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C/007/042
Incoming
#3667
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Sunnyside Cogeneration Associates

P.O. Box 10, East Carbon, Utah 84520 • (435) 888-4476 • Fax (435) 888-2538

October 29, 2010

James D Smith
Division of Oil Gas and Mining
1594 W North Temple, Suite 1210
Salt Lake City, UT 84116

RE: Star Point Waste Fuel - Permit # C/007/042
Permit Amendment – Roads D, F & L Task ID #3653

Dear Mr. Smith:

SCA has made two submittals of an amendment to designate primary roads. The Division has again identified a couple minor deficiencies. SCA has addressed these deficiencies and is resubmitting the package for your final review and approval.

As you are aware, this amendment is submitted in an effort to provide increased efficiency in material hauling operations, SCA is proposing to designate Roads D, F & L as primary roads intended for regular and ongoing use for haul trucks and associated use for loading and hauling of the refuse material at Star Point.

We have enclosed three copies of the drawings and text pages for your review. Upon your approval, we will submit six clean copies for incorporation into the permit documents. We look forward to receiving your approval of this amendment. If you have any questions, please call or Rusty Netz or myself at (435) 888-4476.

Thank You,

Richard Carter
Agent For
Sunnyside Cogeneration Associates

cc: Steve Gross
William Rossiter
Maggie Estrada
Paul Shepard
Rusty Netz
Plant File

File in:
☐ Confidential
☐ Shelf
☒ Expandable
Date Folder 11022010 C/0070042
See: Incoming for additional information

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DIV. OF OIL, GAS & MINING

APPLICATION FOR COAL PERMIT PROCESSING

COPY

Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

Permittee: Sunnyside Cogeneration Associates
Mine: Star Point Waste Fuel **Permit Number:** C/007/042
Title: Roads D, F & L

Description, Include reason for application and timing required to implement:
Three roads are proposed to be classified as Primary and used regularly by refuse hauling / loading vehicles

Instructions: If you answer yes to any of the first eight questions, this application may require Public Notice publication.

☐ Yes ☒ No 1. Change in the size of the Permit Area? Acres: _____ Disturbed Area: _____ ☐ increase ☐ decrease.
☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO# _____
☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes ☒ No 6. Does the application require or include public notice publication?
☐ Yes ☒ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☒ Yes ☐ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes ☒ No 9. Is the application submitted as a result of a Violation? NOV # _____
☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
Explain: _____
☐ Yes ☒ No 11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes ☒ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
☐ Yes ☒ No 13. Does the application require or include collection and reporting of any baseline information?
☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
☐ Yes ☒ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☒ Yes ☐ No 17. Does the application require or include construction, modification, or removal of surface facilities?
☐ Yes ☒ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
☒ Yes ☐ No 19. Does the application require or include certified designs, maps or calculation?
☐ Yes ☒ No 20. Does the application require or include subsidence control or monitoring?
☐ Yes ☒ No 21. Have reclamation costs for bonding been provided?
☐ Yes ☒ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes ☒ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?
☐ Yes ☒ No 24. Does the application include confidential information and is it clearly marked and separated in the plan?

Please attach three (3) review copies of the application. If the mine is on or adjacent to Forest Service land please submit four (4) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations herein.

Richard R Carter (Print Name) | Plant Manager (Position) | 11/1/10 (Date) | [signature] (Signature (Right-click above choose certify then have notary sign below))

Subscribed and sworn to before me this 1st day of November, 2010

Notary Public: Jody Hansen, state of Utah.

My commission Expires: Dec 3rd 2011
Commission Number: 571930
Address: 1 Power Plant Rd. P.O. Box 159
City: Sunnyside State: UT Zip: 84539

ss:

JODY HANSEN
Notary Public
State of Utah
My Comm. Expires Dec 3, 2011
1 Power Plant Rd P.O. Box 159
Sunnyside, UT 84539

For Office Use Only:	Assigned Tracking Number:	Received by Oil, Gas & Mining
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Form DOGM- C1 (Revised December 10, 2007)

APPLICATION FOR COAL PERMIT PROCESSING

Detailed Schedule Of Changes to the Mining And Reclamation Plan

COPY

Permittee: Sunnyside Cogeneration Associates

Mine: Star Point Waste Fuel

Permit Number: C/007/042

Title: Roads D, F & L

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

Add	Replace	Remove	DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED
☐	☒	☐	Map 534.100b Primary Road L
☒	☐	☐	Map 534.100g Primary Road D
☒	☐	☐	Map 534.100h Primary Road F
☐	☒	☐	Permit Text pages 500-13 thru 500-30
☐	☒	☐	Map 731-720a Drainages and Diversions
☐	☒	☐	Map 731-720b Culverts
☐	☒	☐	Section 742 text and Tables 742a thru 742d (pages 700-35 thru 700-40 and 700-65 thru 700-68)
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Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.	Received by Oil, Gas & Mining
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526.114. Evidence of Compliance.

All existing facilities in the SCA - Star Point Permit Area have been previously permitted by CPMC through the State of Utah as being in compliance with the requirements of UMC Subchapter K Performance Standards. These facilities were transferred to SCA without modifications.

526.115. Compliance Plan.

The three proposed structures, listed in Table 526.111b, are bermed containment areas for a portable diesel fuel tank to be used during mining and reclamation. Map 526.115 shows plans and details for construction of the containment areas. These structures will be removed and regraded during final reclamation.

If modifications to the facilities used by SCA become necessary, a compliance plan will be submitted to DOGM addressing the requirements of R645-301-526.115. The modification will not be performed until proper approvals are received.

526.116. Protection of Public and Landowners.

County Road No. 290 is adjacent to the SCA - Star Point Permit Area. Carbon County is responsible for the maintenance of this road to provide private property access on Gentry Mountain. The public will be protected from mining and reclamation activities that occur within 100 feet of the right-of-way of County Road 290 by maintaining geotechnically stable slopes in the permit area. In addition, any mining debris will be removed from the roadway by scraping with equipment on site. SCA will main primary roads being traveled for mining operations to limit tracking onto the county road. Culverts or ditches will also be maintained to allow proper water flow. There are no plans to alter any natural drainage way or make alterations involving a steep cut slope within 100 feet of the right-of-way to ensure the protection of the public. Stop signs will be posted at entrances to all public roads for mining trucks and equipment to stop prior to entering County Road No. 290, (at the intersection of Road D and Road 290, the County Yield sign on controls public traffic and allows mining traffic primary access to the road.

526.200. Utility Installation and Support.

There are no support or pollution control facilities other than the facilities located within the SCA - Star Point Permit Area. These facilities will be reclaimed according to this permit. All water used on the site will be brought in by truck.

526.300. Water Pollution Control Facilities.

The water pollution control facilities within the SCA - Star Point Permit Area include

sediment ponds and diversion ditches. Details (including design drawings and calculations) for all sediment control ponds and diversion ditches are included in Chapter Seven, Section 720. All sediment ponds will be inspected as outlined for impoundments in Section 514. All impoundments meet or exceed the permanent program performance standards.

526.400. Air Pollution Control Facilities.

SCA will continue its programs in the SCA - Star Point Permit Area to comply with the requirements of the Clean Air Act and other applicable air quality laws and regulations, as well as health and safety standards. A copy of the SCA Air Quality permit is included in Exhibit 421a.

To control fugitive dust, roads around the main complex which are being used by mobile equipment will be treated with calcium chloride, potassium chloride, or other acceptable biodegradable, organic wetting agents or sprayed with water as required during dry periods as required by SCA's Air Quality Permit.

527. TRANSPORTATION FACILITIES.

527.100-200. Road Classification.

All transportation facilities are shown on Map 521.100a and 521.100b. Photos are included in Exhibit 526.112a. Three classifications of roads exist within the SCA Star Point Permit Area. These are as follows:

Primary Roads – roads within the permit area with frequent, long-term heavy use. Typically this includes the haul road for transport of the fuel being mined. Design information is included in the permit for these roads and includes plan, profile and cross section information.

Ancillary Roads – roads within the permit area with infrequent, limited or short-term use not intended for hauling of the fuel being mined. Typically, these roads include access roads to ponds, reference areas, monitoring sites, disposal areas, etc. Design information is included in the permit for these roads and includes plan, profile and cross section information.

Pit Roads – roads in the active mining section of the refuse pile. The locations of these roads change as mining progresses and may or may not be shown on current maps. Typically these roads do not include design criteria in the plan.

The primary and ancillary roads within the SCA Star Point Permit Area are identified on maps 534.100a through 534.100h and are labeled roads D, F, G, H, K, L, M, and Haul Road. Road M is a future road that is not anticipated to exist until hauling of Refuse Pile B and C. Road K is also a future road that is not anticipated to exist until reclamation time. Primary and ancillary roads are further discussed in Sections 527.210 and 534.

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Table 527.100a Road Classification

Road	Type and Frequency and Duration of Use
Ancillary Road G to Pond 6	Occasional Access through Life of mine
Ancillary Road H to Pond 5	Occasional Access through Life of mine
Primary Road D	Regular use by haul trucks to access refuse pile
Primary Road F	Regular use by haul trucks to access refuse pile
Primary Road L	Regular use by haul trucks to access refuse pile
Future Primary Road K to Subsoil Area	Not in existence until reclamation then 2-3 months earthwork equipment during reclamation
Future Primary Road M to Refuse Pile B and C	Not in existence until hauling Refuse Pile B and C materials
Primary Haul Road	Frequent Fuel Hauling through Life of mine

Railroad systems near to the SCA - Star Point Permit Area consist of spur lines and main rail lines owned by Utah Railway Company (URC). A small portion of railroad passes near the southeast corner of the SCA - Star Point Permit Area east of the refuse pile. SCA does not control any trackage of any of the rails.

527.210. Design and Specifications.

Ancillary Road G (Access to Pond 6) – The access road to Pond 6 is called Road G. The road is approximately 10 to 12 feet wide and the grade ranges from 0 to 15%. This road is dirt. Between stations 109+00 to 122+00 where grades are steeper, water bars are spaced at approximately 40 feet.

Ancillary Road H (Access to Pond 5) – The access road to Pond 5 is called Road H. The road is approximately 10 to 12 feet wide and the grade ranges from 0.8 to 12.2%. This road is dirt.

Primary Road D (Access to Refuse Pile A) – This access road is intended for regular use by haul trucks to provide access to the northeasterly point of Refuse Pile A. The 20'-60' wide road will have a gravel or road base surface and a grade that ranges from 0% to 10%. This road will also facilitate loading of excavated material from the refuse pile. Construction on this primary road will begin within 1-2 years following DOGM approval.

Primary Road F (Access to Refuse Pile A) – This access road is intended to provide an access road to the refuse pile at a more gentle grade than the Primary Haul Road and facilitates more efficient travel. The 15-35 ft road will have a maximum grade of 5% and crosses portions of old asphalt parking lot and also has a gravel surface.

Primary Road L (Access to Refuse Pile A and Disposal Area) – The one way access road to the middle of Refuse Pile A and the Disposal Area is called Road L. The road is approximately 15 to 30 feet wide and the grade ranges from 0% to 6.2%. This road is surfaced with gravel or road base. The road provides additional access to the south side of Pond 9. Construction efforts to upgrade this ancillary road to the primary road are expected to begin within 1-2 years following DOGM approval.

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Future Primary Road K (Access to Subsoil Area) – The access road to the Subsoil Area is called Road K. The proposed road is approximately 10 to 25 feet wide and the grade ranges from 13% to 23%. Water bars are spaced at approximately 40 feet where grades are steeper between Stations 2+00 and Station 3+70.80. This road will be a dirt road. Prior to construction of Road K, topsoil will be salvaged in accordance with the plan outlined in Section 232.

Future Primary Road M (Access to Refuse Pile B and C) – The access road to Refuse Pile B and C is called Road M. The proposed road is approximately 10 to 24 feet wide and the grade ranges from 0% to 10.9%. This road will be a dirt road.

Primary Haul Road – This is the access road to the coal refuse pile. The road is approximately 12 to 30 feet wide and the grade ranges from 0 to 11%. This road is dirt with some gravel surfacing.

527.220. Relocation of a Natural Drainageway.

No natural drainage will be relocated because of roads.

527.230. Maintenance and Repairs.

All roads will be maintained in safe condition. If a road is damaged it will be repaired as soon as practical.

527.240. Geotechnical Analysis.

No alternative specifications are required.

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.

All coal refuse, which is to be mined, is located within the permit boundary. The coal refuse will be excavated as explained in Section 523. All processing of the coal refuse will be completed in an approved manner outside of this SCA - Star Point Permit Area. Coal Refuse that is unusable (rejects) will be discarded in the disposal area as shown in Map 521.100a. Normally coal mine wastes would be disposed of in a refuse pile. However, due to the nature of this operation, that of excavating the existing refuse piles for fuel, disposal of rejects back on the refuse pile where they came from would impede the ability to continue the excavation.

528.200. Overburden.

Since the coal refuse pile is currently exposed, there is no overburden.

528.300-321. Spoil, Coal Mine Waste.

Excess spoil will be placed in the disposal area as designed on Map 521.100f. The operator may segregate clean spoil materials such as boulders and clean excess spoil, and set aside these materials within the disposal area or on a portion of the refuse pile to be used for enhancements to the reclamation. A relatively small amount of coal mine waste (rejects) that is unusable will also be discarded in the disposal area. Non-coal mine waste will be limited to concrete and cinder block materials. This site is located to replace empty treatment ponds that the original owner, CPMC, used to remove fines from water in its water reuse program. The current design capacity of the disposal area is 145,000 cubic yards. This capacity represents 3.1% of the volume of the coal refuse pile. SCA expects that disposal area is more than adequate for the small amount of coal mine waste, non-coal mine waste and excess spoil anticipated, however, if more disposal is required, the current design would require modification or a second disposal site will need to be designated.

The spoil will be placed in the designated area in a controlled manner to ensure mass stability and prevent mass movement during and after construction. The material will be placed in four-foot maximum lifts and the placement will ensure that regrading will not be required during reclamation procedures. The spoil will be routinely compacted to prevent combustion and wind-borne transport. When the disposal is completed, a soil cover of four feet will exist over the disposal area, and the area will be revegetated in accordance with the approved reclamation plan. The disposal areas will be inspected as required in Section 514.

528.322. Refuse Piles.

Detailed plan views and cross sections and grades for the Refuse Pile are shown in Maps 521.100d and Map 521.100e. This plan shows the limits of the refuse pile. The refuse pile maintains a maximum 27 degree (2 horizontal:1 vertical) outslope.

Geotechnical investigation of the refuse pile were conducted in 1985 presented in Exhibit 528.322a. The 1985 work indicated that slopes should be maintained at a slope of 2H:1V to maintain a factor of safety greater than 1.5. Cross-sections on Map 542.200b indicate the coarse refuse pile embankment maintained the slope criteria established in the geotechnical investigations.

The coarse refuse pile will be in a state of ongoing excavation throughout the permit period. Excess spoil material and coal mine waste not suitable as fuel will be separated from the combustible material; transported and placed in a controlled manner in horizontal lifts not exceeding four feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute

material if required. The disposal area is shown in Map 521.100f.

All surface drainage from the area above the refuse pile will be diverted away from the fill into stabilized diversion channels designed to pass safely the runoff from a 100-year, 6-hour precipitation event. Calculations are found in Section 700.

The refuse pile will be inspected as outlined in Section 514.

Maintenance of the embankments will focus on maintaining a safe and stable slope and on controlling the surface runoff from the top of the pile such that it does not run uncontrolled down the outer slopes. Ditches will be cleaned and graded as need warrants.

Subsidence will not affect the refuse pile as the structure does not overlie any coal seam and is lower in elevation than the nearest outcrop. Mud flows, rock debris falls, or other landslides are not expected to be a problem. Possibility of failure near the sides and downhill of the refuse piles is limited to a thin layer of colluvial material on bedrock. Failure of this material would not threaten the refuse pile.

The refuse pile was certified in 1990 by a professional geotechnical engineer as shown in Exhibit 528.322b.

528.323. Burning and Burned Waste Utilization.

Coal mine waste fires will be extinguished by covering the burning material with non-combustible material or by excavating burning or burned waste for surface extinguishing. Soil materials imported from off site may be used for fire suppression needs. An identified location for clean import soil is Neilson's Pit located in Wellington, Utah. CPMC has reported that fires have not been a problem on the refuse pile; therefore, it is not anticipated that significant quantities of materials will be needed for future fire suppression needs.

Only those persons authorized by the operator and who have an understanding of the procedures to be used will be involved in the extinguishing operations. No burning or burned coal mine waste will be removed from the permit disposal area without a removal plan approved by the DOGM. Consideration will be given to potential hazards to persons working or living in the vicinity SCA - Star Point Permit Area.

Burned coal waste material encountered during excavation of the Refuse Pile will be disposed of in the disposal area.

528.330. Non Coal Mine Waste.

528.331. Designation of Noncoal Mine Waste Materials.

Non-coal materials such as paper, wood, trash and other materials are collected routinely, transported to a central collection area, and periodically removed by a contracted disposal service. Concrete and cinder block materials will be disposed of in the designated disposal area.

528.332. Final Disposal of Noncoal Mine Wastes.

Non-coal waste is collected in a central collection area and periodically removed to a state approved landfill. Concrete and cinder block materials will be disposed of in the designated disposal area.

528.333. Restrictions on Disposal of Noncoal Mine Waste Material.

Non-coal waste, except for concrete and cinderblock materials, will not be deposited in a refuse pile or impoundments, nor will it be deposited within eight feet of any coal outcrop or storage area.

528.334. Hazardous Waste Materials.

Non-coal wastes defined as "hazardous" will be handled in accordance with the requirements of Subtitle C of RCRA. Inventories will be conducted of all chemicals used on the property. Employees are trained in the handling, use, and disposal of hazardous material. If possible non-listed substitutes are found for any chemicals on the RCRA list. Batteries are recycled.

528.340-350. Underground Development Waste.

No underground mining will occur in the SCA - Star Point Permit Area, thus this regulation is not applicable to this permit application.

528.400. Dams, Embankments, and Other Impoundments.

Three sediment ponds and a few interim sediment traps have been constructed by CPMC, and are in use at the present time. None of these have embankments constructed of coal mine waste. These facilities will continue to be used to treat runoff water throughout the operation. Upon final reclamation and at the end of the post mining liability period, the facilities will be removed and the areas reclaimed. Sediment pond designs and additional information are contained in R645-301-531. Dams, embankments and other impoundments are inspected on a regular basis and maintained to operate as designed. Pictures of the Sediment Ponds are in Exhibit 526.112a. The design of each facility is shown in Maps 733.120a, 733.120b, and 733.120j. The original certified CPMC drawings of the ponds are shown in Exhibit 742.221i.

529. MANAGEMENT OF MINE OPENINGS.

No mine openings exist within the SCA - Star Point Permit Area, thus this regulation is not applicable to this permit application.

530. OPERATIONAL DESIGN CRITERIA AND PLANS

531. GENERAL.

Three sedimentation ponds exist near the refuse pile and serve as on-site water pollution control facilities in conjunction with the SCA runoff control plan. These structures have been designed to contain the 10-year 24-hour storm runoff event from disturbed areas and to remove excess suspended sediments picked up from disturbed areas of the mine as required. These facilities will remain in place throughout the operation. After or during mine reclamation, they will be removed and the area reclaimed as required.

No past, present, or future underground mining activities have or will be conducted beneath any existing sedimentation pond, treatment facility or waste pile embankment, therefore there will be no effect upon such structures due to subsidence.

532. - 533. Sediment Control.

The hydrologic design calculations for the sediment ponds are discussed in Section 743. These calculations outline the criteria, assumptions, and parameters used in order to design a structure that would be adequate to control sedimentation.

There is a system of collector ditches throughout the SCA - Star Point Permit Area to collect runoff from roads and disturbed areas. These flow into sediment ponds that are located throughout the SCA - Star Point Permit Area. These ponds discharge into tributaries of Serviceberry Creek. Serviceberry then conveys water to Miller Creek, which is a tributary of the Price River. The discharges are subject to the UPDES permit limitations discussed in Section 700.

The permitted operations in the SCA - Star Point Permit Area include excavations of the refuse piles. The probable hydrologic impacts are expected to change very little with the inclusion of the excavation activities. The disturbance of the refuse piles caused by the excavation may increase sediment yield from these areas. The control of the extra sediment is discussed in Section 730.

533.100-220. Stability.

Embankment stability analyses were completed by CPMC for Pond No. 5 in 1981, 1982, and again in 1985 after pond modifications were made. According to the findings of the studies the pond was finally accepted by the Division with a factor of safety of 1.47 to 1.48. After pond enlargement modifications were made in 1984 the analyses indicate that the dry pond factor of safety is 1.8. A letter prepared by R&M

Consultants dated November 21, 1984, attesting to the latest factors of safety is reproduced in Exhibit 733.210a.

A stability analysis of Pond No. 9 was completed prior to construction by Chen and Associates, which indicated that the 3H:1V embankment slopes will result in a factor of safety greater than 1.5. A letter by Hansen Allen & Luce, Inc. dated August 17, 1988 certifies completion of Pond No. 9 in compliance with accepted engineering standards. A copy of the letter is included in Exhibit 733.210a.
A letter by Boyle Engineering dated November 16, 1981 certifies completion of Pond No. 6 in compliance with the plans and specifications prepared by Vaughn Hanson Associates. A copy of the letter is included in Exhibit 733.210a and includes compaction tests of the soil embankment.

Design details for all three ponds are included in Exhibit 742.221i.

533.300-400. Slope Protection.

All sedimentation pond embankments except Pond No. 9, which borders the coal refuse pile, are vegetated to prevent surface erosion.

Loose or grouted riprap was placed in pond inlet channels, around spillway risers, and at spillway outlets as shown on the previously mentioned design detail maps and as discussed later in this section. Riprap around all spillway risers (except Pond No. 9) has been placed so as to surround the risers to a width of five feet. Rock added to the pond design around spillway risers will generally minimize erosion caused by currents and eddies created by the concentration of flows around the outlet risers. Rock was not placed around the outlet riser for Sediment Pond No. 9 because it was felt that the riser was of sufficient height to prevent embankment erosion.

Consideration was also given to the erosion potential at each pond outlet. It was found that some pond outlets were located on slopes that are too steep for the design of conventional riprap erosion protection. In such locations each outlet has been placed onto a man-made or natural rock or riprap splash pile. For the ponds that have been so constructed, discharge waters appear to be controlled by the existence of the rubble piles and the solution appears to be working well. For ponds using natural rock or riprap splash piles, no calculations are provided since calculation techniques are not currently available for their design on such steep slopes as encountered on the site.

Some pond outlet designs have considered not only riprap basins, but also concrete energy dissipation boxes. To date, riprap solutions appear to be more feasible than concrete energy dissipation boxes with the understanding that routine maintenance may be required.

533.500. Submerged Highwalls.

There are no submerged highwalls within the SCA - Star Point Permit Area.

533.600-700. MSHA Impoundments.

There are no impoundments that meet or exceed 30 CFR 77.216(a) criteria. Also, See Exhibit 513.

534. ROADS.

There are two ancillary roads, Road G, and Road H, which are within the SCA - Star Point Permit Area. In addition, there are four existing primary roads, the Haul Road and Roads D, F and L, and two proposed primary roads, Road K to access the Subsoil Area and Road M to access Refuse Pile B and C. The plan, profile, and cross section of Roads D, F, G, H, K, L, M and the Haul Road are shown on Maps 534.100a through 534.100h. All other roads are temporary pit roads, which may change with the progress of excavation. Existing access roads are in place to the Subsoil Area, additional roads may be desired at the time of reclamation to improve the operation of hauling soil material. Prior to construction of Road K, topsoil will be salvaged in accordance with the plan outlined in Section 232. Additional design and sediment control facilities for these roads if needed will be provided prior to construction of new roads. Road specifications can be found on Table 534.200a, Road Specifications. Exhibit 534 includes the calculation of the road embankments meeting the safety factor of 1.3 or greater.

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TABLE 534.200a. Road Specifications

ROAD*	SURFACE TYPE	SURFACE WIDTH	LENGTH	MAXIMUM GRADE %	MINIMUM GRADE %	AVERAGE GRADE %
D	Gravel or Road Base	20'-60'	0.1 miles	10	0	5
F	Gravel or pavement	15'-35'	0.05 miles	5	0	2.5
G'	Dirt & Gravel	10-12'	0.4 miles	14.6	0	4.7
H	Dirt & Gravel	12-24'	0.6 miles	12.24	0.83	3.8
K	Dirt & Gravel	12-24'	0.05 miles	22.6	11.5	17.3
L	Gravel or Road Base	15-30'	0.11 miles	6.2	0	4.4
M	Dirt & Gravel	10-24'	0.05 miles	10.9	0	8.5
Haul Road	Dirt & Gravel	12-30'	0.16 miles	10.88	0	4.6

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Road maintenance is addressed in R645-301-526.100. Reclamation of roads is addressed in R645-301-542.200. All non-public roads within the SCA - Star Point Permit Area will be reclaimed.

535. SPOIL.

Disposal of spoil is discussed in R645-301-528.300.

536. COAL MINE WASTE.

No underground mining will occur that would generate additional coal mine waste. No sediment ponds or impoundments are constructed from coal mine wastes or refuse materials.

537. REGRADED SLOPES.

Regrading of fills is discussed in R645-301-542.200.

540. RECLAMATION PLAN.

541. GENERAL.

541.100. Commitment.

Upon the permanent cessation of coal refuse pile removal operations, SCA will close, backfill, or otherwise permanently reclaim all affected areas in accordance with the R645-301 regulations and this reclamation plan.

541.200. Surface Coal Mining and Reclamation Activities.

All surface equipment, structures, or other facilities not required for the continued surface coal mining activities and monitoring, unless approved by the Division as suitable for the postmining land use or environmental monitoring, will be removed and the affected land reclaimed following permanent cessation of mining operations.

541.300. Underground Coal Mining and Reclamation Activities.

No underground coal mining and reclamation activities will be conducted within the SCA - Star Point Permit Area.

541.400. Environmental Protection Performance Standards.

The plan presented herein is designed to meet the requirements of R645-301 and the environmental protection performance standards of the State Program.

542. RECLAMATION PLAN.

542.100. Reclamation Timetable.

A timetable for the completion of each major step in the reclamation plan is included as Table 542.100a. This table projects completion of the reclamation within a 5-month period for both the Bonding Scenario and Final Reclamation. However, specifics related to the duration and sequencing of reclamation construction activities will be dependent largely upon contractor preference and equipment. Therefore, selected tasks may shift and the time frame may be extended beyond that indicted in Table 542.100a.

TABLE 542.100a. Reclamation Timetable for All Scenarios

		Reclamation Schedule				
No.	Activity Description	May	June	July	August	Sept.
1	Demolish Surface Structures					
2	Installation of Interim Sediment Controls					
3	General Grading					
4	Soil Cover Placement					
5	Removal of Ponds					
6	Revegetate					

542.200. Plan for Backfilling, Soil Stabilization, Compacting, and Grading.

The plan for reclamation is detailed in the following maps:

Bonding Scenario Reclamation Maps and Cross Sections

Map 542.200a, Refuse Pile Bonding Scenario Reclamation Topography
Map 542.200b, Refuse Pile Bonding Scenario Reclamation Cross Sections
Map 542.200c, Subsoil Area Bonding Scenario Excavation and Reclamation
Map 542.200d, Subsoil Area Bonding Scenario Reclamation Cross Sections
Map 542.200f, Bonding Scenario Reclamation Subsoil Cover Plan

Final Reclamation Maps and Cross Sections

Map 542.200e, Refuse Pile Final Reclamation Topography
Map 542.200g, Final Reclamation Subsoil Cover Plan

The reclamation plan was designed to meet the objectives of balancing cut and fill quantities, while maintaining a geotechnically stable site, and minimizing erosion. The primary features of the Bonding Scenario Reclamation plan are:

- Regrading of areas to create slopes no steeper than 3H:1V which will adequately drain while minimizing long-term erosion concerns;
- Backfilling to remove cut slopes to the extent possible within the objectives noted above (cut and fill balance, site stability, and erosion control);
- Removal of sedimentation ponds and implementation of interim sediment control.

The Final Reclamation is similar to the Bonding Scenario Reclamation except that regrading will be very minimal since the pile will be removed and natural ground should be exposed.

The estimated cut and fill quantities for reclamation of the site for the two scenarios are shown in Table 542.200a and Table 542.200b. Details regarding topsoil placement and revegetation following regrading are provided in Sections 200 and 300 of this plan, respectively.

TABLE 542.200a. Cut and Fill Balance for Bonding Scenario Reclamation

Area-	Cut Quantity (yd^3)	Fill Quantity (yd^3)
Refuse Pile General Grading	270,000	270,000
Pond 6 Removal	1,850	1,850
Road G Removal	1,700	1,700
Subsoil Redistribution	235,300	
Refuse and Disposal Area Soil Cover		235,300
Total	508,850	508,850

TABLE 542.200b. Cut and Fill Balance for Final Reclamation

Area	Cut Quantity (yd^3)	Fill Quantity (yd^3)
General Grading, Refuse Disposal	50,000	50,000
Pond 6 Removal	1,850	1,850
Road G Removal	1,700	1,700
Subsoil Redistribution	235,300	
Refuse and Disposal Area Soil Cover		111,600
Redistribute Remaining Salvaged Subsoil		123,700
Total	288,850	288,850

Demolition. Prior to significant grading activities in the SCA - Star Point Permit Area, remaining structures / foundations and materials will be removed from the area or placed in the disposal area. Those materials requiring off-site disposal will be placed in a permitted landfill. If foundations will not interfere with regrading activities, they will be left in place for on-site burial. Foundations which will be within four feet of the reclaimed surface will be broken up to the extent practical prior to backfilling. Other foundations may be left intact.

Non-coal wastes found during demolition or other reclamation activities (including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned machinery, lumber, and combustible materials generated during previous mining activities) will be placed and stored in a controlled manner. This storage area will be determined at the time of reclamation and will be at the discretion of the permittee. Final disposal of the non-coal mine wastes will be at a designated disposal site within the SCA - Star Point Permit Area or at a State-approved solid waste disposal facility. Notwithstanding any other provision of the R645 rules, any non-coal mine waste defined as "hazardous" under Section 3001 of the Resource Conservation and

Recovery Act ("RCRA")(P.L. 94-580, as amended) and 40 CFR 261 will be handled in accordance with the requirements of Subtitle C of RCRA and any implementing agency.

Backfilling and Compaction. For the Bonding Scenario, the objective of the proposed backfilling, contouring, and grading process is to create reclaimed surface which will remain stable during post-mining land use. This will be achieved by regrading slopes to no steeper than 3H:1V, as shown in Map 542.200a. For the Final Reclamation Scenario, the pile will have been removed and minimal grading is expected to be required except to scrape the ground to remove residual coal materials.

Prior to grading, all vegetation, organic matter, and debris will be cleared from areas to receive fill. The cut material from site regrading will be placed as fill and graded to facilitate drainage from the mine site and contributing side areas. All fill placed during recontouring of the site will be compacted to at least 85 percent of maximum Proctor density (ASTM D698). Compaction will be accomplished using repeated passes of rubber-tired equipment, rollers, and other appropriate equipment.

Fill lifts will be placed with a thickness when compacted of no more than 12 inches. Care will be taken to ensure that fill materials are not frozen during placement or compaction. Any areas that are damaged by freezing will be reconditioned, reshaped, and recompacted to at least 85 percent of maximum Proctor density.

In general, grading and backfilling operations will proceed from the upstream end of the surface facilities to the downstream end, thus allowing the sedimentation ponds to remain effective for as long as possible.

For the Final Reclamation Scenario, all areas where coal refuse has been removed will be scraped to clear residual coal materials which will be disposed of in the disposal area.

Topsoiling, Seeding, and Mulching. Following regrading or scraping, a soil cover for plant-growth will be placed over the refuse pile area and disposal area at thicknesses as described in Section 542.700. Preparation of the rough-graded surface and placement of the plant-growth media will occur as described in Section 240 of this plan.

The Subsoil Area is located to the north of the refuse pile. For the Bonding Scenario Reclamation it is estimated that 235,700 cubic yards of soil material will need to be imported for the soil cover. The Bonding Scenario excavation and reclamation plans

of the Subsoil Area including cross sections are shown in Maps 542.200c and 542.200d. Map 542.200f shows the Bonding Scenario subsoil cover plan. The plans detail the stockpiling of subsoil, placement of erosion control, construction access routes, and final reclamation contours. The anticipated Final Reclamation, however, would only require 30,800 cubic yards. Map 542.200g shows the Final Reclamation subsoil cover plan.

The details regarding soil preparation, seeding, and mulching can be found in the Reclamation Plan of Section 200 and Section 300.

Sedimentation Pond Removal and Interim Sediment Control. The sedimentation ponds will be retained for as long as practical during reclamation. Once backfilling and grading operations proceed to the location of a pond, it will be removed. This removal will consist primarily of filling the pond areas with the adjacent embankment materials using backhoes, loaders, dozers, compactors, and other appropriate equipment.

Before regrading of an area no longer allows that area to drain to the sedimentation pond, plant-growth media will be emplaced on the area and it will be mulched and deep gouged as indicated previously in this section. If necessary alternate sediment controls may also be installed to control localized erosion prior to the establishment of revegetation efforts. Locations of the alternate sediment controls will be selected to reduce sediment contributions to runoff based on field observations. Maps 731.720a (drainages and diversions) and 731.720b (culverts) show the locations for these sediment controls around the coal refuse pile. Maps 542.200c shows the locations for sediment controls around the Subsoil Area for Bonding Scenario Reclamation and Final Reclamation. Silt fences and straw bales will be installed as noted in Figure 542.200a.

Pond 6 is at the downstream end of the site. This pond will be retained as long as possible to provide downstream sediment control at the site during reclamation. Since a reclamation channel will be constructed through this pond, the pond will be removed and the area reclaimed at the end of reclamation, as indicated in Table 542.100a. Prior to removal of these ponds, the majority of the area above these ponds will have been final graded, roughened, mulched, and seeded, with interim sediment control installed as necessary.

If reclamation work is not completed before seasonal conditions require a halt to reclamation work, those areas which have been regraded but which have not been covered with soil from the Subsoil Area and reseeded will be deep gouged and left in a roughened state until reclamation activities resume.

542.300. Final Surface Configuration Maps and Cross Sections.

For the Bonding Scenario Reclamation, the final surface configuration maps and

cross sections are provided on Maps 542.200a, 542.200b, 542.200c, and 542.200d. For the Final Reclamation, the final surface topography of the refuse site is shown on Map 542.200e. The cross sections for this topography are shown on the refuse pile cross sections in Map 521.100e. No facilities related to the coal mining operations will remain in the SCA - Star Point Permit Area following reclamation.

542.400. Removal of Temporary Structures.

All surface structures associated with the operation will be removed as outlined in Section 542.200. A description ensuring that all structures and the sedimentation pond have been removed will be provided to the Division before seeking bond release or abandoning the SCA - Star Point Permit Area.

542.500. Removal of Sedimentation Ponds.

Information regarding removal of the sedimentation ponds associated with the site is provided in Section 542.200. The timetable for removal of these ponds is indicted in Table 542.100a.

542.600. Roads.

All private roads will be reclaimed after they are no longer needed for mining and reclamation operations, except for those specifically designated for an industrial post mining land use. Roads will be reclaimed by pulling fill back up from the downslope and placing it in the cuts. The replaced fill material will be shaped to conform to the adjacent terrain and to meet natural drainage patterns. Following rough grading, the reclaimed roads will be mulched, deep gouged, and revegetated in accordance with Section 542.200 of this plan.

Natural drainages will be re-established across the reclaimed roads as indicated in Section 760. Culverts that are required for an approved post-mining land use (i.e., those which exist along County Road 290) will be retained; all others will be removed. Water bars and cross drains may be constructed across reclaimed roads to minimize erosion where necessary. The entrances to reclaimed roads will be blocked by barriers of native rock or earthen berms to prevent vehicular access.

542.700. Final Abandonment of Mine and Disposal Areas.

Disposal Area. Excess spoil and coal mine waste not suitable as fuel that is generated in the SCA - Star Point Permit Area will be disposed of prior to final reclamation in the disposal area which is to be created on the site previously used by CPMC for water treatment. Material which is added to the disposal area during reclamation will be placed in accordance with the procedures outlined in Section 528.322 of this plan. The materials will be placed in a controlled manner to ensure

mass stability and prevent mass movement during and after construction. The maximum slope for the disposal areas is 4:1. As shown in Table 542.700, the safety factor for the maximum slope in the disposal area is 3. This was calculated using the same methodology used in Exhibit 534.

Table 742a

Diversion Ditch Peak Flow Design Data

Ditch No.	Acreage	Area (mi^2)	CCN	S' (in.)	Basin Length, L (ft)	Basin Average Grade (%)	Lag Time, t_L (hr)	Overall Storm Precip., P (in.)	Overall Storm Runoff, R (in.)	Time of Concentration, t_c (hr)	U.H. Time to Peak, t_p (hr)	Peak Flow, Q_p (cfs)	
												10yr-24hr	100yr-6hr
6B	7.6	0.0119	75	3.26	1,780	36	0.10	2.1	0.44	0.16	0.11	5.71	-
6C	13.9	0.0218	75	3.26	2,703	38	0.13	2.1	0.44	0.22	0.15	9.08	-
7E	4.3	0.0068	81	2.41	1,241	18	0.09	2.1	0.65	0.15	0.10	3.52	-
7G	7.6	0.0119	78	2.82	1,644	9	0.17	2.0	0.48	0.28	0.19	-	3.94
7H	1.7	0.0027	76	3.09	683	19	0.06	2.0	0.43	0.10	0.07	-	5.09
8	13.1	0.0204	70	4.29	1,698	12	0.19	2.0	0.24	0.31	0.21	-	2.45
14	221.8	0.3465	75	3.32	8,241	24	0.41	2.1	0.43	0.68	0.45	56.48	-
15A	1.7	0.0026	88	1.36	485	13	0.04	2.1	1.05	0.06	0.04	2.21	-
15B	0.3	0.0004	87	1.53	200	14	0.02	2.1	0.97	0.03	0.02	2.48	-
15Ba	1.5	0.0023	88	1.36	300	12	0.03	2.1	1.05	0.04	0.03	2.5	-
16A	0.6	0.0010	84	1.90	778	7	0.09	2.0	0.74	0.14	0.10	-	0.75
16B	0.7	0.0011	82	2.14	576	12	0.05	2.0	0.67	0.09	0.06	-	1.74
16Ba	0.9	0.0015	75	3.42	258	15	0.03	2.0	0.37	0.05	0.04	-	0.46
16C	0.5	0.0007	86	1.57	386	10	0.04	2.0	0.87	0.06	0.04	-	2.3
16D	2.6	0.0040	75	3.42	723	9	0.10	2.0	0.37	0.16	0.11	-	3.38
16E	2.5	0.0039	71	4.08	589	16	0.07	2.0	0.27	0.11	0.08	-	0.63
16Ea	3.4	0.0054	70	4.29	744	10	0.11	2.0	0.24	0.18	0.12	-	0.72
16F	3.1	0.0049	73	3.70	713	17	0.07	2.0	0.32	0.12	0.08	-	5.12
32	0.5	0.0008	70	4.29	158	23	0.02	2.0	0.24	0.03	0.02	-	0.11
33	0.3	0.0005	70	4.29	115	22	0.02	2.0	0.24	0.03	0.02	-	0.07
72A	1.3	0.0020	90	1.11	924	12	0.06	2.1	1.18	0.10	0.07	4.59	-
72B	0.2	0.0002	90	1.15	246	8	0.03	2.1	1.16	0.04	0.03	4.65	-
72C	0.2	0.0002	90	1.12	238	5	0.03	2.1	1.17	0.05	0.04	4.68	-
74A	1.6	0.0025	89	1.25	791	12	0.06	2.1	1.10	0.09	0.06	2.25	-
74Ab	1.0	0.0016	89	1.24	150	10	0.02	2.1	1.11	0.03	0.02	1.5	-
76	1.1	0.0018	70	4.29	518	22	0.05	2.0	0.24	0.09	0.06	-	0.24
77	1.2	0.0019	76	3.25	904	8	0.12	2.1	0.45	0.20	0.13	0.55	-
80A	3.8	0.0059	75	3.26	832	13	0.09	2.1	0.44	0.15	0.10	11.01	-
80B	0.3	0.0004	90	1.10	163	12	0.02	2.1	1.19	0.03	0.02	11.39	-
80C	0.7	0.0011	90	1.11	279	9	0.03	2.1	1.18	0.04	0.03	12.43	-
80D	2.3	0.0036	75	3.26	803	12	0.09	2.1	0.44	0.15	0.10	0.86	-
81	2.9	0.0046	72	3.97	860	14	0.10	2.0	0.28	0.16	0.11	-	4.53
82A	0.2	0.0003	90	1.10	236	15	0.02	2.1	1.19	0.03	0.02	0.28	-
82B	0.9	0.0014	90	1.10	495	16	0.03	2.1	1.19	0.05	0.04	1.33	-

Table 742b
Culvert Peak Flow Design Data

Culvert	Drainage Acreage	Drainage Area ($mi.^2$)	CCN	S (in.)	Basin Length, L (ft)	Basin Average Grade (%)	Lag Time, t_L (hr)	Overall Storm Precip., P (in.)	Overall Storm Runoff, R (in.)	Time of Concentration, t_c (hr)	U.H. Time to Peak, t_p (hr)	Design Peak Flow, Q_p (cfs)
81	14.4	0.0225	70	4.29	1,134	2.6	0.29	2.0	0.24	0.49	0.32	2.30
82	7.1	0.0111	71	4.08	1,176	11	0.14	2.0	0.27	0.24	0.16	1.60
15A						Used calculated flows for Ditch 15A						2.21
15B						Used calculated flows for Ditch 15B						2.48
16A						Used calculated flows for Ditch 16A						0.75
16Ba						Used calculated flows for Ditch 16Ba						0.46
16F						Used calculated flows for Ditch 16E						5.10
33A						Used combined calculated flows for Ditch 8 and Ditch 33						2.45
33B						Used calculated flows for Ditch 8						2.45
72A						Used calculated flows for Ditch 72A						4.59
72B						Used calculated flows for Ditch 72B						4.65
72C						Used calculated flows for Ditch 72C						4.68
74B						Used calculated flows for Ditch 74A						2.25
7E						Used calculated flows for Ditch 7H						5.09
7Ea	3.4	0.0053	77	3.07	891	17	0.08	2.1	0.48	0.13	0.09	2.01
7F						Used calculated flows for Ditch 7G						3.94
80A						Used calculated flows for Ditch 7E						3.52
80B						Used calculated flows for Ditch 80A						11.01
8A						Used calculated flows for Ditch 8						2.45

Table 742c

Diversion Ditch Design Criteria

Ditch No.	Design Flow Rate, Q (cfs)	Manning's Roughness, n	Bottom Width, b (ft)	Side Slope, m (m:1 => H:V)	Minimum Slope Conditions						Maximum Slope Conditions						Current Depth (ft)	Available Freeboard (in.)	Lining Required?	Current Rip Rap D_{50} (ft)	Minimum Needed Rip Rap D_{50} (ft)
					Slope, S_o	Area, A (ft^2)	Wetted Perimeter, P_w (ft)	Hydraulic Radius, R_h (ft)	Velocity, v (ft/s)	Depth, y_o (ft)	Slope, S_o	Depth, y_o (ft)	Area, A (ft^2)	Wetted Perimeter, P_w (ft)	Hydraulic Radius, R_h (ft)	Velocity, v (ft/s)					
6B	5.7	0.03	2.5	1.3	0.018	1.51	4.17	0.36	3.52	0.51	0.059	0.36	1.08	3.69	0.29	5.29	1.50	11.9	YES	0.5	0.25
6C	9.1	0.03	2.5	2	0.010	2.90	5.77	0.50	3.13	0.73	0.020	0.81	2.26	5.22	0.43	4.01	1.50	9.2	NO	-	-
7E	3.5	0.03	2.7	0	0.040	0.87	3.34	0.26	4.03	0.32	0.143	0.21	0.58	3.13	1.00	18.73	1.00	8.1	YES	Variance[3]	Variance[3]
7G	3.9	0.03	0	2	0.010	1.48	3.85	0.39	2.62	0.86	0.010	0.86	1.48	3.85	0.39	2.62	1.50	7.7	NO	-	-
7H	5.1	0.03	3	2	0.067	1.03	4.29	0.24	4.95	0.29	0.200	0.21	0.71	3.93	0.18	7.10	0.75	5.5	YES	0.75	0.5
8	2.5	0.03	0.1	5.3	0.080	0.59	3.61	0.16	4.20	0.33	0.120	0.30	0.51	3.35	0.15	4.90	0.80	5.7	NO	-	-
14	56.5	0.023	(half-round CMP D = 54")		0.063	4.37	5.40	0.81	12.92	1.44	0.260	0.96	2.48	4.32	0.57	22.76	2.25	9.8	YES	N/A	N/A
15A[1]	2.2	0.03	0	2	0.11	0.39	1.98	0.20	5.58	0.44	0.130	0.43	0.37	1.92	0.19	5.95	0.75	3.7	YES	NONE	0.5
15B	2.5	0.03	0	2	0.1	0.45	2.12	0.21	5.56	0.47	0.100	0.47	0.45	2.12	0.21	5.56	0.75	3.3	YES	NONE	0.5
15Ba	2.5	0.03	0	1.5	0.015	0.18	1.26	0.15	1.68	0.36	0.050	0.25	0.09	0.90	0.10	2.45	0.75	4.8	NO	NONE	-
16A	0.8	0.03	0.1	4	0.04	0.31	2.29	0.13	2.60	0.27	0.060	0.24	0.26	2.11	0.12	3.02	0.80	6.4	NO	-	-
16B	1.7	0.03	0.1	4	0.040	0.54	3.04	0.18	3.14	0.36	0.030	0.36	0.60	3.19	0.19	2.82	0.80	5.3	NO	-	-
16Ba	0.5	0.03	1	2	0.040	0.21	1.70	0.12	2.43	0.16	0.100	0.12	0.15	1.54	0.10	3.32	0.75	7.1	NO	-	-
16C	2.3	0.03	0.1	4	0.040	0.68	3.39	0.20	3.36	0.40	0.060	0.37	0.58	3.15	0.19	3.95	0.80	4.8	NO	-	-
16D	3.4	0.03	0.1	4	0.040	0.91	3.93	0.23	3.73	0.46	0.060	0.43	0.78	3.64	0.21	4.34	0.80	4.0	NO	-	-
16E	0.6	0.03	0.1	4	0.073	2.51	5.53	0.38	7.08	0.76	0.011	0.22	0.21	1.81	0.11	1.21	0.80	0.2	NO	-	-
16Ea	0.7	0.03	1	2	0.040	0.26	1.84	0.14	2.68	0.18	0.100	0.16	0.19	1.65	0.11	3.69	0.75	5.7	NO	-	-
16F	5.1	0.03	0.1	4	0.040	1.23	4.58	0.27	4.13	0.54	0.060	0.50	1.06	4.24	0.25	4.81	0.80	9.1	NO	0.6	0
18A	1.6	0.03	0	1.5	0.003	1.16	3.17	0.37	1.39	0.88	0.019	0.82	0.58	2.24	0.26	2.77	1.40	6.2	NO		
18B	0.3	0.03	0	1.5	0.005	0.28	1.55	0.18	1.11	0.43	0.005	0.43	0.28	1.55	0.18	1.11	1.00	6.8	NO		
18C	2.1	0.03	0	1.5	0.038	0.54	2.16	0.25	3.83	0.60	0.050	0.57	0.49	2.06	0.24	4.24	1.10	6.0	NO		
18D	2.2	0.03	3	1.5	0.022	0.84	3.90	0.22	2.65	0.25	0.065	0.17	0.55	3.61	0.15	4.13	0.80	5.6	NO		
18E	2.2	0.03	3	1.5	0.050	0.62	3.69	0.17	3.39	0.19	0.120	0.15	0.48	3.54	0.14	4.55	1.00	9.7	NO		
32	0.1	0.03	0.6	2.6	0.100	0.60	2.72	0.22	5.74	0.38	0.100	0.06	0.05	0.95	0.05	2.12	0.60	2.6	NO	-	-
33	0.1	0.03	0.6	6.7	0.060	0.05	1.32	0.04	1.38	0.05	0.060	0.05	0.05	1.32	0.04	1.38	0.60	5.6	NO	-	-
72A	4.6	0.038	3	2	0.060	1.16	4.43	0.26	3.93	0.32	0.290	0.20	0.69	3.90	0.18	6.62	1.40	13.0	YES	0.75	0.5
72B	4.7	0.035	2	2	0.125	0.81	3.38	0.24	5.78	0.31	0.125	0.31	0.81	3.38	0.24	5.78	1.50	14.3	YES	0.5	0.5
72C	4.7	0.035	2	2	0.065	1.02	3.66	0.28	4.61	0.37	0.065	0.37	1.02	3.66	0.28	4.61	1.50	13.5	NO	-	-
74A	2.3	0.03	0	2	0.090	0.44	2.09	0.21	5.24	0.47	0.090	0.47	0.44	2.09	0.21	5.24	0.60	1.6	YES	-	0.5
74Ab	1.5	0.03	0	4	0.030	0.64	3.30	0.19	2.86	0.40	0.050	0.20	0.16	1.65	0.10	2.56	0.80	4.8	NO	-	-
76	0.2	0.03	0.1	6.3	0.120	0.09	1.54	0.06	2.62	0.11	0.120	0.11	0.09	1.54	0.06	2.62	0.63	5.2	NO	-	-
77[2]	0.6	0.03	0.1	4	0.060	-	-	-	-	0.31	0.060	0.32	0.29	1.95	0.15	4.10	1.00	8.3	NO	-	-
80A	11.0	0.038	5	2	0.050	2.59	7.71	0.34	4.23	0.38	0.065	0.35	2.37	7.58	0.31	4.60	1.00	7.4	NO	-	-
80B	11.4	0.03	10	10	0.010	5.19	17.58	0.30	2.20	0.377	0.010	0.36	5.19	17.58	0.30	2.20	1.00	7.5	NO	-	-
80C	12.4	0.042	10	2	0.240	2.12	10.91	0.19	5.82	0.204	0.240	0.20	2.12	10.91	0.19	5.82	1.00	9.6	YES	2	0.5
80D	0.9	0.03	1	1	0.026	0.59	2.17	0.27	3.33	0.414	0.026	0.41	0.59	2.17	0.27	3.33	1.00	7.0	NO	-	-
82A	0.2	0.03	0	2	0.005	0.11	1.05	0.11	0.76	0.235	0.016	0.19	0.07	0.85	0.08	1.21	0.75	5.2	NO	-	-
82B	1.3	0.03	0	2	0.002	0.64	2.52	0.25	0.77	0.564	0.090	0.28	0.15	1.23	0.12	3.68	1.00	5.2	NO	-	-

[1] Ditch geometry assumed the same as for Ditch 15B.
[2] Channel geometry varies. Some values taken from CPMC permit. However, peak flows have now decreased, making the design conservative.
[3] Variance was granted since channel had already eroded down to bedrock.

Table 742d

Culvert Design Criteria

Orifice Coefficients C = 0.49804 (projecting inlet, from nomograph)
C = 0.555 (mitered inlet, from nomograph)

Culvert No.	Design Flow, Q (cfs)	Manning's Roughness, n[3]	Slope, S_o	Diameter, D (in.)	Length, L (ft)	Area, A $(ft^2)^2$	Hydraulic Radius, R_h $(ft)^2$	Available HW/D Ratio	Available HW (ft)	Flow Capacity (cfs) Pipe Flow[2]	Flow Capacity (cfs) Inlet Control	Avg. Velocity, v (ft/s)[1]	Comments
81	2.30	0.013	0.200	27	200	3.98	6.75	2.2	5.00	138.50	31.28	13.04	Projecting steel inlet/outlet
82	1.60	0.013	0.034	27	42	3.98	6.75	2.3	5.23	57.10	32.18	6.29	Projecting steel inlet/outlet
15A	2.21	0.013	0.105	14	82	1.07	3.50	2.1	2.48	17.41	5.89	11.16	Projecting steel inlet/outlet; D50 < 0.5 ft - monitor for erosion.
15B	2.48	0.024	0.088	15	80	1.23	3.75	2.1	2.63	10.34	6.94	6.94	Projecting inlet/outlet
16A	0.75	0.024	0.098	18	180	1.77	4.50	1.6	2.45	17.81	9.21	4.99	Projecting inlet/outlet
16Ba	0.46	0.024	0.010	30	17	4.91	7.50	1.0	2.50	22.22	21.93	1.81	Projecting inlet/outlet
16F	5.10	0.024	0.086	18	130	1.77	4.50	2.5	3.80	14.61	12.33	7.53	Projecting inlet/outlet
33A	2.45	0.024	0.187	24	41	3.14	6.00	1.6	3.10	53.00	20.28	8.58	Mitered inlet; monitor outlet for erosion.
33B	2.45	0.024	0.020	24	40	3.14	6.00	2.7	5.45	17.33	26.49	3.90	Projecting inlet/outlet
72A	4.59	0.024	0.070	18	80	1.77	4.50	2.3	3.50	15.05	11.71	7.47	Projecting inlet; monitor outlet for erosion.
72B	4.65	0.024	0.077	32	80	5.59	8.00	2.2	5.83	73.22	47.35	7.33	Projecting inlet; D50 < 0.5 ft - monitor outlet for erosion.
72C	4.68	0.024	0.080	18	102	1.77	4.50	3.1	4.70	16.09	14.04	7.89	Projecting inlet; D50 < 0.5 ft - monitor outlet for erosion.
74B	2.25	0.024	0.031	24	400	3.14	6.00	3.3	6.50	21.57	29.45	4.44	Projecting inlet; D50 < 0.5 ft - monitor outlet for erosion.
7E	5.09	0.024	0.068	24	40	3.14	6.00	3.1	6.10	31.95	28.36	7.44	Projecting inlet; rocks placed in Pond 5.
7Ea	2.01	0.024	0.010	24	80	3.14	6.00	3.3	6.50	12.25	29.45	2.88	Projecting inlet
7F	3.94	0.024	0.190	12	480	0.79	3.00	1.5	1.50	8.41	3.14	10.53	Projecting inlet; D50 = 1.5 ft.
80A	3.52	0.013	0.250	24	67	3.14	6.00	2.1	4.10	113.11	22.11	16.29	Projecting steel inlet/outlet; D50 = 1.5 ft.
80B	11.01	0.013	0.220	30	55	4.91	7.50	2.2	5.50	192.39	40.45	21.26	Projecting steel inlet/outlet; D50 = 1.5 ft.
8A	2.45	0.024	0.320	24	60	3.14	6.00	4.4	8.70	69.32	38.83	10.36	Mitered inlet; D50 < 0.5 ft - monitor outlet for erosion.
18A	1.90	0.024	0.016	12	54	0.79	3.00	2.0	2.00	2.40	4.28	3.50	Projecting inlet/Outlet Vel<5.0 fps
18B	2.10	0.024	0.042	18	20	1.77	4.50	3.5	5.25	11.70	16.70	5.00	Projecting inlet/Monitor Outlet (14)
18C	2.20	0.024	0.405 (5)	12	160	0.79	3.00	1.3	1.30	24.4 (7)	3.13	9.80	Projecting inlet/Outlet to DSO=0.5 ft
18D	0.91	0.024	0.065	15	20	1.23	3.75	1.0	1.25	8.90	4.32	4.80	Projecting inlet/Outlet Vel <5.0 fps
18E	0.79	0.024	0.070	12	20	0.79	3.00	1.7	1.70	5.10	3.83	4.70	Projecting inlet/Outlet Vel <5.0 fps

NOTE: All culverts made of corrugated metal pipe (CMP) unless otherwise indicated as steel.

[1] If pipe flow not adequate to convey design flow, then inlet control assumed. Average velocity based on design flow.
[2] Full flow conditions assumed.
[3] Manning's roughness, n, assumed 0.024 and 0.013 for corrugated metal pipe (CMP) and steel pipe respectively.

Flow velocities exiting the 54-inch half round CMP lining of Ditch No. 14 are relatively high. In order to reduce these velocities to acceptable velocities that would naturally occur in the downstream channel, energy dissipation is required. By constructing a small basin with zero slope at the exit from the 54-inch half round pipe, a hydraulic jump is forced to occur, thus dissipating excess energy. Channel slopes upstream and downstream of the small basin are super critical and the alternate depth for the hydraulic jump within the basin is greater than critical depth. Therefore, in order for the flow depth to reach normal depth in the downstream channel having super critical slope, the flow will pass through critical depth at the outlet to the basin which serves as control.

In order to determine the location of the hydraulic jump and therefore establish the required basin dimensions, longitudinal water surface profiles were computed from the control at the basin outlet and from normal depth upstream in the 54-inch half round pipe. Water surface profiles moving downstream from normal depth within the 54-inch half round pipe and moving upstream from the basin outlet are presented in Exhibit 742b, Ditch No. 14 Hydraulic Calculations. In order to locate the position of the hydraulic jump a trial and error procedure was followed in which the alternate depth for a given position on one of the profiles is calculated and then compared with the depth at the corresponding location of the opposite profile.

As shown in the calculations, the hydraulic jump will occur approximately ten feet downstream from the change in slope from 26 percent to 5 percent where alternate depths equal 0.71 feet and 2.32 feet respectively. Grouted riprap is required throughout the entire basin to protect against severe erosion created by the dissipation of energy. Design details including plan, profile, and cross-section are presented on Map 742a, Channel Transition and Energy Dissipator from Ditch No. 14 into Existing Natural Channel.

The previous design and construction of Sediment Pond 9 had modified local runoff flow paths and thereby reduced the total flow through Pond 5 and through Ditch 14. Design calculations for both Pond 5 and Ditch 14 have not been modified and are considered conservatively overdesigned since their design does not take into account the reduction in flow resulting from the construction of Pond 9.

All diversions have been constructed as part of the surface water conveyance system to either divert water into or around sedimentation basins.

742.120 thru 742.126. Measures and Methods

It is the belief of the applicant that sediment control measures utilized within the SCA-Star Point Permit area include the proper utilization of mining and reclamation methods and sediment control practices as required under this regulation. It is the desire, intent, and standard practice at SCA to 1) retain sediment within disturbed areas, 2) divert undisturbed area runoff away from disturbed areas, 3) reduce to the extent practical additional erosion, and 4) reduce flow volumes and rates by using

available alternate sediment reduction devices. Further discussion of sediment control measures utilized follows.

Alternative sediment controls are used in the SCA-Star Point Permit area to prevent excess sediment from leaving the site and include (but are not necessarily limited to) straw bale or silt fabric silt traps, terraces, vegetation, sediment traps, sheet flow and total containment. Map 742.100 contains details regarding these alternate sediment controls.

The control measures used are the best technology currently available for controlling sedimentation and their installation and use have become standard practice at Utah coal mines. They are used to prevent, to the extent possible, additional sediment leaving the permit area.

Thunderstorm events in the region are very unpredictable. Records show that storms are usually of short duration (having a median duration time of 38 minutes), and moderate to high intensity (the median rainfall amount being 0.135 inches). Since the slopes in the area are very steep, runoff begins early in the storm event and peaks rapidly. Thunderstorms are also very isolated in areal extent. Many occurrences have been noted wherein one small area of the property can receive a substantial rainfall while very little rain is noted across the canyon.

The sediment control measures regarding the Subsoil Area will include practices carried out within and adjacent to the disturbed area. Alternate sediment controls may include the retention of sediment within the disturbed area or the use of earthen berms, silt fences, straw bales, deep gouging and mulch, etc.

742.200 thru 742.214. Siltations Structures

Additional contributions of suspended solids and sediment to stream flow or runoff outside the permit area is prevented to the extent possible using the best technology currently available. All sediment control and runoff devices are designed by qualified individuals. Any new facilities required for the future will be constructed and certified prior to the commencement of coal mining and or reclamation operations. Other applicable requirements of this regulation are met in Section 742.220.

Contributions of suspended solids to stream flow or runoff outside the Subsoil Area will be prevented to the extent possible. Alternate sediment control measures will be implemented at the Subsoil Area. Sediment contributions from this area will be controlled by placing siltation structures at the Subsoil Area to collect runoff from the disturbed area. Various other alternate sediment controls will be installed downslope from the active portion of the Subsoil Area. Each alternate sediment control will be installed in accordance with the approved permit application. They will be periodically inspected, and accumulated sediment will be removed as needed to maintain functionality. Map 731.720a proposes locations for various sediment control features. The location of specific sediment control structures will be

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recommended gradation for both mild and steep channel conditions. In some cases, grout was used in riprapped sections to increase channel stability and/or reduce riprap size.

TABLE 742.312a
Recommended Riprap Gradation Limits

Design Ratio	Steep Slope	Mild Slope
D_{max}/D_{50}	1.25	2
D_{50}/D_{10-20}	2-3	2-3

From "Surface Mining Water Diversion Design Manual", 1982

Conveyor Lining

A second type of channel lining utilized consists of overlapped conveyor belt material. This lining was installed in excavated channels in short pieces so that the upstream belt material overlapped the downstream piece thereby preventing water from washing beneath the downstream liner. Each section of channel lining was secured with wire and rebar anchors. The locations of lined channel sections are shown on Maps 731.720a through 731.720b.

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Half Round CMP Pipe

In other locations such as around Pond 6, half round CMP pipe has been placed to provide the required erosion protection. CMP pipe has also been used in steep areas where channel flow is infeasible but yet the water must be conveyed down a hillside.

Ditch sections requiring erosion protection are shown on Maps 731.720a through 731.720b. Areas downstream from culvert installations requiring similar protection are shown on Maps 731.720a and 731.720b. Specific mention should be made with regard to the design of erosion protection at some of the locations shown on the maps. Current riprap design methodologies do not allow for the design of erosion protection on extremely steep slopes using such materials as rock riprap. In some locations, however, such as at Culverts 57A through 60A (as well as at other locations within the mine permit area), consideration must be given to the fact that local drainage must be transferred down a steep hillside or stream channel. At such locations, procedures are not available for designing riprap erosion protection and, therefore, calculations under such conditions have not been, nor can they be made.

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An effort has been made by SCA to reduce or eliminate the potential for serious erosion at these locations by placing culvert exits onto existing or man-made rock rubble piles, or onto rock ledges which act as energy dissipation devices and effectively reduce downstream erosion. SCA will continue to monitor culvert outfalls at these locations and thereby determine the efficiency of the rock rubble piles and what additional action, if any, should or can be taken.

Conditions related to lining of individual ditches are shown on Maps 731.720a through 731.720b. Conditions related to culvert outfall linings are shown on Maps 731.720a through 731.720b. Channel and Culvert riprap calculations are presented in Exhibit 742.312a, Riprap Calculations.

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Culvert Design

Following the determination of a given peak watershed discharge, design sizes for culverts were calculated as part of the runoff diversion and conveyance facilities. Flow capacity calculations were made for each pipe culvert located within the mine permit area to determine the total flow capacity of the pipe by comparing the required design flow to the capacity under both inlet and full pipe flow conditions. Pipe inlet capacities were determined using methods derived by the U. S. Bureau of Public Roads as presented by the U. S. Soil Conservation Service (1972) and illustrated in Figure 742.312f, Headwater Depth for Corrugated Metal Pipe Culverts with Inlet Control. Full pipe flow capacities were determined using Manning's equation assuming: 1) a full flowing pipe, 2) a headwater to diameter ratio of 1.0, and 3) tailwater depths no greater than the height of the pipe. For conditions encountered at CPMC, these assumptions are reasonable in light of the relatively steep slope conditions encountered throughout the permit area.

In the event that pipe flow capacity was marginal as predicted by Manning's equation (as was the case with Culvert 10C), the upstream headwater depth was taken into account to verify that the additional head would produce enough energy to overcome pipe frictional losses thereby forcing flow through the pipe. It was found that all culverts presently installed at SCA at the time of this submittal will pass the design flows calculated and discussed within this submittal.

Calculations comparing design flows against inlet and pipe flow capacities are also shown in Exhibit 742.221g. Culvert design data summary tables have been prepared as a quick reference for each of the culverts identified on the SCA-Star Point Permit area. Table 742a gives a summary of the watershed runoff characteristics for each ditch and Table 742d gives a summary of the physical characteristics and capacities of each culvert. Culvert locations are also shown on Map 731.720e. Also included on the above referenced table and map are the specifications for riprap at all culvert outlets requiring its installation, including size and placement.

During the field investigation and design phases of culvert inventories, it was determined that additional culvert inlet protection beyond that already provided through channel design was not needed for the following reasons. First, upstream channels not already lined had design velocities less than 5.0 feet per second, and therefore, riprap lining is not needed. Second, where channel velocity is greater than 5.0 feet per second, riprap lining already exists thereby providing adequate protection. Third, culvert inlet protection is generally only designed and used under highly critical flow conditions such as one would encounter in a large conveyance

channel with the potential for high flows and damage, or at extreme and abrupt channel bends, and fourth, no locations were found where erosion appeared to be occurring at any of the sites visited in preparation for the 1986 permit submittal. Since that time, no changes have been made to the runoff conveyance system with the exception of the addition of riprap within Ditch 16 which parallels County Road 290 in the lower mine yard area.

Culvert outlet erosion protection was determined according to the methods presented earlier in the discussion regarding riprap design. The Barfield, et. al., method was used in the design of appropriate riprap at culvert outlets having exit velocities in excess of 5.0 feet per second as long as the average riprap size was larger than 0.5 feet and the slope was not limiting. At those locations where design procedures predicted riprap sizes less than 0.5 feet, no erosion protection is proposed with the understanding that the outlets will be monitored and riprap installed should severe erosion occur.

Under these guidelines it is expected that some minor erosion will occur downstream from the culverts (which have a velocity in excess of 5.0 feet per second but which required a riprap size of less than 0.5 feet) as exiting waters adjust to the new downstream channel configuration. In normal design it is common to accept this small amount of erosion as part of the design as long as erosion does not produce headcutting thereby threatening the structure. Headcutting is not considered a problem with SCA conveyance facilities because downstream channel sections have been designed to be stable. Erosion, should it occur, will generally be limited to a very short section immediately downstream of the culvert.

It is felt that this solution is acceptable since all such culverts are located in existing diversion channels whereby the small amount of erosion that may occur is diverted into and contained within existing sedimentation facilities. In addition, the majority of culverts located throughout the permit area have been in place for sufficient time for anticipated erosion to have already occurred, therefore there would be no additional gain should riprap be installed at this time. As stated previously, riprap protection will be provided at these locations should serious erosion be noted.

The sediment controls discussed previously contain and treat the runoff to stop sediment from leaving the site. Routine maintenance of these structures ensures continual compliance. Alternate sediment control areas located within the mine permit area are discussed within Section 742.

742.320 thru 742.324. Diversion of Perennial and Intermittent Streams

All conveyance systems and diversions located within the permit area are temporary in nature. Details related to their design and location as required under these regulations are provided within Sections 742.300 through 742.314.

742.330 thru 742.333. Diversion of Miscellaneous Flows

No miscellaneous flow diversions are located within the permit area. All other diversions are discussed in Sections 742.300 through 742.314.

742.400 thru 742.423.5. Road Drainage

The road drainage control system utilized at the SCA-Star Point Permit area was discussed earlier in Section 742, and was presented on Maps 731.720a through 731.720b. The drainage system has been designed to safely convey surface runoff away from road surfaces through a network of ditches and culverts. Local roads have been located to the degree possible on stable surfaces away from local channels. The series of ditches and culverts associated with any road system has been designed to collect and treat all runoff waters thereby protecting downstream water quality, and reducing any flooding potential. The fact that no primary roads ford local stream channels helps to protect downstream water quality.

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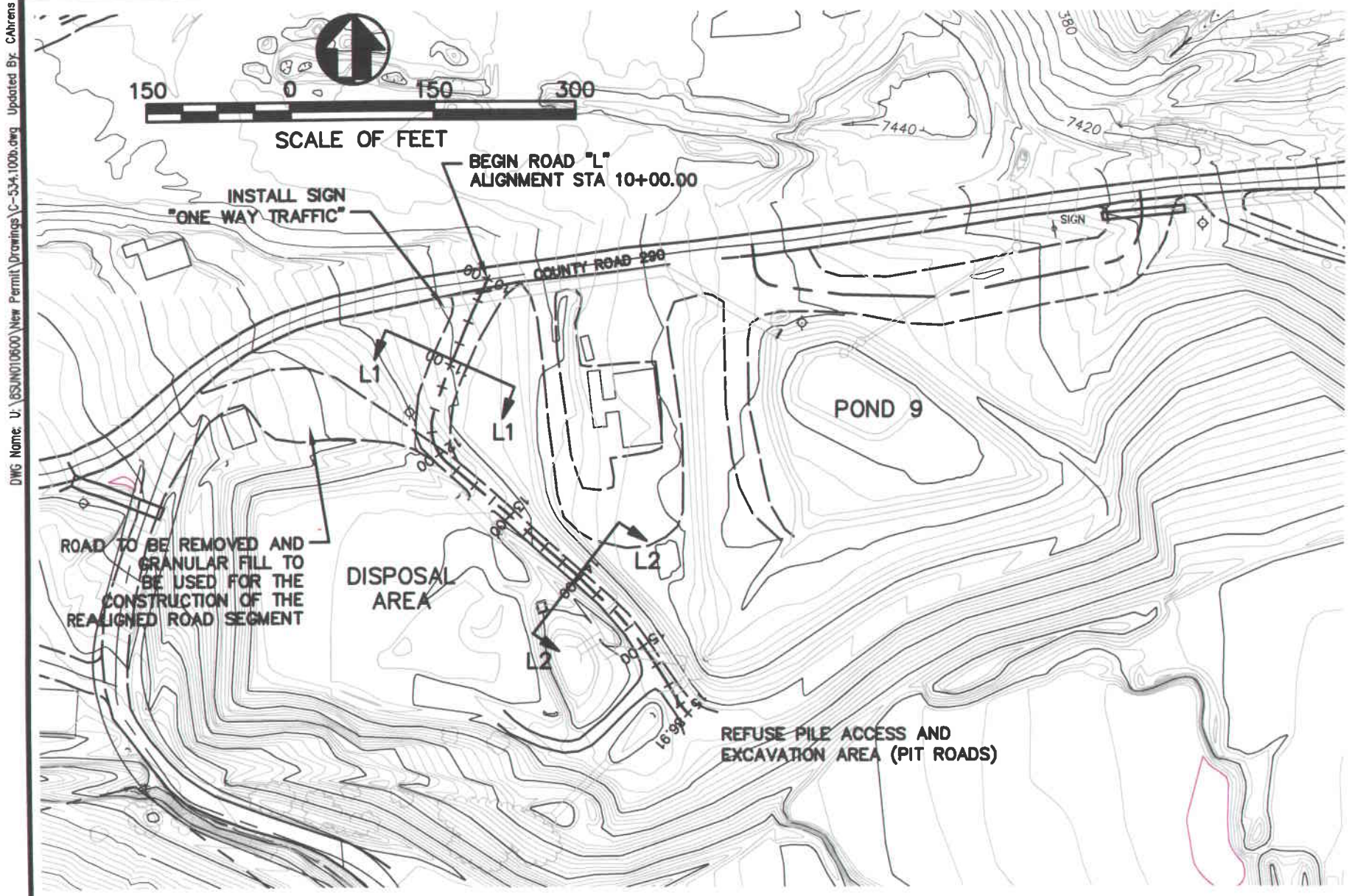
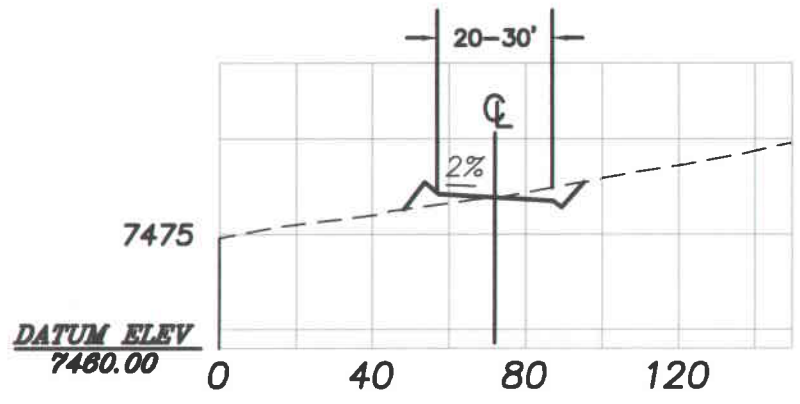
Ditches have been designed according to the methodology presented earlier in this section with at least a 10-year, 6-hour precipitation event being used as the design criteria. Culvert sizes have been selected to ensure design capacity and structural integrity. Should any ditch or culvert be damaged for any reason during the mining process, and flow capacity be reduced below design limits, the culvert will be immediately replaced. Storm overflow which could occur at a damaged structure prior to replacement or repair is intercepted by downstream sedimentation structures. The need for expensive headwalls and grating systems is not warranted at the SCA mine site since runoff from local ditches and culverts is intercepted by local sedimentation control structures.

Future modifications to roadway systems which impact natural stream channels will be reviewed with DOGM prior to construction.

743 thru 743.300. Temporary and Permanent Impoundments

No other temporary or permanent impoundments exist within the permit area other than those identified in Sections 731, 733, and 742. None of the facilities discussed within these sections are subject to MSHA, 30 CFR 77.216(a), all have principal and emergency spillways, adequate freeboard, are inspected regularly, and have been designed to handle at least the 25-year, 24-hour precipitation event.





CROSS SECTION L1–L1

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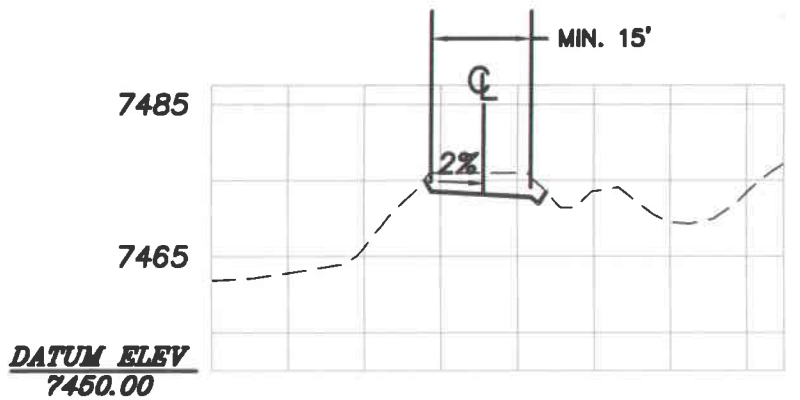

CROSS SECTION L2–L2

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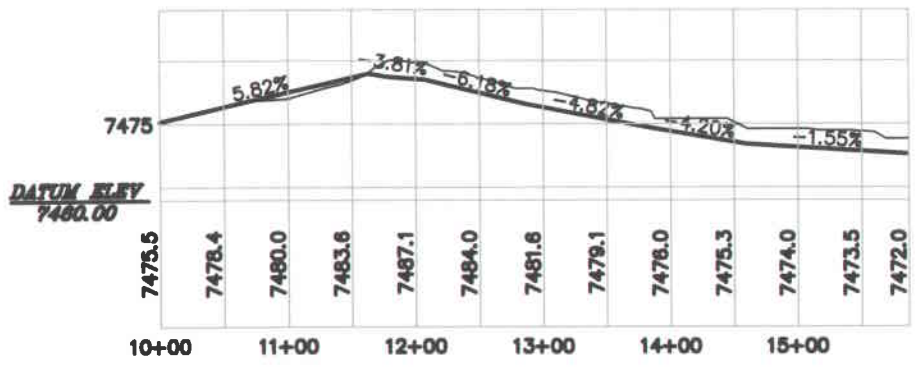
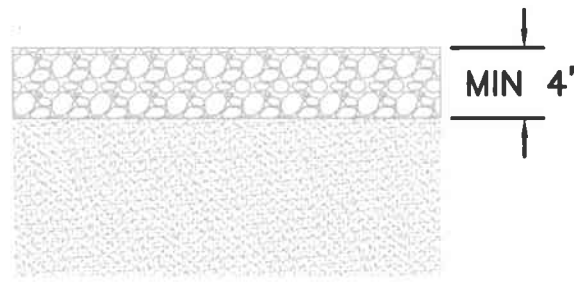


PROFILE ROAD L

SCALE: HORIZ: 1" = 150' VERT: 1" = 75'



ROAD STRUCTURAL SECTION

PROFESSIONAL ENGINEER
LICENSED
No. 187727
S. SCOTT CARLSON
STATE OF UTAH

SCA / STAR POINT WASTE FUEL
PRIMARY ROAD L
PLAN, PROFILE AND CROSS-SECTIONS

TWIN PEAKS
Engineering & Land Surveying
2264 NORTH 1450 EAST LEHI, UTAH 84043
(801) 450-3511, (801) 439-0700 FAX

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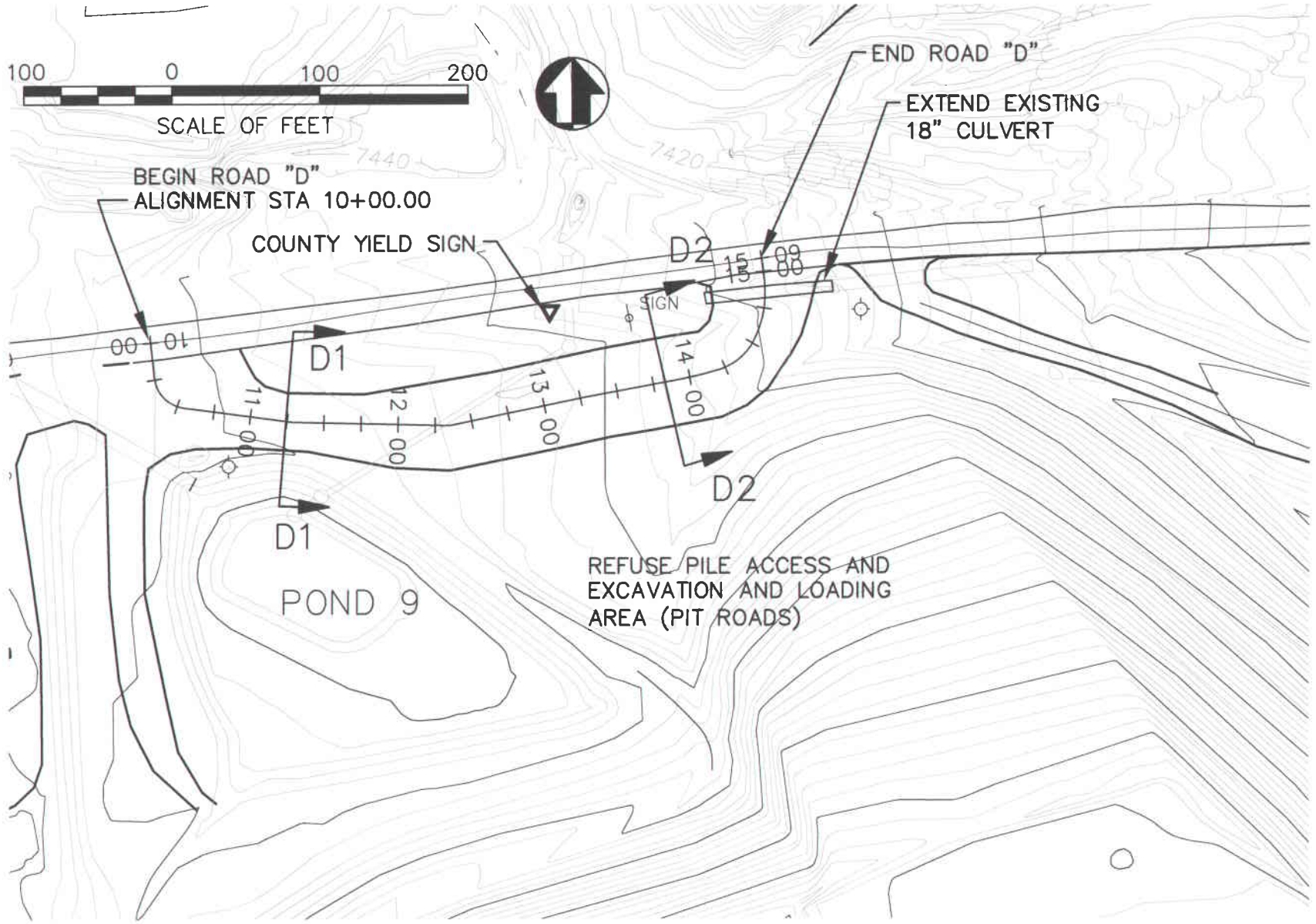
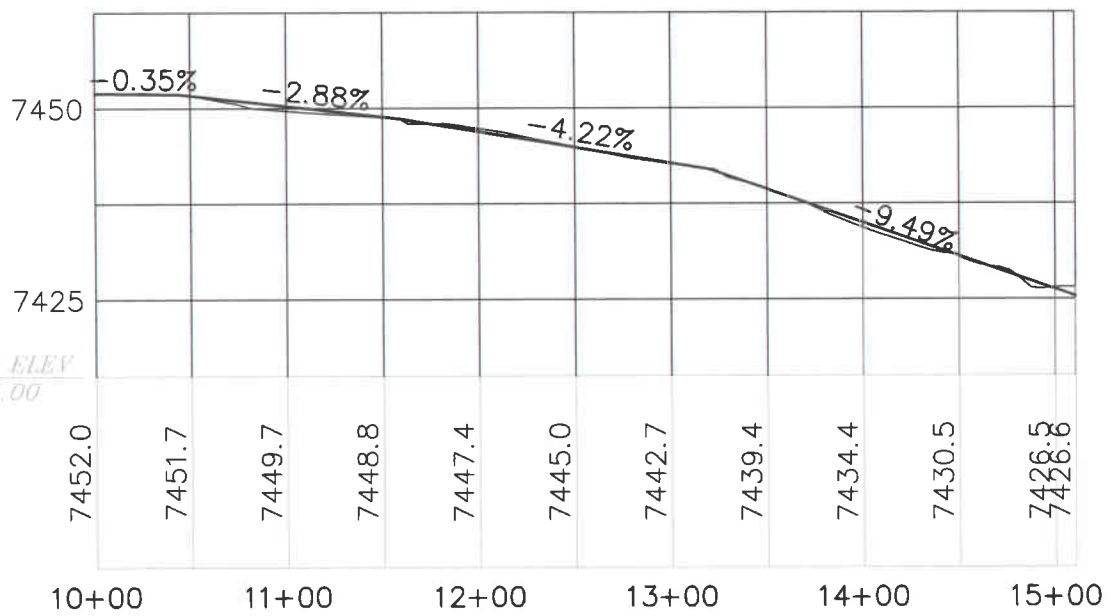
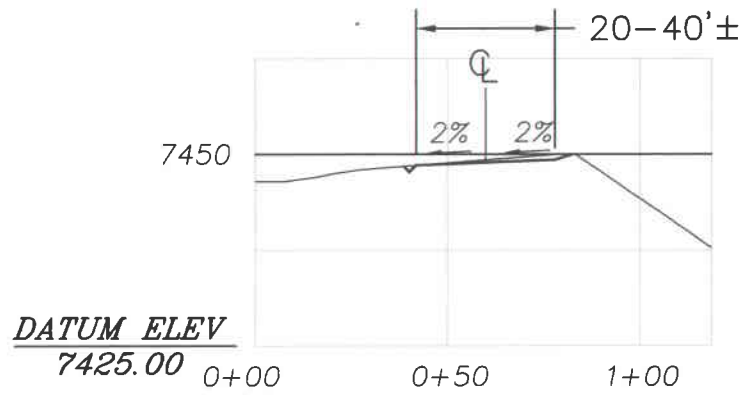




PROFILE ROAD D

SCALE: HORIZ: 1" = 100' VERT: 1" = 25'



TYPICAL CROSS SECTION D1-D1

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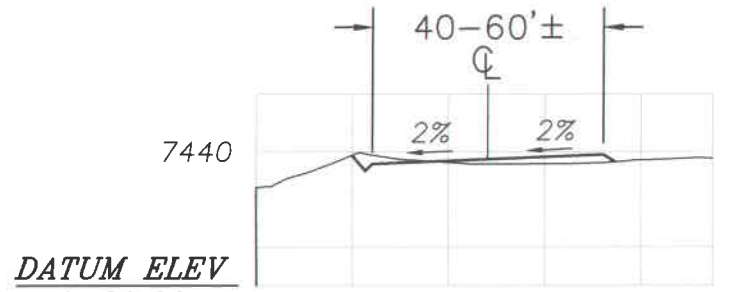

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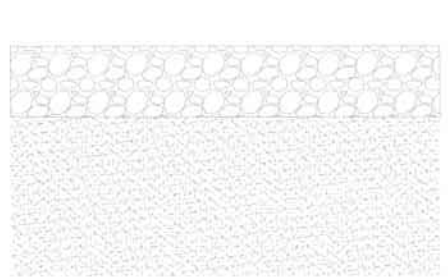

ROAD STRUCTURAL SECTION

PROFESSIONAL ENGINEER
LICENSED
No. 187727
S. SCOTT CARLSON
STATE OF UTAH

TWIN PEAKS
Engineering & Land Surveying
2264 NORTH 1450 EAST LEHI, UTAH 84043
(801) 450-3511, (801) 439-0700 FAX

SCA / STAR POINT WASTE FUEL
PRIMARY ROAD D
PLAN, PROFILE AND CROSS-SECTIONS

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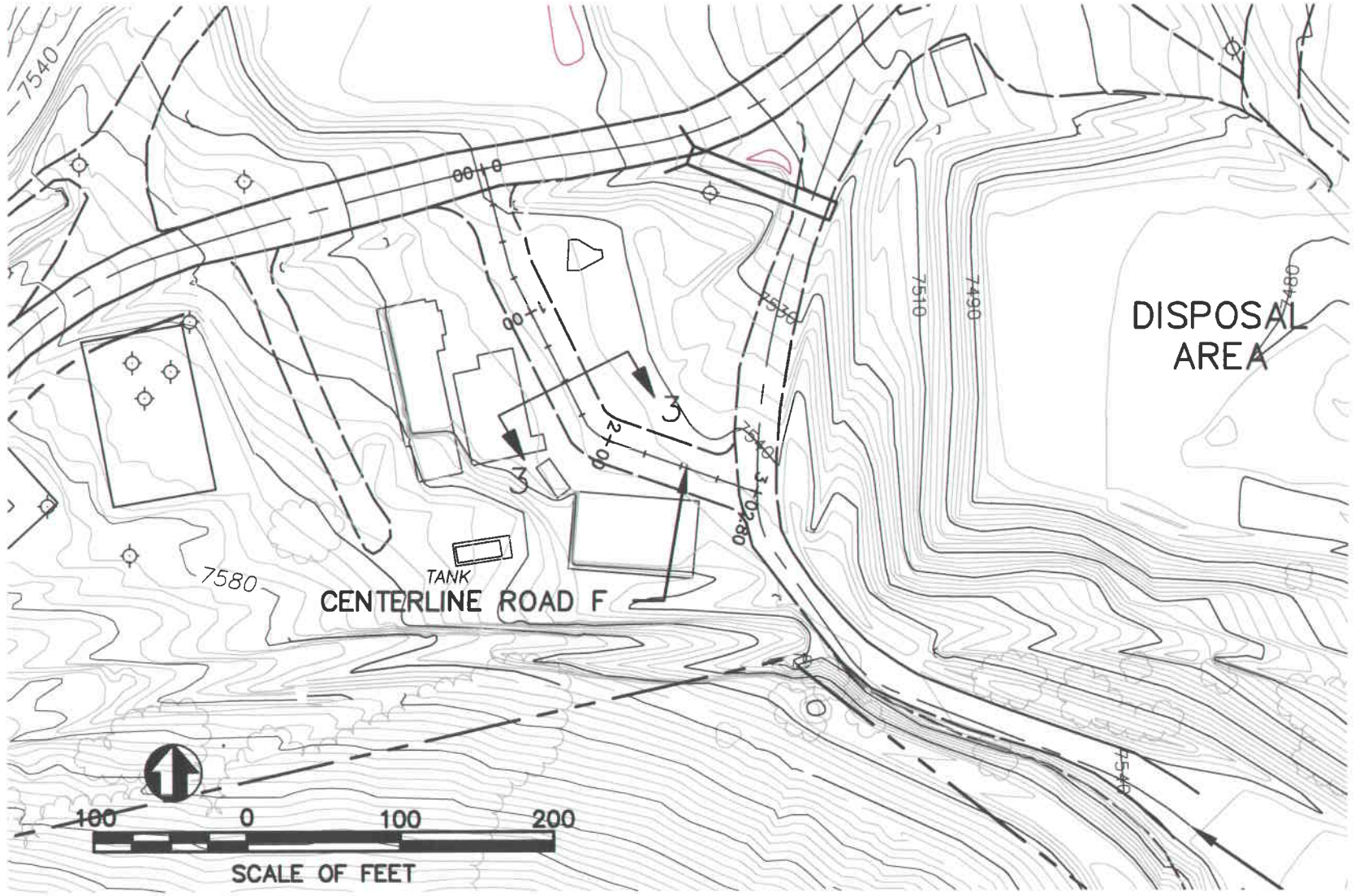
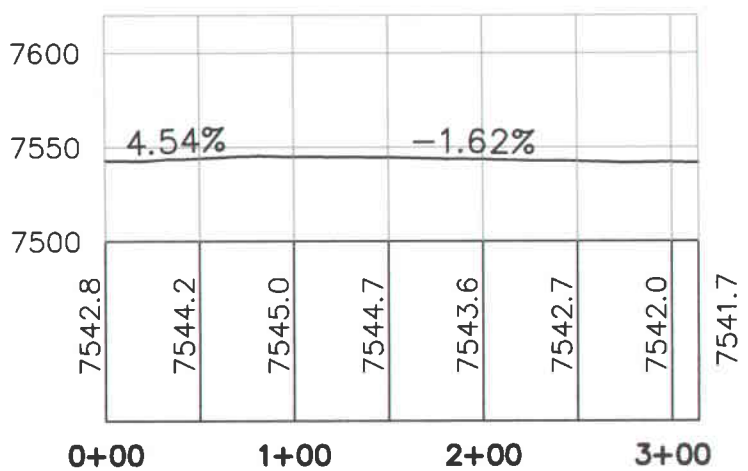


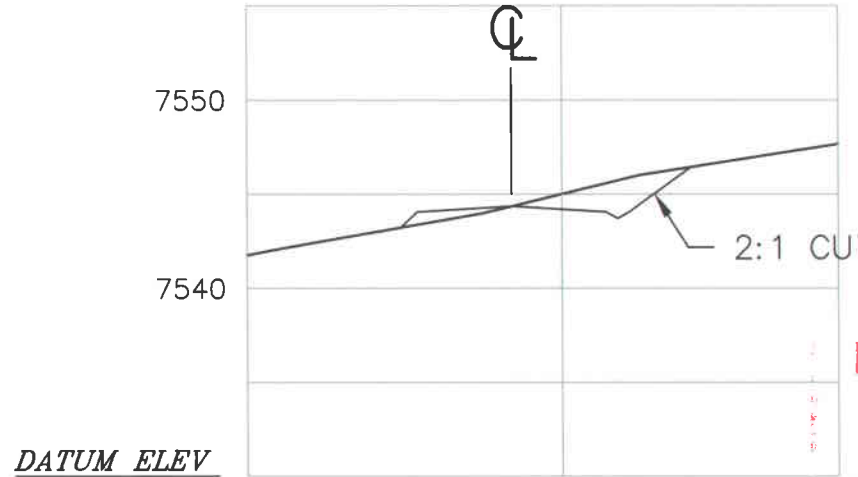
ROAD F PLAN

SCALE: HORIZ: 1" = 100'



PROFILE ROAD F

SCALE: HORIZ: 1" = 100' VERT: 1" = 50'



TYPICAL CROSS SECTION 3-3

SECTION ROAD F

SCALE: HORIZ: 1" = 30' VERT: 1" = 10'

NOTE:
MAINTAIN EXISTING SURFACE OF ROAD F CONSISTING OF INTERMITTANT PAVEMENT AND GRAVEL SURFACES.

LICENSED PROFESSIONAL ENGINEER
No. 187727
S. SCOTT CARLSON
STATE OF UTAH

TWIN PEAKS
Engineering & Land Surveying
2264 NORTH 1450 EAST LEHI, UTAH 84043
(801) 450-3511, (801) 439-0700 FAX

SCA / STAR POINT WASTE FUEL
PRIMARY ROAD F
PLAN AND PROFILE

534.100h