters are generally of calcium bicarbonate type, there are some distinct variations between sources as shown on Map 10, Regional Water Quality. Waters from Angle and Sulfur Springs, and from well CR-06-03ABV show a strongly calcium bicarbonate type water. Miller Outlet, Mud Creek, and Res-1 also show calcium bicarbonate type waters, but with slightly lesser contents than Angle and Sulfur springs and Well CR-06-03 ABV. Mud Creek also appears to show stronger content of sodium potassium, magnesium, and sulfate than other samples, most likely the result of upstream mine discharges. The real water quality anomaly lies with Eagle spring which shows a sodium - calcium bicarbonate type water, but at much higher quality than other sources. From the data shown it can be concluded that a clear distinction lies between the water type of Eagle Spring and all other local waters tested. The data also shows a clear distinction between ground waters and surface waters, ground waters having higher calcium and bicarbonate contents than surface waters.

Basic anion-cation data and total dissolved solids for Eagle Spring shows a significantly higher water quality than other local sources. Average TDS of Eagle Spring is 152 for the documented period of record whereas Angle, Aspen and Sulfur Springs have TDS values of 303 and 366 mg/l respectively.

The average TDS of well CR-06-03 ABV is calculated to be 401 mg/l and surface sources including Miller Outlet, Mud Creek and RES-1 are 299, 470 and 322 mg/l respectively. It is interesting to note that local general surface water quality is quite good, Mud Creek having the poorest water quality of the samples taken. Again, the degradation of water quality in Mud Creek is believed to be the result of upstream mine discharges.

Table 10. Surface and Ground Water Quality Summary				
CR-10-11 thru 8/31/2010				
Analyte	Count	Max	Min	Avg
Acidity	2	50.00	46.00	48.00
Alkalinity (as CaCO3)	2	214.00	212.00	213.00
Aluminum	2	0.00	0.00	0.00
Ammonia (as N)	2	0.00	0.00	0.00
Arsenic	2	0.00	0.00	0.00
Bicarbonate (as CaCO3)	2	214.00	212.00	213.00
Boron	2	0.00	0.00	0.00
Cadmium	2	0.00	0.00	0.00
Calcium	2	82.30	77.90	80.10
Carbonate (as CaCO3)	2	0.00	0.00	0.00
Chloride	2	14.70	14.20	14.45
Copper	2	0.00	0.00	0.00
Hardness (as CaCO3)	2	257.00	243.00	250.00
Iron (Disolved)	2	0.00	0.00	0.00
Iron (Total)	2	22.70	0.65	11.67
Lead	2	0.00	0.00	0.00
Magnesium	2	12.40	11.90	12.15
Manganese	2	0.00	0.00	0.00
Manganese	2	0.43	0.01	0.22
Molybdenum	2	0.00	0.00	0.00
Nitrate (as N)	2	2.54	2.54	2.54
Nitrite (as N)	2	0.08	0.00	0.04
Phosphate, Total Ortho (as P)	2	0.23	0.06	0.14
Potassium	2	1.27	0.00	0.64
Selenium	2	0.00	0.00	0.00
Sodium	2	11.50	11.40	11.45
Sulfate	2	28.30	27.40	27.85
Zinc	2	0.01	0.01	0.01
Total Dissolved Solids	2	470.00	288.00	379.00
Total Suspended Solids	1	2,690.00	2,690.00	2,690.00
Settleable Solids	1	6.50	6.50	6.50

Table 10. Surface and Groundwater Quality Summary				
CR-10-12 thru 8/31/2010				
Analyte	Count	Max	Min	Avg
Acidity	2	0.00	0.00	0.00
Alkalinity (as CaCO3)	2	175.00	175.00	175.00
Aluminum	2	0.00	0.00	0.00
Ammonia (as N)	2	0.00	0.00	0.00
Arsenic	2	0.00	0.00	0.00
Bicarbonate (as CaCO3)	2	175.00	175.00	175.00
Boron	2	0.00	0.00	0.00
Cadmium	2	0.00	0.00	0.00
Calcium	2	99.90	66.20	83.05
Carbonate (as CaCO3)	2	0.00	0.00	0.00
Chloride	2	21.80	17.80	19.80
Copper	2	0.00	0.00	0.00
Hardness (as CaCO3)	2	286.00	191.00	238.50
Iron (Disolved)	2	0.00	0.00	0.00
Iron (Total)	2	44.80	3.01	23.91
Lead	2	0.00	0.00	0.00
Magnesium	2	8.96	6.10	7.53
Manganese	2	0.00	0.00	0.00
Manganese	2	0.56	0.03	0.29
Molybdenum	2	0.00	0.00	0.00
Nitrate (as N)	2	6.70	5.17	5.94
Nitrite (as N)	2	0.18	0.04	0.11
Phosphate, Total Ortho (as P)	2	0.38	0.09	0.23
Potassium	2	1.20	1.04	1.12
Selenium	2	0.00	0.00	0.00
Sodium	2	16.10	25.70	20.90
Sulfate	2	73.90	37.10	55.50
Total Dissolved Solids	2	620.00	308.00	464.00
Zinc	2	0.00	0.00	0.00
Total Suspended Solids	1	95.00	95.00	95.00

Table 10. Surface and Ground Water Quality Summary				
Angle Spring thru 9/27/2006				
Analyte	Count	Max	Min	Avg
Acidity	12	0.00	0.00	0.00
Alkalinity,(As CaCO3)	13	320.00	290.00	300.77
Aluminum	13	0.00	0.00	0.00
Ammonia (as N)	13	0.17	0.00	0.01
Arsenic	13	0.01	0.00	0.00
Bicarbonate (As CaCO3)	14	320.00	0.00	280.00
Boron	14	0.00	0.00	0.00
Cadmium	14	0.09	0.00	0.01
Calcium	14	100.00	90.00	97.07
Carbonate (As CaCO3)	14	0.00	0.00	0.00
Chloride	14	67.00	20.00	25.79
Copper	14	0.02	0.00	0.00
Conductivity	1	670.00	670.00	670.00
Hardness (as CaCO3)	14	340.00	220.00	317.86
Iron - Total	0	na	na	na
Iron - Diss	0	na	na	na
Lead	14	0.00	0.00	0.00
Magnesium	14	20.00	17.00	18.50
Manganese - Total	0	na	na	na
Manganese - Diss	0	na	na	na
Molybdenum	14	0.00	0.00	0.00
Nitrate (as N)	13	1.10	0.92	0.99
Nitrite (as N)	13	0.10	0.00	0.01
Oil & Grease	14	5.50	0.00	3.01
pH @ 25° C	2	7.71	7.04	7.38
Phosphate, ortho (as P)	14	0.04	0.00	0.00
Potassium	14	1.90	0.00	1.33
Selenium	14	0.05	0.00	0.00
Settleable Solids	0	na	na	na
Sodium	14	21.00	8.70	10.49
Sulfate	14	19.00	0.00	13.86
TDS	13	400.00	190.00	303.85
TSS	14	0.00	0.00	0.00
Zinc	14	0.11	0.00	0.04

Table 10. Surface and Ground Water Quality Summary				
Aspen Spring thru 6/23/2010				
Analyte	Count	Max	Min	Avg
Acidity	5	0.00	0.00	0.00
Alkalinity,(As CaCO3)	4	280.00	75.00	188.75
Aluminum	5	0.00	0.00	0.00
Ammonia (as N)	5	0.15	0.00	0.07
Arsenic	5	0.00	0.00	0.00
Bicarbonate (As CaCO3)	5	280.00	71.00	180.20
Boron	5	0.00	0.00	0.00
Cadmium	5	0.00	0.00	0.00
Calcium	5	92.00	20.00	55.40
Carbonate (As CaCO3)	5	0.00	0.00	0.00
Chloride	5	26.00	5.80	19.76
Copper	5	0.00	0.00	0.00
Conductivity	0	na	na	na
Hardness (as CaCO3)	5	290.00	70.00	184.00
Iron - Total	0	na	na	na
Iron - Diss	0	na	na	na
Lead	5	0.00	0.00	0.00
Magnesium	5	15.00	4.70	10.76
Manganese - Total	0	na	na	na
Manganese - Diss	0	na	na	na
Molybdenum	5	0.00	0.00	0.00
Nitrate (as N)	5	0.36	0.00	0.07
Nitrite (as N)	5	0.02	0.00	0.01
Oil & Grease	5	6.40	0.00	3.74
pH @ 25° C	1	7.71	7.71	7.71
Phosphate, ortho (as P)	3	0.00	0.00	0.00
Potassium	5	15.00	3.20	9.24
Selenium	5	0.00	0.00	0.00
Settleable Solids	5	0.00	0.00	0.00
Sodium	5	27.00	5.80	15.48
Sulfate	5	9.90	1.70	6.76
TDS	5	370.00	120.00	266.00
TSS	5	27.00	13.00	23.80
Zinc	5	0.02	0.00	0.01

Table 10. Surface and Ground Water Quality Summary				
Eagle Spring thru 6/16/2008				
Analyte	Count	Max	Min	Avg
Acidity	4	24.00	0.00	10.50
Alkalinity,(As CaCO3)	4	64.00	34.00	45.00
Aluminum	4	3.90	0.94	1.89
Ammonia (as N)	4	0.09	0.07	0.08
Arsenic	4	0.01	0.00	0.00
Bicarbonate (As CaCO3)	4	64.00	34.00	45.00
Boron	4	0.08	0.00	0.02
Cadmium	4	0.00	0.00	0.00
Calcium	4	15.00	11.00	13.00
Carbonate (As CaCO3)	4	0.00	0.00	0.00
Chloride	4	5.00	3.80	4.63
Copper	4	0.01	0.01	0.01
Conductivity	0	na	na	na
Hardness (as CaCO3)	4	55.00	28.00	43.00
Iron - Total	0	na	na	na
Iron - Diss	0	na	na	na
Lead	4	0.00	0.00	0.00
Magnesium	4	3.50	2.70	3.05
Manganese - Total	0	na	na	na
Manganese - Diss	0	na	na	na
Molybdenum	4	0.00	0.00	0.00
Nitrate (as N)	3	0.10	0.00	0.04
Nitrite (as N)	3	0.04	0.01	0.02
Oil & Grease	4	5.40	3.30	3.85
pH @ 25° C	0	na	na	na
Phosphate, ortho (as P)	4	0.13	0.06	0.09
Potassium	4	4.50	1.10	2.15
Selenium	4	0.00	0.00	0.00
Settleable Solids	1	0.00	0.00	0.00
Sodium	4	25.00	4.40	13.85
Sulfate	4	6.20	4.80	5.73
TDS	4	200.00	120.00	152.50
TSS	4	36.00	8.00	22.50
Zinc	4	0.03	0.02	0.03

Table 10. Surface and Ground Water Quality Summary				
Sulfur Spring thru 6/23/2010				
Analyte	Count	Max	Min	Avg
Acidity	30	80.00	0.00	2.67
Alkalinity,(As CaCO3)	30	380.00	290.00	343.67
Aluminum	30	0.00	0.00	0.00
Ammonia (as N)	30	0.44	0.00	0.09
Arsenic	30	0.00	0.00	0.00
Bicarbonate (As CaCO3)	30	380.00	290.00	343.67
Boron	31	0.07	0.00	0.00
Cadmium	31	0.00	0.00	0.00
Calcium	31	95.00	82.00	88.84
Carbonate (As CaCO3)	31	10.00	0.00	0.32
Chloride	31	9.30	5.10	6.58
Copper	31	0.01	0.00	0.00
Conductivity	1	710.00	710.00	710.00
Hardness (as CaCO3)	31	390.00	210.00	364.84
Iron - Total	0	na	na	na
Iron - Diss	0	na	na	na
Lead	31	0.01	0.00	0.00
Magnesium	31	38.00	31.00	35.71
Manganese - Total	0	na	na	na
Manganese - Diss	0	na	na	na
Molybdenum	31	0.00	0.00	0.00
Nitrate (as N)	30	0.02	0.00	0.00
Nitrite (as N)	30	0.10	0.00	0.00
Oil & Grease	31	540.00	0.00	20.73
pH @ 25° C	2	7.38	7.30	7.34
Phosphate, ortho (as P)	29	0.02	0.00	0.00
Potassium	31	5.90	4.20	4.88
Selenium	31	0.01	0.00	0.00
Settleable Solids	10	0.00	0.00	0.00
Sodium	31	19.00	7.40	9.32
Sulfate	31	47.00	29.00	43.97
TDS	30	440.00	230.00	365.67
TSS	31	17.00	0.00	1.84
Zinc	31	0.12	0.00	0.01

Table 10. Surface and Ground Water Quality Summary				
Miller Outlet thru 6/23/2010				
Analyte	Count	Max	Min	Avg
Acidity	30	86.00	0.00	2.87
Alkalinity,(As CaCO3)	30	300.00	210.00	250.67
Aluminum	30	0.24	0.00	0.01
Ammonia (as N)	30	0.16	0.00	0.05
Arsenic	30	0.00	0.00	0.00
Bicarbonate (As CaCO3)	31	300.00	200.00	247.10
Boron	31	0.03	0.00	0.00
Cadmium	31	0.05	0.00	0.00
Calcium	31	100.00	63.00	81.00
Carbonate (As CaCO3)	31	21.00	0.00	3.13
Chloride	31	39.00	8.10	11.14
Copper	31	0.01	0.00	0.00
Conductivity	1	550.00	550.00	550.00
Hardness (as CaCO3)	31	330.00	180.00	269.68
Iron - Total	0	na	na	na
Iron - Diss	0	na	na	na
Lead	31	0.00	0.00	0.00
Magnesium	31	20.00	14.00	16.58
Manganese - Total	0	na	na	na
Manganese - Diss	0	na	na	na
Molybdenum	31	0.00	0.00	0.00
Nitrate (as N)	30	0.92	0.00	0.31
Nitrite (as N)	30	0.04	0.00	0.01
Oil & Grease	31	460.00	0.00	18.12
pH @ 25° C	2	8.29	8.10	8.20
Phosphate, ortho (as P)	29	0.13	0.00	0.03
Potassium	31	2.80	1.10	2.07
Selenium	31	0.03	0.00	0.00
Settleable Solids	10	0.50	0.00	0.18
Sodium	31	19.00	5.40	9.31
Sulfate	31	48.00	19.00	25.84
TDS	30	620.00	200.00	299.33
TSS	31	430.00	18.00	136.48
Zinc	31	0.09	0.00	0.02

Table 10. Surface and Ground Water Quality Summary				
Mud Creek thru 6/23/2010				
Analyte	Count	Max	Min	Avg
Acidity	30	68.00	0.00	2.27
Alkalinity,(As CaCO3)	30	300.00	160.00	238.67
Aluminum	30	0.00	0.00	0.00
Ammonia (as N)	30	0.57	0.00	0.03
Arsenic	30	0.00	0.00	0.00
Bicarbonate (As CaCO3)	30	280.00	150.00	229.00
Boron	31	0.10	0.00	0.00
Cadmium	31	0.05	0.00	0.00
Calcium	31	100.00	48.00	74.00
Carbonate (As CaCO3)	31	55.00	0.00	8.61
Chloride	31	63.00	6.90	20.42
Copper	31	0.01	0.00	0.00
Conductivity	1	1000.00	1000.00	1000.00
Hardness (as CaCO3)	31	490.00	120.00	348.39
Iron - Total	0	na	na	na
Iron - Diss	0	na	na	na
Lead	31	0.00	0.00	0.00
Magnesium	31	59.00	14.00	39.77
Manganese - Total	0	na	na	na
Manganese - Diss	0	na	na	na
Molybdenum	31	0.00	0.00	0.00
Nitrate (as N)	30	1.50	0.07	0.33
Nitrite (as N)	30	0.02	0.00	0.00
Oil & Grease	31	360.00	0.00	14.45
pH @ 25° C	2	8.49	8.18	8.34
Phosphate, ortho (as P)	29	0.07	0.00	0.00
Potassium	31	9.70	1.90	6.55
Selenium	31	0.03	0.00	0.00
Settleable Solids	10	0.20	0.00	0.06
Sodium	31	57.00	18.00	38.81
Sulfate	31	290.00	38.00	152.19
TDS	30	720.00	230.00	470.67
TSS	31	320.00	4.00	43.48
Zinc	31	0.16	0.00	0.02

Table 10. Surface and Ground Water Quality Summary				
Res-1 thru 6/23/2010				
Analyte	Count	Max	Min	Avg
Acidity	0	na	na	na
Alkalinity,(As CaCO3)	0	na	na	na
Aluminum	0	na	na	na
Ammonia (as N)	0	na	na	na
Arsenic	0	na	na	na
Bicarbonate (As CaCO3)	0	na	na	na
Boron	0	na	na	na
Cadmium	0	na	na	na
Calcium	0	na	na	na
Carbonate (As CaCO3)	0	na	na	na
Chloride	0	na	na	na
Copper	0	na	na	na
Conductivity	0	na	na	na
Hardness (as CaCO3)	0	na	na	na
Iron - Total	0	na	na	na
Iron - Diss	0	na	na	na
Lead	0	na	na	na
Magnesium	3	56.00	14.00	34.33
Manganese - Total	0	na	na	na
Manganese - Diss	0	na	na	na
Molybdenum	17	0.00	0.00	0.00
Nitrate (as N)	17	0.37	0.00	0.06
Nitrite (as N)	17	0.04	0.00	0.01
Oil & Grease	17	340.00	0.00	22.05
pH @ 25° C	1	8.50	8.50	8.50
Phosphate, ortho (as P)	15	0.12	0.00	0.03
Potassium	17	15.00	1.30	4.53
Selenium	17	0.01	0.00	0.00
Settleable Solids	10	5.50	0.00	0.98
Sodium	17	42.00	8.30	23.40
Sulfate	17	140.00	24.00	63.06
TDS	17	620.00	96.00	322.12
TSS	17	1600.00	11.00	185.94
Zinc	17	0.04	0.00	0.01

Ground Water Rights and Use

Ground water rights within a 4 mile radius of the central mine area are shown on Map 30, Ground Water Right Locations, and listed in Table 11, Ground Water Rights. None of the ground water rights identified are believed to be potentially impacted by the mining operation for the reasons discussed below.

The closest ground water rights to the mining operation are located approximately ½ mile to the southwest, and are associated with small domestic single family dwellings. Water rights 91-3401 and 91-3402 (included within Exhibit 13, Water Rights) are supplemental rights to each other with a total domestic and stock watering withdrawal limit of 0.73 acre-feet. Exchange applications E164 and E1912 exchange surface water flows for ground water flows tributary to Scofield Reservoir and are both limited to a 1.0 acre-foot withdrawal for domestic purposes. These water rights are all located within valley alluvium, and lie within an unconfined ground water aquifer zone fed by local surface sources, and geologically below the elevation of the coal seams to be mined. With dry conditions encountered during exploration and the fact that geologic strata dip to the north-east, there is little to no potential for mining activities to affect these water rights.

Water rights west of Mud Creek follow a similar impact potential since they are 1) hydrologicaly disconnected from surface sources, and 2) geologically disconnected from the coal seam and overlying strata.

Water rights a28898 and E1934 (see Exhibit 13, Water Rights), both located approximately 2 miles to the north near the mouth of Miller Canyon, are domestic and irrigation ground water rights that have either been changed or exchanged from surface water sources. The volume of water allowed to be diverted under the rights are 2.0 and 20.0 acre-feet respectively. No impact to these water rights is anticipated since 1) the ground water would be withdrawn adjacent to Scofield Reservoir at relatively shallow depths, 2) the rights are located north of planned mined areas, 3) the coal seams to be mined are relatively dry and are located hydrologicaly above the water right areas.

Ground Water/Surface Water Interactions

Ground water/surface water interactions in the permit area are controlled by Stratigraphy, lithology, localized topography, and climatic conditions, which affect recharge, subsurface flow paths and direction, and discharge areas.

In many cases, shallow perched ground water discharges as springs or seeps to the small tributary surface drainages both from outcrop exposures on exposed slopes above the drainages and from stratigraphic exposures within the drainage channels. Discharge of perched ground water to the surface drainage system occurs most frequently where flat lying, relatively low permeable, and consequent low infiltration stratigraphic units are found.

Table 11. Ground Water Rights

WRNUM	CHEXNUM	TYPE	STATUS	PRIORITY	USES	CFS	ACFT	LOCATION	OWNER	SOURCE
91-3401		Underground	DIL	18950000	DS	0.011	0.000	N625 E710 S4 32 12S 7E SL	WAINO E. BURTON	Underground Water Well
91-3402		Underground	DIL	18950000	DS	0.011	0.000	N570 E690 S4 32 12S 7E SL	WAINO E. BURTON	Underground Water Well
91-5160	a34946	Underground	APPLAPP	20081016	DIS	0.000	1.000	S1235 W1351 E4 32 12S 7E SL	BOYD L. PETERSON AND PEGGY PETERSON TRUST	Underground Water Well
91-4889	E1912	Underground	APPLAPP	19810611	D	0.000	1.000	N2145 W1350 E4 05 13S 7E SL	JIM NICOLODEMOS	Scofield Reservoir
91-4891	E1934	Underground	APPLAPP	19810629	O	0.000	20.000	N1320 0 S4 21 12S 7E SL	UCO INCORPORATED	Scofield Reservoir
91-4891	E1934	Underground	APPLAPP	19810629	O	0.000	20.000	N1771 E210 S4 21 12S 7E SL	UCO INCORPORATED	Scofield Reservoir
91-4891	E1934	Underground	APPLAPP	19810629	O	0.000	20.000	N2220 E420 S4 21 12S 7E SL	UCO INCORPORATED	Scofield Reservoir
91-4891	E1934	Underground	APPLAPP	19810629	O	0.000	20.000	N2640 E630 S4 21 12S 7E SL	UCO INCORPORATED	Scofield Reservoir

Significant alluvial/colluvial deposits, particularly in the flatter reaches of area drainages, form localized ground water storage systems which may or may not be laterally continuous along the length of the drainage depending on localized conditions. During periods of high runoff, the alluvial/colluvial deposits are recharged. As surface flows recede, limited stored ground water may discharge to the surface system extending the period of active surface flow. Residual ground water storage in the alluvial/colluvial system may be retained, may serve as a source of recharge to more permeable exposed bedrock units, or may be depleted through normal evapo-transpiration during extended dry periods.

Ground Water Summary

Ground water resources in the permit and adjacent areas are limited in both extent and quantity. Ground water occurrences are limited to: shallow alluvial/colluvial valley-fill deposits in local drainages; perched ground water in thin, laterally discontinuous geologic units and in narrow near vertical aquifers adjacent to faults; ground water accumulated over time in lower underground mine workings; and, the regional aquifer consisting of deeper units in the Blackhawk Formation extending into the underlying Star Point and Mancos Formations.

Ground water movement is limited by low transmissivities, the lack of significant secondary permeabilities, and limited recharge in outcrop zones. It is likely that ground water has gradually accumulated over time in the down-dip workings of abandoned and sealed mines underlying the Hiawatha Coal seam, resulting in potentially significant volumes of water. Mine inflows are minimal.

R645-301-724.200 Surface Water Information

Surface water in the permit and adjacent areas is limited to Scofield Reservoir, perennial flows within Mud Creek, Miller and Long Canyon, and ephemeral flows from various side tributaries. Flows have been quantified by analysis of water quality and quantity characteristics, historic flow and quality data for Mud Creek, Miller Canyon (Miller Outlet), Scofield Reservoir, Angle Spring, Eagle Spring, Sulfur Spring, and Aspen Spring. Some flow data is available for seeps and springs identified in the Seep and Spring survey completed in 2006. The evaluation of surface water involved the collection of surface water data in the permit and adjacent areas and an assessment of regional hydrologic information from adjacent areas. Raw data have been reduced by standard scientific methods to develop interpretations and reach conclusions presented in this section.

Surface Water Environment

As discussed in the ground water section (R645-301-724), both surface and ground water hydrologic features and regimes within the permit and adjacent areas are reflective of and strongly influenced by geologic structure, stratigraphy, lithology, and localized topography and climatic conditions. Map 7, Regional Hydrology and Map 10, Regional Water Quality display surface topography and watersheds in the permit area.

The climate in the proposed lease area and adjacent areas is arid to semi-arid. Table 13, Summary of Temperature Data, Table 14, Summary of Precipitation Data – Scofield Dam, and Table 15, Summary of Wind Data – Price, Utah provide data believed to be representative to the mine site. Wind data provided was the closest found to the project site.

According to the data, the area has an average annual precipitation of 14.56 inches. Average monthly precipitation ranges from 0.90 inches in June to 1.65 inches in January. Most of the precipitation falling as snowfall occurs during November, December, January, February, March and April, although it often falls in October and May, and sometimes in June. Like many areas within the State, precipitation falling as rainfall, commonly occurs in response to high-intensity short-duration storms of limited aerial extent (Butler and Marsell, 1972).

Temperatures in the proposed permit area are seasonal, with the high mean monthly temperature occurring in July and the low mean monthly temperature occurring in February. Evaporation and infiltration rates in the proposed lease and adjacent areas vary with vegetation, soil type, and time of year. The average annual potential evaporation in central Utah is 40 inches per year (Geraghty, et al., 1973).

The permit area is located near the north end of the Wasatch Plateau, which is an uplifted N-S elongated geomorphic feature extending over more than 60 miles in Central Utah. The Wasatch Plateau forms the transition zone between the Basin and Range and Colorado Plateau Structural Provinces. The Uintah Basin structural element also affects this northern end of the Wasatch Plateau, causing the northward "regional dip" of the beds in the area.
Generally, the topography in the area is fairly mountainous with shallow narrow valleys and side channel tributaries. The mountainous terrain combined with climate influence the surface drainage configuration and flow characteristics. Most drainage channels contain no flowing water except during snowmelt and/or precipitation events. Rapid runoff from snowmelt and thunderstorm precipitation often cause relatively brief, high velocity flows in the smaller drainages, and significant flow variation in the larger drainages.

Velocities in Mud Creek measured since May of 2005 have varied between 11.0 and 131.1 CFS. Measured stream flows in Miller Canyon to the north range from 0.0 during winter months when the stream is frozen to 1.21 CFS which occurred on April 26, 2005.

Drainages and Surface Water Bodies

Drainages

The permit and adjacent areas fall within the upper Price River drainage basin. Miller Canyon and Mud Creek are the major perennial streams in the area adjacent to the mine site. These water sources are tributary to Scofield Reservoir, which is the source of headwaters for Price River. Minor perennial streams drain watersheds adjacent to the proposed permit area including several small intermittent and ephemeral tributaries are located within and adjacent to the permit area, including UP Canyon to the south and Eagle Canyon to the north. The majority of the smaller drainages exhibit an ephemeral flow pattern with sustained flows only in

Table 13. Summary of Temperature Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
													Station - Clear Creek #1
Record Mean:	23.5	22.5	28.5	34.5	44.1	52.0	60.0	56.4	49.3	35.8	28.6	20.8	n/a
Record Max:	55.4	59.0	62.6	68.0	77.0	82.4	89.6	86.0	78.8	73.4	64.4	53.6	n/a
Record Min:	-11.2	-5.8	-18.4	-2.2	-11.2	19.4	24.8	19.4	17.6	5.0	-4.0	-22.0	n/a
													Station - Scofield Dam
Avg Max (F):	27.4	31.9	38.1	48.2	59.4	70.2	77.7	75.4	67.3	56.1	39.9	30.4	51.8
Avg Min. (F):	-1.4	0.6	11.9	21.9	31.0	38.0	44.4	42.9	34.9	26.1	15.8	3.4	22.5

response to spring snowmelt and major thunderstorms Exhibit, 20 Ephemeral Drainage Determination. All or portions of the following named drainages fall within a two-mile radius of the permit area. Drainage west of Pleasant Valley as well as Mud Creek are hydraulically disconnected to potential impacts from potential mining activities.

Perennial	Ephemeral
Drainages East of Pleasant Valley	
Mud Creek	Eagle Canyon
Miller / Long Canyon	UP Canyon
Drainage West of Pleasant Valley	
Bear Canyon Creek	Number Four Gulch
Fish Creek	Tucker Canyon
Green Canyon	Woods Canyon
Winter Quarters Canyon	Winter Quarters

General basin characteristics are rolling uplands and open parks above the Price River Canyon, with vegetation communities of sagebrush/grasslands and mixed coniferous/aspen forests.

Mud Creek where it enters Scofield Reservoir drains an area of approximately 42 square miles. The headwaters lie approximately 9 miles south of the proposed lease area. Elevations range from approximately 10,394 feet to 7,612 feet at its confluence with Scofield Reservoir. Mud Creek, having a length of 11.2 miles is the only major tributary to Scofield Reservoir within the vicinity of the proposed permit area.

The general local basin topography can be characterized as moderately steep mountain lands with narrow valleys having a mixed vegetation consisting of pinion, quaking aspen, and sagebrush vegetative mixes. Stream flow from local intermittent/ephemeral drainages is commonly very low.

Surface Water Bodies

Scofield Reservoir, a man-made reservoirs is not located within the permit area, but is located a short distance to the north west. Several very small stock-watering ponds and beaver dams were however, identified in the Seep and Spring Survey, basically located within the small canyon drainages to the east, including Eagle and Long Canyons. As is typical of the region, stock ponds are commonly associated with local springs.

The sedimentation structure planned for the Kinney No. 2 Mine surface facility will exist solely for the containment and retention of disturbed area runoff to allow for settling of suspended solids

prior to release and discharge to natural drainages. The active sedimentation pond will be monitored on a regular basis to verify compliance with all applicable regulatory provisions and effluent discharge limitations. Because the sediment pond will be utilized solely for temporary retention of stormwater runoff, no water rights or beneficial uses are associated with it. Water rights associated with springs and/or stock ponds are provided in Exhibit 13, Water Rights.

Perennial Streams

As previously described under the sub-heading "Drainages", the perennial streams in the permit and adjacent areas include Mud Creek, and Long/Miller Canyons. All other area drainages are characterized by intermittent or ephemeral flow patterns. In the vicinity of the permit area, the floodplain areas of the perennial streams have experienced only limited disturbance. Disturbance along Mud Creek is mostly confined to areas through the Town of Scofield, and very minor disturbance in grazing areas along the creek. Flood plain disturbance within Long and Miller Canyons appears to be basically limited to small road and ranch property zones within the lower reaches of Miller Canyon, and stock watering ponds within the reaches of Long Canyon.

Based on available information, some floodplain areas in the immediate vicinity and downstream of Scofield, Utah have a limited history of irrigation or farming. These small areas bordering Mud Creek are shown on aerial photography easily visible on aerial photography to be west of the proposed permit area and Highway 96. Small irrigated areas are also visible on photography in the vicinity of the ranch house located within Miller Canyon downstream of the confluence of Miller and Long Canyons.

According to the Utah Division of Water Quality, surface water sources including Mud Creek and Scofield Reservoir have stream classifications of 1C, 2B, 3A and 4 in the areas adjacent to the proposed lease area. Definitions of each classification are:

- 1C – Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.
- 2B – Protected for secondary contact recreation such as boating, wading, or similar uses.
- 3A – Protected for cold water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.
- 4 – Protected for agricultural uses including irrigation of crops and stock watering.

These drainage classifications indicate that the Scofield Reservoir and associated tributaries are designated for culinary use when treated, recreation, as cold water non-game fish habitat, and irrigation and stock watering with no associated natural resource waters restrictions other than applicable effluent standards for discharges.

Ephemeral Drainages

Four Ephemeral Drainages are found to cross from, East to West, portions of the Permit Boundary. Three additional Ephemeral Drainages are found in near proximity to the Permit Boundary. Five of the Seven Ephemeral Drainages are shown as no-name drainages on the USGS Scofield Quadrangle Map and are here given names for utility in referencing. These new names appear on nearly all of the Exhibits within this Permit Application that have a topographic base map Figure 2, Drill Hole Locations w/ Hiawatha Outcrop, in Chapter 6 is a good example. New names for the drainages, derived from the old mine portals located in them are, from North to South, Monay Draw, Blue Seal Draw, Kinney Draw, Columbine Draw, and Jones Draw. Monay and Blue

Seal Draws are located North of the Permit Boundary with the other three lying within the Permit Boundary. The other two Ephemeral Drainages are named on the USGS Scofield Quadrangle as Eagle Canyon and UP Canyon. Eagle Canon is the northern-most of the seven drainages and UP Canyon is the southern-most of the seven with the five newly named Drainages positioned between the two others. UP Canyon is South of the Permit Boundary and does not cross the Boundary at any part, while Eagles Canyon exits the mountain front North of the Permit Boundary, however, Eagles Canyon bends sharply southward and crosses a portion of the Permit Boundary on its East Side.

Baseline Surface Water Data were NOT collected from these Seven Drainages simply because there was NO WATER to collect. As part of an "Ephemeral Drainage Determination" Carbon Resources documented with photographs the absence of water in the four drainages that cross the Permit Boundary (Eagle Canyon, Kinney Draw, Columbine Draw, and Jones Draw). These photos together with an in-depth analyses of the drainages 3D geometry, alluvial and vegetative material, and their position relative to the water table is contained in Exhibit 20, Ephemeral Drainage Determination.

Drainages and Surface Water Bodies

Surface Water Occurrence

Significant runoff characteristics relative to both definition of baseline condition and evaluation of any potential mining related impacts include, peak flow rate, low flow rate, mean annual discharge rate, and any seasonal variations in flow. These runoff parameters will be defined through baseline monitoring for individual drainages at approved monitoring stations.

Mean annual discharge for Mud Creek, as measured from 1978-2007 at USGS station 09310700, Mid CRK BL WINTER QUARTERSCYN @ SCOFIELD, UT, is 16.9 CFS (12,260 ac-ft/yr). This station is located on Mud Creek just south of the town of Scofield, Utah and approximately 0.75 miles southwest of the proposed mine portals. A plot of USGS data is shown in Figure 16 Mud Creek Flows.

No historic monitoring information is available for the named and unnamed minor area drainages, most of which are dry over much of the year. In May 2005, in conjunction with

Figure 16 Mud Creek Flows

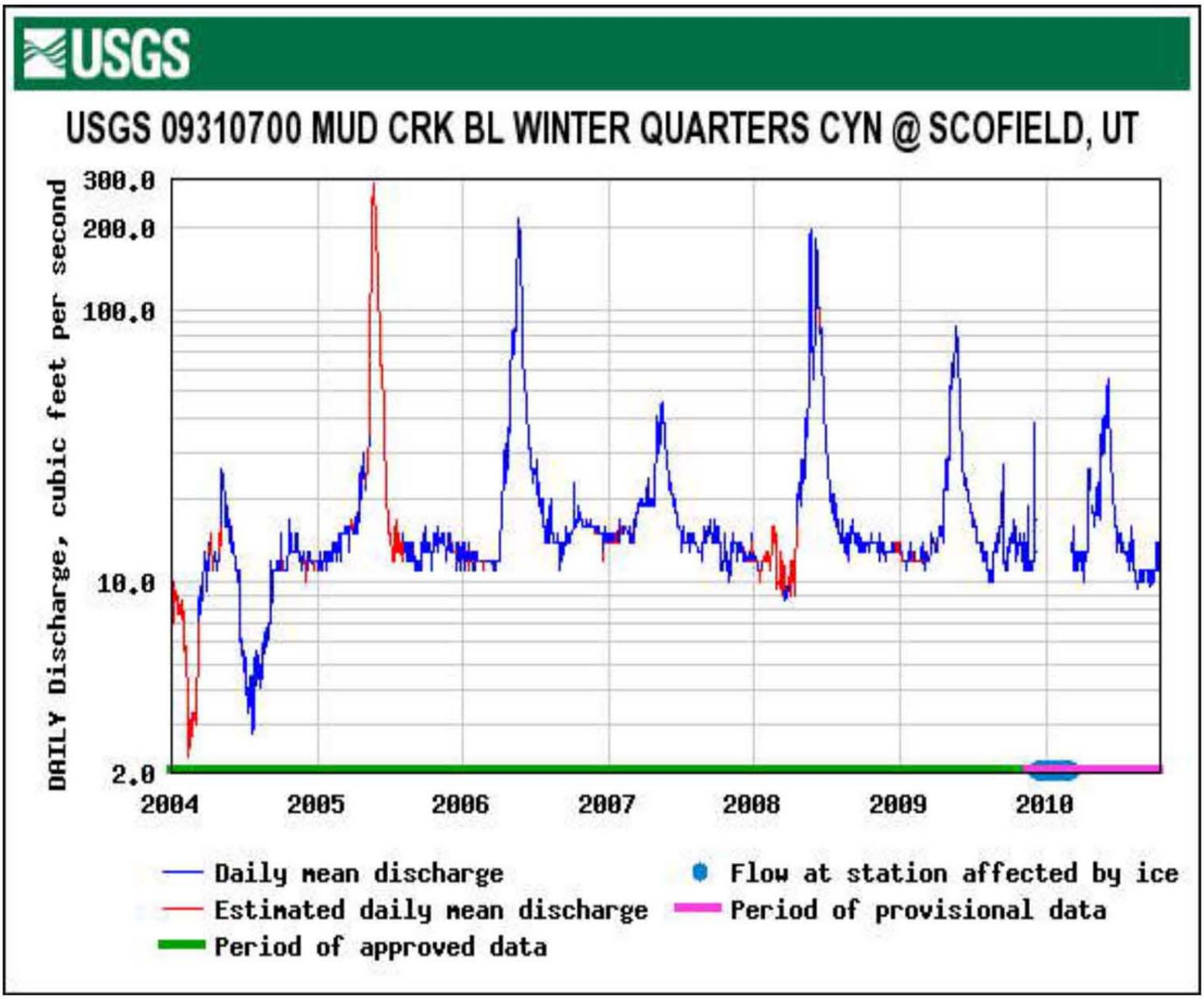


Figure 17 Field Data

Carbon Resources LLC

Kinney II Baseline Water Sampling

Surface Water Field Measurements

Miller Outlet *

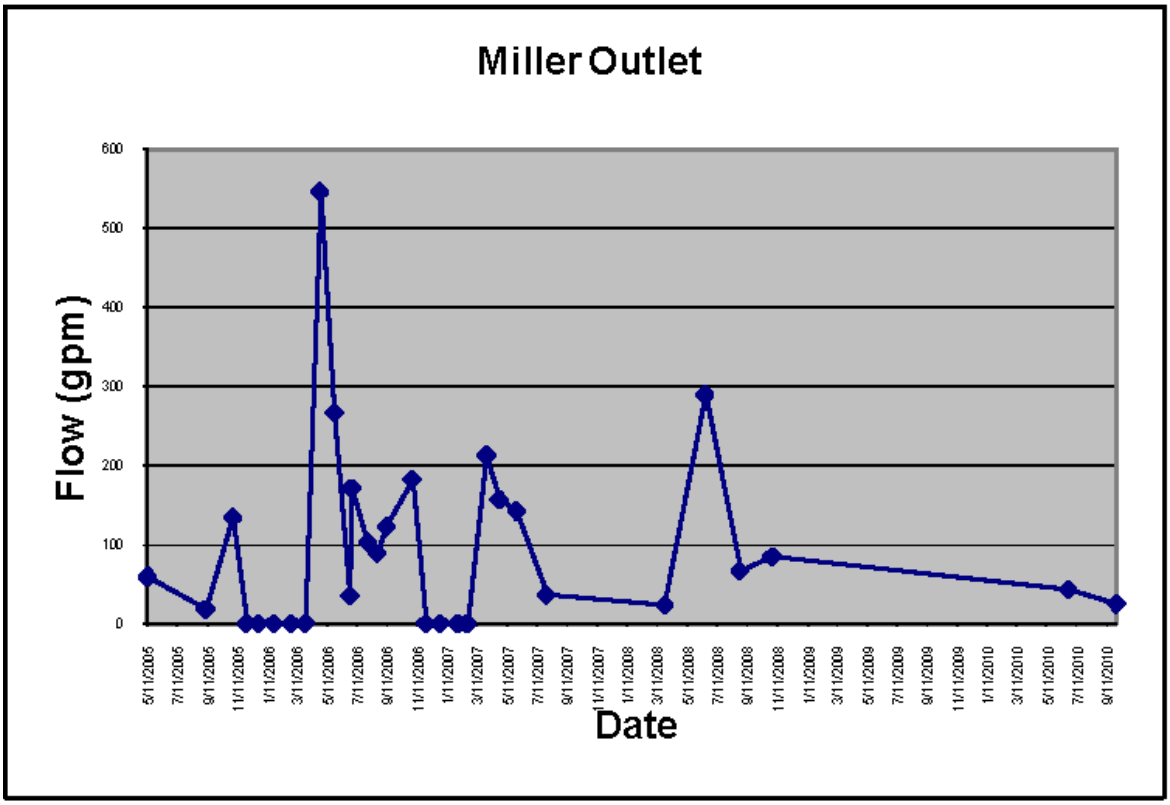
Elevation: **~7,632**

Date	Estimated Flow (gpm)	pH	Dissolved Oxygen (ppm)	Specific Conductivity (Us)	Temp (C)
5/11/2005	59	8.09	6.9	474	10.4
9/6/2005	18	8.04	4.6	433	13.1
10/31/2005	134	6.89	7.2	440	4.8
11/28/2005	frozen	5.65	8.0	556	1.7
12/22/2005	frozen	6.06	6.8	435	4.2
1/22/2006	frozen	6.04	7.1	440	1.2
2/26/2006	frozen		4.6	320	14.0
3/27/2006	frozen	**8.1**		**550**	~1
4/26/2006	545	8.01	3.6	369	19.2
5/25/2006	266	8.53	4.0	408	30.2
6/29/2006	171	8.57	4.2	415	28.6
7/31/2006	103	8.41	4.4	326	27.6
8/20/2006	89	8.6	4.6	110	27.7
9/7/2006	122	lab	7.4	375	13.0
10/30/2006	182	8.33	8.5	285	13.0
11/27/2006	frozen	8	5.1	327	10.0
12/26/2006	frozen	8.06	7.2	428	8.4
1/31/2007	frozen	8.01	5.3	387	8.6
2/19/2007	frozen	8.12	7.0	354	8.0
3/29/2007	212	8.7	9.9	440	13.3
4/25/2007	156	8.54	6.7	436	23.4
5/29/2007	142	8.42	7.9	417	22.9
6/25/2006	35	8.06	4.7	508	31.0
7/30/2007	36	8.45	4.9	362	27.7
3/25/2008	23	7.8	5.0	633	17.5
6/16/2008	289	8.7		377	30.4
8/26/2008	66	8.26	3.9	456	29.6
10/29/2008	85	8.41	9.6	434	12.3
6/23/2010	43	12	22.9	283	16.5
9/28/2010	25	8.65		480	12.5

NOTE: Bolded values measured in March 2006 were analyzed at the laboratory. Specific conductivity values were actually measured as conductivity.

*Miller Outlet was initiallly misnamed "Eagle Outlet" and was once misnamed "Eagle Outlook". Samples collected from may 2005 to may 2006 were mislabled "Eagle Outlet" or "Eagle Outlook" and analyltic data are labled accordingly. From June 2006 to present the data are labled as Miller Outlet. Data labled Miller Outlet, Eagle Outlet, & Eagle Outlook represent samples collected at the same location.

Figure 17 Field Data



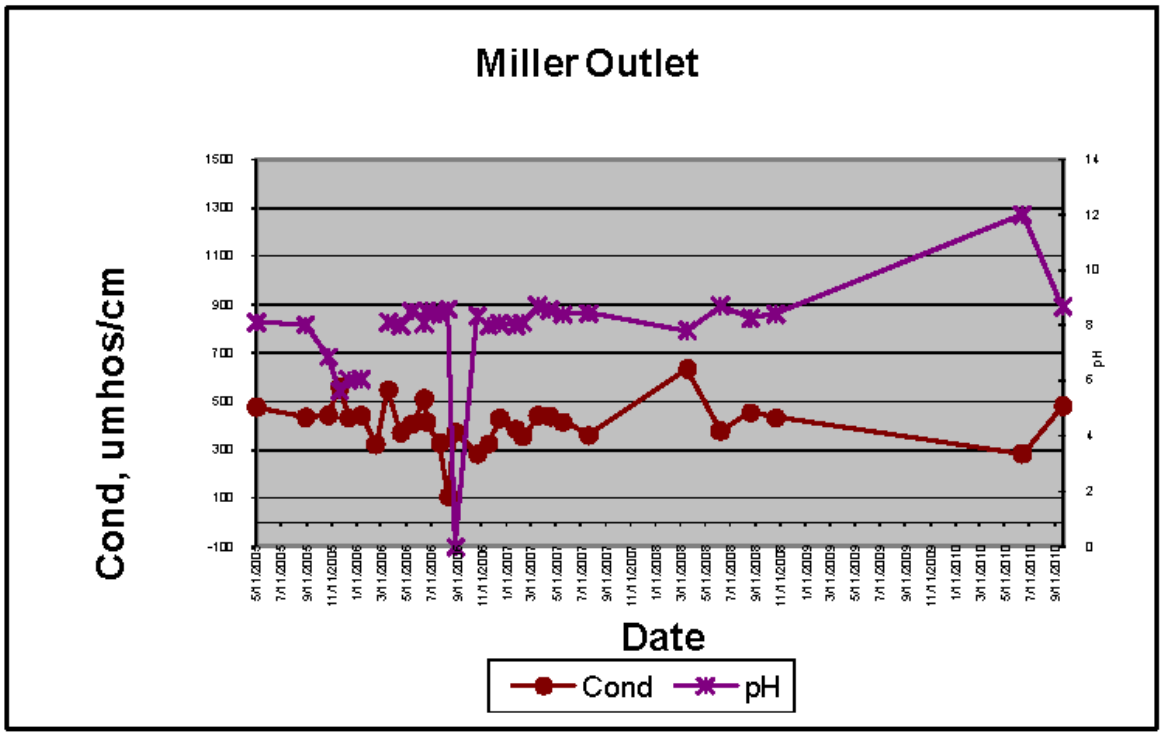


Figure 17 Field Data

Baseline Water Sampling
Surface Water Field Measurements

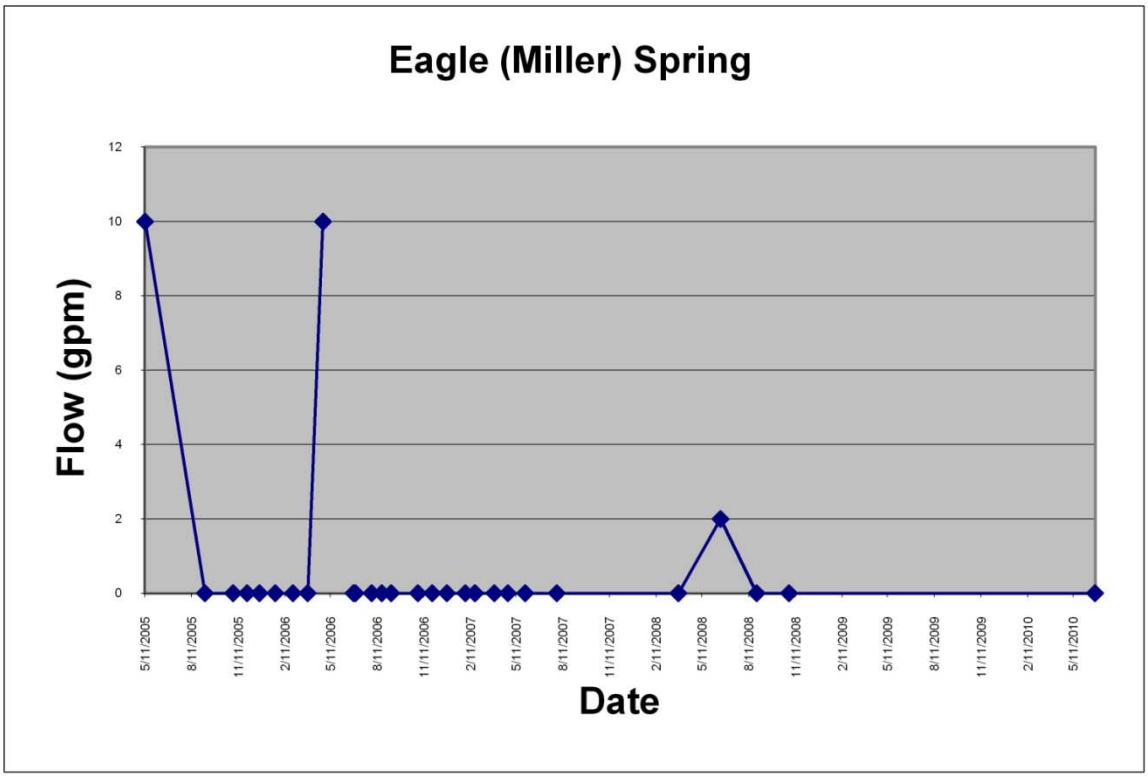
Eagle Spring * (Miller Spring)

Elevation: **~7,700**

Date		Estimated Flow (gpm)	pH	Dissolved Oxygen (ppm)	Specific Conductivity (Us)	Temp (C)
5/11/2005	<	10	7.35	6	98.9	18.0
9/6/2005		dried up				
10/31/2005		dried up				
11/28/2005		dried up				
12/22/2005		dried up				
1/22/2006		dried up				
2/26/2006		dried up				
3/27/2006		dried up				
4/26/2006	<	10	7.2	4.7	41.8	21.0
5/25/2006			8.18	5.9	83.7	28.9
6/29/2006		dried up				
7/31/2006		dried up				
8/20/2006		dried up				
9/7/2006		dried up				
10/30/2006		dried up				
11/27/2006		dried up				
12/26/2006		dried up				
1/31/2007		dried up				
2/19/2007		dried up				
3/29/2007		dried up				
4/25/2007		dried up				
5/29/2007		dried up				
6/25/2006		dried up				
7/30/2007		dried up				
3/25/2008		snow				
6/16/2008		2	7.31	5	44.1	23.5
8/26/2008		dried up				
10/29/2008		dried up				
6/23/2010		dried up				

*The sample collected at Eagle Spring in May 2005 was mislabled "Eagle Springs" and analyltic data are labled accordingly. Data labled Eagle Spring & Eagle Springs represent samples collected at the same location. This same spring was later mislabled Miller Spring

Figure 17 Field Data



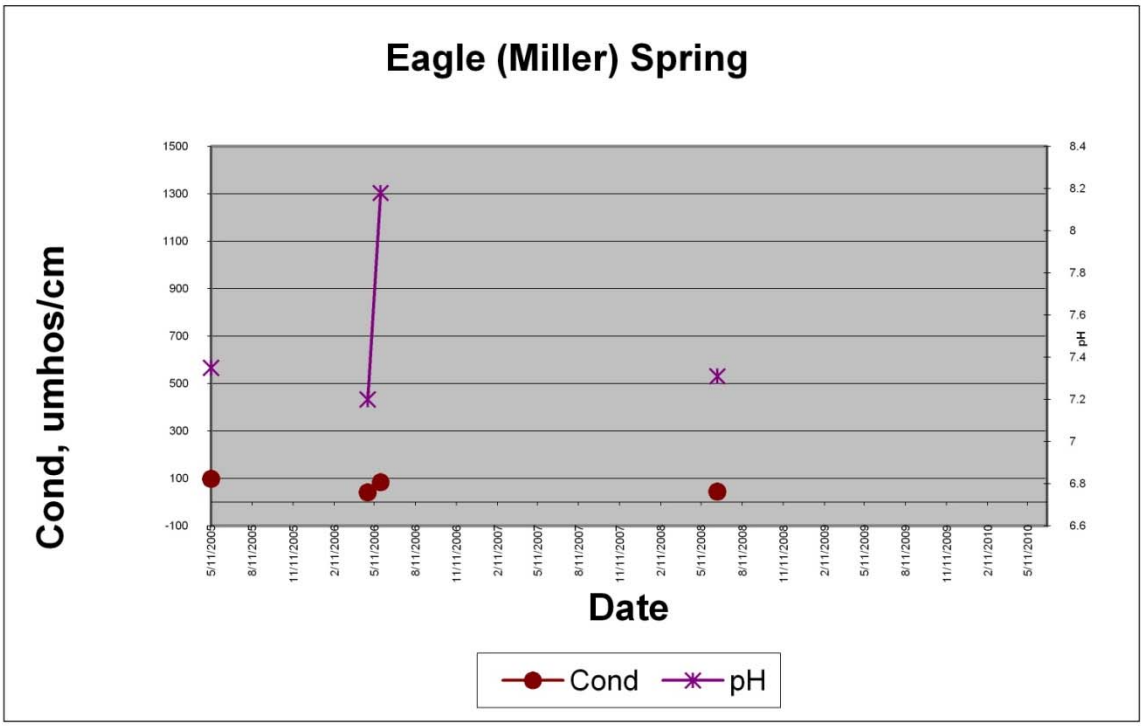


Figure 17 Field Data
Carbon Resources LLC

Kinney II Baseline Water Sampling

Surface Water Field Measurements

Sulfur Spring *

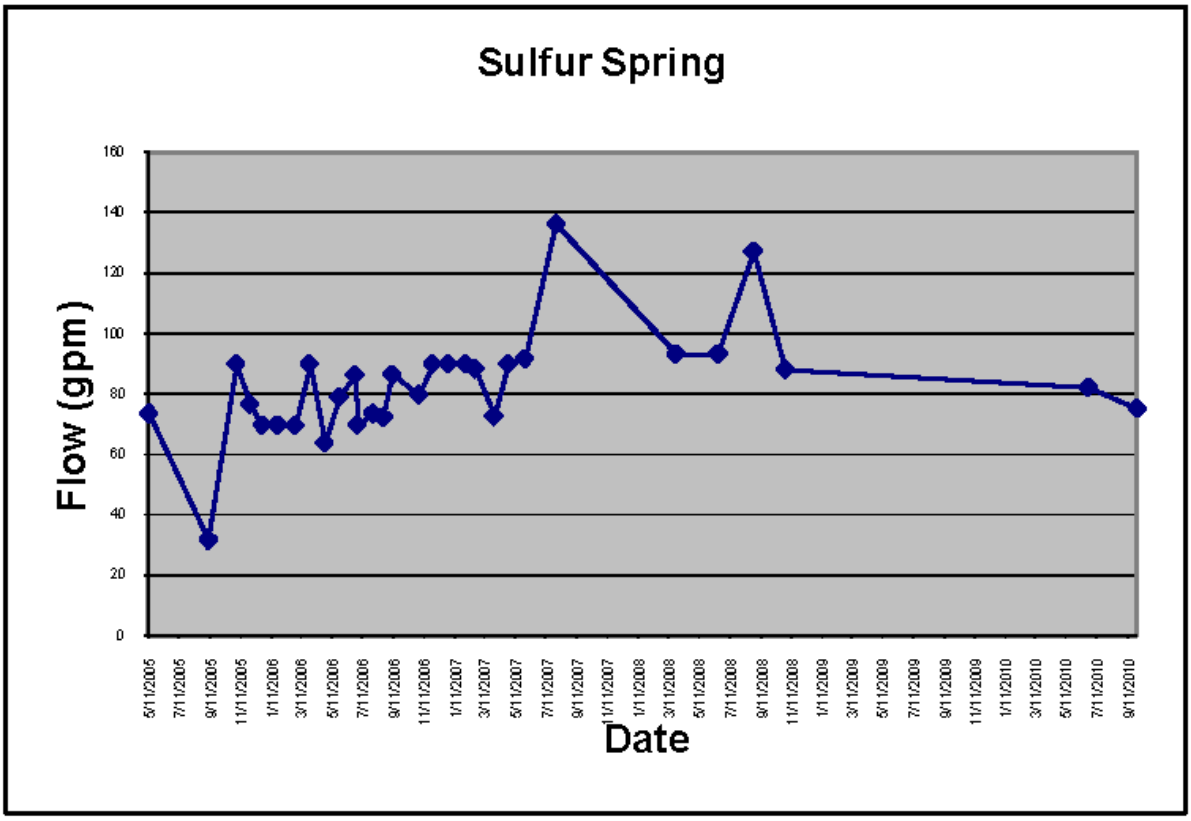
Elevation: **~7,670**

Date	Estimated Flow (gpm)	pH	Dissolved Oxygen (ppm)	Specific Conductivity (Us)	Temp (C)
5/11/2005	73	6.76	0.7	603	13.6
9/6/2005	32	7.2	2.4	559	15.9
10/31/2005	90	5.69	2.6	541	13.2
11/28/2005	76	5.85	3.9	561	11.9
12/22/2005	69	5.64	3.5	490	17.4
1/22/2006	69	7.64	1.3	410	14.7
2/26/2006	69	8.08	4.3	383	23.9
3/27/2006	90	**7.38**		**710**	~14
4/26/2006	64	7.03	1.2	413	23.4
5/25/2006	79	7.46	2.4	503	28.2
6/29/2006	69	7.45	2.9	550	25.1
7/31/2006	74	7.27	2.0	446	24.1
8/20/2006	72	7.29	2.3	169	24.1
9/7/2006	86	lab	2.2	473	22.0
10/30/2006	80	7.27	4.0	384	22.2
11/27/2006	90	7.02	1.8	389	20.0
12/26/2006	90	7.00	3.0	538	20.0
1/31/2007	90	7.01	5.1	682	17.4
2/19/2007	88	7.03	4.1	473	21.5
3/29/2007	72	7.39	4.4	544	21.7
4/25/2007	90	7.33	7.0	557	23.4
5/29/2007	91	7.41	5.5	523	22.8
6/25/2006	86	7.25	2.4	615	27.5
7/30/2007	136	7.33	4.0	507	22.7
3/25/2008	93	6.81	2.2	973	21.9
6/16/2008	93	7.68	1.9	341	31.4
8/26/2008	127	7.14	2.5	646	27.5
10/29/2008	88	7.28	4.4	595	17.1
6/23/2010	82	12.00	14.6	423	17.4
9/28/2010	75	7.38		715	14.8

NOTE: Bolded values measured in March 2006 were analyzed at the laboratory. Specific conductivity values were actually measured as conductivity.

*Samples collected at Sulfur Spring have occasionaly been mislabled "Sulfur Springs", "Sulfer Spring", & "Sulfer Springs". From May 2005 to Nov 2006 sample names varied. From Dec 06 to present, samples have been labled Sulfur Spring. Analyltic data are Labled accordingly. Data labled Sulfur Spring, Sulfur Springs, Sulfer Spring, & Sulfer Springs represent samples collected at the same location.

Figure 17 Field Data



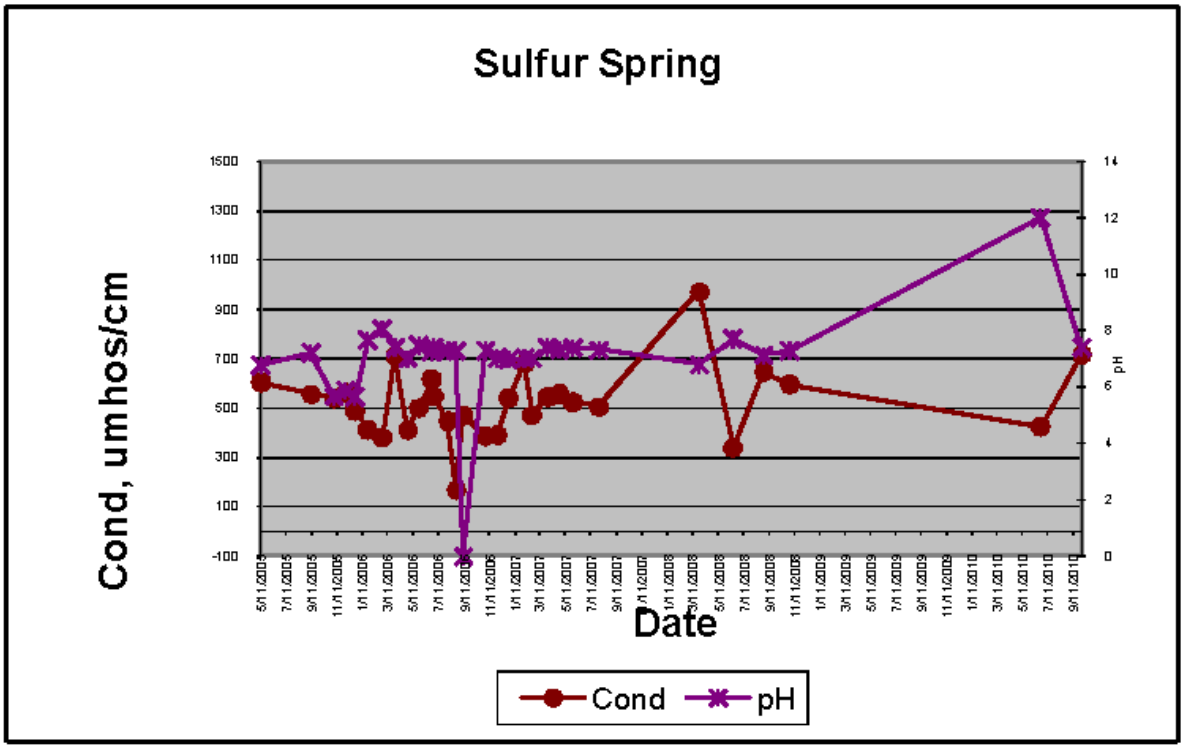


Figure 17 Field Data

Baseline Water Sampling
Surface Water Field Measurements

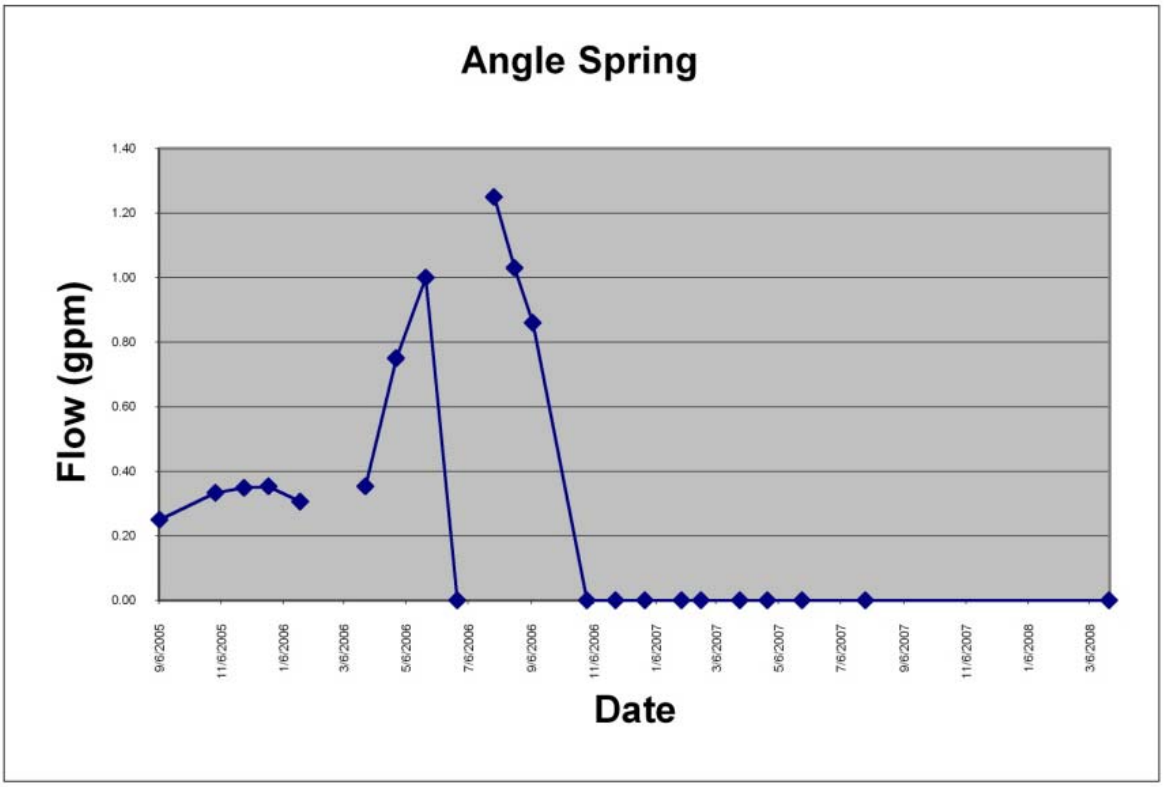
Angle Spring

Elevation: **~7,940**

Date	Estimated Flow (gpm)	pH	Dissolved Oxygen (ppm)	Specific Conductivity (Us)	Temp (C)
9/6/2005	0.25	7.35	3.7	358	22.0
10/31/2005	0.33	6.01	4.7	519	10.6
11/28/2005	0.35	6.46	4.7	428	22.2
12/22/2005	0.35	5.23	3.9	512	11.6
1/22/2006	0.31	4.36	8.4	469	8.9
2/26/2006		8.28	4.7	385	14.7
3/27/2006	0.35	**7.04**		**670**	~10
4/26/2006	0.75	7.28	5.1	361	18.0
5/25/2006	1.00	5.96	3.8	492	20.5
6/29/2006		7.5	6.3	522	20.9
7/31/2006	1.25	7.24	3.7	410	29.9
8/20/2006	1.03	7.26	3.5	156	22.3
9/7/2006	0.86	lab	4	387	18.5
10/30/2006	not measured				
11/27/2006	not measured				
12/26/2006	not measured				
1/31/2007	not measured				
2/19/2007	not measured				
3/29/2007	not measured				
4/25/2007	not measured				
5/29/2007	not measured				
6/25/2006	not measured				
7/30/2007	not measured				
3/25/2008	not measured				
	ACCESS DEINIED				

NOTE: Bolded values measured in March 2006 were analyzed at the laboratory. Specific conductivity values were actually measured as conductivity.

Figure 17 Field Data



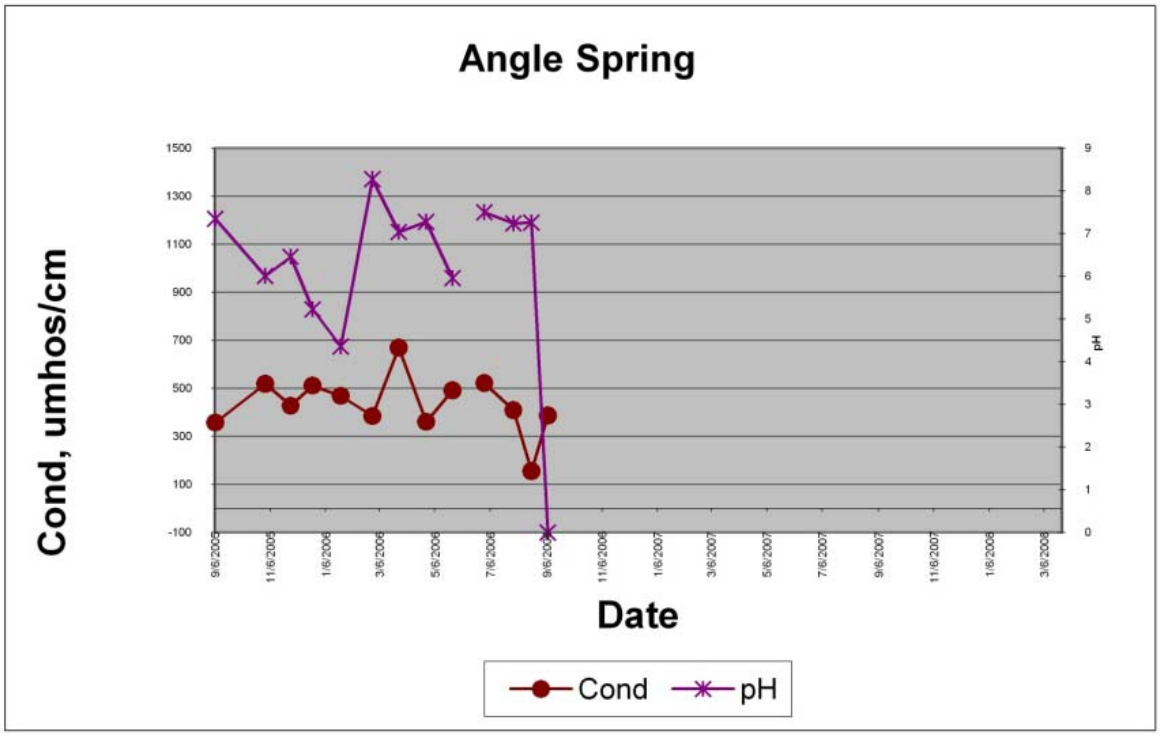


Figure 17 Figure 17 Field Data

Figure 17 Field Data

Carbon Resources LLC

Kinney II Baseline Water Sampling

Surface Water Field Measurements

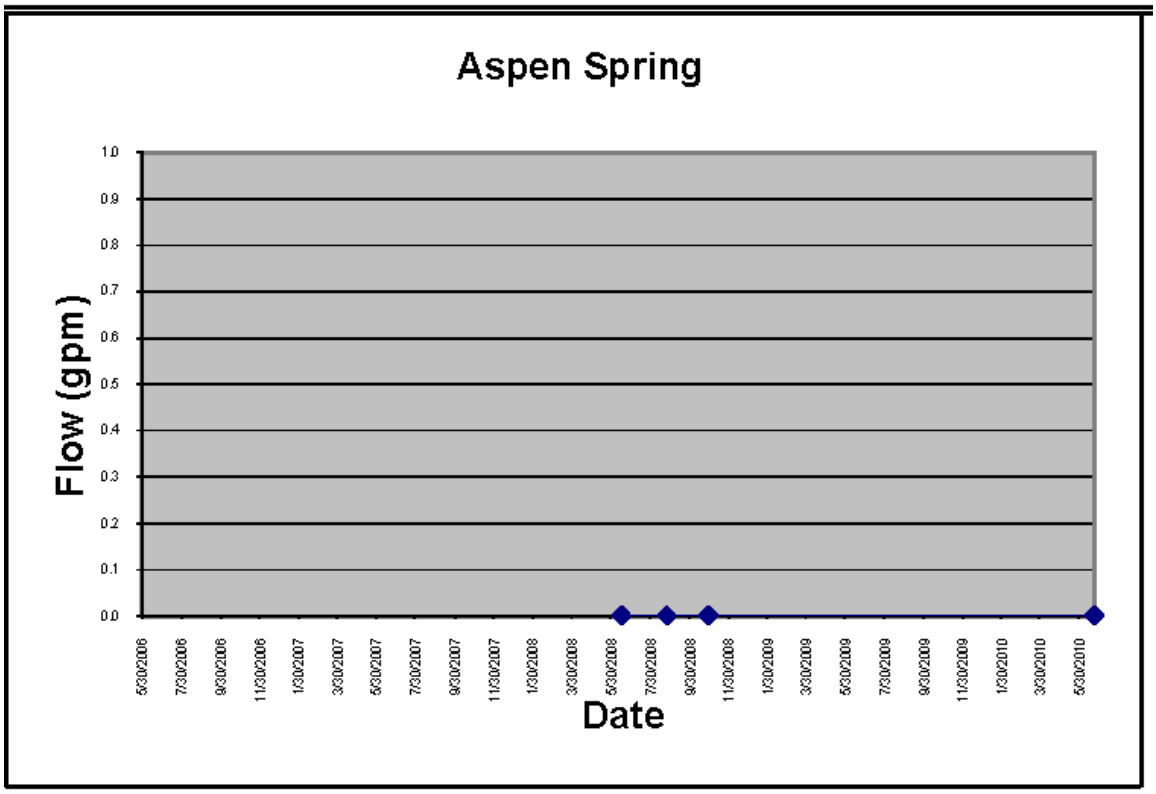
Aspen Spring

Elevation:

Date	Estimated Flow (gpm)	pH	Dissolved Oxygen (ppm)	Specific Conductivity (Us)	Temp (C)
5/30/2006					
6/29/2006					
7/31/2006					
8/20/2006					
9/7/2006					
10/30/2006					
11/27/2006					
12/26/2006					
1/31/2007					
2/19/2007					
3/29/2007					
4/25/2007					
5/29/2007					
6/25/2006					
7/30/2007					
3/25/2008					
6/16/2008	not meas	8.69	2.2	190	29.8
8/26/2008	not meas	7.91	4	496	32.8
10/29/2008	trickle	7.14	3.7	541	5.7
6/23/2010	not meas	12	20.4	295	24.6
9/28/2010	not meas	9.33		419	14.6

*The samples collected at Res-1 in June, July, & Aug 2006 were mislabled "Scofield Res. 1" and analyltic data are labled accordingly. Data labled Res-1 & Scofield Res. 1 represent samples collected at the same location.

Figure 17 Field Data



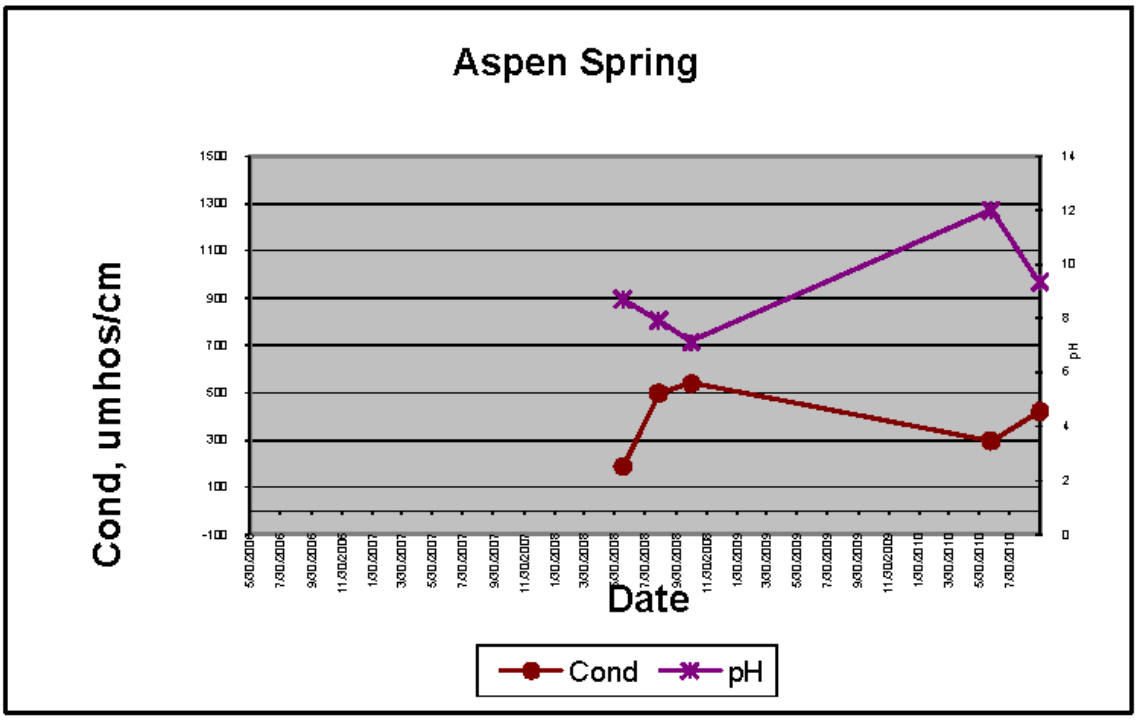


Figure 17 Field Data

Carbon Resources LLC

Kinney II Baseline Water Sampling

Surface Water Field Measurements

Mud Creek *

Elevation: **~7,685**

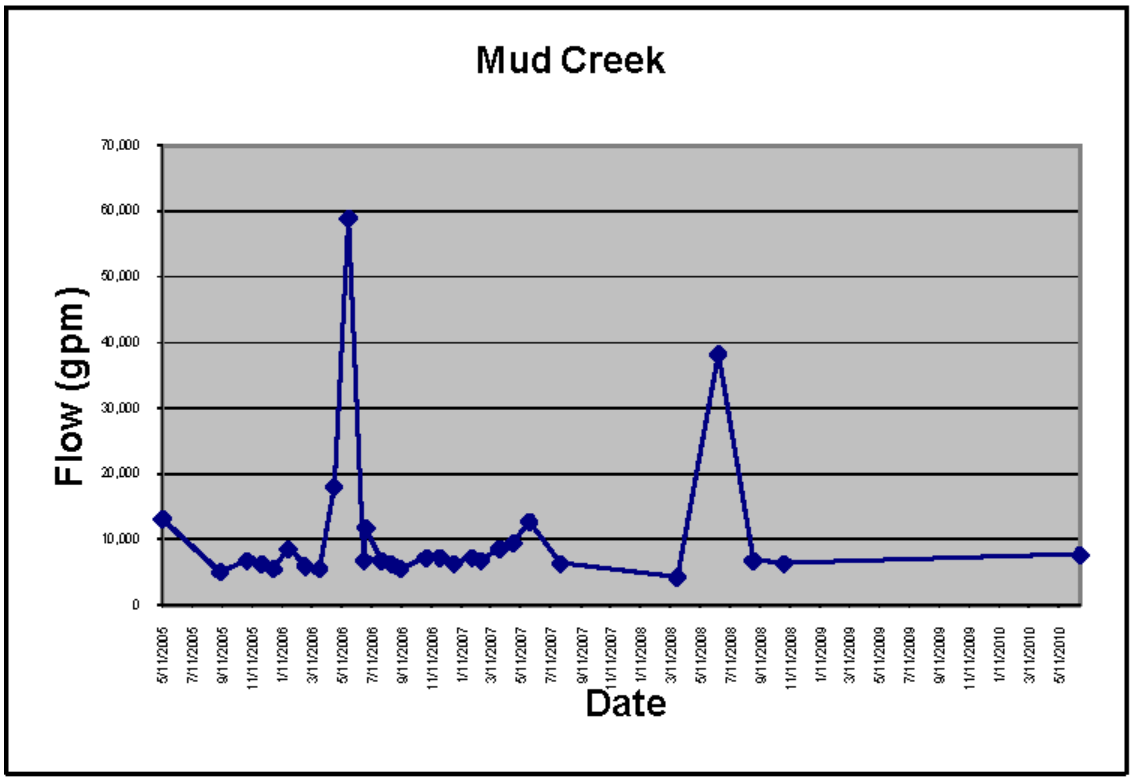
Date	Estimated ** Flow (gpm)	pH	Dissolved Oxygen (ppm)	Specific Conductivity (Us)	Temp (C)
5/11/2005	13,015	8.31	7.4	694	10.0
9/6/2005	4,937	8.51	5.4	655	17.7
10/31/2005	6,732	6.68	6.4	759	10.7
11/29/2005	6,283	6.94	7.2	758	5.6
12/22/2005	5,386	6.67	6.2	520	13.6
1/22/2006	8,527	8.63	4.1	568	7.6
2/26/2006	5,834	9.0	3.6	501	19.3
3/27/2006	5,386	**8.18**		**1000**	~2
4/26/2006	17,952	8.3	5	394	18.5
5/25/2006	58,797	8.45	4.4	324	26.5
6/29/2006	11,670		6.2	581	28.5
7/31/2006	6,732	8.4	4.8	471	26.9
8/20/2006	6,284	8.38	5.1	188	27.7
9/7/2006	5,386	lab	6.1	564	14.3
10/30/2006	7,181	7.94	6.9	424	17.3
11/27/2006	7,181	7.76	6	463	12.0
12/26/2006	6,284	8.08	7.3	571	13.1
1/31/2007	7,181	7.4	5.5	834	12.4
2/19/2007	6,732	8.3	6.8	476	12.4
3/29/2007	8,528	8.33	7.9	555	13.4
4/25/2007	9,425	8.29	7.8	546	25.0
5/29/2007	12,567	8.51	7.9	481	20.7
6/25/2006	6,733	8.65	5.7	742	27.7
7/30/2007	6,284	8.58	5.3	532	25.5
3/25/2008	4,129	7.8	5.0	633	17.5
6/16/2008	38,151	8.93	4.7	355	23.8
8/26/2008	6,732	8.31	3.9	651	28.6
10/29/2008	6,284	8.93	11.4	667	15.9
6/23/2010	7,630	9.29	3.4	289	24.6
9/28/2010	4,937	8.9		732	11.4

NOTE: Bolded values measured in March 2006 were analyzed at the laboratory. Specific conductivity values were actually measured as conductivity.

*The sample collected at Mud Creek in May 2005 was mislabled "Muddy Creek" and analyltic data are labled accordingly. Data labled Mud Creek & Muddy Creek represent samples collected at the same location.

** Flow Data From USGS 09310700 MUD CRK BL WINTER QUARTERS CYN @ SCOFIELD, UT From Web Site; http://waterdata.usgs.gov/nwis/dv/?site_no=09310700&agency_cd=USGS&referred_module=sw

Figure 17 Field Data



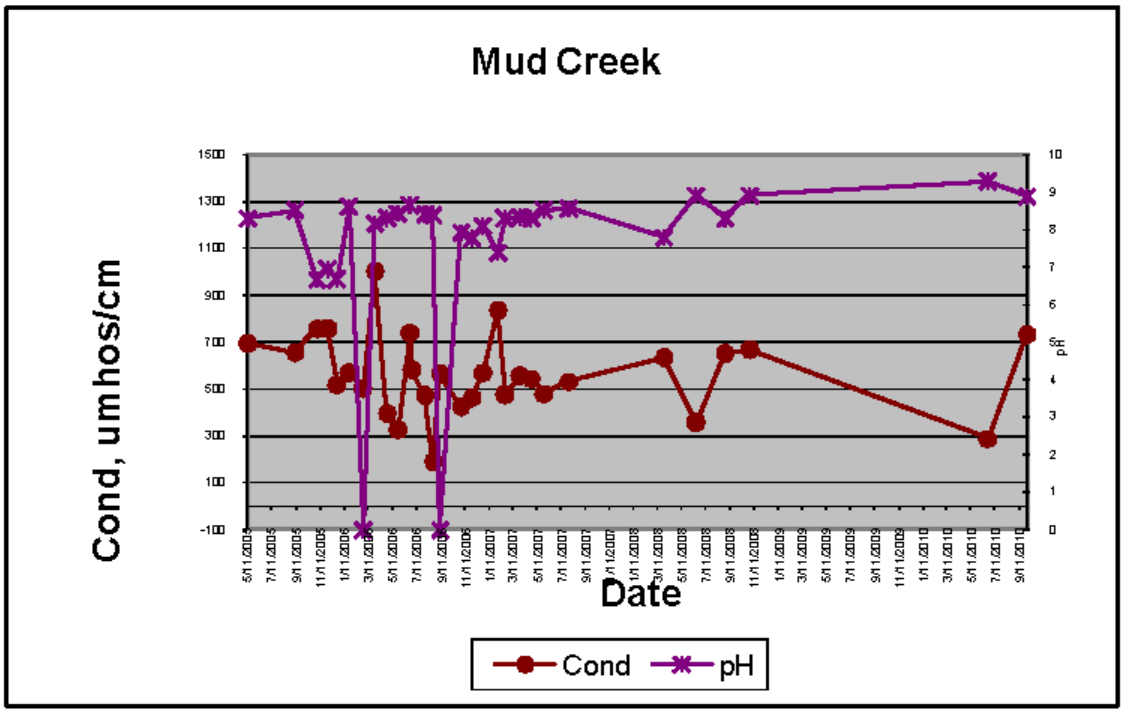


Figure 17 Field Data
Carbon Resources LLC

Kinney II Baseline Water Sampling

Surface Water Field Measurements

Res-1 (Scofield Reservoir) *

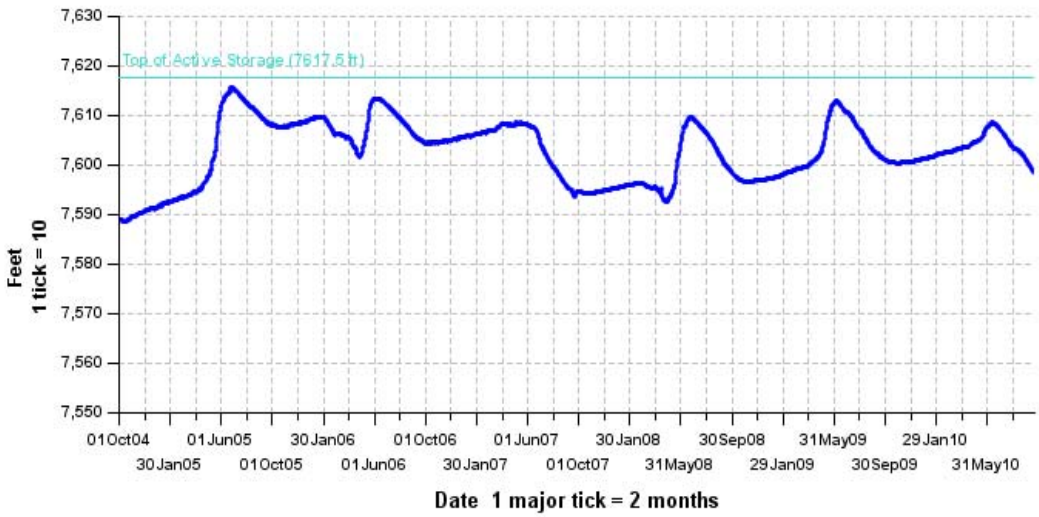
Elevation: **~7620**

Date	Water Level (feet)	pH	Dissolved Oxygen (ppm)	Specific Conductivity (Us)	Temp (C)
5/30/2006	7613.5	8.09	5.6	424	20.6
6/29/2006		9.03	10	287	31.9
7/31/2006	7609.4	10.16	9.1	257	29.8
8/20/2006	7607.7	9.82	9	108	35.7
9/7/2006	7606.0	lab	5.2	365	15.5
10/30/2006	7604.5	8.13	6.7	351	18.2
11/27/2006	7604.8	frozen			
12/26/2006		frozen			
1/31/2007		frozen			
2/19/2007		frozen			
3/29/2007	7607.8	8.43	9.7	408	14.9
4/25/2007	7607.8	8.39	7.8	390	23.4
5/29/2007	7608.1	8.48	8	350	24.9
6/25/2006	7605.6	10.52	7.3	360	36.1
7/30/2007	7600.1	8.02	5.9	616	28
3/25/2008		7.14	5.3	775	12.7
6/16/2008	7609.1	8.69	4.6	341	31.4
8/26/2008	7602.9	8.54	7.5	743	32.1
10/29/2008	7596.8	7.98	7.6	605	17
6/23/2010	7608.2	12	38.2	261	18.7
9/28/2010	7602.7	9.22		867	23.1

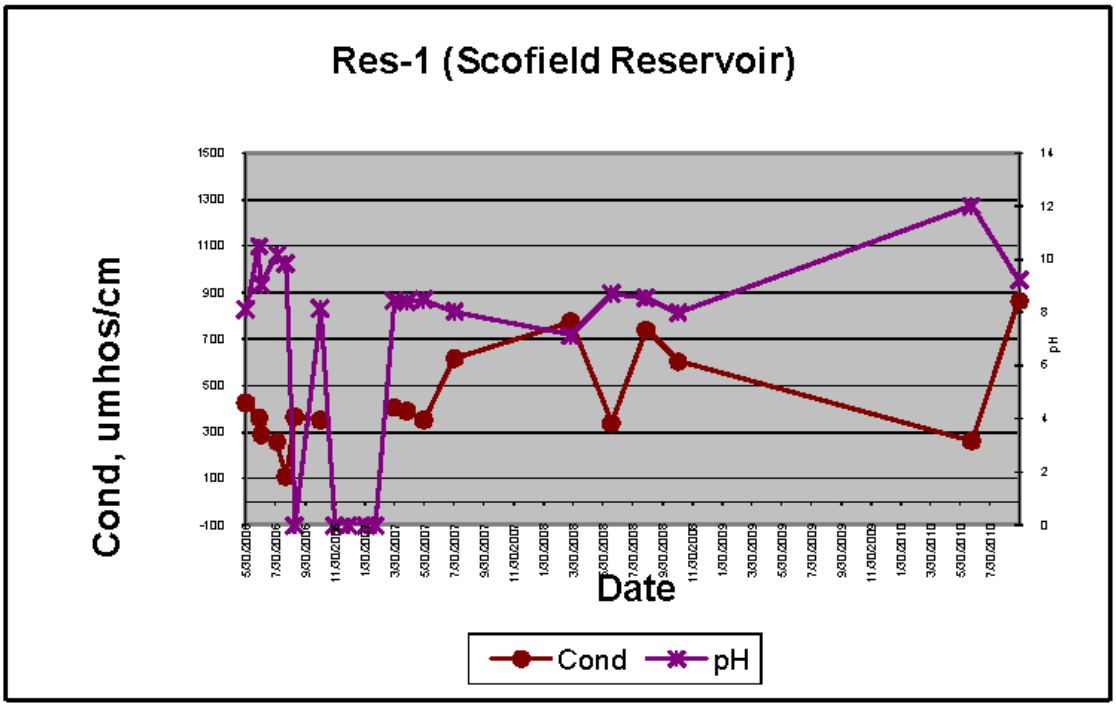
*The samples collected at Res-1 in June, July, & Aug 2006 were mislabled "Scofield Res. 1" and analyltic data are labled accordingly. Data labled Res-1 & Scofield Res. 1 represent samples collected at the same location.

Figure 17 Field Data

Res-1 Scofield Reservoir Pool Surface Elevation (Bureau of Reclamation)



Note: The BOR Bureau Of Reclamation records the lake level in North American Vertical Datum of 1929 (NAVD 29) elevations. The Top of Active Storage (7617.5 ft) shown in the table above is a NAVD 29 elevation. The elevations included in the Kinney No. 2 Mine application are North American Vertical Datum 1988 (NAVD 88). The NAVD 88 use is mandated by Utah State Law for new projects such as the Kinney No. 2 Mine. NAVD 88 elevations are approximately 4 feet higher than NAVD 29 elevations.



development of the Kinney No. 2 Mine Project, Carbon Resources (CR) began monitoring Scofield Reservoir, Mud Creek, and Miller Canyon, the three major surface water sources in the mine vicinity. Ongoing monitoring will supplement existing data and provide a basis for definition of existing hydrologic baseline conditions. Surface water monitoring locations are shown on Map 10, Regional Water Quality. The water level in Scofield Reservoir can be seen in the table above. It should be noted that the Bureau Of Reclamation records the lake level in North American Vertical Datum of 1929 (NAVD 29) elevations. The Top of Active Storage (7617.5 ft) shown in the table above is a NAVD 29 elevation. The elevations shown on the Y line of the graph are in North American Vertical Datum 1988 (NAVD 88), which is the datum used by the Kinney No. 2 Mine. The NAVD 88 use is mandated by Utah State Law for new projects such as the Kinney No. 2 Mine.

The available data indicate the surface hydrology is typical of high-mountain headwater watersheds with a pronounced seasonal variation in the flow regime. Stream flow in Mud Creek, Miller Canyon, and Long Canyon typically peaks with snowmelt in late spring/early summer. Unnamed drainages also have a potential for snowmelt runoff, especially during the spring period when rapid increases in air temperatures are experienced. Low flows in perennial streams occur during late fall and winter months. Field data collected from Miller Canyon are shown along with other surface and spring data in Figure 17 Field Data. During the "non frozen" period of record, high and low flows of 545 GPM (1.21 CFS) and 18 GPM (0.04 CFS) were recorded at the Miller Outlet station.

The Mud Creek data shows, and the Miller Outlet data suggest that flows within local drainages also respond to local precipitation events. Rapid runoff resulting from short-duration high-intensity precipitation events will cause relatively brief, high velocity flows. Most of the local intermittent/ephemeral drainage channels contain flowing water only during rapid snowmelt or precipitation events. The steep slopes and numerous deep, narrow, drainages contribute to a storm-event driven flow regime.

Surface Water Quality

The water monitoring program initiated in 2005 under the Utah coal program and Carbon Resource's ongoing monitoring activities provide relevant water quality information for the permit area. Generally, the objectives of surface water quality monitoring have included; 1) Definition of baseline water quality conditions; 2) Identification of any seasonal variations in water quality and correlation to flow levels; and 3) Identification of any mining related changes in surface water quality. Water monitoring activities for surface drainages have typically included measurement of flow and field parameters (temperature, pH, electrical conductivity, and dissolved oxygen) and collection of water samples for laboratory analyses.

Both field activities and laboratory analyses have been conducted according to standard protocol as defined by applicable regulations, guidelines, and technical standards, and water samples have been analyzed for specific parameters as defined by the regulatory authority. Water quality analysis and testing requirements are reflected in Table 20, Hydrologic Monitoring Schedule.

General Water Quality Characteristics

The chemical characteristics of surface water, based on major ion chemistry, are displayed on Map 10, Regional Water Quality. Surface waters are generally of a calcium-bicarbonate chemical type, although Mud creek shows higher portions of sodium, potassium, and sulfate than does Scofield Reservoir or Miller Outlet. Angle Spring, Sulfur spring, and well CR-06-03-ABV are also found to typically be of a calcium-bicarbonate type, and to have higher concentrations than surface water sources. However, Eagle Spring, is very different than other local sources having very low concentrations of basic anions-cations and being of a higher quality.

Surface water quality is summarized in Table 10, Surface and Ground Water Quality Summary, and in Exhibit 10, Surface and Ground Water Field Measurements. The following discussions summarize important information relative to existing surface water conditions in the proposed permit area.

pH – As shown in Table 10, measured pH values range from 7.04 to 8.5 for samples collected. The low pH values noted were collected from Sulfur and Angle Springs. With the exception of these two springs, pH levels generally indicate a neutral to moderately alkaline condition. High pH values are relatively common in the arid western United States and are reflective of the geochemistry of the dominant stratigraphic units. It is believed that mining will show no impact on local pH data due to hydrologic considerations discussed within this permit.

Sulfate – A natural sulfur spring is located near the north end of the permit area adjacent to Highway 96. However, average sulfate levels of 44 in this spring are not significantly higher than those found within well CR-06-03- or Miller Outlet that average 38, 26 respectively. Scofield Reservoir and Mud Creek with average values of 63 and 169 respectively are clearly distinct from other samples taken and are likely impacted by upstream sources. High Mud Creek sulfate values appear to be diluted by Scofield Reservoir.

Total Dissolved Solids – With one exception, observed high TDS values are relatively consistent within the samples taken, ranging between 96 mg/l in Scofield Reservoir to 720 mg/l in Mud Creek. Eagle spring appears to have a distinctly different water source with an average recorded TDS of 152 mg/l than Angle, Aspen and Sulfur Springs which have respective averages of 304, 266, and 366 mg/l.

Total Suspended Solids - Given the topography and climate of the area, moderately high TSS values may normally be expected during spring runoff and following major thunderstorms. Steep natural slopes and channel gradients combined with short duration, high-intensity flows resulting from snowmelt and major thunderstorms can result in significant surface erosion and sediment transport. TSS variations at the sample points indicates site specific conditions which contribute to erosion and soil movement. Springs generally show very low TSS values as would be anticipated, whereas surface sources are shown to have significant variation. Low values for Miller Outlet, Mud Creek and Res-1 were found to be 18, 4 and 11 mg/l respectively, whereas high values for the three sources were 430, 320, and 1,600 mg/l respectively. These high values likely result from short duration, high-intensity rainfall events, or possibly wind/wave action in the case of Scofield Reservoir.

Temporal and Spatial Water Quality Characteristics

Figure 18, Basic Water Quality, plots pH, Conductivity, TDS and Sulfate data over time for each monitored station. The plots help identify the presence, or lack of, annual cycles or trends. Observations made from the data plots follows:

Miller Outlet Some slight drop in TDS appears to be present during the May-June time

	frame, with a corresponding increase in TSS as would be expected for a surface water source. It is also noted that there appears to be annual increases in Iron and Manganese during high TSS events.
Eagle Spring	Insufficient data available for analysis
Sulfur Spring	TDS appears to show a possible annual low during the February-March time frame with peak TSS values occurring during May and June. Trends are not readily apparent for Iron and Manganese. These trends are masked however by larger fluctuations which are believed to be climatically induced.
Angle Spring	No annual or seasonal cycle identified.
Aspen Spring	Insufficient data available for analysis.
Mud Creek	A slight decrease in TDS appears to exist in the May- June period of each year with highest values occurring during the winter months of November through January. TSS, Iron and Sulfate values appear to be the highest in the May-June time frame and lowest in the winter period.
Res-1	Although a complete record of data is not available for this site during winter months, TDS appears to reach annual lows during the May-June time frame with similarly corresponding peaks in TSS. No consistent trend is noted for Iron and Manganese.

Surface water quality variation plots versus flow for pH, Conductivity, TDS and Sulfate are shown for sampled locations on Figure 19, Water Quality vs. Flow. A unilateral clear and distinct pattern showing variation in quality versus flow in all stations is not apparent. A review of the figures does show what we believe to be improved water quality with increasing flow or storage volume for both Mud Creek and Scofield Reservoir for Conductivity, TDS and Sulfate. Decreased values for Conductivity and TDS may also be indicating some possible water quality improvement with increasing flow for Miller Outlet and Angle Spring although the trends are not as apparent. These water quality improvements with increased flow or volume are believed to result from high flow dilution of existing water quality bases.

As discussed earlier, water quality parameters are relatively consistent for the sites monitored with two basic exceptions, Eagle Spring which has very good water quality, and Mud Creek which has significantly higher values of TDS and Sulfate than other surface or spring sources. Surface waters associated with Miller Outlet for example have TDS and Sulfate values that are on the order of 200 - 620 mg/l and 19 - 48 mg/l respectively. Mud Creek TDS and Sulfate values generally range between 230 – 720 mg/l and 38 – 290 mg/l respectively, as approximate 15% increase over Miller Outlet for TDS, and a 250 to 600% increase for Sulfate.

Surface Water Rights and Use

Surface water rights within a 4 mile radius of the central mine area are shown on Map 31, Surface Water Right Locations, and listed in Table 12, Surface Water Rights. Since the mine is projected to be dry, and is not anticipated to have a mine discharge, there are no anticipated additive effects upon the local surface waters. In a similar manner, no impacts are believed possible to surface waters located within or west of Pleasant Valley and Mud Creek since surface drainages are discontinuous east and west of the valley.

Surface Water/Ground Water Interactions

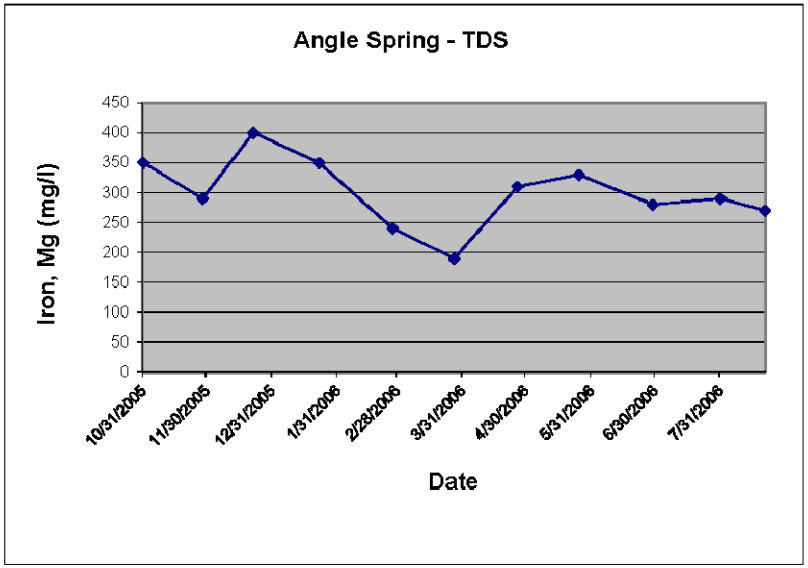
With the exception of the lowermost portions of Mud Creek, which is a gaining system due to

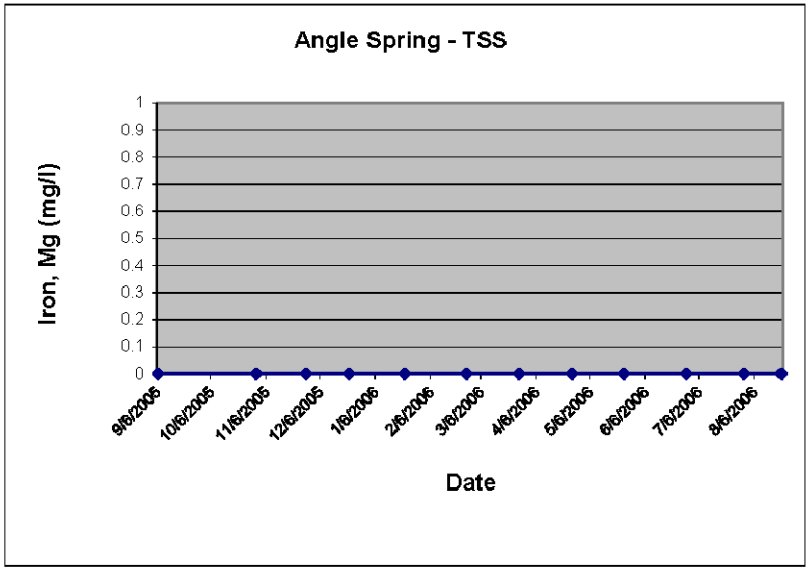
sub-flow from the associated alluvial/colluvial deposits and contributions from tributary drainages, most of the drainages in the permit areas are believed to be losing systems.

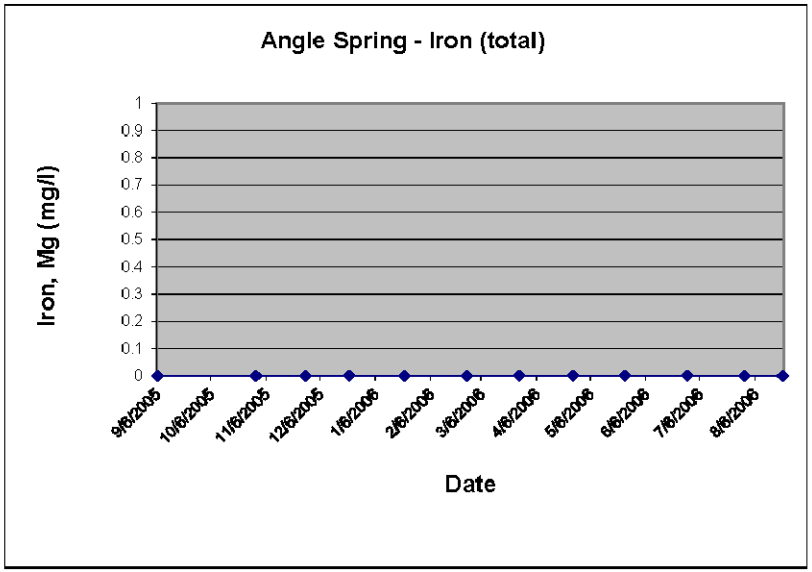
Due to the geologic complexity of the area and significant local variations in topography, geology, and associated recharge conditions, any given drainage may exhibit gaining or losing characteristics over various portions of its drainage length. Recent monitoring indicates that most, if not all, of the surface water discharge from springs and seeps in the upper portions of the smaller drainages is lost to localized ground water storage, ground water recharge, and/or evapo-transpiration resulting in a net surface flow loss over the drainage length.

Discharge to the area stream systems occurs from the alluvial/colluvial aquifer system and from springs and seeps in the upper reaches of the drainages. Alluvial/colluvial deposits are recharged during periods of high stream runoff and later discharge stored water to the stream systems, extending the period of active stream flow. Springs and seeps contribute flow to local tributaries on a seasonal basis or intermittently in delayed response to local recharge.

Figure 18. Basic Water Quality







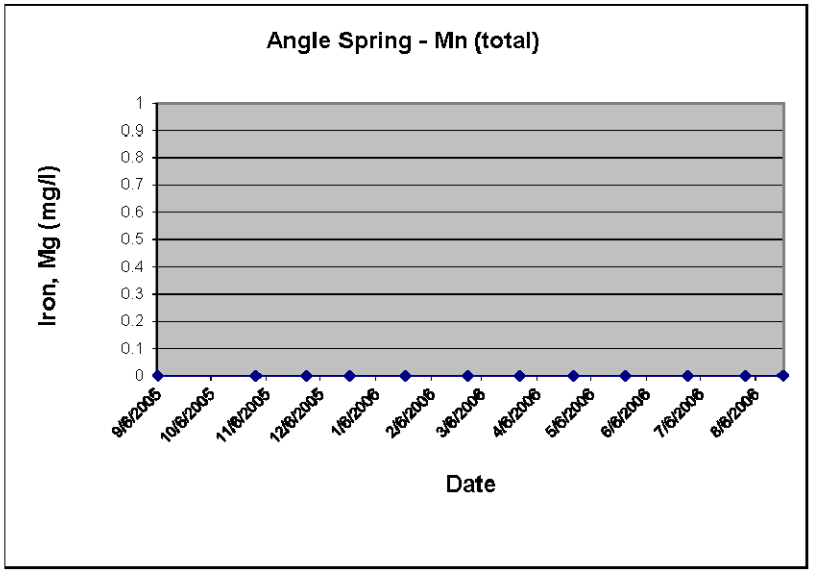
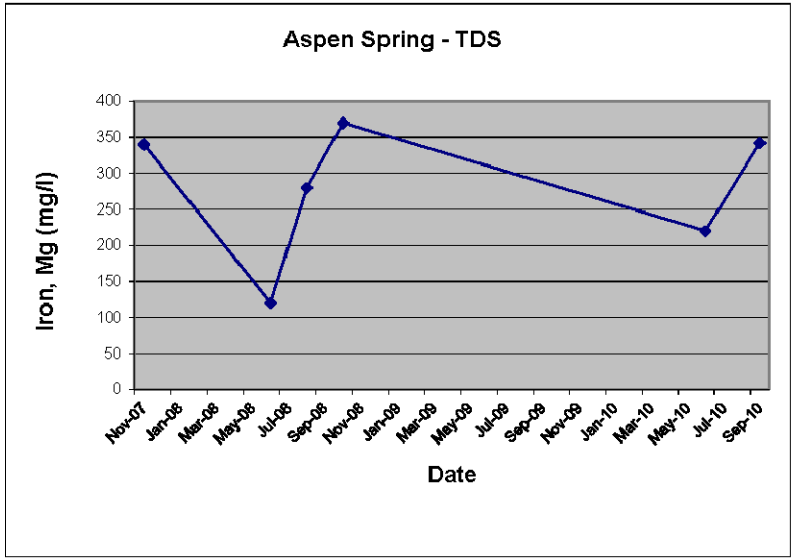
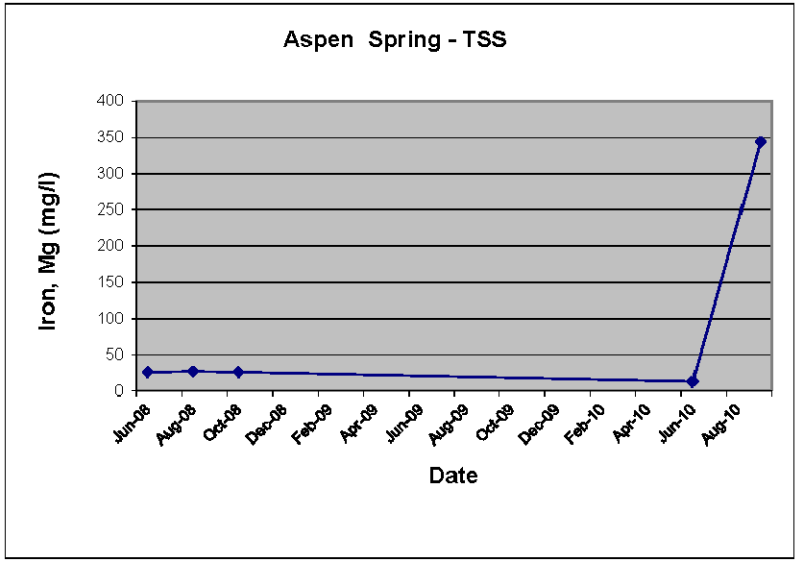
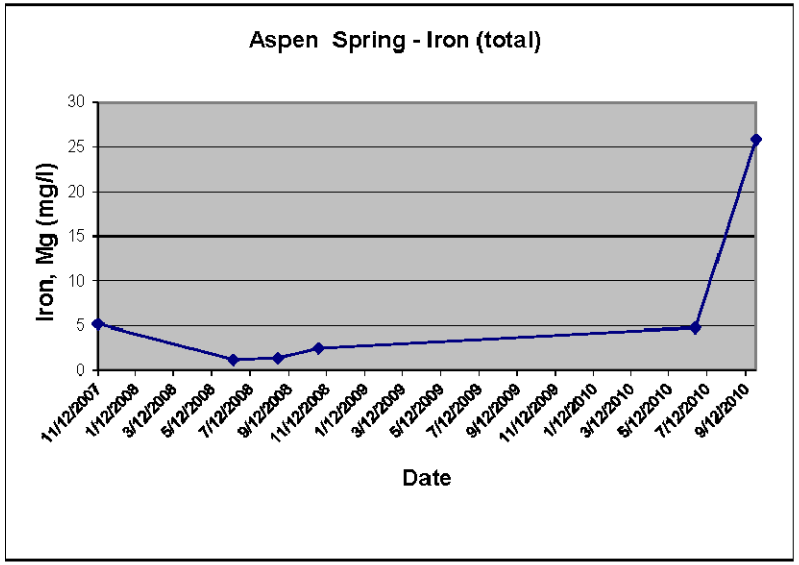


Figure 18. Basic Water Quality







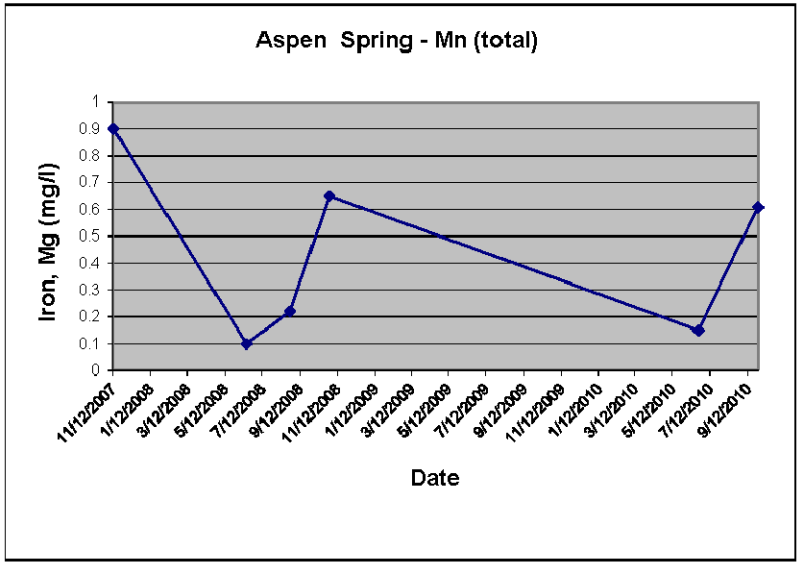
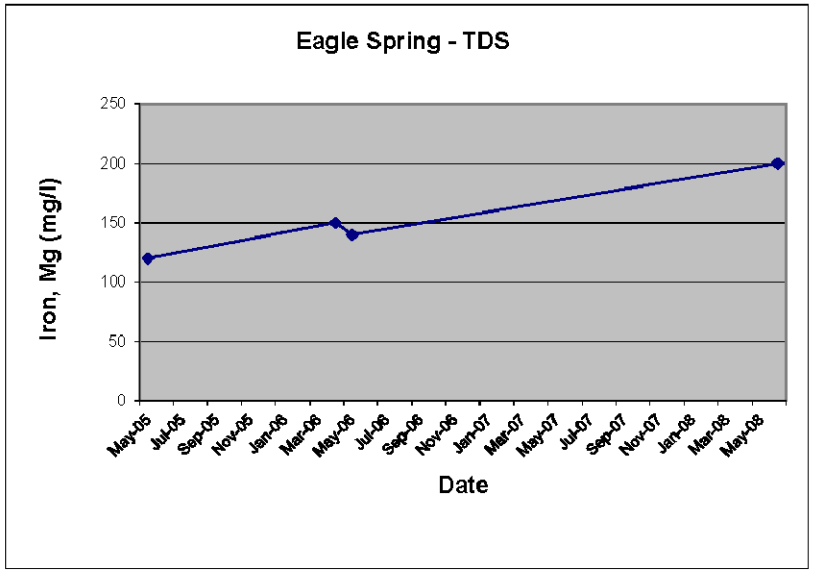
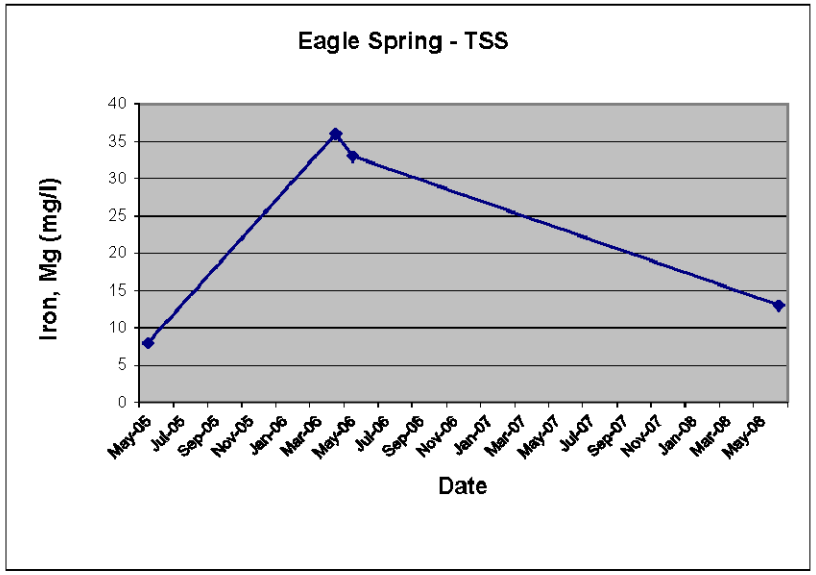
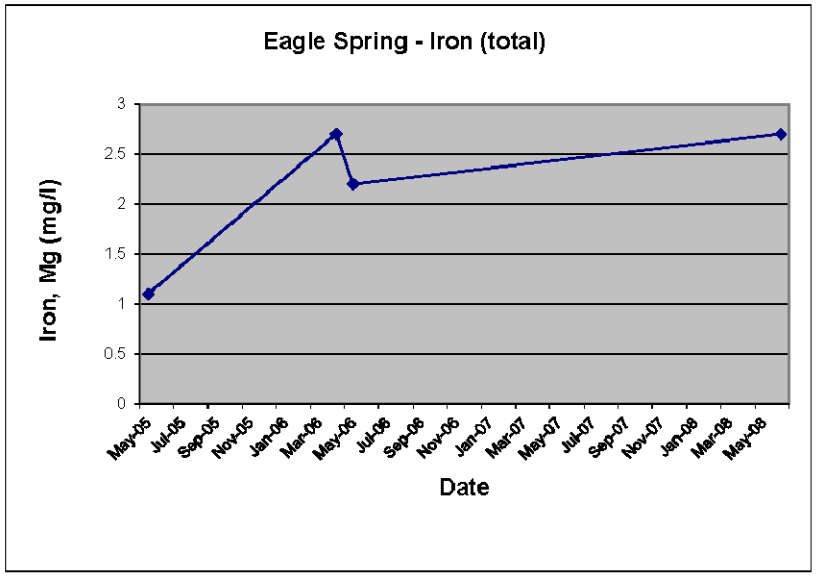


Figure 18. Basic Water Quality







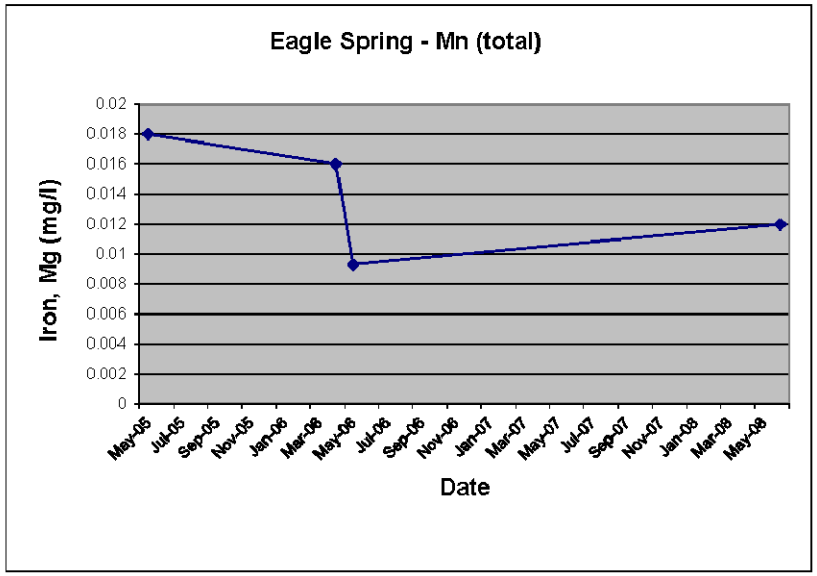
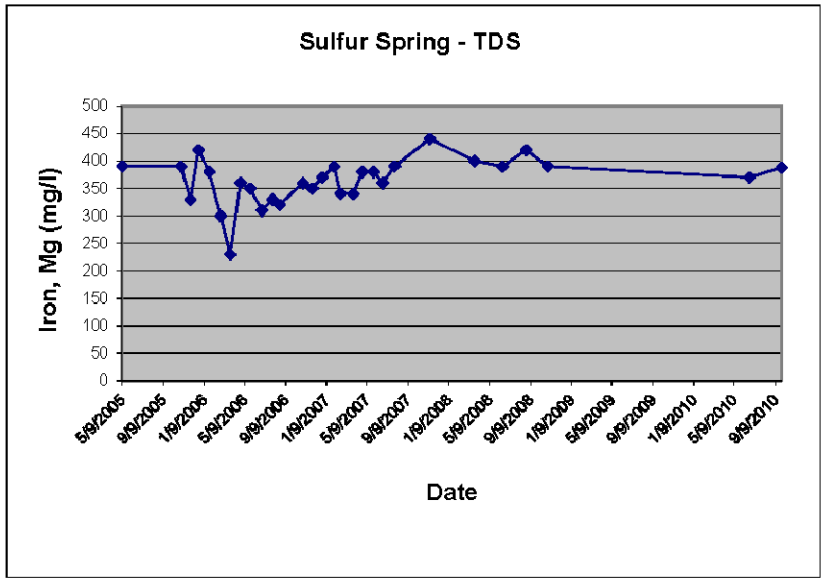
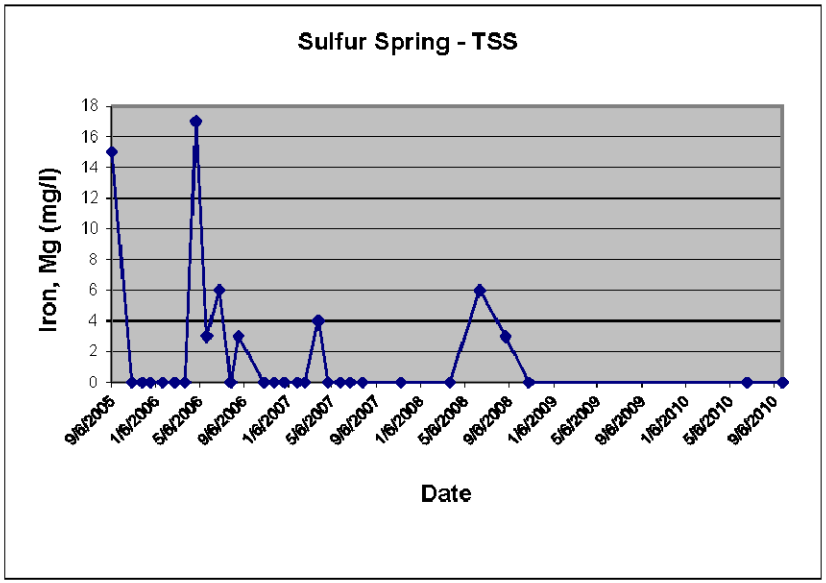
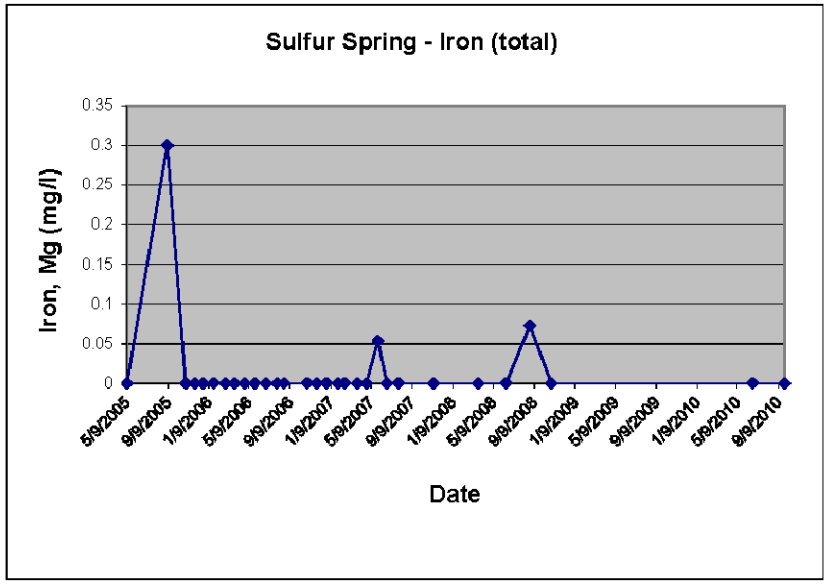


Figure 18. Basic Water Quality







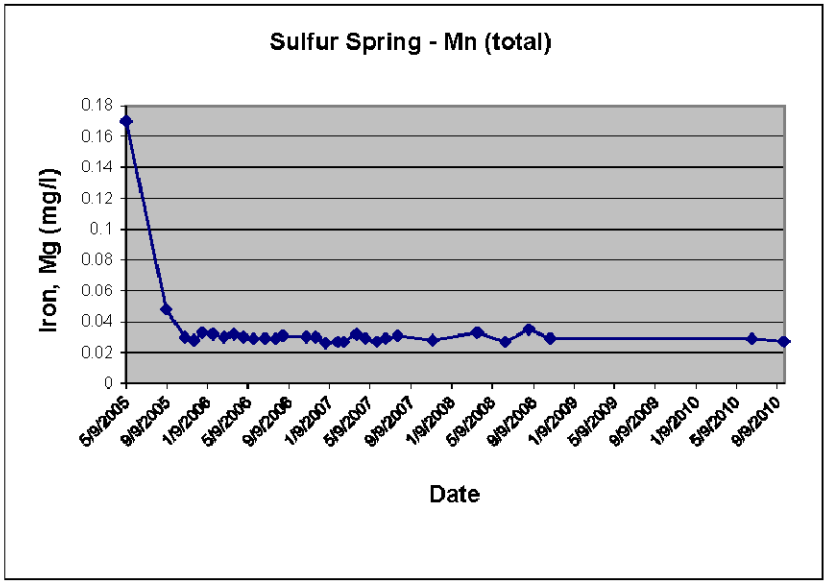
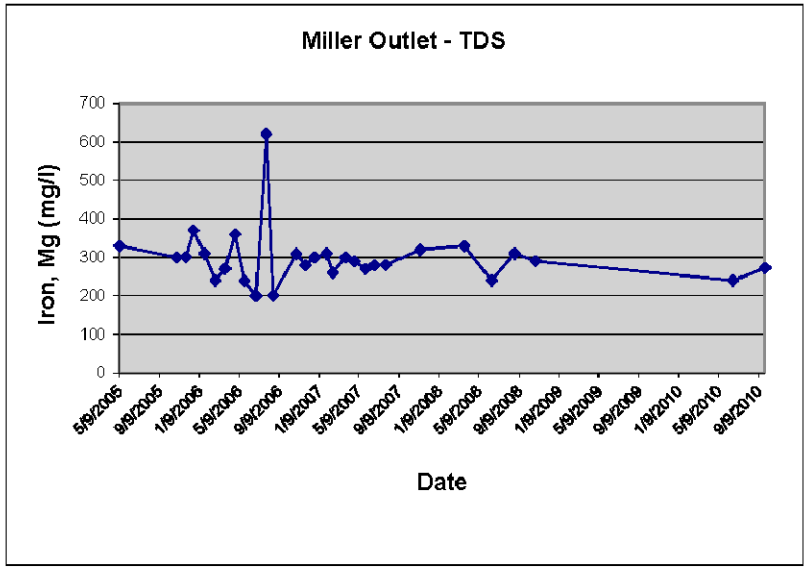
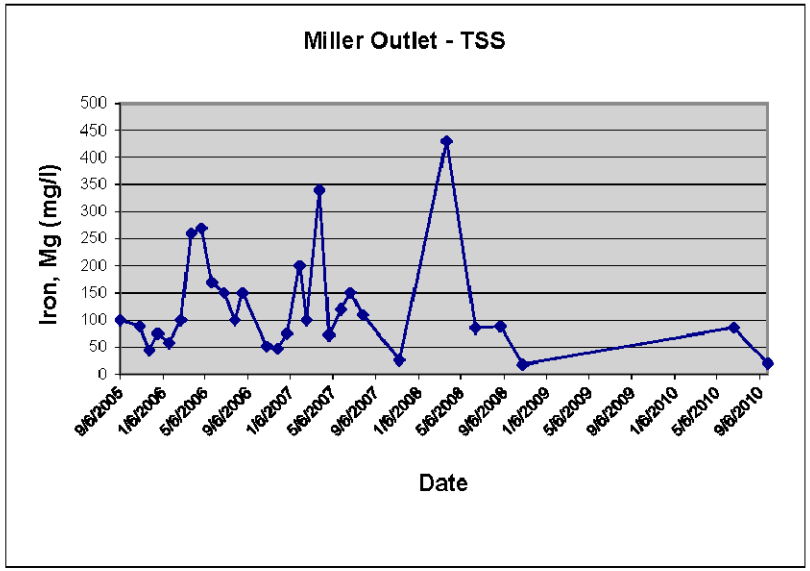
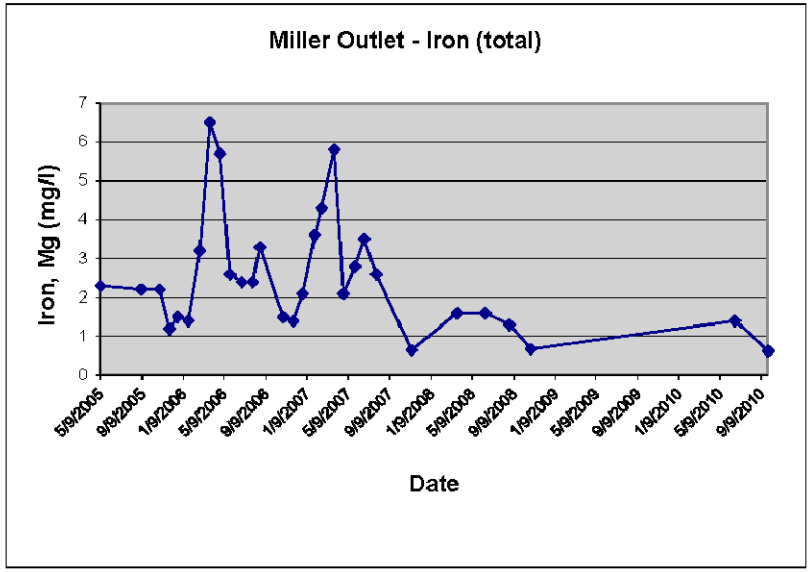


Figure 18. Basic Water Quality







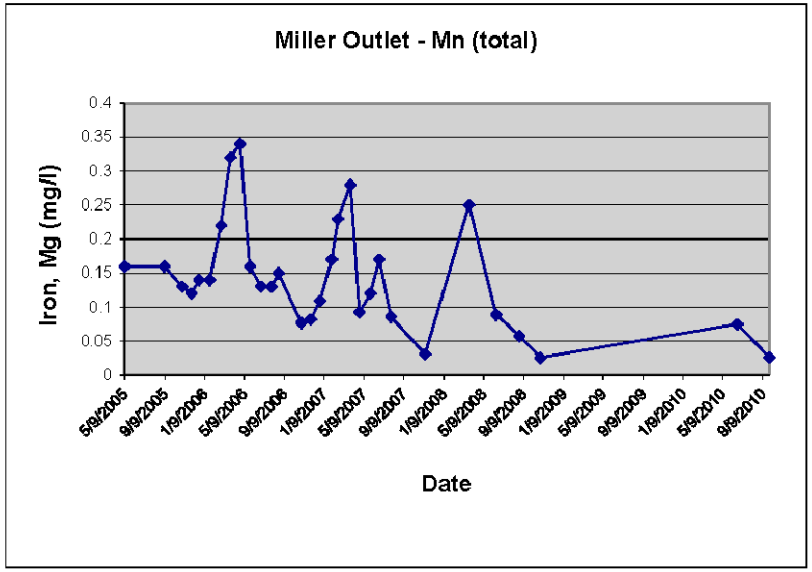
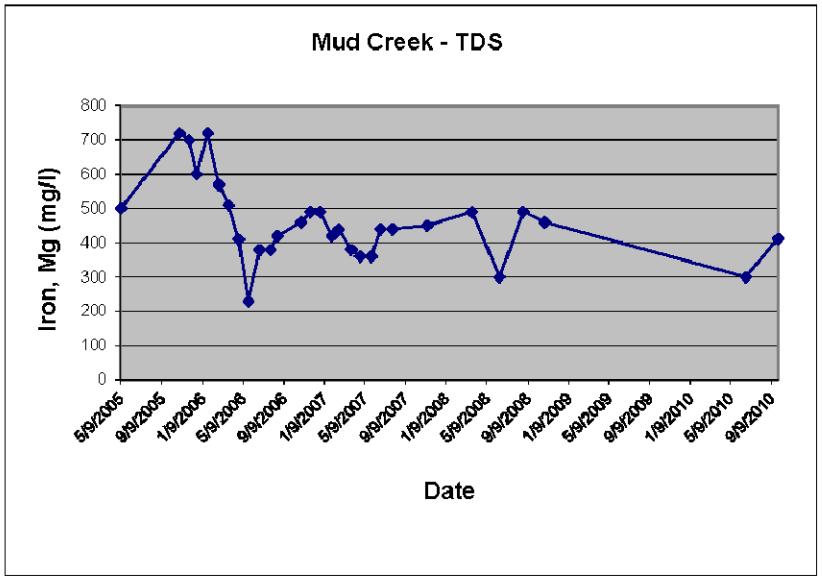
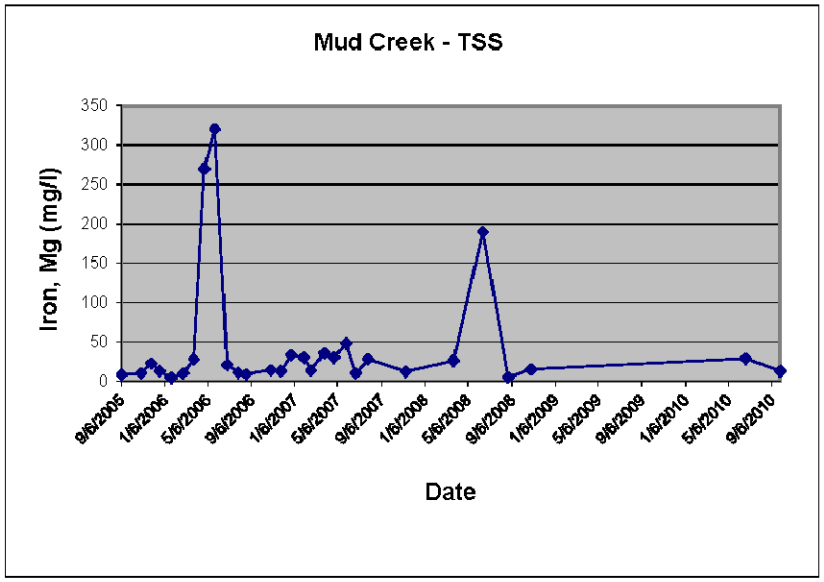
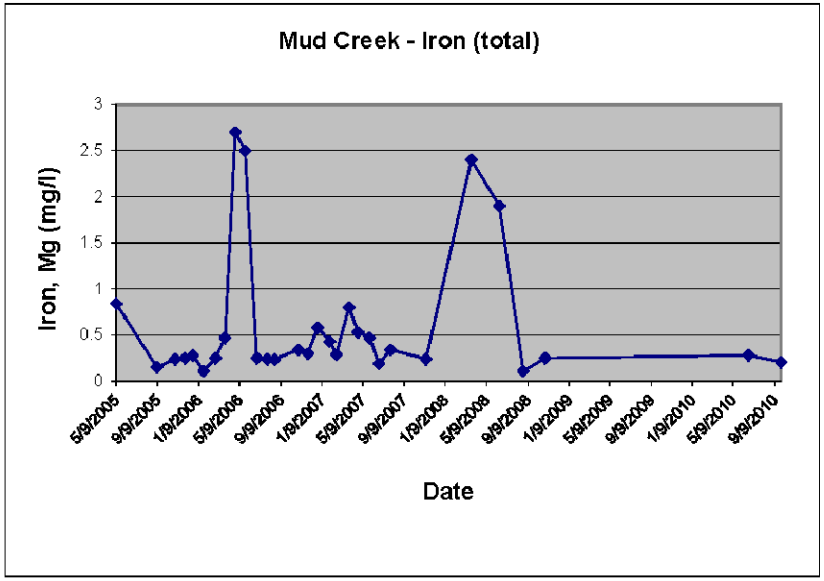


Figure 18. Basic Water Quality







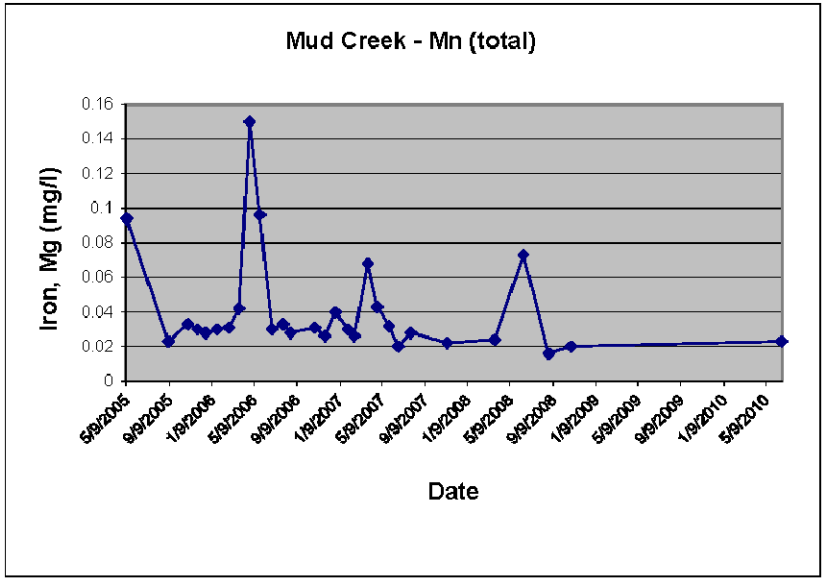
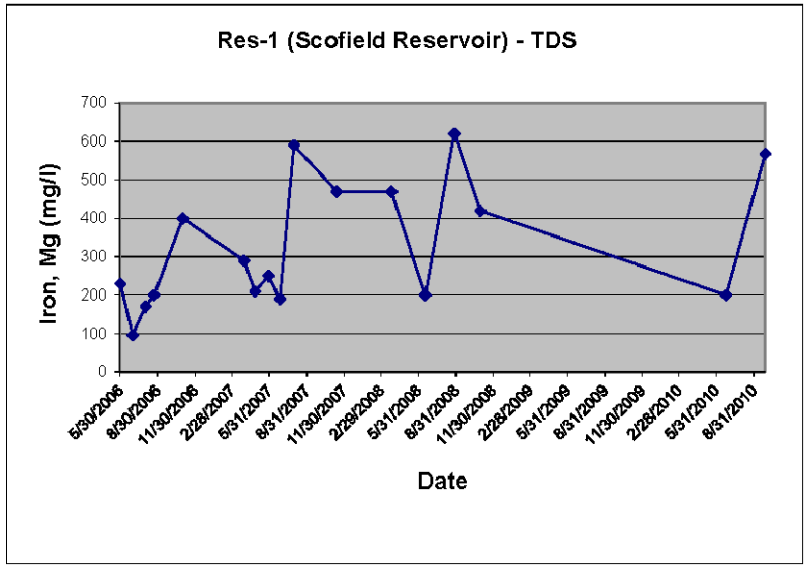
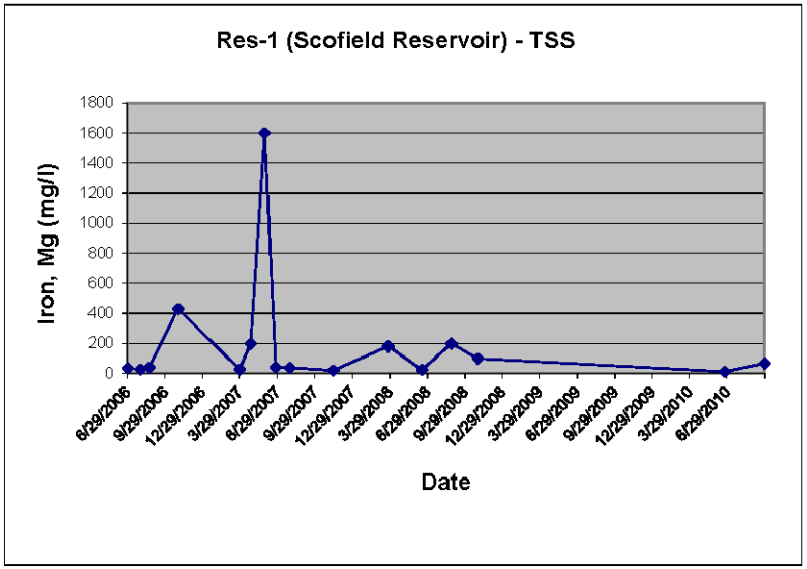
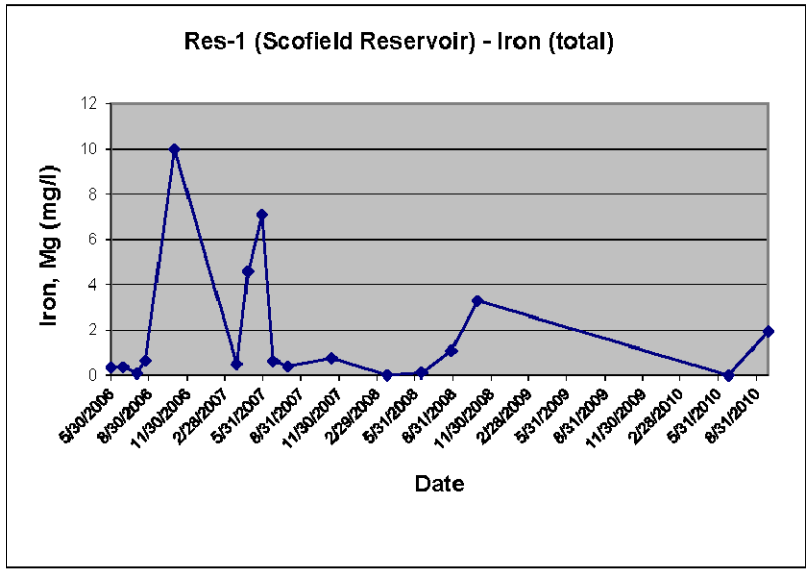


Figure 18. Basic Water Quality







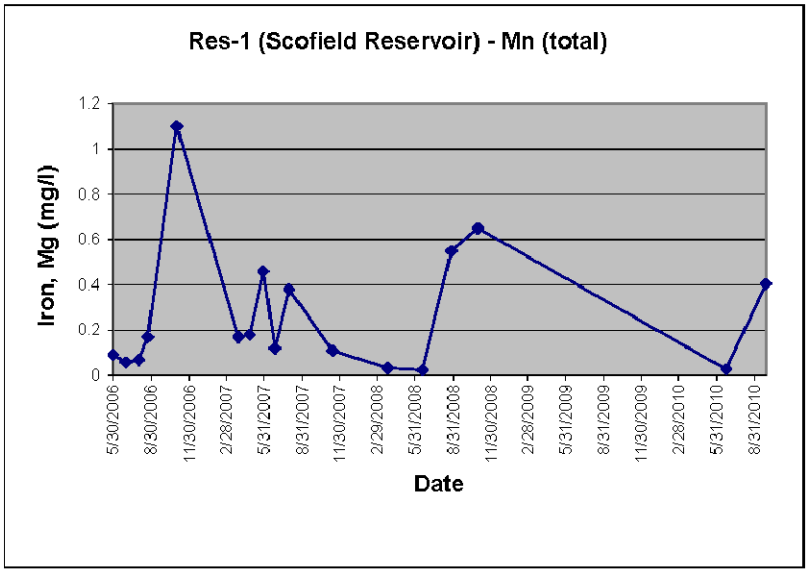
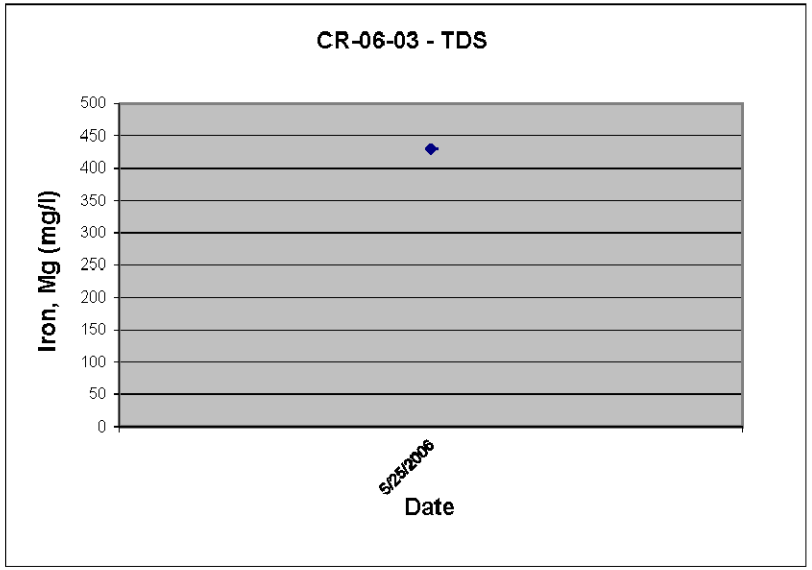
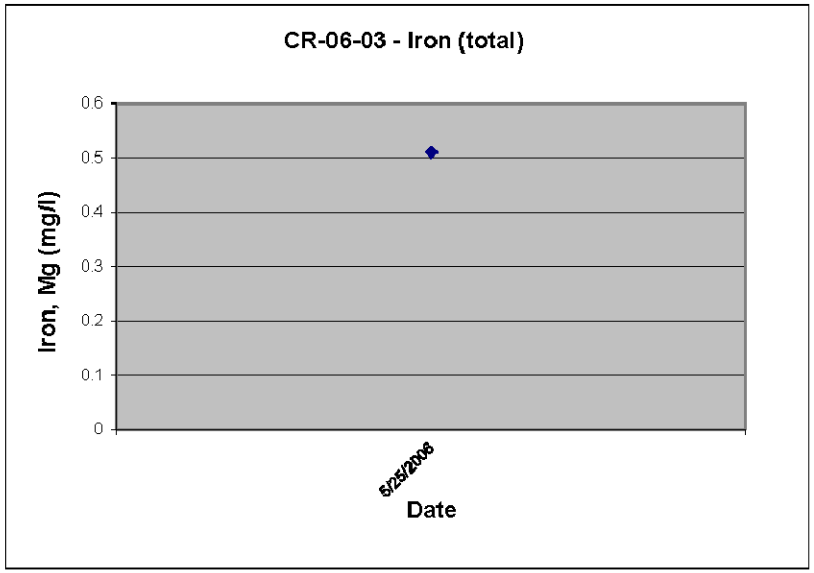


Figure 18. Basic Water Quality





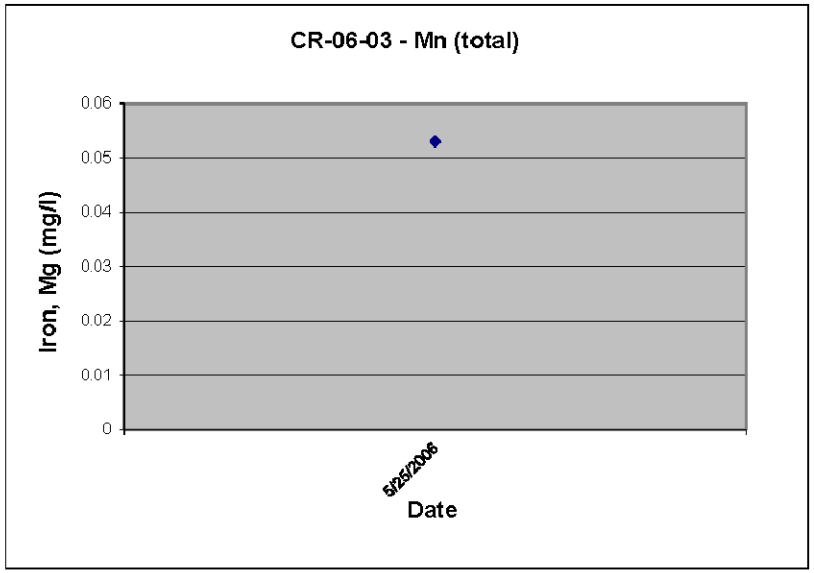
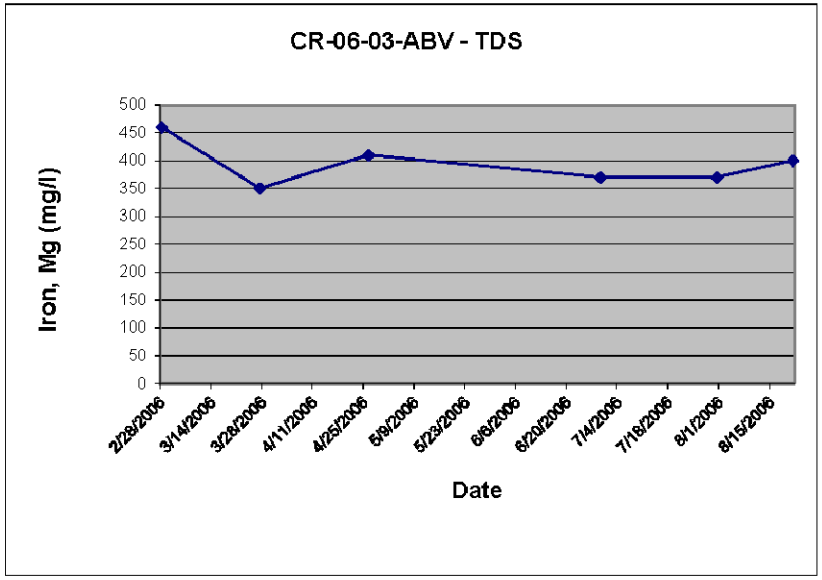
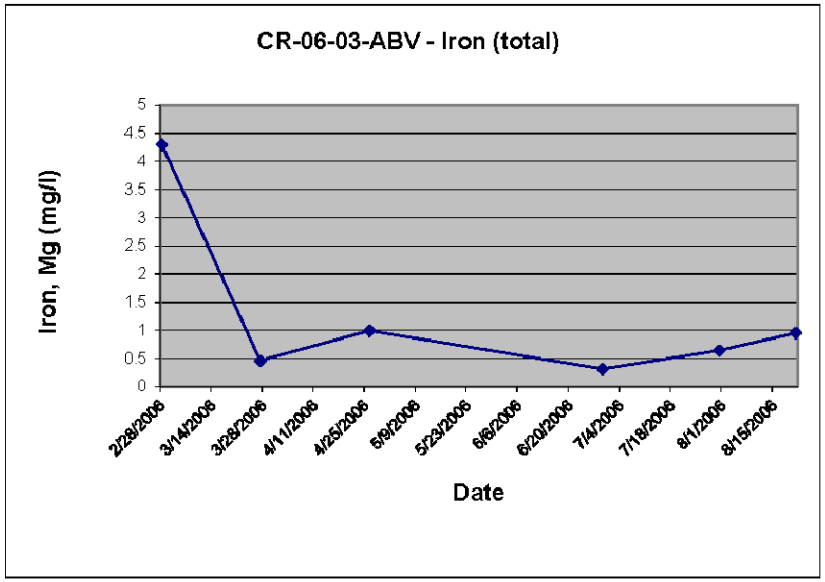


Figure 18. Basic Water Quality





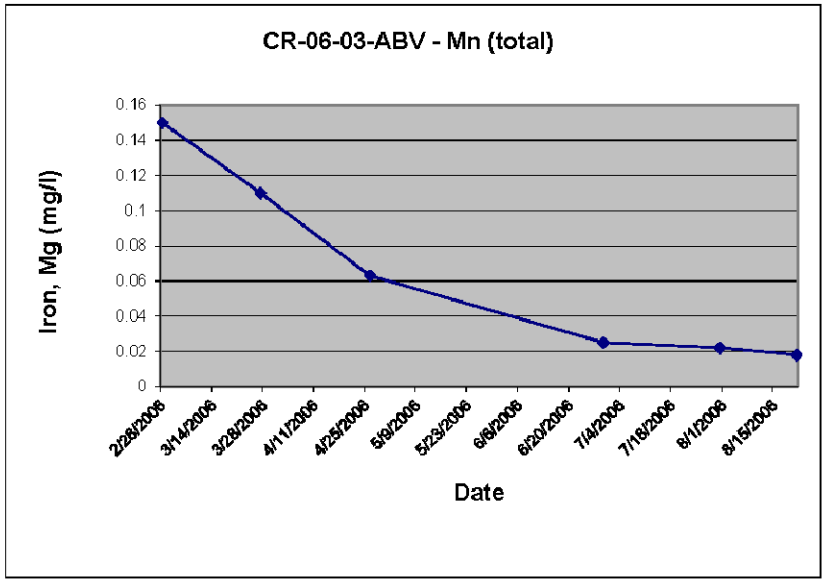
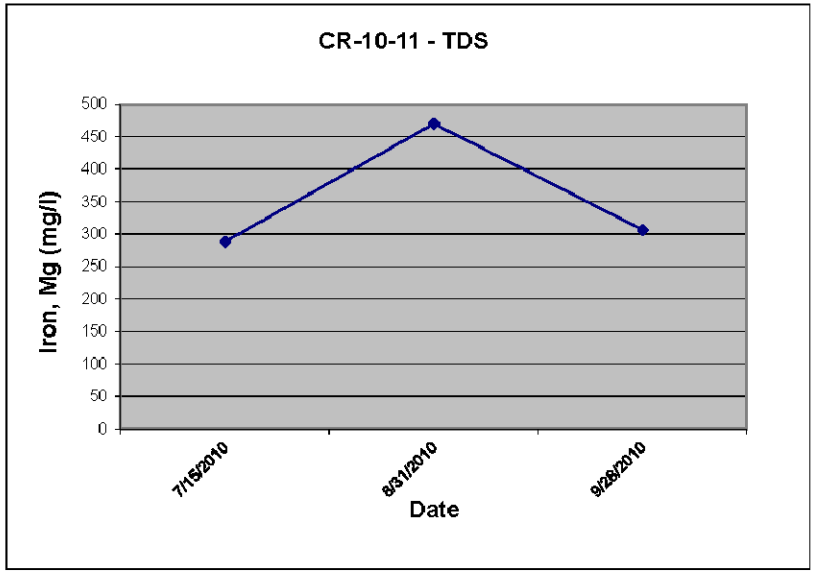
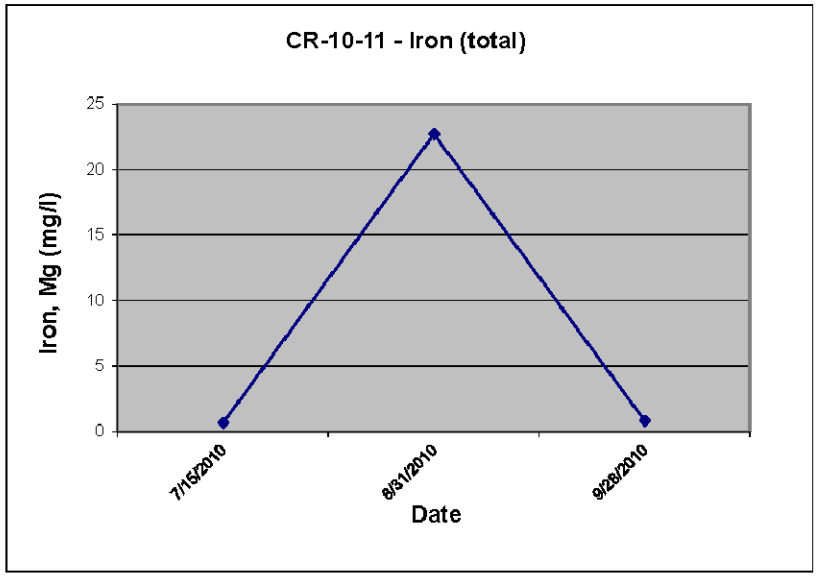


Figure 18. Basic Water Quality





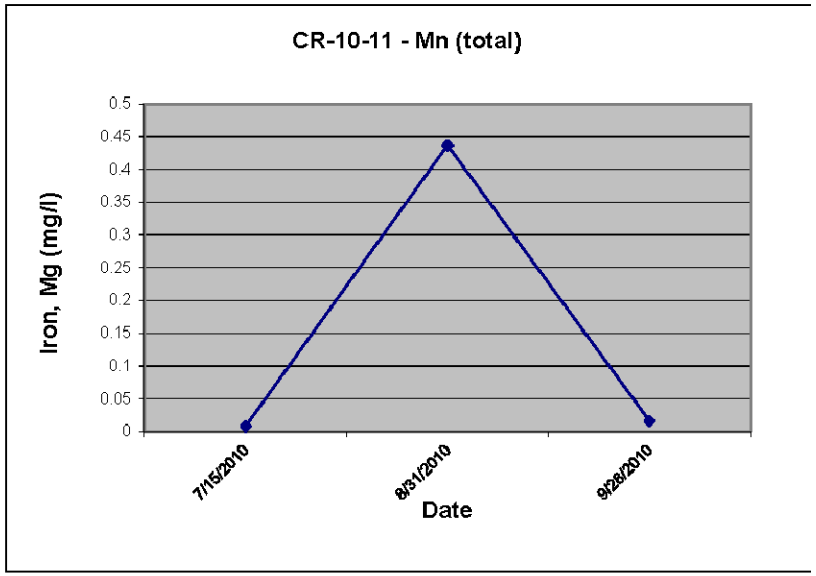
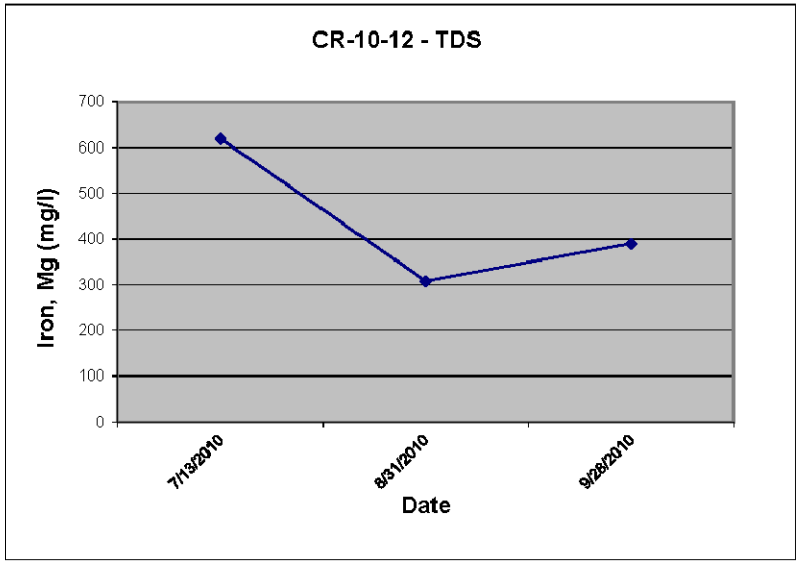
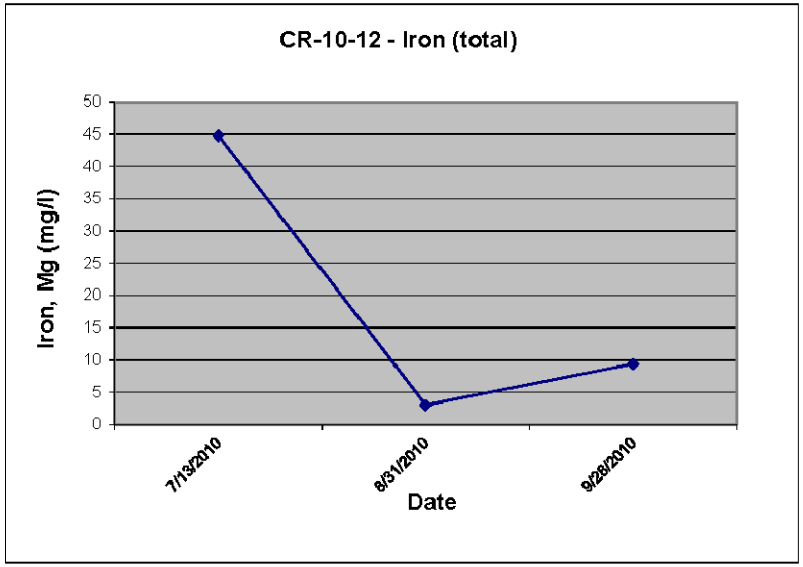


Figure 18. Basic Water Quality





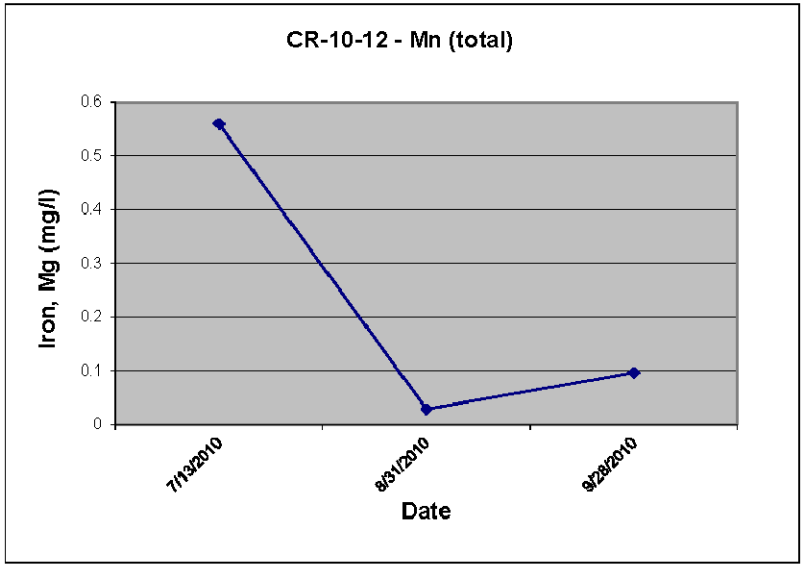
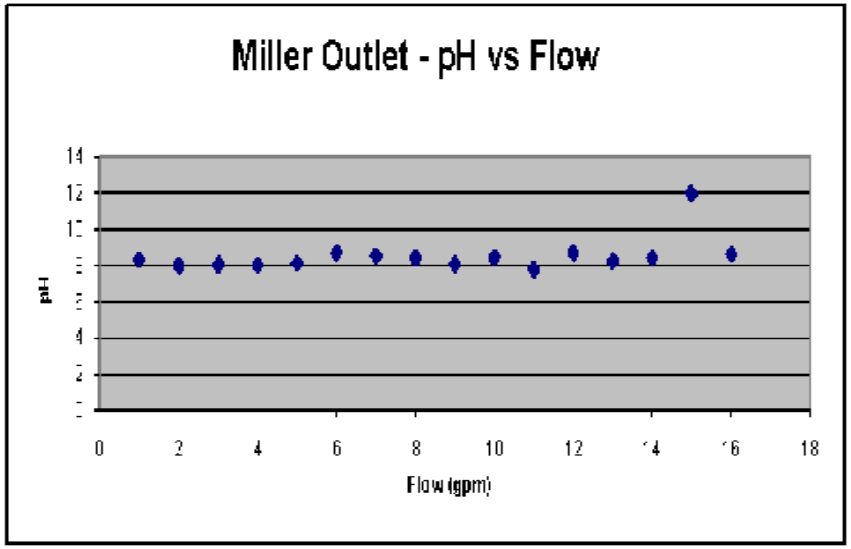
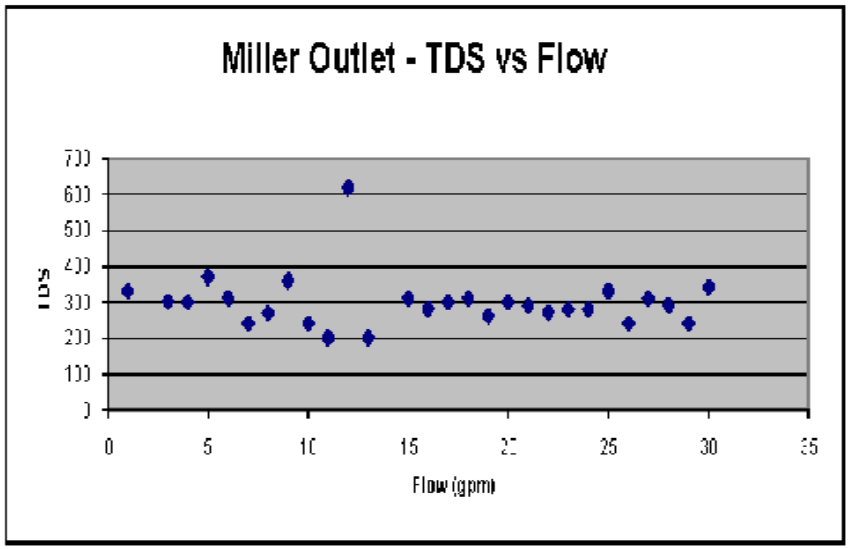
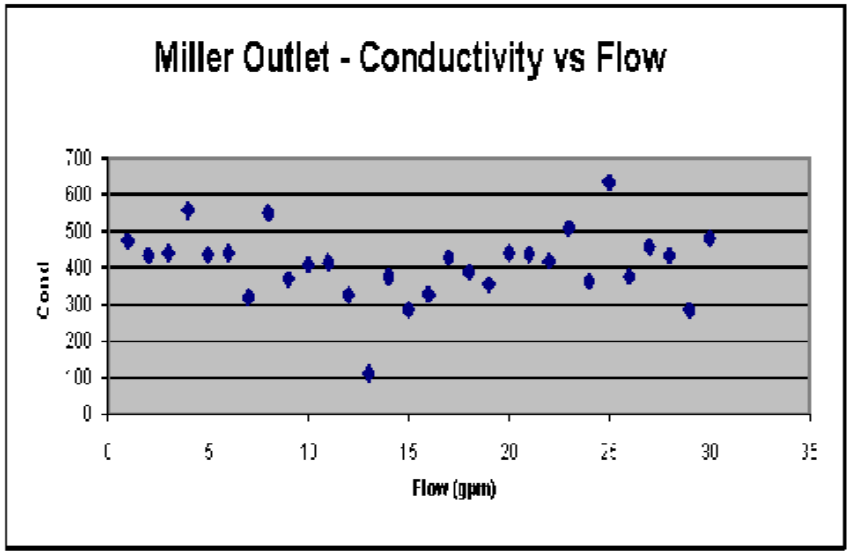
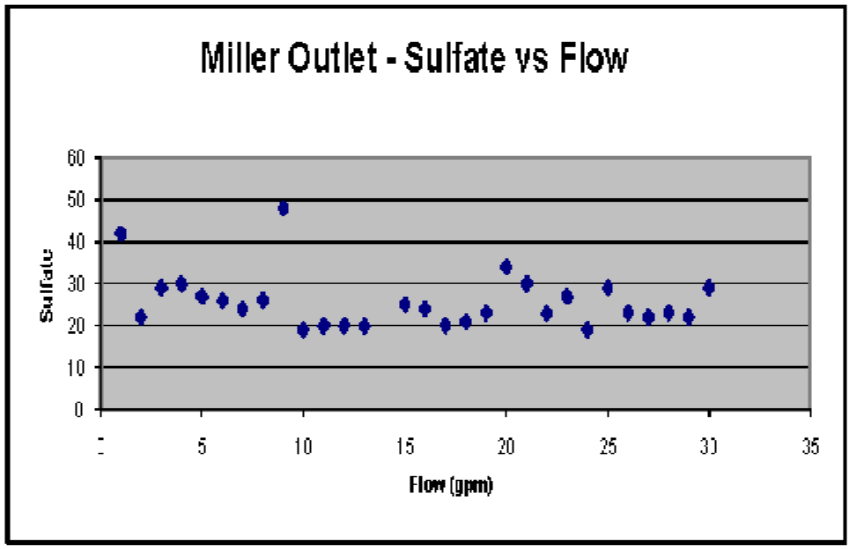


Figure 19 Water Quality vs Flow









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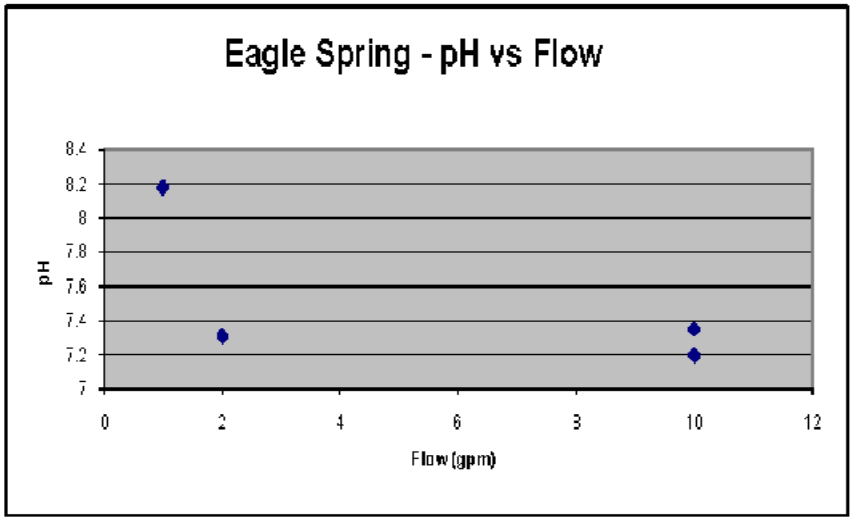

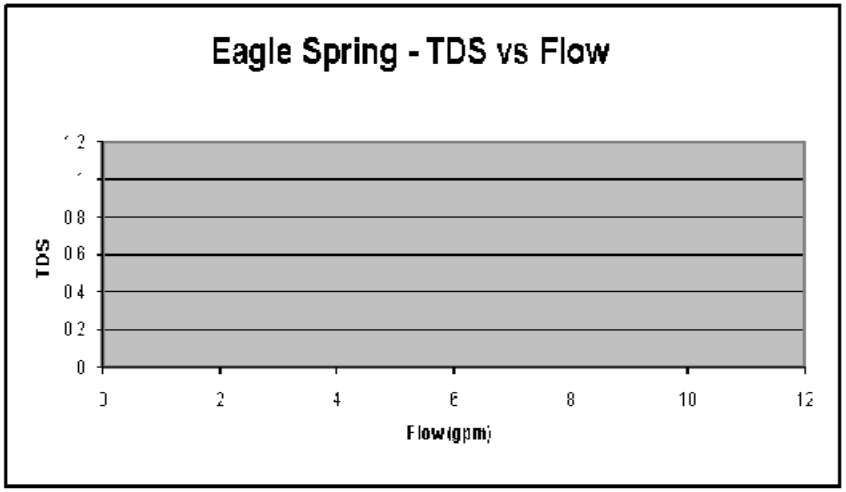

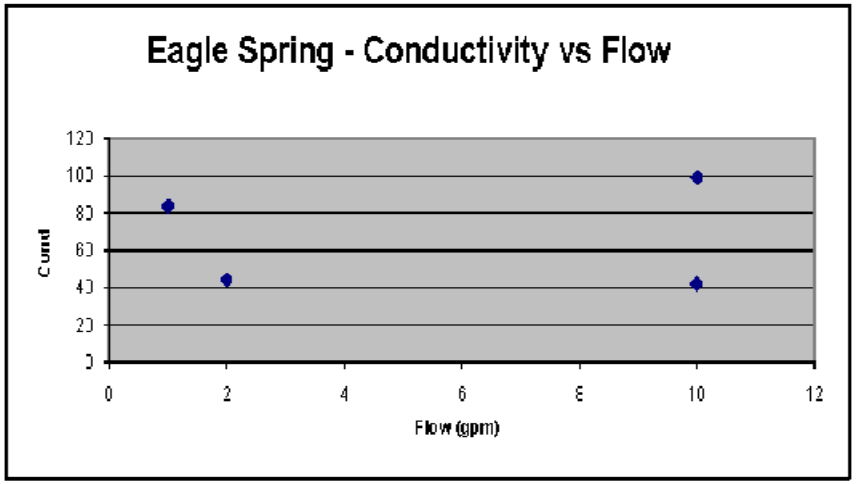

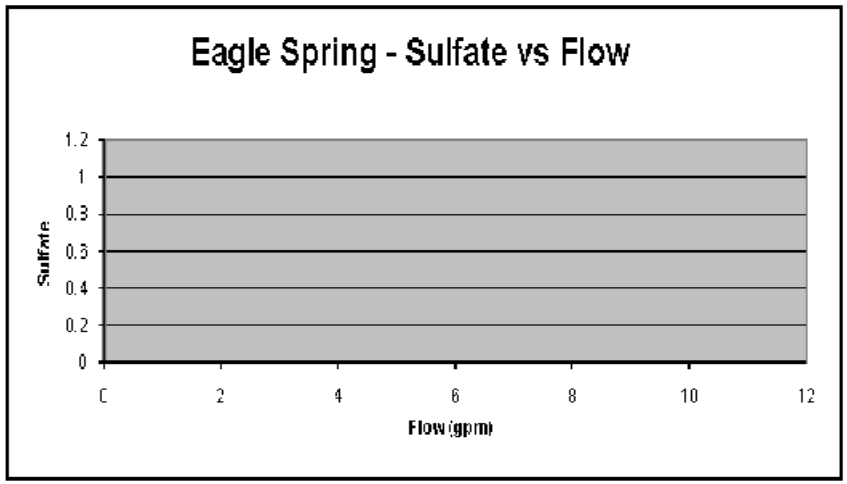

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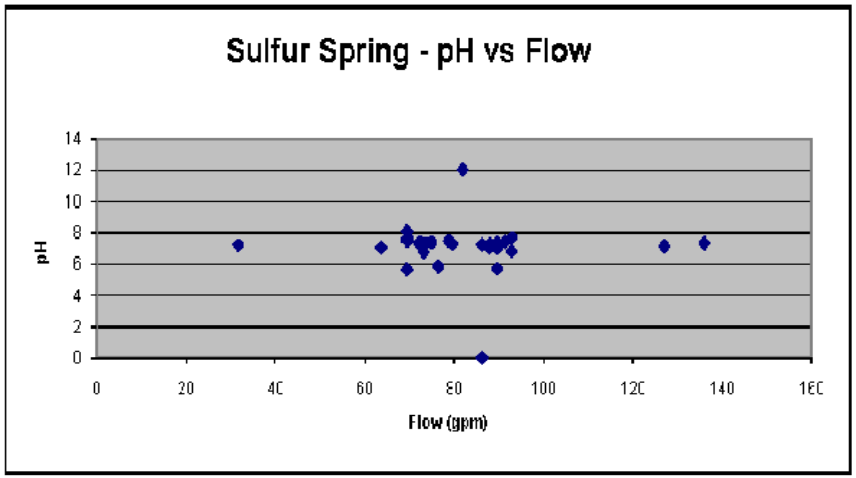

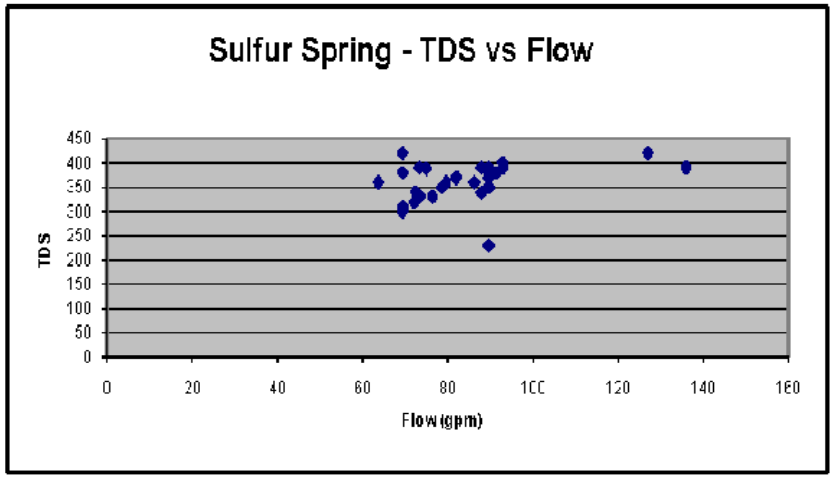

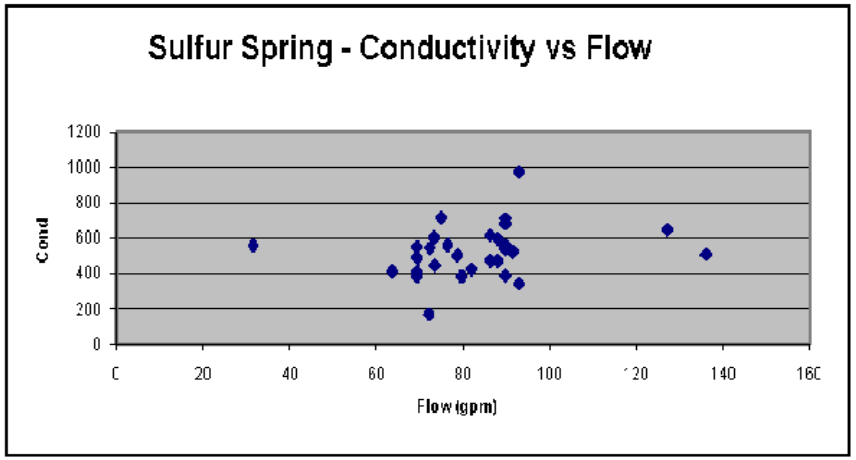

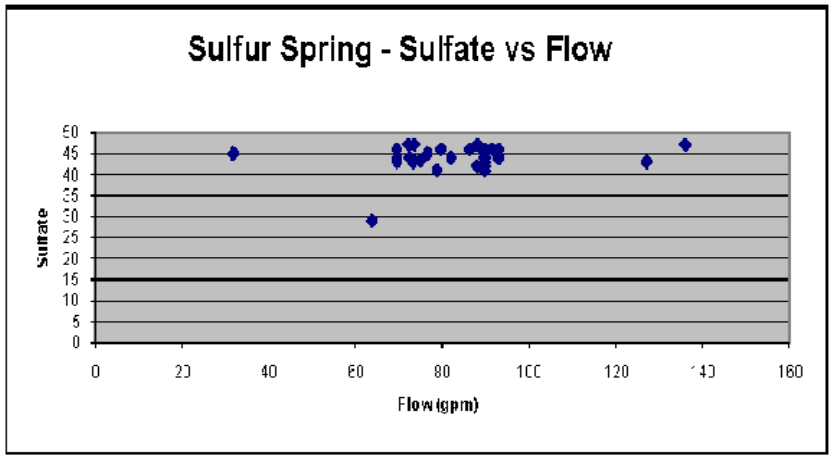

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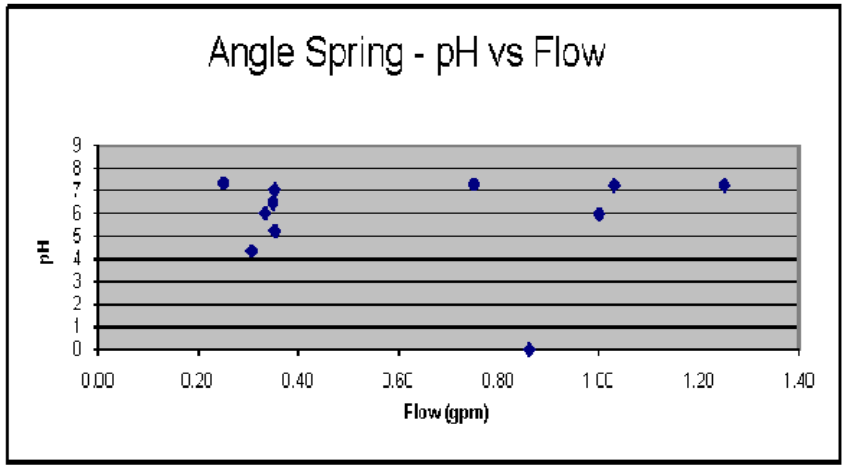

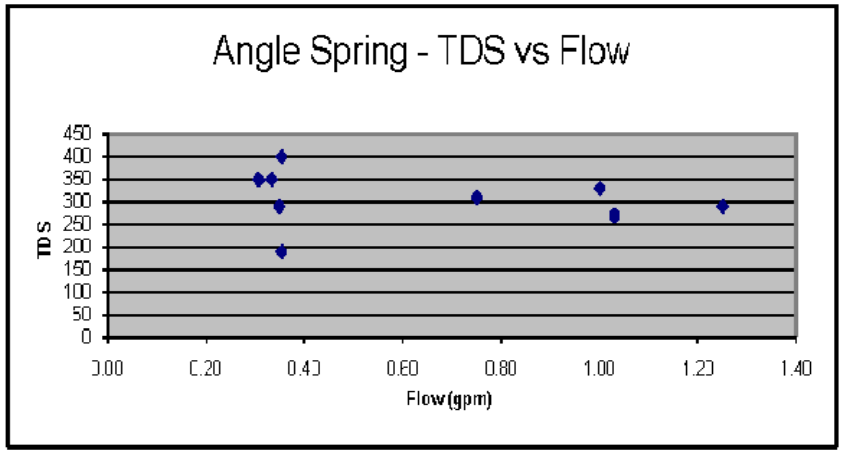

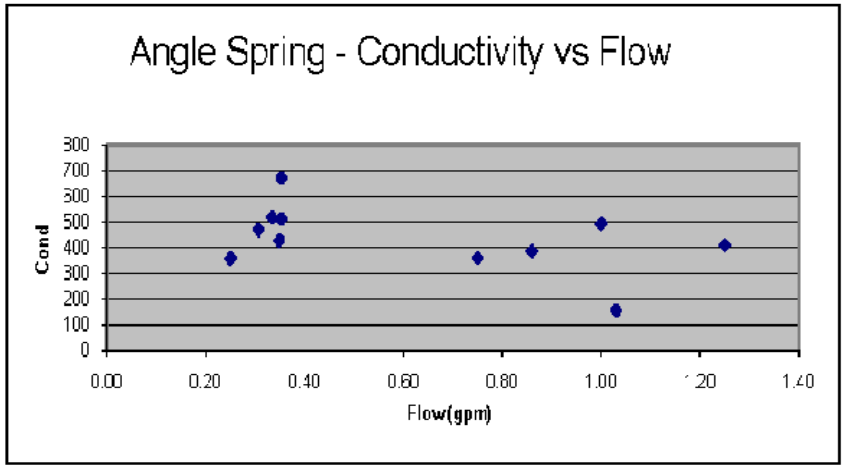

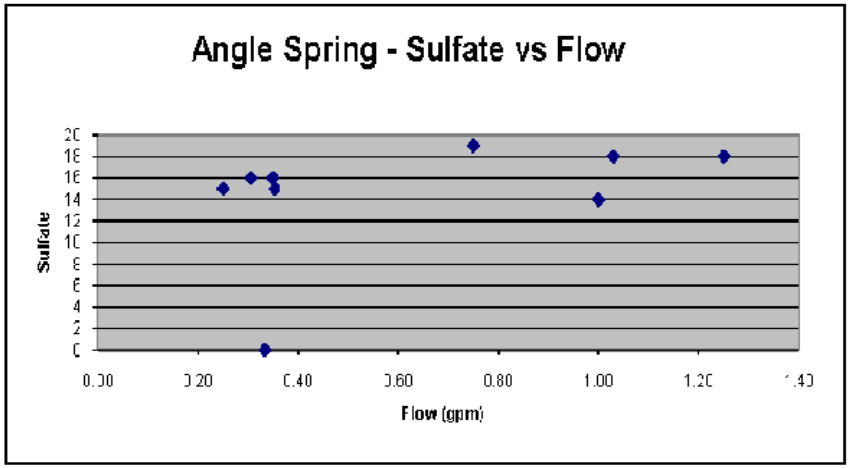

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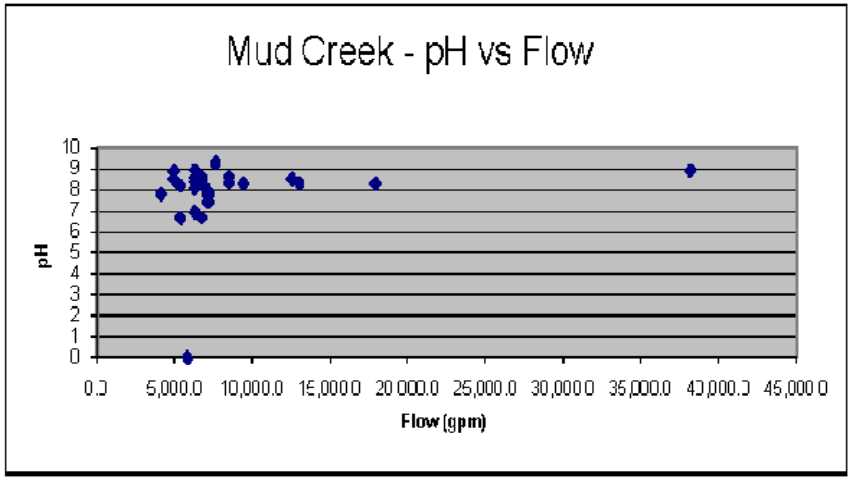

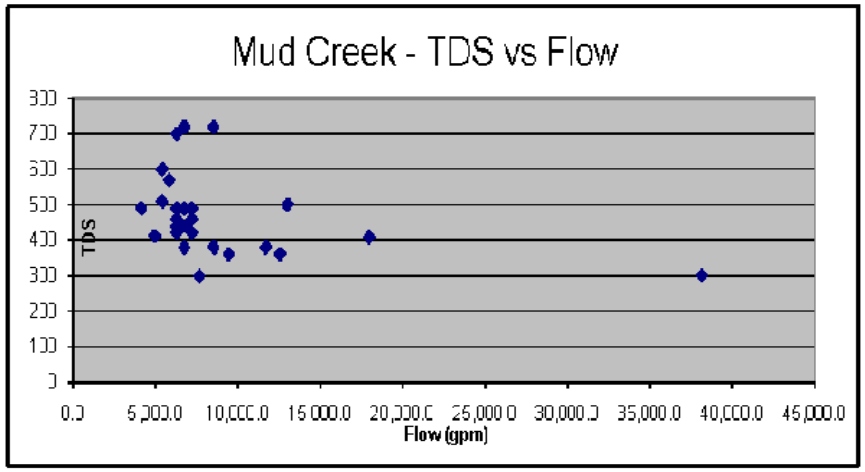

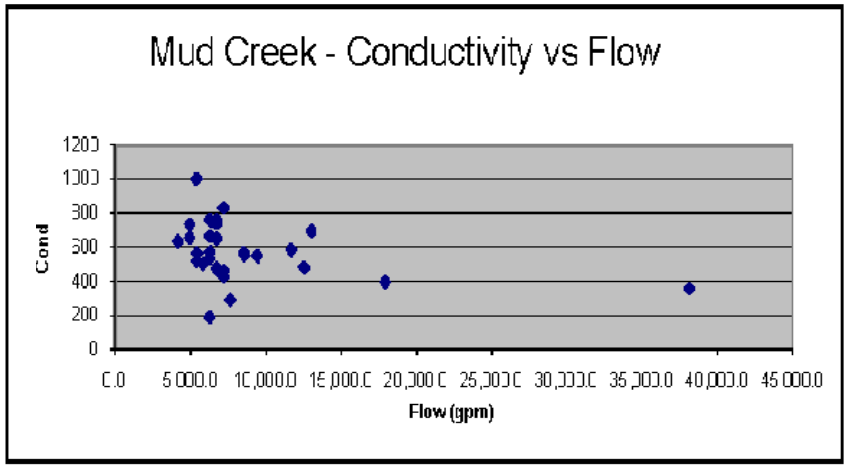

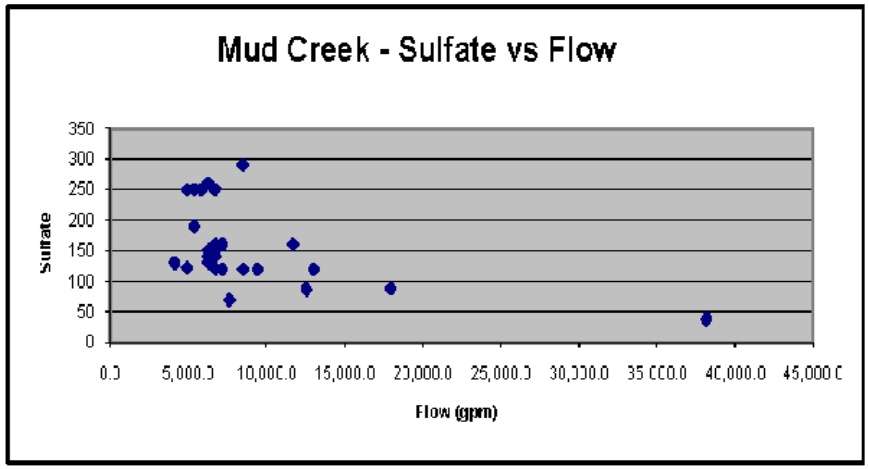

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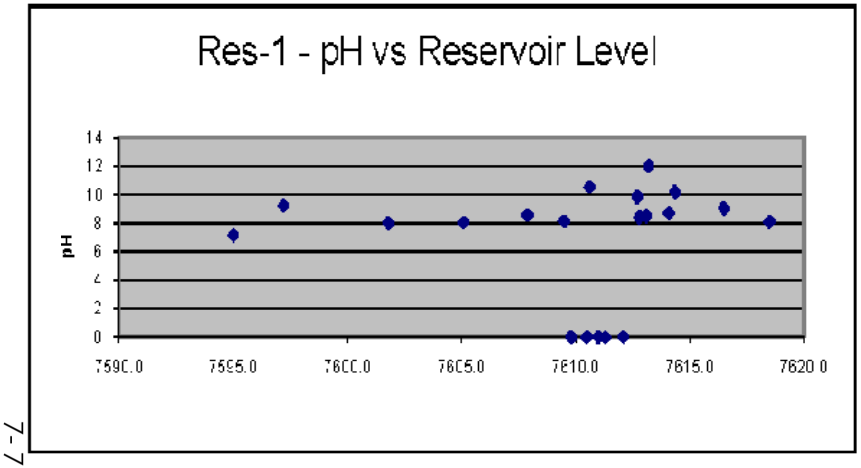
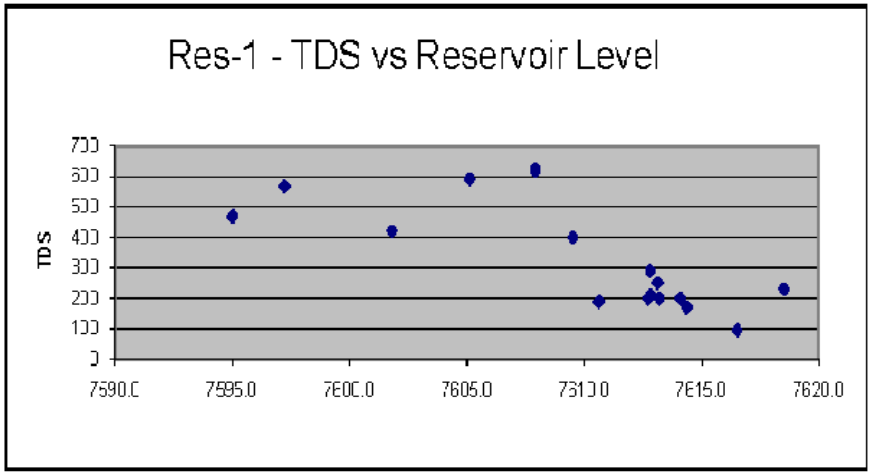
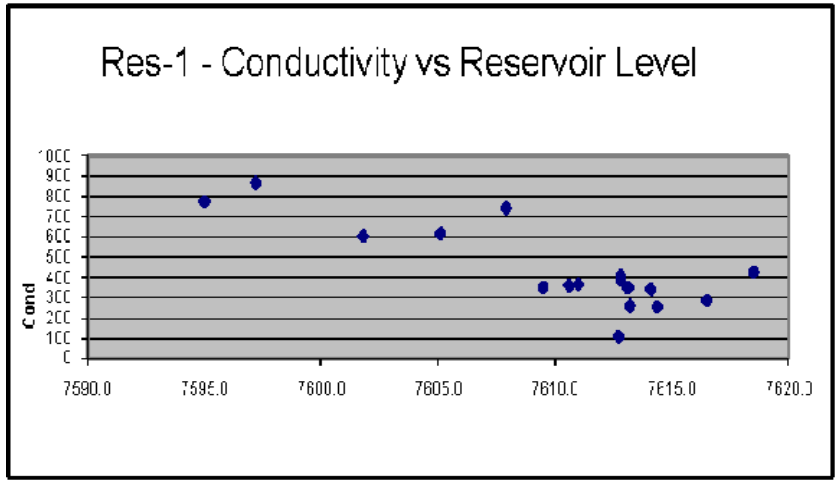






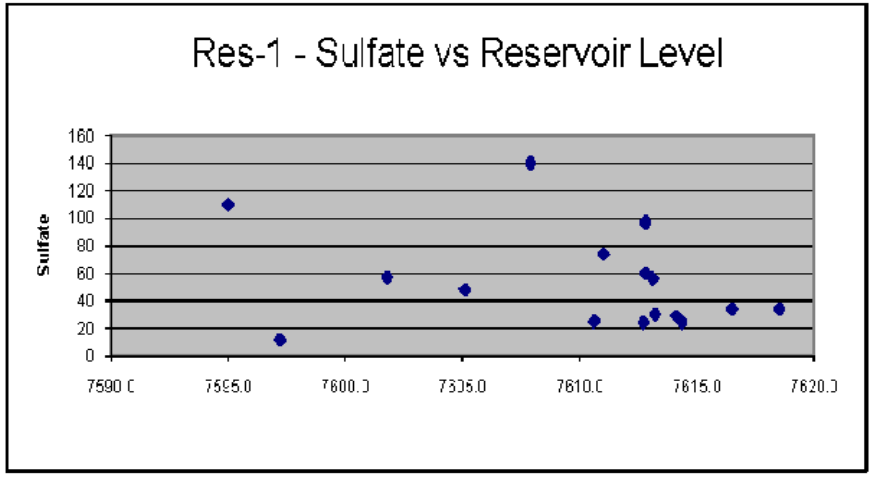


Table 12. Surface Water Rights

WRNUM	TYPE	STATUS	PRIORITY	CFS	ACFT	LOCATION	OWNER	SOURCE
91-1396	Point to Point	DIL	19020000	0.000	0.000	N660 W660 S4 34 12S 7E SL	CLARENCE ANDERSON	Hopkins Creek
91-1475	Point to Point	DIL	19020000	0.000	0.000	N660 W660 E4 27 12S 7E SL	CLARENCE ANDERSON	Hopkins Creek
91-3011	Point to Point	DIL	18690000	0.000	0.000	N660 W660 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Winter Quarters Creek
91-3514	Point to Point	DIL	18690000	0.011	0.000	S660 W660 E4 21 12S 7E SL	MILTON E. JACOB	Unnamed Spring
91-352	Point to Point	DIL	18600000	0.000	0.000	N660 E1980 W4 03 13S 7E SL	CLARENCE ANDERSON	Hopkins Creek
91-3644	Point to Point	DIL	18690000	0.000	0.000	N660 E660 S4 05 13S 7E SL	CARBON CO. REC. TRANSPORTATION SPECIAL SERVICE	Clear Creek
91-3645	Point to Point	DIL	18690000	0.000	0.000	S660 W1980 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Clear Creek
91-3648	Point to Point	DILWUC	1869	0.000	0.000	S660 W1980 E4 32 12S 7E SL	BILL B. AND UTAHNA PACE JONES	Clear Creek
91-4026	Point to Point	PAC	1869	0.000	0.000	S660 W1980 E4 33 12S 7E SL	GEORGE TELONIS	Unnamed Spring
91-4107	Point to Point	PAC	1869	0.011	0.000	S660 E660 N4 27 12S 7E SL	MILTON E. JACOB	Unnamed Spring
91-3011	Point to Point	DIL	18690000	0.000	0.000	S1980 E660 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Winter Quarters Creek
91-3513	Point to Point	DIL	18690000	0.000	0.000	S660 E660 N4 26 12S 7E SL	MILTON E. JACOB	Unnamed Stream
91-352	Point to Point	DIL	18600000	0.000	0.000	N660 W660 W4 03 13S 7E SL	CLARENCE ANDERSON	Hopkins Creek
91-3588	Point to Point	DIL	18690000	0.000	0.000	S660 E660 E4 32 13S 7E SL	CLEAR CREEK HOME ASSOCIATION	Finn Canyon Creek
91-3644	Point to Point	DIL	18690000	0.000	0.000	N660 E660 S4 05 13S 7E SL	CARBON CO. REC. TRANSPORTATION SPECIAL SERVICE	Clear Creek
91-3645	Point to Point	DIL	18690000	0.000	0.000	S1980 E660 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Clear Creek
91-3655	Point to Point	DILWUC	1869	0.000	4.200	S1980 E660 W4 32 12S 7E SL	BILL & UTAHNA JONES FAMILY TRUST	Woods Canyon Creek
91-5069	Point to Point	DIL	18690000	0.000	1.400	S1980 E660 W4 32 12S 7E SL	RUDMAN LAND & LIVESTOCK L.L.C.	Woods Canyon Creek
91-640	Point to Point	DIL	18600000	0.000	0.000	N660 E660 E4 35 12S 7E SL	CLARENCE ANDERSON	Left hand Fork of Hopkins Creek
91-2978	Surface	DEC	18740000	0.683	0.000	N310 E510 S4 05 13S 7E SL	CARBON CO. REC. TRANSPORTATION SPECIAL SERVICE	Clear Creek
91-2979	Surface	DEC	18740000	0.453	0.000	N310 E510 S4 05 13S 7E SL	FRED AND SHELIA JENSEN	Clear Creek
91-2980	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	FRANK T. JR. & PAMELA G. HELSTEN	Clear Creek
91-2981	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	ORSON MARSING	Clear Creek
91-2982	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	LILLIE PEARSON	Clear Creek
91-2983	Surface	DECWUC	1874	0.100	0.000	N310 E510 S4 05 13S 7E SL	THOMAS BIGGS	Clear Creek
91-2984	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	WAINO E. BURTON	Clear Creek
91-2985	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	PHYLLIS M. CONOVER	Clear Creek
91-2986	Surface	DEC	18740000	0.015	0.000	N310 E510 S4 05 13S 7E SL	JAMES F. LEVANGER	Clear Creek
91-2987	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	LEAH B. JOHNSON	Clear Creek
91-2988	Surface	DEC	18740000	0.000	0.000	N310 E510 S4 05 13S 7E SL	NOLAN G. AND LARUE H. DAVIS	Clear Creek
91-2989	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	TOWN OF SCOFIELD	Clear Creek
91-2990	Surface	DEC	18740000	1.166	0.000	N310 E510 S4 05 13S 7E SL	DELLA L. MADSEN	Clear Creek
91-2991	Surface	DECWUC	1874	0.000	0.000	N310 E510 S4 05 13S 7E SL	JOHN B. JONES	Clear Creek
91-2992	Surface	DECWUC	1874	4.580	0.000	S120 W2230 E4 32 12S 7E SL	BILL B. AND UTAHNA PACE JONES	Clear Creek
91-2993	Surface	DECWUC	1874	4.580	0.000	S1200 E800 N4 32 12S 7E SL	BILL B. AND UTAHNA PACE JONES	Clear Creek
91-3008	Surface	DEC	18740000	0.693	0.000	N700 W1400 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Winter Quarters Creek
91-3622	Surface	DECWUC	1874	0.016	0.000	N310 E510 S4 05 13S 7E SL	MAE NICOLODEMAS	Clear Creek
91-4195	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	SCOFIELD TOWN	Mud Creek & Green Canyon Springs

Surface Water Summary

Other than Mud Creek and Scofield Reservoir, surface water resources in the area adjacent to the proposed permit are limited. The principle perennial streams located within or adjacent to the permit area boundary include: 1) Mud Creek, the dominant drainage, and 2) Miller Canyon, both of which drain directly into Scofield Reservoir. Mud Creek drains areas not tributary to lands included within the permit area. Miller Canyon drains tributaries overlying future mining zones within Long Canyon. Limited intermittent and ephemeral channels also drain the area, many of which normally exhibit short term continuous flow in response to spring snowmelt and/or high intensity thunderstorms.

The Major Perennial Streams

Major perennial streams within 5 miles radius of the permit area include the Price River and Fish Creek, Mud Creek, Miller Canyon. Smaller drainages in the area exhibit an intermittent or ephemeral flow regime with sustained flows occurring only in response to spring snowmelt and high intensity thunderstorms. These drainages do not contribute significant quantities, or yields of stream flow to the Price River, except during high-intensity short-duration storm-generated events, and possibly during snowmelt runoff.

Presently, beneficial surface water use in the area includes domestic water supply, secondary recreations uses, cold water fame fish and aquatic life, and agriculture. As discussed in R645-301-724.200, Drainages and Surface Water Bodies, streams are classified as either 1C, "protected for domestic purposes with prior treatment by complete treatment processes", 3A, "protected for cold water species of fish and other cold water aquatic life", or 3C, "protected for non-game fish, and other aquatic life". 1C, Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water, 2B, Protected for secondary contact recreation such as boating, wading, or similar uses, 3A, Protected for cold water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain, and 4, Protected for agricultural uses including irrigation of crops and stock watering.

Although water quality is relatively consistent for monitored sources, some variation is noted to exist as a result of the composition of contributing water, and the flow regime, especially within Mud Creek where the source includes disturbed upstream areas. Overall, surface water conditions are typical of arid regions of the western United States and seasonal or storm-event peak flows tend to dilute geochemical constituent concentrations. However, during low-flow periods, constituent concentrations of surface waters tend to increase. For those constituents that appear to show elevated levels, it is reasonable to assume the elevated levels are a result of natural sources and the processes of weathering, oxidation, erosion, evaporative concentration and sediment transport.

R645-301-724.320 Reclamation & Prevention Material Damage

Reclamation as required by the R645 rules can be accomplished and the mining operation has been designed to prevent material damage to the hydrologic balance outside of the permit area.

R645-301-724.400 Climatological Information

The climate of the permit area is semi-arid with natural variations in climatic conditions due to the size of the area, rugged terrain, and significant elevation differences. Temperatures in the area reflect a typical seasonal pattern with gradual warming beginning in late March, high seasonal temperatures in July and August, a gradual cooling beginning in late August to early September, and seasonal lows in late December through mid-February. Due to fast moving storm fronts, wide temperature variances can occur over relatively short periods of time. More specific data relating to precipitation, temperature and wind speed and direction is provided in R645-301-724.410 – 420.

The general mine permit and surrounding area is characteristic of rugged terrain with significant elevation differences result in some natural variation in climatic conditions. Generally, temperatures are lower on the exposed high plateaus and upper slopes when compared with lower slope and valley areas. Temperature differences are usually pronounced between upper slopes with southern exposures, and deep valleys which can trap and hold cold air masses due to inversions during the winter. Local variations in precipitation amounts may be pronounced dependent on topography, exposure, and the direction of prevailing winds. Exposure may result in higher wind velocities on plateau and ridgeline areas when compared with more sheltered slope, basin, and valley areas, although natural down-valley airflow patterns can result in localized high winds in certain valley areas.

The closest SNOTEL meteorological reporting stations were identified as Clear Creek #1, Clear Creek #2, Scofield Dam, and Price, Utah. The Clear Creek and Scofield Dam sites provided temperature, precipitation and snowfall data, and the Price, Utah site provided wind direction data. Climatic characterization of the permit area is based on historical climate data from these stations and general regional climatic information. Generally, the climate of the Project area is temperate with summer high temperatures in the range from 75° to 80°F (24° to 27°C) and winter lows from 0° to -5°F (-17° to -21°C). Annual average precipitation in the area is on the order of 14.6 inches.

The summer high temperature recorded at the Clear Creek #1 SNOTEL site between 1989 and 2006 was 90°F (32°C). The winter low during the same time period was -22°F (-30°C). Monthly mean, maximum and minimum data are shown in Table 13, Summary of Temperature Data.

Temperature

Temperatures in the area normally reflect a typical seasonal pattern with gradual warming beginning in mid to late-March, high seasonal temperatures in July and early August, a gradual cooling beginning in late August to early September, and seasonal lows in late-December through mid-February. Although recorded high and low temperatures of 90°F (32°C) and -22°F (-30°C) were recorded at the Clear Creek #1 station, the average high and low temperatures for the area are believed to be on the order of 77.7°F (25.4°C) and -1.4°F (-18.6°C) respectively as shown for the Scofield Dam station. The average frost-free period in this area ranges from approximately 60 to 120 days dependent primarily on elevation and exposure. Due to fast-moving storm fronts, wide temperature variances can occur over a relative short period of time. A summary of SNOTEL climatic data is provided in Table 13, Summary of Temperature Data.

Table 12. Surface Water Rights

WRNUM	TYPE	STATUS	PRIORITY	CFS	ACFT	LOCATION	OWNER	SOURCE
91-1396	Point to Point	DIL	19020000	0.000	0.000	N660 W660 S4 34 12S 7E SL	CLARENCE ANDERSON	Hopkins Creek
91-1475	Point to Point	DIL	19020000	0.000	0.000	N660 W660 E4 27 12S 7E SL	CLARENCE ANDERSON	Hopkins Creek
91-3011	Point to Point	DIL	18690000	0.000	0.000	N660 W660 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Winter Quarters Creek
91-3514	Point to Point	DIL	18690000	0.011	0.000	S660 W660 E4 21 12S 7E SL	MILTON E. JACOB	Unnamed Spring
91-352	Point to Point	DIL	18600000	0.000	0.000	N660 E1980 W4 03 13S 7E SL	CLARENCE ANDERSON	Hopkins Creek
91-3644	Point to Point	DIL	18690000	0.000	0.000	N660 E660 S4 05 13S 7E SL	CARBON CO. REC. TRANSPORTATION SPECIAL SERVICE DIS	Clear Creek
91-3645	Point to Point	DIL	18690000	0.000	0.000	S660 W1980 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Clear Creek
91-3648	Point to Point	DILWUC	1869	0.000	0.000	S660 W1980 E4 32 12S 7E SL	BILL B. AND UTAHNA PACE JONES	Clear Creek
91-4026	Point to Point	PAC	1869	0.000	0.000	S660 W1980 E4 33 12S 7E SL	GEORGE TELONIS	Unnamed Spring
91-4107	Point to Point	PAC	1869	0.011	0.000	S660 E660 N4 27 12S 7E SL	MILTON E. JACOB	Unnamed Spring
91-3011	Point to Point	DIL	18690000	0.000	0.000	S1980 E660 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Winter Quarters Creek
91-3513	Point to Point	DIL	18690000	0.000	0.000	S660 E660 N4 26 12S 7E SL	MILTON E. JACOB	Unnamed Stream
91-352	Point to Point	DIL	18600000	0.000	0.000	N660 W660 W4 03 13S 7E SL	CLARENCE ANDERSON	Hopkins Creek
91-3588	Point to Point	DIL	18690000	0.000	0.000	S660 E660 E4 32 13S 7E SL	CLEAR CREEK HOME ASSOCIATION	Finn Canyon Creek
91-3644	Point to Point	DIL	18690000	0.000	0.000	N660 E660 S4 05 13S 7E SL	CARBON CO. REC. TRANSPORTATION SPECIAL SERVICE DIS	Clear Creek
91-3645	Point to Point	DIL	18690000	0.000	0.000	S1980 E660 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Clear Creek
91-3655	Point to Point	DILWUC	1869	0.000	4.200	S1980 E660 W4 32 12S 7E SL	BILL & UTAHNA JONES FAMILY TRUST	Woods Canyon Creek
91-5069	Point to Point	DIL	18690000	0.000	1.400	S1980 E660 W4 32 12S 7E SL	RUDMAN LAND & LIVESTOCK L.L.C.	Woods Canyon Creek
91-640	Point to Point	DIL	18600000	0.000	0.000	N660 E660 E4 35 12S 7E SL	CLARENCE ANDERSON	Left hand Fork of Hopkins Creek
91-2978	Surface	DEC	18740000	0.683	0.000	N310 E510 S4 05 13S 7E SL	CARBON CO. REC. TRANSPORTATION SPECIAL SERVICE DIS	Clear Creek
91-2979	Surface	DEC	18740000	0.453	0.000	N310 E510 S4 05 13S 7E SL	FRED AND SHELIA JENSEN	Clear Creek
91-2980	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	FRANK T. JR. & PAMELA G. HELSTEN	Clear Creek
91-2981	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	ORSON MARSING	Clear Creek
91-2982	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	LILLIE PEARSON	Clear Creek
91-2983	Surface	DECWUC	1874	0.100	0.000	N310 E510 S4 05 13S 7E SL	THOMAS BIGGS	Clear Creek
91-2984	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	WAINO E. BURTON	Clear Creek
91-2985	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	PHYLLIS M. CONOVER	Clear Creek
91-2986	Surface	DEC	18740000	0.015	0.000	N310 E510 S4 05 13S 7E SL	JAMES F. LEVANGER	Clear Creek
91-2987	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	LEAH B. JOHNSON	Clear Creek
91-2988	Surface	DEC	18740000	0.000	0.000	N310 E510 S4 05 13S 7E SL	NOLAN G. AND LARUE H. DAVIS	Clear Creek
91-2989	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	TOWN OF SCOFIELD	Clear Creek
91-2990	Surface	DEC	18740000	1.166	0.000	N310 E510 S4 05 13S 7E SL	DELLA L. MADSEN	Clear Creek
91-2991	Surface	DECWUC	1874	0.000	0.000	N310 E510 S4 05 13S 7E SL	JOHN B. JONES	Clear Creek
91-2992	Surface	DECWUC	1874	4.580	0.000	S120 W2230 E4 32 12S 7E SL	BILL B. AND UTAHNA PACE JONES	Clear Creek
91-2993	Surface	DECWUC	1874	4.580	0.000	S1200 E800 N4 32 12S 7E SL	BILL B. AND UTAHNA PACE JONES	Clear Creek
91-3008	Surface	DEC	18740000	0.693	0.000	N700 W1400 E4 05 13S 7E SL	FRED AND SHELIA JENSEN	Winter Quarters Creek
91-3622	Surface	DECWUC	1874	0.016	0.000	N310 E510 S4 05 13S 7E SL	MAE NICOLODEMAS	Clear Creek
91-4195	Surface	DEC	18740000	0.100	0.000	N310 E510 S4 05 13S 7E SL	SCOFIELD TOWN	Mud Creek & Green Canyon Springs

Precipitation

Given a low average annual precipitation of only 14.56 inches, the permit area is classified as semi-arid. The majority of the precipitation received in the area occurs as snowfall during the months of December, January, February, and March. Rainfall typically occurs in the form of brief, high-intensity thunderstorms with most thunderstorm activity occurring during late summer and early fall, peaking in August. Monthly average precipitation ranges from 0.90 inches (June) to 1.65 inches (January) and the high average monthly snowfall is 26.2 inches (December). Average monthly precipitation and snowfall for the SNOTEL site located at Scofield Dam are summarized by Table 14, Summary of Precipitation Data. While a significant portion of the annual precipitation is captured in Scofield Reservoir (located immediately downstream and to the north of the permit area), some water is lost to evapotranspiration, sublimation, and local ground water recharge.

Table 14. Summary of Precipitation Data – Scofield Dam

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Avg Precipitation (in)	1.65	1.47	1.29	0.95	1.04	0.90	1.09	1.41	1.18	1.18	1.12	1.27	14.56
Avg Snowfall (in)	26.2	21.8	20.1	8.4	2.0	0.1	0.0	0.0	0.3	3.5	13.5	19.8	115.8
Avg Snow Depth (in)	18	20	14	3	0	0	0	0	0	0	3	9	6

Wind

Data is provided in Table 15, Summary of Wind Data - Price, Utah, for the closest wind SNOTEL monitoring site located near Price, Utah. As can be seen in the data, wind speeds average 6.8 mph with average highs and lows of 8.5 and 5.1 mph occurring in April and January respectively. For this station winds are generally out of the north.

Table 15. Summary of Wind Data - Price, Utah

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Avg Wind Speed (mph)	**5.1**	**5.8**	**7.9**	**8.5**	**8.4**	**8.2**	**7.0**	**6.6**	**6.9**	**6.7**	**5.8**	**5.2**	**6.8**
Avg Wind Direction	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**

General regional information taken from the Willow Creek permit indicates that prevailing winds are from the west and northwest with average wind velocities generally not exceeding 20 miles per hour. During the winter the prevailing wind direction can shift for extended periods, blowing predominantly from the northeast.

Locally, surface air movements are strongly affected by natural drainage patterns and daily temperature variations. As local air masses cool at night, the denser, cool air flows down valleys and other natural drainage channels. Generally, the winds associated with this downslope movement are low to moderate, however, if the drainage alignment is the same as the prevailing wind direction or if the natural topography tends to concentrate natural air movement, moderate to strong downslope winds and high-intensity gusts may result. As natural warming occurs during the morning and early afternoon, warm air masses begin to move up-valley. Differential heating and upper level winds tend to have a greater impact on the upward air movements resulting in greater mixing and instability with resultant variable winds and greater potential for gusty conditions.

R645-301-724.700 Including R645-302-320 Alluvial Valley Floors

R645-302-320 & 321 Alluvial Valley Floors Determination

Refer to Chapter 9, Special Categories for a discussion on AVF's.

R645-301-725 Baseline Cumulative Impact Area Information

In order to evaluate the potential cumulative hydrologic impacts which could result from the proposed mining activities in combination with other unrelated activities, it is necessary to define a cumulative impact area and identify other activities which may contribute to any cumulative impacts within that area.

Generally, the surface disturbance associated with the mining operations will involve such a small area (Portal Block Permit Boundary) that the overall impact on surface water resources will be negligible. Any potential surface water impacts which may result from mining and related activities will also be effectively mitigated by a comprehensive drainage and sediment control plan and controlled discharge under specific effluent limitations and permit requirements of the mine UPDES Permit. Similarly, potential mining related ground water impacts will inherently be minimized by limited ground water occurrence and low overall permeabilities. While both mining related surface and ground water impacts are expected to be minimal, a complete evaluation of potential hydrologic impacts must consider the larger area over which any mine related impacts could combine with other unrelated environmental impacts to produce a cumulative adverse impact.

For potential ground water impacts, the cumulative impact area includes the permit area along with any upgradient areas which could be impacted by mining related drawdown and downgradient areas which could be impacted by any mining related changes in ground water flow volumes or ground water quality. Given the characteristic low permeability of the geologic sequence, the limited volume and flow of ground water, and the consistently flat dip of the geologic units to the northeast, the ground water cumulative impact area can reasonably be defined by Mud Creek on the west, Miller Canyon to the north, Long Canyon to the east, and the headwaters of UP Canyon on the south. Other activities which could result in possible contributing ground water impacts within this area are believed to be limited to contributions from existing abandoned underground mine workings.

Any drawdown of perched aquifers would occur either immediately above the underground mine workings or within the limits of subsidence, both of which are believed to be encompassed within the permit area boundary. Given the unconfined nature, overall low permeability, and limited storage and flow volume of the regional aquifer within mined zones, potential mining related drawdown is expected to be negligible. Interruption of groundwater flows should be minimal to non-existent based on the general lack of water encountered during exploratory activities associated with this mine permit. No known potential upgradient effects are projected for the direct permit area since 1) bedrock dips to the east-northeast with no upgradient source beyond the surface mine facilities themselves, and 2) potential mine impacted surface waters associated with Mud Creek flow west of the permit area and will bypass the mine without direct contact or impact.

Any potential downgradient mining related ground water impacts would be most pronounced within and immediately adjacent to the actual area of underground mining disturbance with these impacts becoming less pronounced with increasing distance from the impact source due to the effects of ground water contributions from adjacent areas and consequent mixing, dispersion, and dilution. The area which would be affected by the mining activities is relatively small when compared with the overall regional ground water basin and low permeability combined with relatively flat gradients will effectively limit downgradient ground water movement. Water quality should not be affected as a result of mine development because the existing stored mine water as well as water which will accumulate in new mine workings is regional groundwater. Potential downgradient mining related ground water impacts would, therefore, be confined to a relatively limited downgradient area which is expected to fall within the cumulative impact area as defined above.

R645-301-726 Modeling

Modeling techniques used for this permit application were used based on ground and surface water sampling data.

R645-301-727 Alternative Water Source Information

The surface mining activities are not expected to cause proximate contamination, diminution or interruption of any underground or surface source of water. As discussed previously, mining operations are not expected to have any significant adverse impacts on the prevailing hydrologic balance, existing water resource or water rights. Furthermore, the potential impacts of mining on ground water systems (dewatering of accumulated water, solute leaching, and solute transport) will not result in any measurable effect on surface water or ground water rights nor will the potential impacts of mining on surface water systems (increased runoff, erosion and sediment load, salt loading and changes in ion balance) cause measurable injury to surface water rights. In the unlikely event that proximate contamination, diminution, or interruption does occur, CR will acquire or purchase surface and or ground water rights or supplies from local sources including Scofield Reservoir to replace impacted water rights.

R645-301-728 Probable Hydrologic Consequences Determination

In order to assess the probable hydrologic consequences of the planned mining and related activities CR has reviewed and evaluated all available information on baseline hydrologic

conditions as presented and described in R645-301-711 - 727, Hydrologic Information, in order to accurately characterize the existing surface and ground water environments. Within the context of the existing hydrologic conditions, CR then considered potential hydrologic impacts, both positive and negative, which could occur as a result of the planned mining and related activities based on the operation and reclamation plans presented in R645-301-230 – 252, 330, - 358, Operating Plans and Design Criteria, and R645-301-323– 400, 327, 240 – 244, 341, 342, 352, 353, 356, 357, 358, 511, 512, 515, 541, 542, 553, 760 - 765, Reclamation Plans. Both direct and indirect mining related impacts were identified and evaluated and the effectiveness of operational protection and control measures and reclamation activities in mitigating potential impacts were considered in the assessment of probable hydrologic impacts. The following sections present summary descriptions of the probable hydrologic consequences of the planned Kinney mining and related activities.

Summary of Baseline Conditions

Detailed discussion of surface and ground water occurrence, quality, use, and relationships is presented in R645-301-710, 721, 724 - 728, Hydrologic Information. The following briefly summarize general surface and ground water conditions as a reference for the discussions of probable hydrologic consequences which follow in the subsequent sections.

Ground Water Baseline Conditions

Ground water resources in the permit and adjacent areas are limited in both extent and quantity. Ground water occurrences are limited to; 1) Shallow alluvial/colluvial valley fill deposits in valley areas west of the mine and in area drainages overlying mining zones east of the surface disturbance area; 2) Potential perched ground water occurring in thin laterally discontinuous sedimentary units in the Blackhawk Formation, and adjacent to faults 3) Ground water which has accumulated over time in existing underground mine workings; and 4) a regional water table aquifer occurring in the deeper portions of the Blackhawk Formation and extending into the underlying Star Point and Mancos Formations.

Ground water movement is limited by generally low transmissivities, the lack of significant secondary permeability, and limited recharge due to arid conditions, limited outcrop exposures, and relatively mountainous terrain. While volumes of water may have accumulated over time in abandoned underground mine workings, mine inflow rates are expected to be relatively low.

Only limited ground water quality data is available due to the general dry nature of the explored geologic units. Three of the four groundwater monitor wells completed in the Hiawatha Seam, the seam to be mined, are dry and one of the two groundwater monitor wells completed below the seam to be mined (CR-06-01BLW) is dry demonstrating that the Hiawatha Seam is over 150 feet above the regional groundwater table in the permit area Table 6, Kinney #2 Mine Baseline Monitoring Stations. Data from Sulfur Spring, Angle Spring and Well CR-06-03-ABV show similar calcium bicarbonate water qualities (see Map 10, Regional Water Quality), a moderately alkaline pH, and moderate to low TDS concentrations. Ground water use is limited to isolated use of perched ground water issuing from springs or seeps for stock watering.

Surface Water Baseline Conditions

Other than Mud Creek and Scofield Reservoir, surface water resources in the permit and adjacent areas are limited. The principal perennial drainages located adjacent to the permit area include; 1) Mud Creek, the principal drainage in this area and Miller Canyon, both tributary to Scofield Reservoir. Some intermittent and ephemeral drainages occur within the permit area,

most if not all of which normally exhibit flow only in response to spring snowmelt and high intensity thunderstorms.

Surface water quality is typical of mountainous regions of the western United States exhibiting chemical characteristics including calcium bicarbonate types with neutral to moderately alkaline pH, and moderate to moderately high TDS and TSS values. Quality of Mud Creek does not fit this profile well and It is believed that water quality within Mud Creek is influenced by surface mine operations and mine discharges within Eccles Canyon (Map-10). Seasonal flow increases or peak flow resulting from storm events tend to dilute geochemical constituents concentrations while during low flow periods these concentrations tend to increase. Surface water uses in the general area are mostly used for agricultural and recreational use, however surface waters are also used downstream for culinary and industrial purposes. All surface water use is outside the permit area boundaries. More information on surface water resources is presented in R645-301-724 - 728, Surface Water Information.

Given the general absence of both aquifers within the permit or adjacent areas which can be characterized as significant water supplies and significant recharge areas, the potential for adverse water supply impacts due to mining related subsidence is negligible. Mining may result in drainage of small perched ground water occurrences and localized increases in mine water storage, however, the depth of mining, limited coal seam thickness and specific mine design which calls for first mining only provides effective protection for area drainages and associated alluvial/colluvial aquifer systems.

The hydrogeologic characteristics of the coal-bearing Blackhawk and overlying formations will effectively limit the extent of impacts to the hydrologic system as a result of new mining. Therefore, impacts from the mines will be of local, as opposed to regional, significance. Potential impacts to the hydrologic resources are discussed further below.

Mining activities may result in the following potential localized, temporary effects on the surface and ground water environments:

Stream Flows and Surface Water Quality

Mine related surface development will result in removal of vegetation and soils, grading, paving and other surface alterations which may increase surface runoff and sediment transport from the disturbed areas. During construction, development, and active operations, runoff and sediment will be controlled through the use of temporary diversion and collection ditches, berms, sedimentation ponds, and appropriate alternative sediment control measures. Increased runoff amounts will be buffered to some extent by temporary containment in sedimentation ponds but some minor temporary increases in discharge to stream reaches downgradient of surface disturbance areas is anticipated. Following completion of active operations, surface disturbance areas will be reclaimed with the objective of reestablishing baseline drainage conditions. Runoff and sediment control structures will remain in place until this objective is achieved.

The only site available for construction of the required mine facilities is a very limited area adjacent to and east of Highway 96. As a component of the overall mine development plan, CR proposes to convey one short segment of "Jones Draw"an ephemeral drainage near the south end of the mine site beneath the mine surface facilities via the construction of a bypass culvert. The diversion will protect natural drainage flows upstream of the disturbed area, thus preventing or minimizing potential runoff degradation. Upon mine abandonment, the culvert will be removed, the area regraded, and the stream channel restored as closely as possible to

current conditions within the constraints of site conditions and practical construction capabilities.

With the exception of the temporary conveyance of the "Jones Draw" channel discussed above, underground mining activities are not expected to result in any impact on the alluvial/colluvial aquifer system. Recharge areas for the alluvial/colluvial system will not be affected, and CR plans to avoid full extraction under any of the local drainages. Underground mine development and mining operations may intercept perched aquifers, but are not expected to intersect the regional ground water system. Resulting impacts on stream flow are not anticipated since flow contributions from the perched ground water systems represent only very small flow potentials.

Surface runoff from mining related disturbance areas has the potential to impact surface water quality. As noted in the preceding section, surface runoff and associated sediment loading will be effectively addressed through operation of engineered drainage and sedimentation control structures and site reclamation. During active mining operations, the limited underground mine drainage encountered will be controlled using sumps at the face, transfer pumps and pipelines wherein the water will be pumped to a section sump where the water will be allowed to settle and it will either percolate back into the groundwater system or be reused for dust suppression. The surface discharge of mine water is not anticipated.

Given that the proposed mine workings will be down-dip from the mine portals, any upgradient workings will drain to the lower workings. History has also shown that there has been no direct surface discharge from inactive mine workings locally. Given the anticipated mining depth and configuration of the proposed mine workings, it is anticipated that the ultimate equilibrium water level in the mine workings (if any) will be below any potential mine discharge point.

There have been some indications in other local and regional mines that the interception and accumulation of ground water in underground mine workings limits percolation of the water through the underlying sediments, preventing further contact with underlying shales and resultant increases in TDS. Given this consideration, mine water accumulations and any associated lateral ground water movements through the geologic sequence to a surface discharge point may actually result in an overall enhancement of downgradient water quality. Since the coal seams dip to the northeast and become increasingly deep with no outcrops on the east side of the mining area, there is little or no potential for mine water to impact water users.

Ground Water Occurrence, Movement, Discharge, and Quality

Underground mine development and operations, and related surface disturbances are not expected to significantly impact ground water recharge areas given the limited extent of anticipated surface disturbance. There is also little to no potential for minor, localized, mining-related impacts on the alluvial/colluvial ground water system (as discussed previously), localized impacts on the perched ground water system, increases in the amount and areal extent of stored ground water, and limited short-term impacts on the regional ground water system.

Mine development entries may intercept limited water-bearing members of the perched ground water system. These activities could increase vertical permeability and result in localized drainage of perched ground water resources. However, given the limited thickness and areal extent, storage capacity, and transmissivity of most of the perched ground water occurrences, direct mining-related impacts resulting from interception by development or mine workings are anticipated to be very localized with relatively low flow rates and total flow volumes. Similarly,

loss of ground water from the perched ground water system due to rock fracturing would be a localized phenomenon.

Development of mine workings and subsequent coal removal is not expected to directly impact the regional ground water system since a consistent water system has not been identified. If a regional system is however encountered during mining, the void spaces and resultant mine inflows created would provide for the accumulation of storage of ground water. Impacts on the regional ground water system in this case would be expected to include a localized, temporary, depression of the potentiometric surface and localized reduction of ground water volumes and flow rates in effected portions of the regional aquifer zone. As noted in the previous section, ground water accumulations are not expected to result in direct mine water discharges. Instead, under such conditions, gradual accumulations of ground water would reach an equilibrium point with the regional ground water system with no significant long-term effects.

The primary potential mining-related impact relative to ground water quality would be an increased oxidation potential in the void spaces resulting from mine development and coal extraction.

Potential for Adverse Impacts

Ground Water Impacts

Unlike many local mines, ground exploration in and around the proposed Kinney No. 2 Mine has encountered only limited amounts of water, indicating the presence of very limited ground water resources. Although some limited water was reported during drilling, it appears that all but three of the wells drilled within the proposed Portal Block permit boundary are dry. This conclusion was reached based on the observation that the reported water levels within many of the wells remained below the top of the lowermost blank section following bailing. The lack of water level change since that time has shown that there have been no inflows into most of the wells, thus indicating that wells CR-06-01 CR-06-01-BLW, CR-06-02, CR-06-02-ABV, and CR-06-05A are dry. Table 8, Well Conditions as of 6/23/2010, has been inserted to show the location of the water level in each well in reference to the bottom of the lowermost screen. The locations of these wells are shown on Map 7, Regional Hydrology.

Data within Table 8 also show that only minor water level variations have been noted for well CR-06-09-BLW for water that was encountered within zones below the coal seam. Mining is not anticipated to impact any water or aquifer zone below the coal seam.

Five wells (CR-06-03-ABV, CR-06-09, and CR-06-09ABV, CR-10-11, CR-10-12) show the presence of water above the Hiawatha Coal Seam. The first of these wells is located within the Eagle Canyon drainage, and was abandoned due to property and easement restrictions. The CR-06-09 wells are located along the ridgeline between Eagle and Long Canyons. It will be noted that CR-06-03-ABV encountered water above the Hiawatha Coal Seam only because this hole is located in the Eagle Canyon Graben which dropped the Hiawatha Seam below the regional water table. CR-06-09 lies nearly a half mile NE of the permit boundary and in an area where the elevation of the Hiawatha Seam is lower than the elevation of the peizometric surface Map 7, Regional Hydrology. Similar to CR-06-03AVB, monitor wells CR-10-11 and CR-10-12 are completed above the Hiawatha Seam because the Hiawatha Seam has been dropped down nearly 600 feet by faulting. Water encountered within the mine is expected to be limited to the draining of localized perched zones.

It is fully anticipated that mining operations will have little if any impacts on the ground water hydrologic balance. This conclusion is reached based on the fact that limited ground water was encountered during drilling and that a significant number of the wells are dry. The area appears to be strongly influenced by localized confining layers that have the ability to create perched aquifers which overly the regional ground water aquifer shown on Map 7.

It is unlikely that the limited water encountered within well drilling operations is sufficient to provide any significant source for the local seeps and springs identified in the survey completed by Rock Logic, Consulting, LLC in 2006.

Further evaluation also shows that with the exception of Sulphur Spring, seeps and springs located along the western facing slope of the mine permit area are all located south of the mine permit area and are at elevations of 8,000 feet msl or higher. Water measured on May 29, 2007 within wells CR-06-01, CR-06-01 BLW, and CR-06-02 during and after drilling has noted at a maximum water elevation of 7898 feet msl, over 100 feet below the lowermost spring elevation. The fact that well levels are lower than the springs, that the wells are dry, and that the springs are located approximately ¾ mile south of the permit area supports the "no impact" by mining conclusion.

The majority of water resources including seeps, springs and ponds noted within the seep and spring survey are located east of the permit area within Long Canyon and its tributaries. Three small seeps, one small spring, and two ponds are located within the eastern portion of the permit area are located within Eagle Canyon. A review of the mine portal elevation and the location of these springs indicates that there will be in excess of 500' of cover over mine workings, and hence there will be little potential for spring disturbance. As indicated earlier, mine workings dip to the east, increasing cover as the mine advances. As such, mine workings will have even less potential to impact surface water resources further east in Long or Miller Canyons.

It is further anticipated that no impact to the local surface or ground water systems west of the mine will occur due to 1) the general lack of water encountered during drilling and 2) the fact that the regional ground water aquifer is located beneath the majority of all proposed mine workings..

Surface and ground water hydrologic systems may potentially be impacted by mining, processing, and related operations. These impacts are not expected to be significant, will not affect either surface or groundwater users, and are expected to be localized and temporary in nature. Operational mitigation measures and reclamation of disturbance areas will result in effective restoration of surface and ground water conditions similar to those existing prior to initiation of the Kinney mining and related disturbance.

Ground Water Consequences

CR's planned mining, processing, and related activities have the potential to cause localized and temporary impacts to ground water. These potential, although likely limited ground water hydrologic consequences include:

- Alterations of local ground water flow patterns
- Drainage of seeps/springs (If this occurs it is likely to be temporary)
- Alterations of recharge/storage/discharge relationships
- Localized increases in concentrations of TDS and certain individual chemical constituents

Mining related probable hydrologic consequences for ground water resources in the Kinney Mine permit area will be limited by the lack of significant ground water recharge in the area, the general lack of ground water identified during exploratory drilling, the presence of low permeability geologic strata between the coal seams to be mined and the ground surface, the general lack of significant regional ground water movement, and very limited beneficial ground water use in the permit and adjacent areas. Probable ground water consequences are discussed in the following sections.

Alterations to Ground Water Flow Patterns - Although mining is not expected to enter a regional aquifer system, alterations of ground water flow patterns will occur as a result of underground mining excavation and consequent drainage of localized perched aquifer systems resulting from subsidence fracturing. Mining operations therefore have the potential to induce ground water flow into the underground workings as the hydrologic system adjusts to mining. A shift in ground water flows toward the mine workings will occur when perched aquifers are intercepted, thus altering existing ground water storage and flow patterns. This may result in partial or full drainage of the perched aquifers and may affect the discharge of springs and seeps. Impacts on perched aquifers and associated springs and seeps due to secondary subsidence effects are not expected to be significant since only very limited ground water was encountered during exploratory drilling, and the perched aquifers are believed to be very limited in aerial extent. Captured flows will thereafter flow down dip within the mine, and serve as a source of recharge within mined sections to the adjacent environment.

Upon completion of operations and final mine reclamation and closure, it is expected that the underground workings may partially fill with water encountered during mining, resulting in the re-establishment of a stable and ongoing hydrologic environment. No significant changes (if any) in the regional potentiometric surface are expected to occur since the regional ground water aquifer is believed to be below target mining zones. Reductions in the quantity and availability of ground water as a result of alterations to the ground water flow patterns are expected to represent only a minor percentage of total ground water flows within the region or basin and will be limited in areal extent.

In addition, reductions in groundwater flows are not expected to adversely impact ground water users since, as is shown on Map 30, Ground Water Right Locations, there are no ground water rights shown in the vicinity of the mine permit area. Primary beneficial ground water uses in the vicinity of the permit area are all concentrated along the south eastern shoreline of Scofield Reservoir, and likely take water from the shallow ground water - surface water interface adjacent to the reservoir. With stratigraphic units dipping to the east, these locations are effectively hydraulically isolated from potential mining impacts. Potential impacts to springs and seeps discharging from the perched aquifer system are discussed below.

Drainage of Seeps and Springs - Kinney No. 2 Mine mining activities may result in some drainage and dewatering of overlying perched ground water aquifers as a result of vertical seepage through mining related fractures. Consequently, springs and seeps discharging from the stratigraphic units containing the perched ground water may be effected. CR will attempt to minimize fracturing to the extent possible while maximizing recovery of available coal resources. Fracturing will be controlled through the maintenance of barrier pillars, limiting extraction to first or development mining, and proper mining and roof control design and operations practices. Effective control of fracturing will limit stress on the overlying strata and the consequent potential for drainage through fractures. Additional discussion of potential mining effects is presented in R645-301-522, 523, and 525, General Description of Mine Plans, Mining Methods, and Related

Design Requirements, under the subheading of Subsidence Control.

If discharge from seeps or springs is documented to decrease below historic conditions as a result of mining related activities, CR will mitigate these impacts through the purchase of and subsequent augmentation of effected water rights, monetary compensation, development of alternative watering facilities such as guzzlers, or other appropriate mitigation measures.

Alterations to Recharge/Storage/Discharge Relationships - CR's planned mining, processing, and related activities are not expected to have any significant long-term effect on recharge, storage, or discharge relationships. As described in R645-301-710, Hydrology Information, recharge within the ground water basin occurs primarily as a result of direct precipitation and infiltration. CR's operations are both limited in areal extent and are not located within any major recharge area, nor are mining operations expected to interfere with existing stored mine water in adjacent abandoned mines. Upon completion of operations and mine reclamation and closure, ground water will accumulate in the mine workings, thereby increasing localized ground water storage. Discharge relationships are also expected to be minimally effected with some temporary reduction in downgradient ground water flows during filling of the underground mine workings and re-establishment of a hydrologic balance, as well as localized alterations in ground water flow patterns. The quantity of ground water discharge which will be effected is a relatively small percentage of the total volume within the ground water basin.

Increases in Chemical Constituents - As ground water encounters freshly exposed subsurface materials in the mine, oxidation and weathering will cause changes in ground water chemistry including increases in TDS and the concentrations of individual chemical constituents. Over time these increases will stabilize and start to decrease as available soluble chemical constituents are depleted and chemical concentrations in the mine water and the exposed rock reach equilibrium. Any filling of the mine workings by perched ground water would also have a beneficial water quality effect, displacing oxygen and reducing the oxidation potential in any flooded abandoned workings.

As described in R645-301-710 - 724, Hydrology Information, ground water in both the Kinney Mine permit and adjacent areas is a calcium bicarbonate chemical type. Increases in both sodium and sulfate may occur within the mine, although they are not expected to change the ground water type. While various chemical constituents of the ground water may increase as a result of mining, these increases will not effect ground water use. Due to the limited volume of ground water drainage relative to total flows within the ground water basin, minor changes in ground water chemistry and levels of certain constituents are not expected to significantly effect overall ground water quality.

Surface Water Impacts

The proposed Kinney No. 2 Mine and related surface facilities are confined to a very small area or footprint. The surface facilities plan has been developed to consolidate the disturbed surface area into as small a space as possible, utilizing a series of pads to contain needed infrastructure. Impacts are limited to:

- Control of runoff and erosion within the disturbed permit area. When it occurs, historical runoff is generally noted as either sheet flow or small concentrated flow within ephemeral channels. Because of decreased vegetation which results in higher runoffs, it is anticipated that total runoff volume will increase slightly from historic conditions. Operational runoff will be contained and controlled via a series of ditches, culverts, a

sedimentation pond, and alternate sediment control methods. In general, it is anticipated that better runoff controls, resulting in less sediment leaving the site, will exist during mining than pre mining.

- Surface water from undisturbed areas historically ran downhill to the highway, then flowed parallel to the highway until culvert(s) were encountered wherein the water could cross the highway and continue its path toward Scofield Reservoir. Runoff during operational mining will work in very much the same way with only minor exceptions. First, runoff from areas immediately above the permit area will be diverted by a non-mine access road and two undisturbed area drainage ditches (UDD-1 and UDD-2) which will parallel the eastern permit boundary. Water collected by UDD-1 will flow to the north until it joins UDD-2 which directs water from the north. Water from both undisturbed drainage ditches are then combined and conveyed via culvert UDC-2 through the mine area and discharged to an inlet of an existing highway culvert. From there, undisturbed drainage water is combined with pond discharge water, and conveyed via an existing 36" culvert (CP2) beneath the highway before continuing toward Scofield Reservoir.

- The last minor change involves the construction of an undisturbed area bypass culvert UDC-1 which will convey potential runoff from upland areas, beneath surface mine facilities and the highway, into the Scofield Reservoir drainage system west of the highway.

- Water quality impacts are projected to be similar to other local mine working operations. Historical runoff, and hence quality impacts has been sporadic as evidenced by limited and weathered upland channels. In similar nature, it is anticipated that impacts to water quality will be minor, and limited to major runoff events wherein runoff is sufficient to result in a water discharge from the sedimentation pond. Discharges during these potential extreme events are expected to be in compliance with regulations thus resulting in minimal, if any, negative water quality impact due to mining.

Surface Water Consequences

CR's planned mining and related activities have the potential to generate temporary impacts to surface water resources. These impacts will typically be localized, being confined to those segments of area drainages directly impacted by mining activities, although in some cases impacts may have the potential to also effect downstream drainage areas. The primary mining related activities which may specifically impact surface water resources include:

- Temporary increases in runoff from surface disturbance areas

- Minor reductions in surface flows and alteration of surface flow patterns due to operation of the sedimentation structure

- Changes in surface water chemistry

- Increases in the levels of TDS, TSS, and certain individual chemical constituents

In general, probable hydrologic consequences for surface water resources resulting from CR's mining operations will be limited by the relatively small surface disturbance area near the town of Scofield, and will be effectively mitigated by operation of the drainage and sediment control

system and ultimate reclamation of mine disturbance areas. R645-301-521, Affected Areas and Timing of Disturbance, describes the extent of proposed mining related surface disturbance. Probable surface water impacts and their significance relative to the hydrologic system are discussed in the following sections.

Temporary Increases in Runoff from Surface Disturbance Areas - Proposed new mining related surface disturbance will be limited to the mine facilities areas and will involve removal of vegetation and soil/substitute materials and grading of disturbance areas for specific mining related uses. These disturbance activities will reduce infiltration potential and evapotranspiration due to elimination of vegetation and will increase surface runoff and erosion potential. In order to effectively control erosion and increased runoff from disturbance areas, CR will divert runoff from undisturbed upgradient areas around the area of mining disturbance, grade disturbance areas to minimize runoff and erosion, and collect runoff as close as possible to its source and route it to a sedimentation pond for retention and settlement of suspended solids prior to discharge to natural drainages. CR will control and mitigate potential increased runoff from surface disturbance areas using a number of commonly accepted surface management and drainage control practices. Specifically, disturbed areas will be graded to minimize runoff and to the extent operationally feasible surface flow velocities will be controlled through the use of appropriate surfacing materials and runoff will be collected as close to disturbance source areas as possible to minimize erosion and increased sediment loading.

In addition to specific drainage control practices, CR will effectively minimize the area of surface disturbance by keeping all surface facilities within a relatively limited area. Provisions for minimizing mine related surface disturbance are detailed in R645-301-521, Affected Areas and Timing of Disturbance. Increases in runoff from disturbance areas may result in minor increases in stream flows for the receiving drainages, however, any increases will not be significant given the very limited area of surface disturbance relative to total drainage basin areas for the potentially effected drainages. Potential flow increases will also be partially mitigated by operation of the sedimentation pond which will retain disturbed area runoff providing some buffering effect.

As documented in R645-301-731 and on Figure 35, Pond 1 Stage-Volume Curve, total runoff volume for the 10-year, 24-hour storm event for mine facilities disturbance areas is approximately 2.03 acre feet (3.15 acre-foot – 1.12 acre-feet sediment storage). Comparing this runoff volume with a calculated total average annual runoff volume of 6,500 acre feet for the receiving drainage of Mud Creek, it is evident that total runoff from the disturbed area, even under storm conditions, constitutes a relatively small portion of total watershed runoff.

On completion of mining operations, disturbed areas will be reclaimed. Reclamation will involve backfilling and grading, re-establishment of natural drainage patterns, soil/substitute replacement, and re-vegetation. It is anticipated that reclamation will effectively restore infiltration and runoff patterns to approximate the baseline conditions currently existing for the surface disturbance areas.

Minor Reductions in Surface Flows and Alteration of Surface Flow Patterns Due to Operation of the Sedimentation Structure - Although sedimentation ponds are integral to mitigating mining related impacts on the surface hydrologic system, operation of sedimentation ponds tends to reduce discharge flow volumes and extend the period of effective flow for runoff from both snowmelt and thunderstorm events. In effect, sedimentation ponds function as limited capacity flood control structures reducing the effective discharge rate for large volume flows through temporary storage and flow routing. The sedimentation pond is designed to gradually release impounded runoff following required retention for sediment control. Given provisions for retention and gradual discharge of retained storm flows, most of the runoff is returned to the

surface drainage system with only a short lag time corresponding to the design retention time for the pond.

Operation of the drainage and sediment control network, and specifically the sedimentation pond that retain runoff from disturbance areas, has the potential to alter flow patterns in receiving drainages. Because the Kinney Mine operations are located in a relatively arid climate, runoff contributions to most of the drainages occur only as a result of snowmelt and large storm events. As previously noted, the retained runoff volume for the sedimentation pond represents a relatively small percentage of normal flow volumes for the receiving drainage, and should not adversely impact flow volumes even during low flow periods. Additionally, operation of the sedimentation structure will not result in significant discharge delays since the maximum design detention time is only 24 hours for the design storm runoff volume and discharge will be occurring continuously once the pond level reaches the discharge orifices.
The pond has been designed such that discharge structure is above the design sediment level and any runoff accumulations in the pond below this discharge elevation will be retained in the pond as dead storage (note that dead storage will not effect pond capacity since the design sediment storage capacity is being utilized for dead storage). Similar to the pond capacity comparison discussed previously, the design sediment storage volume available for temporary runoff storage represents a negligible amount relative to area stream discharge volumes and so does not constitute a significant potential flow reduction.

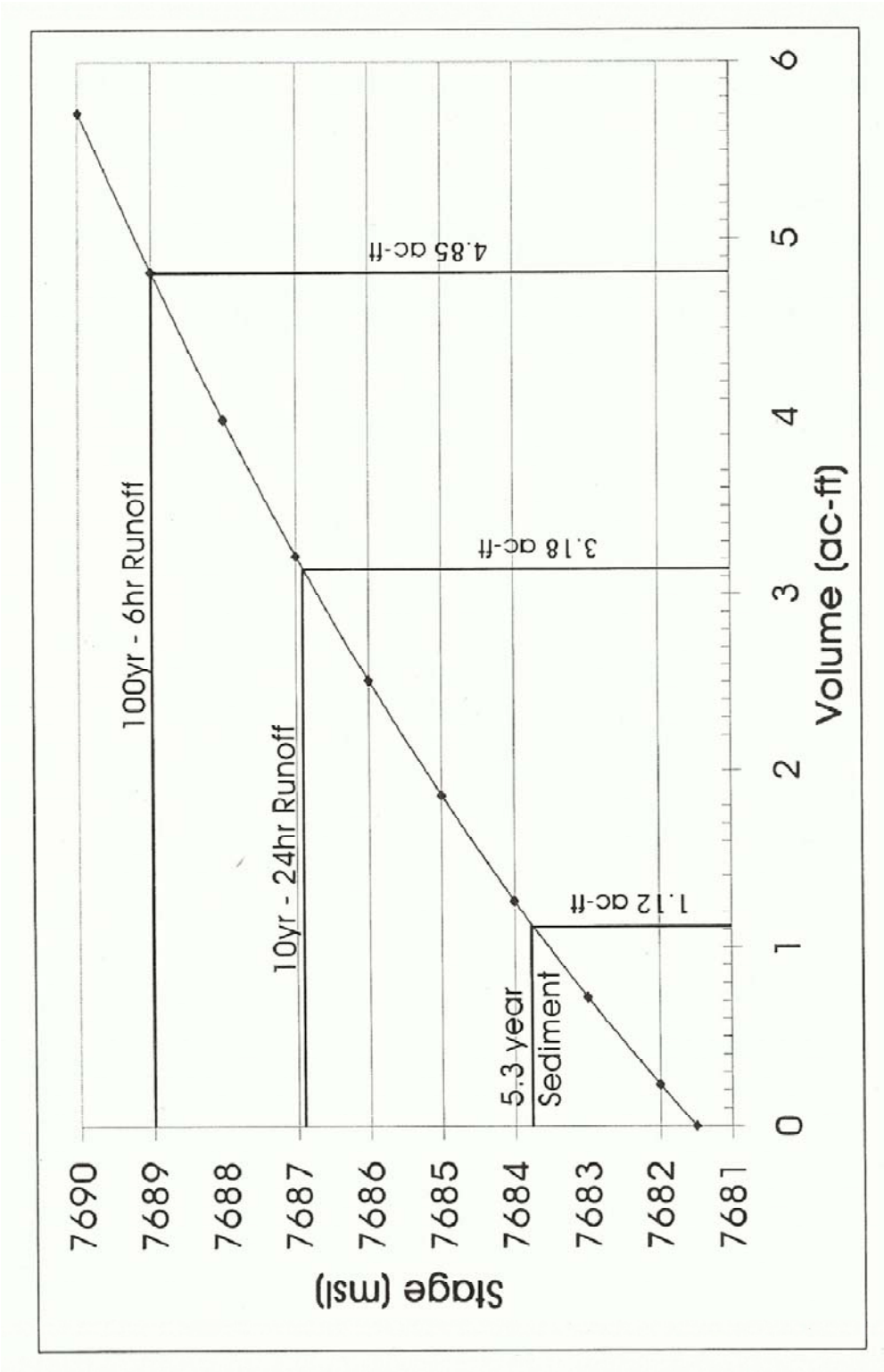
Changes in Surface Water Chemistry - Exposure of surficial materials by mining related surface disturbance and contact of disturbed area runoff with these materials may result in changes in runoff water chemistry. Surface water in the mine area is almost exclusively a calcium bicarbonate type. The most probable potential change in runoff water chemistry would be a shift from a strong calcium bicarbonate type toward a sodium sulfate type due to the weathering and leaching of exposed surface coal materials.

CR's proposed surface drainage and sediment control measures, specific limitations on total surface disturbance, and the collection of disturbed areas runoff as close as reasonably feasible to the disturbance source area, will be effective in limiting runoff exposure to surficial materials and consequent leaching. The fact that none of the materials which will be exposed, including overburden, soils, coal refuse, and mine waste materials, have been conclusively documented to be potentially acid or toxic forming is an important factor which will also limit the potential for any significant changes in surface water chemistry. While minor changes in runoff water chemistry may occur as a result of mining and related operations, limited surface disturbance areas and corresponding limited disturbed area runoff volumes will minimize any potential for significant changes in water chemistry for the receiving drainages since disturbed area runoff flows will be buffered by significantly greater volumes of normal runoff from adjacent drainage basin areas.

Increases in the Levels of TDS, TSS, and Individual Chemical Constituents - Similar to the potential mining related impacts discussed above relative to surface water chemistry, contact between disturbed area runoff and surficial materials exposed to weathering and oxidation, may result in increases in TDS and individual chemical constituents in surface runoff flows. In addition, one of the natural consequences of surface disturbance and the minor erosion which results will be increases in sediment loading and TSS levels for the disturbed area runoff. Surface water in the mine area is generally neutral to moderately alkaline with low to moderate levels of TDS, TSS, sulfate, iron, and phenols. Mining and related activities will probably not result in any significant change in surface water pH although TDS, TSS, and sulfate levels may increase slightly in the disturbed area runoff. The same considerations and mitigation measures previously discussed for potential changes in surface water chemistry are also applicable for potential increases in TDS

and individual chemical constituents. Potential increases in TSS levels will be effectively addressed on a short-term basis by establishment and operation of the drainage and sediment control system and compliance under the required UPDES permits with applicable monitoring requirements and discharge effluent limitations. Reclamation and restoration of effective surface drainage conditions will address all potential mining and related surface water impacts over the long-term.

Figure 35 Kinney Mine Sedimentation Pond 1 Stage-Volume Curve



R645-301-729 Cumulative Hydrologic Impact Assessment

Ground water impacts resulting from the planned mining and related activities will be minimal due to limited ground water occurrence, low overall permeabilities and consequent limitations on the effective area of influence, and the lack of beneficial ground water use in the area. Similarly, surface disturbance associated with the Kinney mining and related operations will involve such a small area that potential mining related surface water impacts will be negligible. Any potential surface water impacts will be effectively mitigated through effective control of mine water supply withdrawals, operation of a comprehensive drainage and sediment control system, compliance with applicable monitoring requirements and discharge effluent standards under the required UPDES permits, and reclamation of surface disturbance areas and restoration of surface drainage characteristics. In order to fully evaluate potential hydrologic impacts, the cumulative impact of any mining related ground or surface water impacts when combined with potential impacts resulting from other development or land use activities must be considered. Utilizing the information presented in this mining and reclamation plan submittal along with other available information for the general mine area, UDOGM will complete a Cumulative Hydrologic Impact Assessment (CHIA), which on completion will be inserted in Exhibit 17, From UDOGM.

A cumulative impact area for evaluation of potential cumulative ground water impacts will include the permit area along with any upgradient areas which could be impacted by mining related drawdown and downgradient areas which could be impacted by any mining related changes in ground water flow or quality. Given the characteristic low permeability of the geologic sequence, the limited volume and flow of ground water, and the downward dip of the geologic units to the north-east, the ground water cumulative impact area can be defined by the surface disturbance area associated with the mine on the west, UP canyon on the south, Miller Canyon on the north, and Eagle Canyon on the east. Beyond that distance, we believe impacts would be undeterminable. Other activities which could result in possible contributing ground water impacts within this area are believed to be limited to possible contributions from existing abandoned underground mine working in the area.

A cumulative impact area for evaluation of potential cumulative surface water impacts will include the permit and adjacent areas and downstream waters which could be impacted by mining related changes in surface water flows or quality. Given these constraints and the nature of general surface drainage patterns in the area, the surface water cumulative impact area can be defined as a boundary extending on the west from Scofield Reservoir to Eagle Canyon on the east, and from UP canyon on the south to Miller Canyon on the north. There are a number of activities within the cumulative impact area which could result in potential contributing surface water impacts including public access to wildlife and fishing areas, community impacts from the Town of Scofield, private cattle operations and recreation within Eagle, Miller, and other tributary canyons, railroad operations that run along the western border of the permit area, surface runoff contributions from U.S. Highway 96, and mine discharge and surface runoff from historical mining operations in the area.

R645-301-730 Operation Plan

This section describes plans for protection of hydrologic resources, including surface and ground water quantity and quality, and recharge, storage, and discharge relationships, for the permit and adjacent areas that could potentially be affected or impacted by the proposed mining and reclamation activities. Information in this section was developed in accordance with applicable regulatory requirements (R645-301-700) for coal mine permitting in the State of Utah.

Mining and related activities may result in temporary changes in runoff and infiltration characteristics for surface disturbance areas; additional contributions of sediment to surface

runoff; ground water drainage to and storage in underground mine workings; some dewatering of perched aquifers and localized dewatering of the regional water table aquifer due to direct mining and indirect subsidence related effects; minor modification of infiltration and recharge characteristics in subsidence areas; and limited localized changes in surface and ground water chemistry and quality. Based on available information, the potential mining related impacts will be localized, temporary, and will not involve any significant long-term adverse impacts. The hydrologic control and mitigation measures proposed in conjunction with mining and related activities should effectively mitigate any potential adverse hydrologic impacts.

As described in R645-301-710 - 724, Hydrologic Information, Carbon Resources (CR) both researched the extensive existing information on the hydrologic environment of permit and adjacent areas and collected additional supplemental hydrologic information in order to accurately characterize existing conditions and develop an overall understanding of hydrologic systems and relationships. The hydrologic protection plans have been developed with consideration of the resource values and relationships described in R645-301-710 - 724 and CR plans for mining and related activities, as outlined in R645-301-201 - 203, 225, 231, 240 – 244, 312 – 358, 421 – 422, 515, 521 – 537, 632, 642, 700, 760 – 765. Operating Plans and Design Criteria. The plans, therefore, reflect site-specific conditions and the nature and extent of anticipated mining related impacts in order to assure effective compliance with the following applicable regulatory requirements and consistency with overall environmental objectives:

- Minimize disturbances to the hydrologic balance
- Prevent material damage outside of the permit area
- Support the approved post-mining land use(s)
- Comply with applicable provisions of the Clean Water Act
- Meet applicable Federal and State water quality regulations

Detailed discussions of specific potential impacts and proposed control and mitigation measures are presented in the following sections.

R645-301-728.320 Presence of Acid or Toxic Forming Materials

This issue is dealt with in Chapter 6, R645-301-624.

Contamination, Diminution, or Interruption of Ground or Surface Water Sources with Current Beneficial Use Within the Permit and Adjacent Areas

Within the Kinney Mine area, only the off-site alluvial/colluvial aquifer system and the perched aquifer systems yield adequate quantities of ground water of suitable quality for beneficial use, and use within the permit area is limited to small scale seasonal stock watering. As discussed in R645-301-710 - 724, Hydrology Description, under the subheading Water Rights and Replacement, and in R645-301-728.310, Potential for Adverse Affects, CR's mining and related operations are not expected to adversely impact any surface or ground water rights. Consequently, there is no need to explicitly address provisions for replacement of impacted water rights at this time. In the unlikely event, however, that proximate contamination, diminution, or interruption does occur, CR will mitigate these impacts through the purchase and augmentation of effected water rights, monetary compensation, development of alternative watering facilities such as guzzlers, or other appropriate mitigation measures. The amount of water owned by CR (two shares of Scofield reservoir water rights)is believed adequate to mitigate any potential impacts to beneficial water use as a result of potential consequences to

the hydrologic balance. The primary postmining land use in the mine, loadout, and adjacent areas will be wildlife habitat, requiring minimal supporting water requirements, consistent with existing demands. The discussions presented in R645-301-710 - 724, Hydrology Information, indicate that while surface and ground water resources are limited in areas affected by the Kinney Mine operations, they will be adequate in terms of both quantity and quality to support the proposed postmining use.

R645-301-731 Hydrologic-Balance Protection

Components of the Hydrologic Protection Plans

The hydrologic protection plans outline specific measures for the Kinney Mine that will be taken to:

- Avoid acid or toxic drainage
- Prevent additional contributions of suspended solids to area drainages
- Control runoff and erosion
- Protect or replace affected water rights
- Restore approximate pre-mining recharge capabilities

Specific prevention, control, and mitigation measures will include limiting the area of surface disturbance; construction, operation, and maintenance of an effective drainage and sediment control system; controlled collection, storage, use, and recycling of mine drainage; and effective reclamation of surface disturbance areas and restoration of surface drainage patterns. In addition to descriptions of specific hydrologic control and mitigation measures, compliance with specific applicable design standards and requirements are addressed, and potential adverse hydrologic consequences specific to the site are identified in the Probable Hydrologic Consequences (PHC) determination prepared under R645-301-728.

In order to minimize potential mining related impacts to existing hydrologic systems in the permit and adjacent areas, CR has incorporated specific monitoring, operational, and mitigation measures into the mining and reclamation plans for the Kinney Mine. These measures are based on historic and baseline monitoring information for the site, modeling of hydrologic systems, the experience of similar mining operations in controlling hydrologic impacts, applicable regulatory requirements, and the results of ongoing monitoring programs. Historic and baseline monitoring data have been used to characterize current hydrologic conditions as described in R645-301-710 - 724, Hydrologic Information. During the operation of the mine, monitoring will be performed to determine if any mining-related impacts to the hydrologic balance have occurred and remedial actions taken, if necessary. Measures that may be taken to remediate any mining-related impacts to the hydrologic balance are addressed in the hydrologic restoration plans presented in R645-301-700 - 765, Hydrologic Resource Restoration.

Operational plans for the Kinney mine include standard hydrologic controls and mitigation measures that are designed to prevent significant changes in the quantity and quality of surface and ground water resources, preserve existing hydrologic functions, comply with regulatory requirements, and limit adverse impacts to surface water or ground water users. These measures include:

- Limiting surface disturbance areas
- Proper design, construction, and grading of facilities areas and roads

- Construction of drainage and sediment control structures to divert undisturbed runoff around disturbance areas, collect and route disturbed area runoff to sedimentation ponds to allow settlement of suspended solids, and provide any treatment which may be necessary to meet applicable discharge effluent limitations
- Interim re-vegetation of disturbed cut and fill slopes not used for operations and re-vegetation of topsoil stockpiles, pond outslopes, alternate sediment control areas, and other unused areas.
- Utilization of localized erosion control measures, as appropriate, in any areas having high erosion potential
- Initiation of reclamation operations as soon as practical following completion of mining
- Effective reclamation to minimize gradients, re-establish surface drainage patterns, restore pre-mining runoff and infiltration characteristics, and establish an effective and self-sustaining vegetative cover.
- Post-reclamation land use management

CR has incorporated specific control and mitigation measures in mining, processing, and reclamation plans in order to prevent any significant impacts on surface or ground water quantity and quality. All mining related activities including soil/substitute removal, mine development, coal recovery, mine sealing, backfilling and grading, soil/substitute replacement, and re-vegetation are designed and sequenced to minimize disturbance and progress in a logical manner towards effective restoration of disturbed areas to a condition and configuration consistent with conditions which existed prior to development of the Kinney Mine and applicable regulatory provisions for remining of previously disturbed areas. The following sections discuss the details of the various components of the hydrologic protection plan.

R645-301-731.110 Ground Water Protection

CR has incorporated specific control and mitigation measures in the proposed mining, processing, and reclamation plans to effectively prevent or minimize significant mining related impacts on groundwater quantity, quality, and recharge, storage and discharge relationships. Ground water systems will be protected by limiting surface disturbance and mining related subsidence both of which can alter runoff and infiltration characteristics; controlling mine drainage and recycling any significant mine inflow volumes in the operational mine water system; handling earth materials, mine drainage, and runoff in a manner that minimizes acidic, toxic, or other harmful infiltrations to groundwater; and managing excavations and other disturbances to prevent or control discharge of pollutants to the ground water system.

CR's mining operations and related activities have the potential to effect ground water quantity through limited inflows to the mine workings from the subsidence of local perched aquifer systems, and the alteration of surface infiltration characteristics. Mining within a regional aquifer is not anticipated. Although believed to be minor (due to the general lack of water identified within the planned mining area) mining and related operations may also effect ground water quality by modifying ground water chemistry, altering pH, and increasing concentrations of TDS and specific chemical constituents. Specific activities which may potentially impact ground water quantity and quality include the following:

- Underground coal removal
- Retention of drainage in sedimentation pond structures

Operational measures that will be implemented to mitigate these impacts are discussed below.

Underground Coal Removal

CR's planned underground mining operations may result in passive drainage requiring handling of mine inflows from proposed mine workings. Potential ground water inflow sources include the stratigraphic units directly disturbed by mining, and the overlying perched aquifer system due to downward leakage through fractures. According to information available, historic mining operations located within the general Kinney mine permit area did not encounter significant quantities of water, and it is anticipated that mine inflows may be limited. Any significant mine inflows encountered will be collected and routed to either abandoned (inactive) mining areas or temporary underground storage areas for recycling to the operational mine water system. As mining proceeds, any significant disturbance has the potential of fracturing the natural seals supporting local perched aquifers, resulting in the localized release of perched water. Following the cessation of mining, mine inflows and outflows will stabilize as water collects within down gradient abandoned mine sections.

Specific mine design and operation including layout and sizing of mine openings based on retention of barrier pillars and first mining only, with no pillar extraction, is projected to prevent subsidence. Mine design and operational control measures, when combined with mining depth should eliminate fracture propagation at or near the ground surface in areas overlying the underground workings, effectively prevent the drainage of perched aquifers and alteration of surface infiltration characteristics.

Underground mining operations will expose coal, floor, and roof materials to oxidation and increased leaching as mining is completed and working areas are abandoned. Natural caving will also expose substantial quantities of broken coal and roof material to oxidation, and although not anticipated, by the leaching of local groundwater. It is anticipated that pH may increase slightly and the local ground water chemistry may evolve toward a sodium sulfate water type with increases in TDS and certain mineral constituents including iron and manganese. A similar evolution appears to have occurred within Mud Creek as upstream mining and transport has advanced. In order to effectively prevent or mitigate these impacts, underground mining operations will be limited to development and disturbance of the minimum area necessary to provide for effective coal extraction. CR will also keep all development (except ramping and overcasts) in the minable coal seams to the extent operationally practical. While there will undoubtedly be some impacts on localized ground water quality, these impacts will generally be confined to the mine and immediately adjacent areas by the relatively low flows and volumes of water historically encountered as we as due to the low permeability of the geologic units and the limited hydrologic connection with other more permeable units.

Minor changes in ground water quality will not affect any ground water users since all existing ground water use in the immediate area is limited to units which are stratigraphically above the interval to be mined, and since no mine water discharge is anticipated following the closure and sealing of the mine. It should be noted that anticipated changes in ground water quality are anticipated to be relatively small and localized, and not so significant as to preclude beneficial use of affected ground water resources. This contention is supported by historic monitoring data for other Central Utah mines which receive some mine water drainage from old mine workings while showing no significant adverse long-term effects.

Surface Placement of Coal, Mine Waste

Surface placement of coal has the potential to affect ground water quantity and quality as a result of increased runoff from the associated disturbance areas and from the subsurface infiltration and leaching of the stockpiled materials. The great majority of leachate from the stockpile will be conveyed via the surface water runoff control system to the sediment pond located at the downstream end of the disturbed mine area.

Coal mine rock from fault crossings will be placed in developed entries and cross cuts specifically designated for that purpose. There is no mine rock anticipated to be placed on the surface other than that which comes out with the coal stream and will be shipped as part of the coal product. No wash plant is planned and therefore no coal refuse will be generated as part of the mining operation. However, per the Divisions Request a "Small Mine Development Rock Waste Pile" as shown on Map 13 (Surface Facilities) has been designed to accommodate the possibility that a small amount of rock waste may be generated during development and make it to the surface coal handling facilities. This "Small Mine Development Rock Waste Pile" will be drained to the sediment pond.

Analyses of both actual existing and potential future coal materials, including incidental roof and floor rock, are described in R645-301-623 - 627, Coal and Overburden/Interburden Characteristics. Based on analyses of coal, roof, and floor samples, in a washability study, overall sulfur content is moderate to low with organic sulfur as the dominant form. Buffering capacity is relatively high due to the presence of significant quantities of calcium carbonate. Consequently, the overall acid-producing potential from this mine is low. Similarly, chemical analyses indicate low concentrations of most potentially toxic components, including a low alkalinity potential.

Available analysis results for existing surficial mine waste and stockpiles, which have been in place a number of years and have had ample opportunity to weather and oxidize, offers an expanded and probably more accurate perspective of potential water quality impacts than chemical analysis results for fresh coal, roof, and floor samples. The weathered reclaimed coal samples show no significant acid. alkaline, or toxicity potentials. Leaching of mine waste and coal refuse materials has the potential to cause a shift in the ground water chemical type towards a sodium sulfate water type and may also cause minor increases (quantify) in concentrations of iron, manganese, and TDS.

With reference to the potential impacts of surface coal placement on ground water quantity and quality, similar considerations apply to coal stockpiling in the mine, process, and loadout areas. Stockpile areas will be constructed to provide effective drainage of both runoff from stockpile surfaces and infiltration through coal stockpiles. Runoff from stockpile areas will be collected and routed to nearby sedimentation ponds. CR will also limit stockpiled coal inventory for operational and environmental reasons.

Limited inventory results in rapid stockpile turnover, which minimizes the potential for weathering or leaching of coal materials.

Retention of Drainage in Sedimentation Pond Structures

CR will utilize a single sedimentation pond and associated drainage structures to intercept and route runoff from disturbed areas, retain runoff for sediment control, and to control discharges to stream drainages. Map 23, Drainage and Sediment Control Plan – Undisturbed Drainage Areas, Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas, and Map 25,

Sedimentation Pond 1 – Section and Details, provide information related to the identification and control of surface water runoff. The regional drainage basins identify those undisturbed areas not tributary to the mining operation and their discharge locations. The drainage and sediment control plan provides specific ditch, culvert, erosion control, and pond design information and locations used to controls runoff within the active surface mining area. Operation of the sedimentation pond has some limited potential to affect both ground water quantity and quality by altering the timing and volume of discharge flows, providing additional recharge to alluvial/colluvial ground water systems, causing changes in water chemistry, increasing TDS levels, decreasing TSS levels and increasing the concentrations of specific mineral components.

Disturbed area runoff flowing into the sedimentation pond will be retained to allow suspended sediment to settle out prior to discharge to the downstream natural drainage. During the time that water is retained in the sedimentation structure, some evaporation will occur, resulting in reduction of overall water volume and inherently increasing concentrations of TDS and individual chemical constituents. Since the proposed sedimentation pond is located in lowland areas, any infiltration losses through the bottom of the ponds will have similar effects on surface discharge volumes and chemical characteristics. Any changes in surface water quality or chemistry have the potential to effect groundwater resources since surface flows are a component of the limited down-gradient groundwater recharge.

Effects of evaporation will be minimized by limiting detention time in the sedimentation structure to that interval required for effective reduction of suspended solids. Because runoff typically occurs only in response to snowmelt and major storm events, evaporation will be further limited by cold temperature during spring when the majority of snowmelt occurs. Pond design, as outlined in Exhibit 16, Runoff Control Design Details, provide for both minimal detention times and effective pond routing so any delay in discharge to the receiving drainages will be limited to the maximum detention time of 24 hours. With pond routing, discharge will occur continuously once the water reaches the discharge orifice and 25-Year overflow discharge elevation so effects on downstream flows will likewise be minimal.

Infiltration will similarly be limited by minimal detention times, by compaction of the pond base during construction, and accumulations of fine suspended solids which tend to further limit overall base permeability. Both TSS, and TDS and various chemical constituents tend to accumulate in the sediment in the bottom of sedimentation ponds due to natural settling and chemical precipitation. Regular periodic removal of sediment accumulations from the sedimentation ponds will eliminate a significant source of concentrated TDS and other constituents, minimizing TDS and chemical buildup. CR will monitor sedimentation pond discharge in order to detect any significant changes in surface water quality. If significant changes are noted, CR may, with consultation from the UDOGM, develop and implement appropriate water treatment plans.

Upon completion of mining, all mine disturbance areas will be reclaimed. Reclamation and establishment of effective vegetative cover will minimize disturbed area runoff to the sedimentation pond, limiting potential effects of surface leaching and evaporation. Reclamation will also result in restoration of natural drainage and direct discharge to the receiving drainages once the sedimentation pond is removed at the end of the extended liability period. Given this consideration, any potential ground water impacts will be both limited in scope and of a temporary nature.

R645-301-731.120 Surface Water Protection

As a surface water reservoir located adjacent to the mine surface disturbance area, special protection measures will be required relative to Scofield Reservoir to prevent or mitigate potential adverse impacts on associated hydrologic, aquatic, fisheries, and riparian habitat and resource values. It is important to note that Mud Creek, the major perennial surface water drainage, does not come into direct contact with any portion of the mine permit area. Surface runoff from mined or disturbed areas are not directly tributary to Mud Creek, but are tributary to Scofield Reservoir. The existing Scofield Reservoir and the associated environmental conditions and values reflect the effects of the previous historic disturbance.

Specific protection measures to be implemented for Scofield Reservoir within and adjacent to the surface facilities area will include establishment and maintenance of runoff control ditches and culverts, grading of surface disturbed areas, the installation of erosion protection in appropriate ditches and hillslopes, and the construction of a runoff control sedimentation pond. Scofield Reservoir will be protected from direct or indirect mining construction, operation, and maintenance or impacts via an effective drainage and sediment control system.

Mapping of Hydrologic Resource Protection Information

Information presented on mapping included within this permit addresses hydrologic protection issues including:

- Receiving surface water drainages
- Diversion, collection, treatment, storage, and discharge facilities and structures
- Water monitoring locations and elevations
- The proposed sedimentation pond impoundment and coal processing waste embankments
- Cross-sections for sedimentation ponds, impoundments, and coal processing waste embankments

CR has incorporated specific control and mitigation measures in the proposed mining, processing, and reclamation plans to effectively prevent or minimize significant mining related impacts on surface water quantity and quality. Surface water systems will be protected by limiting surface disturbance; controlling surface runoff and erosion; handling earth materials, any ground water discharges, and runoff in a manner that minimizes the formation of acidic or toxic drainage, prevents additional contributions of suspended solids to stream flow outside of the permit area, and otherwise prevents pollution of surface water. Surface water treatment facilities needed to protect surface water are not anticipated.

CR's mining operations and related activities have the potential to effect surface water quantity through modification of surface runoff characteristics and increased sediment contributions from surface disturbance areas; consumptive use of surface water for mining and processing operations; and discharge of sediment and other potential pollutants from mining related surface activities. Mining and related operations may also effect surface water quality by modifying surface water chemistry, altering pH, and increasing concentrations of TSS, TDS, and specific chemical constituents. Specific activities which may potentially impact surface water quantity and quality include the following:

- Removal of vegetation and soil materials from disturbance areas
- Surface placement of coal

- Mine water supply withdrawals
- Operation of drainage and sediment control structures

Operational measures that will be implemented to mitigate these impacts are discussed below.

Removal of Vegetation and Soil Materials from Disturbance Areas

In order to conserve available soil resources, vegetation and soil materials will be removed from all mine facilities areas prior to disturbance. While beneficial in terms of soil conservation and provision of a suitable growth medium to support final reclamation and revegetation efforts, this practice exposes underlying materials to potential erosion and loss, can increase suspended sediment levels in the runoff water, and may increase sediment contributions to area drainages. To maintain effective surface drainage, mitigate erosion, prevent loss of surficial materials, and minimize additional contributions of suspended solids to area drainages CR will route undisturbed drainage around disturbance areas, grade and stabilize disturbed areas to provide for effective drainage control, establish a drainage and sediment control network to collect and retain runoff from disturbed areas, reclaim disturbance areas as soon as operationally practical, and utilize other specific localized drainage and erosion control methods as necessary. These activities are discussed further in the following sections.

In conjunction with mine development, facility installation, and ongoing coal refuse placement, CR will grade, stabilize, and maintain all disturbed areas to provide for effective drainage and minimize potential erosion. Where appropriate, CR will utilize localized grading and stabilization measures to effectively control and route drainage and minimize flow velocities. Examples would include graveled surfaces and the yard area drainage system in the mine facilities area; temporary sumps and ditches in active coal refuse placement areas; and the placement of drainage control berms which will isolate disturbed area drainage in the Kinney Mine loadout area.

Localized drainage control and grading measures will be supplemented by CR's drainage and sediment control network. This network consists of diversion ditches which route undisturbed runoff around or through disturbance areas, collection ditches which intercept disturbed area runoff and route it to the sedimentation pond, the sedimentation pond, and associated discharge structures. Design information and calculations are provided in Map 23, Drainage and Sediment Control Plan Map – Undisturbed Drainage Areas, Map 24, Drainage and Sediment Control Plan Map – Disturbed Drainage Areas, Map 25, Sedimentation Pond 1 – Section and Details, and by Exhibit 16, Runoff Control Design Details. Design details regarding runoff hydrology, ditches, culverts, energy dissipation, and the sedimentation pond are included within Exhibit 16, Runoff Control Design Details. The drainage and sedimentation control network will collect and retain disturbed area runoff allowing settlement of suspended solids and any necessary treatment prior to release to natural drainages. The sedimentation pond will be operated under applicable provisions of CR's UPDES discharge permit. Compliance with the terms of these permits will assure that downstream water quality impacts are minimized.

Basic components of the drainage and sediment control plan follow:

- Undisturbed area runoff within the main drainage channel located toward the south end of the operation area will be conveyed beneath the mine surface facilities and across Highway 96 via culvert UDC-1.

- Undisturbed area runoff control ditches (UDD-1 and UDD-2) located along the eastern edge of the disturbed area is part of a property access road constructed for the property owner. A check of the road cross section shows that discharges from the up-gradient undisturbed area can be safely conveyed to a culvert (UDC-2) that conveys the undisturbed area runoff beneath the mine site to an existing 36" culvert located beneath Highway 96. Water conveyed beneath Highway 96 is then discharged onto an energy dissipation pad before continuing toward Scofield Reservoir.

- A series of operation pads and runoff control ditches and culverts. In general terms, storm water tributary to each operation pad is controlled and directed to the back of the pad, then conveyed toward a runoff ditch or culvert which in turn conveys the water to a downstream pad, ditch, or culvert. Specifics related to each runoff segment and any variances follow. A visual reference for the runoff system described is shown on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas.

- Portal Pad (Pad A) runoff flows to ditch DA-1, to the Coal Pile Pad (Pad B). Water enters culvert CB-1, goes beneath the coal stockpile, then enters a junction box connected to culvert CB-2. Culvert CB-2 discharges to ditch DC-2, to ditch DC-3, joins with ditch DC-4, is conveyed under the adjacent property owner access road via culvert CC-1, to ditch DC-5, then goes into Pond 1 via ditch DC-6.

- Storage Pad (Pad D) runoff combines with road ditch DD-1 and road ditch DD-2, goes through culvert CD-1, to ditch DD-3, joins with Pad D runoff, enters culvert CD-2 to Pad E and ditch DE-1, joins with road ditch DE-2, enters culvert CE-1, then enters Pond 1 via ditch DE-4.

- Office Pad (Pad F) drainage enters ditch DF-3 where it joins with road ditch DF-1 before entering culvert CF-1, joins with road ditches DF-2, goes to ditch DF-4, joins with road drainage and road ditch DF-5 via the cattle guard, goes to ditch DE-3, joins with culvert CE-1, then enters Pond 1 via ditch DE-4.

- Surface runoff flows from the small area between ditch DE-3 and the highway along the north side of the main access road P1, flows in ditch ALT C-1 into the sediment trap and then north, in the existing highway ditch. Runoff from the small area along the south side of the main access road below Pad F flows in ditch ALT B-1 into the sediment trap and then south in the existing highway ditch. This flow combines with additional flows from the topsoil stockpile area (conveyed in ditches ALT A-1 and ALT A-2 along the berm and passing through a silt fence) which are conveyed across the highway through an existing culvert.

- Topsoil stockpile areas (west of the Sediment Pond No. 1 on the west side of the highway) drainage is not enough to require ditches. Silt Fences will be installed around these stockpile areas.

- Irrigation bypass culvert IBC-1 will be installed under the topsoil stockpile area located between the highway and Pad F. The downstream culvert that historically conveyed the corresponding irrigation and runoff flows across the highway, is a 24-inch diameter pipe. The new irrigation culvert IBC-1 was conservatively designed to be a 30-inch diameter pipe. The capacity of the new 30-inch diameter culvert IBC-1 was verified for both inlet and barrel control conditions, to be greater than the capacity of the existing 24-inch diameter pipe downstream.

- Ditch and culvert design details including design criteria, flows and other appropriate information is provided in Table 18, Ditch Design Details and Table 19, Culvert Design Details. Figure 35, Pond 1 Stage-Volume Curve provides data regarding pond volume. Map 24, Drainage and Sediment Control Plan – Undisturbed Drainage Areas and Map 26, Drainage and Sediment Control Plan – Disturbed Drainage Sub Basins, have been prepared to show runoff drainage areas represented in Table 19, Culvert Design Details.

All areas disturbed by mining and related operations will be reclaimed as soon as operationally practical following completion of mining. Reclamation will involve removal of mine structures and facilities, backfilling and regrading disturbance areas, replacement of soil and substitute materials, and revegetation. These activities are designed to re-establish drainage patterns similar to those which existed prior to development of the Kinney Mine and develop a self-sustaining vegetative community. As a result of effective reclamation, infiltration and runoff relationships will be restored, limiting the time interval over which water quality impacts may occur. Where appropriate, CR will utilize drainage control measures to prevent or mitigate potential impacts from ongoing operations. Such measures may include use of surface binders and dust suppressions agents on haulage roads, soil/substitute stockpiles, and in active working areas the placement of straw bales, sediment fence, erosion netting, mulch berms, stilling basins, sumps and other small structures to control and route drainage, limit surface erosion, minimize flow velocities, and reduce suspended sediment levels.

Surface Placement of Coal, Mine Waste

Surface placement of coal, mine waste, may effect surface water quantity and quality in several ways. Surface runoff from the related disturbance areas may increase resulting in increased erosion and sediment loss, and surface flows may infiltrate through stockpiled materials generating leachate with both sediment laden runoff and leachate potentially discharging to surface drainages. Although believed to be of minimal impact, Leachate not collected by an underdrain system may impact ground water, which may later discharge to the sedimentation pond or to the alluvial/colluvial aquifer.

Coal stockpile areas will be constructed to provide effective drainage of both runoff from stockpile surfaces and infiltration through coal stockpiles. Designed ditches will collect and route runoff from coal stockpile areas to the sedimentation pond. The locations of the designed ditches and sedimentation pond on disturbed mine areas are shown on Map 24, Drainage and Sediment Control Plan Map – Disturbed Drainage Areas, Map 25, Sedimentation Pond 1 – Section and Details, and detailed design calculations are presented in Exhibit 16, Runoff Control Design Details. CR will also limit stockpiled coal inventory for operational and environmental reasons. Limited inventory results in rapid stockpile turnover, which minimizes the potential for weathering or leaching of coal materials.

Operation of the sedimentation pond for the coal stockpile area under CR's UPDES permits will assure compliance with applicable water quality regulations and effectively mitigate any potential surface water quality impacts.

Coal stockpile areas will be reclaimed as soon as operationally practical after they are no longer required to support ongoing mining and related operations. The initial step in reclamation of coal stockpile areas will involve removal of stockpiled coal materials and any associated structures. Subsequent reclamation of the coal stockpile area will involve removal, re-grading of the disturbance areas to the final design configuration, replacement of soil and substitute materials, and re-vegetation. These activities are designed to establish effective

surface drainage, stabilize the affected areas, and develop a self-sustaining vegetative community.

Discharge of Mine Water to Surface Drainages

No surface discharge of mine water is anticipated. Direct and/or indirect drainage from any perched aquifers intercepted by fractures may serve as potential sources of ground water inflow to the Kinney Mine workings. In order to facilitate ongoing mining operations and assure safe operating conditions, CR will collect any significant mine inflows and transfer the resulting mine drainage to either abandoned mining areas or temporary underground storage areas. If sufficient quantities of mine drainage are available, stored mine drainage will be utilized to supplement the operational mine water supply. Plans for handling mine drainage are described in R645-301-521 - 531, General Description of Mine Plans, Mining Methods, and Related Design Requirements.

TABLE 18 - Ditch Design Details

Drainage Ditch	10yr-6hr Design Flow	Side Slope		Ditch Slope		Manning's n	Max Velocity	Flow Depth	Freeboard	Minimum Ditch Depth[1]	Bottom Width	Top Width	Riprap D_{50}[2]	Grout
	(cfs)	m1 (H:1)	m2 (H:1)	Max (%)	Min (%)		(fps)	(ft)	(ft)	(ft)	(ft)	(ft)	(inches)	(yes/no)
DA-1	0.6	2	2	14.0	5.0	0.02	6.64	0.32	0.48	0.8	0.0	3.2	0.25	Yes
DC-1	1.0	2	2	0.5	0.5	0.02	1.90	0.32	0.48	0.8	1.0	4.2	n/a	No
DC-2	2.9	2	2	15.0	0.6	0.02	8.68	0.52	0.48	1.0	1.0	5.0	0.25	Yes
DC-3	2.9	2	2	0.8	0.8	0.02	3.05	0.48	0.52	1.0	1.0	5.0	n/a	No
DC-4	1.0	2	2	9.3	9.3	0.02	5.86	0.29	0.51	0.8	0.0	3.2	0.25	Yes
DC-5	2.9	2	2	0.8	0.8	0.02	3.01	0.49	0.51	1.0	1.0	5.0	0.25	Yes
DC-6	3.5	2	2	12.3	12.3	0.02	8.88	0.44	0.46	0.9	0.0	3.6	0.25	Yes
DD-1	0.2	2	2	3.8	3.8	0.02	2.8	0.19	0.51	0.7	0.0	2.8	n/a	No
DD-2	0.2	2	2	13.0	13.0	0.02	4.44	0.15	0.55	0.7	0.0	2.8	0.25	Yes
DD-3	0.3	2	2	3.8	3.8	0.02	3.10	0.22	0.48	0.7	0.0	2.8	n/a	No
DE-1	0.6	2	2	0.9	0.9	0.02	2.15	0.37	0.53	0.9	0.0	3.6	n/a	No
DE-2	0.2	2	2	2.0	2.0	0.02	2.18	0.21	0.49	0.7	0.0	2.8	n/a	No
DE-3	4.1	2	2	1.0	1.0	0.02	2.55	0.53	0.47	1.0	2.0	6.0	n/a	No
DE-4	4.2	2	2	1.0	1.0	0.02	2.57	0.53	0.47	1.0	2.0	6.0	n/a	No
DF-1	0.4	2	2	14.3	3.3	0.02	5.47	0.25	0.55	0.8	0.0	3.2	0.25	Yes
DF-2	0.4	2	2	6.1	6.1	0.02	3.97	0.22	0.48	0.7	0.0	2.8	n/a	No
DF-3	1.3	2	2	10.0	10.0	0.02	6.42	0.32	0.48	0.8	0.0	3.2	0.25	Yes
DF-4	1.7	2	2	5.7	5.7	0.02	5.56	0.39	0.51	0.9	0.0	3.6	0.25	Yes
DF-5	1.7	2	2	5.7	5.7	0.02	5.56	0.39	0.51	0.9	0.0	3.6	0.25	Yes
ALT A-1	0.4	2	2	4.7	4.7	0.02	3.60	0.24	0.56	0.8	0.0	3.0	n/a	No
ALT A-2	0.4	2	2	4.7	4.7	0.02	3.60	0.24	0.56	0.8	0.0	3.0	n/a	No
ALT B-1	0.2	2	2	14.3	5.3	0.02	4.60	0.18	0.52	0.7	0.0	2.7	0.25	Yes
ALT C-1	0.2	2	2	14.3	5.3	0.02	4.60	0.18	0.52	0.7	0.0	2.7	0.25	Yes
UDD-1	9.4[3]	50	4	7.0	7.0	0.02	5.18	0.26	0.00	0.26	0.0	15.0	n/a	n/a
UDD-2	9.4[3]	50	4	7.0	7.0	0.02	5.18	0.26	0.00	0.26	0.0	15.0	n/a	n/a

1 - Includes 0.5 foot freeboard.
2 - Maximum riprap size is 1.5 times D_{50}. All Riprap to be installed over 1.0 foot Type II Granular Filter.
3 - 100 Year, 6 Hour runoff.

TABLE 19 - Culvert Design Details

Culvert	Tributary Sub-Basins[1]	Area (acre)	Weighted CN	Peak Flow (CFS)	Total Design Flow (CFS)	Diameter (in)
CB-1	A1	4.09	83	0.9	2.0	18
	B1	3.50	86	1.1		
CB-2	A1	4.09	83	0.9	2.0	18
	B1	3.50	86	1.1		
CC-1	A1	4.09	83	0.9	2.9	18
	B1	3.50	86	1.1		
	C1	4.18	84	1.0		
CD-1	D2	1.97	79	0.2	0.4	18
	D3	1.34	80	0.2		
CD-2	D1	2.79	81	0.3	0.6	18
	D2	1.97	79	0.2		
	D3	1.34	80	0.2		
CE-1	D1	2.79	81	0.3	2.4	18
	D2	1.97	79	0.2		
	D3	1.34	80	0.2		
	E1	4.44	88	1.6		
	E2	1.68	82	0.2		
CF-1	F1	3.72	87	1.3	1.7	18
	F2	1.27	85	0.4		
UDC-1	UDC-1	99.37	75	14.3	14.3	30
UDC-2	UDD-1, UDD-2	64.96	75	9.4	9.4	24
CP-1	Pond 1 100 Yr, 6 Hr Discharge			22.5	22.5	24
CP-2	UDD-1, UDD-2	64.96	75	9.4	33.8	42
	Pond 1 100 Yr, 6 Hr Discharge			22.5		
	G1	4.56	78	1.9		
IBC-1[2]	N/A	N/A	N/A	N/A	10.4	30

1 - See Map 23, Drainage and Sediment Control Plan – Undisturbed Drainage Areas, and Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Sub Basins.

2 - Conservatively designed according to the capacity of the existing 24-inch diameter pipe crossing the highway and checked to verify adequacy under both inlet and barrel control conditions (see calculations in Exhibit 16 – Ditches and Culverts)

Based on preliminary estimates of anticipated mine inflow volumes and mine water use requirements, it is anticipated that all mine inflows can be either recycled through the operational mine water system or stored underground. The previous discussion in R645-301-731.110 - 112, Ground Water Protection Measures, indicated that based on available sampling data mine water, no mine water discharges are expected. If it becomes necessary to discharge any excess mine drainage to the surface, a revision to the mine permit will be made and coordinated with the Division.

Mine Water Supply Withdrawals

Mining, related coal processing operations, and support activities will require a consistent water supply with adequate capacity to meet all operational mine water supply requirements. Potable and sanitary water requirements will be provided through a water supply connection to the existing Scofield Town water system located adjacent to the mine site. Mine water requirements will be supplied from Scofield Town via Mud Creek, and from possible water sources encountered during mining, which are anticipated to be small.

Recycling of in-mine drainage to supplement the operational mine water system will help reduce water supply requirements. Dependent on the actual rate of mine inflows, mine drainage could provide the water required for dust control applications in the underground operations. CR plans to construct a surface mine water storage tank and may be able to develop additional mine water storage capacity in inactive areas of the underground mine workings. This storage capacity may be utilized to good advantage during seasonal low flow periods to limit required stream withdrawals. CR's existing water rights provide additional water supply capacity beyond that acquired from Scofield Town.

Coal Preparation Activities

No coal preparation activities are planned.

Operation of Drainage and Sediment Control Structures

The Kinney Mine drainage and sediment control network is designed to function as the primary mitigation system to prevent significant impacts on surface water quality. Operation of the sedimentation pond may, however, result in some delay in water discharge to the receiving drainages potentially altering discharge volume and consequently streamflow entering Scofield Reservoir, and may increase concentrations of TDS and other constituents in the runoff retained in the pond due to evaporation. Both delays in discharge and potential evaporative effects and related mitigation considerations were previously discussed in R645-301-731.110 - 1124.7.2.1, Ground Water Protection Measures. Significant overall increases in TDS and other chemical constituents for the receiving drainages are not expected because runoff volumes from disturbed areas will be limited by upstream diversion of undisturbed drainage, surface disturbance areas will be of limited size, and reclamation of disturbance areas will be occurring. CR will monitor all discharges from the sedimentation structure to ensure compliance with UPDES requirements. If problems are noted with TDS or any other discharge constituent, CR will coordinate with the regulatory agency regarding acceptable solutions to effectively control and mitigate the problems.

Mine disturbance areas will be reclaimed on completion of mining or when they are no longer required to support ongoing mining and related operations. Reclamation, re-establishment of vegetative cover, and restoration of effective surface drainage will minimize disturbed area

runoff to the sedimentation pond, limiting the potential effects of surface leaching and evaporation. Restoration of natural drainage and direct discharge to the receiving drainages once the sedimentation pond is removed at the end of the extended liability period will effectively eliminate any potential surface water impacts related to the sedimentation pond.

R645-301-731.200 Water Monitoring

CR currently maintains, and will continue, a program to monitor surface and groundwater quality and quantity for the duration of the proposed mining, processing, and reclamation operations. The Hydrologic Monitoring Plan consists of monitoring stations identified in Table 6, Kinney Mine Baseline Monitoring Stations, and Table 7, Kinney Mine Operational Monitoring Stations, according to the parameter sampling schedule shown in Table 20, Hydrologic Monitoring Schedule. Baseline monitoring has been conducted on a monthly basis and quarterly basis. Operational monitoring is planned to be conducted on a quarterly basis as follows.

Samples will be collected quarterly for parameters shown in Table 20, Hydrologic Monitoring Schedule, for all surface and ground water stations when the sites are accessible. At some sampling sites, winter conditions may create inaccessible or unsafe conditions. To help ensure as complete a data set as possible, first and fourth quarter samples will be collected during the time periods wherein there is the greatest likelihood of collecting a valid sample. This is believed to be in March and October respectively. Second and third quarter samples will be collected at a convenient time for the mine operator within the respective quarter.

The monitoring program thus instated serves as an integral part of CR's efforts to protect the hydrologic balance by providing an accurate and timely method of identifying and quantifying any possible concerns with respect to surface and ground water resources. The monitoring network is shown on Map 28, Surface and Ground Water Monitoring Sites. Table 6, Kinney # 2 Mine Baseline Monitoring Stations, and Table 7, Kinney # 2 Mine Operational Monitoring Stations, when combined with Map 28, summarizes the type and location of monitoring sites. The frequency, density and accuracy of monitoring will allow CR to evaluate and determine the success of mine plans, drainage and sediment control facilities, and reclamation for the purpose of minimizing disturbance to the hydrologic balance. The monitoring data and resulting evaluations will be used to identify any potential problems and develop necessary mitigation measures.

Hydrologic information submitted in R645-301-711- 727 of this permit application includes an identification of surface drainages and general flow characteristics, modeling of corresponding peak flows and annual runoff volumes, identification of ground water aquifers, and a general description of aquifer characteristics including ground water levels, movements, and recharge/discharge/storage characteristics.

The Hydrologic Monitoring Plan for the Kinney Mine provides for a frequency and distribution of both baseline and operational monitoring data collection adequate to identify and document baseline conditions and trends and fluctuations in the quantity and quality of surface water, the level and quality of ground water, and the overall effects of mining and reclamation activities on the hydrologic balance. As shown on Table 20, Hydrologic Monitoring Schedule, water quality parameters include field measurements for water level or flow, pH, specific conductance, dissolved oxygen, and temperature. Laboratory measurements include a significant list covering general water quality characteristics such as TDS, nutrients, major ions, and trace metals. Both surface and ground water quality samples will be collected, labeled and transported to a qualified analytical laboratory for analyses. Proper sample collection, preservation, handling, and storage methods will be utilized at all times to preserve the integrity of the samples and ensure validity of the analytical results.

The ongoing monitoring network consists of 10 ground water wells, some having the capability of sampling from above, within or below the mined coal seam, 3 springs, and 3 surface or stream locations. Data from one additional well (CR-06-03-ABV) was drilled as part of the mine water monitoring program and was sampled between April and September 2006. However, due to legal issues related to the well it was abandoned and is not part of the ongoing water monitoring program. In a similar fashion, monitoring from Angle Springs has been terminated due to access limitations. Each of the historic and current sampling locations are identified on Table, 6 Kinney No. 2 Mine Baseline Monitoring Stations, and on Map 28, Surface and Ground Water Monitoring Sites. The spring/seep locations and monitoring wells will be used to evaluate the occurrence of ground water and the hydraulic characteristics of the aquifers. The surface water monitoring sites will be used to evaluate the quality and quantity of surface water.

Baseline and operational monitoring will be performed for the Kinney Mine at the following frequency:

Spring - Discharge measurements, field water quality parameters, and laboratory samples were collected for Eagle and Sulfur Springs starting in May 2005 and for Aspen Spring in November 2007. Baseline data having been collected. These springs will now be monitored for operational mining parameters.

Stream Stations - Flow and field water quality parameters were measured on Mud Creek and Miller Outlet from May 2005 through June 2010. Flow and field water quality parameters were measured for Scofield Reservoir beginning in June 2006. Operational monitoring can now continue.

Monitoring Wells - Groundwater level measurements, field water quality parameters, and laboratory samples were taken following well installation and development for wells CR-06-01 and CR-06-02 beginning in March 2006. Baseline sampling for well CR-06-05 began in September 2006 and continued through May 2007 after which time operational monitoring began. Data for this site is available through June 2010. Baseline sampling of different zones within well CR-06-09 began as early as August 2006, with all three zones being sampled simultaneously beginning in October 2006. Samples for this site area also available for June 2008 through June 2010. Operational monitoring began for well CR-06-09 in July 2007. Per the Divisions request, two additional monitor wells were completed in 2010; CR-10-11 and CR-10-12. Both of these wells have been sampled twice once in July and once in August 2010. They will be picked up as part of the operational quarterly sampling program.

All water monitoring analysis results will be recorded, reviewed to identify potential problems or trends, and filed at the mine so as to be available for future inspection and review. In addition, and following initiating of development activities, CR will file copies of both field data and laboratory analysis sheets on a quarterly basis with the UDOGM. At the end of each annual year, CR will also tabulate all water monitoring data for the year, review the data with respect to changes in surface and groundwater hydrology systems, and provide a summary Annual Hydrology Report in compliance with the UDOGM schedule. CR will continue to collect and evaluate hydrologic monitoring data during the operations and reclamation phases. If the additional data resulting from ongoing hydrologic monitoring indicates that any significant changes in general baseline characterizations are appropriate or that any assumptions or projections used to evaluate potential impacts are not accurate, CR will review potential changes with UDOGM and modify any sections of the mining and reclamation permit application as appropriate to reflect necessary changes.

Following baseline monitoring, operational monitoring will be conducted for each sample location quarterly in accordance with the requirements of R645-301-731-212 and R645-301-731-223. In general, samples will be collected four times a year with one sample being taken within each quarter period. Ideally the samples will be taken in February, May, August and November. However, sample dates may be shifted one month earlier or later depending upon weather and environmental conditions. If the analysis of any surface water or groundwater sample indicates noncompliance with the permit conditions, then CR shall promptly notify the Division and

immediately implement expanded monitoring for the site in question. Expanded monitoring will include a single sample for the noncompliant parameter to be taken within 15 days of learning of the noncompliant event. The new sample will then be evaluated to determine the magnitude and seriousness of the event, and with the Division, determine whether additional sampling is warranted. If monthly monitoring is warranted, sampling of the parameter will continue until the cause is identified and rectified, appropriate action is taken to the satisfaction of the Division, or the cause is determined to be non-mine related.

Carbon resources will file for, and meet any provisions of UPDES permit(s). In addition, CR will prepare and submit quarterly UPDES compliance reports to the UDOGM and UDWQ in compliance with Part 4.05.13 (2) (ii) (b). If non-compliance with a UPDES permit effluent limitation does occur, CR will forward the analytical results concurrently with the written notification of non-compliance.

CR will continue surface and ground water monitoring activities after completion of reclamation operations to document restoration of pre-mining hydrologic characteristics. All surface and groundwater monitoring installations and associated structures and equipment will be properly installed, maintained, and operated to assure the accuracy and consistency of monitoring data. Surface water monitoring will be discontinued when untreated surface runoff meets applicable effluent limitations and the UDOGM approves removal of drainage and sediment control structures. Groundwater monitoring wells will be abandoned and removed in accordance with UDOGM guidelines following UDOGM approval to discontinue groundwater monitoring.

R645-301-731.300 Acid and Toxic Forming Materials

This topic is dealt is addressed in R645-301-624.

R645-731.500 Discharges

The Kinney mine workings will progress down dip from the outcrop area and mine drainage will be controlled during active operations so there is little or no potential for direct gravity discharge of water from the mine. The minor amounts of water encountered within the mine will be controlled underground and pumped, if necessary, to mined out areas. Upon completion of mining and related activities in-mine drainage control operations will cease and portions of the mine workings (especially the mine workings furthest down dip) may either partially or gradually fill as ground water inflows discharge to the mined-out areas. No post cessation flow is anticipated and CR will seal and backfill the mine portals. Sealing practices are discussed in R645-301-542.300 – 800 & 550 – 553.900 and 560, Reclamation Practices, and R645-301-764 - 765, Casing and Sealing of Wells and Mine Openings.

There are no plans to develop, divert, or discharge any surface water into any underground mine in conjunction with ongoing mining and reclamation operations at the Kinney Mine.

Possible alternatives for the disposal of any in-mine water encountered are 1) discharge the water into remote or abandoned mine workings, 2) request a new NPDES discharge permit for surface discharge, 3) construct shallow or deep injection wells, 4) treat and discharge the water into Mud Creek, and 5) evaporate through new ponds. The feasibility and cost associated with these alternative will be investigated in the unlikely event that mine discharges are required.

All temporary and permanent diversions within the Kinney mine and loadout areas have been designed and will be constructed to maintain effective flow under all anticipated conditions. Upon completion of mining and related activities, mine openings will be sealed and backfilled

to further preclude any potential ground water discharge or surface water inflows in mine portal areas or boreholes.

R645-301-731.600 Stream Buffer Zones

No streams requiring a buffer zone are located within the immediate or adjacent surface disturbed areas.

R645-301-731.700 Cross Sections and Maps

Hydrologic information is presented in various locations within the permit including:

R645-301-731.800 Water Rights and Replacement

As discussed in R645-301-727, Potential Impacts on Surface and Ground Water Sources, CR's mining and related operations are not expected to adversely impact any surface or ground water sources or water rights. Consequently, there is no need to explicitly address provisions for replacement of impacted water rights at this time. In the unlikely event however, that proximate contamination, diminution, or interruption does occur and can be documented as resulting from the Kinney mining and related operations, CR will mitigate the associated water rights impacts through discussion and development of a cooperative agreement with any effected water rights holder. Potential mitigation options may include but will not be limited to replacement or augmentation of effected water rights, monetary compensation, development of alternative watering facilities such as guzzlers.

The primary postmining land use in the mine, loadout, and adjacent areas will be undeveloped wildlife habitat, requiring minimal supporting water requirements. The discussions presented in R645-301-711 – 727, Hydrology Information, indicate that while surface and ground water resources are limited in those areas to be affected by the Kinney Mine operations, they will be adequate in terms of both quantity and quality to support the designated postmining land use. Given the proposed postmining use, CR currently has no plans to transfer any exploration boreholes or monitoring wells for subsequent use as water wells for the current mine plan. It is however anticipated that new ground water monitoring wells will be constructed to define subsurface conditions east of the current mine plan area in the future. Details regarding this need will be coordinated with DOGM in advance of any action.

R645-301-732 Sediment Control Measures

Sediment control measures for the Kinney Mine operations have been designed to meet or exceed all applicable State effluent limitations under the provisions of the required UPDES discharge permit. Primary long-term sediment control measures include re-grading and re-vegetating mine disturbance areas to control runoff and siltation and increase infiltration, and use of localized sediment control measures including mulching, erosion netting, sediment fences, check dams, sediment traps, straw bales and other means as appropriate. Short-term operational sediment control measures include the use of localized sediment control measures as noted above, construction of collection and diversion ditches where necessary to intercept and route runoff flows, and the use of a sedimentation pond to retain runoff and allow suspended solids to settle out prior to discharge to natural drainages. Major sediment control structures for the Kinney Mine are shown on Map 24, Drainage and Sediment Control Plan Map – Undisturbed Drainage Areas, and Map 24, Drainage and Sediment Control Plan Map – Disturbed

Drainage Areas. The runoff control pond is shown on Map 25, Sedimentation Pond 1 – Section and Details. These facilities have been designed utilizing the best technology currently available and will result in effective compliance with both the requirements of Kinney Mine's UPDES permit and all other applicable regulatory requirements.

One new sedimentation pond will provide effective sediment control for the Kinney mine facilities area. This pond is located in the northern end of the surface disturbed area east of and adjacent to Highway 96. This sedimentation pond is located as close as possible to the contributing disturbed areas and is not located within the floodplains of any perennial streams.

Complete detailed plans, calculations, and design specifications for sedimentation ponds are presented in Exhibit 16, Runoff Control Design Details. This design documentation include discussion of design methodology and assumptions, descriptions of specific drainage and sediment control structures or types of structures, hydrologic and hydraulic design calculations, and design specifications for all structures. In addition to compliance with applicable design standards and requirements under the Utah Coal Mining Regulations, the Kinney Mine sedimentation pond will be constructed, operated, and maintained to effect compliance with applicable UPDES discharge effluent standards. The pond has been designed to provide a minimum detention time of 24 hours, and longer if necessary, to meet applicable effluent limitations with respect to TSS and is sized to control pond discharge rates so that adequate detention times are maintained.

The proposed sedimentation pond has been designed to provide adequate storage for anticipated sediment accumulations from contributing drainage areas. Sediment storage calculations are conservative, reflecting the maximum anticipated disturbance acreage for each drainage area over the mine life. In addition to designing for adequate sediment storage capacity, CR will monitor the sediment level in the sedimentation pond, and as necessary to maintain adequate storage capacity, will remove accumulated sediment and dispose of it within abandoned mine sections. Sediment removal volumes will be minimal and should not have any significant effect on refuse stockpile stability, overall volume, or overall storage issues within the mine. It is anticipated that sediment removal will be only be required on an occasional basis.

As sediment removal becomes necessary, CR, in order to facilitate removal, minimize the potential for additional contributions of sediment to downstream waters, and prevent any potential adverse impacts on coal refuse stockpile stability, will schedule sediment removal during the portion of the year when sedimentation ponds are normally dry. Any water retained in the ponds at this time will be utilized for mine dust control application and pond surfaces will be allowed to dry out prior to initiation of equipment operations and sediment removal. If runoff occurs during pond cleanout, sediment removal operations will be temporarily suspended until any accumulated water can be discharged and effective operating conditions for sediment removal reestablished as described in R645-301-522, 523.100 – 220, 524.100 – 800, & 525.100 – 300, General description of Mine Plans, Mining Methods, and Related Design Requirements.

The sedimentation pond, unless otherwise required by Federal or State law, will be completely removed and effected area reclaimed upon completion of mining and related activities and restoration of contributing drainage areas. Restoration criteria include a re-vegetation success determination as described by R645-301-341.250, 300, 353.100 – 300, 356.100 – 400, & 357.100 - 300, Re-vegetation Success - Criteria and Evaluation Methods, and effective restoration of drainage characteristics such that the quality of untreated runoff from reclaimed areas is approximately equal to the quality of receiving drainages before the initiation of any mining activity as established by baseline water quality data.

Sedimentation pond reclamation will involve removal of any man-made discharge structures, removal and disposal of any riprap and bedding materials which will not be utilized in conjunction with re-establishment of postmining drainages, grading of embankment fill into pond basin areas, and re-grading associated disturbance areas to blend with surrounding reclaimed and undisturbed terrain. Replacement of soil/substitute materials and re-vegetation as described in R645-301-542.300 – 800, 500 – 553.900, & 560, Reclamation Practices, will complete pond reclamation.

As previously discussed in the introduction to this section, operational plans for the Kinney Mine include standard hydrologic controls and mitigation measures that are designed to prevent significant changes in the quantity and quality of surface and ground water resources, preserve existing hydrologic functions, comply with regulatory requirements, and limit adverse impacts to surface water or ground water users. These measures include:

- Limiting surface disturbance areas
- Proper design, construction, and grading of facilities areas and roads
- Construction, operation, and maintenance of drainage and sediment control structures to divert undisturbed runoff around disturbance areas, collect and route disturbed area runoff to sedimentation ponds to allow settlement of suspended solids, and facilitate any treatment which may be necessary
- Utilization of localized erosion control measures in any areas having high erosion potential
- Initiation of reclamation operations as soon as practical following completion of mining or when the associated facilities are no longer required to support ongoing mining and related operations
- Effective reclamation to minimize gradients, re-establish surface drainage patterns, restore pre-mining runoff and infiltration characteristics, and establish an effective and self-sustaining vegetative cover
- Post-reclamation land use management

During active operations, the designed drainage and sediment control system along with appropriate surface grading and stabilization measures will be the primary mechanism used to provide effective erosion and sediment control. A detailed discussion of this system was provided in R645-301-731.120 – 122, Surface Water Protection Measures. The locations and configuration of disturbed area drainage and sediment control structures are shown on Map 24, Drainage and Sediment Control Plan Map – Disturbed Drainage Areas, and design information and calculations are provided in Exhibit 16, Runoff Control Design Details. Because of limited surface disturbance area available for the Kinney Mine, the surface facilities have been laid out in a series of elevated pads as shown on the map.

Following completion of mining operations reclamation of surface disturbance areas, restoration of effective drainage, and revegetation as described in R645-301-511.300, 541.100 – 400, 553.500 – 524, & 553.600 - 653, Reclamation of Mining Disturbance, will be the primary means of establishing both effective short and long-term erosion and sediment control.

This section presents the climatological information and methodology used in performing a hydrologic analysis to determine runoff volumes and peak runoff discharges which were used in designing the sediment pond, drainage ditches, conveyance/by-pass culverts, and reclamation

channel.

Runoff Calculations

Discharge Rate Calculations

There are no streams that traverse the permit area. Three perennial streams however are located within ¾ to 2 1/5 miles which are tributary to Scofield Reservoir. Mud Creek is the largest and is located within the central valley area west of the proposed permit area and Long and Miller Canyons are located ¾ and 2 1/3 miles to the east. Smaller local drainages exhibit intermittent flow in response to spring snowmelt and high intensity thunderstorms. These drainages do not contribute significant quantities, or yields of stream flow to Mud Creek or Scofield Reservoir.

The USGS monitors stream flow in the area at the Mud Creek below Winter Quarters Canyon @ Scofield (USGS Station 09310700). This monitoring station is immediately downstream of the confluence of Winter Quarters Canyon and Mud Creek.

Mud Creek is the only perennial stream potentially directly tributary to the mine permit area. It is however more likely that permit area discharges will enter Scofield Reservoir directly and will not enter Mud Creek itself. Long and Miller Canyons enter Scofield Reservoir approximately 1.6 miles north of the mine site.

Flows within Miller Canyon, to which Long Canyon is tributary, and from Sulphur Spring are measured in the field utilizing flow area and velocity calculations.

All other surface water discharge rates used for ditches, culverts and the pond are calculated using standard runoff prediction modeling which utilizes the SCS Curve Number method.

Volume Calculations

Surface water volume determinations used within in the permit area for the design of the sediment pond utilizes the SCS Curve Number procedure mentioned above for flow calculations, and is reported in ac-ft/year.

Climatological Information

Precipitation depths were obtained from the Point Precipitation Frequency Estimates from National Oceanic and Atmospheric Administration (NOAA) Atlas 14 found on the NOAA website (http://hdsc.nws.noaa.gov/hdsc/pfds). This site calculates rainfall depths at various durations and return frequencies for a given location and elevation. Estimates are based on annual precipitation data from over 300 stations in Utah and over 2,000 stations in the semiarid southwest. The design rainstorm depths were taken from the NOAA website at a location approximately near the center of the proposed mine site. The design rainfall depths used in the hydrologic analysis are shown in Table 16, Design Rainfall Depths.

TABLE 16 - DESIGN RAINFALL DEPTHS

LOCATION	RETURN PERIOD	RAINFALL DEPTH (INCHES) BY DURATION	
		6-HOUR	24-HOUR
Kinney Mine	10-Year	1.28	1.92
	100-Year	2.08	2.73

Modeling Methodology

There are two ephemeral drainages located at the north and south ends of the mine permit area with no perennial drainages. These two drainages currently are conveyed under Highway 96. The south drainage will be conveyed by way of culvert UDC-1 through the mining area and under Highway 96. The north drainage will also be culverted to bypass the proposed roads and ditches without effecting the mine permit area via culvert UDC-2. Storm drainage runoff from the remaining permit area, with exception of a small area south of the main mine access road and east of Highway 96, will be captured and conveyed to a sediment pond by way a drainage collection system consisting of a series of ditches and culverts. Runoff from the small area south of the entrance will be managed using alternate sediment control methods with revegetation and silt fencing and/or straw bales. The runoff conveyance plan is shown in Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas.
In order to design the collection system ditches and culverts, hydrographs and peak runoff flows were determined. The hydrology for the mine permit area was modeled with Hydrologic Modeling Software (HEC-HMS) 3.1.0 developed by the Army Corps of Engineers using the Soil Conservation Service (SCS) curve number loss method and the SCS unit hydrograph transform method. The SCS Type II rainfall distribution was used in analyzing the storm drainage runoff which was developed by the Natural Resources Conservation Service (NRCS) for 24 hour rainfall events. A modified SCS Type II 6-hour distribution was also developed by the Soil Conservation Service and is provided in the SCS National Engineering Handbook-4 (NEH-4).

Drainage basins (also referred to as watersheds or catchments) were delineated in AutoCAD using existing and proposed elevation contour data and the location of proposed pads and storm drainage facilities. A drainage basin is an area where all rainfall or snowmelt runoff within it will collect to a common point. Each drainage basin includes one or a combination of the following three land types: hard surface pad area revegetated graded area, and natural undisturbed area.

Each basin was assigned an SCS (Soil Conservation Service) curve number. The curve number is a function of vegetative cover, hydrologic soil groups, and Antecedent Moisture Conditions (AMC). Curve numbers range from 0 to 100. Areas with high runoff rates have high curve numbers. Areas that are more pervious have lower curve numbers. Area-weighted curve numbers for each drainage basin were estimated by delineating the area of the three land types within each drainage basin and using curve numbers for the three land types obtained from the SCS NEH-4 which are 90 for the hard surface pads (C soil, hard surface, AMCII), 82 for

the revegetated graded area (C soil, 10% ground cover density, AMCII condition), and 75 for the natural undisturbed area (C soil, 20% ground cover density, AMCII condition).

Drainage basins were modeled in HEC-HMS using the SCS unit hydrograph transform method which requires a lag time t_L for each basin. Lag time is described as the time from the center of mass of rainfall excess to the peak of the runoff hydrograph. According to the SCS, the watershed lag time is equal to 0.6* t_c (Time of concentration). The time of concentration t_c, (not is defined as the time required for flow from the hydraulically most remote point in a basin to reach the basin outlet. Times of concentration and lag times were calculated for each basin within the mine permit area using the method described in SCS Technical Report55 (TR-55) which takes into account sheet flow travel time, shallow concentrated flow travel time, and channel flow travel time. A lag time for the mountain watershed tributary to UDC-1 was estimated using the method described in the publication by M.J. Simas and R.H. Hawkins called "Lag time characteristics for small watersheds in the U.S." which takes into account width, slope, and curve number of the mountain drainage basin.

R645-301-733 Impoundments

CR does not propose any permanent impoundments within the mine or loadout areas. Upon restoration of disturbed areas, the sedimentation pond will be removed and associated disturbance areas reclaimed. In addition, all reclaimed areas will be re-graded to re-establish natural drainage patterns and eliminate any significant depressions which could impound water.

As described and referenced in R645-301-526.100 – 300, 527.100 – 250, 528.100 – 322, & 529.100 - 400, Mine Structures and Facilities, all impoundments will be designed and constructed with stable perimeter side-slopes, inlets, the tops of pond embankments, and embankment outslopes will be protected against erosion by vegetation or riprap as necessary. With the exception of downstream embankment slopes, all embankment areas will drain to the impoundment basins providing inherent sediment control. Runoff from downstream embankment slopes will be effectively limited by the semi-arid climate, minimal slope angles, and re-vegetation so that no additional sediment control will be necessary.

CR has developed a pond maintenance program designed to assure continued safe and effective operation of the Sediment Detention pond and surface water control system. The sedimentation pond will be inspected at regular intervals during construction and on completion of construction by a professional engineer or specialist experienced in impoundment construction. An impoundment inspection report certified by a Registered Professional Engineer will be provided to UDOGM promptly following each inspection. The report will verify construction in accordance with design plans and will note and discuss any apparent instability, structural weakness, or other hazardous conditions. A copy of the report will be retained on file at the mine site for inspection by authorized agency representatives.

Operation and Maintenance

Operation and maintenance of drainage and sedimentation control structures will involve periodic inspection of all ditches and culverts, quarterly inspection and annual certification of the impoundment and related structures, ongoing discharge monitoring for the impoundment, and any necessary maintenance or repair of problems noted during the inspections.

CR's ditch inspection and maintenance procedures will focus on identification and repair of any

significant ditch erosion, removal of any trash or debris from ditches, and maintenance of an adequate cross-sectional flow area, regardless of actual ditch configuration, to pass the design flows. In practice this will mean that CR will not modify, recut, or clean out a ditch simply because the physical ditch dimensions are not the same as the original design or originally constructed configuration so long as the actual ditch configuration is adequate to pass the design flow. Since the ditches and culverts have been designed to a larger runoff event than is required by UDOGM regulations, there is excess capacity in the ditches and culverts. This approach allows for some siltation, and erosion without affecting the capacity of the ditches and culverts to carry the regulatory required flow. Culvert maintenance will involve removal of trash or debris from culvert inlets and any upgradient debris fences, repair of any significant erosion at culvert inlets, outlets, or of the cover material, and repair or replacement of any damaged culverts.

Sedimentation pond maintenance and operation procedures will include ongoing sampling and discharge monitoring under applicable provisions of a UDWQ permit; quarterly inspections of pond embankments, impoundment areas, discharge structures, and inlet/outlet structures and areas and reporting; notification of any hazardous conditions and development of emergency remedial control measures; maintenance or repair of any problems noted during the inspections; and the periodic removal of accumulated sediment. The sedimentation pond has been designed and will be operated and maintained to effectively retain storm runoff to allow settlement of suspended solids prior to discharge. Control of potential water quality impacts from pond discharge is monitored through compliance with applicable effluent standards under a UDWQ discharge permit. Effluent sampling and reporting will occur as outlined in R645-301-731.200 - 225, Water Monitoring Plan, and under the provisions of the UPDES permit in Exhibit 4, Other Permits, UPDES Permit.

The sedimentation pond will be inspected quarterly by a qualified person for any indication of structural weakness or other hazardous condition, instability, and any erosion or other problems; the depth and elevation of any impounded water will be measured; based on the depth measurements storage capacity will be estimated; and any required structural monitoring will be performed. Copies of the quarterly inspection reports discussing each of the noted inspection categories and verifying that the pond has been constructed and maintained as designed will be prepared, certified by a qualified Registered Professional Engineer, and submitted promptly to UDOGM. Copies of the inspection reports will also be maintained on file at the minesite. Any minor problems noted during the inspection will be addressed in a timely manner. This may involve repair of any minor localized erosion, clean-out or minor repair of discharge structures, reseeding of embankment slopes, mowing weeds which may interfere with pond inspection, or other minor maintenance and repair as necessary. If the inspection identifies any structural weakness or other conditions which could pose a hazard to the public, the person who conducted the inspection will notify UDOGM promptly of the hazardous condition and any emergency procedures which may be appropriate to protect the public and address the hazardous condition. In consultation with and with approval from UDOGM, appropriate remedial measures will be implemented as soon as is reasonably practicable to address any hazardous condition.

CR has no plans for future construction of any additional ponds beyond that addressed in this mining and reclamation plan submittal. If changes in mine plans or effected areas dictate the necessity for additional sedimentation control structures, CR will evaluate requirements, complete the necessary designs, and submit the designs as technical revisions to the approved permit for UDOGM review and approval prior to initiating any construction work.

R645-301-735 Disposal of Excess Spoil

As described in R645-301-521, 522, 523.100 – 220, 524.100 – 800 & 525.100 - 300, Engineering Designs and Operating Plans, mining and related operations will not result in the generation of any excess spoil and, in fact, reclamation activities will be limited to backfilling and re-contouring utilizing the limited spoil materials available on the site. Plans for handling and disposal of non-coal wastes are presented in R645-301-526.100 – 300, 527.100 – 250, 528.100 – 322, & 529.100 - 400, Mine Structures and Facilities, under the subheading of Noncoal Waste Disposal. The specific handling and disposal methods described in the referenced permit sections will effectively protect ground and surface water resources by minimizing the potential for pollution or contamination from placement and handling of waste materials generated by mining and related operations.

R645-301-736 Coal Mine Waste & Underground Development Waste

Mine Development Rock

Mine development, ongoing mining operations, and ancillary operations such as development of overcasts for mine ventilation and coal haulage will result in production of mine development rock including carbonaceous shale, weathered coal, floor clay, and parting material. Where it is operationally feasible to separate these material from the coal during development and mining, the mine development rock will be removed and handled separately from the coal. Where separation is not operationally feasible, mine development rock will be handled with the coal and will be removed in the surface facilities, separated from the coal product and temporarily stockpiled until it can be returned to the mine as discussed previously.

Generally, the same mining equipment and haulage systems used for coal production will be used to remove and handle mine development rock. Continuous miners, electric shuttle cars, and LHD scoops may be used to load and haul mine waste to the mine conveyor system. Normally mine development rock haulage will occur on a scheduled rock handling shift when the conveyor belt system will be cleared of coal. Typically, any development rock produced during periods other than on a scheduled development rock handling shift will be temporarily stockpiled in an inactive area underground for later handling and haulage from the mine. Once the mine rock is placed on a belt at the loading point, it will be transferred to the main haulage belt running from the mine. From the main haulage belt, the mine rock will transfer to the surface coal haulage system which will carry the rock to the primary usher building.

The surface coal haulage system has been designed to facilitate mine development rock handling in two ways:
One; The stacking tube at the off spec coal stockpile can be emptied by a direct feed chute in its base allowing rock to bypass the coal stockpile and feed directly to Conveyor SB-3. In the primary crusher building a flop-gate and diversion chute will allow mine development rock to bypass the primary crusher and feed directly to the truck loadout where it can be transported to a segregated location on the off speck coal pile prior to returning the rock to the mine.
Two; Development rock may simply be dumped onto the off spec coal pile, via the flop gate

atop the stacking tube, if circumstances are favorable. That is, if there is sufficient rock volume to warrant temporarily converting the entire off spec coal pile to a temporary development rock storage pile prior to returning the rock to the mine.

R645-301-737 Noncoal Mine Waste

Plans for handling and disposal of non-coal wastes are presented in Chapter 5, Engineering Design and Operations Plans Noncoal Waste Disposal, and to follow. The specific handling and disposal methods described in the referenced permit sections will effectively protect ground and surface water resources by minimizing the potential for pollution or contamination from placement and handling of waste materials generated by mining and related operations.

Noncoal Waste Disposal

Noncoal wastes generated in conjunction with mining and related activities will including but not limited to used oil and lubricants, garbage, paper waste, machinery parts, tires, cable, wood waste, and other miscellaneous debris. All smaller noncoal solid wastes will be collected and stored in dumpsters or similar closed containers. Larger solid waste materials including such items as used equipment, machinery parts, tires, and cable will be temporarily stored in designated sap yards located in areas as shown on Map 13, Surface Facilities Map. Dumpsters will be located primarily near buildings during mine operations, however, during construction they may be located throughout the disturbed area. Used oil will be handled according to Utah State and EPA requirements. Any waste other used oil and lubricants and any used oil not meeting the applicable EPA requirements will be collected and stored in either closed drums or in the waste oil storage tank located in the maintenance shop building. Temporary storage areas for used oil and lubricants will provide full containment to prevent accidental release of petroleum products to the surface drainage system.

CR does not currently plan or anticipate that any materials classified as "hazardous waste" will be utilized or generated in conjunction with the proposed mining and related operations. In the unlikely event that hazardous materials storage or disposal become necessary, CR will comply with all applicable storage, labeling, and documentation requirements, and disposal will occur off-site at a licensed hazardous waste disposal facility.

A contract disposal service will regularly collect and haul the noncoal solid wastes from the dumpsters to the permitted Carbon County municipal landfill, or to the East Carbon Development Corporation (ECDC) facility. Dependent on the market for sap materials, the larger noncoal solid waste and sap will be collected periodically either by a salvage contractor for salvage and recycling or by a contract disposal firm which will haul these material off-site and dispose of it in a suitable disposal site. Any used oil, lubricants, or other potentially combustible materials will be collected and either recycled or disposed of by a licensed disposal contractor in accordance with all applicable Utah and EPA regulations. No noncoal wastes will be disposed of on site during active operations.

R645-301-738 Temporary Casing and Sealing of Wells

All exploration boreholes and any boreholes which have been converted to monitoring wells following completion of drilling within the Kinney Mine permit area will be plugged and sealed during mining reclamation. In the case of the boreholes, plugging and sealing will occur as soon

as drilling, sampling, and logging operations are completed. In the case of monitoring wells, the wells will be plugged and sealed when no longer needed for ongoing ground water monitoring. Standardized procedures for plugging and sealing are detailed in R645-301-631 – 631.200, & 641, Casing and Sealing Exploration Holes and Boreholes. Measures to plug and seal boreholes and water monitoring wells will minimize the potential for mixing of surface and ground water sources and will also limit the potential for communication and mixing between various but locally limited ground water aquifers.

R645-301-740 Design Criteria and Plans

This section presents detailed information on the design standards and requirements which have been or will be utilized in the design, construction, operation, maintenance, and reclamation of drainage and sediment control structures and facilities for disturbed and undisturbed areas.

R645-301-742 Sediment Control Measures

CR has designed and will construct, operate, and maintain drainage and sediment control structures to minimize erosion, control surface runoff, and prevent, to the extent possible, increased contributions of suspended solids to area drainages. By effectively accomplishing these objectives CR will also effect full compliance with all applicable discharge effluent limitations under any required UPDES discharge permit(s). Discussions of drainage and sediment control practices are presented in R645-301-521, General Description of Mine Construction and Development Activities and in R645-301-526.100 – 300, 527.100 – 250, 528.100 – 322, and 529.100 - 400, Mine Structures and Facilities, under the subheading of Drainage and Sediment Control Structures. In addition, a description of design methodology and all design calculations for drainage and sediment control structures to be constructed in the mine facilities area are presented in Exhibit 16, Runoff Control Design Details.

During construction, active mining operations, and reclamation, drainage from all disturbance areas will be effectively controlled by the drainage and sediment control network. To the extent reasonably feasible, runoff from undisturbed areas will be diverted and routed around the effected areas, and all disturbed area runoff will be intercepted and routed to a sedimentation pond except for the small area south of the main mine access road where alternate sediment control measures will be utilized. Operation of the drainage and sediment control network will effectively control disturbed area runoff and retain sediment from disturbed area runoff within mine disturbance areas. In addition to the engineered drainage and sediment control structures site specific drainage control and surface stabilization measures will be utilized on an as needed basis. These may include the use of temporary berms, straw bales, mulch, sediment traps, vegetative filters, silt fence, and other appropriate drainage localized drainage and sediment control measures.

Upon completion of mining and related activities, all disturbance areas will be reclaimed, with reclamation activities designed to restore drainage conditions and land use capabilities comparable to those existing prior to the Kinney mining related disturbance. Disturbance areas will be backfilled where necessary and re-graded to establish an undulating configuration with relatively short gradual slopes which will blend with surrounding undisturbed terrain. Re-graded surfaces will be left in a roughened condition to limit runoff and provide for an effective bond between the re-graded materials and subsequently placed topsoil. Reclamation will be completed by replacing available topsoil resources and re-vegetating disturbance areas to establish an effective vegetative cover which will control runoff, erosion, and provide effective habitat and grazing/forage values for wildlife and domestic livestock.

R645-301-742.200 Siltation Structures

The purpose of siltation structures is to prevent additional contributions of suspended solids from disturbed area watersheds to receiving drainages. Consistent with applicable regulatory requirements, siltation structures should represent the best control technology currently available and are intended to be constructed prior to initiation of any mining related disturbance within the contributing watershed. As described in R645-301-522, 523.100 – 220, 524.100 – 800, & 525.100 - 300, General Description of Mine Construction and Development Activities, CR will construct required drainage and sediment control structures as one of the initial development activities prior to other construction related surface disturbance. Generally, the downstream sedimentation pond will be utilized as the primary siltation structure and the design criteria and other requirements for the sedimentation pond will therefore be applicable as described in the following section. In the following case where routing of disturbed area drainage to the sedimentation pond is not practical, siltation structures will consist of appropriate alternative sediment control measures:

Outslope of Office Pad (Pad F) and the Topsoil Stockpile (see Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas) - Siltation control for the outslope of Pad F and areas adjacent to the mine entrance will be achieved through the use of silt traps, vegetative matting and perimeter silt fencing which will intercept and contain runoff sediment. If vegetative matting and perimeter silt fencing prove inadequate to control erosional runoff, straw bales and/or additional silt fencing will be placed on contours to further control local silt movement.

Silt control for the alternate sediment control area west of Highway 96 (see Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas) will be achieved through the use of vegetative matting and perimeter silt fencing which will intercept and contain runoff sediment. If vegetative matting and perimeter silt fencing prove inadequate to control erosional runoff, straw bales and/or additional silt fencing will be placed on contours to further control local silt movement.

Sediment traps will be used on both sides of the mine entrance off of Highway 96 to control runoff from the small area between the cattle guard and Highway 96 (see Map 24).

R645-301-742.220 Sedimentation Ponds

One sedimentation pond will provide effective sediment control for the Kinney mine facilities disturbance areas. This pond is located near the north end of the mine facilities Loadout Pad (Pad C) as shown on Map 24, Drainage and Sediment Control Plan Map – Disturbed Drainage Areas and is located as close as possible to the contributing disturbance area(s). The proposed sedimentation pond is not located within the floodplain of any perennial streams as documented by the classification of streams within the permit areas described in detail in R645-301-711, 720, 722, 724726, & 727, Hydrology Information.

The sedimentation pond has been designed to be constructed to provide adequate storage for anticipated sediment contributions from contributing drainage areas. Sediment storage calculations reflect the maximum anticipated disturbance acreage for each drainage area over the mine life. The design also reflects a basin capacity sufficient to retain the flood routed volume equal to the runoff resulting from a 10-year, 24-hour storm event. Design calculations are presented and design methodology for the sedimentation pond are discussed in Exhibit 16,

Runoff Control Design Details. Generally, mining and related activities will result in the direct hydrologic impacts associated with initial site disturbance and facility construction but will not result in significant further changes in hydrologic conditions for disturbed area drainages. Runoff from undisturbed areas will be diverted around or under disturbance areas and is not considered in sedimentation pond design.

The pond has been designed to provide a minimum detention time of 24 hours, and longer if necessary, to meet applicable effluent limitations with respect to TSS. Pond outlet structures are sized to control pond discharge rates so that adequate detention times are maintained. Inflow to the sedimentation pond will be routed through the pond and discharged through the outlet structure. The principal/emergency spillway structure is designed to pass the peak flows resulting from a 100-year, 6-hour storm event.

The discharge structure for the sedimentation pond is sized based upon calculated flows for the design storm events. Invert elevations for principal spillways are set above design sediment levels and the pond is designed with adequate freeboard consistent with applicable regulatory requirements. CR has designed the sedimentation pond to minimize the potential for short circuiting, and constructed it so that the primary outlet structure is located as far as possible from pond inlets. The pond outlet structure is also specifically designed to insure adequate retention time, prevent short circuiting, and minimize erosion with vegetation or riprap lined spillway and discharge channels as appropriate based on discharge flow velocities.

Pond design for the Kinney mine facilities have been developed under the supervision of a qualified Registered Professional Engineer. Consistent with applicable regulatory requirements, construction of the pond will be certified by a Registered Professional Engineer. Pond certifications for the new pond will be included as an appendix to Exhibit 16, Runoff Control Design Details.

Pond construction will also be consistent with applicable regulatory construction requirements. Foundation areas will be cleared, soil and incorporated vegetative materials removed, and foundation areas graded prior to embankment construction. Embankments will be constructed of materials specifically selected to exclude vegetation, roots, frozen soil, coal or other unsuitable materials. The selected embankment fill materials will then placed and compacted in a controlled manner in thin horizontally continuous lifts. As previously noted, embankments will be designed and constructed to provide a minimum of one (1) foot of freeboard between the emergency spillway design flow level and the top of the embankment. Actual embankment construction height (except for excavated portions) will be increased by approximately 5 percent to allow for any potential settlement, and upstream and downstream embankment slopes will be established at slopes no greater than 2H:1V. Upon completion of construction, all embankment slopes as well as exposed basin areas will be graded, scarified and seeded to stabilize the slopes, prevent erosion, and establish an effective vegetative cover.

The sedimentation pond will be completely removed and effected areas reclaimed upon completion of mining and related activities and restoration of contributing drainage areas. Pond reclamation will occur following a determination by UDOGM of re-vegetation success and hydrologic restoration. Sedimentation pond reclamation will involve removal of any man-made discharge structures, removal and disposal of any riprap and bedding materials which will not be utilized in conjunction with re-establishment of post-mining drainages, grading of embankment fill into pond basin areas, and re-grading associated disturbance areas to blend with surrounding reclaimed and undisturbed terrain. Replacement of soil/substitute materials and re-vegetation will complete pond reclamation.

As shown in Figure 35, Pond 1 Stage-Volume Curve, the sedimentation pond has an embankment height and storage volume of 8 feet and 4.82 acre-feet respectively, and therefore does not fall within the jurisdiction of the State Engineer requiring additional regulatory

submittals. Pond 1 is therefore designated an MSHA pond and will be inspected on a quarterly basis at a minimum for structural weakness, erosion and other hazardous conditions. Consistent with applicable regulations, UDOGM will be notified of any hazardous conditions. Should any such conditions be identified, remedial measures will be initiated and appropriate modifications will be completed in a timely manner.

R645-301-742.300 Diversions

Surface facilities diversions will be constructed to intercept and divert surface runoff flows from undisturbed upgradient areas around the mine surface facilities areas. Diversion of undisturbed drainage will minimize additional sediment contributions, prevent impacts from the undisturbed drainage on mine disturbance areas, and limit requirements for retention and treatment of surface runoff to disturbed area drainage flows. All temporary diversions related to the mine facilities area are shown on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Areas. The permanent re-establishment of the ephemeral drainage through the disturbed mining area is shown on Map 29, Mine Surface Facilities Area - Postmining Topography. Design calculations for temporary and permanent diversions are provided in Exhibit 16, Runoff Control Design Details.

Diversion structures utilized in conjunction with the Kinney Mining and related operations will include both temporary diversions to control undisturbed runoff during active mining and reclamation operations and the permanent diversions which will be constructed in order to restore effective surface drainage following completion of ongoing mining and related operations.

To provide for effective transmission of runoff flow through reclaimed culverted channel USC-1, side-slopes will be graded to blend with both upstream and downstream channel segments and the overall diversion channel gradient will approximate the natural stream gradient. The original and post-mining alignments of the channel UDC-1 are similar in nature in both the horizontal as well as the vertical directions. As can be seen in Map 29, Mine Surface Facilities Area – Post Mining Topography, the reclaimed channel is in reality short, and thus has little potential for significant alignment variation. Given the relatively arid climate of this area and ephemeral nature of channel UDC-1, aquatic habitat values are non-existent.

Collection Ditches and Associated Structures

Collection ditches for disturbance areas associated with the proposed Kinney Mine surface facilities diversions will be established to collect and route disturbed area runoff flows to a designed sedimentation pond. The locations of disturbed area collection ditches in the mine facilities areas are shown on Map 24, Drainage and Sediment Control Plan – Disturbed Drainage Area and corresponding design calculations are provided in Exhibit 16, Runoff Control Design Details.

All temporary runoff ditches have been conservatively sized to carry the peak runoff flows from the 25-year, 6-hour storm event. Ditches UDD-1 and UDD-2 are upgradient undisturbed area ditches which will remain following reclamation. These two ditches were designed using the 100-

year, 6-hour storm event. In order to assure effective collection and routing of disturbed drainage flows and minimize both erosion and sedimentation, required culverts have been sized to safely pass the peak flow from the contributing inlet ditches with a significant factor of safety and culvert inlets, outlets, diversion channels, and those areas where one or more channels intersect have been designed and will be constructed using properly sized and placed riprap or other erosion control materials, as required. Specific information on culvert design and erosion protection measures is also provided in Exhibit 16, Runoff Control Design Details.

Temporary diversion ditches in disturbed areas are designed to safely pass the peak discharge from the 10-year, 6-hour storm event. All diversions have been designed and will be constructed to remain stable under design flow conditions. Calculated flow velocities based on channel configuration, slope and flow volume have been utilized as the basis for design of either vegetative channel linings or specification of riprap and bedding materials to assure channel stability. Locations of all temporary diversions are shown on Map 23, Drainage and Sediment Control Plan Map – Undisturbed Drainage Areas , and on Map 24, Drainage and Sediment Control Plan Map – Disturbed Drainage Areas. Design calculations for the mine facilities area are included and design methodologies discussed in Exhibit 16, Runoff Control Design Details.

Upon completion of mining and related activities all temporary diversions will be removed (with the exception of ditches DE-2, and DE-3) and the effected lands reclaimed when no longer required for sediment control. Ditches UDD-1 and UDD-2 remain as permanent structures. Ditches DE-2 and DE-3 will remain to divert and control runoff and from the reclaimed areas into the sediment pond. Ditches De-2 and DE-3 will be reclaimed along with the sediment pond. When it occurs, reclamation will consist of full or partial filling of the diversion ditches with material from adjacent areas consistent with the design post mining drainage configuration, grading to blend ditch areas with surrounding terrain, replacement of available soil/substitute materials, and reseeding.

None of the planned diversions will drain into underground mines. The potential for subsidence will generally be limited and is not expected to impact surface structures. Because of location, there is no potential for drainage from Mud Creek to enter underground workings. In addition, upon completion of mining and related activities, CR will seal and backfill the mine portals and other mine openings to prevent any significant exchange between surface and ground water systems. Details of portal sealing are discussed in R645-301-541.100 – 400, & 542.200, Reclamation Plan, under the subheading of Stabilization and Sealing of Mine Openings.

R645-301-742.400 Road Drainage

All roads have been designed to be constructed, operated, and maintained to provide for effective control of drainage from road surfaces, associated cuts and fills, and other related areas. Road construction in perennial and intermittent streams has been avoided except where a road crossing for UDC-1 was necessary, and road alignments and designs minimize the potential for downstream sedimentation or flooding and uncontrolled drainage over the road surface.

Road designs incorporate grading or crowning to promote effective drainage off the road surface, road surfaces will generally be protected from erosion and damage by appropriate surfacing materials and regular maintenance, roadside ditches have been designed to effectively collect and convey runoff from road areas, and culverts are provided where appropriate to convey drainage flows under or around designed roads. All road ditches and culvert structures have been designed to pass the flows from the 10-year, 6-hour storm event. Road culverts have been located and sized to avoid plugging or collapse and culvert

installations will incorporate inlet and outlet protection and trash racks as appropriate to minimize both plugging and erosion. Roads, ditches, and associated culverts are shown on Map 24, Drainage and Sediment Control Plan Map – Disturbed Drainage Areas.

Flows from the 100 year, 6 hour storm were used to check the design capacity of undisturbed area drainage road ditches UDD-1 and UDD-2. In fact, the design is slightly conservative for UDD-1 since the area used also includes that area tributary to UDD-2. In a similar fashion, the design for UDD-2 is conservative since it also includes flows from the area tributary to UDD-1. Details regarding ditch design are provided within R645-301-731.110 - 112.

R645-301-743 Impoundments

The sedimentation pond described in the preceding section is the only impoundment which will be utilized for drainage and sediment control purposes in conjunction with the Kinney mining and related operations. Applicable regulatory requirements for impoundments essentially duplicate the specified requirements for sedimentation ponds addressed above. Given limited pond size and capacity, the minimum design freeboard of 1 foot is more than adequate to resist overtopping of the embankment due to wave action or sudden increases in inflow.

R645-301-744 Discharge Structures

Flow rates and velocities for temporary diversion ditches and discharge calculations for the sedimentation pond outlet are presented in Exhibit 16, Runoff Control Design Details. Where specific constraints imposed by the natural terrain result in steeper gradients, flows may exceed five feet per second and placement of riprap and bedding material may be necessary to limit flow velocities, assure channel stability, and prevent any significant erosion. Design calculations include information on riprap sizing where required and the descriptive text in Exhibit 16, Runoff Control Design Details addresses standard procedures to be utilized in placing and securing riprap and bedding materials, and can be seen on Map 27, Runoff Control Details.

Generally, discharge structures have been designed at minimum gradients to limit discharge flow energy. Any potential for erosion at the outflow of discharge structures will be effectively controlled by placement of riprap and bedding materials in an apron configuration at the outflow. Generally, once the initial discharge energy is dissipated in these apron areas, erosion from the discharge flow will not be a problem since most receiving drainages have established a stable bed configuration and most drainages are effectively armored by exposed cobble and gravel materials. Because of limited space, grouted riprap has been utilized where hydraulic calculations show the need for ditch erosion control. Riprap aprons have also been utilized to dissipate energy as undisturbed area flows exit culverts west of Highway 96. Use and placement of riprap and bedding materials as designed herein should provide adequate channel protection and erosion control.

Other than the sedimentation pond and alternative sediment control measures discussed in the preceding sections, no additional treatment facilities will be necessary or will be utilized to provide effective drainage and sediment control and meet applicable discharge effluent limitations.

Runoff from the Kinney No. 2 Mine area to be disturbed flows to 4 existing culverts beneath UDOT Highway 96, one culvert is located at the south end of the permit area adjacent to the proposed topsoil stockpile, a second culvert is located near the existing gravel road accessing the proposed mine site, a third culvert is located near the north end of the proposed permit area adjacent to the proposed sediment pond, the fourth culvert is located well north of the proposed permit area. The vast majority of runoff water flows to the second and third culverts mentioned above. The vast majority of runoff from the mining disturbed area will report to the sediment pond, with a discharge point at the west side of Highway 96. The first three culverts discussed above can be seen on Map 24, Drainage and Sediment Control Plan Disturbed Drainage Areas Map.

Of the two existing culverts carrying the vast majority of the pre-mine runoff, the third culvert mentioned above will be replaced with culvert No. CP-2 during reconstruction of Highway 96 for turning lanes into the mine site. This culvert will receive discharge from the sediment pond. Pre-mining runoff reports to this culvert so no significant increase in flows will be experienced, and in fact, since the sediment pond will collect sediments from the runoff water and act as a regulating pond for storm events there should be no adverse affects from the pond discharge. There is little evidence of flows through this culvert in recent years. An energy dissipation fan structure will be constructed to prevent erosion at the end of Culvert No. CP-2 as shown on Map 24, and detailed in Exhibit 16, Runoff Control Design Details.

The sediment pond is an incised pond. In the event of the pond over-topping due to an extreme runoff event, or plugging of the primary and emergency spillways, water would flow overland to the UDOT Highway 96 rode-side ditch and flow through Culvert CP-2.

R645-301-745 Disposal of Excess Spoil

As described in R645-301-521, 523.100 – 220, 524.100 – 800, & 525.100 - 300, Engineering Designs and Operating Plans, mining and related operations will not result in the generation of any excess spoil and, in fact, reclamation activities will be limited to backfilling and re-contouring utilizing the limited spoil materials available on the site. Plans for handling and disposal of non-coal wastes are presented in R645-301-526.100 – 300, 527.100 – 250, 528.100 – 322, & 529.100 - 400, Mine Structures and Facilities, under the subheading of Noncoal Waste Disposal. The specific handling and disposal methods described in the referenced permit sections will effectively protect ground and surface water resources by minimizing the potential for pollution or contamination from placement and handling of waste materials generated by mining and related operations.

R645-301-746 Coal Mine Waste

Plans for handling and disposal of non-coal wastes are presented in Chapter 5, Engineering Design and Operations Plans Noncoal Waste Disposal, and to follow. The specific handling and disposal methods described in the referenced permit sections will effectively protect ground and surface water resources by minimizing the potential for pollution or contamination from placement and handling of waste materials generated by mining and related operations.

R645-301-738 Temporary Casing and Sealing of Wells

All exploration boreholes and any boreholes which have been converted to monitoring wells following completion of drilling within the Kinney Mine permit area will be plugged and sealed during mining reclamation. In the case of the boreholes, plugging and sealing will occur as soon as drilling, sampling, and logging operations are completed. In the case of monitoring wells, the wells will be plugged and sealed when no longer needed for ongoing ground water monitoring. Standardized procedures for plugging and sealing are detailed in R645-301-631 – 631.200, & 641, Casing and Sealing Exploration Holes and Boreholes. Measures to plug and seal boreholes and water monitoring wells will minimize the potential for mixing of surface and ground water sources and will also limit the potential for communication and mixing between various but locally limited ground water aquifers.

R645-301-747 Disposal of Noncoal Mine Waste

Noncoal Waste Disposal

Noncoal wastes generated in conjunction with mining and related activities will including but not limited to used oil and lubricants, garbage, paper waste, machinery parts, tires, cable, wood waste, and other miscellaneous debris. All smaller noncoal solid wastes will be collected and stored in dumpsters or similar closed containers. Larger solid waste materials including such items as used equipment, machinery parts, tires, and cable will be temporarily stored in designated sap yards located in areas as shown on Map 13, Surface Facilities Map. Dumpsters will be located primarily near buildings during mine operations, however, during construction they may be located throughout the disturbed area. Used oil will be handled according to Utah State and EPA requirements. Any waste other used oil and lubricants and any used oil not meeting the applicable EPA requirements will be collected and stored in either closed drums or in the waste oil storage tank located in the maintenance shop building. Temporary storage areas for used oil and lubricants will provide full containment to prevent accidental release of petroleum products to the surface drainage system.

CR does not currently plan or anticipate that any materials classified as "hazardous waste" will be utilized or generated in conjunction with the proposed mining and related operations. In the unlikely event that hazardous materials storage or disposal become necessary, CR will comply with all applicable storage, labeling, and documentation requirements, and disposal will occur off-site at a licensed hazardous waste disposal facility.

A contract disposal service will regularly collect and haul the noncoal solid wastes from the dumpsters to the permitted Carbon County municipal landfill, or to the East Carbon Development Corporation (ECDC) facility. Dependent on the market for sap materials, the larger noncoal solid waste and sap will be collected periodically either by a salvage contractor for salvage and recycling or by a contract disposal firm which will haul these material off-site and dispose of it in a suitable disposal site. Any used oil, lubricants, or other potentially combustible materials will be collected and either recycled or disposed of by a licensed disposal contractor in accordance with all applicable Utah and EPA regulations. No noncoal wastes will be disposed of on site during active operations.

R645-301-748 Casing and Sealing of Wells

All exploration drillholes established by CR within the Kinney Mine permit area will either be completed as monitoring wells or sealed following completion of drilling, sampling, and logging. Well completion methods are described in R645-201 – 225, 323.200, 325, 202-235, & 236, Completion as Ground Water Monitoring Wells, and in Figure 21, Typical Well Completion Diagram. Similar to exploration drillholes, monitoring wells will be plugged and sealed when they are no longer needed for ongoing ground water monitoring activities. Standardized procedures for plugging and sealing are detailed in R645-301-631 – 631.200, & 641, Casing and Sealing Exploration Holes and Boreholes. Measures to plug and seal boreholes and water monitoring wells will minimize the potential for mixing of surface and ground water sources and will also limit the potential for communication and mixing between various ground water aquifers.

R645-301-750 Performance Standards

R645-301-751 Water Quality Standards and Effluent Limitations

Discharges of water from areas disturbed by coal mining and reclamation activities will be in compliance with all applicable Utah and Federal water quality laws and regulations. Additionally, discharges will comply with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency as set forth in 40 CFR Part 434.

Water quality standards and effluent limitations for discharges from the Kinney Mine permit area will be regulated by the UDWQ under the terms of UPDES discharge permit(s) for the Kinney Mine. As part of the mine permitting process, CR has obtained a discharge permit from the UDWQ. A copy of the UPDES Permit can be found in Exhibit 4, Other Permits. Compliance with applicable UPDES effluent limitations will involve diversion of runoff from undisturbed areas around areas effected by mining operations, collection of disturbed area runoff which will be routed through the sedimentation pond prior to discharge, other localized drainage and sediment control measures, reclamation practices designed to effectively restore effected areas, and implementation of a comprehensive ongoing discharge monitoring program to verify compliance.

Drainage from mine and loadout areas, after retention in the sedimentation pond, is not anticipated to exceed applicable effluent limitations or any other Federal or State water quality limitations or standards. No acid or toxic mine drainage is anticipated from surface runoff and no mine drainage discharge is anticipated.

R645-301-752 Sediment Control Measures

Refer to responses to: R645-301-732, Sediment Control Measeures; R645-301-742.200, Siltation Structures; R645-301-742.300, Diversions; and R645-301-742.400 Road Drainage.

R645-301-753 Impoundments and Discharge Structures

Refer to responses to: R645-732, Sediment Control Measures; R-645-301-742, Sediment Control Measuers; and R645-301-743, Impoundments.

R645-301-754 Disposal of Excess Spoil, Coal Mine Waste and Noncoal Mine Waste

Refer to responses to: R645-301-735, Disposal of Excess Spoil; R645-301-736, Coal Mine and Underground Development Waste; R645-301-737, Noncoal Mine Waste; R645-301-742.300, Diversions; and R645-301-747, Disposal of Noncoal Waste.

R645-301-755 Casing and Sealing of Wells

Generally, a determination will be made either prior to or during completion of any exploration holes or boreholes of whether or not the hole(s) will be utilized for ground water monitoring purposes. If the hole is to be utilized for monitoring it will be cased, completed, and developed as a monitoring well consistent with Figure 21, Typical Well Completion Diagram, and as described in R645-301-201 – 225, 323.200, 325, 202-235, & 236, Completion as Ground Water Monitoring Wells. If the hole(s) is not to be utilized as a monitoring well or when an existing well is

no longer required for ongoing monitoring, it will be sealed by filling the borehole or casing with cement to form a plug from the bottom of the hole to at least 20 feet above any zone of completion or water-bearing zone; filling the remainder of the hole to within 20 feet of the ground surface; and filling the remainder of the hole to the ground surface with cement to form a surface plug. A steel fence post will be placed in the center of the surface plug before the cement sets-up to provide a permanent marker for the hole location.

R645-301-760 Reclamation

This section describes the plan for restoration of hydrologic resources in the permit and adjacent areas that could potentially be affected or impacted by the mining and reclamation activities. Information in this section was developed in accordance with applicable regulatory guidelines (R645-301-700) for coal mine permitting in the State of Utah.

Before abandoning the Kinney No. 2 Mine area or seeking final bond release, CR will remove and reclaim temporary structures and take appropriate actions to assure that any permanent sedimentation ponds, diversions, impoundments, and treatment facilities meet applicable regulatory requirements.

All areas disturbed by mining and related operations will be reclaimed as soon as operationally practical following completion of mining. CR has incorporated specific control and mitigation measures in mining, processing, and reclamation plans in order to prevent any significant impacts on surface or ground water quality. All mining related activities including soil/substitute removal, mine development, coal recovery, mine sealing, backfilling and grading, topsoiling, and revegetation are designed and sequenced to minimize disturbance and progress in a logical manner towards effective restoration of disturbed areas to pre-disturbance conditions. Reclamation will involve backfilling and regrading disturbance areas, re-establishment of drainage patterns similar to those existing in the premining environment, replacement of soil or substitute materials, and revegetation, and development of a self-sustaining vegetative community. As a result of effective reclamation, infiltration and runoff relationships will be restored, limiting the time interval over which water quality impacts may occur.

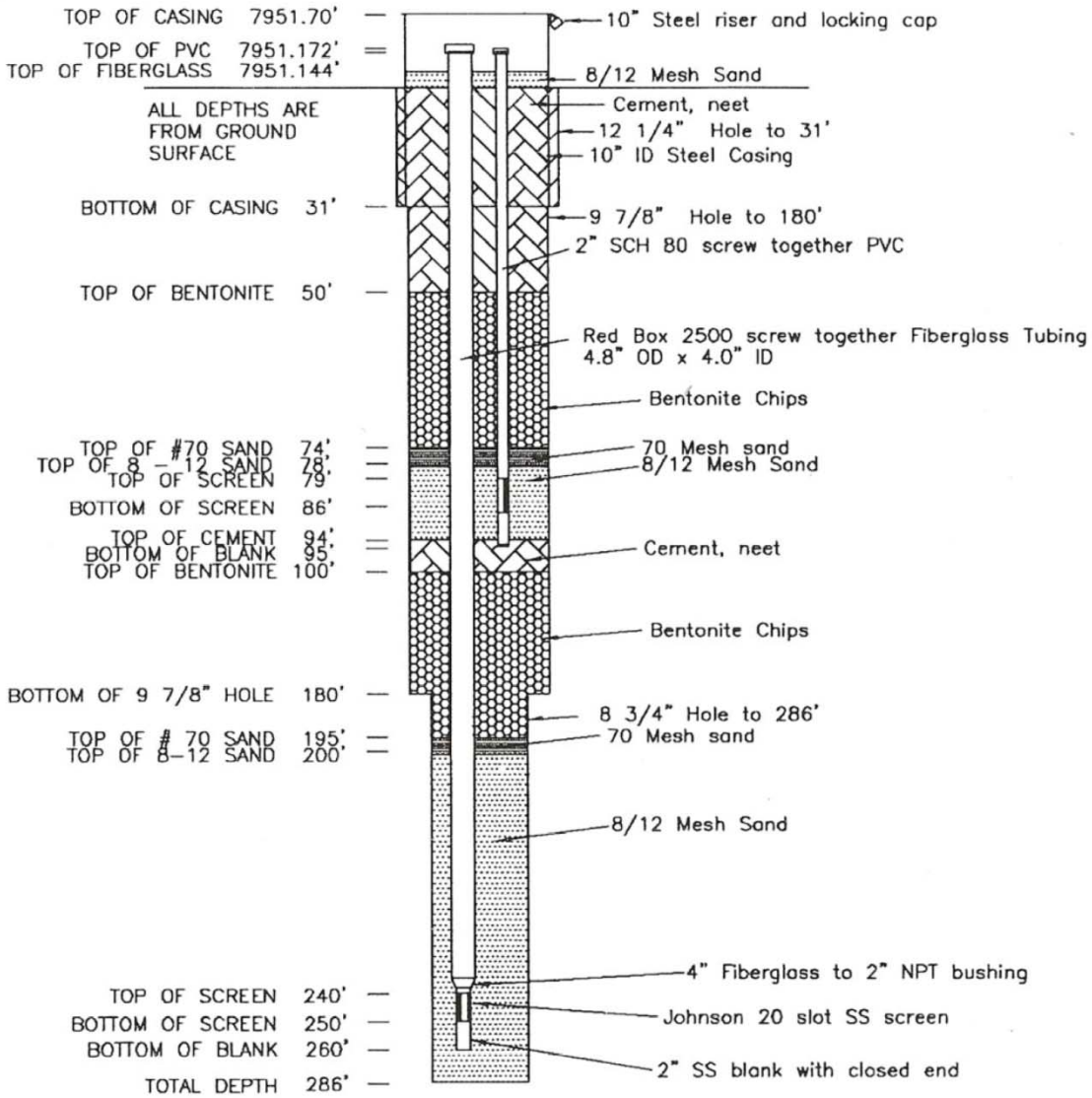
R645-301-761 General Requirements

In conjunction with reclamation of all areas disturbed by mining and related activities, CR will reestablish an effective post mining drainage configuration as shown on the Mine Facilities Area Post Mining Topography & Interim Drainage Control Map, (Map 29). Permanent runoff control structures remaining following reclamation include ditches UDD-1, UDD-2, culverts UDC-2 and CP-2 and the reconstructed irrigation ditch. Post mining drainages have been designed in compliance with requirements for permanent diversions and provide drainage distribution and density characteristics similar to the pre-disturbance environment. Anticipated runoff characteristics and site geomorphic considerations have been incorporated in post mining drainage designs to assure long-tern stability, minimize erosion, and prevent significant additional contributions of suspended solids to area drainages. CR will continue to operate and maintain sedimentation ponds and associated drainage structures until contributing drainage areas are effectively restored through application of the reclamation practices. Effective restoration will include a determination of re-vegetation success and restoration of surface drainage characteristics such that contributions of suspended solids from untreated disturbed area runoff are within applicable water quality limitations.

Figure 21

TYPICAL WELL COMPLETION DIAGRAM

NOT TO SCALE



8000 ft Elevation Datum
E. 1739299.757
N. 7073837.862
Gounnd Surface, ELEV. 7950'

Carbon Resources LLC
Monitor Well Completion Diagram

DWG BWL
CKD
APD

PIPE MATERIALS MAY VARY IN TYPE OR MANUFACTURER

Table 8 Well Conditions as of 9/28/2010

Well	Bottom of Screen	Water Level	Depth above Blank Casing	Status
CR-06-01	7865.2	7853.8	-11.4	Dry
CR-06-01-BLW	7701.1	7697.1	-4.5	False Positive Water Levels, But Hole is Dry.
CR-06-02	7901.6	7898.5	-3.1	Dry
CR-06-02-ABV	8039.8	8036.0	-3.8	Dry
CR-06-03-ABV*	7646.0	7798.2	152.2	Reclaimed Per UDOGM Directive
CR-06-05A	7747.9	7741.1	-6.8	Dry
CR-06-09-BLW	7802.9	7851.9	49.0	Water level has varied by only 1.7 feet over period of record
CR-06-09	7841.8	7860.7	18.9	Water level has varied by only 1.5 feet over period of record
CR-06-09-ABV	7945.3	7977.2	31.9	Water level has varied by 5 feet over period of record, and is falling.
CR-10-11	7586.51	7647.2	60.7	Artesian, water far above blank
CR-10-12	7611.23	7650.7	39.5	Artesian, water far above blank

* - Last reading taken on 9/7/2006 due to a property owner access dispute.

All of the monitor wells were professionally completed using either fiberglass or PVC as non-corrosive well tubing with stainless steel slotted well screens and a ten foot stainless steel closed bottom "blank" beneath each well screen. Washed round silica sand was tremmied into position around the screen/blank assembly (Figure 21 & Exhibit 11). Water level in each well was measured and recorded through the baseline period. Field visit to each well is demonstrated by the date and water level noted in the field notes (Figure 17 & Exhibit 10). Confusion is caused by the fact that the ten foot "blanks" capture and hold water even in a dry hole because there is always some drilling water remaining in the formation immediately following the drilling process that is captured by the blank. The water levels shown in all of the "dry holes" are below the well screens, but within the blanks which contain only remnant water from the drilling process, and therefore do not represent a groundwater level and consequently are dry holes.

CR-06-01-BLW is completed with 4" fiberglass well tubing and a custom made reducer connecting the 2" stainless steel well screen and blank assembly to the 4" fiberglass. The inside of this reducer is not tapered but has a "lip" at the bottom of the 4" fiberglass. Unfortunately, the well deviates from vertical causing the water level probe to strike the lip of the reducer instead of entering into the 2" well screen. These two factors when combined with a third, that is , moisture condensation in the well tubing, caused the water level probe to encounter the moisture at, and in some cases above the lip by scraping sided of the casing, and gave "false positive" water levels for this hole. This information has been verified by lowering a color, led lighted, borehole camera into the hole that produced a digital video.

R645-301-762 Roads

Roads that will not be retained for use under an approved postmining land use will be reclaimed immediately after they no longer needed for coal mining and reclamation activities. Reclamation of roads will include reshaping of all cut and fill slopes to be compatible with post-mining land use and to compliment the drainage pattern of the surrounding terrain.

R645-301-763 Siltation Structures

As a component of the planned reclamation activities CR will implement an interim runoff control plan wherein the majority of temporary operational drainage structures will be removed. Interim structures (including the sediment pond) will remain throughout the re-vegetation of the mine site after which time they too will be removed and the area re-vegetated. The only structures which will remain following final reclamation will be those identified as permanent ditches and culverts (and related riprap energy dissipation aprons). Details of the interim drainage control plan addressing the period between site reclamation and final bond release are discussed in R645-301-542.100, & 500, and illustrated by the Mine Surface Facilities Area – Post Mining Topography & Interim Drainage Control Map, (Map 29).

When no longer required for sediment control, all temporary diversions and associated structures will be removed and the affected lands reclaimed, with the exception of permanent diversion ditches UDC-2, culvert CP-2, and the associated energy dissipation riprap shown on Map 29. The irrigation ditch shown at the southern end of Map 29 will also be re-established. The Post Mining Land Use road will also remain to allow private property access following mining. Reclamation will consist of filling of the diversion ditches with material from adjacent areas consistent with the design postmining drainage configuration, grading to blend ditch areas with surrounding terrain, replacement of available soil and reseeding.

Sedimentation pond reclamation will involve removal of any man-made discharge structures, removal and disposal of any riprap, concrete, and bedding materials which will not be utilized in conjunction with reestablishment of post-mining drainages, grading of embankment fill into pond basin area, and regrading associated disturbance areas to blend with the surrounding terrain. Replacement of soil and revegetation as described in R645-301-240, 241, 250, 242.100, 242.100 – 310, 243, & 244.100 - 320, Reclamation Plan, will complete pond reclamation. Upon restoration of disturbed areas, all sedimentation ponds and water storage and treatment impoundments will be removed and associated disturbance areas reclaimed. In addition, all reclaimed areas will be regraded to reestablish natural drainage patterns and eliminate any significant depressions which could impound water.

Postmining drainages and temporary ditches will route any disturbed area runoff to the sedimentation pond through the post-reclamation period to the point of bond release. Runoff from the area south of the site access road cannot flow to the sedimentation pond and therefore will be controlled by alternative sediment control measures as shown on Map 29, Mine Facilities Area Post Mining Topography & Interim Drainage Control Map. Following determination of reclamation success, sedimentation ponds and temporary diversion ditches will be reclaimed and postmining drainages will be connected to existing natural drainages. Where postmining drainages intersect existing natural drainages, the transition channel will be constructed to provide a smooth transition of both channel configuration and flow. Siltation structures will be maintained until removal is authorized by UDOGM and the disturbed area has been stabilized and revegetated. Structures will not be removed within two years after the last augmented seeding.

R645-301-764 Structure Removal

As an underground mining operation, surface disturbance associated with CR's mining activities will be minimal relative to the overall permit area. However, where disturbance does occur, CR will reclaim disturbed areas using reclamation practices that restore normal infiltration and runoff characteristics to conditions that are comparable to premining conditions. This will be done as soon as operationally feasible following completion of mining and related activities.

Reclamation will involve backfilling and grading to stabilize the slopes, reestablishment of natural drainage patterns, topsoil replacement, and revegetation. CR has also designed the postmining topography and associated backfilling and grading plans to effectively utilize available materials and minimize disturbance of adjacent areas.

Permanent postmining drainages have been located and designed to generally duplicate premining drainage patterns and densities and to effectively convey surface drainage flows. Postmining drainage patterns and designs are illustrated by the Mine Surface Facilities Area – Post Mining Topography & Interim Drainage Control Map, (Map 29) and Exhibit 16 Runoff Control Design Details.

Disturbance areas will be backfilled where necessary and regraded to establish a stable undulating configuration with relatively short gradual slopes which will blend with surrounding undisturbed terrain. Regraded surfaces will be left in a roughened condition to limit runoff and provide for an effective bond between the regraded materials and subsequently placed topsoil. Soil replacement and reseeding will be scheduled to minimize the period of time during which soil materials will be exposed without a protective vegetative cover.

Reclamation will be completed by replacing available soil resources and revegetating disturbance areas to establish an effective vegetative cover which will control runoff, erosion, and provide effective habitat and grazing/forage values for wildlife.

Under applicable regulatory provisions, one of the conditions for final bond release is documentation of restoration of premining drainage conditions. CR will develop and provide this documentation to UDOGM using one of two methods or by a combination of the two; 1) Comparisons of post-reclamation water monitoring data with premining baseline data and applicable effluent standards; 2) Runoff and sedimentation modeling utilizing measured reclamation cover values to determine runoff curves and sediment contributions and comparison with model results developed using baseline cover values.

R645-301-765 Permanent Casing and Sealing of Wells

References

All exploration drillholes completed by CR within the Kinney No. 2 Mine permit area will either be completed as monitoring wells or sealed following completion of drilling, sampling, and logging. Generally, a determination will be made either prior to or during completion of any exploration holes or boreholes of whether or not the hole(s) will be utilized for ground water monitoring purposes. If the hole is to be utilized for monitoring it will be cased, completed, and developed as a monitoring well consistent with Figure 21, Typical Well Completion Diagram. If the hole(s) is not to be utilized as a monitoring well or when an existing well is no longer required for ongoing monitoring, it will be sealed by filling the borehole or casing with cement to form a plug from the bottom of the hole to at least 20 feet above any zone of completion or water-bearing zone;

filling the remainder of the hole to within 20 feet of the ground surface with bentonite; and filling the remainder of the hole to the ground surface with cement to form a surface plug. A steel fence post will be placed in the center of the surface plug before the cement sets-up to provide a permanent marker for the hole location.

CR does not intend to transfer title of any monitoring wells to a second party following the cessation of mining and reclamation activities.

Chapter 8

R645-301-800 BONDING

Kinney No 2 Mine

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R645-301-820 General Requirement

This section defines the requirements for filing and maintenance of performance bonds, addresses requirements for determination of bond amounts, identifies acceptable bond forms and required bond terms and conditions, describes requirements for replacement of bonds, and defines specific actions and requirements for bond release. Information in this section was developed in accordance with applicable regulatory requirements (R645-301-811) for coal mine permitting in the State of Utah.

R645-301-820.100 – 352 Requirement to File a Bond

After approval but prior to issuance of the mining permit, CR will file a reclamation bond payable to UDOGM. The bond will be provided on a form prescribed and provided by UDOGM and will be conditioned on faithful performance of the permit plans, and applicable requirements of the State of Utah Coal Mining Rules. As an underground coal mining operation, the bond will cover long-term surface facilities and structures and surface disturbance areas associated with the mining and related activities. Bond coverage may be for a specific term but will be maintained to provide continuous bonding coverage over the entire period of active mining and reclamation and for the extended liability period following completion of reclamation. Under the bond, CR's liability will be limited to those obligations or commitments under the approved permit specifically including reclamation of surface disturbance to return the land to a condition and productive capacity capable of supporting the approved postmining land use.

R645-301-830.100 – 500 Determination of Bond Amount

Under Rule R645-301-830.120, the bond amount will depend on the requirements of the approved permit and reclamation plan. Consistent with this requirement, bond reclamation calculations do not accompany this initial permit application submittal. Once UDOGM has had opportunity to review and comment on the permit application and reclamation plan and any related issues have been effectively resolved, CR will proceed with preparation of a detailed bond reclamation cost estimate. This estimate, which will be submitted to UDOGM for insertion in Exhibit 18, Bonding and Insurance Information, will be based on the approved reclamation plan; reflect the anticipated level of effort required to reclaim all surface disturbance given site topography, geology, hydrologic conditions, revegetation potential, and other relevant factors; and will reflect any appropriate inflation factors to address potential increases in reclamation cost over the permit term.

Generally, the method used in calculating the bond reclamation cost estimate is consistent with the guidance provided by the Handbook for Calculation of Reclamation Bond Amounts (USDI-OSMRE, [latest version]) and will involve the following sequential steps:

- Determine the maximum disturbance scenario relative to reclamation requirements
- Identify, delineate, and determine disturbance area acreages
- Determine required reclamation functions and sequencing
- Calculate material handling requirements and volumes
- Delineate haulage routes and determine material haul or push distances
- Select and specify appropriate reclamation equipment
- Calculate equipment productivities

- Calculate equipment and manpower schedules and project time requirements
- Develop equipment, labor, material, demolition, and revegetation unit costs
- Calculate project profit and indirect, overhead, management and other costs
- Develop cost summary for total estimated bond reclamation cost
- Develop and present bond reclamation cost estimate documentation including description of methodology, summary calculations, and supporting volumetric, productivity, and cost data

With the exception of the text description included in the summary report, reclamation calculations will be developed and presented in computer format to facilitate review and any necessary future modifications.

Following submission of CR's detailed bond reclamation cost estimate, UDOGM will determine the appropriate bond amount which will be based on but not necessarily limited to CR's bond estimate. If the cost of reclamation and corresponding bond coverage increases or decreases due to changes in the method of operation or other factors, CR may request or UDOGM may determine that an adjustment in the bond amount is appropriate. CR and the bond surety will be notified by UDOGM of any proposed adjustment in bond amount and will have opportunity for review of the proposed adjustment and an informal conference to discuss the adjustment and related matters. If CR elects to request an adjustment in bond amount, the request will be accompanied by appropriate documentation supporting the request. Adjustments involving undisturbed lands or revised reclamation costs are not considered a bond release.

R645-301-840.100 – 520 Bond Terms and Conditions

In compliance with applicable regulatory provisions, the reclamation bond submitted prior to permit issuance and initiation of development, construction, and operations will be in the amount determined by UDOGM and will be payable to UDOGM. Other specific required bond terms and conditions will include the following:

- The bond will be conditioned on faithful performance of all applicable requirements of the State Program and the approved permit, including completion of the reclamation plan
- Continuous bonding coverage will be provided for the latter of, the period of active mining and reclamation and the extended liability period following completion of reclamation, or until the reclamation requirements under the State Program and permit are achieved
- The bond will provide for prompt notification of UDOGM and CR by the surety in the event of any action which would render the surety incapable of providing continuing, valid bond coverage including insolvency or bankruptcy of the surety or CR, or alleged violations which could result in suspension or revocation of the surety's charter or business licenses
- If the surety is incapable of providing continuing, valid bond coverage, CR will promptly notify UDOGM and UDOGM will, in turn, provide written notification to the CR that replacement bond coverage must be obtained within a specified period not to exceed 90 days. If replacement coverage is not obtained prior to the end of the specified period, the CR will cease coal mining operations and will comply with applicable requirements for temporary cessation. Mining operations will not resume until a suitable replacement bond has been posted.

R645-301-850.100 – 320 Bonding for Underground Coal Mining and Reclamation Activities

Specific reclamation bonding requirements and provisions which are applicable to underground coal mining and reclamation operations include limitation of bonding coverage to surface facilities and structures and surface disturbance areas associated with the underground mining operations and designation of a "long-term period of liability" in recognition of the extended period of use which is typical for such facilities and areas.

The long-term liability period will begin with permit issuance and will continue until the bond has been released, replaced, or extended in compliance with applicable regulatory provisions.

In order to maintain continuous bonding coverage, the bond will be conditioned on extension, replacement, or payment in full 30 days prior to expiration of the permit term. If the bond does not provide coverage for the entire reclamation liability period or alternatively, if a bond for the new permit term is not filed 30 days prior to expiration of the permit term, UDOGM may act to initiate bond forfeiture.

R645-301-860.100 – 380 Form of Bond

The applicable regulations provide several alternatives for compliance with requirements for reclamation bonding coverage. Each specific alternative or bond form has a number of associated compliance requirements. Once the bond amount is determined, CR will evaluate potential bonding alternatives and will select and submit a bond in a form which meets all applicable compliance criteria.

R645-301-870.100 – 200 Replacement of Bond

Under regulatory provisions for bond replacement, CR may elect to replace any existing bond(s) with another bond(s) providing equivalent coverage, however, existing bond(s) will not be released until UDOGM has approved as acceptable the replacement bond and bond replacement will not constitute bond release.

R645-301-880.100 – 932 Bond Release

The applicable UDOGM regulations provide specific guidance relative to procedures for release of reclamation performance bonds. On completion of mining and related activities, CR anticipates that all associated surface disturbance will be reclaimed consistent with the approved reclamation plan in order to restore the effected lands to a condition and capability consistent with the approved postmining land use. Upon completion of reclamation and surface restoration CR will file application for bond release consistent with the following bond release process:

- CR files application for bond release
- Within 30 days of the application date, CR will file a public notice in a local newspaper general circulation with publication at least once per week over a period of four weeks
- CR mails notices of bond release inspection to surface owners
- Within 30 days of the application filing UDOGM will conduct a bond release inspection which may also include interested surface owners or agents
- Persons with a valid legal interest which could be effected by bond release or

responsible officials of jurisdictional agencies can submit written comments or objections and may request a hearing within 30 days following the date of last publication of the public notice

- If a hearing is requested it will be held within 30 days of receipt of the hearing request
- If no public hearing is held UDOGM, within 60 days of the application filing, will notify CR, the bond surety, and other interested persons of its determination on the bond release request
- At least 30 days prior to bond release UDOGM will notify, by certified mail, the municipality in which the mining activities are located of the pending bond release.

Chapter 9

R645-302 Special Categories

Kinney No 2 Mine

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R645-302 SPECIAL CATEGORIES AND MINING AREAS

This section of the Kinney No. 2 Mine Permit Application provides both general and specific information on design, construction, operation, maintenance, and reclamation for mining and related operations which fall under the categories of either "Special Categories of Mining", as defined by Rule R645-302-200, or "Special Areas of Mining", as defined by Rule R645-302-300. Information sources utilized in developing the descriptions presented in this section include baseline investigations, particularly with respect to evaluation of areas as potential alluvial valley floors or prime farmlands; detailed mining plans developed by the CR team; conceptual and detailed facility layouts and designs; and specific plans for control, monitoring, and mitigation of mining related impacts. The information presented in this section has been prepared in compliance with applicable provisions of the State of Utah Coal Mining Rules and are intended to address the applicability of the regulatory definitions and provisions under the two designated special categories. The discussions presented in this section reflect consideration of the environmental resource information presented in Chapters 2 through 7, and are designed to address prevention, control, and mitigation of the potential effects of mining for areas or activities falling within the defined categories.

Each subsection identifies the applicable regulatory provisions addressed and sources for the information presented and includes related supporting tables and figures. Other supporting documentation, including maps and exhibits, is referenced in the text and provided in the separate map and exhibit volumes.

This section also provides information on the applicability of the designated regulatory categories of either "Special Categories of Mining", as defined by Rule R645-302-200, or "Special Areas of Mining", as defined by Rule R645-302-300 relative to the Kinney No. 2 Mine mining and related operations. For any categories which are applicable, design, construction, operation, maintenance, and reclamation information is provided for mining and related operations which fall under the categories. Information in this section was developed in accordance with applicable regulatory requirements (R-645-302-200 and 300) for coal mine permitting in the State of Utah.

R645-302-211 through 218 EXPERIMENTAL PRACTICES

CR has no current plans to implement or utilize experimental practices in conjunction with planned mining and related activities for the Kinney No. 2 Mine Mine. In addition, all of CR's planned operations will affect full compliance with applicable regulations without a variance from the environmental protection performance standards for experimental or research purposes or alternative postmining land uses. Since CR does not plan to conduct experimental practices in conjunction with planned mining and related operations the provisions of Rule R645-302-210 are not applicable.

R645-302-221 through 227.900 MOUNTAINTOP REMOVAL

As described in Chapter 5, Mine Plans, Mining Methods, and Related Design Considerations, the Kinney No. 2 Mine operations will be exclusively underground coal mining operations. Since no surface mining activities are planned in conjunction with the Kinney No. 2 Mine operations, the provisions of Rule R645-302-220 are not applicable.

R645-302-231 through 234.400 STEEP SLOPE MINING

The only areas where steep slopes exist in the planned surface disturbance area which will be affected by mining and related activities are along the eastern margin of the facilities area and disturbance in these areas will be limited. Consistent with Rule R645-301-231.100, most of the planned surface disturbance will occur on terrain condusive to topsoil salvage, and planned reclamation efforts will result in a configuration similar to that which existed prior to the Kinney No. 2 Mine disturbance. Reclamation considerations relative to the existing land configuration and final reclamation will be addressed under the applicable provisions for remining of previously mined areas (R645-301-553.500). Given these considerations, the provisions of Rule R645-302-230 are not applicable.

R645-302-241 through 245.500 AUGER MINING

As described in Chapter 5, Mine Plans, Mining Methods, and Related Design Considerations, the Kinney No. 2 Mine operations will be conventional underground coal mining operations utilizing continuous underground mining methods. The planned mining operations will result in significantly higher production levels and greater resource recovery and conservation than would be possible using auger mining methods. Given these considerations, CR has no present plans to conduct auger mining in conjunction with the Kinney No. 2 Mine operations and the provisions of Rule R645-302-240 are not applicable.

R645-302-251 through 254.620 IN-SITU PROCESSING

CR has no current plans to implement or utilize in-situ extraction or processing methods in conjunction with planned mining and related activities for the Kinney No. 2 Mine Mine. Since CR does not plan to conduct any type of in-situ activities in conjunction with planned mining and related operations the provisions of Rule R645-302-250 are not applicable.

R645-302-261 through 264.900 COAL PROCESSING PLANTS NOT WITHIN THE MINE PERMIT AREA

The Kinney No. 2 Mine mining and related operations will not utilize a coal processing plant at the mine site, all coal will be sold FOB mine site.

R645-302-271 through 275 VARIANCES FROM AOC RESTORATION REQUIREMENTS

Planned final backfilling and grading activities will result in a reclaimed land configuration which is similar to that which existed prior to the Kinney No. 2 Mine disturbance. The area which will be affected by construction of the required mine surface facilities is a previously mined area consisting of an existing face-up area which has been partially reclaimed by the Utah AML program. An old railroad grade exists at the western edge of planned surface facilities and had very limited reclamation done by the AML project, if any. This railroad grade will not be affected by the Kinney No. 2 Mine operations. Given this previous mining related disturbance, the planned mine construction activities constitute remining of a previously mined area under applicable provisions of Rule R645-301-553.500. These provisions take into consideration the practical reclamation limitations associated with previously mined areas and encourage

effective restoration by allowing final backfilling and grading utilizing all available spoil material and partial retention of highwall exposures if the volume of available spoil material is not sufficient to provide for total highwall elimination.

The planned postmining topography for the mine surface facilities areas effects compliance with all applicable provisions of Rule R645-301-553.500 and will result in a stable regraded configuration which provides for effective drainage, is compatible with the planned postmining land use, and minimizes the height and extent of any highwall remnant which remains. Under the applicable provisions of Rule R645-301-553.500 a variance from AOC restoration requirements is not necessary for remining of previously mined areas, therefore, the provisions of Rule R645-301-270 are not applicable. The remaining highwall at the pre-SMCRA mine was partially backfilled and will not be disturbed by the Kinney No. 2 Mine, however small pre-SMCRA cuts may be disturbed by Kinney No. 2 Mine operations in the general mine area. These small cuts may be reclaimed back to similar configurations as existed pre-Kinney No. 2 Mine.

R645-302-281 through 284 VARIANCES FOR DELAY IN CONTEMPORANEOUS RECLAMATION

As described in Chapter 5, Mine Plans, Mining Methods, and Related Design Considerations, the Kinney No. 2 Mine operations will be exclusively underground coal mining operations and will not include surface mining operations or combined surface and underground mining operations. Under Rule R645-301-553, requirements for contemporaneous reclamation are only applicable to surface coal mining operations. Since no surface mining activities are planned in conjunction with the Kinney No. 2 Mine operations, the provisions of Rule R645-302-280 are not applicable.

R645-302-291 through 299.400 SMALL OPERATOR ASSISTANCE PROGRAMS

The small operator assistance program (SOAP) is designed to provide financial, technical, and permitting assistance to operators who qualify under specific production threshold limits and other eligibility criteria. CR does not qualify under the SOAP eligibility guidelines and is not seeking assistance under SOAP, therefore the provisions of Rule R645-301-900 are not applicable.

R645-302-311 through 317 OPERATIONS ON PRIME FARMLANDS

As described in R645-301-221, Prime Farmland Investigation, formal consultation with the USDA-NRCS resulted a determinations that prime farmlands do not exist in the Kinney No. 2 Mine permit area. Documentation of these determinations is provided in Exhibit 6, Soils Information. Given the determination that prime farmlands do not exist in the Kinney No. 2 Mine permit area and, therefore will not be affected or impacted by the planned mining and related operations, the provisions of Rule R634-302-310 are not applicable.

R645-302-320 Alluvial Valley Floors

The area adjacent to the west of the permit, but not within the permit area, displays characteristics that fit two different parts of the AVF definition and have been identified with two different AVF boundaries. A “True AVF Boundary” and a “Qusi AVF Boundary” Map (32). A review of the definitions is required prior to continuing discussion of the adjacent AVF boundaries.

R645-302-100

BEFORE ADDRESSING THE FOLLOWING REGULATIONS, IT IS CLEAR IN THIS REGULATION THAT THEY APPLY ONLY TO SURFACE MINING AND RECLAMATION OPERATIONS. As stated in R645-302-100, "Before applying for a permit to conduct, or before conducting surface coal mining and reclamation operations within a valley holding a stream or in a location where the adjacent area includes any stream, the applicant shall either affirmatively demonstrate, based on available data, the presence of an alluvial valley floor, or submit to the Division the results of a field investigation of the proposed permit and adjacent area." *(Underlining added)*

Since the Kinney No. 2 Mine is an underground mine, these regulations do not apply, however, to complete the application and to fully address the hydrologic consequences of operating the mine, CR has addressed this regulation as follows:

DEFINITIONS OF ALLUVIAL VALLEY FLOOR (AVF)

Rule R645-100. Administrative: Introduction.

http://www.rules.utah.gov/publicat/code/r645/r645-100.htm
"Alluvial Valley Floors" means the unconsolidated stream-laid deposits holding streams with water availability sufficient for subirrigation or flood irrigation agricultural activities, but does not include upland areas which are generally overlain by a thin veneer of colluvial deposits composed chiefly of debris from sheet erosion, deposits formed by unconcentrated runoff or slope wash, together with talus, or other mass-movement accumulations, and windblown deposits.

TITLE 30 - MINERAL RESOURCES
http://cfr.vlex.com/vid/19696193
CHAPTER VII - OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT, DEPARTMENT OF THE INTERIOR SUBCHAPTER G - SURFACE COAL MINING AND RECLAMATION OPERATIONS PERMITS AND COAL EXPLORATION SYSTEMS UNDER REGULATORY PROGRAMS

PART 785 - REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

785.19 - Surface coal mining and reclamation operations on areas or adjacent to areas including alluvial valley floors in the arid and semiarid areas west of the 100th meridian.

(a) Alluvial valley floor determination. (1) Permit applicants who propose to conduct surface coal mining and reclamation operations within a valley holding a stream or in a location where the permit area or adjacent area includes any stream, in the arid and semiarid regions of the United States, as an initial step in the permit process, may request the regulatory authority to make an alluvial valley floor determination with respect to that valley floor. The applicant shall demonstrate and the regulatory authority shall determine, based on either available data or field studies submitted by the applicant, or a combination of available data and field studies, the presence or absence of an alluvial valley floor. Studies shall include sufficiently detailed geologic, hydrologic, land use, soils, and vegetation data and analysis to demonstrate the probable existence of an alluvial valley floor in the area. The regulatory authority may require additional data collection and analysis or other supporting documents, maps, and illustrations in order to make the determination.

(2) The regulatory authority shall make a written determination as to the extent of any alluvial

valley floors within the area. The regulatory authority shall determine that an alluvial valley floor exists if it finds that (i) Unconsolidated streamlaid deposits holding streams are present; and (ii) There is sufficient water available to support agricultural activities as evidenced by (A) The existence of current flood irrigation in the area in question; (B) The capability of an area to be flood irrigated, based on evaluations of typical regional agricultural practices, historical flood irrigation, streamflow, water quality, soils, and topography; or (C) Subirrigation of the lands in question derived from the ground-water system of the valley floor.

Title of Report:

OSM ALLUVIAL VALLEY FLOOR GUIDELINES (1980). 54 pp.

Performing Organization Name and Address: OSM

Type of Report: Final Report – Guidelines

OSM Library Number: 002 Date to NTIS: 05/31/90
NTIS Accession No: PB90-225681/AS
CFR Citation: 30 CFR 785.19

Abstract:

Part 1: Investigations used to distinguish between lands which may be alluvial valley floors (AVFs) and lands clearly not AVFs. Part 2: Intermediate investigation provides sufficient information to permit final determination of AVF studies which could be used in submittal of a complete permit application. Three studies can lead to definition of important characteristics of AVFs, agricultural significance of AVFs, and the impact of mining on AVFs. Procedures in Part 1 are intended to be those which can be accomplished in a short period of time.

Significant and applicable sections of this OSM report together with sections of Rule R-645-100 are:

Study in areas surrounding permit area:
- Operators discretion as to study area

Study area in relation to permit area:
- The department suggests but does not require an evaluation of AVF in the mine plan area and adjacent areas

Map Scales Acceptable:
- 1:6,000 to 1:24,000

Qualifications of Personnel conducting alluvial valley floor studies Includes:
- Geologists
- Geomorphologists

Applicability to Underground Mining:
- Must assess potential affect from mining or from surface operations

"All available data" to be used includes:
- Aerial Imagery
- Soil Studies

Geologic Characteristics:
- "unconsolidated stream-laid deposits holding streams with water availability sufficient for subirrigation or flood irrigation agricultural activities, but does not include upland areas which are generally overlain by a thin veneer of colluvial deposits composed chiefly of

debris from sheet erosion, deposits formed by unconcentrated runoff or slope wash, together with talus, or other mass-movement accumulations, and windblown deposits."

Geomorphic Characteristics:

- Terraces not considered part of AVF

Floodplains:

- Not a criterion for AVF determination

Channel Size:

- At least 3 feet in width
- No standard method of measure

Alluvial Fans:

- Case by case evaluation in complex alluvial fans
- Fan has to be part of the hydrologic system

Flood Irrigation Assessment:

- Determination of irrigable land as well as irrigated land by flood irrigation

Identification of Marsh Areas:

- Sub-irrigated areas do not automatically qualify as AFV's

Sprinkler irrigation Assessment:

- Only where it simulates or makes more efficient traditional flood irrigation

Artificial sub-irrigation:

- Not distinguished from natural sub-irrigation

DISCUSSION

As stated above, the area adjacent to the west of the permit area but not within the permit area displays characteristics that fit two different parts of the AVF definition demanding the construction of two different AVF boundaries. That is, when a definition of limiting AVF to the "unconsolidated stream-laid (alluvial) deposits" is applied, a rather small AVF boundary is created and is referred to here as the "True AVF" as can be seen on Map 32, AVF Evaluation. In contrast, when the definition of ability to be watered by "flood irrigation" is used and the limit of "unconsolidated stream-laid deposits" is ignored, a larger AFV boundary is the result, referred to as the "Quasi-AFV" (Map 32).

There are alluvial deposits adjacent to Mud Creek and Miller Creek that fit the "classical definition of AVF"; where alluvial material, transported by these streams, is deposited in the channels and along the banks and flood planes. The areas occupied by these deposits are relatively small and located in near proximity (tens to hundreds of feet) to the present stream channels, forming sinuous ribbon deposits of alluvial material. The AVF boundary drawn using the limit of "unconsolidated stream-laid deposits" is a sinuous ribbon shadowing the streams and is referred to as the "True AVF (Map 32)"

Geologically, Pleasant Valley is a "graben" in a series of north-south "horsts" and "grabens" that characterize the structural geology and thus the geomorphology of the Eastern Wasatch Plateau. The floor of Pleasant Valley is much broader and flatter than would have ever been created by the fluvial processes associated with Mud Creek. As a consequence the Quasi AVF is largely defined by the "Pleasant Valley Graben," and not the action of Mud Creek. The west and east boundaries of the Pleasant Valley Graben are formed by large (~600 ft. throw) normal faults formed several millions of years in the past. Since the last major movement on the "Pleasant Valley Graben – Boundary Faults" "detritus" from the valley walls have been carried into the valley floor by flood stage sheet wash and in many cases have formed alluvial fans that are elevated above the flat lying portion of the graben formed valley floor. This study determined that multiple Alluvial Fans extend from the hillsides (walls of Pleasant Valley) into

Pleasant Valley. These fans of non-AVF material form prominences or protrusions toward the center of the valley from the valley walls. Note the consequential alluvial fans juxtaposed to the mouth of nearly all the small drainages along the valley wall. It is just such an alluvial fan that the small triangular portion of the permit area occupies immediately west of highway 96, (Map 32). These "alluvial fans" do not fit the true definition of AVF because they are generally poorly sorted storm deposits.

Note the very small alluvial fan immediately opposite the culvert that passes under highway 96 within the permit boundary near NW corner and shown on (Map 32). This fan appears to have been formed after the highway was constructed when the culvert began carrying runoff , diverted south to the culvert, from the drainage immediately north of the culvert and will continue to do so.

The geology of Pleasant Valley, described above, has created a rather large flat lying area that contains many of the AVF criteria when the criteria weighs the "flood irrigation assessment" heavily in the determination and ignores the "alluvial material assessment." Map 32 shows two different AVF boundaries, a "True AVG" and a "Quasi-AVF". The boundary of the smaller (True AVF) is supported by less direct data than the larger (Quasi-AVF). However, in spite of imprecise boundary locations, the True-AVF boundary is definitely in the ball park as being an order of

magnitude smaller than the Quasi-AVF boundary. Both AVF boundaries fall outside the permit boundary, but just barely in the case of the Quasi-AVF boundary.

As the operator we have used our discretion and chosen a study area that includes Pleasant Valley adjacent to the permit area but have not included Miller Creek as it is removed from the present permit area. In future, when the need to expand the Permit Boundary arises, Miller Creek may be included in an AVF assessment.

Map 32 is constructed at a scale of 1:4800 or 1"on the map = 400'on the ground. The AVF study was conducted by Gregory Hunt a qualified geologist who also has substantial experience interpreting geomorphology within the Eastern Wasatch Plateau.

The AVF's so determined are applicable to underground mining at Kinney No. 2 Mine only to the extent that the AVF'S are adjacent to the mine permit area. Potential impacts to the AVF's will be discussed at the end of this section. Because any impacts to the AVF would come from ground and surface water originating within the phreatic zone of influence of the underground mining and the surface facilities, the area within the AVF is limited. This area is shown on Map 32, AVF Evaluation Map, and is labeled "Zone of Ground Water Contribution to AVF From Mine Permit Boundary Area." As can be seen on the map, the solid colored areas zone is an area encompassed by Mud Creek on the west, south to a line projected from the southeastern corner of the permit boundary intersecting Mud Creek, and extending northward to a line originating at the northwest corner of the permit boundary and sweeping westward and northward slightly until it intercepts the high water mark of Scofield Reservoir. This Zone of Ground Water Contribution to the AVF From Mine Permit Boundary Area could be considered to be the phreatic zone of possible influence. The western boundary of Mud Creek is assumed to be the boundary because the ground water surface west of Mud Creek is likely shaped similarly to the ground water surface on the east side of the creek as determined in this application and shown on Map 32. Since water will not move upgradient, the creek is the low point and thus the western boundary of the zone of possible influence.

All available data were incorporated in this study, including:

- High Resolution ortho-rectified Aerial Photography

    - Registered to Kinney Coordinate System and imported into AutoCAD for precision drawing
- Soil Survey conducted as part of baseline data collection for this permit application. Please refer to (Chapter 2, Soils, and Exhibit 6, Soils Information) for the complete soil survey
- Digital topographic maps
- Geomorphic Characteristics of the valley fill material
- On the ground site visits as part of the larger data collection effort

Because determination of Floodplains is not part of the OSM criteria for determining AVF, a Floodplain study was not conducted. However, observations from site visits, and from soil samples show NO EVIDENCE that high water from a flood of Mud Creek has ever reached the permit area.

Channel Size, of Mud Creek, did not enter into the AVF study because it is so small relative to the existing "quasi AVF" due to the geologic control of Pleasant Valley.

A "Flood Irrigation Assessment" was completed in this study and became key to determining the lateral extent of the AVF in defining the larger AVF. The combination of that portion of the AVF that is presently being "flood irrigated" together with that portion of valley floor that could be "flood irrigated" largely defines the two AVFs.

An abandoned ditch can be seen and is labeled in the crossing the west side of the permit boundary. This ditch was last used approximately 25 years ago, and the diversion structure for the ditch has been destroyed therefore it is no longer functioning (Mike Erkkila, Mayor Scofield Town, Personal communication). The presence of the ditch does demonstrate that a portion of the Quasi AVF south and west of the permit boundary was at one time irrigated. Other portions of the Quasi AVF, west and north of the permit boundary, are being irrigated periodically at present.

An "Identification of Marsh Areas" was completed as part of this study. The area identified as Marsh on Map 32, AVF Evaluation Map, fits the classical definition of a Marsh, i.e., a marsh is a type of wetland that is subject to frequent or continuous flood. Typically the water is shallow and features grasses, rushes, reeds, sedges, and other herbaceous plants. The area was identified from aerial photographs, field evaluation of soil types, vegetation, and from the latest USDA SCS, Soil Survey of Carbon County, Utah, published June 1988.

A "Sprinkler irrigation Assessment" was not conducted as part of this study because the key parameter of whether or not the land could be flood irrigated, regardless of whether sprinkling may be more efficient in some areas, it was more important in determining extent of AVF than comparing the potential efficiency differences of sprinkling vs. flooding. Currenty there is no sprinkler irrigation being used in the AVF area.

A determination of the extent of potential "Artificial Sub-Irrigation" was not completed as a part of this study. For Soil Maping Unit 108 the SCS soils report does not indicate a water table depth, however, for Soil Mapping Unit 109 the SCS report indicates a fluctuating water table depth of 28 to 25 inches in spring and between depths of 35 and 45 inches during the drier season (page 77). Effective rooting depth for Soil Mapping Unit 108 is reported to be 60 inches or more for water-tolerant plants but is limited to 20 to 40 inches for non-water-tolerant plants (page 77). Effective rooting depth for Soil Mapping Unit 109 is reported to be 60 inches or more for water-tolerant plants but is limited to 18 to 24 inches for non-water-tolerant plants.

Evaluation of SCS Soil Survey of Carbon Area, Utah, Published June, 1988 (the most current survey as of August 2010).

As shown on Map 32, AVF Evaluation Map, there are two Soil Map Units according to the SCS Soil Survey, Unit 108, Silas loams, and Unit 109, Silas-Brycan loams. Soil Map Unit 109 comprises a very small area of 8.69 acres and Soil Map Unit 108 includes 220.45 acres.

Soil Map Unit 109

Unit 109 includes 8.69 acres within the Quasi AVF/AVF boundary shown on Map 32. This area is within property owned by Hilda Hammand, Carbon County Parcel 1B-483. Soil Map Unit 109 is described in the Soil Survey on page 77 as "This unit is 65 percent Silas loam, wet, 0 to 3 percent slopes; 20 percent Brycan loam, 3 to 8 percent slopes; and 15 percent other soils." The 8.69 acres lie on the eastern edge of the AVF area where the ground is sloping toward the east and Highway 96, and therefore fits in the 3 to 8 percent category of being Brycan loam. Further, the Soil Survey says, "…the Brycan soil is on alluvial fans adjacent to the narrow alluvial valleys." Further, the Soil Survey says, "The present vegetation in most areas is mainly silver sagebrush, bluegrasses, sedges, wiregrass, and scattered Colorado glue spruce." The 8.69 acres is above the grassy lower, flatter land is does exhibit the vegetation types mentioned, with a predominance of grasses, but does not contain and Colorado blue spruce.

On page 107 of the Soil Survey, it says, "The Brycan series consists of very deep, well drained, moderately slowly permeable soils on alluvial fans and in valleys. These soils formed in alluvium derived from shale and sandstone.

On page 131 of the Soil Survey it says, "The Silas series consists of very deep, somewhat poorly drained, moderately permeable soils on narrow alluvial valleys. These soils formed in alluvium derived from shale and sandstone."

Use and Management of the Soil

On page 93 of the Soil Survey Land Capabiltiy Classification is explained as follows, " Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (5). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are use for crops, and the way they respond to management." Also, "Capability subclasses are soil groups within one class. They are designated by adding a small letter, e, w, s, or c, to the class numeral, for example IIe. The letter e shows that the main limitiation is risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry."

The Capability Classification for Soil Map Unit 109 is VIw (page 78), which as can be seen on page 93 of the Soil Survey exhibits "…severe limitations that make them generally unsuitable for cultivation." And the subclass is w, meaning, "…that water in or on the soil interferes with plant growth or cultivation…."

Productivity

On page 94 of the Soil Survey, Total production is defined as "··· the amount of vegetation that can be expected to grow annually on well managed land that is supporting the natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. ··· It is expressed in pounds per acre of air-dry vegetation for favourable, normal, and unfavourable years. In favorable years, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavourable year, growing conditions are well below average, generally because of low available soil moisture."

On Table 4, Rangeland and Woodland Understory Productivity and Characteristic Plant Communities, Soil Unit 109 is listed as producing 3,500 pounds per acre, dry weight in a favorable year, with 3,000 pounds per acre in a normal year and 2,500 pounds per acre in an unfavourable year.

As explained on page 94 (see above) the productivity is stated to be "···on well managed land that is supporting the natural plant community." Although no species identification has been conducted on the 8.69 acres, it is evident from casual observation that grasses make up the predominant vegetation community, either native, or planted many years ago. Some shrubby species are present in the area that likely have been introduced with irrigation water, or have blown in or have been introduced by other natural processes. Whether the area has been well managed is debatable. Casual observations made over the past 25 years indicates that marginal management has been done in the area, with marginal effort to rotate grazing allotments, and irregular flood irrigation having been done. As can be seen on Map 32 an irrigation ditch called the East Branch Ditch terminates in the 8.69 acre area, and as stated before in this discussion, the Mayor of Scofield, Mike Erkkila stated that this ditch has not been used for approximately 25 years, and in fact the diversion has not been maintained, thus making the ditch unusable. According to Mayor Erkkila, a farmer attempted to run irrigation water down this ditch last year (2009) and could not get water to the fields due to poor maintenance.

Therefore, productivity of the 8.69 acre area could be expected to be approximately what the SCS Soils Survey shows on Table 4 (as stated above) at best, and at worst, much less. Since the SCS considers the production estimates to be from "well managed" land, and since the land within the 8.69 acres is not well managed as exemplified by the fact that the irrigation ditch has not been used in the past 25 years, it is likely that productivity from this soil unit is much less than the SCS estimates.

Soil Map Unit 108

Unit 108 includes a total of 220.45 acres which are owned by several individuals as shown on Map 32 within the Quasi AVF/AVF boundary. Soil Map Unit 108 is described in the Soil Survey on page 76 as "This very deep, somewhat poorly drained soil is in narrow alluvial valleys. ··· It formed in alluvium derived dominantly from sandstone and shale of the Price River and Black Hawk Formations. Slopes are 0 to 3 percent, w00 to 200 feet long, and concave to convex. The present vegetation in most areas is mainly Kentucky bluegrass, wiregrass, carex, and arrowgrass. ··· average freeze-free period is 60 to 80 days."

On page 131 of the Soil Survey it says, "The Silas series consists of very deep, somewhat poorly drained, moderately permeable soils on narrow alluvial valleys. These soils formed in alluvium derived from shale and sandstone."

Use and Management of the Soil

On page 93 of the Soil Survey Land Capabiltiy Classification is explained as follows, " Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (5). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are use for crops, and the way they respond to management." Also, "Capability subclasses are soil groups within one class. They are designated by adding a small letter, e, w, s, or c, to the class numeral, for example IIe. The letter e shows that the main limitiation is risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry."

The Capability Classification for Soil Map Unit 108 is VIw (page 77), which as can be seen on page 93 of the Soil Survey exhibits "…severe limitations that make them generally unsuitable for cultivation." And the subclass is w, meaning, "…that water in or on the soil interferes with plant growth or cultivation…."

Productivity

On page 94 of the Soil Survey, Total production is defined as "… the amount of vegetation that can be expected to grow annually on well managed land that is supporting the natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. … It is expressed in pounds per acre of air-dry vegetation for favourable, normal, and unfavourable years. In favorable years, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavourable year, growing conditions are well below average, generally because of low available soil moisture."

On Table 4, Rangeland and Woodland Understory Productivity and Characteristic Plant Communities, Soil Unit 109 is listed as producing 3,500 pounds per acre, dry weight in a favorable year, with 3,000 pounds per acre in a normal year and 2,500 pounds per acre in an unfavourable year.

As explained on page 94 (see above) the productivity is stated to be "…on well managed land that is supporting the natural plant community." Although no species identification has been conducted on the 8.69 acres, it is evident from casual observation that grasses make up the predominant vegetation community, either native, or planted many years ago. Some shrubby species are present in the area that likely have been introduced with irrigation water, or have blown in or have been introduced by other natural processes. Whether the area has been well managed is debatable. Casual observations made over the past 25 years indicates that marginal management has been done in the area, with marginal effort to rotate grazing allotments in the area, and irregular flood irrigation having been done. As can be seen on Map 32 an irrigation ditch called the East Branch Ditch terminates in the 8.69 acre area, and as stated before in this discussion, the Mayor of Scofield, Mike Erkkila stated that this ditch has not been used for approximately 25 years, and in fact the diversion has not been maintained, thus making the ditch unusable. According to Mayor Erkkila, a farmer attempted to run irrigation water down this ditch last year and could not get water to the fields due to poor maintenance.

Therefore, productivity of the 161.8 acre area could be expected to be approximately what the SCS Soils Survey shows on Table 4 (as stated above) at best, and at worst, much less. Since the SCS considers the production estimates to be from "well managed" land, and since the land within the 8.69 acres is not well managed as exemplified by the fact that the irrigation ditch has not been used in the past 25 years, it is likely that productivity from this soil unit is much less than the SCS estimates.

Livestock Capability

According to Mr. Ron Patterson, Extension Agent Carbon County, Utah State University Cooperative Extension Service (personal communication 83/2010), the AVF area could be expected to accommodate 1 AMU (Animal Month Unit).

"The AUM is the amount of forage needed by an "animal unit" (AU) grazing for one month. The animal unit in turn is defined as one mature 1 000 pound cow and her suckling calf. It is assumed that such a cow nursing her calf will consume 26 pounds of dry matter (DM) per day as forage. That consumption, combined with a factor for tramping and waste of about 25%, results in an estimate of about 1000 pounds of dry matter (DM) from forage to supply one AU each month. This translates into 1108 lb of hay at 90% dry matter. Various other types of stock are assigned AUM equivalents based on size and consumption. For example, the fact sheet Grazing Tame Pastures Effectively (Agdex 130/53-1) suggests a mature bull is the equivalent of 1.3 AU, a yearling steer or heifer is 0.67 AU and a weaned calf is 0.5 AU. These are the equivalents suggested by the Society for Range Management."
http://www.thedairysite.com/articles/981/understanding-the-animal-unit-month-aum

Since the AVF is in a high mountain valley, with an average frost-free period of from 60 to 80 days per year, the livestock carrying capacity of the AVF is limited to the frost-free period plus an indeterminate period of time in the spring when the vegetation begins to sprout until some indeterminate time when snows cover the ground making grazing difficult or impossible. Grass-hay harvested and stored from the AVF would then be required for livestock feed, or feed from other sources provided. This time period when livestock could potentially be supported from the AVF is somewhere in the range of 6 to 7 months at best.

Animals other than cows would of course consume and/or demand varying amounts of resources, but since the area is in a high mountain valley with a relatively short growing season, carrying capacity of the AVF is restricted and marginal for high production of animals or fowls, and economically the area is limited in usefulness for large scale producers.

R645-302-322.100 Affect on AVF

For the purposes of this discussion, the Quasi AVF and True AVF areas are considered the same and the acreages and other discussions below apply to both areas.

While limited areas downstream from the study area and west of the line labeled as Pastureland on Map 1A, Facilities Area Vegetation Map contain resource values consistent with the AVF criteria, future mining activities will not change the status or condition of the geology, ground water, surface water, or soils in this possible area for the following reasons:

1. Mining will not interrupt or cause significant diminution of surface or ground water flows. Refer Chapter 7, Hydrology for a complete discussion of the Ground and Surface Water

environment in the permit and general mine area, and specifically the discussion under R645-301-728, Probable Hydrologic Consequences Determination. To summarize, mining will be conducted above the regional ground water table, therefore no impacts to ground water that possibly feeds the AVF areas are possible. Surface runoff from the mining operation facilities are directed through the surface runoff control system and directed to Sediment Pond No. 1, which is an approved UPDES discharge point, with effluent limitations that protect downstream environmental values, and any possible AVF uses.

2. Irrigation water supplying the AVF area comes from Mud Creek at a diversion point well upstream of the proposed mine site. As can be seen on Map 32, AVF Evaluation Map, irrigation ditches supplying water to the AVF area are part of the Scofield Ditch system. The diversion point for this irrigation system is in the south half of Section 5, Township 13 South, Range 7 East on Mud Creek, some three quarters of a mile south of the most southerly point of the Kinney No. 2 Mine permit area. The AVF area
3. The only ditch supplying water to the AVF area that is near the proposed mine site has not been used for many years and appears not to be used due to maintenance neglect.
4. Surface runoff water from the proposed mine site will be diverted through sedimentation controls including the sedimentation pond, and alternative sediment controls including but not limited to silt fences, straw bales, and sediment traps.
5. Water quality discharges from the mine site are required to meet effluent standards that would prevent adverse impacts. Discharge from the sediment pond must meet NPDES requirements.
6. Runoff water from the mine site historically flows to the AVF area. The proposed mine operations will not stop this flow from reaching the area, other than a very small amount of water retained in the sedimentation pond.
7. Drill hole data, data from geotechnical drilling, and data from soils pits dug during soils investigations did not indicate any ground water in the shallow alluvium in the mine site area, with exception of Monitoring Wells CR-10-11 and CR-10-12, which are at the western edge of the permit area. These two monitoring wells are below surface impacts that could be contaminated by mining operations. Since the mine site is upgradient from the AVF area, it would be expected that the ground water would flow towards the AVF, and since little ground water was encountered, there is little risk of contamination from mining operations.

Water supply for use in the AVF area includes irrigation water from Mud Creek through irrigation ditches well upstream from the proposed mining operations. One irrigation ditch flows through the southwestern corner of the proposed mine permit area, and will be culverted through the operations area, thus preventing possible diminution of the irrigation water quality. It should be noted however that this irrigation ditch has not been used for many years as evidenced by the condition of the ditch and culvert crossing Highway 96 at the location of the proposed mine entrance road at Highway 96, and as discussed previously. The irrigation ditch is very overgrown with vegetation and has partially silted in from non-use over an extended period of time. The irrigation ditch culvert crossing Highway 96 is almost complete silted closed, thus evidencing non-use for an extended period of time. Surface runoff controls have been designed to collect all surface runoff from mining operations. The sedimentation pond will prevent siltation of the downstream environment. An oil/grease skimmer has been included in the pond outlet design to prevent any floating oil or grease from exiting the pond. The pond discharge will meet UPDES discharge requirements and thus adverse downstream impacts will be prevented. Relatively small areas at the topsoil stockpile and very small areas at the entrance road to the site from Highway 96 will be controlled by alternative sediment controls including, but not limited to silt fences, berms, straw bales, an/or sediment traps. These areas are very small and will not include mining operations that would create any significant discharge volumes containing harmful substances.

Risk To AVF Area

The information above demonstrates that there is negligible risk of material damage to quantity or quality of water flowing to the AVF area from the proposed mining operations at the Kinney No. 2 Mine. Historic mining by several mines in the area, and reclamation work completed by the Utah AML program have not adversely impacted the AVF area. New mining operations by CR would provide runoff controls and other controls of air quality, and control of chemical contamination that were not considered or attempted by historic mining and reclamation by AML. In addition, reclamation completed at the end of the Kinney No. 2 Mine life would be conducted in a more comprehensive manner, with more controls, and with full vegetative cover and diversity requirements. Therefore, the Kinney No. 2 Mine will have negligible impact on the AVF area.

Monitoring of water discharges, and monitoring of air quality during mining operations will document any adverse impacts, and regulatory requirements will dictate that any negative impacts must be corrected.

CR therefore believes that there will be no negative impact to the AVF and request UDOGM make a finding of no significant impact.

Guide to Deficiencies Response By Carbon Resources
Kinney #2 Mine

The current submittal (4 Oct. 2010) has been reformatted and includes responses to the UDOGM Deficiencies List Dated September 24, 2008. Otherwise it is identical to the initial Kinney # 2 Mine Permit Application submittal dated February 29, 2008 and updated with supplemental information on 13, June 2008. This document is a guide to the responses by Carbon Resources (CR) to the Deficiencies listed in the September 24, 2008 letter. This guide gives a very brief comment on each deficiency in the order they came with the UDOGM deficiency list. Where clarification or an explanation of the response by CR to the deficiencies is appropriate it is presented. This document is meant to assist the Division in reviewing the recently submitted Kinney No. 2 Mine permit application resubmittal.

The original UDOGM deficiencies are copied directly from the deficiency document in this font: *Times New Roman*. Carbon Resources responses are presented in this font: Century Gothic.

The members of the UDOGM review team include the following individuals:

Priscilla Burton-(PB)
Steve Christensen- (SC)
David Darby- (DD)
Joe Helfrich- (JH)
Wayne Western- (WW)

R645-103-235, *The application must include a written waiver from the owner of each occupied dwelling within 300 ft of the disturbed area boundary, to allow coal mining and reclamation operations within 300 feet of the dwelling. (PB)*

Response: A written waiver is included in Exhibit 4, Other Permits, and is discussed in Chapter 1, R645-301-115.300.

R645-300-113, *The Applicant must maintain current registration with the Utah Department of Commerce. Carbon Resources LLC registration lapsed on November 17, 2007. (PB)*

Response: Proof of current registration is addressed in R645-301-112, and a copy of a printout from the Utah State Department of Commerce web site is included in Exhibit 4, Other Permits.

R645-300-114.400, *Corporate identification numbers for Western Reserve Coal Company, Inc. and WRCC, LLC. and Carbon Resources, LLC are required, are not confidential, and must be provided in the application. (PB)*

Response: There appears to be no regulation R645-300-114.400 so we are confused as to what this comment is referring to. CR corporate ID numbers are Provided in Chapter 1, in response to R645-301-112.330. CR's Utah State Department of Commerce registration number is given in R645-301-112.100 with a copy of a printout from the Department of Commerce web site included in Exhibit 4, Other Permits.

R645-300-141, *The application must provide the legal description of the land designated as permit area. Numerous errors in the legal description were noted in Section 2.1.5.1 for the permit area portion of the lease and these must be verified. (PB)*

Response: A legal description of the permit boundary is included in R645-301-114.100. The legal descriptions all have been verified.

R645-301-112, *The Applicant must disclose all company officers' names and addresses and telephone numbers along with their employer identification numbers. All those who own 10% or more controlling interest in the company must be disclosed. • Percent ownership of the officers in each company and percent ownership of parent companies within the organizational family tree must be disclosed. • For all officers and directors and members, the date their position was assumed must be provided. (PB)*

Response: This information is included in R645-301-112.

R645-301-112.700, *Prior to permit issuance, the application must provide MSHA numbers for mine associated structures. (PB)*

Response: Addressed in R645-301-112.700.

R645-301-112.800, *Map 4.5.1.2-2, Coal Regional Ownership Map, mis-represents the coal ownership by Carbon Resources, LLC, according to the legal description in Section 2.1.5.1. The legal description provided in Section 2.1.5.1 is for a much larger area than the 452.5 acre permit area shown on Map 4.5.1.2-2. All adjacent coal leases must be shown on Map 4.5.1.2-2. In addition, Map 4.5.1.2-2 must designate the separation between R. 6 E. and R. 7 E. (PB)*

Response: Map 4.5.1.2-2 (now Map 12) has been corrected, and interest in lands is discussed in R645-301-112.800. Documentation of ownership is addressed in R645-301-114.100.

R645-301-121.200, *The legend provided for Regional Land Use Map 3.4.1.4-1 provides a hatch marking for Bureau of Reclamation land, but Scofield Reservoir is not marked with this legend and the Scofield Lake State Recreation Area boundary should be marked on the Regional land Use Map 3.4.1.4-1. • The application should note the connection between Exhibit 1.2-1 photographs and the pre-mining site condition Map 4.5.1.2-4 that provides photograph locations. Likewise, the application should refer to Exhibit 1.2-1 on Map 4.5.1.2-4 for photographs of numbered locations shown on that map. (PB)*

Response: Regional Land Use Map 3.4.1.4-1 (now Map 4) has been corrected. The photographs in Exhibit 1.2-1 (now Exhibit 1) have been referenced to Map 14, and a note has been added to Map 14 referencing the photo locations to Exhibit 1.

R645-301-121.200 and R645-103-234.100, *Applicant states that they have obtained approval for access to SR 96, from Emery County, but the authority with jurisdiction over the State highway is the Utah Department of Transportation. The permit application must contain the approvals from Utah Department of Transportation. (PB)*

Response: Addressed in Chapter 5, R645-526-116.1. Carbon Resources will provide to the UDOGM UDOT approval documents prior to permit approval.

R645-301-121.200 and R645-301-526.210, *Section 4.5.2.3 refers to Section 4.7 for further information on the 50,000 gallon water tank and water system to be supplied by the Scofield Town. No further information was found in Section 4.7 with regard to the water system. Is this potable water? Is this water for dust control? Is there an agreement in place with the Town of Scofield? (PB)*

Response: Scofield Town passed a resolution and signed a letter of intent to provide water to the Kinney# 2 Mine. Scofield Town has a 160,000 gallon potable water storage tank and ample water rights to serve the potable water needs of Scofield Town and the Kinney #2 Mine. A water system study currently being conducted by Scofield Town is expected to demonstrate that not only does the system have sufficient capacity to serve the Kinney #2 potable water needs but also provide sufficient water for dust suppression for the first several years of mining. These issues are fully addressed under R645-301-731.120 and R645-301-526.

R645-301-221 and R645-301-121.100, *Please include in Exhibit 1.5-1, the original correspondence letter and map (if any) that was sent to the NRCS, so that the area reviewed by the NRCS is documented. (PB)*

Response: Please refer to Exhibit 2 and Exhibit 6.

R645-301-222 and R645-301-121.200, *Figure 1 must show the proposed disturbed area boundary and references to the acreage enclosed by the "proposed mine facilities area" in Section 4.2.2.2 and the "actual proposed disturbance" in Section 4.2.2.1 should agree with the proposed disturbed area boundaries shown on Figure 1.• Figure 1 Soils Map should be produced on a scale equivalent to other mine maps (scale of 1 inch equals 200 feet, with 2 ft. contours), such that it can be used for soil salvage during site construction (and so that the Division can read the symbols on the map!). • Figure 1 should illustrate the known locations of buried coal fines. (PB)*

Response: Figure 1 in the Soils Report has been left in place to avoid confusion. New Map 34, Top Soil To Be Disturbed, has been added to address these concerns with additional information provided on Map 37, Planned Topsoil Cut Design.

R65-301-222.400, *Provide an estimate of productivity for each soil type or range type or vegetation type. (PB)*

Response: Table 25 has been added to Chapter 2, R645-301-222.400. Annual biomass production of the plant communities is presented.

R645-301-231.400, *The maximum dimensions of the soil stockpile are requested. (PB)*

Response: Topsoil piles have been modeled in 3D with SURVCAD Software and are shown on Maps 38, 39, 40, 41, 42, 43, and 44.

R645-301-232.100, *A second soil stockpile is necessary to provide for salvage of all 68,092 cubic yards available from the site. This second stockpile would allow separation of undisturbed from previously disturbed soil and coal fines. In addition, a second stockpile would provide room for expansion, if needed. The Division notes that 0.1 acres of map Unit 3A was included in the total*

disturbed acreage (27.3 acres) on Figure 1. Map Unit 3A is on the west side of the highway (Telonis owned property) and might be evaluated for use as a stockpile location. (PB)

Response: Per the Divisions Request, two additional topsoil stockpiles were added west of highway 92. A total of four topsoil piles are planned that facilitate the separation of pristine A-Horizon topsoil from previously disturbed topsoil. This issue is fully addressed in Chapter 2 under R645-302-232.100.

R645-301-232.700, *Figure 1 should have a symbol for those areas considered too steep or otherwise unavailable for soil salvage. An estimate of acreage unavailable for soil salvage should be included in the narrative and in the Planned Disturbance Table on Figure 1. (PB)*

Response: Map 33, Slope Analysis, was constructed to evaluate slopes over the proposed disturbed area. The result of that analysis is posted on Map 34, Topsoil to be Disturbed. This map has been constructed as a clarification of Figure 1. The (averaged) 30% slope line is also seen on Map 36, Planned Salvage Area Soil Map, and Map 37, Planned Topsoil Cut Design. This issue is fully addressed in Chapter 2 under R645-301-232.

R645-301-234.210, *The application should explain how the soil stockpile will be separated from the bathhouse fill pad. (PB)*

Response: As described in Chapter 2 under R645-301-232, plastic fabric "marking strips" will be placed along the contact and the contact between topsoil and non topsoil will be carefully surveyed.

R645-301-234, *The applicant commits to reporting final salvage volumes in an annual report (Section 4.4.2.1). This commitment should state that the mining and reclamation plan (MRP) will be amended with the as-built information on final soil salvage volumes, areas and recovery depths, as well. • The application should state the source, and describe the quality and quantity of the excavated material to be used as a base for the soil stockpile construction. (PB)*

Response: As described in Chapter 2 under R645-301-232.500 Carbon Resources Commits to having a qualified person present during soil salvage operations, and as-built configurations will be carefully surveyed, and the results of the removal operation will be reported in the Annual Reclamation Monitoring Report. R645-301-232.00 details the source, sequence and quality of each topsoil area of to be removed.

R645-301-234.220 and R645-301-121.200, *The plan describes protection of the topsoil stockpile from Hwy 96 by means of a ditch and a berm. As illustrated on Map 4.7.2.1-2, the plan should clearly indicate that the ditch begins approximately 200 ft. from the southern end of the stockpile and that the main protection for salt loading at the southern end of the stockpile is the six foot fill. (PB)*

Response: Maps 38, 39, 41 show the six foot fill (Volume A) which underlay's the topsoil pile at the south western edge of the parking lot which is the main protection from salt loading, per the Divisions request. Map 24 (inset) shows location of the berm and ditch

designed to protect the topsoil pile.

R645-301-241, *The topsoil sampling described in Sec. 5.2.2.3 is appropriate, but, the commitment should include a description of the analyses to be performed. (PB)*

Response: Chapter 2 R645-301-231.300. Prior to final reclamation Carbon Resources will sample the topsoil storage piles per the UDOGM Topsoil/Overburden Guidelines.

R645-301-242.110 and R645-301-553.130, *Reclamation slopes will vary from 5h:1v to 0.5h:1v (Section 5.4.2.3, Backfilling and Grading to Establish Final Configuration). The geotechnical investigation in Exhibit 4.5.2.1-1 recommends construction of cutslopes no greater than 1.25h:1v or in the vicinity of B-B' no greater than 1.75h:1v. The geotechnical investigation does specify that cuts into competent sandstone may approach 0.5h:1v, but does not indicate fill slopes may approach this steepness. No specific recommendations for fill slopes were made, except that the sandy lean clay soils are collapsible and have a friction angle of 20 degrees. Map 4.7.2.9-1 shows reclamation contours. To facilitate the Division's understanding of where topsoil will be replaced, this map should also identify steep slope segments by their slope angle as well as those slopes which are pre-existing, pre-SMCRA remnants of previous mining. Topsoil should not be replaced on areas that are too steep. (PB)*

Response: Addressed in Chapter 5, R645-301-553.130 as follows:

The Geotechnical Investigation, dated November 26, 2007 states on page 17 of 17, "It is anticipated that fill slopes will be created with on-site materials. If this material is placed and compacted in accordance with recommendations provided in Section IV, fill slopes as steep as 1.5H:1V will have a factor of safety of at least 1.3 if constructed of the native clayey soils. Fill slopes shown on Sections A-A, B-B, and F-F will likely be constructed of this clayey on-site fill. Test pits in the vicinity of the fill areas shown on Sections C-C, D-D, and E-E encountered significant amounts of medium-dense silty sand. Fill slopes as steep as 1.8H:1V constructed of this silty sand material have a computed factor of safety of at least 1.3. Plots of stability analyses for typical fill slopes are included in the appendix."

In Addendum No. 1 to the Geotechnical Investigation, dated September 28, 2010, RB&G Engineers, Inc states,

"Note that the Direct Shear test on the sample of sandy lean clay which had a friction angle of 20 degrees also had cohesion of 15 psi. Two Triaxial Shear tests performed on samples of the lean clay had total stress friction angles of 29.6 and 32.5 degrees with 2 psi cohesion and effective stress friction angles of 36.0 and 36.7 degrees with 2 psi cohesion."

Since fill slopes properly constructed of native materials will have a minimum static safety factor of 1.3, the base material for the topsoil piles will be stable. CR will insure that the bases of topsoil stockpiles are stable and will support the topsoil material.

R645-301-244.100, *For those areas where discing the surface is not an option due to excessive slope, Section 5.2.2.4 must describe seeding, and mulch application immediately following topsoil application, regardless of season. • Section 5.2.2.4 must describe a method of soil stabilization for those areas where seeding does not immediately following topsoil application. •The plan should differentiate on a map, which slopes will be deep gouged as described in Section 5.3.2.2 and which will be disced as described in Section 5.2.2.4. (PB)*

Response: Addressed in Chapter 2, R645-301-244.200, also in Chapter 3, R645-301-355.

R645-301-244.320, *The application must include a commitment to repair rills and gullies, including replacement of topsoil and reseeding or replanting, if necessary. (PB)*

Response: Addressed in Chapter 2, R645-301-244.300

R645-302-321*, The application should provide the name of the irrigation company or individual that owns the irrigation ditch running across the proposed mine site and the date the ditch was last used. • The application must describe agricultural activity (production quantities by crop type, animal units supported, etc.) for each agricultural land owner adjacent to the mine site. • The application must provide a map showing the adjacent agricultural lands, identifying subirrigated and irrigated lands, showing all irrigation ditches, and define the extent of the adjacent alluvial valley floor in Pleasant Valley. (PB)*

Response: The irrigation company is identified on Map 32, AVF Evaluation Map in Note 3. The dates of use of the subject irrigation ditch are addressed in Chapter 9, R645-302-320. A complete evaluation of potential AVF values is presented in Chapter 9. Map 32, AVF Evaluation Map includes pertinent information. This map is complex, containing a lot of information – it is important to present all of the information on one map to be able to understand the relationships of all of the information.

R645-301-422, *Prior to permit issuance, the application must include the Air Quality Approval Order. (PB)*

Response: Utah Division of Air Quality Approval Order DAQE-AN0141180001-08 is included in Exhibit 4.

R645-301-624, *Table 3.6-2 provides some information on the acid forming potential for roof and floor, but it is not clear whether this is the acid/base potential of the rock or the acid forming potential of the sulfate in the rock or the base forming characteristic of the rock. This table must be supported by the analytical results accompanied by the name of the organization that analyzed the data (R645-301-131). According to R645-300-124.300, acid/toxic reporting on roof and floor is not confidential. • Table 3.6-3 does not provide the laboratory analysis for the parameters identified. Table 3.6-3 must be accompanied by the analytical results accompanied by the name of the organization that analyzed the data. According to R645-300-124.300, chemical characteristics of roof and floor are not confidential. • Section 4.7.2.1 states that "Analysis of both actual existing and potential future coal materials, including incidental roof and floor rock, are described in Section 3.6-3 Coal and Overburden/Interburden Characteristics." However, Section 3.6-3 does not discuss the characteristics of the coal currently buried on site. The plan*

must provide information on the characteristics of the buried waste that will be unearthed in the process of site development. (PB)

Response: Addressed in Chapter 6 under R645-301-624; Table 4 lists Roof and Floor Samples with Data from Acid Forming and Neutralization Potential Analysis. These samples are a combination of new analysis of pulp stored in the laboratory and additional samples taken from archived core. Lab sheets supporting these data can be found in Exhibit 19, SGS Lab Sheets. Additional lab sheets with data including Sulfur Forms of Hiawatha Seam Coal can be found in Exhibit 3, Confidential Information.

Addressed in Chapter 6 R645-301-624 and Chapter 2 R645-301-232.100. Available analysis of coal buried during AML reclamation here referred to as "reclaimed coal" is shown in Chapter 6 Table 5A with lab sheets for same located in Exhibit 6, SGS Lab Sheets. Acid potential has been calculated from Total Sulfur. Location and thickness of the "reclaimed coal" is shown on Maps 34 and 45. This "reclaimed coal" will be sold to Arch Minerals and hauled off site per a written agreement with Arch Minerals.

R645-301-553.252, *A commitment to bury coal mine waste beneath four feet of cover is required. Section 5.4.2.3, Disposal of Mine Waste, and Non-Coal Waste is silent on this issue. (PB)*

Response: A commitment has been added to Chapter 5, R645-301-553.250 to bury coal mine waste a minimum of 4 feet. Also a commitment to bury exposed coal seams a minimum of 4 feet is included in Chapter 5, R645-301-553.300

R645-301-731.300 and R645-301-121.200, *The applicant should verify whether the statements made in Section 4.7.2.4 and Section 4.7.4.3 agree with other statements in the plan concerning blending of development waste with spec coal. •The application should include in Sections 4.7.2.4 and 4.7.4.3 a discussion of the information known about the chemical acid/toxic characteristics of the roof, floor, coal, and buried mine waste on site. (PB)*

Response: The statements have been corrected as to not be conflicting.
Low grade coal as well as that portion of mine development waste not placed in designated underground storage will be stacked on the "off-spec" stacking tube and blended into the stream of "spec coal" as immediacy as possible. Two additional mechanisms have been created to deal with "mine development waste" that is inadvertently taken with the coal and who's volume exceeds the capacity of the "spec coal" stream to accept it; 1- Per the Divisions request, a small short term storage or temporary pile has been designed and added to the surface operational plan shown on Map 13, Surface Facilities, 2- A letter of intent has been signed between Carbon Resources and Arch Coal allowing Arch to purchase as "distressed coal" volumes of low quality coal whether the coal was mined as low quality or diluted with mine development rock waste, and process said "distressed coal" through their processing facility on Ridge Road south of Price.
Addressed in Chapter 6 under R645-301-624.

R645-301-731.300 and R645-301-536.320, *Provide a sampling plan to identify acid/toxic*

characteristics of waste stored on the surface. (PB)

Response: As detailed in Chapter 6 under R645-301-624, there will be NO Long Term Storage of waste rock on the surface. The mine development waste and or low quality coal will follow one of three paths none of which results in long term surface storage. The temporary pile will act as overflow from the "off-spec" stacking tube and will be blended into the product stream at the earliest possibility.

R645-301-120, *The Permittee should provide legends for all maps within the application. If a map depicts a feature or item of interest that is denoted by a specific symbol or demarcation, that symbol should be noted in a legend and identified. For example, Map 4.7.2.1-1, Drainage and Sediment Control Plan Undisturbed Drainage Areas, depicts components of the mine sites drainage design, yet there is no legend on the map that identifies what those components are. Map 3.7.2-1, Works-Wells-Springs-Faults depicts numerous geological and hydrologic features that are not identified within the legend. (SC)*

Response: Legends of all maps have been corrected.

R645-301-150, *The List of Tables indicates that the application contains Table 3.7-1, Kinney No. 2 Mine Baseline Monitoring Stations, at the end of section. Upon review of the application, it does not appear that this table was included in the application. The Permittee should include Table 3.7-1, Kinney No. 2 Mine Baseline Monitoring Stations, as indicated in the table of contents. (SC)*

Response: Baseline monitoring stations are listed in Chapter 7 Table 6.

R645-302-321, *Based on available data or field studies, the application must define the extent of any adjacent alluvial valley floors within the permit and adjacent area. (SC)*

Response: A complete evaluation of potential AVF values and areas is presented in Chapter 9. Map 32, AVF Evaluation Map includes pertinent information. This map is complex, containing a lot of information – it is important to present all of the information on one map to be able to understand the relationships of all of the information.

R645-301-724.300, *The Permittee should provide more discussion/data to address the nature of the material contained within the north-south trending fault systems. On page 3.7-13, 5th paragraph, "At times shales in or adjacent to fractured of faulted zones will swell, acting as an aquitard thus limiting vertical ground water movement via the fault, and horizontal movement through the fault." The Permittee should provide further characterization as to the hydrologic properties of the numerous faults located within and adjacent to the permit area. The application should address how it was determined that the faults serve as confining layers to hydrologic flow within the permit and adjacent area as opposed to (as in some cases within the Utah coal fields) a fault that is capable of transmitting water. (SC)*

Response: An extensive study with conclusions regarding the nature of materials contained with the north-south trending faults systems and the hydrologic properties of said faults and the role these faults play in "Vados Zone Springs". Appropriate portions of that study are cited in Chapter 6 R645-301-624.310.

R645-301-723, *The Permittee should provide commitment to conduct all water quality analyses according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434. Upon review of the application, it did not appear that such a commitment or discussion per R645-301-723 (as to the sampling protocols/standards to be followed) was included. In addition, the Permittee should provide a commitment to submit water quality data electronically to the Division's Utah Coal Mining Water Quality Database. (SC)*

Response: Commitment made in Chapter 7, R645-301-723 Sampling and Analysis.

R645-301-724, *The Permittee should provide the laboratory analytical reports generated from both the ground and surface water monitoring activities. (SC)*

Response: Paper Copies of analytical reports generated from all ground and surface water monitoring activities can be found in Exhibit 12.

R645-301-724.100, *The application should provide a more clear and concise presentation as to the groundwater characterization within the permit and adjacent area. The discussion should explicitly address why the minimum groundwater quality samples could not be obtained (with the exception of CR 06-03 ABV) from the monitoring wells depicted on Map 3.7.2.1-1, Ground Water Level Data. Exhibit 3.7.2.2-2, Surface and Ground Water Field Measurements, outlines the numerous field visits where water level readings were obtained from below, within and above the coal seam. Map 3.7.2.1-1 identifies CR-06-02 as a dry well, however upon review of the field data presented in Exhibit 3.7.2.2-2 water level data was obtained from CR-06-02 fifteen times and exhibited fluctuations of more than four feet. In addition, the application should discuss why the minimum groundwater quality samples were not obtained for Eagle Springs 1A, 2 and 3. (SC)*

Response: Addressed in Chapter 7 under R645-301-724.100. Issues addressed in Chapter 7. Maps 7, 8, 9, and 10, combine to present a very clear and concise visual characterization of the groundwater within the permit and adjacent area.

Carbon Resources completed a total of 9 groundwater monitor wells in 2006 and, per the Divisions request, two "down gradient" monitor wells were added in 2010 (see Exhibit 11). As predicted by Carbon Resources in 2005, the Hiawatha Coal Seam within the Permit Boundary is "high and dry" residing in excess of 165 feet above the regional groundwater table (CR-06-01-BLW Exhibit 10 and Exhibit 11)except within the Eagle Canyon Graben (CR-06-03-ABV) where the seam has been displaced downward within the graben placing it below the regional groundwater table. Mining is not planned within the Eagle Canyon Graben; therefore the Hiawatha Seam is "high and dry" everywhere mining is planned within the permit boundary.

Two unfortunate compounding issues resulted in some confusion that in turn contributed to the Divisions under appreciation of zero as a valid data point. Issue one; all of the monitor wells were professionally completed using either fiberglass or PVC as non-corrosive well tubing with stainless steel slotted well screens and a ten (10) foot stainless steel closed bottom "blank" beneath each well screen. Washed round silica

sand was tremmied into position around the screen/blank assembly (Exhibit 11). Water level in each well was measured and recorded diligently through the baseline period. Visit to each well is demonstrated by the date and water level noted in the field notes (Exhibit 10). Confusion was caused by the fact that the blanks capture and hold water even in a dry hole because there is always some drilling water remaining in the formation immediately following the drilling process. The Division apparently did not notice that the water levels shown in many of the wells were below the well screens, but within the blanks which contain only remnant water from the drilling process, and therefore were not representing any groundwater level and in fact are dry holes. An example of this is that the Division pointed out there were 15 field visits to CR-06-02 with water levels noted for those field visits (see Exhibit 10), however, upon close inspection not one of the water levels recorded during the field visits are above the bottom of the screen but were in fact within the blank. This hole is also dry.

The second issue; an unfortunate circumstance that contributed to confusion is the "false positive water levels" recorded from monitor well CR-06-01 BLW. This well is completed with 4" fiberglass well tubing and has a custom made reducer connecting the 2" stainless steel well screen and blank assembly to the 4" fiberglass. This custom made reducer has a "lip" at the bottom of the 4" fiberglass. Unfortunately the well deviates from vertical within the bottom 50 feet causing a plumb bob, when held on a string from the surface, to strike the lip of the reducer instead of entering into the 2" well screen. These two factors when combined with a third, that is , moisture condensation in the well tubing, caused the water level probe to encounter the moisture at the lip and give "false positive" water levels for this hole. This information has been verified by lowering a color, led lighted, borehole camera into the hole and producing a digital video, recording the absence of water within the well screen and sh~~n~~owing water only within the blank, over 10 feet beneath the "false positive" readings recorded. This demonstrates that the groundwater level is in excess of 165 feet below the Hiawatha Coal Seam at this point within the permit boundary.

By completing groundwater monitor wells "above", "within", and "below" "the seam to be mined", Carbon Resources has complied with regulations and has demonstrated that the Hiawatha Seam (seam to be mined) is "high and dry" within the planned mining area of the permit boundary, as predicted. By completing CR-06-01 BLW 165 feet below the Hiawatha Seam, Carbon Resources demonstrated more than a token effort to characterize the three dimensional ground water configuration within the permit boundary.

By repeatedly taking baseline measurements from all of the groundwater monitoring wells and thereby demonstrating that many of the wells are in fact dry, has produced a body of baseline data documenting the three dimensional groundwater regimes within the permit boundary over the course of several years. Some of the data points are zero, that is NO WATER; however, these are still VALID DATA points. Water samples were not retrieved from the dry holes because it is impossible to retrieve water samples from dry wells.

Per the Divisions request, Carbon Resources completed CR-10-11 and Cr-10-12 as down-gradient groundwater monitor wells. Both of these wells are completed far above

the Hiawatha Seam owing to the fact that the seam has been displaced downward by the Pleasant Valley Graben. Both of these monitor wells are artesian and both show water levels for the regional groundwater aquifer. These wells confirm the model which was constructed prior to drilling the wells, of the regional peizometric surface and have provide additional water level information and water samples from the regional groundwater table.

The situation is the same for Eagle Springs 1, 2, and 3 as for many of the dry drill holes. Carbon Resources visited the springs and captured water samples when water was available. The springs are annual springs, only flowing water in early spring and summer, as demonstrated by field visits that noted a ZERO DATA POINT when the visit demonstrated the spring had dried up. No water samples were collected when the springs dry-up in mid-summer, however, the field visits document the seasonal variation of the springs.

R645-301-724.100, *The application should provide a more clear and concise presentation as to the groundwater characterization within the permit and adjacent area. A regional aquifer is discussed in several instances within the application. It is unclear as to whether the application has provided the data necessary (i.e. water quality, quantity, seasonal fluctuation, usage etc.) in order to accurately characterize the nature/characteristics of the regional aquifer system. The Permittee should provide the data and/or a reference to information that can substantiate the characterization of the regional aquifer system in the permit and adjacent area. Page 3.7-11 of the application states, "Because the lower portion of the Blackhawk Formation is the primary coal-bearing sequence in the area, the regional aquifer system is the only ground water system which could be directly affected by the mining operations". Page 4.7-5 states, "Mining within a regional aquifer is not anticipated, however, if it were to occur, a reduction in the amount of water available within the aquifer due to in-mine pumping and extraction, would result in a temporary localized depression of the piezometric surface". The groundwater baseline discussion should provide data and/or a reference that characterizes the seasonal fluctuation of the regional aquifer's potentiometric surface, it's usage and it's water quality. (SC)*

Response: Issues addressed in Chapter 7. Maps 7, 8, 9, and 10, combine to present a very clear and concise visual characterization of the groundwater within the permit and adjacent area including a regional peizometric surface.

R645-301-724.100, *The Permittee should provide a more clear and concise characterization/discussion as to the origin of recharge to the seeps and springs identified within the permit and adjacent area. (SC)*

Response: Addressed in Chapter 7 under R645-301-724.100 groundwater and surface water interactions.

R645-301-724.100,*The Permittee must address the following discrepancy. Page 3.7-4 states, "No seeps and springs were found within the permit area itself". However, Map 3.7.1.3-1, Regional Hydrology depicts Eagle Springs 1, 1A, 2 and 3 within the permit boundary. (SC)*

Response: This discrepancy has been corrected. Eagle Springs and Aspen Spring are

found within the permit boundary see Map 7.

R645-301-724.100, *On page 3.7-9, the application states, "Further evaluation also shows that with the exception of Sulphur Spring, seeps and springs located along the western facing slope of the mine permit area are all located south of the mine permit area and are at elevations of 8,000 feet msl or higher". Upon review of Exhibit 3.7.2.2-1, Seep and Spring Survey and Map 3.7.1.3-1, it's difficult to determine the locations of the springs located south of the proposed permit area. The application should provide a more clear and concise presentation as to the springs and seeps located within the permit and adjacent area. (SC)*

Response: This has been corrected; see Map 7 and Map 8.

R645-301-724.100, *The Permittee should provide a map that depicts the locations of the groundwater rights within and adjacent to the permit area. Per R645-301-724, the Permittee must provide the location and ownership for the permit and adjacent areas of existing wells, springs and other ground-water resources. The table of contents lists Figure 3.7.2.5-1, Ground Water Right Locations, in the table of contents. However, it appears that the figure was not inserted into the application prior to submittal. The locations of these water rights are necessary in order to evaluate the potential impacts from the proposed mining operation on groundwater resources. (SC)*

Response: Ground and surface water rights are addressed in Chapter 7. Ground and Surface water rights information obtained from the Utah State Water Rights Office are included in Exhibit 13, Water Rights. Ground water rights locations are shown on Map 30, and surface water rights locations are shown on Map 31. Ground water wells are shown on Map 30, Ground Water Rights Locations, and can be correlated with the same wells shown on Map7, Regional Hydrology.

R645-301-724.200, *The Permittee should provide data and discussion as to how the characterizations of the Eagle Canyon and UP Canyon drainages were formulated. Page 3.7-17 of the application states, "Minor perennial streams drain watersheds adjacent to the proposed permit area including several small intermittent and ephemeral tributaries are located within and adjacent to the permit area, including UP Canyon to the south and Eagle canyon to the north." The sentence is unclear. On page 3.7-18, the application states that with the exception of Mud Creek and Long/Miller Canyon, "all other area drainages are characterized by intermittent or ephemeral flow patterns". The Permittee should provide the data that was utilized in determining the flow/usage characteristics as well as the water quality for all drainages located within the permit and adjacent area. The additional information should also be supplied for any undisturbed drainage that intercepts the surface facilities as depicted on Map 4.7.2.1-2. Page 3.7-7 discusses the nature of surface runoff within the disturbed permit area. The application notes that when runoff occurs, it is either sheet flow or small concentrated flow within ephemeral channels. The application should clearly identify and characterize the drainages that intersect the surface facilities. Upon review of map 4.7.2.9-1 and the discussion regarding diversions, it's clear that ephemeral drainages intersect the disturbed area. The surface water baseline information needs to address all drainages within and adjacent to the permit area (i.e. ephemeral, intermittent and perennial). (SC)*

Response: The ephemeral drainages that are located within and close to the permit boundary are characterized in Exhibit 20.

Flow calculations and methods of determining same are found in Exhibit 10, and in Chapter 7,

R645-301-729, *The application does not meet the Baseline Cumulative Impact Area Information requirements of the State of Utah R645-Coal Mining Rules. The Permittee must address the baseline data deficiencies outlined previously in order for the Division to assess the probable cumulative hydrologic impacts from the proposed operation on ground and fsystems. The Permittee must address the baseline data deficiencies outlined previously in order for the Division to make that assessment. (SC)*

Response: Addressed in Chapter 7 under R645-301-724.100. The baseline data deficiencies are not specifically listed or enumerated in any one location within the deficiencies letter. Those that are mentioned are located in several different places have been identified as a combination of confusion about data from dry monitor wells and the unfortunate occurrence of false positive data in the case of CR-06-01-BLW. The confusion led to the under appreciation of Zero as a valid data point.

The lab sheets which were originally provided in PDF format are now provided in paper format (Exhibit 12); additional data have now been collected from all sources except CR-06-03 ABV and Angle Spring. New groundwater data are now available from CR-10-11 and CR-10-12. Maps have been updated to provide a more clear presentation of the data addressed in Chapter 7. Maps 7, 8, 9, and 10, combine to present a very clear and concise visual characterization of the groundwater within the permit and adjacent area.

Carbon Resources completed a total of 9 groundwater monitor wells in 2006 and, per the Divisions request, two "down gradient" monitor wells were added in 2010 (see Exhibit 11). As predicted by Carbon Resources in 2005, the Hiawatha Coal Seam within the Permit Boundary is "high and dry" residing in excess of 165 feet above the regional groundwater table (CR-06-01-BLW Exhibit 10 and Exhibit 11)except within the Eagle Canyon Graben (CR-06-03-ABV) where the seam has been displaced downward within the graben placing it below the regional groundwater table. Mining is not planned within the Eagle Canyon Graben; therefore the Hiawatha Seam is "high and dry" everywhere mining is planned within the permit boundary.

Two unfortunate compounding issues resulted in some confusion that in turn contributed to the Divisions under appreciation of zero as a valid data point. Issue one; all of the monitor wells were professionally completed using either fiberglass or PVC as non-corrosive well tubing with stainless steel slotted well screens and a ten (10) foot stainless steel closed bottom "blank" beneath each well screen. Washed round silica sand was tremmied into position around the screen/blank assembly (Exhibit 11). Water level in each well was measured and recorded diligently through the baseline period. Visit to each well is demonstrated by the date and water level noted in the field notes (Exhibit 10). Confusion was caused by the fact that the blanks capture and hold water even in a dry hole because there is always some drilling water remaining in the formation immediately following the drilling process. The Division apparently did not notice that the water levels shown in many of the wells were below the well screens, but within the blanks which contain only remnant water from the drilling process, and

therefore were not representing any groundwater level and in fact are dry holes. An example of this is that the Division pointed out there were 15 field visits to CR-06-02 with water levels noted for those field visits (see Exhibit 10), however, upon close inspection not one of the water levels recorded during the field visits are above the bottom of the screen but were in fact within the blank. This hole is also dry.

The second issue; an unfortunate circumstance that contributed to confusion is the "false positive water levels" recorded from monitor well CR-06-01 BLW. This well is completed with 4" fiberglass well tubing and has a custom made reducer connecting the 2" stainless steel well screen and blank assembly to the 4" fiberglass. This custom made reducer has a "lip" at the bottom of the 4" fiberglass. Unfortunately the well deviates from vertical within the bottom 50 feet causing a plumb bob, when held on a string from the surface, to strike the lip of the reducer instead of entering into the 2" well screen. These two factors when combined with a third, that is , moisture condensation in the well tubing, caused the water level probe to encounter the moisture at the lip and give "false positive" water levels for this hole. This information has been verified by lowering a color, led lighted, borehole camera into the hole and producing a digital video, recording the absence of water within the well screen and snowing water only within the blank, over 10 feet beneath the "false positive" readings recorded. This demonstrates that the groundwater level is in excess of 165 feet below the Hiawatha Coal Seam at this point within the permit boundary.

By completing groundwater monitor wells "above", "within", and "below" "the seam to be mined", Carbon Resources has complied with regulations and has demonstrated that the Hiawatha Seam (seam to be mined) is "high and dry" within the planned mining area of the permit boundary, as predicted. By completing CR-06-01 BLW 165 feet below the Hiawatha Seam, Carbon Resources demonstrated more than a token effort to characterize the three dimensional ground water configuration within the permit boundary.

By repeatedly taking baseline measurements from all of the groundwater monitoring wells and thereby demonstrating that many of the wells are in fact dry, has produced a body of baseline data documenting the three dimensional groundwater regimes within the permit boundary over the course of several years. Some of the data points are zero, that is NO WATER; however, these are still VALID DATA points. Water samples were not retrieved from the dry holes because it is impossible to retrieve water samples from dry wells.

Per the Divisions request, Carbon Resources completed CR-10-11 and Cr-10-12 as down-gradient groundwater monitor wells. Both of these wells are completed far above the Hiawatha Seam owing to the fact that the seam has been displaced downward by the Pleasant Valley Graben. Both of these monitor wells are artesian and both show water levels for the regional groundwater aquifer. These wells confirm the model which was constructed prior to drilling the wells, of the regional peizometric surface and have provide additional water level information and water samples from the regional groundwater table.

The situation is the same for Eagle Springs 1, 2, and 3 as for many of the dry drill holes.

Carbon Resources visited the springs and captured water samples when water was available. The springs are annual springs, only flowing water in early spring and summer, as demonstrated by field visits that noted a ZERO DATA POINT when the visit demonstrated the spring had dried up. No water samples were collected when the springs dry-up in mid-summer, however, the field visits document the seasonal variation of the springs.

R645-301-728, *In order to accurately assess the PHC Determination provided in the application, the Permittee must first address the baseline data deficiencies outlined in the Environmental Resource Information section. Per R645-301-728, "The PHC determination will be based on baseline hydrologic, geologic and other information collected for the permit application". Once the baseline deficiencies have been addressed, the Division will be able to accurately assess the probable hydrologic consequences associated with the proposed mining activity. (SC)*

Response: Addressed in Chapter 7 under R645-301-724.100. The baseline data deficiencies are not specifically listed or enumerated in any one location within the deficiencies letter. Those mentioned are located in several different places and have been identified as a combination of confusion about data from dry monitor wells and the unfortunate occurrence of false positive data in the case of CR-06-01-BLW. The confusion led to the under appreciation as Zero as a valid data point.

The lab sheets which were originally provided in PDF format are now provided in paper format (Exhibit 12); additional data have now been collected from all sources except CR-06-03 ABV and Angle Spring. New groundwater data are now available from CR-10-11 and CR-10-12. Maps have been updated to provide a more clear presentation of the data addressed in Chapter 7. Maps 7, 8, 9, and 10, combine to present a very clear and concise visual characterization of the groundwater within the permit and adjacent area.

Carbon Resources completed a total of 9 groundwater monitor wells in 2006 and, per the Divisions request, two "down gradient" monitor wells were added in 2010 (see Exhibit 11). As predicted by Carbon Resources in 2005, the Hiawatha Coal Seam within the Permit Boundary is "high and dry" residing in excess of 165 feet above the regional groundwater table (CR-06-01-BLW Exhibit 10 and Exhibit 11)except within the Eagle Canyon Graben (CR-06-03-ABV) where the seam has been displaced downward within the graben placing it below the regional groundwater table. Mining is not planned within the Eagle Canyon Graben; therefore the Hiawatha Seam is "high and dry" everywhere mining is planned within the permit boundary.

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(Exhibit 10). Confusion was caused by the fact that the blanks capture and hold water even in a dry hole because there is always some drilling water remaining in the formation immediately following the drilling process. The Division apparently did not notice that the water levels shown in many of the wells were below the well screens, but within the blanks which contain only remnant water from the drilling process, and therefore were not representing any groundwater level and in fact are dry holes. An example of this is that the Division pointed out there were 15 field visits to CR-06-02 with water levels noted for those field visits (see Exhibit 10), however, upon close inspection not one of the water levels recorded during the field visits are above the bottom of the screen but were in fact within the blank. This hole is also dry.

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R645-301-724.100, *The Permittee should provide a table that clearly identifies the monitoring schedule and sample parameters for each individual water-monitoring site. Table 4.7.2.3-1, Monitoring Schedule provides a table listing the parameters and the frequency with which sites will be monitored, however; based upon access issues with surface owners within the permit area, it's the Division's understanding that CR-06-03-ABV and Angle Spring depicted on Map 4.7.2.3-1, Surface & Ground Water Monitoring Sites can not be monitored. The application should provide a clear presentation as to what sites are to be monitored (identified by specific Site ID), as well as the sampling frequency and analytical parameters for each individual site. (SC)*

Response: Addressee in Chapter 7, Table 7, Table 20, #

R645-301-724.100, *The Permittee should remove the sentence on Page 3.7-8 that states, "The first of these wells is located in Eagle Canyon and has been ordered to be abandoned by DOGM". The application is discussing water-monitoring well CR-06-03-ABV. The Division ordered the well to be abandoned due to contract disputes that arose between the landowner and the Permittee. The well was reclaimed because of the language in the Permittee's access agreement and the wishes of the landowners. (SC)*

Response: The sentence has been removed.

R645-301-724.100, *The Permittee should include Table 3.7-1, Kinney No. 2 Baseline Monitoring Stations, as identified in the Table of Contents. None of the permit applications submitted to the Division contained this table. (SC)*

Response: Addressed in Chapter 7, Table 6.

R645-301-724.200, *The Permittee should provide some discussion/justification for not establishing water-monitoring points within Eagle and UP Canyon as well as any ephemeral or intermittent drainage that exists within the proposed permit and adjacent area. (SC)*

Response: Exhibit 20 demonstrates that Eagle and UP Canyons are ephemeral drainages and are clearly above the groundwater table therefore it is not appropriate to collect water samples in a dry drainage.

R645-301-724, *The Permittee should include Table 3.7-1, Kinney No. 2 Baseline Monitoring Stations as identified in the Table of Contents. None of the permit applications submitted to the Division contained this table. (SC)*

Response: Table 6 has been added to Chapter 7.

R645-301-722, *The scale of Exhibit 3.7.2.2-1, Spring and Seep Survey June 2006, needs to be enlarged. The map in Exhibit 3.7.2.2-1 depicts the locations/results of the spring and seep survey conducted by Rock Lock Consulting, LLC in June of 2006. However, the scale of the map is such that it's difficult to make out the names and locations of the various springs and seeps. In addition, the proposed permit boundary should be depicted on the map. (SC)*

Response: The Spring and Seep Survey map was a work product provided to Carbon Resources by Rock Logic LLC. Information from the map has been duplicated onto Maps 7 and 8 which are enlarged with clear legends.

R645-301-722, *The Permittee must provide a map that depicts the locations of the groundwater rights located within the permit and adjacent area. A surface water right location map was submitted, however, it appears that a groundwater right location map was not. It is noted however, that a Ground Water Right location map is shown on the table of contents submitted with the application. (SC)*

Response: Ground and surface water rights are addressed in Chapter 7. Ground and Surface water rights information obtained from the Utah State Water Rights Office are included in Exhibit 13, Water Rights. Ground water rights locations are shown on Map 30, and surface water rights locations are shown on Map 31. Ground water wells are shown on Map 30, Ground Water Rights Locations, and can be correlated with the same wells shown on Map7, Regional Hydrology.

R645-301-722, *The Permittee should provide a cross-section that depicts the relationship between the coal seam to be mined and the groundwater levels encountered during baseline data collection at each of the monitoring wells as show on Map 3.7.2.1-1, Ground Water Level Data. (SC)*

Response: Please refer to Maps 7A and 7B.

R645-301-722.200, *The Permittee should modify Map 3.7.1.3-1, Regional Hydrology. In Section 3.7.3.2 on Page 3.7-17, the application identifies the UP Canyon and Eagle Canyon as "small intermittent and ephemeral tributaries within and adjacent to the permit area". A hatched line or some demarcation should be utilized to depict the locations of these ephemeral/intermittent drainages. The UP Canyon drainage is not depicted on Map 3.7.1.3-1. In addition, page 4.7-17 discusses the re-establishment of an ephemeral drainage through the disturbed area. Map 3.7.1.3-1 should depict all of the ephemeral, intermittent and perennial drainages that are located within or adjacent to the permit area. (SC)*

Response: The corrections have been made on Regional Hydrology Map 7.

R645-301-722.200, *The Permittee should revise Map 3.7.1.3-1, Regional Hydrology. Based on the surface water discussion on page 3.7-16, perennial flows are exhibited in Miller and Long Canyon. However, the aforementioned map depicts the drainage path of the Miller and Long Canyon as a discontinuous blue line. If the flow is perennial, the drainage should be depicted with a solid blue, contiguous line. (SC)*

Response: Regional Hydrology, now Map 7, has been corrected together with nearly every other map with base topography shown.

R645-301-722.400, *The application must include the location and depth, if available, of water wells in the permit area and adjacent area. Upon review of the application, it's not clear as to whether this regulation has been addressed. If there are no water wells within the permit and adjacent area, the Permittee should provide a brief discussion and provide a reference that supports that conclusion. (SC)*

Response: Ground and surface water rights are addressed in Chapter 7. Ground and Surface water rights information obtained from the Utah State Water Rights Office are included in Exhibit 13, Water Rights. Ground water rights locations are shown on Map 30, and surface water rights locations are shown on Map 31. Ground water wells are shown on Map 30, Ground Water Rights Locations, and can be correlated with the same wells shown on Map7, Regional Hydrology. The water rights information from the Utah State Water Rights Office gives information on well depths where known.

R645-301-746, *The Permittee should provide a clear and concise discussion as to how generated coal mine waste will be handled on the mine site. Surface facility item number 9 on Map 4.5.1.2-3, Surface Facilities, is listed as a screening and crushing building. If screening is to occur at the mine site, it's assumed that some form of residual material (i.e. coal mine waste) would be produced as a result of that physical processing. The application must provide a discussion as to how coalmine waste will be stored and handled. The discussion should also address the hydrologic design criteria requirement in R645-303-746.212. (SC)*

Response: Addressed in Chapter 6 under R645-301-624. Low grade coal as well as that portion of mine development waste not placed in designated underground storage will be stacked on the "off-spec" stacking tube and blended into the stream of "spec coal" as immediatleyy as possible. Two additional mechanism have been created to deal with "mine development waste" that is inadvertently taken with the coal and who's volume exceeds the capacity of the "spec coal" stream to accept it; 1- Per the Divisions request, a small short term storage or temporary pile has been designed and added to the surface operational plan shown on Map 13, Surface Facilities, 2- A letter of intent has been signed between Carbon Resources and Arch Coal allowing Arch to purchase as "distressed coal" volumes of low quality coal whether the coal was mined as low quality or diluted with mine development rock waste, and process said "distressed coal" through their processing facility on Ridge Road south of Price.
Also addressed in Chapter 7 under R645-301-731.110.

R645-301-.731.210, -220, *The Permittee must first address the deficiencies relative to ground and surface water baseline data, geologic baseline data and the PHC before the Division can make a finding that the proposed operational phase monitoring plan meets the requirements of the State of Utah R645-Coal Mining Rules. The water-monitoring plan must be based upon the PHC determination as well as all baseline hydrologic and geologic information. (SC)*

Response: Addressed in Chapter 7 under R645-301-724.100. The baseline data deficiencies are not specifically listed or enumerated in any one location within the deficiencies letter. hose mentioned are located in several different places and have been identified aTs a combination of confusion about data from dry monitor wells and the unfortunate occurrence of false positive data in the case of CR-06-01-BLW. The confusion led to the under appreciation as Zero as a valid data point.

The lab sheets which were originally provided in PDF format are now provided in paper format (Exhibit 12), additional data have now been collected from all sources except CR-06-03 ABV and Angle Spring. New groundwater data are now available from CR-10-11 and CR-10-12. Maps have been updated to provide a more clear presentation of the data addressed in Chapter 7. Maps 7,8,9, and 10, combine to present a very clear and concise visual characterization of the groundwater within the permit and adjacent area.

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as demonstrated by field visits that noted a ZERO DATA POINT when the visit demonstrated the spring had dried up. No water samples were collected when the springs dry-up in mid-summer, however, the field visits document the seasonal variation of the springs.

R645-301-731, *The application should discuss how acid- and toxic-forming materials will be identified and handled during the construction, operational and reclamation phases of the mining operation. (SC)*

Response: Chapter 2 describes in detail soil handling during construction. The only potential acid forming materials, "reclaimed coal" will be hauled off site to the Arch processing plant south of Price.

R645-301-731.510, *The application should discuss the potential for discharges into the underground mine Per R645-301-731.510. Page 4.7-15 of the application discusses gravity discharges of water from the mine, but it does not appear that the application discusses discharges into an underground mine. (SC)*

Response: Carbon Resources does not plan to discharge water ~~all~~ into the underground mine. As discussed in Chapter 5, R645-301-553.120, the portal pad will be graded to prevent surface runoff water from entering the mine. A typical cross section of the portals can be seen on Map 17, Mine Surface Facilities Area Pre-Mining, Mining & Post Mining Cross Sections demonstrates the design which prevents surface water from entering the mine.

R645-301-751, *The Permittee must obtain a Utah Pollutant Discharge Elimination System (UPDES) permit prior to Division approval of the application. A copy of the UPDES permit should be included within the application. (SC)*

Response: Division of Water Quality permit No. UTG040028 has been approved, a copy of which is included in Exhibit 4, Other Permits.

R645-301-742.300, *The Permittee should provide a clear and concise discussion as to which diversions are temporary and which diversions will be permanent. On page 4.7-17 of the application, the Permittee discusses "permanent diversions" which will be constructed following the termination of mining activity. However, Map 4.7.2.9-1, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control appears to depict only one diversion (Culvert UDC-2). (SC)*

Response: See response in Chapter 7, R645-301-742.300. The operational diversions are shown on Map 23, Drainage and Sediment Control Plan , Undisturbed Drainage Areas, Map 24 Drainage and Sediment Control Plan Disturbed Drainage Areas, Map 25 Sediment Pond 1, Sections and Details. Post mining drainage control is shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control.

R645-301-742.300, *The Permittee should provide a clear and concise discussion as to the diversions to be utilized at the site. On page 4.5-31 the application discusses the designs of "temporary diversion ditches" and a 10-year, 6-hour storm event. In the same paragraph, the application discusses "collection ditches" and peak flows utilized from a 25-year, 24-hour storm event. Upon reviewing the application, it's unclear as to what the difference is between a 'temporary diversion ditch' and a 'collection ditch' and why they would require two different design storm events. Upon reviewing Exhibit 4.7.2.2-1, Runoff Control Design Details and Table 4.7.2.2-1, Ditch Design Details, it appears that the 10-year, 6-hour storm was utilized in designing all of the diversions. In addition Table 3.7.8.2-1, Design Rainfall Depths, does not list a 25-year, 24-hour storm event. (SC)*

Response: See response in Chapter 7, R645-301-742.300. The operational diversions are shown on Map 23, Drainage and Sediment Control Plan , Undisturbed Drainage Areas, Map 24 Drainage and Sediment Control Plan Disturbed Drainage Areas, Map 25 Sediment Pond 1, Sections and Details. Post mining drainage control is shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control.

The text in Chapter 7, R645-301-742.300 (old Section 4.5.2.3) has been modified to clarify issues related to the conveyance structures and design storm event. The modified text clarifies that temporary diversion ditches were designed based on the 10-year, 6-hour storm event. Permanent ditch designs are based on the 100-year, 6-hour event. Any reference to a 24-hour rainfall event was an editing oversight made during our final review of the permit application.

The collection ditches referenced include permanent ditches UDD-1 and UDD-2 that convey runoff from undisturbed upslope areas (east of disturbed mine areas). These two collection ditches have been designed to convey peak runoff flows from the 100-year, 6-hour storm event. The 100-year event was used since the roads will remain as post mining land use roads following reclamation.

Table 19 (Old Table 4.7.2.2-1) shows that the design event for all temporary ditches to be the 10-year, 6-hour event. Footnote 3 however clarifies that for ditches UDD-1 and UDD-2 the design event is the 100-year, 6-hour event consistent with permanent facilities.

R645-301-742.300, *The Permittee should revise the routing figure provided in Exhibit 4.7.2.2-1. Due to the scale of the drawing, it's extremely difficult to determine the routing that was utilized in the hydraulic/hydrologic modeling runs. (SC)*

Response: The routing figure has been revised to make it more readable. Exhibit 4.7.2.2-1 is now Exhibit 16.

R645-301-742.300, *In order for the Division to make a finding that the proposed diversions meet the requirements of the State of Utah R645-Coal Mining Rules, the Permittee must first present more information as to the location and characteristics of any drainage that intersects the proposed surface facility. (SC)*

Response: The ephemeral drainages that are located within and close to the permit

boundary are characterized in Exhibit 20.

R645-301-731.600, *The Permittee must address the baseline deficiencies relative to baseline surface water data in order for the Division to determine whether stream buffer zones will be required. The Permittee must characterize any drainage that exists within 100 feet of the proposed disturbed area (See Baseline Deficiencies). Upon review of the application, it's clear that drainages intersect the disturbed area of the mine site. (SC)*

Response: There appears to not be a section titled "Baseline Deficiencies". The assertion that the baseline surface water data is deficient is confusing. A full suite of surface water baseline data spanning second half of 2005 through September 2010 can be found in Exhibits 9,10,and 12. Also refer to Exhibit 20, Ephmeral Drainage Determination for a complete discussion on the drainages bisecting the permit surface facilities area. There are no streams that warrant buffer zones in the area of the surface facilities, or any other location within the permit area.

R645-301-743, *The Permittee should clarify the design information provided regarding the sediment pond. On page 4.5-30, the application states, "Sedimentation Pond 1 has been designed to contain or treat the runoff from the 10-year, 24-hour storm event and total design capacity includes storage for at least <u>five</u> years accumulation of sediment." However, on page 4.5-34 of the application, the Permittee states, "The pond has been designed to provide adequate capacity for at least <u>three</u> years accumulation of sediments.." The Permittee must address this discrepancy. (SC)*

Response: The pond as designed has been calculated to contain 5.3 years of accumulated sediments. The text within Chapter 5, R645-301-526.300 has been modified to consistently indicate that the pond has been designed to provide adequate capacity for at least five years of accumulated sediment.

R645-301-744, *The Permittee should provide a clear and concise presentation as to the primary and emergency spillways to be utilized with Sediment Pond 1. Map 4.7.2.1-3 depicts the sediment pond design details. It appears that two spillway devices will be utilized. However, one design drawing of the 24" CMP inlet structure is presented. The profile view at the bottom of Map 4.7.2.1-3 depicts a primary and an emergency spillway tee connected to a riser with the same design detail citation called out. The plan view also shows a primary and emergency spillway with the same design detail citation called out. If the same inlet design is to be utilized for two structures, the text sections of the plan that discuss the sediment pond spillways as well as any design drawings should make that clear. (SC)*

Response: The text within Chapter 5, R645-301-526.300 has been modified to clarify that the Primary and Emergency Spillway designs are the same. Both use a 24" CMP inlet riser. Changes made to Map 25 (Old Map 4.7.2.1-3) include a projection of the Emergency Spillway onto the cross-section and the addition of Note 4 in Detail 1 indicating that the designs are the same.

R645-301-744, *The plan should briefly discuss the ultimate discharge point of the sediment pond in the sediment pond/discharge structure section of the MRP. The MRP should also provide some*

discussion as to where the overflow water would ultimately report in the event that the pond overflow elevation of 7,690' is breeched. (SC)

Response: Discussed in Chapter 7, R645-301-744.

R645-301-731, -760, *The application should include a map that clearly depicts the ground and surface water monitoring sites to be sampled during the operational and reclamation phase of mining. Map 3.7.3.1-1, Regional Hydrology and Map 4.7.2.3-1, Surface and Ground Water Monitoring Sites both depict well CR-06-03-ABV as a monitoring site. However, on page 4.7-13 the application discusses how groundwater monitoring well CR-06-03-ABV and Angle Spring cannot be monitored due to access limitations resulting from "legal issues". In addition, on page 4.7-13, the application states, "The monitoring network is shown on Map 3.7.1.3-1, Surface and Ground Water Monitoring Sites." This appears to be incorrect as Map 3.7.3-1 is entitled Regional Hydrology. The Permittee must address this discrepancy in the text. (SC)*

Response: Refer to Map 28. The discrepancy in the text has been corrected.

R645-301-760, *The Permittee must provide a clear and concise discussion as to the hydrologic reclamation components to be implemented at the site. In several places the application discusses 'temporary' and 'permanent' drainages, but does not provide sufficient specificity as to what features of the hydrologic design system are 'temporary' and which ones 'permanent'. In addition, on page 5.5-2 states, "As a component of the planned reclamation activities CR will remove some temporary operational drainage structures, establish designed permanent post mining drainage structures, and modify some of the existing temporary drainage structures to provide for effective drainage…" The Permittee must provide additional detail as to what drainage features are part of what phase of the hydrologic reclamation plan (i.e. temporary, interim or permanent). (SC)*

Response: See response in Chapter 7, R645-301-742.300. The operational diversions are shown on Map 23, Drainage and Sediment Control Plan , Undisturbed Drainage Areas, Map 24 Drainage and Sediment Control Plan Disturbed Drainage Areas, Map 25 Sediment Pond 1, Sections and Details. Post mining drainage control is shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control.

R645-301-760, *The Permittee must revise the text of the application as well as Map 4.7.2.9-1 so as to more clearly depict the hydrologic reclamation plan. On page 5.4-4, the application states, "The proposed interim drainage and sediment control plan includes four areas where CR proposes to utilize alternative sediment control methods as the primary means of controlling erosion and sediment contributions." The application then cites Map 4.7.2.9-1 as depicting the sediment control features. Upon review of the map, it's not possible to determine what the 'four areas' are that will be utilizing alternative sediment control. (SC)*

Response: See response in Chapter 7, R645-301-742.300. The operational diversions are shown on Map 23, Drainage and Sediment Control Plan , Undisturbed Drainage Areas, Map 24 Drainage and Sediment Control Plan Disturbed Drainage Areas, Map 25 Sediment Pond 1, Sections and Details. Post mining drainage control is shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control. Sediment controls are also discussed in response to R645-301-526.300 in Chapter 5. Sediment controls are shown on Map 24, Drainage and Sediment Control Plan

Disturbed Drainage Areas, and Map 27, Runoff Control Details. Alternative sediment controls to be utilized after reclamation are shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control map.

R645-301-760, *The Permittee must provide a clear depiction of the runoff controls and alternative sediment control measures to be utilized during reclamation. The application discusses the use of alternative sediment controls such as silt fences, hay bales. These alternative sediment control measures and their installation locations do not appear to be on any of the maps submitted in the application. On page 5.5-4 of the application, the Permittee states, "Runoff from the area south of the site access road cannot flow to the sedimentation pond and therefore will be controlled by alternative sediment control measures as shown on Map 4.7.2.9-1." Upon review of the map, it does not appear that the alternative sediment control measures are depicted. (SC)*

Response: See response in Chapter 7, R645-301-742.300. The operational diversions are shown on Map 23, Drainage and Sediment Control Plan , Undisturbed Drainage Areas, Map 24 Drainage and Sediment Control Plan Disturbed Drainage Areas, Map 25 Sediment Pond 1, Sections and Details. Post mining drainage control is shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control. Sediment controls are also discussed in response to R645-301-526.300 in Chapter 5. Sediment controls are shown on Map 24, Drainage and Sediment Control Plan Disturbed Drainage Areas, and Map 27, Runoff Control Details. Alternative sediment controls to be utilized after reclamation are shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control map.

R645-301-760, *The Permittee should provide a reclamation treatment map that clearly depicts what drainage features will be temporary and which drainage features are permanent. The text of the application indicates that a component of the reclamation plan includes the removal of 'some' temporary operational drainage structures, establish designed permanent post-mining drainage structures, and modify 'some' of the existing temporary drainage structures to provide for effective drainage and sediment control. (SC)*

Response: See response in Chapter 7, R645-301-742.300. The operational diversions are shown on Map 23, Drainage and Sediment Control Plan , Undisturbed Drainage Areas, Map 24 Drainage and Sediment Control Plan Disturbed Drainage Areas, Map 25 Sediment Pond 1, Sections and Details. Post mining drainage control is shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control. Sediment controls are also discussed in response to R645-301-526.300 in Chapter 5. Sediment controls are shown on Map 24, Drainage and Sediment Control Plan Disturbed Drainage Areas, and Map 27, Runoff Control Details. Alternative sediment controls to be utilized after reclamation are shown on Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control map.

R645-301-760, *The Permittee should clarify Map 4.7.2.9.1, Post Mining Topography. Map 4.7.2.9-1 depicts a sediment trap in the legend as a hatched oval. Upon review of the map, the location of the sediment trap is unclear. (SC)*

Response: Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control map has been revised to show all post mining sediment controls.

R645-301-729, *In order for the Division to make a finding that the mine plan has been designed to prevent material damage to the hydrologic balance outside the permit area, the Permittee must provide additional hydrologic information relative to ground and surface water resources located within and adjacent to the proposed permit area. (SC)*

Response: Paper copies of all water analysis sheets can be found in Exhibit 12. Exhibit 9 is the spring and seep survey. Exhibit 10 details a full suite of field observations including stream flow calculations and additional data from CR-10-11 and CR-10-12.

R645-301-624.310, *The applicant shall submit drill holes shoeing lithologic characteristics, including physical properties and thickness of each stratum that may be impacted. (DD)*

Response: Drilling data for 9 2006 vintage drill holes have been submitted and are held in the SLC DOGM office under C0070047 Confidential Information. These data include geophysical logs, core logs, cuttings logs, deviation logs, coal, and roof, and floor quality analysis lab sheets, completion diagrams and data checklist. These data document lithologic character of coal and roof and floor Lithologies. This issue is addressed in Chapter 6 where Table 5A depicts physical properties of coal, roof and floor material. Lab sheets with the Agapito rock mechanics investigation are located in Exhibit 19.

R645-301-624.320*, The applicant shall submit chemical analyses for acid- or toxic forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined. (DD)*

Response: Addressed in Chapter 6 under R645-301-624; Table 4 lists Roof and Floor Samples with Data from Acid Forming and Neutralization Potential Analysis. These samples are a combination of new analysis of pulp stored in the laboratory and additional samples taken from archived core. Lab sheets supporting these data can be found in Exhibit 19, SGS Lab Sheets. Additional lab sheets with data including Sulfur Forms of Hiawatha Seam Coal can be found in Exhibit 3, Confidential Information.

R645-301-624.330, *The applicant shall submit Chemical analyses of the coal seam for acid or toxic forming materials, including the total sulfur and pyritic sulfur. (DD)*

Response: Lab data sheets documenting chemical analyses of the coal seam including sulfur forms are located in Exhibit 3 Confidential information and with the previously submitted drilling data also held as confidential information under C0070047 confidential information in the DOGM Salt Lake Office.

R645-301-120, *The applicant needs to complete the formatting of the application in accordance with the coal regulations. (JH)*

Response: The submittal has been reformatted to the regulations.

R645-301-411, *The SHPO has requested that the applicant develop a mitigation plan for the eligible sites that would be eliminated by the development of the mining operations (correspondence from Jim Dykman to Joe Helfrich dated August 26, 2008). This correspondence was "E" mailed to the applicant and Jody Patterson on September 11, 2008. (JH)*

Response: This issue is currently under discussion with the UDOGM and the SHPO. Resolution of the issue will dictate any future revisions to the permit application.

R645-301-320, *a current list of the TE&S plant, animal and fish species for Carbon County needs to be included in the application.The list of maps section in volume 1 page LOM-I needs to identify map 3.2.1.2-1 as "Facilities Area Vegetation". (JH)*

Response: Table 1 in Chapter 3 includes a current list of TE&S species. The LOM-I has been revised.

R645-301-320*, a current list of the TE&S animal and fish species for Carbon County needs to be included in the application. The TE&S information provided by the Utah Natural Heritage Program needs to be field verified by a qualified professional in the identification of TE&S species. (JH)*

Response: Table 1 in Chapter 3 includes a current list of TE&S species.

R645-301-411, *The land use classifications on page 3.4-4 do not coincide with those noted on map 3.4.1.4-1. The legend on the map does not show hash marks running from left to right as noted in the upper portion of the disturbed area. These inconsistencies need to be clarified. (JH)*

Response: Land use classifications have been modified in Chapter 4 and on Map 4, Regional Land Use Map.

R645-302-320, *According to the information in the application section 3.2.1.2-1 "Facilities Area Vegetation Map contain resource values consistent with the AVF criteria" the applicant needs to explain what that means and define the boundaries of the AVF in relation to the proposed mining operations. The application also needs to address the requirements of this section of the regulations and explain how the eight reasons stated on page 7.0-5 do not meet the criteria for an AVF. (JH)*

Response: A complete evaluation of potential AVF values is presented in Chapter 9. Map 32, AVF Evaluation Map includes pertinent information. This map is complex, containing a lot of information – it is important to present all of the information on one map to be able to understand the relationships of all of the information.

R645-301-411, *the applicant needs to address this section of the regulations. (JH)*

Response: Refer to Chapter 4, R645-301-411.

R645-301-322, -301-333, -301-342, -301-358, *Page 4.3-2 section 4.3.1.2 includes a list of mitigation measures. The applicant needs to explain what these measures mean and how each of these measures will be implemented to ensure disturbance to the smallest practicable area and protect and enhance wildlife during the operational phase of the mining operation. (JH)*

Response: Refer to Chapter 4 for a response to all of these regulations.

R645-301-322, -301-333, -301-342, -301-358, *Page 4.3-2 section 4.3.1.3 includes a description of animals and habitats within the permit area. These habitats need to be clearly defined on map 3.3.1.4. The map lists habitat acronyms for various species in certain sections but does not define the range of these habitats. The habitats for all species listed on the map must be clearly defined on perhaps several maps and described in a clear and concise manner in this section of the text. Section 4.3.1.3 also needs to be revised to include a clear and concise protection and enhancement plan for these species. Any assumptions need to be supported by accurate reliable data and the names of the individuals who collected the data and or made the assumptions or statements. (JH)*

Response: New Maps 2 through 2G have been prepared to address this issue. Chapter 3 has been revised to address each habitat.

R645-301-322, -301-333, -301-342, -301-358, *Page 4.3-2 section 4.3.1.4, Section 2.1.2, page 2.1-2 of the application states that "27.3 acres are planned to be disturbed by mining operations. Within this acreage there are a several high value wildlife species habitats some of which the applicant needs to further define as previously noted in section 4.3.1.3. The 27.3 acres of disturbance will eliminate these habitats until final reclamation is achieved after the conclusion of mining activities. Therefore this section of the application needs to be revised to include a clear and concise protection and enhancement plan for the vegetation and wildlife species that are displaced as a result of the proposed mining disturbance. Any assumptions need to be supported by accurate reliable data and the names of the individuals who collected the data and or made the assumptions or statements. (JH)*

Response: Chapter 3 addresses these issues.

R645-301-322, -301-333, -301-342, -301-358, *The regional wildlife map 3.3.1.4 includes the location of stick nests. The application needs to include the species of raptor associated with each nest and the status of the nest. This data is available through the DWR. (JH)*

Response: Map 2, Raptor Map includes a table showing the species for each nest identified in the raptor inventory – obtained from the Utah DWR.

R645-301-322, -301-333, -301-342, -301-358, *Page 4.3-3, section 4.3.2.1 includes a list of impacts to vegetation and wildlife. Once again this section of the application needs to be revised to include a clear and concise protection and enhancement plan for the vegetation and wildlife species that are displaced as a result of the proposed mining disturbance. The plan should include how these impacts*

listed on page 4.3-2 will by mitigated during active mining operations. Any assumptions need to be supported by accurate reliable data and the names of the individuals who collected the data and or made the assumptions or statements. (JH)

Response: Chapter 3 addresses these issues.

R645-301-322, -301-333, -301-342, -301-358, *Page 4.3-5 paragraph two should be deleted as it makes reference to the "Barn Canyon air ventilation shaft". (JH)*

Response: References to Barn Canyon have been removed.

R645-301-322, -301-333, -301-342, -301-358, *The proposed mining activities are located in a watershed that contributes water to the upper Colorado River. Within that section of the river are four endangered fish species, the Colorado pike Minnow, Razorback Sucker, Humpbacked Chub and Bonytail Chub. The USFWS considers water depletion to the Colorado River drainage as a potential jeopardy to these endangered fish. Water users may be required to mitigate if the overall water consumption is greater than 100 acre-feet per year. Currently, the mitigation fee is approximately 16.00 per acre-foot of depletion, but may change marginally from year to year. (JH)*

Response: Addressed in Chapter 3, R645-301-330.

R645-301-322, -301-333, -301-342, -301-358, *The Permittee is required to address possible adverse affects to these four fish species by first calculating the amount of water used by all mining operations and explorations. The "Windy Gap Process" provides a guideline of parameters necessary to calculate overall water consumption for coal mines. (JH)*

Response: Addressed in Chapter 3.

R645-301-322, -301-333, -301-342, -301-358, *The application needs to include calculations for an estimate of mine water consumption for the mining activities. Criteria used to determine an estimate of the consumption can be obtained from the Division (801 538-5290). (JH)*

Response: As discussed in Chapter 5 under 526.210; Utility Water requirements for the Kinney # 2 Mine is calculated to be a maximum of 4.7 acre feet per year potable water for bathhouse and shop, and 61 acre feet per year non-potable water for dust suppression at full production. The full water requirement will not be realized the first year of operation but will ramp up over an estimated three year period.

R645-301-322, -301-333, -301-342, -301-358, *Page 3.3-28 paragraph 3 describes the habitat for the Bald Eagle but does not include protection and enhancement measures for this species or Golden Eagles. (JH)*

Response: Addressed in Chapter 3.

R645-301-322, -301-333, -301-342, -301-358, *The application needs to include information about these habitat types if they are present in the proposed permit and adjacent areas. The information*

needs to include how they will be protected and enhanced during the life of the mine and throughout reclamation. (JH)

Response: Addressed in Chapter 3.

R645-301-330, -301-331, -301-332,*There are two vegetation maps in the application that show these features, Map 3.2.1.2-1 and Figure 1 but no Map 5. There are several other references to map 5 in exhibit 3.2 that need to be corrected. (JH)*

Response: References to Map 5 have been corrected.

R645-301-330, -301-331, -301-332,*Page 5 of Exhibit 3.2 references the compilation of a list of threatened, endangered and sensitive plant species for the area. The list should be included in the application. (JH)*

Response: Table 1 in Chapter 3 presents the listed TS&E species.

R645-301-330, -301-331, -301-332,*Page 4.3-2 section 4.3.1.4, Section 2.1.2, page 2.1-2 of the application states that "27.3 acres are planned to be disturbed by mining operations. Within this acreage there are a several high value wildlife species habitats some of which the applicant needs to further define as previously noted in section 4.3.1.3. The 27.3 acres of disturbance will eliminate these habitats until final reclamation is achieved after the conclusion of mining activities. Therefore this section of the application needs to be revised to include a clear and concise protection and enhancement plan for the vegetation and wildlife species that are displaced as a result of the proposed mining disturbance. Any assumptions need to be supported by accurate reliable data and the names of the individuals who collected the data and or made the assumptions or statements. (JH)*

Response: Chapter 3 addresses these issues.

R645-301-330, -301-331, -301-332,*Page 4.3-3, section 4.3.2.1 includes a list of impacts to vegetation and wildlife. Once again this section of the application needs to be revised to include a clear and concise protection and enhancement plan for the vegetation and wildlife species that are displaced as a result of the proposed mining disturbance. The plan should include how these impacts listed on page 4.3-2 will by mitigated during active mining operations. Any assumptions need to be supported by accurate reliable data and the names of the individuals who collected the data and or made the assumptions or statements. (JH)*

Response: Chapter 3 addresses these issues.

R645-301-412, -301-413, -301-414,*The application needs to include information that addresses the post mining land-use section of the regulations. (JH)*

Response: Chapter 4 addressed post mining land uses.

R645-301-412, -301-413, -301-414,*There is one reference to "a post mining land use of wildlife habitat and watershed" noted on page 5.0-1, paragraph one. The wildlife habitat needs to be defined by species occupancy and their type of habitat (example deer critical winter range). What is a watershed land use? (JH)*

Response: Chapter 3 addresses wildlife habitat. Watershed Land Use is a Carbon County designation as described in detail in Chapter 4.

R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280 *Section 5.3.2.4 includes a description of the mulching and stabilization practices for the reclaimed area. This section needs to include a method for incorporating the mulch into the soil. (JH)*

Response: Refer to responses to mulching and stabilization in the following: Chapter 2, R645-301-244.100 and 200; Chapter 3, R645-301-331, 340, 341 and 355.

R645-301-521*, The Applicant must give a description of the permit area in the MRP, such as in Section 2.1.5.1. The information in Section 2.1.5.1 of the application describes the lease areas, which can be different from the permit area. (WW)*

Response: A legal description of the permit boundary is included in R645-301-114.100. The legal descriptions all have been verified.

R645-301-521.190*, The Applicant must include a table the states the acreages for permitted area and the disturbed area and list what acreages as owned by the federal government, State government, local government or private ownership. The Division needs that information for reports that are given to the Office of Surface Mining. (WW)*

Response: A legal description of the permit boundary is included in Chapter 1, R645-301-114.100. The legal description includes land owned by Evangelos George Telonis, Et. al. and fee land owned by Carbon Resources LLC. The descriptions include portions of existing legal description boundaries where applicable, and follows standard legal description protocol and United States Public Land System protocol.

R645-301-521.120, *The Permittee must provide the Division with a map that shows the existing surface and subsurface facilities within the proposed disturbed area. Map 4.5.1.2-4, Mine Surface Facilities Area Pre-Mining Topography, must either be updated or a new map provided that show • the disturbed area boundaries, • list on the map or in the text those existing facilities that will be used in connection with mining. (WW)*

Response: Map 14, Mine Surface Facilities Area Pre-Mining Topography map includes the location of existing surface and subsurface facilities. Carbon Resources will not use any of the facilities found on this map. The premining topography is presented on the map.

R645-301-521.150, *The Applicant must provide the Division with a map the shows the existing surface contours of proposed disturbed areas. The maps that the Applicant supplied the Division do not show the disturbed area boundaries. (WW)*

Response: Map 14, Mine Surface Facilities Area Pre-Mining Topography map includes the premining topography, and shows the proposed disturbance boundary.

R645-301-521.190*, The Applicant must provide the Division with a list of sources that they used to compile the existing mine working map. The Division recommends that the Applicant contact the Utah Geologic Survey and the Office of Surface Mining map repository in Pittsburgh, Pennsylvania. (WW)*

Response: The historic mine maps used to prepare Map 5, Previous Mining Activity Map were obtained from the Utah Geological Survey Office as well as maps from other sources.

R645-301-526.110*, The Applicant must list in the text of the MRP all existing structures within the disturbed area that will be used in connection with mining and reclamation activities. The Applicant must also list those structures with the proposed disturbed area that will not be used or reclaimed. (WW)*

Response: Response: Map 14, Mine Surface Facilities Area Pre-Mining Topography map includes the location of existing surface and subsurface facilities. Carbon Resources will not use any of the facilities found on this map. The facilities remaining on the proposed mine site were left in place by the UDOGM Abandoned Mine Reclamation program and consist of old foundations and one small concrete structure apparently used as a powder magazine.

R645-301-526.116.1 and R645-301-526.116.1*, The Applicant must have detailed plan on what work will be done in connection with modifications to Highway 96. Specifically will the Applicant relocated the road or the State. The Division needs to have plans in place or commitments not to begin construction until the plans have been approved. (WW)*

Response: Addressed in Chapter 5, R645-301-526.116. Carbon Resources will provide to the UDOGM UDOT approval documents prior to permit approval.

R645-301-527.210*, The Applicant must show the thickness of asphalt and sub-base on Figure 4-5.3. The Division also needs specific information on asphalt and sub-base thickness. (WW)*

Response: Refer to Figure 25, Typical Primary Road Configuration.

R645-301-534.130 and R645-301-121.200*, The Applicant must address the safety factor for roads within the text of the MRP. (WW)*

Response: Addressed in Chapter 5, R645-301-534.130; also refer to Exhibit 14, Geotechnical Investigation.

R645-301-528.320 and R645-301-121.200*, The Applicant must refer to underground development rock as either coal mine waste or underground development waste. Those terms has specific meaning for the Utah Coal Rules while underground development rock does not have a specific meaning and the term could be confusing to the reader. In addition, the Applicant must not refer to low-grade coal as underground development waste. The rules for handling and disposing of coal are much different that coal mine waste. (WW)*

Response: Addressed in Chapter 6 under R645-301-624. Low grade coal as well as that portion of mine development waste not placed in designated underground storage will be stacked on the "off-spec" stacking tube and blended into the stream of "spec coal" as immediately as possible. Two additional mechanism have been created to deal with "mine development waste" that is inadvertently taken with the coal and who's volume exceeds the capacity of the "spec coal" stream to accept it; 1- Per the Divisions request, a small short term storage or temporary pile has been designed and added to the surface operational plan shown on Map 13, Surface Facilities, 2- A letter of intent has been signed between Carbon Resources and Arch Coal allowing Arch to purchase as "distressed coal" volumes of low quality coal whether the coal was mined as low quality or diluted with mine development rock waste, and process said "distressed coal" through their processing facility on Ridge Road south of Price.
Also addressed in Chapter 7 under R645-301-731.110.

R645-301-528.320*, The Applicant must specifically state the volume of material that will stored in the temporary underground development waste storage site and the maximum time that material will remain on site. The Division needs so that there will not be any confusion about what constitutes temporary storage. (WW)*

Response: Volume of temporary storage on the loadout pad (Map 13, Surface Facilities) is approximately 3,900 tons. Addressed in Chapter 5 under 521.143 Mine Waste Disposal Sites.

R645-301-536.510, *If the Applicant wants to ship coal mine waste off site then the Applicant must state specifically to which permitted disposal site the material will be sent. In addition, the receiving site must also be permitted to receive material from the Applicant. (WW)*

Response: Per the LOI with Arch Coal, "distressed coal" which will include low grade coal, and coal that has a high percentage of mine development waste included will be purchased by Arch Coal and shipped to The Ridge Road washing facility south of Price UT. The material will then be processed to salvage usable coal and the remaining waste material will be disposed of in the approved refuse pile at that location.

R645-301-528.323.1, *The Applicant must state that only authorized personal who understand the plan will be involved with extinguishing the fires. In addition, the Division does not recommend that the Applicant try to extinguish the fire with water due to the possibility of a steam explosion. (WW)*

Response: Addressed in Chapter 5, R645-301-528.323.

R645-301-533.100 and R645-301-121.200*, The Applicant must state if any of the impoundments meet the NRCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CRF Section 77.216. (WW)*

Response: Addressed in Chapter 5, R645-301-528.323.

R645-301-512.240*, The Applicant did not have the designs for Sediment Pond 1 certified by a registered professional engineer. The information in Exhibit 4.7.2.2.1 was not certified. (WW)*

Response: The sediment pond drawing, Map 25, Sediment Pond No. 1, Sections and Details has been certified by a Professional Engineer.

R645-301-533.100 and 533.110*, the Applicant did not specifically state the safety factor for Sediment Pond 1. (WW)*

Response: Addressed in Chapter 5, R645-301-533.110; also refer to Exhibit 14, Geotechnical Investigation.

R645-301-533.300*, The Applicant did not state how Sediment Pond 1 would be protected against sudden drawdown. (WW)*

Response: Addressed in Chapter 5, R645-301-533.110; also refer to Exhibit 14, Geotechnical Investigation.

R645-301-524 *The Applicant must address is applicable blasting regulation. Specifically the Applicant must cite each specific regulation and then describe how they will comply. The Division needs to have specific information on how the public will be protected from blasting given the State Highway 96 is within 1,000 of the disturbed area. The Applicant may want to submit the blasting plan at a later day. See R645-301-524.220, when specific blasting plans can be developed. (WW)*

Response: Addressed in Chapter 5, R645-301-524. A blasting plan is included in Exhibit 15, Kinney No. 2 Mine Blasting Plan.

R645-301-553.120*, The Applicant must provide the Division with cross sections for each portal area that show the existing configuration (including any previously mined areas) the proposed operational configuration and the reclaimed configuration. The Division needs that information to evaluate highwall reclamation. (WW)*

Response: Addressed in Chapter 5, R645-301-120. A typical Cross Section of the portals is included on Map 17, Mine Surface Facilities Area Pre-Mining, Mining and Post Mining Cross Sections.

***R645-301-553.130**, The Applicant must provide the Division with information on the angle of repose and if any of the reclaimed slopes will exceed that angle. (WW)*

Response: Addressed in Chapter 5, R645-301-553.130; also refer to Exhibit 14, Geotechnical Investigation.

***R645-301-553.300**, The Applicant must provide the Division with cross sections that show that all coal seams will be backfilled with a minimum of four feet of material. (WW)*

Response: Addressed in Chapter 5, R645-301-120. A typical Cross Section of the portals is included on Map 17, Mine Surface Facilities Area Pre-Mining, Mining and Post Mining Cross Sections.

***R645-301-551**, The Applicant must also backfill the portal openings with a minimum of 25 feet of material. The main reason is that backfill acts a protection against vandalism to the seals. (WW)*

Response: Addressed in Chapter 5, R645-301-551. A typical Cross Section of the portals is included on Map 17, Mine Surface Facilities Area Pre-Mining, Mining and Post Mining Cross Sections. A detail of the portal seals is included on Figure 37, Typical Portal Seal.

***R645-301-542.600**, The Applicant must revise the road reclamation plan so that all roads not to be retained as part of the postmining land use will be removed during the bond liability period. The Permittee must also state what roads if any will be retained as part of the postmining land use. (WW)*

Response: Addressed in Chapter 5, R645-301-542.600. All mine roads will be reclaimed except a road as shown on Map 29, Mine Surface Facilities Area – Post Mining Topography and Interim Drainage Control Map that must be left for post-mining land use as access to private property to the north and east of the mine site.

***R645-301-512.130**, The Applicant must have all reclamation maps and cross sections certified by a registered professional engineer. (WW)*

Response: Regulation R645-301-512.130 says, "Surface configurations as described under R645-301-542.300 and R645-302-200; will be certified by (512), "…a professional qualified, registered, professional engineer; a professional geologist; or a qualified, registered, professional surveyor, with assistance from experts in related fields such as hydrology, geology and landscape architecture." All reclamation maps and cross sections have been certified by Mr. Ben Grimes, PLS (Professional Land Surveyor, Utah License 167246), who has over 40 years experience in designing, surveying, and building roads, ponds, embankments, sediment traps, ditches, and in topographic designs and cut and fill designs.

***R645-301-542.200,** The Applicant must have provide the Division with maps and cross section that show final reclamation. Map 4.7.2.9-1 does not show the site after final reclamation. The pond,*

which is scheduled for removal, is shown. In addition, the Applicant must show identify what surface and subsurface manmade features will remain after final reclamation. (WW)

Response: Map 29, Mine Surface Facilities Area Post Mining Topography & Interim Drainage Control map presents the post mining topography which is the approximate original contour. One road is shown on this map for post mining land use. The road is access for two private property owners, one to the north and one east of the mine site.

LIST OF TABLES

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