CHAPTER 5

ENGINEERING
(R645-301-500)

TABLE OF CONTENTS
CRANDALL CANYON MINE, MINE AND RECLAMATION PLAN
CHAPTER 5
ENGINEERING

TABLE OF CONTENTS (Continued)
CHAPTER 5

TABLE OF CONTENTS (Continued)
CHAPTER 5

CHAPTER 5

FIGURES

(Note: Unless otherwise noted, figures follow Chapter 5 text)

Revised 4/05/2003

CHAPTER 5

LIST OF PLATES

PLATE NUMBER	DESCRIPTION
5-1	Old Works
5-2	Mining Projections
5-2A	State Lease Mining Projections

Plates 5-2B and 5-2C have been removed.

5-3	Surface Facility Map
5-4	Proposed In-Mine Sump
5-5	Subsidence Control Point Locations
5-6	Truck Loadout
5-7	Rock Dust Silo
5-8	Electrical Substation Installation
5-10	Road Profile and Cross Section

Plate 5-11 has been removed

5-12	Aerial Photography
5-13	Aerial Photography
5-16	Reclamation (Phase I)
5-17	Reclamation (Phase II)

CHAPTER 5

LIST OF PLATES (continued)

PLATE NUMBER	DESCRIPTION
5-17A	Reclamation Cross Sections
5-18	Underground Bath House (As Built)
5-19	Hilfiker Welded Wire Wall Details (3 Sheets)
5-20	Original Surface Contour Map
5-17B	Reclamation Cross Sections
5-18	Underground Bathhouse, As Built
5-19	Typical Road Sections, 3 sheets
5-20	Original Surface Contour Map

Note: Bold number plates and appendices are included with this submittal.

CHAPTER 5

LIST OF APPENDICES

APPENDIX NUMBER	DESCRIPTION
5-1	Geomechanics Laboratory Report
5-2	Coal Pillar Sizing Report
5-3	Coal Pillar Safety Factor Calculations
5-4	Coal Pillar Safety Factor Calculations
5-5	BLM Report
5-6	Terratek Report
5-7	Method Used to Determine Maximum Surface Limit of Possible Subsidence
5-8	Subsidence Monitoring Plan
5-9	Deleted
5-10	Spill Prevention and Countermeasure Control Plan (SPCC) January 21, 1992
5-11	Culinary Water Supply
5-12	Sewage Plans
5-13	Coal Silo Calculations
5-14	NPDES Permit
5-15	Contract Document & Specifications for Haul Road Improvement Project

LIST OF APPENDICES (continued)

APPENDIX NUMBER	DESCRIPTION
5-16	Storage Pad Stability Analysis
5-17	Road Expansion (within permit area) Safety Factor, Drawings
5-18	Fire Prevention Plan
5-19	Slope Stability Investigation Portal Pad
5-20	Bond Estimate (DOGM determination)
5-21	Reclamation Fill Stability Analysis At The Crandall Canyon Mine Emery County, Utah
5-22	Crandall Canyon Mine Site Reclamation Plan
5-23	Air Quality Permit Amendment, South Portals
5-24	Blasting Plan
5-24	R2P2 (Resource Recovery and Protection Plan) Approval Letter (South Crandall Federal Lease UTU-78953)
5-24A	R2P2 (Resource Recovery and Protection Plan) Approval Letter (120 Acre Modification, Federal Lease UTU-68082)
5-25	Subsidence Survey Letters of Notification

CHAPTER 5

ENGINEERING

5.10 Introduction

This chapter will present the Operation Plan, Reclamation Plan, Design criteria, and Performance standards which will affect the mining operations of the Crandall Canyon Mine. The facilities and structures have been and/or will be designed in such a way to minimize the potential impacts of mining operations at the mine site.

5.11 General Requirements

The methods, calculations, maps, plans, and cross-sections pertinent to the operations of the Crandall Canyon Mine Facilities and subsequent reclamation operations are presented in the following sections. These designs are required to comply with the design within the R645-301-500 regulations.

5.12 Certification

All maps, cross-sections, designs, and plans, as required will be prepared by or under the direction of and certified by a professional engineer or land surveyor.

5.13 Compliance with MSHA Regulations and MSHA Approvals

As required by MSHA, the surface of the mine site is inspected on a quarterly basis, as mandated by law, and on spot inspections as deemed necessary by the governing agency. All mine openings are inspected on a quarterly basis and/or more often if deemed necessary by MSHA. GENWAL will comply with the requirements of both DOGM and MSHA regarding these facilities.

5.14 Inspections

All engineering inspections, except those described under R645-301-514.330, will be conducted by a registered professional engineer or other qualified professional specialist under the direction of the professional engineer.

The existing sedimentation pond will be inspected by a professional engineer or a qualified person under the supervision of a professional engineer on an annual basis. The inspection report, see Figure 5-1, will be certified by the professional engineer and be provided to the Division as part of the annual report.

Quarterly inspections will be performed by a qualified person for appearance of structural weakness and other hazardous conditions, as specified in R645-301-330.

CERTIFICATION REPORT

On _____,199_, an inspection of GENWAL Resources sedimentation pond number 1 revealed the following:

A. The pond has been constructed and maintained in accordance with the approved plan.

B. The pond's embankment appeared sound with no signs of instability or hazardous conditions.

C. The water evaluation was _____ feet. The water depth was _____ feet.

D. The existing storage capacity is _____ acre-feet which is greater than/less than 3.988 acre-feet required by the Mining and Reclamation plan.

E. The pond is inspected quarterly for signs of structural weakness or problems.

F. Comments and Remarks _____

_____

_____

_____

_____

_____

I have performed the above inspection on this pond to comply with R645-301-514 and do hereby certify the inspection to be a true and accurate representation of the pond at this time.

_____
Signature

_____
Date

Figure 5-1. Certification Report Form.

SEDIMENTATION POND INSPECTION REPORT *

DATE	TIME	DECANT LEVEL	DISCHARGE	CONTROL DEVICE	DIKE	INSPECTED BY

* Note any appearances of instability, structural weakness, and other hazardous conditions; and change in piezometer readings.

Figure 5-2. Sedimentation Pond Inspection Report Form.

The Sedimentation Pond Inspection Report Form is used to record information from each inspection and is located at the mine site.

5.15 Reporting and Emergency Procedures

5.15.10 Reporting a Slope Failure

At any time a slope failure occurs which may have a potential adverse effect on public, property, health, safety, or the environment, GENWAL will notify the Division promptly of the problem and of any remedial measures planned to correct the problem. If any examination or inspection of the sedimentation pond discloses that a potential hazard exists, the Division will be notified by the fastest available means of the hazards and of the remedial measures to correct such hazards. GENWAL will comply with any remedial measures requested by the Division and agreed upon by the operator.

5.15.20 Impoundment Hazards

If any examination or inspection discloses that a potential hazard exists, GENWAL will promptly inform the Division of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division will be notified immediately.

5.15.30 Temporary Cessation

In the event of a temporary cessation of mining operations, as defined by the Division, GENWAL will notify the Division as soon as possible. GENWAL will effectively support and maintain all surface access openings to the underground operations, and secure surface facilities in areas in which there would be no current operations but operations would resume under an approved permit.

Before temporary cessation of coal mining and reclamation operations for a period of 30 days or more, or as soon as it is known that a temporary cessation will extend beyond 30 days, GENWAL will submit to the Division a notice of intention to cease or abandon operations. This notice will be as required by R645-301-515.321.

5.20 Operation Plan

This section presents the operations plan for the Crandall Canyon Mine.

5.21 General

This section presents a description of the plan for operation of the permit area, including descriptions of previously mined and presently mined areas, surface and subsurface facilities, land owner and right-of-way maps, permit area maps,and other feature maps which apply.

5.21.11 Previously Mined and Presently Mined Areas

Plates 5-1 and 5-2 show the location and extent of past and present underground mining operations.

5.21.12 Existing Surface and Subsurface Facilities and Features

The location of surface and subsurface man-made features within, passing through, or passing over the proposed permit area are combined on Plates 5-3, 7-5 and 7-5A. Other detailed plans are as shown on Plate 5-4 (In Mine Sump), Plate 2-2 (Top Soil Storage Piles), Plate 5-6 (Truck Loadout Facility), Plate 5-7 (Rock Dust Silo), Plate 5-8 (Electrical Substation), and Plates 7-4A and 7-6A (Sedimentation Pond Details and Cross-Sections).

The design and details for the USFS road within the permit area are shown on Plate 5-19, sheet 5 of 9 (Concrete Turnaround), sheet 6 of 9 (Layout of the USFS road), sheet 7 of 9 (Gabion Wall), sheet 8 of 9 (Rock Wall Details), and sheet 9 (Upper Parking Area).

5.21.13 Landowners and Right-of-Entry and Public Interest Maps

The landowners of record both surface and subsurface, included in or contiguous to the permit area are shown on Plate 1-1. The permit area on which GENWAL has the legal right to enter is shown on Plate 5-2.

Appendix 1-1, 1-2, 1-3, 1-4, 1-5 and 1-13 shows the legal right of the applicant to enter and conduct coal mining and reclamation operations, and the measures to be used to ensure that the interests of the public and landowners affected are protected under R645-103-234.

GENWAL has included the entire T 16 S, R 7 E, SW1/4 of section 5 in the permit area. GENWAL owns in fee (surface and coal) the entire SW1/4 of section 5, which was previously known as the Dellenbach property. GENWAL acquired the property from ARCO. Previously, only a small portion of the SW1/4 of section 5 had been included in the permit area. Expansion of the surface facility area requires the inclusion of this fee section within the permit area boundary.

GENWAL is requesting an Incidental Boundary Change in order to mine a long, narrow block of coal adjacent to projected longwall panels in Section 2, T. 16 S., R. 6 E. This block contains about 40,000 tons of federal coal that would not otherwise be mined. An Incidental Boundary Change would allow for maximum recovery of the coal reserves by allowing the longwall setup entires and panels to be moved westward but, in no case, would the longwall panels extend into the 22 degree angle projected downward from the surface expression of the Joe's Valley Fault. The amending the permit boundary would include approximately 50 acres in T 16 S, R 6 E as the Incidental Boundary Change area. Refer to Plates 1-1 and 5-2 for GENWAL's existing lease area and the Incidental Boundary Change Area. This addition would allow GENWAL to mine additional coal reserves located on the eastern edge of sections 3 and 10 from their proposed underground workings in section 2 thus optimizing the coal reserves in this area. This coal would not be mineable from the west due to the Joes's Valley fault, nor from the north or south because of limited access.

GENWAL will obtain a coal right-of-way (application has been submitted) from the BLM in order to extend the longwall panels up to the western boundary of section 2. By extending the longwall panels to the western edge of section 2, a total of approximately 300,000 additional tons could be mined in this area of the mine. The Incidental Boundary Change area would consist of first mining only. The right-of-way would accommodate the setup rooms and barrier pillars for the longwall panels allowing the panels to be extended to the western boundary of section 2. The legal description for the area included in the Incidental Boundary Change is as follows:

T. 16 S., R. 6 E.	Section 3	E1/2 E1/2 SE1/4 NE1/4	10 acres
		E1/2 E1/2 NE1/4 SE1/4	10 acres
		E1/2 SE1/4 SE1/4	20 acres
	Section 10	NE1/4 NE1/4 NE1/4	10 acres
		TOTAL	50 acres

Refer to Plate 5-2 for mine projections in the IBC area.

GENWAL acquired federal lease UTU-78953 (South Crandall tract) on June 2003 (refer to Appendix 5-24 for right of entry information.) Lease UTU-78953 is described as follows:

T. 16 S., R. 7 E.	Section 4	W1/2 SW1/4,	80.00 acres
		S1/2 SW1/4 NW1/4	20.00 acres
	Section 5	SE1/4	160.00 acres
		S1/2 SE1/4 NE1/4	20.00 acres
	Section 8	E1/2	320.00 acres
		NE1/4 NW1/4	40.00 acres
		S1/2 NW1/4	80.00 acres
	Section 9	NW1/4	160.00 acres
		TOTAL	880.00 acres

GENWAL Resources acquired the SITLA/PacifiCorp sublease in February 2004 (Refer to Appendix 1-14 for right-of-entry information.) This sublease is described as follows:

T. 16 S., R. 7 E.	Section 8	NW¼NW¼	40.00 acres

GENWAL Resources acquired the Nielson Fee Lease in April 2004 (Refer to Appendix 1-15 for right-of-entry information.) This sublease is described as follows:

T. 16 S., R. 7 E.	Section 8	SW¼	160.00 acres

It should be noted that throughout this Mining and Reclamation Plan the combined area (1080 acres) of Federal Lease UTU-78953, the SITLA/PacifiCorp sublease and the Nielson Fee Lease is collectively referred to as the South Crandall lease area, the South Crandall tract, the South Crandall mining area and other similar terms.

GENWAL Resources acquired the modification of Federal Lease U-68082 in March, 2005. (Refer to Appendix 1-15 for right of entry information.) This modification is described as follows:

T.15S., R. 7 E.	Section 32	W½NW¼	80.00 acres
		NW¼SW¼	40.00 acres
		Total	120.00 acres

The Forest Service and GENWAL have agreed to than arrangement whereby a certain portion of the trailhead parking lot can be utilized for GENWALl employee parking under the terms of the existing special use permit. To facilitate the flow of public traffic in and out of the trailhead, GENWAL will construct a barricaded exit from the trailhead out through the existing material storage area. This exit will be kept clear of materials, supplies, vehicles and all other potential obstructions so that the public will have unimpeded egress from the trailhead parking area at all times. Employee parking will be restricted to those designated areas as shown on the drawing in Appendix 5-26, so that a 30' wide area along the perimeter of the parking lot is maintained for public parking and run-around. Within this perimeter parking area no employee parking will be allowed. Signs will be installed to delineate the appropriate designated parking areas. Under the terms of the existing Forest Service special use permit GENWAL will continue to utilize the perimeter area of parking lot for snow storage during the winter months when the public no longer uses the trailhead.

To provide for better utilization of this area the trailhead will be expanded slightly, by less than 0.01 acres, by removing an irregular part of the bank at the upper end of the lot. (Refer to Appendix 5-26). Within this area of excavation topsoil will be salvaged and stockpiled in accordance with the approved reclamation plan. A minimum of 24" of topsoil/subsoil will be salvaged and stored at topsoil pile #4 located at the mouth of Crandall Canyon. A minimum of 32 cubic yards of topsoil material will be salvaged from this bank. Any additional material below the top 24" which, based on visual observation, appears to be suitable growth medium will also be salvaged. Once this additional topsoil material has been placed on the existing storage pile it will be re-vegetated as

required by the Forest Service special use permit. The newly created slope-bank at the trailhead will be re-seeded with a final -reclamation seed mix, exclusive of any clover and/or alfalfa.

GENWAL Resources acquired the SITLA/PacifiCorp sublease in February 2004 (Refer to Appendix 1-14 for right-of-entry information.) This sublease is described as follows:

T. 16 S., R. 7 E.	Section 8	NW¼NW¼	40.00 acres

GENWAL Resources acquired the Nielson Fee Lease in April 2004 (Refer to Appendix 1-15 for right-of-entry information.) This sublease is described as follows:

T. 16 S., R. 7 E.	Section 8	SW¼	160.00 acres

It should be noted that throughout this Mining and Reclamation Plan the combined area (1080 acres) of Federal Lease UTU-78953, the SITLA/PacifiCorp sublease and the Nielson Fee Lease is collectively referred to as the South Crandall lease area, the South Crandall tract, the South Crandall mining area and other similar terms.

GENWAL Resources acquired the modification of Federal Lease U-68082 in February, 2005. (Refer to Appendix 1-15 for right of entry information.) This modification is described as follows:

T.15S., R. 7 E.	Section 32	W½NW¼		80.00 acres
		NW¼SW¼		40.00 acres
			Total	120.00 acres

5.21.14 Mine Maps and Permit Area Maps

Plate 1-1 shows leases of the existing permit area (including the South Crandall lease area and the U-68082 lease mod area) and defines the Incidental Boundary Change area. Plate 5-2 shows the boundaries of all areas affected by mining operations, including the proposed underground workings within the IBC area. Plate 5-3 shows the disturbed surface area within the permit area including the culvert expansion. The location and extent of potential subsidence is shown on Plate 6-2.

5.21.15 Land Surface Configuration Maps

Topographic maps used by GENWAL to depict surface contours within the permit area are represented on Plate 5-3.

5.21.16 Maps and Cross-Sections of the Features and Proposed Features

Maps produced by GENWAL show the facilities, disturbed area, disturbed area boundary, (Plate 5-3), explosive storage (there is no explosive storage on the surface), and point source discharges (Plate 7-5). These maps are located within this application.

5.21.17 Transportation Facilities Maps

This application describes each road and conveyor system to be constructed and used by the applicant as required by R645-301-527. Maps supporting this section include Plates 5-3, 5-6, 5-10, 5-19, 7-5, 7-5A, 7-5B and 7-5C.

5.21.18 Support Facilities

Drawings showing support facilities are located on Plates 5-3, 5-6, 5-7, 5-8, 5-18, 7-5, 7-5A, 7-5B, and 7-5C.

5.21.20 Signs and Markers

Signs and Markers are posted, maintained, and removed by the operator; will be of uniform design that can be easily seen and read, be made of durable material, and conform to local laws and regulations, and be maintained during all activities to which they pertain. Identification signs will be placed, maintained, and marked in accordance with R645-301-243.

5.21.24 Mine and Permit Identification Signs

Mine and permit identification signs will be displayed in accordance with R645-301-521.240 through R645-301-521.244.

5.21.25 Perimeter Markers

The perimeter of all areas affected by surface operations or facilities are or will be clearly marked.

5.21.26 Buffer Zone Markers

Signs which have been or will be erected for buffer Zones as required by R645-301-731.600 will be clearly marked.

5.21.27 Topsoil Markers

Markers have been and will be erected to mark where topsoil or other vegetation-supporting material is stockpiled as required under R645-301-234.

5.22 Coal Recovery

The Bureau of Land Management (BLM) and the Utah State Division of Natural Resources govern the conservation and royalty payments of the coal located within GENWAL's proposed permit boundary. Mining plans must be approved by the BLM before mining can occur within the new area. A Resource Recovery Protection Plan (R2P2) is currently on file with the BLM and all federal coal will be mined in accordance with the R2P2 to ensure the diligent development and extraction of all minable coal. (See Appendix 5-24 and Appendix 5-24A)

The lower Blackhawk Formation of the Wasatch Plateau is known to contain two minable seams in this general area. These two seams are locally referred to as the Hiawatha and Blind Canyon (lower and upper coal respectively) seams. Drilling which began in March of 1985, and has since concluded, revealed that the upper seam is not of minable thickness in previous Lease Area. In the South Crandall lease area both seams are minable. In the U-68082 lease mod area only the Hiawatha seam is minable.

In the State lease (M-21568) GENWAL has committed to drilling 150 foot "up-holes" every half-mile in the mains prior to second mining. Installation of the 150 foot up-holes will allow for location and evaluation of the overlying seams for coal production. Mine development plans for the upper seam will be developed and submitted for approval if the horizontal extent and mining conditions make mining the upper seam economically feasible. The BLM has determined the upper seam is not minable and during 1985, approval was given by both the BLM and the Division to commence pillaring of the lower seam.

GENWAL will mine from rock to rock in areas where coal is less than 8' thick and geologic conditions allow. However, in areas where the top is poorly consolidated (i.e. shale partings are present with laminae of carboniferous materials with slickensides) and the roof is not self-supporting, coal top may be left. In addition, on development only, in areas where the coal is more

than 8' thick, coal top or bottom may be left. Within the physical limitations of the mining equipment retreat coal will be mined rock-to-rock in order to maximize resource recovery.

GENWAL has found that in areas of the mine, cutting coal higher than 8' on development results in excess rib sloughage, exposing miners to unnecessary dangers. GENWAL has found that width to height (w/h) ratios lower than 5.6 results in large slabs (2' - 3' thick and 8' high) separating from pillars and sliding or rotating into the entry. These slabs cause an immediate safety hazard to personnel working or traveling in the area and may be classified as accumulations by MSHA. Cleaning up the slabs results in more slabs sloughing which reduces the size of the pillar and results in entries that are wider than legally allowed. For these reasons, GENWAL may not cut higher than 8' on development. Although maximum recovery is an important design criteria, other considerations must be looked at in the final analysis in the extraction of coal. These factors consider the insurance of protection of personnel and the environment. Coal reserves will not be recovered in the following areas:

1. Areas where the coal thickness is less than 5'. Mining below this height is not feasible under current economic conditions.

2. Solid coal barriers will be left to protect main entries from mined out panels and to guarantee stability of the main entries for the life of the mine.

3. Solid coal barriers will be left between particular panels for roof and floor protection.

4. When extreme hazardous conditions exist, and personnel safety is compromised, coal extraction could then be terminated in that area of concern.

5. Coal will only partially be recovered in areas under existing perennial streams within the specified angle of draw with the consent of the Forest Service and approval by the Division. Expected recovery at GENWAL is predicted to be 80% in panels and 60% overall.

6. In areas of development in coal height of 8' or greater, top and/or bottom coal may be left.

7. In panels where the coal height exceeds the effective mining height of the mining equipment, including longwall equipment, either top or bottom coal will be left.

Mining in the South Crandall lease area will be done in accordance with the approved Resource Recover and Protection Plan (R2P2) (See Appendix 5-24). This plan was recommended for approval by the BLM on Nov. 12, 2004. This plan states that full extraction mining (i.e. longwall mining) is not authorized in panels BC-4 and HIA-5 in areas with less than 600' overburden unless it can be determined that these areas can be mined without adverse impacts to the Little Bear

Canyon municipal watershed. Final approval of full extraction mining in these panes will be addressed as a modification to the approved R2P2. Multiple seam mining beyond spring site LB-7 in Little Bear Canyon is contingent upon a monitoring plan approved by the Division in concurrence with the Forest Service at least two years prior to mining in that area.

Maps 5-2 (BC) and 5-2 (H) and Appendix 7-63 show the areas with less than 600' cover affected by this R2P2 condition. These maps show which areas are planned for longwall mining and which areas are planned to be mined with continuous miner units.

According to stipulation #17 of Federal Lease UTU-78953 (see App. 1-13) the Castle Valley Special Service District water treatment plant (constructed as water replacement for Little Bear Spring) must be operational prior to mining in the following areas:

- Mill Fork Graben - Area within 1,000 feet of the southeast corner of the lease in Section 8 (corner of Sections 8, 9, 17, and 16 in T, 16 S., R. 7 E., SLM).

- North of Little Bear Spring (possible water-bearing fracture system) - Area within 1,000 feet of the southern boundary of the lease in Section 9, T. 16 S., R. 7 E., SLM).

It should be noted that under the currently approved R2P2 there is no mining being proposed in either of these areas. The water treatment plant is scheduled for completion in January 2005.

5.23 Mining Methods

GENWAL will use both Room and Pillar and longwall mining methods for coal production. Projected mine development is depicted on Plate 5-2. In general, room and pillar development mining will be accomplished using continuous mining methods. Retreat mining will use longwall mining and room and pillar methods. The mine plan has been developed to maximize coal recovery in an economical manner.

Second (recovery) mining by continuous miner will occur in those areas which are not longwall mined (Plate 5-2) and will be done in accordance with the approved MSHA roof control plan. Specifically, in areas where long-wall panels cannot be installed due to the presence of stream buffer protection zones or in perimeter areas with irregular boundaries, room and pillar methods will be utilized to maximize coal recovery and still maintain regard for environmental and safety concerns listed in Section 5.22 above. All pillars in the mine, with the exception of barrier pillars or other pillars needed to protect the outcrop, will be fully extracted. However, safety or economic reasons may dictate some pillars or partial pillars remain in place. Pillars used to protect mains, submains, and fire breaks will be left until final retreat or when they serve no useful purpose.

Mining in the Incidental Boundary Change area will consist primarily of longwall gateroads, setup rooms and barrier pillars. (No room and pillar mining will be conducted in the Incidental Boundary Change Area or adjacent areas.) First mining will be done with continuous miners. The longwall entries will be extended to the west but in no case will they extend past the 22 degree angle of draw projected from the surface expression of the Joes's Valley Fault. No pillars will be removed during mining in the Incidental Boundary Change area and consequently, no subsidence will occur. No surface disturbance or breakouts will occur within the Incidental Boundary Change area. Refer to Plate 5-2A.

When mining in the longwall gate entry nears the fault (between 200-300 feet away) an underground drill will be used to drill west toward the fault to determine its location. The drill will drill horizontally toward the fault up to 50 feet ahead of the entry face. If the fault is not encountered, the continuous miner will advance about 30-40 feet toward the fault, leaving at least 10 feet of coal between the entry and the end of the hole. The drill will again drill ahead. This sequence will continue until either water or fault gouge is encountered in the hole or the entry has been developed to its maximum extent (providing no fault was detected). If the fault is encountered prior to reaching the bleeder entries, then mining will stop and the bleeder entries will be relocated. At least 10 feet of solid coal will be left between the face of the entry and the fault. GENWAL will notify the Forest Service and DOGM if substantial water is produced from the drill holes or the fault. Any appreciable outflow from the fault will be monitored.

At least one horizontal hole will be drilled in the headgate and tailgate of each panel. Should water be encountered by the drill hole, the hole would be evaluated. If flow is low to moderate and the flow rate diminishes, drilling would be re-initiated. However, if the flow is high (greater than

50 gallons per minute) and the end of the hole close to the fault, the hole would immediately be plugged and entry development would stop at least 10 feet from the end of the hole.

Although large amounts of water and high pressure have not been previously encountered by mining near the fault, an emergency plan to handle water inundation from the fault has been developed. The plan consists of the following actions:

1. Pull equipment back from face
2. Erect two Kennedy stoppings at least 2 feet apart
3. Place appropriate sized de-water pipe w/valve at bottom of stoppings
4. Pump quick drying cement into the space between the stopping
5. After minimum drying time, close water valve

5.23.10 Mining Operation

The mine was developed in an area of old works in the Hiawatha seam. Coal was produced from this operation during the period of 1940 through 1955 and was sold locally for domestic use. Certain sections of the old-mine were reopened so that water sumps, ventilation, and coal haulage facilities were re-established. Plate 5-2 illustrates the manner in which the old workings were modified and repaired in order to bring them into compliance with current regulations and the overall mining plans of GENWAL.

Where necessary, the old workings were widened to accommodate a 48-inch coal haulage conveyor. Proper roof supports were placed in areas where questionable roof control conditions were encountered.

The mining operations has accessed the Hiawatha seam by drifting into the seam from the coal outcrop. The portal area for the Hiawatha seam has three entries: one intake ventilation entry, which will also serve as a haulage route, one neutral coal haulage conveyor entry, and one return airway. The portal access area for the mine has the necessary surface support items such as a ventilation fan, conveyor belt drive, power, etc.

5.23.20 Mining History

The Hiawatha seam, is the only seam to be mined on the leases, has an average thickness of 7.5 feet. The coal heights encountered range from 5.5 to 11 feet except in the sandstone roll area

which is approximately 4.5' high as shown on Plate 6-2. The coal within the permit area is high volatile bituminous. The seam will be accessed at an elevation of 7895 feet. The old works in the Hiawatha seam are accessible and it appears that the immediate roof is a competent sandstone, with bedding ranging from laminated to massive, interrupted by an occasional shale-siltstone lenses varying in thickness from approximately six-inches to two-feet. Roof falls in the old works are confined to the siltstone lenses, and where observed, are usually at intersections of rooms and entries. Falls are generally over the width of the opening extending rib to rib and less than 2-feet thick. The historic mine development plans for the Hiawatha seam are illustrated on Plate 5-2.

Mining was completed in lease ML-21569 as shown Plate 5-2. 1st North, a four entry system with 100' X 60' pillars, has been developed off Main West and runs up the eastern side to the northern boundary of the lease, while 1st Right, a five entry system with 100' X 50' pillars, has been developed up the western side to the northern boundary of the lease. 1st North was used as mains for development of pillar sections 1st Left through 9th Left while 1st Right was used as the bleeder for these pillar sections. 1st Left through 9th Left sections have been developed and pillared. 1st North, 1st Right, and Main West will not be retreat mined. These three sections will be left intact to be used as mains in future mining. Typical entry width is 20' wide.

Lease UTU-68082 has been accessed to the east by the use of the 1st North Submains. First (1st) Right through 4th Right have been developed and 2nd mined while 5th, 6th, and 7th Right (longwall gates) still need to be developed to accommodate 6th and 7th Right longwall panels.

GENWAL attempted to access Sections 25 and 30 of Lease UTU-68082 from 1st North section and 1st Right pillar section. This attempt failed due to low coal height. Isopachs show better coal height on the north and west side of Lease UTU-68082. This area will be accessed through Main West by the development of gates for longwall mining.

Lease UTU-68082, sections 26 and 35, will be accessed by the use of the Main West section. Main West will be developed to the west through Section 35. Longwall panels will be developed north off Main West as shown on Plate 5-2.

Lease ML-21568 has been accessed from Main West by a five entry system (South Mains) which extends southward from the Main West Section along the eastern edge of the lease as shown on Plate 5-2. A five entry bleeder system, 2nd South Bleeder, will be developed in conjunction with the longwall panels (Plate 5-2). Longwall mining will commence with 1st Right South longwall panel and end with the 5th Right South longwall panel and will be accessed from South Mains.

Lease UTU-68082 in Section 1 and 6 will be accessed by the use of the South Mains developed in State Lease ML-21568. Sections 1st Left South through 11th Left South will be developed in that order with the bleeder be developed in conjunction with each section. One longwall panel will be pulled on the east side of South Mains between 1st and 2nd Left South sections (Plate 5-2). 3rd through 11th Left South sections will be room and pillar sections.

GENWAL has made application to the BLM for a right-of-way in order to access federal coal reserves in sections 3 and 10, T. 16 S., R. 6 E. This Incidental Boundary Change application is for a 50 acre modification to the existing permit boundary.

5.23.3 Underground Equipment

Typical mining equipment used in this area will be employed to mine coal in this permit area. Two continuous miners will be employed to mine coal in this lease area. The following is a list of equipment, or equivalent, that may be utilized underground and on the surface as required:

Joy Miners (2) 12 cm 12 (5.5 - 11.5' cutting height)

Roof Bolters (2)

HDDR 13 Fletcher (Min. 6' operating height) (2)

TD143 Lee Norse

Feeder Breakers (2) Stamler 54" (1) Long Airdox 118"

Battery powered scoops and face haulage

Various Electrical Equipment

Long Airdox continuous haulage system

Stamler continuous haulage system

The Longwall System will include:

4LS-2 Joy Longwall Shearer

Kloeckner-Becorit Shields (effective 5-7' height) H & B pan line

H & B head and tail drives

American Longwall Stage loader

Appurtenant pumps

Diesel shield haulers

Other appurtenant equipment as needed.

5.23.4 Geotechnical

Within the projected mining area, conclusions from existing drill hole data (see Appendix 6-5) and from BLM databases excludes the possibility of multiple minable seams being present. The coal seam to be mined on the GENWAL leases occur in the lower part of the Blackhawk Formation. The Formation is comprised of approximately 1000 feet of gray carbonaceous shales, siltstones, coals, and interbedded sandstones of late Cretaceous age. The Star Point Sandstone, a massive cliff forming 700 to 900 foot thick sandstone unit, underlies the Blackhawk Formation and its top serves as a useful lithologic landmark in the area.

An isopach map of the Hiawatha coal seam overburden appears in Plate 6-6. Overburden thickness above the area to be mined in the permit area ranges from 750' to 2400'. Coal pillar height ranges from 5' to 10' in the permit area. A uniaxial compressive strength of 2400 psi (geomechanical tests, Appendix 5-1) was used in the pillar safety factor calculations.

The formations in the physiographic area dip gently 1 to 3 degrees westward off the west flank of the San Rafael Swell. However, locally the mine is relatively flat experiencing a 0 to 2 degree dip to the southeast. The regional structure is broken by several north-south trending, high angle normal faults which offset the lithologic units from less than 1 foot to 250 feet or more. No faults are projected to be encountered within the proposed mine development area.

5.23.5 Initial Pillar Design

Methods used to evaluate safety factors of the pillar design are discussed in Appendix 5-2. Current data indicate that minimum acceptable safety factors range from 1.5 to 2.5. Calculations of previous pillar safety factors are found in Appendix 5-3. Lease ML-21568 pillar safety factors for rooms and main entries ranged from 1.37 to 1.96 and 1.39 to 2.45 respectively. Pillar safety factors for rooms and main entryways in Lease ML-21569 range from 1.47 to 2.45 and 1.78 to 4.37, respectively.

As the ratio of pillar length to height approaches 12, pillars are regarded as being able to bear and load. The pillar recovery plan currently approved by MSHA, DOGM, and the USFS was designed by GENWAL employees with the aid of MSHA Technical Support in Denver and information in a technical report "Coal Pillar Sizing, GENWAL Mine" prepared by Mr. Dan W. Guy of Blackhawk Engineering Co. on 10-1-84. The purpose of the Blackhawk Engineering Report was to evaluate the use of 60' x 60' centers on the entries and rooms during panel development.

5.23.5 Revised Pillar Design

Because pillar sloughage did not develop as had been previously calculated, a new pillar design study was undertaken to determine more precisely the existing site conditions. Using values obtained from the above studies, coupled with the new Seratta studies, and 10 years of mining experience at the Crandall Canyon Mine, a new pillar design was determined. The new data conclude that safety factors alone are not adequate for sizing pillars and that site specific overburden conditions must be considered. The table located on page 29 in Appendix 5-2 present the new factors of safety developed for pillar size and overburden thickness.

Roof span design is derived from the accepted practice in the Wasatch Plateau of 20 foot entry and crosscut widths. Previous experience in the Crandall Canyon and nearby mines have supported this roof span width. Roof span in Leases ML-21568 and ML-21569 is 20 feet in entries and crosscuts. Roof support bolting will consist of a minimum 4 foot resin pins with 5 foot centers during development of each section with the exception of the right-of-way UTU-66838. This lease has roof support consisting of a minimum of 4 foot resin pins with 4 foot centers. The floor of the coal seam grades from a clayey shale less than one foot thick to massive sandstone.

5.23.6 Barrier Perimeters

The barrier pillar around the perimeter of the property has been designed according to Utah mining regulations which is based upon the following formula:

Width = 2 * coal thickness of coal to be extracted in feet + 5 * overburden thickness in feet / 100 + 10'

The perimeter pillar is shown on Plate 5-2. The following selected points were used to establish the pillar size at various locations:

Location	Overburden	Barrier	Coal Height
1. Southwest Corner Tract 1	550 feet	50 feet	6 feet
2. Northwest Corner Tract 2	1550 feet	100 feet	6 feet
3. Western Boundary (Max.)	1700 feet	108 feet	6 feet
4. Northwest Corner U-054762	1500 feet	97 feet	6 feet

5.23.7 Annual Production of Coal

Annual coal production in 1991, 1992, 1993 and 1994 was 877,500, 1,178,089, 1,474,824 and 1,660,900 raw tons, respectively. During 1993-1995 total production tonnage was approximately 1,750,000 raw tons annually. This production was achieved by the use of continuous mining machines, continuous haulage equipment, and/or diesel driven coal haulers. From 1995 to the end of the century total production coal tonnage is forecasted to be 2,500,000 tons, with the aid of longwall mining.

5.23.8 Access To Future Reserves

Access to future reserves will be maintained by the North Mains entries, Main West entries, 1st North, and 1st Right sections. North Mains will maintain access to the mine as well as Main West. Main West will also maintain access to the west and to the South. 1st North will maintain access to the north and east, while 1st Right will maintain access to the north and west. (See Plate 5-2 and page 5-15A). Access to federal coal south and east of the Dellanback fee parcel (i.e., the South Crandall LBA) will be maintained.

5.23.9 Projected Mining by Future Permit for the Planned Life of the Mine

All coal around the permit area has the potential for future mining by the Crandall Canyon Mine. The projected mining for the Incidental Boundary Change area, the Dellanback fee parcel, and the South Crandall lease area is shown on Plate 5-2.

Operating Schedule and Employment

The mine employees approximately 125 people at present. The mine will operate four eight hour production shifts per day, five days a week. Two maintenance crews will operate 8 hours a day, five days a week, to accommodate rockdusting and general cleanup of the mine. When market or mining conditions dictate, production can be expanded to seven days per week, 52 weeks per year.

5.23.10 Safety Training

The mine is equipped with modern emergency facilities and has an organized safety program. All mine employees are required to meet MSHA first aid and safety training requirements. Visitors are required basic training before entering the mine.

Revised 4/05/2003

5.23.11 Fire Protection

Fire protection will be maintained in accordance with all Federal and State regulations pertaining to coal mining operations. Additionally the fire prevention plan can be found in Appendix 5-18.

5.23.12 Water Systems, Dust Suppression, Dewatering, and Electrical

The sump areas, as shown on Plate 5-4, will have a capacity of approximately 3.0 acre feet of water. The impoundment walls are constructed of concrete block with mortared joints and sealed on both sides. All the contact areas around the walls are sealed with concrete to prevent seepage. These sumps are constructed to allow the sediment to settle out and have an oil skimmer installed, as shown on Plate 5-4, to allow the water to be pumped directly to Crandall Creek under a UPDES permit. All water pumped to Crandall Creek will meet all effluent limitations and will be sampled in accordance with the UPDES permit requirements. Refer to Plate 5-3 for the location of the UPDES discharge point.

5.24 Blasting

There are no structures or dwellings within one mile of the mine permit area. All blasting will be done under the direction of a person trained, examined and certified as provided by 30 CFR 850 and applicable regulations of the State Industrial Commission. The use of explosives will be done in accordance with R645-301-524 and all records as outlined in R645-301-524.700 will be kept at the mine site or at the mine office in Huntington, Utah for a period of at least three years.

GENWAL will post blasting signs, in accordance with R645-301-524.510, in the vicinity of the surface blasting operations indicating that blasting is being done in the area and the audible signals and meanings. GENWAL will limit access to people from the area immediately prior to and after the blast until the applicants representative determines all is clear. Signals, audible within a half mile, will be given prior to and after the blast as outlined in R645-301-465.

The amount of explosives used within any 8 millisecond period will be determined with the following equation as outlined in R645-301-524.651. Blasting will be done between sunrise and sunset, unless other criteria is met in R645-301-524.420. Blasting will be done so as no fly rock will leave the permit area, where practical. Netting will be used to achieve this where there exists a possibility of this occurrence. Flyrock traveling in the air or along the ground will not be cast from the blasting site more than ½ the distance to the nearest occupied structure; beyond the area of control required under R645-301-524.530.

5.25 Subsidence

The term "subsidence" applies to the deformation or movement in the overburden. The thickness of the overburden ranges from zero at the outcrop to approximately 2400 feet, as shown on Plate 6-2. In general, the strength of the overburden is typical of the late Cretaceous sediments being mined in Eastern Utah and Western Colorado. However, it should be noted that the overburden at the Crandall Canyon mine has substantially more massive sandstones than in other areas (i.e., the Deer Creek Mine). Thus, providing greater overburden strengths and reducing the potential for significant subsidence.

Four methods have been utilized to arrive at the range of the possible maximum subsidence at the Crandall Canyon Mine. The methods are: Dunrud's (USGS) equation (discussed in the text below); Boundary Element Method (BEM) using "TABEX-2D" and a Finite Element Mathematical (FEM) simulation using "ANSYS (Appendix 5-6); and the National Coal Board (NCB) of England Technique (Appendix 5-6). The amount of subsidence varies from 3.9', 5.5', 3.34', and 0.25', respectively. Experience at the mine indicates that the 0.25' range of subsidence most accurately represents specific site conditions under room and pillar conditions and the projected maximum of 3.34' under longwall conditions.

The magnitude of vertical subsidence is a function of coal height, overburden depth, stratigraphy, mining technique, and distance from barrier pillars. According to Dunrud's work completed in 1980, based upon a study of subsidence in an underground coal mine at Somerset, Colorado, (USGS 1980), the maximum amount of subsidence expected is equal to 70% of the coal height extracted, (Figure 5-4). The Somerset subsidence curves are included because the overburden characteristics are similar to those encountered at Crandall Canyon and the lack of reported data indicating amounts of subsidence for western underground coal mines.

The maximum subsidence experienced for western coal mines according to Peng, ranges from 33 to 65% and Gentry and Abel cited examples of 70% of the coal height extracted. Thus, to be conservative, a 70% value will be used within this report. The maximum value may be reduced by the amount of coal not recovered in the mining areas, i.e., 20% of the coal is expected to be unrecoverable in the pillared areas at the Crandall Canyon Mine and approximately 12% for the longwall areas. For the areas near an unmined solid pillar the maximum amount of subsidence is reduced (irrespective of the mining method) according to the graph shown in Figure 5-5 based upon work by Gentry and Abel.

The largest magnitude of subsidence that may occur is 3.9 feet at a point 40 feet east of the section line between Sections 5 and 6 and 1522 feet south of the section line between Sections 32 and 5. The values were calculated by reducing the coal heights shown on Plated 5-2 by 20% which represents the unrecoverable coal in the pillared areas (using a six foot coal height), then multiplying by 70% to obtain the maximum possible subsidence value from Figure 5-4 which assumes a worse

case scenario. The subsidence values were reduced according to Figure 5-5 for areas that border a barrier pillar along the perimeter of the lease shown on Plate 5-2.

Horizontal movement which would create slope failure along the escarpment is not expected to occur due to subsidence because only limited coal outcrop occurs within the lease (the east side of the lease area). Within that area of old works no pillar extraction is anticipated.

As with areas in the western part of lease SL-062648 and at the Co-Op's Trail Canyon and Bear Canyon Mines and the Beaver Creek #4 mine, no escarpment failure has occurred. Horizontal movement creating tension or compression cracks can not be projected due to the overburden thickness and lack of jointing density and attitude data along the surface rock exposures.

In addition, GENWAL will second mine no closer than 200 feet to any outcrop (with the exception of portals) and, in accordance with Forest Service Stipulation #20, no mining will be done within a zone that might impact the Joes Valley Fault. This area is determined by a 22 degree angle-of-draw (from vertical) eastward from the surface expression of the Joes Valley Fault was used to project the outer limits of subsidence. Thus, subsidence will not intercept the Joes Valley Fault. If subsidence does occur along the western perimeter, all effects of the subsidence will be maintained within the mining permit boundary. No perennial streams will be affected. On the Dellenbach fee tract mining will not extend closer than 200 feet from the outcrop (other than portals) and no closer than 50 feet from the property boundaries. It should be noted that the mine projections and timing for the Dellenbach tract, and the South Crandall lease and the U-68082 lease mod area are shown on Plate 5-2.

It is accepted practice in this area to use two sources of information for subsidence evaluation. The sources are: 1) "Some Engineering Geologic Factors Controlling Coal Mine Subsidence in Utah and Colorado",Geologic Survey Professional Paper 969, by C. Richard Dunrud, 1976, and 2) "SME Mining Engineering Handbook", Volume 1, by Arthur B. Cummins and Ivan A. Given, 1973. The conclusions based upon the above source material are tempered by on site evaluation and actual experience based on similar mining conditions in late Cretaceous overburdens with similar thicknesses and strengths. The surface area topography within the lease is shown on Plate 3-1, 3-1a, 1-1 and others. The topographic map shows the relative steep sloping sides of the canyons which contains Crandall Canyon Creek, Blind Canyon Creek, and Horse Canyon Creek where rock outcrops are abundant. However, there are few, if any, talus slopes.

5.25.10 Subsidence Control Plan

The Subsidence Control Plan contained herein addresses specifically those items that are required by R645-301-525 Pertaining to Subsidence. This plan is an amendment to the original application filed on December 17, 1980, by GENWAL the SUBSIDENCE CONTROL PLAN FOR GENWAL COAL COMPANY, INC., as prepared by David A. Skidmore and L. G. Manwaring of Revised 4/05/2003

Coal Systems Inc., on August 28, 1981; and the Mid-term permit revisions dated 5-30-86. The format of the currently approved COAL SYSTEMS report will be used with the conclusions based upon the results of the drilling of the Blind Canyon seam which was obtained in April, 1985, and the Hiawatha seam data obtained to date during mine development. The original application was submitted pursuant to the following: Title 40, Chapter 10, Utah Code Annotated, 1943, as amended, the "Cooperative Agreement between the United States Department of Interior and the State of Utah"; the Surface Mining Control and Reclamation Act (P. L. 95-87); and all regulations promulgated under those Acts affecting mining operation conducted in the State of Utah.

It should be noted that, according to the stipulations of federal lease UTU-78953, there will be no second mining or subsidence under Little Bear Creek within the South Crandall lease area.

Surface Features and Facilities Subject to Subsidence.

An examination of the surface area as well as of state, federal, and county records indicate there are no man made structures, utilities right-of-ways and public or private resources necessitating protection from subsidence (Plates 5-12, 5-13, and 5-3) within the mine permit boundaries. In addition, aerial inspection of the permit and adjacent area confirmed the absence of existing man made structures. The occurrence of subsidence will not produce material damage or diminution of value of properties or foreseeable use of lands. Possible effects of mine subsidence on groundwater resources are discussed in Chapter 7. Creeks within the area include Crandall Canyon Creek, Blind Canyon Creek, and the left fork of Horse Canyon. Both forks of Crandall Creek are considered to be perennial at least up to the federal lease boundary with State Lease ML-21568.

The surface in the area is controlled and administered by the United States Forest Service with a small southern parcel of land owned by GENWAL (Plate 2-1). The land is used for domestic grazing in the areas of gentle slope and wildlife habitat and recreation over the total acreage. The vegetative resources will not be negatively impacted by subsidence. Thus, the current land use is expected to continue. Similar mining conditions and practices exist at Beaver Creek #4 Mine and CO-OP's Trail Canyon and Bear Creek mines and no significant loss of vegetation has occurred at those sites.

The Crandall Canyon Mine on the western half of lease SL-062648 has experienced second mining under conditions similar to Huntington Canyon and has not experienced any vegetation change, subsidence or escarpment failure. Visual impact will only be observed in the case of a total escarpment failure. Tension cracks, if any do develop, as viewed from the bottom of the canyons will not be visible and the maximum subsidence of three feet when viewed from below and at a distance of greater than ½ mile will not be visible. As per the USFS, there is no marketable timber in the area of potential subsidence.

Since the original submittal, several operations and construction modifications have been submitted to satisfy regulatory compliance requirements. Consideration was given to the subsidence experienced at nearby mines (CO-OP, Beaver Creek #4) exhibiting similar overburden composition and mining methods, on site inspections at the operating Crandall Canyon, CO-OP and Beaver Creek #4 mines and calculation based upon a generally accepted formulas using limited physical coal strength data in determining coal pillar sizes, barrier pillar design and direction of mining. The aforementioned mines were observed from the surface to note any surface effects from subsidence from pillar mining. No substantial affects from mining have been observed. The Crandall Canyon Mine has pillared coal in areas with as little cover as approximately 200' of overburden. The CO-OP

and Beaver Creek #4 mines have pillared under the same types of escarpments as are located at the Crandall Canyon Mine with no apparent failures.

5.25.11 Methods of Coal Removal

The reserve area will be mined in the room and pillar and longwall methods. These methods are described in Section 5.23 of this chapter.

5.25.12 Description of Physical Conditions

The depth of cover is shown on Figure 6-6. Seam thickness of the Hiawatha coal seam is shown on Plate 6-3. The Bear Canyon and Blind Canyon seam thicknesses are shown on Plates 6-4 and 6-5). Structure of the top of the Hiawatha seam is shown on Figure 5-8. A description of the Lithology of the area is found in appendix 6-6. Other mine progress, interval, subsidence, and lithologic maps within this section and in the mine planning section also address the description of physical conditions.

5.25.13 Measures to Prevent Subsidence

In areas where mining may cause undesirable surface movement, steps will be taken to control or prevent subsidence. To prevent subsidence, permanent support can be achieved by selectively mining certain areas, leaving support pillars of coal, and/or by not mining specific areas. Although planned subsidence is not projected outside of the permit area due to the mining of the Hiawatha coal seam within the area of the Crandall Canyon Mine, potential subsidence may occur within areas of retreat mining sections.

The main objectives are to delineate the areas within the lease and adjacent lands that may be affected by subsidence and to determine the extent of the disturbance. Significant guiding design criteria are as follows:

1. Barrier pillars within the lease boundaries left intact to protect adjacent lands.

2. First mining only areas which significantly reduces the potential chances of subsidence.

3. Research indicates that a 20 degree "angle of draw" be used to project maximum extent of subsidence.

   A 20 degrees angle-of-draw was used to project a protection area for perennial streams within the mining area. The 20 degree angle was determined by two documents which show this angle of draw to be representative of the area. A Bureau of Land Management letter to the Utah State Division of Oil, Gas, and Mining dated

Dec. 11, 1991 states that possible draw angle should be in the 15 to 20 degree range. This conclusion was made on previous history of subsidence occurring in the Wasatch Plateau/Book Cliffs area. This letter is provided as Appendix 5-5.

Appendix 5-6 is a report, "Preliminary Study of Potential Subsidence Over the GENWAL Coal Mine". This report includes subsidence calculations, subsidence history, analysis, and charts with final conclusions showing that there may be a maximum subsidence result of 3 to 4 inches within the boundaries of the leased area, and the angle of draw is expected to be approximately 20 degrees.

4. Protection of perennial streams using only first mining directly under and within a 20 degree angle of draw of the stream. GENWAL recognizes that the Division of Wildlife Resources, the Division of Oil, Gas, and Mining, and the United States Forest Service consider all perennial streams to be important to wildlife. A buffer zone is shown on Plate 5-2 where no subsidence will take place until GENWAL has delineated those reaches which exhibit perennial flow, and shown that mining activity will not adversely effect these stream reaches.

5. Protection of the Joes Valley Fault. As depicted on Plate 6-2, the maximum possible subsidence with respect to a 22 degree angle of draw is within the permit area, As shown on Plate 5-2, Mining Projections, all mining will occur within the permit boundary. No mining will be done within limits that might impact the Joes Valley Fault. In accordance with Forest Service Stipulation #20, a 22 degree angle-of-draw (from vertical) eastward from the surface expression of the Joes Valley Fault was used to project the outer limits of subsidence.

6. There are no plans to backfill any area of the mine with waste material in order to reduce subsidence. In order to delineate the maximum limit of possible subsidence in the vicinity of the Crandall Canyon Mine area, a positive limit (draw) angle of 20 degrees from vertical (70 degrees from horizontal) from the lease boundaries was used. A correction for topographic variability was made in order to accurately determine the maximum surface limit of subsidence. The maximum surface limit of possible subsidence is shown on Plate 6-2. A discussion of the methodology used in determining the maximum limit of subsidence is given in Appendix 5-7. Draw angles of 15 degrees or less have been observed in moderately strong overburdens in the Book Cliffs.

The data contained in Appendix 5-2 were used to determine the potential for subsidence under any perennial streams which may be present within the permit area. Plate 7-16 defines the perennial reaches of Horse and Crandall Canyons, as substantiated by field surveys in 1991 and 1992. Using the data from Plate 7-16 only the lower portions of Crandall Canyon have perennial sections under which first mining may occur.

Overburden thicknesses in the upper perennial reaches of Crandall Canyon have been determine to be about 540 feet. Using a pillar size of 70 x 65 and the worst case analytical condition, the factor of safety has been calculated to be 2.2. The coal outcrops within Blind and Horse (both the north and south forks of Horse Canyon) Canyons are above the perennial portions of the stream. Thus, no subsidence will occur under perennial sections of Horse Canyon (the Blind Canyon drainage is ephemeral).

All state appropriated water within the subsidence zone of the South Crandall lease area is shown on Plates 7-14 and 7-15. Plates 5-2(H) and 5-2(BC) show the mine plan for the South Crandall lease area. Plate 5-2(H) shows the mine plan for the U-68082 lease mod area. These maps depict which areas will be longwalled (full extraction) and which areas will be developed as first-mining only. Subsidence Survey Letters of Notification to surface owners and water conservancy districts are included in Appendix 5-25.

The following state appropriated waters are located within the subsidence zone: 93-383, 93-381, 93-483, 93-191, 93-190 and 93-1180. Information about quality, quantity, and ownership of these waters can be found in Chapter 7, Table 7-6, and in Appendix 7-1.

5.25.14 Subsidence Monitoring

The applicant commits to implement the proposed subsidence control plan and applicant hereby incorporates the same into this submittal. An aerial monitoring system for the Crandall Canyon Mine which has been accepted for implementation and vertical and horizontal control have been established using ground control stations, shown on Plate 5-5. (The program is included as Appendix 5-8). Baseline flight lines were flown over Sections 31 and 32 of T15S R9E, Sections 5 and 6 T16S R7E, Sections 1 and 2 T16S R6E, and Sections 35 and 36 T15S R6E in October of 1989. Selected portions and/or all of Sections 34, 35, and 36 T15S R6E and Sections 2 and 3 T16S R6E (Plate 5-5) will be included in the 1995 Fall Survey to ensure that all projected mined areas within LBA#9 are included in the subsidence monitoring program. Control points within and adjacent to the leased area (including the South Crandall lease area) have been established and located by surveying practices. Prior to mining the area was photographed and a pin map was generated.

Aerial surveys will be conducted by GENWAL each year for the areas above and within the 20 degree angle of draw of the actual mined area. Based on a written request by the Forest Service, GENWAL is revising the subsidence monitoring plan. Monitoring will now be conducted annually until subsidence of less than one foot has been measured for three consecutive surveys showing that subsidence is substantially complete.

The following information will be forwarded to the Division on an annual basis when it becomes available:

1. A current map of the underground workings with areas delineated as to where the second mining will begin.
2. The approximate dates when second mining will commence and terminate.
3. The date of monitoring.
4. The vertical and horizontal positions of all monitoring points and pins, directly over and within the 20 degree angle of draw to the mined area, surveyed by aerial photography for that specific year.

There was and has been no evidence of escarpment subsidence or failure. There are no further plans to monitor escarpments in the area not visible from Huntington or Crandall Canyons. The subsidence/escarpment survey results were recorded and submitted to the appropriate regulatory authority. No escarpment failure occurred.

5.25.15 Anticipated Effects of Planned Subsidence

If subsidence does occur, surface effects may include minimal ground lowering and temporary tensional fractures at the margins of the subsided area. Any subsidence occurring on the 160 acre Dellenbach fee tract should have minimal effects on the surface. There are no escarpments, raptor nests, archeology site, streams or springs located the Dellenbach tract. This tract (surface and underground) is privately owned by Genwal Resources Inc. The tract is within the presently approved permit area and is included in the current subsidence monitoring plan.

Subsidence monitoring for the South Crandall lease area and the U-68082 lease mod area will be done according to the existing plan approved for the Crandall Canyon mine. Pre-subsidence base-line aerial surveys have been completed and the initial survey control monuments have been installed on the ground. Additional control points (monuments) will be installed as mining progresses. (Refer to Plates 5-2 for the location of the existing and future monuments.)

In much of the area of the South Crandall lease area, both the Hiawatha and the Blind Canyon seams are proposed for full extraction longwall mining. In these areas the combined thickness of both seams ranges upward to about 12 feet. If surface subsidence in these areas is 80% of total mined seam thickness, then it may be possible to see nearly 10 feet of subsidence in some areas of the lease after mining. It should be noted that the Forest Service and BLM have imposed a special stipulation in the South Crandall federal lease specifically to provide additional protection to the Little Bear spring system. These lease stipulations prohibit full-extraction mining in the following areas;

a) area under the Little Bear stream channel with less than 600' of overburden.
b) area within 1000' of the southeast corner of the lease (to protect the Mill Fork graben.)
c) area within 1000' of southern boundary of lease (to protect possible water-bearing fracture system.)

GENWAL personnel will conduct a surface inspection of all areas where subsidence has occurred no sooner than 6 months but no later than 12 months after extraction mining has occurred.

Multiple seam mining beyond spring site LB-7 in Little Bear Canyon is contingent upon a monitoring plan approved by the Division in concurrence with the Forest Service at least two years prior to mining in that area.

5.25.16 Mitigation of Damages

As previously presented within this chapter, no material damage or diminution of value or foreseeable use of lands is expected to occur. GENWAL has been in consultation with the BLM and received their concurrence with the conclusions presented in this document, a copy of the BLM correspondence may be found in Appendix 5-5. Displacement of wildlife due to subsidence may be minimal. However, springs within the potential subsidence limit are a significant resource to the local wildlife and may be impacted.

Seeps and springs within the possible subsidence limit emit water from the North Horn Formation, Price River Formation, Blackhawk Formation, and the Castlegate Sandstone. A limited number of seeps and springs are found to issue from the Blackhawk Formation and Castlegate Sandstone units within the area of possible subsidence limits. These seeps and springs show only limited use by deer and elk. Subsidence from mining in these areas will have minimal impacts on water supplies from seeps and springs in the vicinity of the mine. Water monitoring and the Probable Hydrologic Consequences are discussed in detail in Chapter 7 of this permit.

Seeps and springs within the possible subsidence limit of mining emit water from the North Horn and Price River Formations 100 to 2100 feet (10 to 210 times the coal bed thickness) above the interval to be mined. If repeated subsidence via roof failure occurs, elastic deflation is believed to occur at a distance of nine coal seam thicknesses (90 feet) above the coal. If any tension cracks do develop, they should be sealed by clay migration occurring during elastic deformation. As a result, these seeps and springs should not be affected by subsidence. However, monitoring will be conducted as described in Chapter 7.

GENWAL recognizes the fact that the Division of Wildlife Resources, the Division of Oil, Gas, and Mining and the USFS consider all seeps and springs to be important to wildlife. If, during the monitoring of the springs, non-climatic diminutions of flow from any seep or spring in the area are substantiated, GENWAL will notify the Division of Wildlife Resources, the Division of Oil, Gas, and Mining, the State Engineer and the U. S. Forest Service. If documentation concludes that mining efforts at the Crandall Canyon Mine have reduced or eliminated the flow from the seeps and springs, then acceptable remedial action plans will be submitted for approval and subsequently installed.

In the event subsidence negatively impacts grazing, the applicant will compensate the owner or appropriate the party by paying the fair market value for the loss experienced. Compensation will be made after the grazing loss is proven to have resulted from surface subsidence related to the operation of the Crandall Canyon Mine.

Should any structures such as roads, bridges, etc., be adversely impacted as a direct result of subsidence directly related to the operation of the Crandall Canyon Mine, the operator will repair or replace the structure, whichever is more economical.

Mitigation for potential disruption to the Little Bear Spring will be accomplished through the construction of a water treatment plant which will provide replacement water for the spring if mining activity in the South Crandall lease area affects the quality or quantity of the spring. Construction of this water treatment plant will be done under the provisions of a water replacement agreement between GENWAL Resources, Inc. and the Castle Valley Special Service District who maintain culinary water rights to Little Bear Springs. A copy of this water replacement agreement is included in Appendix 7-51.

Subsidence projections for the South Crandall lease area are depicted on Plates 5-2(H) and 5-2 (BC). Subsidence projections for the U-68082 lease mod area are shown on Plate 5-2(H).

The powerline that crosses the South Crandall lease was built by GENWAL to serve the Crandall Canyon mine. There are no other users on this line. This powerline follows the highline of the ridge and is more than 1500' above the coal seam to be extracted. Due to the depth of cover no damage to this powerline is expected due to subsidence. As full extraction mining approaches under the powerline GENWAL will monitor the situation to ensure that the potential for damage to the powerline is minimized. Most of the powerline within the subsidence zine is visible from th Genwal mine and can be inspected by mine personnel. The section of line on the ridge will be inspected during annual subsidence monitoring. Much of this line utilizes double pole X-braced structures which are inherently stable in design. This line is equipped with ground fault protection which will automatically and instantly de-energize the line in the event of any damage, including grounding, and/or short-circuiting. Vegetation has been cleared on either side of the powerline within the right-of-way. The powerline runs over the area that was mined out by the ARCO #4 mine, and there was no resulting damage. If any damage occurs GENWAL will be out of power and will immediately make arrangements for any necessary repairs.

It shall be noted that the extent of possible subsidence in the U-68082 lease mod area is difficult to predict because the extent of mining in this area is extremely speculative due to the low coal (5' and less) in this area. However, in keeping with special lease stipulation #1 (see Appendix 1-15A, Attachment 3) there will be no second mining (and hence no subsidence) in any areas where the cover is less than 50 times the seam height plus 50', or approximately 300' overburden. A detailed discussion of this stipulation can be found in Appendix 3-20, (Final Environmental Assessment, Modification of Federal Coal Lease UTU-68082, U.S. Forest Service.)

GENWAL has discussed the powerline situation with officials of Utah Power & Light (Dale Robertson, transmission and Distribution; Greg Bean, System Engineering; and Aaron Gibson; Customer Service Representative, verbal communication February 8, 2005). These representatives are very familiar with the surface effects of full extraction longwall mining and are in agreement that the risk to this line is quite minimal. GENWAL commits to immediately notify the Forest Service in the event of any damage to the powerline so that proper fire prevention measures can be implemented as required.

5.25.20 Subsidence Control

GENWAL will comply with all provisions of the approved subsidence control plan and will correct any material damage resulting form subsidence to surface lands as a direct result of the operation of the Crandall Canyon Mine. This will be done to the extent technically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses which it was capable of supporting before subsidence.

The mine plan is designed so that mining will not result in material damage to perennial streams or impoundments having a storage volume of 20 acre feet, or which could result in environmental degradation or safety hazards to streams and associated structures.

5.25.30 Public Notice of Proposed Mining

At least six months prior to mining, or within that period if approved by the Division, all owners and occupants of surface property will be notified, by mail, identifying specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined.

5.26 Mine Facilities

The existing surface facilities were partially located in a predisturbed area and the only area where the coal outcropped in the lease area. The existing surface facilities are located in a very limited disturbed area. The culvert expansion project adds the minimally necessary area for additional and improved facilities. The use of a 72" diameter culvert, through which Crandall Creek is routed, is the primary feature used to minimizing the disturbed area within the steeply sloped canyon. See Plate 5-3 for the surface layout and Plates 3-7, 3-8, and 3-9 and 5-20 for the premining land configuration.

A construction sequence for the culvert expansion project is included in Appendix 7-50.

The new facilities will incorporate several design features which will minimize the spread of coal fines and dust compared to the existing facility.

1) With the new system, all coal will be reclaimed by underground feeders located in the reclaim tunnel below the coal pile. During normal operations, coal will not have to be handled by heavy equipment (i.e. dozers and loaders) as with the existing facility.

2) The new coal pile will be contained by the hillside on the south, the new upper mine pad on the west, and the new road extension on the north. This containment will help prevent the pile from spreading. Concrete road barricades (Jersey Barriers) will be placed along the outside edge of the road from the new truck turnaround to the new loadout and beyond which will further limit the spread of coal and coal fines onto the roadway. This new pile configuration is in contrast to the existing design wherein the coal pile is located immediately adjacent to the road and migration of coal onto the roadway is not uncommon especially where mobile equipment is constantly working the pile during the loading and reclaim process.

3) The new truck loadout will be constructed outside of the road alignment in contrast to the existing facility where the loadout is situated directly within the roadway. Because the new loadout will be a state-of-the-art computer controlled facility, coal spills will be minimal compared to the existing facility. However, what little coal spillage that may occur with the new system will be cleaned up immediately and coal fines will report directly to the new sediment pond without being swept across the roadway as is now the case with the existing facility. With the new facility, the coal pile, crusher facility and loadout will all be located on the same side as the sediment pond and away from the existing roadway.

A Forest Service road use permit was obtained from the United States Forest Service, Manti-La Sal National Forest, Price, Utah in order to upgrade, use, and maintain the road to the mine permit area. This Forest Development road does not lie within the permit area and is not included as part of this permit application. The Forest Service road that lies within the disturbed area boundaries is included in the permit area for the purpose of drainage control.

The topsoil was stripped according to the plan, stockpile, and seeded with the topsoil stockpile seed mix. The topsoil stockpiles are protected from encroachment by placing earthen berms, straw bails, silt fences, or equivalent where needed.

There are no pre-existing structures or facilities located within the permit area. GENWAL has constructed a metal building (80' x 40') that is used as an outside shop. A new warehouse and office complex (50' x 25') has been built east of and connected to the existing shop. An additional 30' x 20' shop bay has been approved for construction by the Division and is projected to be constructed in the future.

During the summer of 1990, a power line from Utah Power & Light was brought in across the top of the canyon. At this time the use of the diesel generator was terminated. Presently, a state of the art substation and transformer provide all power needs. The high voltage lines from the substation to the mine are run underground in cement covered conduit thus eliminating the need of overhead power poles and transmission lines.

The oil storage and fuel containment area (80' x 20') is located at the west end of the old loadout area. This containment area is of sufficient volume to hold the volume of the largest storage tank found within the containment area plus any additional storm water . The containme. : area has a valve connected to the drain inside the wall. The valve and drain will provide a means for removing any spills or water in the containment area. A certified SPCC plan outlining emergency action as per R645-301-730 is available at the mine site (Appendix 5-10). Refer to Plate 5-3 for all surface buildings and structures. A fuel storage area will be located in the coal storage yard for fueling coal handling equipment. This will eliminate the need to cross truck traffic for refueling. The diesel fuel tank will be 11 feet long and 4 feet in diameter. A containment structure for the tank will be 6 feet wide, 12 feet long and will have walls 2 feet high. This containment will be able to retain the contents of the tank should it leak or rupture. See Map 5-3 for the location of this refueling area.

An underground bathhouse has been constructed to provide shower and sanitary facilities for the miners. This underground bathhouse was designed and installed in accordance with all State Health, MSHA, and Forest Service regulations. These agencies were contacted prior to the design and implementation for their input and approval as necessary. The water and sewage plans can be found in Appendix 5-11 and 5-12, respectively.

Two mine fans located on the surface, as shown on Plate 5-3, are used to ventilate the mine workings to insure a sufficient amount of oxygen for mine employees to continue operations within the mine. Other structures such as cement guard rails and cement walls have been constructed, with the Division's approval, and are listed within pages 5-33 and 5-34. This list includes the approximate date of completion of each structure and the description of each construction project.

Shotcrete was sprayed onto the cut-slope above the portals, the portal roads, and the coal storage area, as shown on Plate 5-3. A 4" square wire mesh was used, being spaced approximately 1" to 2" away from the existing slope. The wire mesh was secured to the slope with standard metal clips and bolts. Two-inch PVC pipe, perforated for drainage, was inset 2 to 3 feet into the slope at two different elevations, approximately 6" to 12" from the bottom of the project and 12" to 24" from the top of the project. These pipes were spaced 6 to 10 feet apart for the entire length of the project, with 2" to 4" of shotcrete then being sprayed onto the wire mesh. The intent of the project is to stabilize the cut slope to eliminate sloughage and enhance safety for personal.

Specifications for Shotcreting Cut Slopes

Average slope:	1/3:1
Matting:	11 gauge 2" x 4" or 9 gauge 4" x 4" wire mesh 6' wide x full length of slope
Securement:	5/8" x 24" long bolts w/ plates or 3/4" x 24" long rebar type anchors w/ plates
Drainage:	2" PVC pipe, 24" long, perforated, located at top and bottom of slope, 6' to 10' on centers. Pipes will be inset into the slope with the end extending outside the shotcrete. Drainage of the slope will be collected by the 2" PVC pipes and allowed to flow to the outside of the shotcrete.
Shotcrete: (per batch)	1800 lbs sand 800 lbs pea gravel 425 lbs cement 400 lbs fly ash
Application:	Applied with a Reed Sova III or Reed M40 pump w/ accelerator. Minimum thickness applied 2"

See Figure 5-10 for a cross sectional detail of shotcrete application.

This MRP covers the expansion of the surface facilities as shown on Plate 5-3. It should be noted that this represents the initial phase of the Crandall Canyon mine surface improvement. As shown, surface improvements will include a new intake portal, a new belt conveyor portal and a new fan portal.

Revised 4/05/2003

The new portals will be constructed along the south side of the upper pad of the existing mine-yard (refer to Plate 5-3). This area is presently serving as the parking lot and material storage yard. The new portals will consist of an intake portal, a fan portal, and a belt portal. The intake portal will be used to accommodate fresh air intake into the mine, and also to provide primary travel access into the mine for employees and materials. The fan portal will support a ventilation fan which will suck return ventilation air out of the mine. The belt entry will be located south of the existing coal pile and will contain the main conveyor belt hauling coal out of the mine.

Construction of the portals will be done within the existing permitted disturbed area boundary. The existing disturbed area boundary will not be increased. The existing sediment pond has been sized to accommodate this new portal construction area, so no changes to the sediment pond will be required. Except for adding a new culvert under the access ramp to the new portal, none of the previously approved and existing surface drainage structures will be affected.

In the area of the new south portals, the base of the coal seam is located approximately 17' above (i.e., higher than) the level of the existing mine-yard. An earthen ramp will be constructed on the existing pad to gain access up to the level of the coal seam. In the area of the intake and fan portals, the existing hill slope will be excavated with a back-hoe to expose the coal seam in preparation for construction of the portal canopies. A small elevated pad will also be constructed in front of the fan portal on which the mine fan can later be installed. This fan pad will be constructed as a continuation of the access ramp leading to the intake portal. The access ramp to the intake portal and the fan pad will be constructed partially using the earthen material generated in the process of facing up the coal seam and partially using fill material hauled in from an off-site borrow source. The imported fill material will come from the same source (i.e., the same borrow pit) that supplied the pad material for the recently completed surface expansion. This borrow site would be the Nielson Construction commercial borrow pit located in Huntington Canyon below the power plant. As the access ramp is being constructed a new culvert (C-11A) will be added to handle sheet flow drainage from the upper material yard (see Plate 7-5).

As the access ramp and fan pad are constructed from the existing yard surface up to the level of the coal seam outcrop, some of the new fill material will be placed up against the intervening existing undisturbed slope. Part of the access ramp/fan pad will therefore be constructed on top of the existing slope. Before this ramp/pad is constructed, topsoil along the existing slope below the fan pad and access ramp will be protected in-place using a geotextile cover placed along the undisturbed slope under the fill material. This topsoil protection technique would be identical to the approved method used during construction of the existing surface expansion facilities (Phase I surface expansion).

After the access ramp and fan pad have been constructed (and the underlying in-place topsoil protected with geotextile), the portal excavation can begin. Prior to starting the portal cuts, the existing topsoil at the portal sites will first be salvaged. Topsoil conditions along the south slope

Revised 4/05/2003

portal area is similar to the conditions at the adjacent coal pile area where topsoil was salvaged during August, 1998. This topsoil salvage effort is described in appendix 2-5, Part II, prepared by Pat Johnson, soil scientist. At that area, according to Ms. Johnson's report, the depth of true topsoil was 3" but an average of 8" - 9" of material was taken due to the operating nature of the backhoes which were employed in the salvage process. In addition, an intensive soil inventory and site investigation was performed on the south slope on August 18, 1998 and is included in Appendix 2-6.

In order to minimize the area of additional disturbance associated with the construction of the south portals these portals will be constructed by excavating individual pockets into the hillside for each portal rather than along a common highwall. Topsoil has already been removed from the belt portal site. By utilizing individual pocket cuts for the portals the total area of new disturbance is expected to be less than 4500 sq. ft. (0.11 acres). Topsoil will be removed from the areas of the south portal pocket cuts prior to excavation as described in Section 2.31.1. According to the Nyenhuis survey, the upper two feet (24 inches) is suitable for salvage. Based on the Nyenhuis soil survey it is anticipated that approximately 9000 cu. ft. (333 yds.) of topsoil will be salvaged from the intake and fan portal cuts.

The salvaged topsoil will be stored on the existing topsoil pile #4 located off-site at the bottom of Crandall Canyon. This topsoil pile is constructed on Forest Service land under a Special Use Permit issued on 8/17/87. This pile #4 was originally constructed in 1997 during Phase 1 of the surface facility expansion. At that time it was designed and constructed sufficiently large to accommodate the additional topsoil storage requirements for the Phase 2 south portal construction. The Forest Service has concurred with the addition of the south portal topsoil to this pile. All topsoil removal, salvage and storage will be over-seen, directed and monitored by an independent soils scientist approved by the Division. A report of the topsoil salvage operation will be prepared by the soil scientist and added to the MRP upon completion as Appendix 2-5, Part III.

After the portal sites have been faced up construction of the portal canopies will begin. These canopies will be constructed from 6" steel I-beams and 1/4" steel plate according the MSHA guidelines. These canopies will measure approximately 8' high by 20' wide and will extend underground as far as needed to insure adequate roof protection. The canopies will be anchored to concrete footers. These canopies will provide a safe structure from which the miners can begin driving the entries back into the coal seam. These portal canopies will be similar to the existing portal canopies. After the intake and fan entries have been driven into the hillside and connected together underground with a cross-cut, work can then be started on construction of the mine fan installation. The fan will be an 8' diameter Spendrup or Joy axial vane (or equivalent) electric powered fan. It will not have a diesel powered back up. It will be mounted on concrete foundations located on the newly constructed fan pad. The fan installation will be very similar to the existing fan structure. While the fan is being installed, the miners will drive the belt entry from inside the mine out to the belt portal. During this phase of development, mined coal will be moved away from the surface with a front-end loader, a mobile radial stacker, or some other temporary means of conveyance. After the belt portal connection is completed, a new conveyor truss will be

Revised 4/05/2003

installed from a concrete landing at the belt portal out to the existing coal pile. The conveyor will be 48" wide, supported on a steel box truss which will extend from the new portal to the existing stacking tube. An intermediate bent support may be required, depending on final engineering. If this bent is required it will be anchored to a concrete foundation constructed on the existing coal pad. The conveyor will be covered to minimize fugitive dust. The air quality permit will be revised prior to construction to include the new conveyor (see Appendix 5-23). This truss/bent structure will be similar to the existing truss/bent structure, but only one fourth as long. All coal from the mine will then be delivered directly to the existing coal pile and will be crushed and loaded on trucks through the existing coal handling facilities.

The access ramp leading into the portals will be approximately 100' long and 20' wide. It will have jersey barrier guards along both sides. The ramp will be constructed from the imported fill material, laid down in 12" - 18" lifts, and compacted to 90%. The only vehicles using the ramp will be underground mine vehicles going in and out of the mine. Therefore the ramp is not considered a road. Drainage from the ramp will be handled by the existing drainage structures and the new culvert (C-11A) as shown on Plate 7-5. It is estimated that approximately 3500 cubic yards of fill will be needed to construct the access ramp/fan pad. This quantity will be verified after construction on the as-built plans.

Power, water, communications, and other mine infrastructure will be supplied to the south portals as an extension of the pre-existing Crandall Canyon Mine facilities.

Figure 5-11 depicts a typical cross-section through the south portals, showing the pocket cut, access ramp, in-situ soil geotextile protection, and the portal canopy construction.

Figure 5-12 depicts a typical cross section along the south portal conveyor belt structure.

Revised 4/05/2003

GENWAL is also considering a second possible option for constructing the south portal intake and fan portals. Instead of constructing a ramp up to the level of the coal seam, short tunnels would be driven from the existing yard level up to the coal seam. In this scenario the pocket cuts would be be made into the hillside lower down at the same level as the existing pad. This level is approximately 15' below the base of the coal seam. Since the coal seam sits directly on top of the Star Point Sandstone, this sandstone out-crops at the existing yard level. Tunneling would begin in the sandstone and ramp up underground to the coal seam.

If the tunnels are driven at an incline of 10% they will be about 160' long to where they intersect the base of the coal seam. At 8' high and 20' wide, excavation of the two tunnels (intake and fan) would generate approximately 1900 cu yds. of material during construction. This tunnel excavation material will consist of sandstone mixed with coal. This excess material would be disposed of by placing it in a 6' deep layer along the existing fill bank located between the upper material yard and the coal storage pad. This embankment is part of the designated coal storage area and currently is covered with coal. Therefore, after the tunnel excavation material is layered onto the embankment, it too will be covered over by the active coal pile for the remaining life of the mine. Refer to Figure 13-a and 5-13b for more details of this tunneling construction option.

Upon final reclamation the tunnel excavation material would be hauled back into the mine tunnels where it would be sealed up prior to backfilling the portals. Backfilling and reclamation of the portal pocket cuts would be the same regardless of whether the ramp or tunnel option is selected. If GENWAL elects the tunnel construction option, topsoil will be salvaged in exactly the same manner as described previously. The amount of topsoil salvaged, stored and redistributed would be the same regardless. If the tunnel option is selected, there would be no additional in-place topsoil required to be protected with geotextile, because there would be no fill material placed up against the hillside.

If this option is selected, GENWAL commits to ensuring the protection of the hydrologic balance for surface and groundwater systems as required by R645-301-731. The tunnel excavation material will be tested for acid- and toxic-forming material and the analytical results of this testing will be presented to the Division. The hydrologic balance will be protected in the following manner.

a) The excavation material will consist of fragmented Star Point sandstone. This sandstone outcrops naturally in the minesite area and is one of the major geological features which determine the character of Crandall Canyon and many other canyons in the Wasatch Plateau. This predominant sandstone is not known to be acid- or toxic-forming anywhere in the Utah coalfields. However, further site-specific testing of the sandstone will be conducted prior to any construction.

Revised 4/05/2003

b) The proposed location of the material storage is on top of the existing pad fill. Any runoff from this area would report to the existing sediment pond.

c) The existing pad fill in the proposed storage area varies between 10' and 40' thick over the bypass culvert and is densely compacted. This thickness of compacted fill material is sufficient to preclude any leaching downward into the bypass culvert or groundwater.

Revised 4/05/2003

5.26.10 Coal Handling

Coal exits the mine on a 48" conveyor belt, is transferred onto 48" overhead conveyor belt and drops into the run of mine coal stockpile. The coal is reclaimed from the stockpile and is conveyed to crusher station. Crushed coal is then conveyed directly to the silo. From the silo, it is weighed and loaded into coal trucks.

An automated coal processing facility has been installed at the GENWAL mine site. The facility, as-built layout, can be found on Plate 5-6. Design calculations are located in Appendix 5-13.

Coal from the mine is delivered to a concrete stacking tube. This structure will support a nominal 30,000 ton storage pile. The coal is reclaimed from the pile through an underpile drawdown system designed to feed a reclaim conveyor. Reclaimed coal is screened and crushed to a 2 x 0 product, then transported to a computer-operated batch-weight truck loadout facility. From there it is loaded into the trucks and transported off the minesite to market. The new surface facilities has been painted a neutral gray color to blend with the existing environment with minimal visual obtrusiveness.

After the new facilities are operational, the old loadout facilities were completely dismantled and removed from the site. The truck scales were also removed and the road repaved and re-established as a two lane road meeting Forest Service standards. Coal and coal debris will be cleaned from the loadout area and from around the existing retaining wall area. The rehabilitated loadout site will be used for storage of snow and/or road traction material in the winter time and other suitable storage needs in the summer time. A slotted culvert has been installed on the roadway below this storage area. The slotted drain will direct any road runoff and material tracked down the road into the sediment pond for treatment.

5.26.12 Power System, Transmission Lines, Substations, Feeders

Power for the mine, both underground and surface use, is provided by transmission lines from Utah Power, and Light. The substation and transformer built by PEMCO provides 7200 volts to surface and underground power centers. The power lines run in underground cement covered conduit from the substation to a visual disconnect located by the bathhouse portal. From the visual disconnect it travels through 4" steel conduit into the mine. All electrical installations meet the appropriate 30 CFR Part 75 and 77 MSHA regulations. The placement of electrical installations can be found on Plate 5-3. Plate 5-8 gives a detailed layout of the substation and transformer facility.

Utility poles located on the surface will be constructed to protect raptors, all wires will be insulated and there will be no exposed conductors. All electrical installations will be done in accordance with MSHA regulations.

5.26.13 Surface Equipment

Underground supply equipment will be used on the surface as needed. The following is a list of equipment used exclusively on the surface:

Fork Lift	Snow Plow	Front End Loader
Pick-up Trucks	Diesel Tractors	Bobcat tractor
Dozer		

5.26.14 Culinary Water System

The culinary water used at the mine is purchased from a vendor who is supplied from a state approved water system, or taken from the deep well (MW-1) located at the mine portals. This deep well has been installed in accordance with state health regulations for culinary use. The culinary water is placed in containers designed for this purpose. Drinking water at the mine is provided as bottled water.

The water used underground is placed in the mine sumps located underground. The location of the sumps will change as mining progresses across the reserve and will not remain in any one area permanently.

5.26.15 Sewage System

The bathhouse, located underground, and a new proposed bathhouse for the culvert expansion project is designed and constructed in accordance with the State Health Department's rules and regulations. The sewage will be contained in a concrete holding tank and pumped by a licensed contractor and disposed of at a State approved sewage treatment plant. The sanitary facilities underground will comply with all MSHA regulations. The sewage facility can be found in Appendix 5-12.

5.26.16 Sedimentation Control Structures and Water Treatment Facilities

The existing sedimentation pond was reconstructed during the 1986 and 1989 construction seasons and enlarged during the culvert expansion project in accordance with R645-301-526.300, as detailed in the Runoff and Sediment Control Plan located in Chapter 7.

Underground sumps will be built in order to effectively treat underground water before discharging into Crandall Creek, refer to Plate 5-4 for the sump locations. All discharge into the creek will meet effluent limitations of the UPDES permit and monitored in accordance with that permit, (Appendix 5-14). The sediment pond and the underground sumps are the only water treatment facilities proposed at the mine site.

5.26.21 Utility Installation and Protection

All coal mining and reclamation operations will be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells; oil, gas, and coal slurry pipelines, railroads; public utilities; etc. which pass over, under, or through the permit area, unless otherwise approved by the owner of those facilities and the Division.

5.26.22 Operation of Support Facilities

Support facilities will be operated in accordance with a permit issued for the mine to which it is incident or from which its operation results.

5.26.3 Water Pollution Control

See "Waste Disposal Plans" under the Mining Operation section of this chapter.

5.26.4 Air Pollution Control

Coal mining and reclamation activities will be conducted in accordance with R645-301-420 and the Air Quality Approval Order issued by the Utah Division of Air Quality (Appendix 4-7).

5.27 Transportation Facilities

The coal from the mine will be transported to the rail loadout or final destination by truck. The trucks are typical 45 ton tandem trailer coal haulers used in the Utah coal fields. GENWAL uses a loading site on the Utah Railway located at Mohrland, Utah, a loading facility on the Southern Pacific Railway in Wellington, Utah, and other independently owned loadouts within the Carbon/Emery county area.

The Forest Development Road from Huntington Creek to the truck turn around area was constructed under the definition of a class one road and will be maintained as a primary road, in compliance with the road use permit issued by the U. S. Forest Service, Manti-La Sal National Forest. The forest access road will remain as part of the post mining land use in accordance with the Forest Service Permit (Appendix 1-2). The Forest Service Access Road, upgraded under the definition of a class two road, is maintained as a primary road. The road connects the main pad area, the truck turn around area, and the Forest Service Parking/Turnaround to the Huntington Canyon Road (State Route 31). The road is designed, maintained and will be restored in accordance with the Forest Service road use permit.

The road from the lower pad area to the upper pad area was built under the definition of a class two road and is maintained as a primary road. It is designed (as shown on Plate 5-10)

maintained and restored in accordance with R645-301-527.120. The Ancillary road to the portal area was built under the definition of a class three road and was designed (as Shown on Plate 5-10), is maintained and restored in accordance with R645-527.130.

The Forest Service Development road has been designed and was approved by the USFS prior to construction. The design drawings are on file with the Manti-La Sal National Forest in Price, Utah. During the 1991 construction season GENWAL Resources Inc. improved and asphalted the Forest Service Development road and surface facilities area of the Crandall Canyon Mine (as shown on Plate 5-3). The improvement information covering the haul road and facilities area is addressed in Appendices 5-15, 5-16, and 5-17.

The Forest Service road (primary road) is utilized by coal haul trucks, mining equipment (on a limited basis), support vehicles, employees, and recreational users (public). The two roads located on the permit area, the portal pad road and the access road to the main pad, are utilized by both surface and underground mining equipment, support vehicles, and employee vehicles. The ancillary road to the portal area is utilized by service vehicles on a very limited basis. The ancillary road to the upper unused area has been reseeded.

The forest parking area past the mine site was preserved for recreational/forest service parking and with verbal approval for the short term storage or mine equipment being onloaded/offloaded or moved as a part of upgrading or retrofitting.

Because of the limited space available at the existing site, snow removal and storage is now a problem. Currently, under agreement with the Forest Service, limited snow storage is allowed in the Forest Service trailhead parking area. This practice is less than ideal however. Snow storage in this area limits the amount of available public parking. Snow melt and runoff from the snowpiles often makes the parking area muddy in the springtime and makes sediment control into nearby Crandall Creek more challenging. The expanded operations area should relieve congestion at the site and free up both the parking area and the Forest Service road and make snow storage in the parking area unnecessary. Snow storage will become available in the area of the existing loadout facilities once these facilities have been removed and the area cleaned up properly as part of the overall site expansion project. Snowmelt from this new storage area will be able to report directly to the sediment pond located nearby. There will be absolutely no snow storage in the sediment pond itself.

After construction of the surface expansion is completed, the Forest Development Road 50248 will be returned to double lane width through the permit area to the Forest Service trailhead parking area. This will be accomplished by the following:

a) The existing loadout facilities will be removed and cleaned up and the road will be widened, realigned, and repaved through this area.

b) The existing truckscales and exit ramp will be removed from the middle of the road and the roadway will be re-established and repaved in this area.

c) The existing oil storage shed will be rehabilitated and the roadway will be regraded and repaved in this area. This storage facility has been designed and constructed to adequately contain the volume of the largest storage tank plus the additional volume of any direct precipitation which may accumulated within the containment area.

d) The existing roadway from the loadout up to the truck turnaround area will be widened by approximately 15 feet. This will result in an additional (third) lane which can be used by the trucks as a stacking lane as they wait to enter the loadout to be loaded. This will free up the existing road for unobstructed two-way, two lane traffic to facilitate public use of the road for Forest related activities.

e) The turn-around area will also be widened to allow the trucks to turn in a standard counter-clockwise direction and thereby eliminate the present practice of clockwise cross traffic turnarounds.

f) Construction of the high speed, high efficiency truck loadout will in and of itself help minimize the congested conditions which now exist within the mine site. Presently trucks are often forced to stop along the Forest Service road while waiting to be loaded. The expanded coal storage capabilities and the new high-speed truck loading facilities will allow the trucks to be loaded in a continuous, uninterrupted basis, thereby eliminating the major cause of tie-ups and congestion.

g) After the Forest Service road has been re-established, (i.e. realigned and repaved) the roadway will be striped to properly delineate the travelway through the mine site areas to the Forest Service Trailhead. The travel lanes will be clearly marked to help separate public traffic on the road from truck traffic associated with the coal operations. Signs will also be installed to direct the public to the trailhead and to instruct the public as to which areas within the minesite should be avoided in order to prevent conflicts with the ongoing operations. These direction signs will be readily visible to the motoring public and will conform to the Manual of Uniform Traffic Control Devices .

The plan view for roads may be found on Plate 5-3. The typical cross section for each road and their corresponding profile may be found on Plate 5-10.

The coal trucks exit to the east of the loadout facility and onto the USFS road (see Plate 5-3). Roads in the permit area are inspected in order to determine the maintenance required to minimize and correct erosion problems before they become extensive. Maintenance will be performed as required to control erosion. This maintenance will include maintaining the ditches, resurfacing when needed and maintaining proper drainage.

See Plates 5-3, 5-10, 5-19, and Appendix 1-2 for more sections and details of the roads within the permitted boundaries. If a road is damaged by a catastrophic event, such as a flood or earthquake, it will be repaired as soon as practical after the damage has occurred.

5.28 Handling and Disposal of Coal, Overburden, Excess Spoil and Coal Mine Waste

5.28.10 Coal Removal, Handling, and Storage

See Section 5.26 of this chapter. See Section 5.4 for removal and reclamation.

5.28.20 Overburden

See Section 5.28.30 for removal and reclamation.

5.28.30 Mine Development Waste, and Noncoal Waste Removal, and Overburden

The Crandall Canyon Mine produces a run of mine product for final sale, this product does not contain any mine related rock or development waste. The method of mining used at the Crandall Canyon mine produces no development waste, however small amounts of rock waste are generated in unexpected roof falls and overcasts. This rock waste is not brought to the surface, but is disposed of on pillar lines or stored in areas that have been mined or where no second mining is to be done. The material disposed of on the pillar lines will be of the same nature that naturally caves in the pillaring process, therefore no leachate will be formed other than that associated with normal pillaring.

In no event will the disposal of this material interfere with future recovery of the coal resource without consent of the BLM or the managing agency of the coal resource. In the unlikely event either rock, development, and/or processing waste is encountered, and the volume exceeds the capacity that can be disposed of along pillar lines; GENWAL commits to disposing of the waste in a DOGM approved disposal facility. GENWAL will notify and consult with DOGM regarding disposal sites; all waste disposal will be done in accordance with MSHA regulations.

The waste generated by the normal underground mining activities will be brought outside the mine for disposal. No oil or grease will be intentionally disposed of underground. All solid waste brought to the surface will be disposed of in a trash container until the container becomes full, at which time the container will be transported to a State approved landfill for final disposal.

At the present time the landfills to be used will be the state approved Nielson landfill or American Kinfold landfill (M&P Enterprises, which are located next to the county landfill, approximately 1.5 miles north of Orangeville, Utah, and if another State approved landfill becomes available and is more cost effective, then this landfill will be utilized. The operator will notify the Division prior to any waste disposal in any landfill other than those mentioned. The location of the new landfill and a statement from the DOH indicating the landfill permit number, the permit term and any conditions that the DOH has concerning the disposal of noncoal waste will be submitted to the Division. In no event will liquids be disposed of in landfills that are not permitted to handle such

material. Scrap metal and used equipment will be removed from the mine unless safety considerations prevent removal.

Oil contaminated soil from the gas and oil storage area will be disposed of prior to reclamation or moving of the facility. If oil or gas spills occur outside the containment area, the spill will be contained, cleaned up and disposed of in a permitted facility. The contaminated material will be disposed of at a facility licensed to accept oil/gas contaminated soil or remediated onsite with appropriate approvals from the pertinent regulatory agencies.

Processing Waste

No processing waste is generated at the Crandall Canyon Mine. Only coal is removed from the mine, all of which is trucked off site and sold. Exploratory drill hole data and mining conditions indicate that no development or processing waste will be produced. However, in the unlikely event either rock, development and/or processing waste is encountered, and the volume of waste generated exceeds the capacity that can be disposed of along pillar lines, GENWAL commits to disposing of the waste in a DOGM approved disposal facility. GENWAL will notify and consult with DOGM regarding disposal sites. All disposal operations will be in compliance with Utah Coal Mining regulations R645-301-536 and R645-301-746.

Hazardous Wastes

In the unlikely event that hazardous or toxic material is encountered, GENWAL will notify the Division as well as the State Health Department; the hazardous or toxic material(s) will be disposed of at a facility permitted to accept the specific contaminants found.

Sediment Pond Waste

Sediment removed from the pond during the cleaning process will be hauled to an approved waste disposal facility. Prior to cleaning the sediment pond, representative sediment samples will be collected and analyzed for any acid- and/or toxic forming materials (as listed on page 5-39A). If the analytical results exceed the toxic limit, the waste material will be handled and disposed of in compliance with regulations applicable to acid- and/or toxic forming materials. GENWAL will notify DOGM if the analytical results of the samples show that acid or toxic forming materials are present.

Sanitary Waste

There are less than 10 regularly assigned employees on the surface per shift. These surface employees use the bathhouse for their sanitary waste needs. Waste from the underground bathhouse toilets and showers is pumped to a holding tank located underground. When required the holding tank is pumped and the materials are disposed of by a licensed contractor at a State Health approved disposal site (See Appendix 5-12). GENWAL will keep records of the sewage pumped from the tank by the contractor. The sanitary waste needs for the miners underground will be handled in accordance with MSHA regulations.

5.29 Management of Mine Openings

Five portals have been placed on the Star Point Sandstone in the Hiawatha coal seam. Four of the five portals are used while one of the portals is sealed. Three portals are used for intake ventilation, beltline, and return ventilation. The fourth portal opening is used for access to the underground bathhouse. Two identical fans located at the return portal will operate in parallel. One fan will discharge horizontally and the second vertically.

These portals existed during previous mining attempts and will be utilized during current mining operations. The highwall above the portals has been secured and canopies have been installed to maintain the portals at MSHA standards. During operation of the Crandall Canyon Mine, access to all mine openings are controlled by the operator during working and nonworking hours. Due to public access through the mine site, a security person is located at the mine during times of no work or when surface personnel are not present. Permanent sealing of underground openings is discussed in Section 5.42.71 of this chapter.

5.30 Operational Design and Plans

5.32 Sediment Control

The design of the sediment control structures is presented in Chapter 7, Section 7.42 of this document. The designs are intended to minimize the disturbance to the hydrologic balance by disturbuting the smallest practical area at any one time during the mining operation through progressive backfilling, grading, and prompt revegetation as required in R645-310-353.200, and to stabilizing the backfilled material to promote a reduction of the rate and volume of runoff in accordance with the regulations.

5.33 Impoundments

The only impoundment on the Crandall Canyon Mine site is the sedimentation pond. The design of the sediment control structures is presented in Chapter 7, Section 7.42 of this document. The sedimentation pond meets criteria of R645-301-533 as shown in Appendix 7-10, page 7.

EarthFax Engineering, Inc. previously conducted the sediment pond design and stability analysis (Chapter 7, Section 7.42 and Appendix 7-6) which determined that the old sediment pond was stable under static and seismic conditions. The redesigned pond, constructed in conjunction with the surface facility expansion, does meet the minimum regulatory requirement of 1v:5h combined upstream and downstream side slopes. Refer to Appendix 7-4 for additional detail on the sediment pond.

5.34 Roads

The primary roads associated with the Crandall Canyon Mine have been located on the most stable available surfaces. They have been surfaced with materials (gravel, road base, asphalt, etc.) approved by the Division as being sufficiently durable for the anticipated volume of traffic and weight and speed of vehicles using the road. All roads falling under DOGM regulations are built on cut material and, as a result, no embankments were used during road construction. The roads are routinely maintained to include repairs to the road surface, blading, filling potholes and adding replacement surface material when needed. Culverts and ditches have been installed and are maintained to sustain the life of the roads during the operational life of the mine. See Plate 7-5A for the location of culverts and Appendix 7-11 for the culvert designs. See Section 5.27 for further information on these roads.

The area not designated as a primary road is the upper pad. This area has been asphalted to the approval of the Division. The pad is utilized for parking, loading and unloading of supplies and equipment, storage for those supplies, a staging area for new and rebuilt underground equipment, and access to the primary road to the portal area. It is maintained to include repair to the pad surface, blading, filling potholes and adding replacement surface material when needed. Roads within the permit area used for mining operations will comply to R645-301-534.100 through R645-534.340.

After the new expansion facilities were completed, the existing loadout facility, including the truckscales, were dismantled and removed from the site. The oil storage shed will also be rehabilitated. The area was then regraded and repaved, allowing the Forest Service road to be re-established as a two lane road. In addition, the existing roadway heading up to the truck turnaround area was widened by approximately 15 feet. This resulted in an additional third lane which can be used by the trucks as a stacking lane as they wait to be loaded. This will free up the existing road for unobstructed two way, two lane traffic to better accommodate public, Forest related use of the

road. The turn around area will also be widened to allow the trucks to turn in a standard counter-clockwise direction and thereby eliminate the present practice of clockwise cross traffic turn arounds.

The expanded coal storage capabilities and the new high-speed truck loading facilities now allow the trucks to be loaded in a continuous, uninterrupted basis, thereby eliminating the major cause of tie-ups and congestion.

5.35 Spoil

There are no permanent refuse sites located on the property. All spoil is controlled and maintained as described in Section 5.28.30 and Section 7.54 of Chapter 7.

5.36 Coal Mine Waste

See Section 5.28 of this chapter.

5.37 Regraded Slopes

The following information supplied is incorporated within the currently approved mine plan and variances have been granted. If a slide should occur within the permit area, GENWAL will notify the regulatory authority and comply with the remedial measures required by the regulatory agency.

The applicant concurs, that 1:1 excavation slopes are not suitable in the superficial topsoil deposits and have included slope rounding of these slopes at 1.5:1. If the factor of safety of 0.72 was correct, most areas of the existing canyon would already have failed as the natural slope approaches 1:1 in the entire canyon. Any excavation slope greater than 1:1 (with exception of slope rounding) would be unrealistic and impose unnecessary impact far beyond the current limits. In many instances, a 1.5:1 excavation slope is not realistic as the topography of the canyon exceeds this value.

Careful monitoring of construction in critical areas will be necessary to identify and use the correct design profile (i.e. 1:1, 1/2:1, or 1/4:1 slopes). The stability of the recontoured slopes has been demonstrated by the interim reclamation in evidence at the property. A number of these slopes are in excess of the proposed 1.5 to 1 final reclamation contours and have been in place for over ten (10) years. GENWAL will continue to observe these slopes and in the event that a failure occurs or evidence of instability is noted, such as sloughing, tension fractures, etc., all appropriate regulatory authorities will be notified and an acceptable plan to modify the proposed final reclamation contours will be agreed upon at a minimum of five (5) years prior to cessation of mining.

The roads are used to access the portal and substation areas and operations area as shown on Plate 5-3. Cut slopes of 0.25h:1v for competent bedrock, 0.5h:1v for fractured bedrock and 1h:1v for shallow surficial deposits less than four feet deep overlaying bedrock are proposed for the portal access roads.

A slope stability investigation was submitted by Delta Geotechnical Consultants and is included as Appendix 5-19 with a safety factor of 0.72 for the shallow surficial deposits of the proposed 1:1 cut slopes. Since the safety factor does not comply with UMC 817.162 (c) requirements, cut slopes with 1:1 slopes will be rounded to 1.5:1 in the shallow superficial material. Appendix 5-16 is a stability analysis of the storage pad (upper pad) at the Crandall Canyon Mine prepared by EarthFax Engineering, Inc. A reclamation slope stability analysis has been prepared by JME Consultants and is included in Appendix 5-21. This analysis shows that the minimum static safety factor of 1.3 for the reclamation fill slopes will be met.

5.40 Reclamation Plan

5.41 General

When no longer needed for mining operations, all entry ways or other openings to the surface from the underground mine will be sealed and backfilled. The permanent closures will be constructed to prevent access to the mine workings by people, livestock, and wildlife. Potential surface drainage will also be kept from entering the sealed entries.

Prior to final sealing of any openings, the BLM will require an on site inspection and a submission of formal sealing methods for approval of the BLM. The formal sealing methods will be presented as a plan including cross sections demonstrating the measures taken to seal or manage mine openings will comply with R645-301-529.100. At the time that the mine closure plan is submitted to the BLM, a copy will be forwarded to the Division for concurrence and approval and for addition to the mine plan on file. A copy will also be placed at the Emery County Recorder's office.

A formal plan will be submitted to the BLM for approval prior to final sealing of any openings. As per their on site inspection and plan approval, the openings will be sealed. All surface equipment, as well as structures, including all concrete foundations, will be removed by the applicant after the permanent cessation of operations.

MW-1 Supply Well Abandonment

Upon permanent cessation of mining operations, the water supply well, MW-1, will be permanently abandoned in accordance with regulations promulgated by the Utah Division of Water

Rights. This will include filling of the well with a neat cement grout in accordance with the regulations.

Temporary Cessation

If operations are to be temporarily suspended for 30 days or longer, the applicant will submit a notice of intention to the Division. This notice will include a description of the extent and nature of existing surface and underground disturbance prior to temporary cessation. The statement will also cover the type of reclamation which will have been accomplished to date and also include the type of ongoing monitoring, number of opening closures, water treatment activities and other topographic rehabilitative efforts which have been or will be undertaken during this period. The applicant will maintain and secure the surface facilities and mine openings.

GENWAL will implement the temporary cessation regulations as follows:

(a) GENWAL shall effectively support and maintain all surface access openings to underground operations, and secure surface facilities in areas in which there are no current operations, but operations are to be resumed under an approved permit. Temporary abandonment shall not relieve GENWAL of its obligation to comply with any provisions of the approved permit.

(b) Before temporary cessation of mining and reclamation operations for a period of thirty days or more, or as soon as it is down that a temporary cessation will extend beyond thirty days, GENWAL shall submit to the Division a notice of intention to cease or abandon operations. This notice shall include a statement of the exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been in the permit area prior to cessation or abandonment, the extent and kind of reclamation of surface area which will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, underground opening closures, and water treatment activities that will continue during the temporary cessation.

(c) Each mine entry which is temporarily inactive but has a further projected useful service under the approved permit application, shall be protected by barricades or other covering devices, fenced and posted with signs to prevent access into the entry and to identify the hazardous nature of the opening. These devices shall be periodically inspected and maintained in good operating condition by GENWAL.

(d) Each exploration hole, other drill hole, bore hole, shaft, well or other exposed underground opening which has been identified in the approved permit application for use to return underground workings, or to be used to monitor ground water conditions, shall be temporarily sealed until required for actual use.

5.42 Narratives, Maps, and Plans

5.42.10 Timetable

All reclamation, other than areas handled in interim reclamation, will commence with removal of the surface structures, redistribution of the cut and fill materials and final grading of disturbed surface areas. Within 30 days following completion of final grading (which should be in August), topsoil from the stockpile will be redistributed. Nutrients and soil amendments, if shown to be required by soil tests, shall be applied to the redistributed topsoil before the end of October. Seeding, transplanting and mulching will then proceed when moisture conditions are optimal for planting and seeding. Seeding will commence as soon as the seedbed is finished in the late fall. Tree planting will be done in conjunction with seeding or in the following spring, as soon as one can work the soil.

A reclamation sequence for the mine yard, including the proposed culvert expansion project, is described in Appendix 5-22.

Timetable-Reclamation Activities: First available season following cessation of mining

Normal Access- May 15,

Begin demolition- May 15
Structure removal- May 15 to June 30
Seal portals- Sept 1 to Sept 30
Asphalt Removal- June 15 to June 30
Earthwork/recontouring- May 15 to September 30
Topsoil redistribution- August 30 to Oct 15
Drainage Construction- Sept 1 to Sept 30
Hydroseeding- Sept 15 to Oct 30
Seeding/Planting- Oct 1 to Oct 30

Final Reclamation- (cessation of mining)

Year 1	May	June	July	Aug.	Sept.	Oct.
Struct. remove	———					
Portal Seals					——	
Asphalt remove	—					
Earthwork/recontour	———	———	———	———	———	
Topsoil redistribution/final grade					———	
Drainage Construction					——	
Seeding/Mulching						———
Planting						———

Year 2 through 10

Vegetation Monitoring	July 1 to August 30
Hydrologic Monitoring	June 1 to Oct 30 (4 times)
Subsidence Monitoring	July 1 to Oct 30

5.42.20 through 5.42.32 Final Surface Configuration

All areas affected by surface operations will be graded and restored to approximate original contour. All final grading will be done along the contour to minimize erosion and instability unless this operation becomes hazardous to the equipment operators. Backfilling and grading will proceed so as to eliminate the cut slopes and highwalls. Refer to Plates 5-16, 5-17, and 5-17A. The proposed culvert expansion project will supply all backfill material needed to achieve approximate original contour and to reclaim existing highwalls.

A reclamation map showing post construction interim reclamation area, Plate 7-5, and final reclamation, Plates 5-16, 5-17, and 5-17A, accompanies this document. Slope rounding on Plate 5-3 has been revised to meet the required slope of 1.5:1 at the specified reclaimed cross sections.

Interim Reclamation

All surface areas disturbed during construction and which are not needed for mining operations were revegetated in the fall of the year following completion of the construction. This revegetation was performed as described in Chapter 3 of this document.

Disturbed areas within the mine plan area that contribute water directly to the sediment pond have undergone interim reclamation. The goal of this reclamation was to achieve vegetative cover that will minimize erosion thus reducing the amount of soil material entering the sediment pond. To achieve this goal, a standard of 80% vegetative cover was met. Ocular estimates of cover are made each fall (early September) to determine if supplemental seeding is warranted.

A reclamation map showing post construction interim reclamation areas and final reclamation accompanies this chapter as Plate 5-17. The correct number of acres to be revegetated in final reclamation is 8.73 acres.

5.42.40 Bond Release

Before seeking bond release, GENWAL will provide a description of all temporary structures to be removed and reclaimed. No permanent sedimentation ponds, impoundments, and treatment

facilities that meet the requirements of the R645 rules for permanent structures will remain after final reclamation, Phase 2.

5.42.50 Timetable and Plans, Removal of Sedimentation Pond

The sediment pond will remain after the mining operations and through phase 1 reclamation until adequate revegetation has been established to control erosion. Reclaimed disturbed area drainages will be routed to the pond and diversions will be maintained to preserve the integrity of the pond until requirements of R645-301-763.100 have been met. These diversions can be found on Plate 5-16 and 7-5.

Upon approval of phase 1 revegetation, the sediment pond will be cleaned out and the material disposed of in the approved method. The sediment which accumulates in the sediment pond as a result of runoff from the reclaimed area should only be topsoil that has eroded from the reclaimed site (care will be taken not to mix the pond liner with this topsoil). This topsoil will be excavated, stockpiled and allowed to dry. Once the topsoil has been dried the sediment pond will be removed and the area regraded to remove any capability to impound water. Topsoil will be redistributed over the reclaimed sediment pond site and the area reseeded.

Removal of the sediment pond was included during final reclamation to comply with the direct request of the Price Office of the U.S. Forest Service.

5.42.60 Roads

The Forest Service Development Road from Huntington Creek to the Forest Service turn around will remain as part of the post mining land use in accordance with the Forest Service permit shown in Appendix 1-2. During reclamation, the Forest Service access road will be altered to comply with the special use permit. GENWAL has and maintains a "reclamation" bond with the Forest Service which covers the costs for the proposed post-mining road configuration.

As stipulated in the existing Forest Service special use permit (8/26/89) covering the road, during final reclamation the width of the road surface within the permit area will be reduced from a 27 foot subgrade and 22 foot running surface to a 20 foot subgrade and 14 foot running surface. Asphalt and subgrade removed from the permit area as part of this road narrowing will be taken to a RCRA-approved disposal site.

Based on recent correspondence, the Forest Service now indicates that it prefers to have the asphalt totally removed from the road surface upon final reclamation. GENWAL commits to reclaiming the road through the minesite to the specifications stated in the Road Use Permit.

All other roads used for the operation of the Crandall Canyon Mine, within the permit boundaries, will be reclaimed in accordance with R645-301-542.610 through R645-301-542.640.

5.42.70 Final Abandonment of Mine Openings and Disposal Areas

The old truck loadout was dismantled once the new loadout facility became operational. The loadout structures were removed and the excess coal around the area was cleaned up and hauled to the new coal stockpile area. This area will provide a place to store material as well as snow and salt in the winter time.

After the new loadout facilities was constructed, the existing loadout area was removed and the area rehabilitated and cleaned up. These rehabilitation measures include the following:

a) The existing loadout facilities will be dismantled and removed from the site, including the coal bin, crushers, scalehouse and loading chute.

b) The existing truck scale will be removed from the middle of the road and the roadway will be regraded and repaved.

c) The existing oil shed will be rehabilitated and the roadway will be regraded and repaved in this area.

d) The existing coal pile/storage area will be totally cleaned up. All coal and coal products will be removed. The area will then be swept and vacuumed.

e) The hillside below the coal storage area will be dressed up. The mine discharge waterlines will be relocated in a more orderly fashion. Coal products will be vacuumed from the hillside.

5.42.71 Closure and Management of Mine Openings

When no longer needed for mining operations, all entry ways or other openings to the surface from the underground mine will be sealed and backfilled. Prior to the sealing of the mine openings, all combustible material will be removed from the underground bathhouse. All structures that will interfere with sealing of the mine openings will also be removed. The permanent closures will be constructed to prevent access to the mine workings by people, livestock, and wildlife. Potential surface drainage will also be kept from entering the sealed entries.

All combustible material will be removed from underground and hauled to a state approved land fill. The portals will be backfilled with soil and two rows of solid concrete blocks placed across each entry and then backfilled to the surface and recontoured as shown on Plate 5-17. The block stoppings will be placed as far from the surface as is necessary to obtain a competent top and bottom.

5.42.72 through 5.42.742 Excess Waste

All waste material generated from the removal of the structures will be removed from the property and sold as scrap or disposed of in a state approved land fill. See Section 5.28 of this chapter for more detail on excess waste and spoil.

5.42.80 Estimate of Reclamation Costs

Estimate of reclamation costs as provided by the Division (included under Appendix 5-20) is as follows:

Direct Costs		
Subtotal Demolition and Removal	$630,986.00	
Subtotal Backfilling and Grading	$451,209.00	
Subtotal Revegetation	$42,385.00	
Direct Costs	$1,124,580.00	
Indirect Costs	$112,458.00	10.0%
Mob/Demob	$56,229.00	5.0%
Contingency	$56,229.00	2.5%
Engineering Redesign	$28,115.00	2.5%
Main Office Expense	$76,471.00	6.8%
Project Management Fee	$28,115.00	2.5%
Subtotal Indirect Costs	$301,388.00	26.8%
Total Cost in 2003 Dollars	$1,425,968.00	
Escalation factor		0.0289
Number of years		4
Escalation	$172,126.00	
Reclamation Cost 2007	$1,598,094.00	
Bond Amount (rounded to nearest $1,000)	$1,598,000.00	

Revised 06/06/2003

5.53 Backfilling and Grading

Backfilling and regrading of disturbed lands has been designed to restore all disturbed areas affected by surface operations to the approximate original contour of the land. This is made possible by the fill material required by the 1997 facility expansion project. Reclamation of affected areas, including revegetation is outlined in Chapter 3, Section 3.41.

During reclamation, the subsoils or backfill material will be laid down in 12" to 18" lifts and compacted through repeated travel by heavy equipment. This method has been utilized by a number of mines in the area and appears to give excellent compaction prior to topsoiling. In areas with slopes of less than 30%, the subsoil will be ripped to a depth of 18" prior to topsoil placement. In areas having average slopes of more than 30% the subsoil will be ripped to a depth of 12", where practical. Topsoil will then be redistributed in a manner that achieves an approximate, uniform stable thickness and other specifications stated in Chapter 2, Section 2.42 of this document.

Removal or Reduction of Cut Slopes and Highwalls

Prior to backfilling and grading of the highwall area above the portals and the cutslopes above the old coal loadout area and the pocket cuts at the south portals, existing shotcrete, wire mesh, clips, and other related material will be removed and disposed of in an appropriate manner. All noncombustible material generated from the removal of shotcrete will be disposed of underground (within the mine) prior to the sealing of the portals. All other waste generated will be removed and disposed of in an appropriate State permitted land fill.

Backfilling and grading will proceed so as to eliminate the cut slope, pocket cuts and highwall. Refer to Plate 5-3 for the highwall location. The cut slope above the coal stockpile area will be backfilled to match the approximate original contour with fill material from the Expansion Area pad. The Forest Service Trailhead Access Road will be left in place, but the surface will be modified to meet design specifications, as directed, by the Forest Service (see Appendix 1-2). See Plate 5-17 for the Forest Service road location.

The stability of the reclaimed highwall and cutslopes has a safety factor greater than 1.3 and is shown in Appendix 5-21.

No highwalls or remnants will remain after reclamation.

Terracing and Erosion Control

No terracing will be done. All final grading and surface preparation of overburden completed prior to the redistribution of the topsoil will be done along the contour to minimize erosion in areas with slopes less than 30%. In areas with slopes greater than 30% the grading, preparation and placement in a direction other than generally parallel to the contour will be used.
Revised 4/05/2003

Refuse Piles

There are no refuse piles at the Crandall Canyon mine site.

Surface Coal Mining

There will be no surface coal mining at the Crandall Canyon Mine.

5.60 Performance Standards

All mining and reclamation operations at the Crandall Canyon Mine will be conducted in accordance with the R645 rules and this permit.

CHAPTER 5

FIGURES

MAXIMUM SUBSIDENCE GRAPH

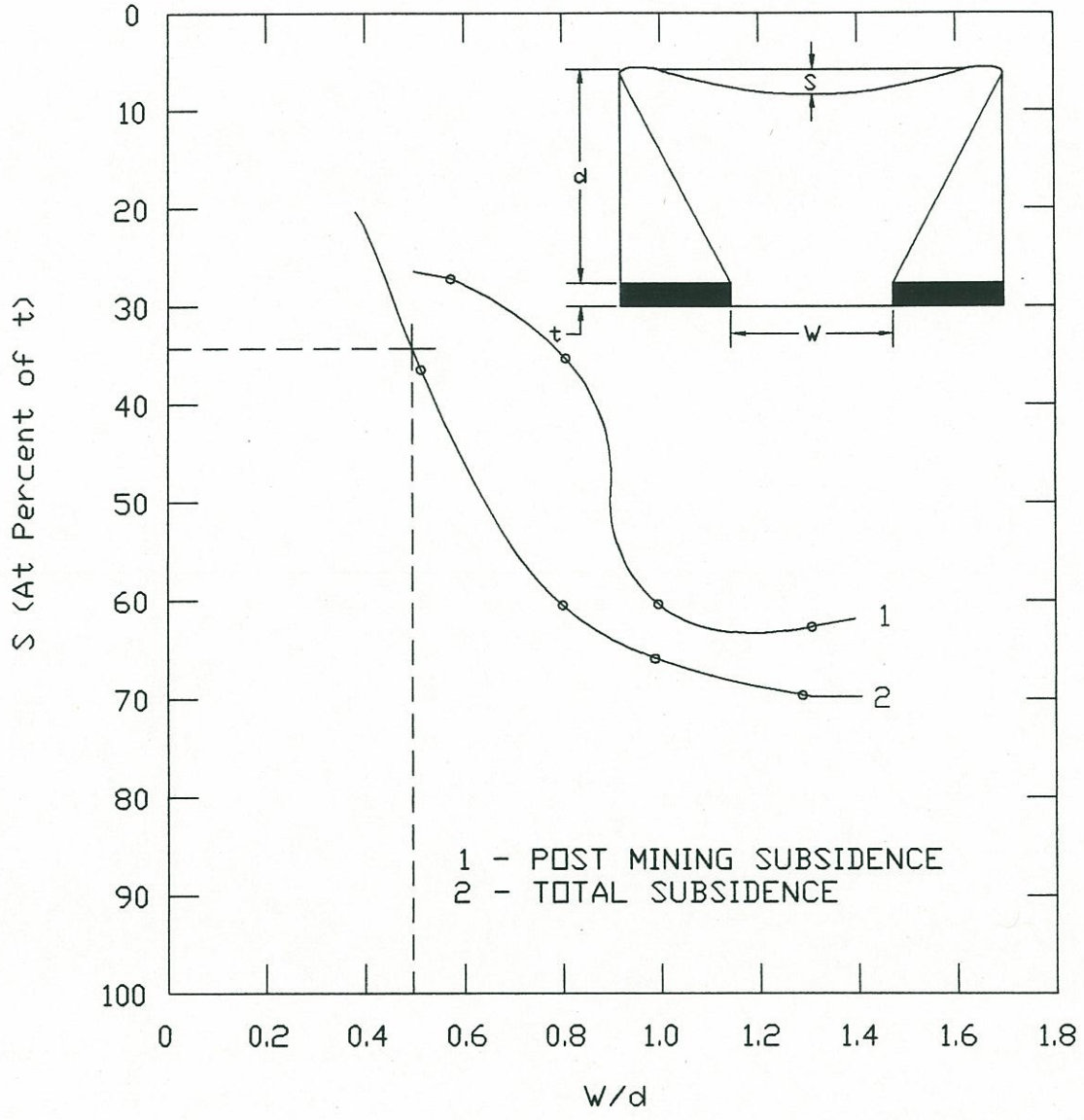
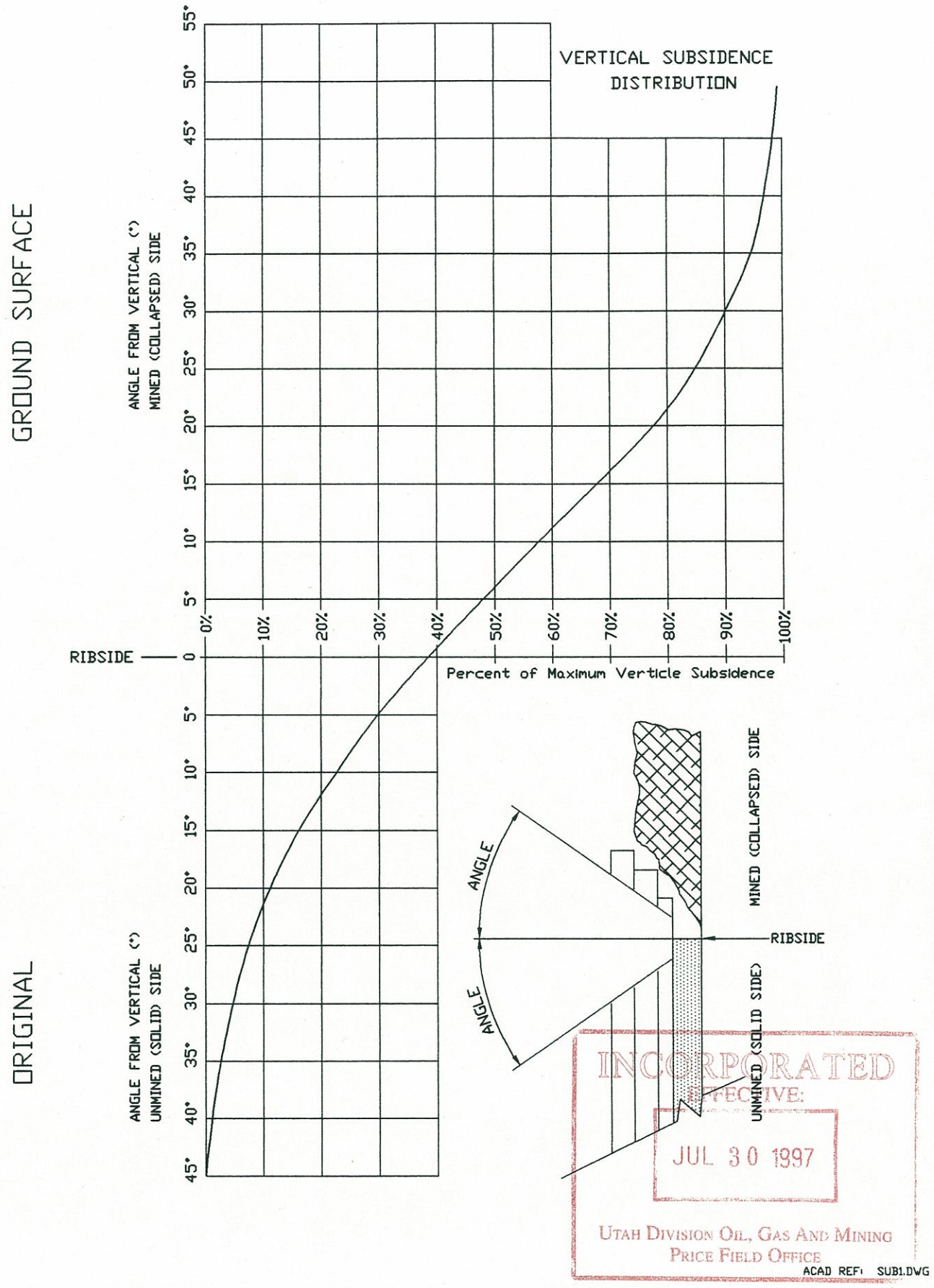


Figure 5-4

Maximum subsidence, as a percentage of seam thickness, versus width/depth ratio for room and pillar mine at Somerset, Colorado (after Dunrud, 1980).

ACAD REF: SUB2.DWG

FIGURE 5-5



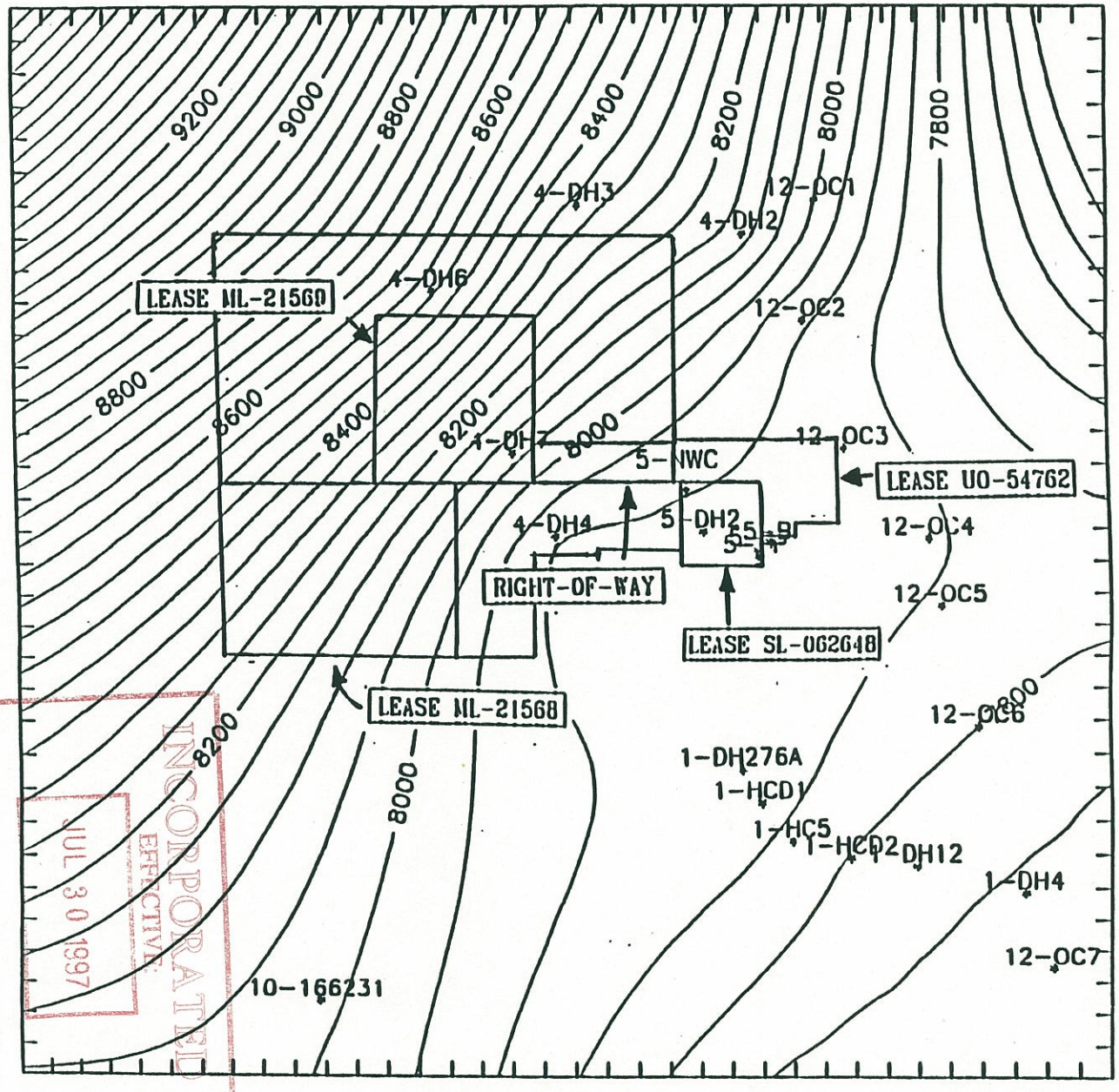


FIGURE 5-8

CONTOUR INTERVAL 50 FT.

SCALE 0' 5000'

EarthFax Engineering Inc.
Engineers/Scientists

FIGURE 5-8 STRUCTURE MAP

TOP OF HIAWATHA COAL SEAM.

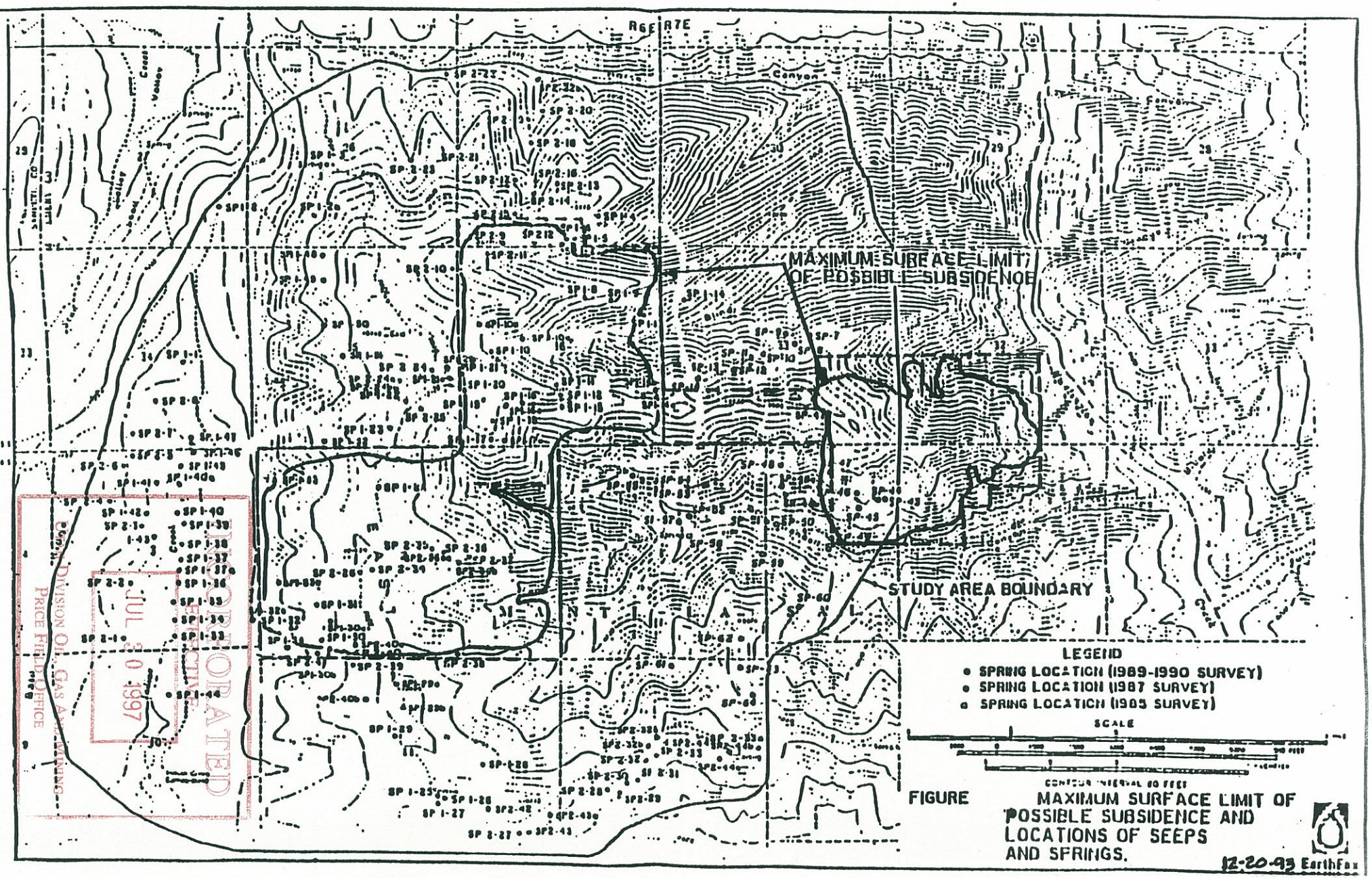
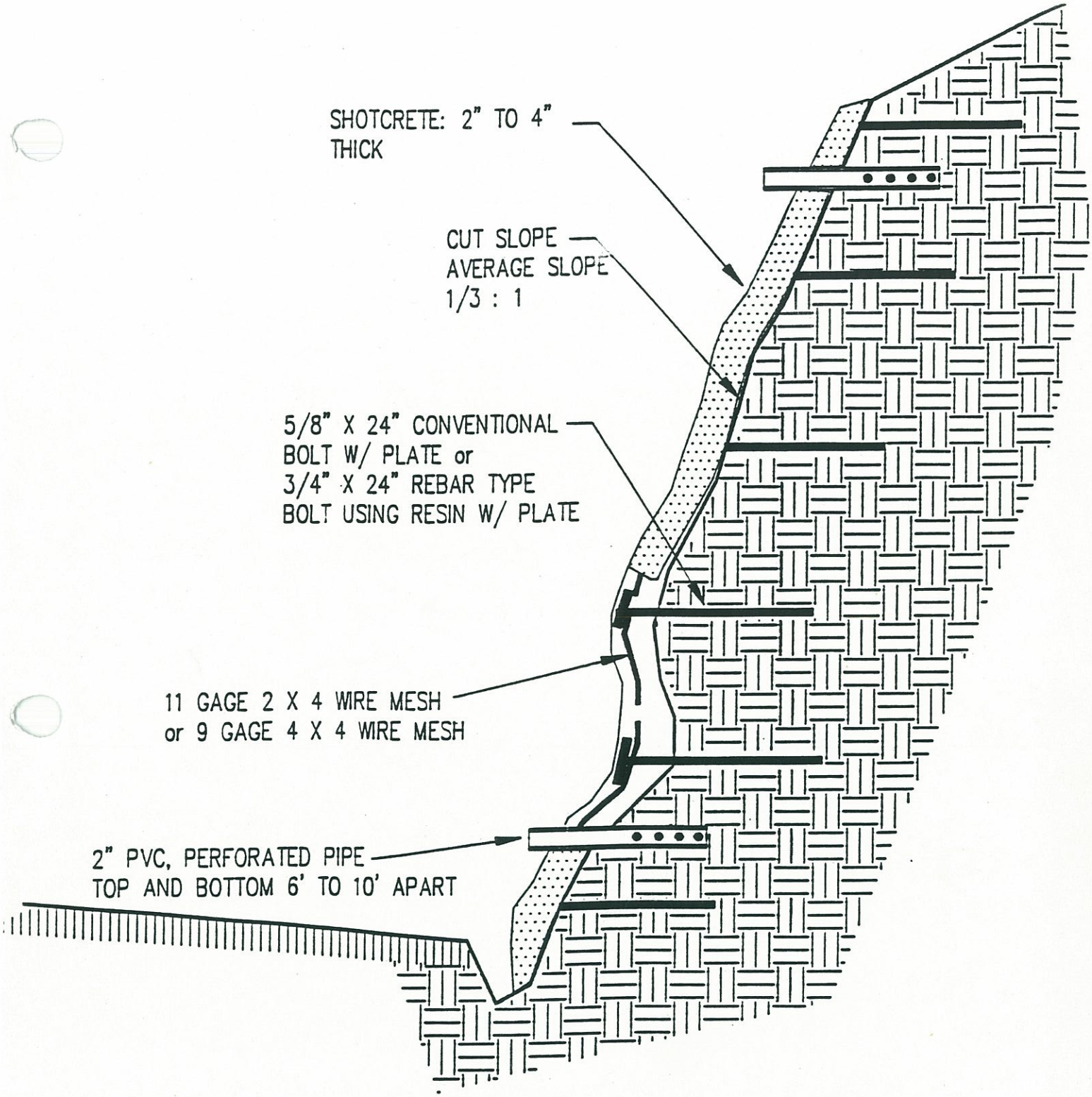


FIGURE 5-9

FIGURE MAXIMUM SURFACE LIMIT OF POSSIBLE SUBSIDENCE AND LOCATIONS OF SEEPS AND SPRINGS.

12-20-93 EarthFax

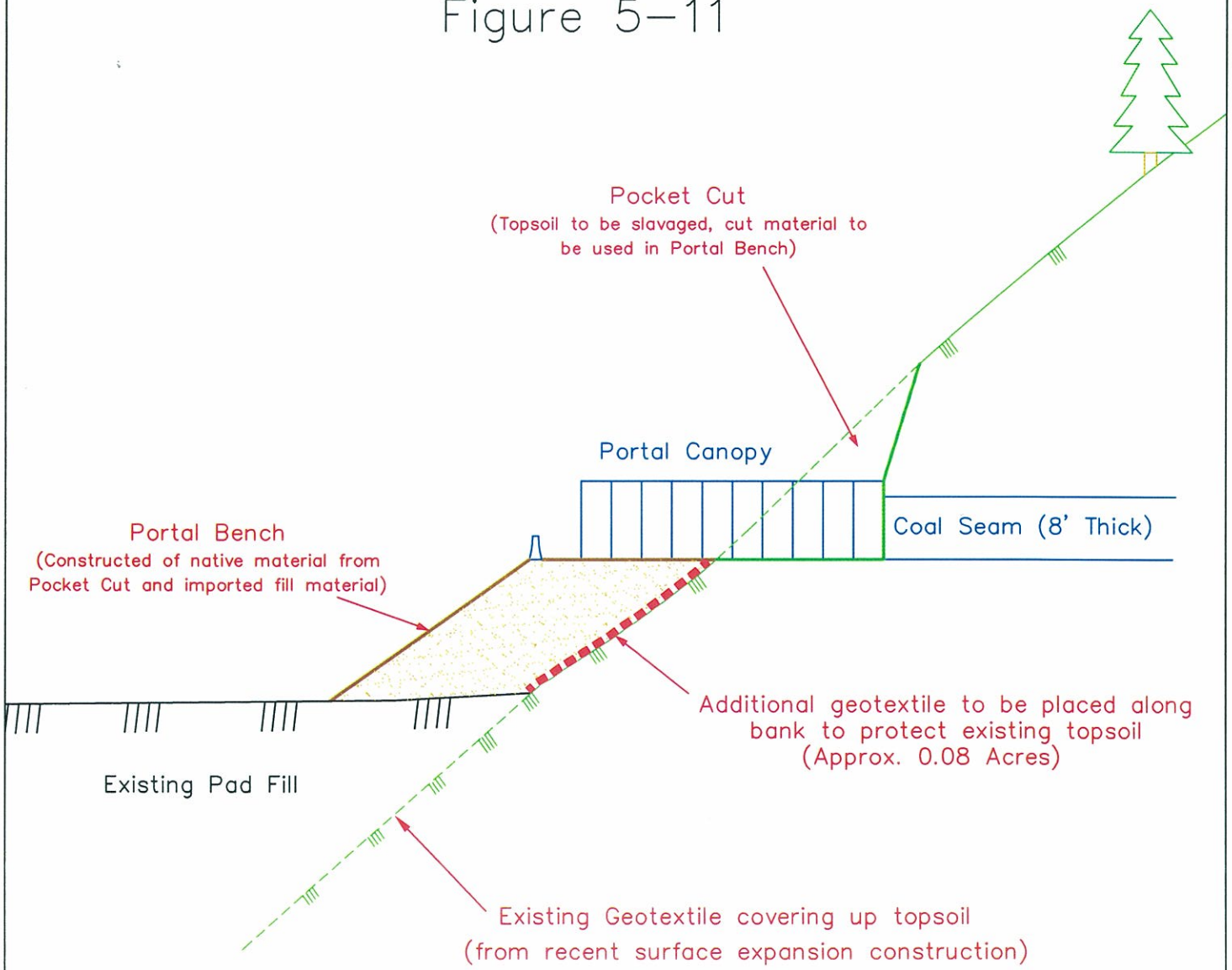


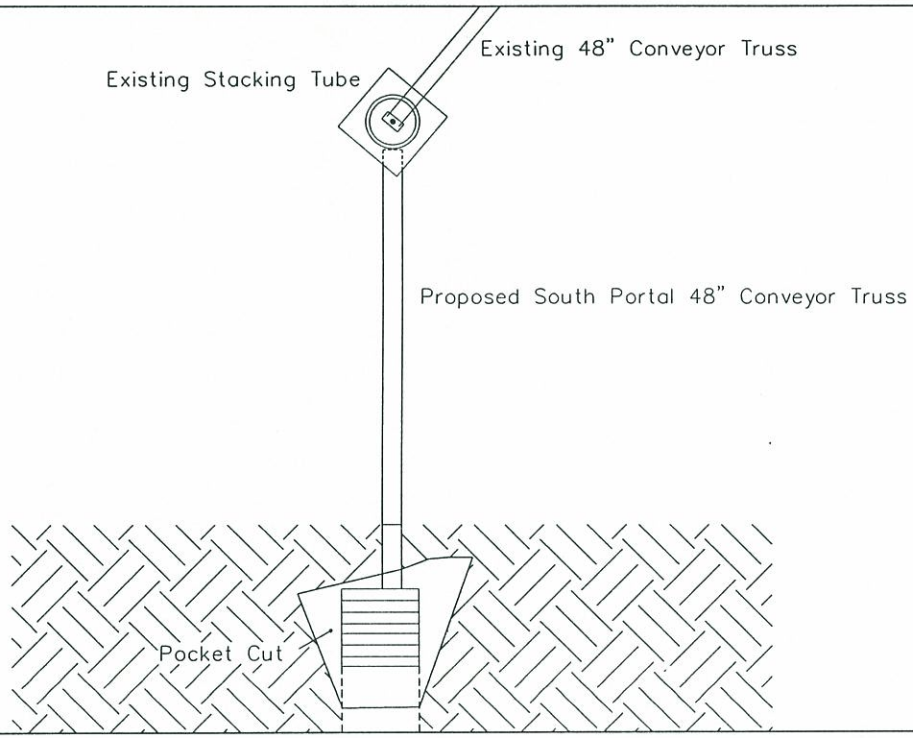
TYPICAL SHOTCRETE APPLICATION TO CUT SLOPES

SCALE: NONE

FIGURE 5-10

Profile of South Portal Pocket Cuts
Typical Section Through Intake Portal
Figure 5–11





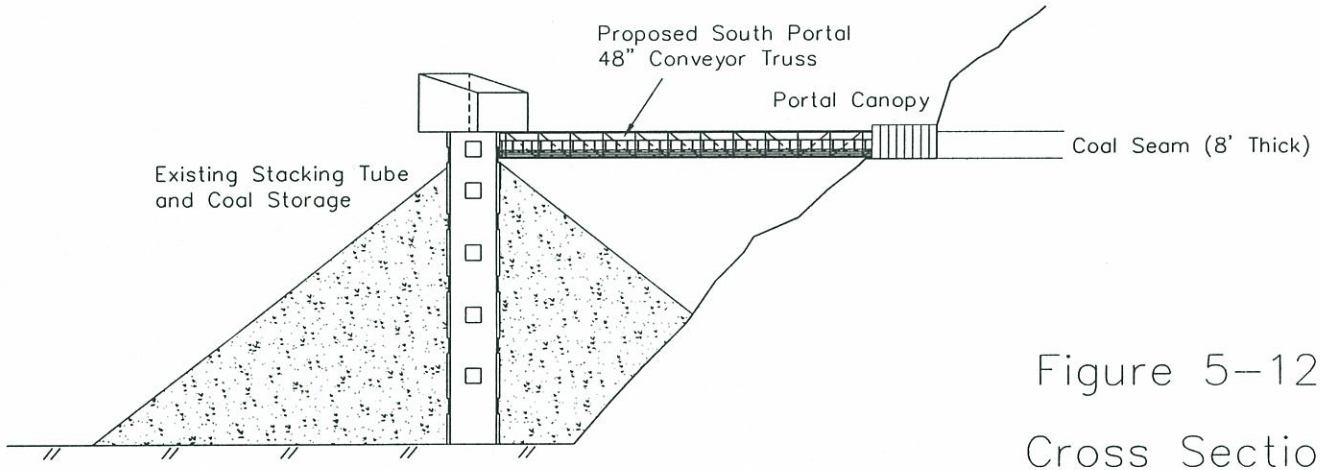


Figure 5–12

Cross Section
South Portal Belt Conveyor

Acad Ref: Figure 5–12.Dwg

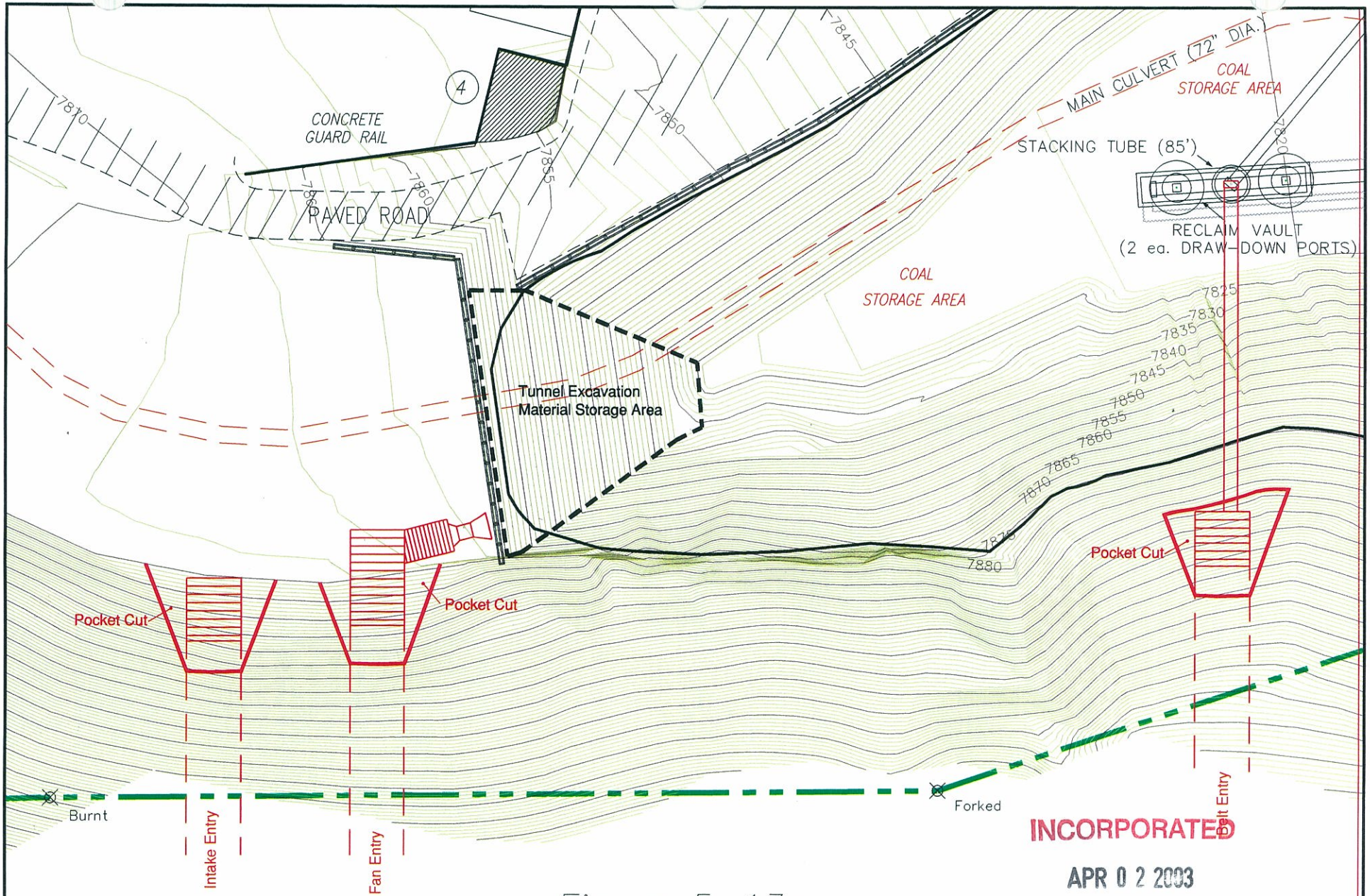


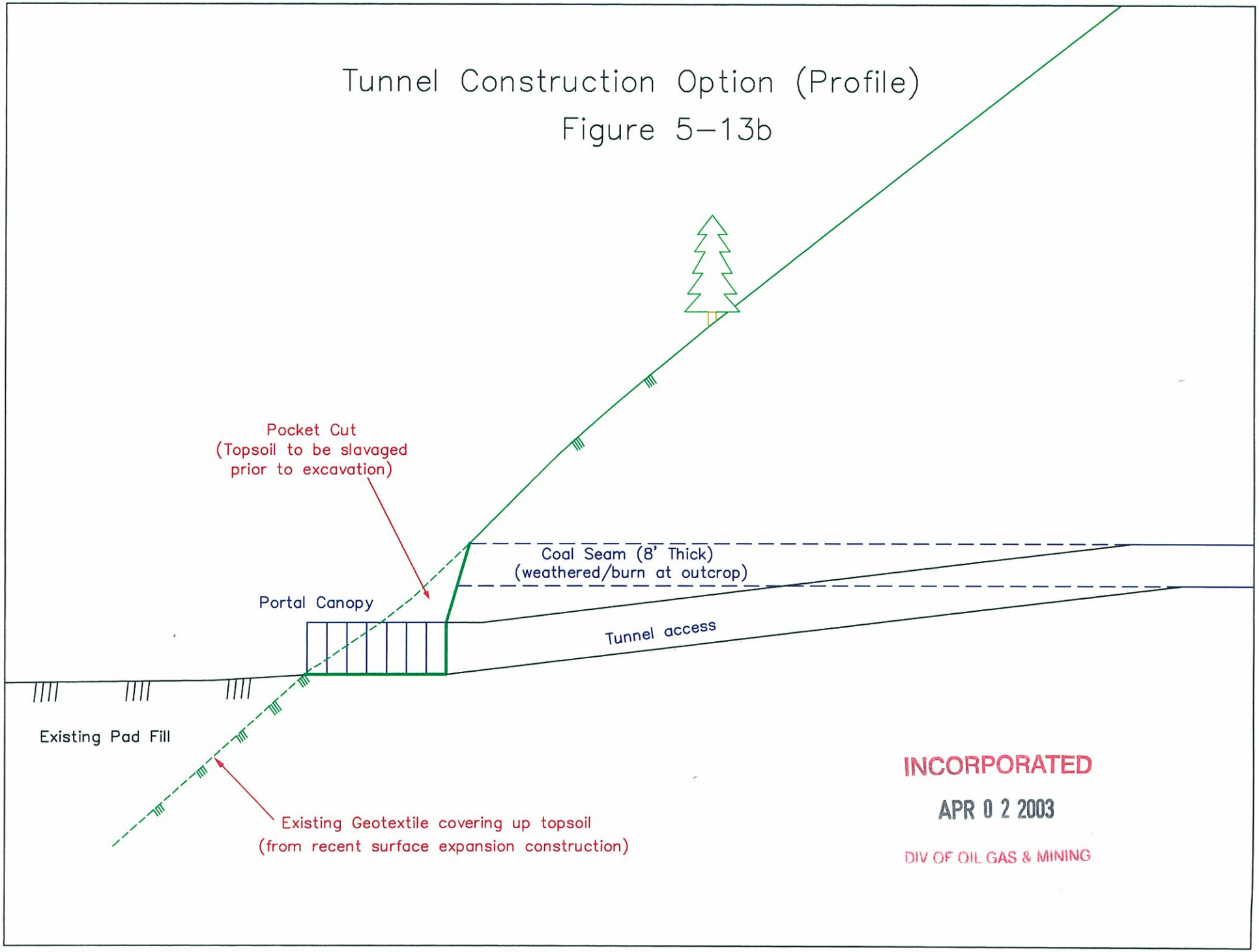
Figure 5–13a
Tunnel Construction Option (Plan)

Scale: 1"=50'

Acad Ref: Figure 5–13.dwg

Tunnel Construction Option (Profile)

Figure 5–13b



Appendix 5-20

Bond Calculations
(DOGM)

Bonding Calculations
Crandall Canyon Mine C/007/032
Revised June 3, 2003

Bond Summary

Direct Costs		
Subtotal Demolition and Removal	$630,986.00	
Subtotal Backfilling and Grading	$451,209.00	
Subtotal Revegetation	$42,385.00	
Direct Costs	$1,124,580.00	
Indirect Costs		
Mob/Demob	$112,458.00	10.0%
Contingency	$56,229.00	5.0%
Engineering Redesign	$28,115.00	2.5%
Main Office Expense	$76,471.00	6.8%
Project Mainagement Fee	$28,115.00	2.5%
Subtotal Indirect Costs	$301,388.00	26.8%
Total Cost in 2003 Dollars	$1,425,968.00	
Escalation factor		0.0289
Number of years		4
Escalation	$172,126.00	
Reclamation Cost 2007	$1,598,094.00	
Bond Amount (rounded to nearest $1,000)	$1,598,000.00	

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
01	Shop 01																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF	160	20	20										64000	CF	$16,000.00
	Structure's Vol. Demolished																0.35	830	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													830	CY	$8,591.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	Nielson Construction	Neilson Con.	7	/TON													830	CY	$5,810.00
	Steel's VWeight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$30,401.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	160	20	0.5										59	CY	$594.00
	Concrete's Vol. Demolished																1.3	77	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													77	CY	$104.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													77	CY	$249.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													77	CY	$554.00
	Subtotal																			$1,501.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$31,902.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
02	Ventilation Fan 02																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF	60	20	16.67										20004	CF	$5,001.00
	Structure's Vol. Demolished																0.35	259	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													259	CY	$2,681.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	Nielson Construction	Neilson Con.	7	/TON													259	CY	$1,813.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$9,495.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	60	20	0.5										22	CY	$221.00
	Concrete's Vol. Demolished																1.3	29	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													29	CY	$39.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													29	CY	$94.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													29	CY	$209.00
	Subtotal																			$563.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$10,058.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
03	Rock Dust Silo 03																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF			30	12							FT		3393	CF	$848.00
	Structure's Vol. Demolished																0.35	44	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													44	CY	$455.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	Nielson Construction	Neilson Con.	7	/TON													44	CY	$308.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$1,611.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	2	3	2							4			2	CY	$20.00
	Concrete's Vol. Demolished																1.3	3	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													3	CY	$4.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													3	CY	$10.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													3	CY	$22.00
	Subtotal																			$56.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$1,667.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
04	Concrete Dump Pad 04																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	30	25	1								FT		28	CY	$282.00
	Concrete's Vol. Demolished																1.3	36	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													36	CY	$49.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													36	CY	$116.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													36	CY	$259.00
	Subtotal																			$706.00
	Asphalt Demolition																			
	Demolition Cost	Pavement removal (asphalt) 3 inch	02220 875 1710	3.89	/SY	135	130									FT		1950	YD2	$7,586.00
	Concrete's Vol. Demolished							0.25								FT	1.3	211	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													211	CY	$285.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													211	CY	$682.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													211	CY	$1,519.00
	Subtotal																			$10,072.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$10,778.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
05	Power Center 05																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Mechanical Equipment	Mechanical equipment heavy	15055 300 3600	745	/ton							5				Ton		5	Ton	$3,725.00
	Transformer	Mechanical equipment heavy	15055 300 3600	745	/ton							2				Tom		2	Tom	$1,490.00
	Underground Wire	Wire Removal	Soldier Creek	4.81	/LF	900										CLF		900	LF	$4,329.00
	Aerial Wire	Wire Removal	Soldier Creek	4.81	/LF	500										CLF		500	LF	$2,405.00
	Chain Link Fence	Chain link remove 8'-10'	02220 875 0700	2.77	/LF	120										LF		120	LF	$332.00
	Subtotal																			$12,281.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	25	21	0.67										13	CY	$131.00
	Concrete's Vol. Demolished																1.3	17	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													17	CY	$23.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													17	CY	$55.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													17	CY	$122.00
	Subtotal																			$331.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$12,612.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
06	Power Poles 06																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Remove wire	Wire Removal	Soldier Creek	4.81	/LF	180												180	LF	$866.00
	Remove conduit (use wire)	Wire Removal	Soldier Creek	4.81	/LF	100												100	LF	$481.00
	Remove Fixtures (use poles)	Powerpole	Hiawatha	100	EA										6	EA		6	EA	$600.00
	Remove Poles	Powerpole	Hiawatha	100	EA										6	EA		6	EA	$600.00
	Disposal Costs																			
	Subtotal																			$2,547.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$2,547.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
07	Underground Bathhouse 07																			
	Structure's Demolition Cost	Masonary Bld, Large	02220 100 0080	0.26	/CF						14000					CF		14000	CF	$3,640.00
	Structure's Vol. Demolished																0.35	181	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													181	CY	$1,873.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													181	CY	$724.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$6,237.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	70	20	0.5										26	CY	$262.00
	Concrete's Vol. Demolished																1.3	34	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													34	CY	$46.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													34	CY	$110.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													34	CY	$245.00
	Subtotal																			$663.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$6,900.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
08	Portals 08																			
	Structure's Demolition Cost	Seal Portals	AML1	5200	EA.										6	EA		6	EA	$31,200.00
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$31,200.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$31,200.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
09	BeltPortals 09																			
	Structure's Demolition Cost	Seal Portals	AML1	5200	EA.										1	EA		1	EA	$5,200.00
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$5,200.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$5,200.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
10	Crusher Pad 10																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF	36	20	1										720	CF	$180.00
	Structure's Vol. Demolished																0.35	9	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													9	CY	$93.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													9	CY	$36.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$309.00
	Equipment 's Disposal Cost	Mechanical equipment heavy	15055 300 3600	745	/ton							3				ton		3	ton	$2,235.00
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			$2,235.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	36	20	1										27	CY	$272.00
	Concrete's Vol. Demolished																1.3	35	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													35	CY	$47.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													35	CY	$113.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													35	CY	$252.00
	Subtotal																			$684.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY							418				CF		15	CY	$151.00
	Concrete's Vol. Demolished																1.3	20	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													20	CY	$27.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													20	CY	$65.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													20	CY	$144.00
	Subtotal																			$387.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$3,615.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
11	Mine Belt 11																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost	Mechanical equipment heavy	15055 300 3600	745	/ton							2.5				ton		3	ton	$2,235.00
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			$2,235.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$2,235.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
13	Silo 13																			
	Structure's Demolition Cost	Mixed Materials Bld. Large	02220 100 0100	0.26	/CF			75	30							FT		53014	CF	$13,784.00
	Structure's Vol. Demolished																0.35	687	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													687	CY	$7,110.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													687	CY	$2,748.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$23,642.00
	Equipment 's Disposal Cost	Mechanical equipment heavy	15055 300 3600	745	/ton							20				ton		20	ton	$14,900.00
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			$14,900.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	160	20	0.5										59	CY	$594.00
	Concrete's Vol. Demolished																1.3	77	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													77	CY	$104.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													77	CY	$249.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													77	CY	$554.00
	Subtotal																			$1,501.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$40,043.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
14	Weight Shed 14																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						2					CY		2	CY	$20.00
	Concrete's Vol. Demolished																1.3	3	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													3	CY	$4.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													3	CY	$10.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													3	CY	$22.00
	Subtotal																			$56.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						235					CF		9	CY	$91.00
	Concrete's Vol. Demolished																1.3	12	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													12	CY	$16.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													12	CY	$39.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													12	CY	$86.00
	Subtotal																			$232.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						60					CF		3	CY	$30.00
	Concrete's Vol. Demolished																1.3	4	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													4	CY	$5.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													4	CY	$13.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													4	CY	$29.00
	Subtotal																			$77.00
	Total																			$385.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
15	Bulk Oil 15																			
	Structure's Demolition Cost	Masonary Bld. Large	02220 100 0080	0.26	/CF	55	20	10										11000	CF	$2,860.00
	Structure's Vol. Demolished																0.35	143	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													143	CY	$1,480.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													143	CY	$572.00
	Subtotal																			$4,912.00
	Tank																			
	Dismantling Cost	9000 gal to 12000 gal tank	02115 200 0130	1225	Ea.										1	Ea		1	EA	$1,225.00
	Loading Costs																			
	Transport Costs	9000 gal to 12000 gal tank	02115 200 1029	1100	Ea.										1			1	EA	$1,100.00
	Disposal Costs	9000 gal to 12000 gal tank	02115 200 0320	305	Ea.										1			1	EA	$305.00
	Subtotal																			$2,630.00
	Slab																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	20	55	0.5								FT		20	CY	$201.00
	Concrete's Vol. Demolished																1.3	26	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													26	CY	$35.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													26	CY	$84.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													26	CY	$187.00
	Subtotal																			$507.00
	Footings																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	150	2	1								FT		11	CY	$111.00
	Concrete's Vol. Demolished																1.3	14	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													14	CY	$19.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													14	CY	$45.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													14	CY	$101.00
	Subtotal																			$276.00
	Slab																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	20	20	0.5								FT		7	CY	$70.00
	Concrete's Vol. Demolished																1.3	9	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													9	CY	$12.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													9	CY	$29.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													9	CY	$65.00
	Subtotal																			$176.00
	Walls																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	20	0.67	8.4								FT		4	CY	$40.00
	Concrete's Vol. Demolished																1.3	5	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													5	CY	$7.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													5	CY	$16.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													5	CY	$36.00
	Subtotal																			$99.00
	Total																			$8,600.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
17	Truck Pad 17																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF															
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						750					CF			28	CY	$282.00
	Concrete's Vol. Demolished																1.3		36	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY														36	CY	$49.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY														36	CY	$116.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY														36	CY	$259.00
	Subtotal																				$706.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$706.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
18	General Storage 18																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF	20	60	23								FT		27600	CF	$6,900.00
	Structure's Vol. Demolished																0.35	358	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													358	CY	$3,705.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													358	CY	$1,432.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$12,037.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	20	67.5	0.67								FT		34	CY	$342.00
	Concrete's Vol. Demolished																1.3	44	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													44	CY	$59.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													44	CY	$142.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													44	CY	$317.00
	Subtotal																			$880.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$12,897.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
19	Reclaim Hopper Belt 19																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost	Mechanical equipment heavy	15055 300 3600	745	/ton							5				ton		5	ton	$3,725.00
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			$3,725.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$3,725.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
20	Visual Disconnect 20																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Nen Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost	Mechanical equipment heavy	15055 300 3600	745	/ton							1				ton		1	ton	$745.00
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			$745.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	4	6	0.5								FT		0	CY	$0.00
	Concrete's Vol. Demolished																1.3	0	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													0	CY	$0.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													0	CY	$0.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													0	CY	$0.00
	Subtotal																			$0.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$745.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
21	New Shop 21																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF	20	62.5	20								FT		25000	CF	$6,250.00
	Structure's Vol. Demolished																0.35	324	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													324	CY	$3,353.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													324	CY	$1,296.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$10,899.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	20	62.5	0.5								FT		23	CY	$231.00
	Concrete's Vol. Demolished																1.3	30	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													30	CY	$41.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													30	CY	$97.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													30	CY	$216.00
	Subtotal																			$585.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$11,484.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
22	Shop Extension 22																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF	20	30	12								FT		7200	CF	$1,800.00
	Structure's Vol. Demolished																0.35	93	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													93	CY	$963.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													93	CY	$372.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$3,135.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	20	30	0.5								FT		11	CY	$111.00
	Concrete's Vol. Demolished																1.3	14	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													14	CY	$19.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													14	CY	$45.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													14	CY	$101.00
	Subtotal																			$276.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$3,411.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
23	Shotcrete Slopes 23																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						46					CY		46	CY	$463.00
	Concrete's Vol. Demolished																1.3	60	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													60	CY	$81.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													60	CY	$194.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													60	CY	$432.00
	Subtotal																			$1,170.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$1,170.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
24	Fan Transfomer 24																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost	Mechanical equipment heavy	15055 300 3600	745	/ton							0.25				ton		0.25	ton	$186.00
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			$186.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	6	8	0.67								FT		1	CY	$10.00
	Concrete's Vol. Demolished																1.3	1	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													1	CY	$1.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													1	CY	$3.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													1	CY	$7.00
	Subtotal																			$21.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$207.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
25	Chain Link Fence 25																			
	Structure's Demolition Cost	Chain link remove 8'-10'	02220 875 0700	2.77	LF	120										LF		120	LF	$332.00
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$332.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$332.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
26	Concrete Guard 26																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	530	2	3								FT		118	CY	$1,187.00
	Concrete's Vol. Demolished																1.3	153	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													153	CY	$207.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													153	CY	$494.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													153	CY	$1,102.00
	Subtotal																			$2,990.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	250	10	0.67								FT		62	CY	$624.00
	Concrete's Vol. Demolished																1.3	81	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													81	CY	$109.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													81	CY	$262.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													81	CY	$583.00
	Subtotal																			$1,578.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$4,568.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
27	Retaining Wall 27																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	530	2	3								FT		118	CY	$1,187.00
	Concrete's Vol. Demolished																1.3	153	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													153	CY	$207.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													153	CY	$494.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													153	CY	$1,102.00
	Subtotal																			$2,990.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$2,990.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
28	Culverts 28																			
	UD-1	Excavation 1 CY backhoe earth	02315 440 2040	12.3	/CY	295	3.5	7								FT		268	CY	$3,296.00
	C2, C4, C8, C10	Excavation 1 CY backhoe earth	02315 440 2040	12.3	/CY	600	2	4								FT		178	CY	$2,189.00
	C1	Excavation 1 CY backhoe earth	02315 440 2040	12.3	/CY	60	1.5	3								FT		10	CY	$123.00
	C12	Excavation 1 CY backhoe earth	02315 440 2040	12.3	/CY	85	1.25	2.5								FT		10	CY	$123.00
	C3, C7, C9, C11	Excavation 1 CY backhoe earth	02315 440 2040	12.3	/CY	251	1	2								FT		19	CY	$234.00
	UD-3	Excavation 1 CY backhoe earth	02315 440 2040	12.3	/CY	500	1.5	3								FT		83	CY	$1,021.00
	C-5	Excavation 1 CY backhoe earth	02315 440 2040	12.3	/CY	120	1	2								FT		9	CY	$111.00
	Bypass	Excavation 1 CY backhoe earth	02315 440 2040	12.3	/CY	1400	2	4								FT		415	CY	$5,105.00
	Main Creek	Excavation 1 CY backhoe earth	02315 440 2040	12.3	/CY	1400	6	12								FT		3733	CY	$45,916.00
	Subtotal																			$58,118.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$58,118.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
29	Guard Rail 29																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Remove Rails	Guiderail remove	02220 875 0800	10.75	LF	120										LF		120	LF	$1,290.00
	Remove Posts	Guide Posts Remove	02220 875 0860	12.7	Ea										10	EA		10	EA	$127.00
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			$1,417.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$1,417.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
30	Inlets 30																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost	Mechanical equipment heavy	15055 300 3600	745	/ton							1				ton			1 ton	$745.00
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			$745.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						11				3	CY		33	CY	$332.00
	Concrete's Vol. Demolished																1.3	43	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													43	CY	$58.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													43	CY	$139.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													43	CY	$310.00
	Subtotal																			$839.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	4	6	0.67								FT		1	CY	$10.00
	Concrete's Vol. Demolished																1.3	1	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													1	CY	$1.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													1	CY	$3.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													1	CY	$7.00
	Subtotal																			$21.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$1,605.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
31	Sed Pond Culvert 31																			
	CMP 24	Excavation 1 CY backhoe earth	02315 440 2040	12.3	CY	110	2	4								FT		33	CY	$406.00
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$406.00
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$406.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
32	Gabion Retaining Wall 32																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						2000					CF		74	CY	$744.00
	Concrete's Vol. Demolished																1.3	96	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													96	CY	$130.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													96	CY	$310.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													96	CY	$691.00
	Subtotal																			$1,875.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$1,875.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
33	Water Wells 33																			
	Structure's Demolition Cost	Plug Well	AML3	5000	EA.										4	EA		4	EA	$20,000.00
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$20,000.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$20,000.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
34	Headwalls 34																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Leading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY		18	18	0.5							FT			6	CY	$60.00
	Concrete's Vol. Demolished																1.3		8	CY	
	Leading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY														8	CY	$11.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY														8	CY	$26.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY														8	CY	$58.00
	Subtotal																				$155.00
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						3600					CF			133	CY	$1,338.00
	Concrete's Vol. Demolished																1.3		173	CY	
	Leading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY														173	CY	$234.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY														173	CY	$559.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY														173	CY	$1,246.00
	Subtotal																				$3,377.00
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Leading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Overhead Conveyor Supports 35																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Nen Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Leading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	7	7	2							6	FT		22	CY	$221.00
	Concrete's Vol. Demolished																1.3	29	CY	
	Leading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													29	CY	$39.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													29	CY	$94.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													29	CY	$209.00
	Subtotal																			$563.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	2	2	4							6	FT		4	CY	$40.00
	Concrete's Vol. Demolished																1.3	5	CY	
	Leading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													5	CY	$7.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													5	CY	$16.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													5	CY	$36.00
	Subtotal																			$99.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Leading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$662.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
36	Reclaim Tunnel 36																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	170	12	1								FT		76	CY	$765.00
	Concrete's Vol. Demolished																1.3	99	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													99	CY	$134.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													99	CY	$320.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													99	CY	$713.00
	Subtotal																			$1,932.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$1,932.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
37	Feeder Boxes 37																			
	Structure's Demolition Cost	Concrete Bld. Large	02220 100 0050	0.35	/CF	13.5	16.5	8.5							3	FT		5680	CF	$1,988.00
	Structure's Vol. Demolished																0.35	74	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													74	CY	$766.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													74	CY	$296.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$3,050.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	8	5	0.5							3	FT		2	CY	$20.00
	Concrete's Vol. Demolished																1.3	3	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													3	CY	$4.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													3	CY	$10.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													3	CY	$22.00
	Subtotal																			$56.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$3,106.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
38	Reclaim Conveyor Supports 38																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	4.5	4.5	1							2	FT			2	CY $20.00
	Concrete's Vol. Demolished																1.3		3	CY
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY														3	CY $4.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY														3	CY $10.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY														3	CY $22.00
	Subtotal																			$56.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	2	4	2							2	FT			1	CY $10.00
	Concrete's Vol. Demolished																1.3		1	CY
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY														1	CY $1.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY														1	CY $3.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY														1	CY $7.00
	Subtotal																			$21.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$77.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
39	Crusher Platform Supports 39																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	8	8	3							4	FT		28	CY	$282.00
	Concrete's Vol. Demolished																1.3	36	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													36	CY	$49.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													36	CY	$116.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													36	CY	$259.00
	Subtotal																			$706.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	4	4	4							4	FT		9	CY	$91.00
	Concrete's Vol. Demolished																1.3	12	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													12	CY	$16.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													12	CY	$39.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													12	CY	$86.00
	Subtotal																			$232.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$938.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
40	Feeder Conveyor Supports 40																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	4.5	4.5	1							2	FT		2	CY	$20.00
	Concrete's Vol. Demolished																1.3	3	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													3	CY	$4.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													3	CY	$10.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													3	CY	$22.00
	Subtotal																			$56.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	2	4	2							2	FT		1	CY	$10.00
	Concrete's Vol. Demolished																1.3	1	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													1	CY	$1.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													1	CY	$3.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													1	CY	$7.00
	Subtotal																			$21.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$77.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
41	Scale Pads 41																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	20	20	0.5							2	FT		15	CY	$151.00
	Concrete's Vol. Demolished																1.3	20	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													20	CY	$27.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													20	CY	$65.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													20	CY	$144.00
	Subtotal																			$387.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	12	60	1							2	FT		53	CY	$533.00
	Concrete's Vol. Demolished																1.3	69	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													69	CY	$93.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													69	CY	$223.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													69	CY	$497.00
	Subtotal																			$1,348.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	12	60	2							2	FT		107	CY	$1,076.00
	Concrete's Vol. Demolished																1.3	139	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													139	CY	$188.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													139	CY	$449.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													139	CY	$1,001.00
	Subtotal																			$2,714.00
	Total																			$4,447.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
42	New Scale House 42																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF	20	20	8								FT		3200	CF	$800.00
	Structure's Vol. Demolished																0.35	41	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													41	CY	$424.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													41	CY	$164.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$1,388.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	20	30	0.5								FT		11	CY	$111.00
	Concrete's Vol. Demolished																1.3	14	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													14	CY	$19.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													14	CY	$45.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													14	CY	$101.00
	Subtotal																			$276.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	3	8	1.5								FT		1	CY	$10.00
	Concrete's Vol. Demolished																1.3	1	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													1	CY	$1.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													1	CY	$3.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													1	CY	$7.00
	Subtotal																			$21.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	0.66	80	0.66								FT		1	CY	$10.00
	Concrete's Vol. Demolished																1.3	1	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													1	CY	$1.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													1	CY	$3.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													1	CY	$7.00
	Subtotal																			$21.00
	Total																			$1,708.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
43	Proposed Bathhouse 43																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF	60	100	18								FT		108000	CF	$27,000.00
	Structure's Vol. Demolished																0.35	1400	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													1400	CY	$14,490.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													1400	CY	$5,600.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$47,090.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	60	100	0.5								FT		111	CY	$1,117.00
	Concrete's Vol. Demolished																1.3	144	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													144	CY	$194.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													144	CY	$465.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													144	CY	$1,037.00
	Subtotal																			$2,813.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	3	320	1.5								FT		53	CY	$533.00
	Concrete's Vol. Demolished																1.3	69	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													69	CY	$93.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													69	CY	$223.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													69	CY	$497.00
	Subtotal																			$1,346.00
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY	1	80	0.66								FT		2	CY	$20.00
	Concrete's Vol. Demolished																1.3	3	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													3	CY	$4.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													3	CY	$10.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													3	CY	$22.00
	Subtotal																			$56.00
	Total																			$51,305.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
44	Coal Silo 44																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF			60	12							FT		6786	CF	$1,697.00
	Structure's Vol. Demolished																0.35	88	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													88	CY	$911.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													88	CY	$352.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$2,960.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$2,960.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
45	Conveyors 45																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF	5	780	4								FT		15600	CF	$3,900.00
	Structure's Vol. Demolished																0.35	202	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage	12 CY (16 Ton) Dump Truck 5 mi. rnd. trip	02320 200 0540	10.35	/CY													202	CY	$2,091.00
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY													202	CY	$808.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$6,799.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$6,799.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
46	Parking Lot 46																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Pavement removal (asphalt) 3 inch	02220 875 1710	3.89	/SY					4800						SY		4800	SY	$18,672.00
	Concrete's Vol. Demolished							0.25								FT	1.3	520	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													520	CY	$702.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													520	CY	$1,680.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													520	CY	$3,744.00
	Subtotal																			$24,798.00
	Concrete Demolition																			
	Demolition Cost	Pavement removal (asphalt) 3 inch	02220 875 1710	3.89	/SY					4400						SY		4400	SY	$17,116.00
	Concrete's Vol. Demolished							0.25								FT	1.3	477	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY													477	CY	$644.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	/CY													477	CY	$1,541.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	/CY													477	CY	$3,434.00
	Subtotal																			$22,735.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$47,533.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
47	RubberLiner 47																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished	Mechanical equipment heavy	15055 300 3600	745	/ton							32.5				ton		33	ton	$24,585.00
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$24,585.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	xxxxx																			
	Total																			$24,585.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
48	Culvert Bedding Removal 48																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Stream Bed Sand																			
	Demolition Cost	Excavation 1 CY backhoe earth	02315 440 2040	12.3	CY						1296					CY		1296	CY	$15,941.00
	Concrete's Vol. Demolished																1.3	1685	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	CY													1685	CY	$2,275.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	CY													1685	CY	$5,443.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	CY													1685	CY	$12,132.00
	Subtotal																			$35,791.00
	Culvert Bed Sand																			
	Demolition Cost	Excavation 1 CY backhoe earth	02315 440 2040	12.3	CY						3630					CY		3630	CY	$44,649.00
	Concrete's Vol. Demolished																1.3	4719	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	CY													4719	CY	$6,371.00
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rnd. trip	02320 200 0320	3.23	CY													4719	CY	$15,242.00
	Disposal Costs	Disposal on site	02220 550 4200	7.2	CY													4719	CY	$33,977.00
	Subtotal																			$100,239.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	xxxxx																			
	Total																			$136,030.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	See Backfilling & Grading Plan																			
49	Off Site Dump Fee 49																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	Nielson Construction Dirt	Neilson Dirt	1	TON						66096					CY		66096	CY	$66,096.00
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			$66,096.00
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$66,096.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	See Backfilling and Grading																			
	Drainage Control 50																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Filter Material	Silt fence	02370 550 1100	0.97	LF	3000										LF		3000	LF	$2,910.00
	Rip-rap	Rip-Rap dumped 300 lbs. average	02370 300 0370	27.5	Ton							2100				TON		2100	TON	$57,750.00
	Subtotal																			$60,660.00
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			$60,660.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Shop 01																			$31,902.00
	Ventilation Fan 02																			$10,058.00
	Rock Dust Silo 03																			$1,667.00
	Concrete Dump Pad 04																			$10,778.00
	Power Center 05																			$12,612.00
	Power Poles 06																			$2,547.00
	Underground Bathhouse 07																			$6,900.00
	Portals 08																			$31,200.00
	BeltPortals 09																			$5,200.00
	Crusher Pad 10																			$3,615.00
	Mine Belt 11																			$2,235.00
	Silo 13																			$40,043.00
	Weight Shed 14																			$365.00
	Bulk Oil 15																			$8,600.00
	Truck Pad 17																			$706.00
	General Storage 18																			$12,897.00
	Reclaim Hopper Belt 19																			$3,725.00
	Visual Disconnect 20																			$745.00
	New Shop 21																			$11,484.00
	Shop Extension 22																			$3,411.00
	Shotcrete Slopes 23																			$1,170.00
	Fan Transfomer 24																			$207.00
	Chain Link Fence 25																			$332.00
	Concrete Guard 26																			$4,568.00
	Retaining Wall 27																			$2,990.00
	Culverts 28																			$58,118.00
	Guard Rail 29																			$1,417.00
	Inlets 30																			$1,605.00
	Sed Pond Culvert 31																			$406.00
	Gabion Retaining Wall 32																			$1,875.00
	Overhead Conveyor Supports 35																			$662.00
	Reclaim Tunnel 36																			$1,932.00
	Feeder Boxes 37																			$3,106.00
	Reclaim Conveyor Supports 38																			$77.00
	Crusher Platform Supports 39																			$938.00
	Feeder Conveyor Supports 40																			$77.00
	Scale Pads 41																			$4,447.00
	New Scale House 42																			$1,706.00
	Proposed Bathhouse 43																			
	Coal Silo 44																			$2,960.00
	Conveyors 45																			$6,799.00
	Parking Lot 46																			$47,533.00
	RubberLiner 47																			$24,585.00
	Culvert Bedding Removal 48																			$136,030.00
	Off Site Dump Fee 49																			$66,096.00
	Drainage Control 50																			$60,660.00
	Total																			$830,988.00

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
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	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
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	Disposal Cost Steel																			
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	Dismantling Cost																			
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	Truck's Capacity																			
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	Steel's Weight																			
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	Structure's Vol. Demolished																			
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	Truck's Capacity																			
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	Disposal Costs																			
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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
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	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
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	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
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	Equipment 's Disposal Cost																			
	Dismantling Cost																			
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	Disposal Cost Non Steel																			
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	Dismantling Cost																			
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	Structure's Demolition Cost																			
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	Truck's Capacity																			
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	Disposal Cost Non Steel																			
	Steel's Weight																			
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	Dismantling Cost																			
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	Disposal Costs																			
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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
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	Disposal Cost Non Steel																			
	Steel's Weight																			
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	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
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	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
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	Subtotal																			
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	Demolition Cost																			
	Concrete's Vol. Demolished																			
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	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
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	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
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	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
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	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
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	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Crandell Canyon Mine															
Backfilling and Grading															
Ripping Fill Area (D9 Dozer)															
D9R Semi-U EROPS (9-43) (3Q02)	17060	64.8	0.1	49.35	227.26	1	227.26	$/HR	57387	CY	1473	CY/HR	39	HR	$8,863.00
Multi-Shank Ripper 360-519 P (9-49) (3Q02)	2580	7.65	0.1	0	24.54	1	24.54	$/HR					39	HR	$957.00
Subtotal															$9,820.00
Backfill On Site															
Loading															
988F Series II 2000 EROPS (9-27) (3Q02)	12710	54.35	0.1	49.35	188.57	1	188.57	$/HR	70192	CY	498	CY/HR	140.9	HR	$26,570.00
Hauling															
769D (20-1) (2Q02)	10640	39.75	0.1	39.15	149.38	2	298.76	$/HR	70192	CY	498	CY/HR	140.9	HR	$42,095.00
Place with Excavator															
CAT 375L 2001 (10-8)(3Q02)	23630	83.6	0.1	49.35	289	1	289	$/HR	12805	CY	181.3	CY/HR	70.6	HR	$20,403.00
Place with Dozer															
D9R Semi-U EROPS (9-43) (3Q02)	17060	64.8	0.1	49.35	227.26	1	227.26	$/HR	57387	CY	215	CY/HR	266.9	HR	$60,656.00
Subtotal															$149,724.00
Backfill Off Site															
Loading															
988F Series II 2000 EROPS (9-27) (3Q02)	12710	54.35	0.1	49.35	188.57	1	188.57	$/HR	66096	CY	583	CY/HR	113.4	HR	$21,384.00
Hauling															
8X4 85,000lbs 15-18 CY (20-1) (2Q02)	4430	25.2	0.1	39.15	94.56	17	1607.52	$/HR	66096	CY	583	CY/HR	113.4	HR	$182,293.00
Subtotal															$203,677.00
Miscellaneous Removal/Excavate Stream Channels															
436B (4WD) Ext. 2000 EROPS (9-17) (3Q02)	3575	13.75	0.1	49.35	86.82	1	86.82	$/HR	1560	CY	151.1	CY/HR	10.3	HR	$894.00
Subtotal															$894.00
Total Backfilling and Grading															$364,115.00

	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Crandell Canyon Mine															
Topsoil Distribution															
Load From Topsoil Stockpile															
Load															
966F Series II EROPS 1999 (9-27) (3Q02)	6295	25.25	0.1	49.35	116.47	1	116.47	$/HR	10737	CY	298.8	CY/HR	35.9	HR	$4,181.00
Haul															
6X4 50,000lbs 10-12 CY (20-1) (2Q02)	2855	18.25	0.1	39.15	77.07	5	385.35	$/HR	10737	CY	298.8	CY/HR	35.9	HR	$13,834.00
Subtotal															$18,015.00
Place Topsoil						38.5	0.5	19.25	$/HR				35.9	HR	$691.00
Place with Wheel Loader															
966F Series II EROPS 1999 (9-27) (3Q02)	6295	25.25	0.1	49.35	116.47	1	116.47	$/HR	7354	CY	160.1	CY/HR	45.9	HR	$5,346.00
Grading															
D7R Semi-U (9-43) (3Q02) 2001	10335	35.55	0.1	49.35	153.05	1	153.05	$/HR	7354	CY	145	CY/HR	50.7	HR	$7,760.00
Excavator															
CAT 375L 2001 (10-8)(3Q02)	23630	83.6	0.1	49.35	289	1	289	$/HR	3383	CY	181.3	CY/HR	18.7	HR	$5,404.00
Subtotal															$19,201.00
Total															$37,216.00

	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Crandell Canyon Mine Support Equipment and Labor															
Backfilling															
5,000 gal H2O truck Diesel (20-6) (2Q02)	4895	27.15	0.1	39.15	99.61	1	99.61	$/HR					306	HR	30481
Pickup Truck Crew 4x4 1 ton (20-7) (2Q02)	880	3.85	0.1	0	9.74	1	9.74	$/HR					306	HR	2980
Foreman Average, Outside				53.65			53.65	$/HR					306	HR	16417
Subtotal															49878
Total															49878

	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Crandell Canyon Mine															
Earthwork Costs															
Backfilling and Grading															364115
Topsoil Distribution															37216
Support Equipment and Labor															49878
Total															451209

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Vegetation																			
	Non Riparian																			
	Hydroseed Equipment and Labor	Hydro Spreader (equip. & labor) B-81	Reveg005	18.92	/MSF					6						AC		261.36	MSF	4945
	Hydroseed Materials	Seed Non Riparian Area	Crandall15321	281.72	$/AC					6						AC		6	AC	1690
	Hydromulch Equipment and Labor	Hydro Spreader (equip. & labor) B-81 80MSF	Reveg002	19.01	/MSF					6						AC		261.36	MSF	4968
	Hydremuluch Material	Hay 1" material only 0291205000250	Reveg001	48.95	/MSF					6						AC		261.36	MSF	12794
	Transplant																			
	Non Riparian																			
	Transplant Labor 150/AC	Bare root seedlings 6 to 10 inch heavy soil	M0291203500711	1.21	EA										675	EA		675	EA	817
	Transplant Material	Transplants Non Riparian	Crandall 15322	116.5	$/AC					4.5						AC		4.5	AC	533
	Transplant North Slope																			
	In addition to Non-Riparian Trans.																			
	Transplant Labor 150/AC	Bare root seedlings 6 to 10 inch heavy soil	M0291203500711	1.21	EA										2300	EA		2300	EA	2783
	Transplant Material	Transplants North Slopes	Crandall 15323	1859	$/AC					1.8						AC		1.8	AC	3346
	Riparian																			
	Hydroseed Equipment and Labor	Hydro Spreader (equip. & labor) B-81	Reveg005	18.92	/MSF					0.3						AC		13.07	MSF	247
	Hydroseed Materials	Seed Riparian Area	Crandall 15324	261.01	$/AC					0.3						AC		0.3	AC	78
	Hydromulch Equipment and Labor	Hydro Spreader (equip. & labor) B-81 80MSF	Reveg002	19.01	/MSF					0.3						AC		13.07	MSF	248
	Hydromuluch Material	Hay 1" material only 0291205000250	Reveg001	48.95	/MSF					0.3						AC		13.07	MSF	640
	Transplant																			
	Riparian																			
	Transplant Labor 150/AC	Bare root seedlings 6 to 10 inch heavy soil	M0291203500711	1.21	EA										189	EA		189	EA	229
	Transplant Material	Transplants Riparian	Crandall 15325	1967.3	$/AC					0.3						AC		0.3	AC	590
	Subtotal																			33808
	Revegetation																			
	Assume 25% revegetation rate																			8477
	Subtotal																			8477
	Total																			42285

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
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	Demolition Cost																			
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	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
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	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
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	Demolition Cost																			
	Concrete's Vol. Demolished																			
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	Disposal Costs																			
	Subtotal																			
	Total																			

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
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	Transportation Cost Steel Truck																			
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	Disposal Cost Steel																			
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	Equipment 's Disposal Cost																			
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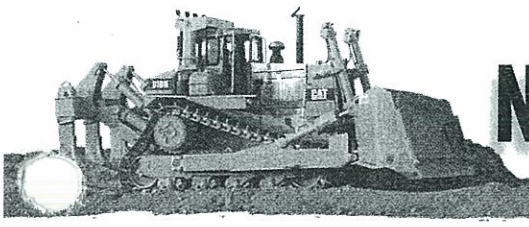
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			



Nielson Construction

GENERAL CONTRACTORS

P.O. Box 620 • 825 North Loop Road • Huntington, Utah 84528
(435) 687-2494 • Fax (435) 687-9721

750 East Ridge Road • Price, Utah 84501
(435) 636-0303

May 21, 2003

Genwal Resources
Dave Shaver
Project Engineer
P.O. 1077
Price, Utah 84501

R.E. Crandall Canyon Reclamation

Dear Mr. Shaver,

Nielson Construction has two sites in Huntington Canyon where the excess material that will be generated during Crandall Canyon Reclamation can be disposed of. One is our gravel pit where the asphalt plant is located. The other is one mile closer to Huntington on the north side of the highway. We have a yard where we store various materials. We would handle any excess material from Crandall Canyon in these two sites for a $1.00 per cubic yard disposal fee.

Any solid waste that needs to be disposed of off site could be hauled to our landfill next to the Emery County Landfill. We have a $12.00/ton disposal fee at this facility.

These prices would also apply to any other entity performing reclamation of the Genwall Mine site.

Sincerely,

Wayne Nielson
Nielson construction

APPENDIX 5-20

RECLAMATION COST ESTIMATE

FOR BOND AMOUNT

April 22, 1997

An estimate of the costs to reclaim the disturbed surface of Genwal's permitted area is presented in this appendix.

The primary sources of the unit costs for this estimate are from DataQuest's Rental Rate Blue Book and R.S. Means' Heavy Construction Cost Data. The demolition and disposal of the surface equipment and facilities comes from Section 020 of Mean's. The items which can be disposed inside the mine portals have no dump fee included, otherwise the demolished items will be disposed in an approved landfill (Nielson's). The items to be demolished are shown on the Facilities Map.

The earthwork estimates for backfilling, grading and soil distribution was based on Caterpillar Handbook production rates, DataQuest's Rental Rate Blue Book equipment rental rates and operating costs and the Means' Labor Rates Table from inside the back cover. Earthwork volumes come from the mass-balance tables for reclamation (and cross-sections shown on Plates 5-17a & 5-17b).

The general costs also come from Means and include laborers, foremen, pickups, water trucks etc.

The revegetation costs are based upon quotes, the disturbed area, the permitted application rates.

The 10-Year monitoring costs are based upon the permitted sampling sites and frequencies and the lab costs charged by CT& E in Huntington.

The costs are in 1997 dollars and are escalated from 1997 to 1998, which is the permit renewal date.

TABLE OF CONTENTS

April 22, 1997

TABLE 5-20-1

TOTAL RECLAMATION COST FOR BONDING

ITEM		CALC AMT	ADJ AMT
1 DEMOLITION (TABLE 5-20-2)		$608,063	$529,015
2 BACKFILL & GRADE (TABLE 5-20-3)		$296,189	$296,189
3 SOIL DISTRIBUTION (TABLE 5-20-4)		$31,473	$27,382
4 GENERAL (TABLE 5-20-5)		$115,993	$100,914
5 REVEGETATION (TABLE 5-20-6)		$23,608	$23,608
6 10 YR MONITORING (TABLE 5-20-7)		$107,748	$107,748
SUBTOTAL		$1,183,074	$1,084,855
CONTINGENCY	10.00%		$108,486
ENGINEERING	5.00%		$54,243
TOTAL			$1,247,584
ESCALATION TO 1998	1.42% PER YEAR	1.42%	$17,716
GRAND TOTAL RECLAMATION COST			$1,265,299
ESTIMATED BOND AMOUNT			**$1,266,000**

NOTE: Adjustment made to reduce MEANS National Average Costs to Utah Average Costs

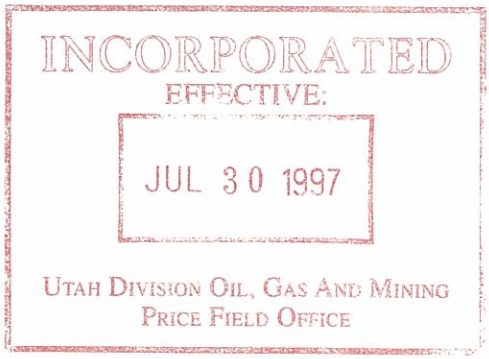


TABLE 5-20-2
DEMOLITION & DISPOSAL COSTS

ITEM	TYPE	WIDTH	LENGTH	HEIGHT	DEMOLITION AMOUNT	DEMOLITION UNIT	DEMOLITION UNIT COST	DEMOLITION COST	DISPOSAL AMOUNT	DISPOSAL UNIT	DISPOSAL UNIT COST	DISPOSAL COST	DUMP FEE AMOUNT	DUMP FEE UNIT	DUMP FEE UNIT COST	DUMP FEE COST	TOTAL
1 SHOP, WAREHOUSE & OFFICE BUILDING																	
SLAB	CONC	20	160	0.5	3200	SQ FT	$4.39	$14,048	77.0	CU YD	$6.55	$505	0.0	CU YD	$4.17	$0	$14,553
BLDG	METAL	20	160	20	64000	CU FT	$0.23	$14,720	782.2	CU YD	$8.15	$6,375	782.2	CU YD	$4.17	$3,262	$24,357
2 VENTILATION FANS & STRUCTURE																	
SLAB	CONC	20	60	0.5	1200	SQ FT	$4.39	$5,268	28.9	CU YD	$6.55	$189	0.0	CU YD	$4.17	$0	$5,457
BLDG	METAL	20	60	16.67	20000	CU FT	$0.23	$4,600	244.4	CU YD	$8.15	$1,992	244.4	CU YD	$4.17	$1,019	$7,612
3 ROCKDUST SILO																	
FOOTINGS	CONC	2	3	2	12	LN FT	$19.45	$233	0.6	CU YD	$6.55	$4	0.0	CU YD	$4.17	$0	$237
SILO	STEEL	12	DIA	30.00	3391	CU FT	$0.23	$780	41.4	CU YD	$8.15	$338	41.4	CU YD	$4.17	$173	$1,291
4 CONCRETE DUMPSTER PAD																	
SLAB	CONC	25	30	1	750	SQ FT	$7.98	$5,985	36.1	CU YD	$6.55	$237	0.0	CU YD	$4.17	$0	$6,222
PAVEMENT	ASPHALT	130	135	0.25	1950	SQ YD	$4.08	$7,956	211.3	CU YD	$6.55	$1,384	0.0	CU YD	$4.17	$0	$9,340
5 SUBSTATION																	
SLAB	CONC	21	25	0.67	525	SQ FT	$7.98	$4,190	16.9	CU YD	$6.55	$111	0.0	CU YD	$4.17	$0	$4,300
FENCE	STEEL	30	30	10	120	LN FT	$2.39	$287	11.1	CU YD	$6.55	$73	0.0	CU YD	$4.17	$0	$360
TRANSFORMEI	EQUPT	3750 KVA			5	EA	$800	$4,000	30.0	CU YD	$8.15	$245	30.0	CU YD	$4.17	$125	$4,370
DISCONNECTS	EQUPT				2	TON	$615	$1,230	2.0	CU YD	$8.15	$16	2.0	CU YD	$4.17	$8	$1,255
UGRD WIRE	COND				9	C.L.F.	$36.00	$324	2.0	CU YD	$8.15	$16	0.0	CU YD	$4.17	$0	$340
AERIAL WIRE	COND				5	C.L.F.	$42.50	$213	1.0	CU YD	$8.15	$8	0.0	CU YD	$4.17	$0	$221
6 POWER LINE																	
AERIAL WIRE	COND				1.8	C.L.F.	$11.05	$20	30.0	CU YD	$8.15	$245	0.0	CU YD	$4.17	$0	$264
CONDUIT	METAL				100	LN FT	$1.53	$153	2.0	CU YD	$8.15	$16	2.0	CU YD	$4.17	$8	$178
FIXTURES	MIX				6	EA	$52	$312	2.0	CU YD	$8.15	$16	2.0	CU YD	$4.17	$8	$337
POLES	WOOD				6	EA	$116	$696	1.0	CU YD	$8.15	$8	1.0	CU YD	$4.17	$4	$708
7 UGRD BATH HOUSE/OFFICE																	
SLAB	CONC	20	70	0.5	1400	SQ FT	$4.39	$6,146	33.7	CU YD	$6.55	$221	0.0	CU YD	$4.17	$0	$6,367
BLDG	MASONRY	20	70	10.00	14000	CU FT	$0.23	$3,220	171.1	CU YD	$8.15	$1,395	171.1	CU YD	$4.17	$714	$5,328
8 PORTALS (3)																	
SEALS	CONC	20	3	7	3	EA	$3,300	$9,900									$9,900
9 BELT PORTAL																	
SEAL	CONC	20	3	7	1	EA	$3,300	$3,300									$3,300
10 EXISTING CRUSHER PAD																	
SLAB	CONC	20	36	1	720	SQ FT	$7.98	$5,746	34.7	CU YD	$6.55	$227	0.0	CU YD	$4.17	$0	$5,973

TABLE 5-20-2
DEMOLITION & DISPOSAL COSTS

ITEM	TYPE	WIDTH	LENGTH	HEIGHT	DEMOLITION AMOUNT	DEMOLITION UNIT	DEMOLITION UNIT COST	DEMOLITION COST	DISPOSAL AMOUNT	DISPOSAL UNIT	DISPOSAL UNIT COST	DISPOSAL COST	DUMP FEE AMOUNT	DUMP FEE UNIT	DUMP FEE UNIT COST	DUMP FEE COST	TOTAL
11 MINE BELT CONVEYOR																	
MECH EQUPT					2.5	TON	$615	$1,538	55.0	CU YD	$8.15	$448	55.0	CU YD	$4.17	$229	$2,215
15 BULK OIL STATION																	
SLAB	CONC	20	55	0.5	1100	SQ FT	$4.39	$4,829	26.5	CU YD	$6.55	$173	0.0	CU YD	$4.17	$0	$5,002
FOOTINGS	CONC	1	150	2	150	LN FT	$19.45	$2,918	14.4	CU YD	$6.55	$95	0.0	CU YD	$4.17	$0	$3,012
BLDG	MASONRY	20	55	10.00	11000	CU FT	$0.23	$2,530	134.4	CU YD	$8.15	$1,096	134.4	CU YD	$4.17	$561	$4,186
SLAB	CONC	20	20	0.5	400	SQ FT	$4.39	$1,756	9.6	CU YD	$6.55	$63	0.0	CU YD	$4.17	$0	$1,819
WALLS	CONC	0.67	20	8.4	168	SQ FT	$10.65	$1,789	5.4	CU YD	$6.55	$35	0.0	CU YD	$4.17	$0	$1,825
TANK	STEEL				1	EA	$2,200	$2,200	0.0	CU YD	$8.15	$0	0.0	CU YD	$4.17	$0	$2,200
18 GENERAL STORAGE FACILITY																	
SLAB	CONC	20	67.5	0.67	1350	SQ FT	$5.61	$7,574	43.6	CU YD	$6.55	$285	0.0	CU YD	$4.17	$0	$7,859
BLDG	METAL	20	60	2.33	2800	CU FT	$0.23	$644	34.2	CU YD	$8.15	$279	34.2	CU YD	$4.17	$143	$1,066
20 VISUAL DISCONNECT																	
SLAB	CONC	4	6	0.5	24	SQ FT	$4.39	$105	0.6	CU YD	$8.15	$5	0.0	CU YD	$4.17	$0	$110
ELECT BOX	METAL				1	EA	$275	$275	1.0	CU YD	$8.15	$8	1.0	CU YD	$4.17	$4	$287
21 NEW SHOP, WAREHOUSE & OFFICE BUILDING																	
SLAB	CONC	20	62.5	0.5	1250	SQ FT	$4.39	$5,488	30.1	CU YD	$6.55	$197	0.0	CU YD	$4.17	$0	$5,685
BLDG	METAL	20	62.5	20	25000	CU FT	$0.23	$5,750	305.6	CU YD	$8.15	$2,490	305.6	CU YD	$4.17	$1,274	$9,514
22 SHOP EXTENSION																	
SLAB	CONC	20	30	0.5	600	SQ FT	$4.39	$2,634	14.4	CU YD	$6.55	$95	0.0	CU YD	$4.17	$0	$2,729
BLDG	METAL	20	30	12	7200	CU FT	$0.23	$1,656	88.0	CU YD	$8.15	$717	88.0	CU YD	$4.17	$367	$2,740
23 SHOTCRETE SLOPES																	
SLOPE	CONC	SEE MAP FOR AREA		2"	7420	SQ FT	$2.90	$21,518	60.0	CU YD	$6.55	$393	0.0	CU YD	$4.17	$0	$21,911
24 FAN TRANSFORMER																	
SLAB	CONC	6	8	0.67	48	SQ FT	$4.39	$211	1.5	CU YD	$6.55	$10	0.0	CU YD	$4.17	$0	$221
TRANSFORME	METAL				0.25	TON	$805	$201	9.0	CU YD	$8.15	$73	1.0	CU YD	$4.17	$4	$279
25 CHAIN LINK FENCE																	
FENCE	STEEL	0.1	120	4	120	LN FT	$2.39	$287	4.4	CU YD	$6.55	$29	0.0	CU YD	$4.17	$0	$316
26 CONCRETE GUARD																	
MEDIAN BARRIER (TEMP.		2	530	3	530	LN FT	$8.15	$4,320	0.0	CU YD	$6.55	$0	118.0	CU YD	$4.17	$492	$4,812
WALL	CONC	10	250	0.67	2500	SQ FT	$10.65	$26,625	80.6	CU YD	$6.55	$528	0.0	CU YD	$4.17	$0	$27,153

TABLE 5-20-2
DEMOLITION & DISPOSAL COSTS

ITEM	TYPE	WIDTH	LENGTH	HEIGHT	DEMOLITION AMOUNT	DEMOLITION UNIT	DEMOLITION UNIT COST	DEMOLITION COST	DISPOSAL AMOUNT	DISPOSAL UNIT	DISPOSAL UNIT COST	DISPOSAL COST	DUMP FEE AMOUNT	DUMP FEE UNIT	DUMP FEE UNIT COST	DUMP FEE COST	TOTAL
27 **RETAINING WALL**																	
WALL	CONC	10	192	1	1920	SQ FT	$14.90	$28,608	92.4	CU YD	$6.55	$606	0.0	CU YD	$4.17	$0	$29,214
28 **CULVERTS**																	
UD-1	CMP	42			295	LN FT	$26.33	$7,767	34.7	CU YD	$6.55	$227	34.7	CU YD	$4.17	$145	$8,139
C2 C4 C8 C10	CMP	24			600	LN FT	$4.92	$2,952	23.0	CU YD	$6.55	$151	23.0	CU YD	$4.17	$96	$3,199
C1	CMP	18			60	LN FT	$4.39	$263	5.1	CU YD	$6.55	$33	5.1	CU YD	$4.17	$21	$318
C12	CMP	15			85	LN FT	$4.39	$373	5.0	CU YD	$6.55	$33	5.0	CU YD	$4.17	$21	$427
C3 C7 C9 C11	CMP	12			251	LN FT	$4.39	$1,102	9.5	CU YD	$6.55	$62	9.5	CU YD	$4.17	$40	$1,204
UD-3	PVC	18			500	LN FT	$4.39	$2,195	10.8	CU YD	$6.55	$71	10.8	CU YD	$4.17	$45	$2,311
C-5	PVC	12			120	LN FT	$4.39	$527	4.5	CU YD	$6.55	$30	4.5	CU YD	$4.17	$19	$575
BYPASS	CMP	24			1400	LN FT	$4.92	$6,888	53.7	CU YD	$6.55	$352	53.7	CU YD	$4.17	$224	$7,464
MAIN CREEK	CMP	72			1400	LN FT	$45.14	$63,196	483.6	CU YD	$6.55	$3,167	483.6	CU YD	$4.17	$2,016	$68,380
29 **GUARD RAIL**																	
RAIL	STEEL				150	LN FT	$6.05	$908	4.0	CU YD	$6.55	$26	4.0	CU YD	$4.17	$17	$950
POSTS	WOOD				10	EA	$16.15	$162	5.0	CU YD	$6.55	$33	5.0	CU YD	$4.17	$21	$215
30 **INLETS**																	
DROP INLETS	CONC				3	EA	$250.00	$750	0.0	CU YD	$6.55	$0	0.0	CU YD	$4.17	$0	$750
UD1	STEEL				1	EA	$150.00	$150	1.0	CU YD	$6.55	$7	1.0	CU YD	$4.17	$4	$161
UD3	CONC	4	6	0.67	24	SQ FT	$10.65	$256	0.8	CU YD	$6.55	$5	0.0	CU YD	$4.17	$0	$261
31 **SED POND RISER & CULVERT**																	
	CMP	24			110	LN FT	$4.92	$541	0.0	CU YD	$6.55	$0	0.0	CU YD	$4.17	$0	$541
32 **GABION RETAINING WALL**																	
	STONE				2000	CU FT	$4.69	$9,387	0.0	CU YD	$6.55	$0	0.0	CU YD	$4.17	$0	$9,387
33 **SEAL WATER WELLS**																	
					4	EA	$373.80	$1,495									$1,495
34 **HEADWALLS - CULVERT INLET AND OUTLET**																	
INLET	CONC	18	18	0.5	324	SQ FT	$2.17	$703	7.8	CY	$6.55	$51	0.0	CY	$4.17	$0	$754
GABION OUTLET	STONE	12	64	VARIES	3600	CU FT	$4.69	$16,884	0.0	CU YD	$6.55	$0	0.0	CU YD	$4.17	$0	$16,884
35 **OVERHEAD CONVEYOR SUPPORTS (6)**																	
SLAB	CONC	7	7	2	42	LIN FT	$19.45	$817	28.3	CY	$6.55	$185	0.0	CY	$4.17	$0	$1,002
PILLARS	CONC	2	2	4	24	LIN FT	$19.45	$467	4.6	CY	$6.55	$30	0.0	CY	$4.17	$0	$497
36 **RECLAIM TUNNEL**																	
SLAB	CONC	12	170	1	2040	SQ FT	$14.90	$30,396	98.2	CY	$6.55	$643	0.0	CY	$4.17	$0	$31,039

TABLE 5-20-2
DEMOLITION & DISPOSAL COSTS

ITEM	TYPE	WIDTH	LENGTH	HEIGHT	DEMOLITION AMOUNT	DEMOLITION UNIT	DEMOLITION UNIT COST	DEMOLITION COST	DISPOSAL AMOUNT	DISPOSAL UNIT	DISPOSAL UNIT COST	DISPOSAL COST	DUMP FEE AMOUNT	DUMP FEE UNIT	DUMP FEE UNIT COST	DUMP FEE COST	TOTAL
37 **FEEDER BOXES (3)**																	
BOXES	CONC	13.5	16.5	8.5	5680	CU FT	$0.19	$1,079	273.5	CY	$6.55	$1,791	0.0	CY	$4.17	$0	$2,871
FOOTINGS	CONC	5	8	5	24	LIN FT	$19.45	$467	28.9	CY	$6.55	$189	0.0	CY	$4.17	$0	$656
38 **RECLAIM CONVEYOR SUPPORTS (2)**																	
PILLARS	CONC	4.5	4.5	1	9	LIN FT	$19.45	$175	2.0	CY	$6.55	$13	0.0	CY	$4.17	$0	$188
FOOTINGS	CONC	2	4	2	8	LIN FT	$19.45	$156	1.5	CY	$6.55	$10	0.0	CY	$4.17	$0	$165
39 **CRUSHER PLATFORM SUPPORTS (4)**																	
SLAB	CONC	8	8	3	256	SQ FT	$14.90	$3,814	37.0	CY	$6.55	$242	0.0	CY	$4.17	$0	$4,057
PILLARS	CONC	4	4	4	16	LIN FT	$19.45	$311	12.3	CY	$6.55	$81	0.0	CY	$4.17	$0	$392
40 **FEEDER CONVEYOR SUPPORTS (2)**																	
PILLARS	CONC	4.5	4.5	1	9	LIN FT	$19.45	$175	2.0	CY	$6.55	$13	0.0	CY	$4.17	$0	$188
PILLARS	CONC	2	4	2	8	LIN FT	$19.45	$156	1.5	CY	$6.55	$10	0.0	CY	$4.17	$0	$165
41 **SCALE PADS AND SUPPORTS (2)**																	
PAD	CONC	20	20	0.5	800	SQ FT	$4.39	$3,512	19.3	CY	$6.55	$126	0.0	CY	$4.17	$0	$3,638
RAMPS	CONC	12	60	1	1440	SQ FT	$8.32	$11,981	69.3	CY	$6.55	$454	0.0	CY	$4.17	$0	$12,435
FOOTINGS	CONC	12	60	2	240	LIN FT	$19.45	$4,668	138.7	CY	$6.55	$908	0.0	CY	$4.17	$0	$5,576
42 **NEW SCALE HOUSE**																	
PAD	CONC	20	20	0.5	400	SQ FT	$4.39	$1,756	9.6	CY	$6.55	$63	0.0	CY	$4.17	$0	$1,819
FOOTINGS	CONC	3	80	1.5	80	LIN FT	$19.45	$1,556	17.3	CY	$6.55	$114	0.0	CY	$4.17	$0	$1,670
STEM WALL	CONC	0.66	80	0.66	52.8	SQ FT	$10.65	$562	1.7	CY	$6.55	$11	0.0	CY	$4.17	$0	$573
BUILDING	METAL	20	20	8	3200	CU FT	$0.23	$736	39.1	CY	$8.15	$319	39.1	CY	$4.17	$163	$1,218
43 **PROPOSED BATH HOUSE**																	
PAD	CONC	60	100	0.5	6000	SQ FT	$4.39	$26,340	144.4	CY	$6.55	$946	0.0	CY	$4.17	$0	$27,286
FOOTINGS	CONC	3	320	1.5	320	LIN FT	$19.45	$6,224	69.3	CY	$6.55	$454	0.0	CY	$4.17	$0	$6,678
STEM WALL	CONC	1	80	0.66	80	SQ FT	$10.65	$852	2.5	CY	$6.55	$17	0.0	CY	$4.17	$0	$869
BUILDING	METAL	60	100	18	108000	CU FT	$0.23	$24,840	1320.0	CY	$8.15	$10,758	1320.0	CY	$4.17	$5,504	$41,102
44 **COAL SILO**																	
	STEEL	12	DIA	60	6782	CU FT	$0.23	$1,560	82.9	CY	$8.15	$676	82.9	CY	$4.17	$346	$2,581
45 **CONVEYORS**																	
	STEEL	5	780	4	15600	CU FT	$0.23	$3,588	190.7	CY	$8.15	$1,554	190.7	CY	$4.17	$795	$5,937
46 **PARKING LOT**																	
EXISTING PAD	ASPHALT				4800	SQ YD	$4.08	$19,584	520.0	CY	$6.55	$3,406	0.0	CU YD	$4.17	$0	$22,990
PROPOSED PADS	ASPHALT				4400	SQ YD	$4.08	$17,952	520.0	CY	$6.55	$3,406	0.0	CU YD	$4.17	$0	$21,358

TABLE 5-20-2
DEMOLITION & DISPOSAL COSTS

ITEM	TYPE	WIDTH	LENGTH	HEIGHT	DEMOLITION AMOUNT	DEMOLITION UNIT	DEMOLITION UNIT COST	DEMOLITION COST	DISPOSAL AMOUNT	DISPOSAL UNIT	DISPOSAL UNIT COST	DISPOSAL COST	DUMP FEE AMOUNT	DUMP FEE UNIT	DUMP FEE UNIT COST	DUMP FEE COST	TOTAL
47 **RUBBER LINER REMOVAL**																	
RUBBER	FABRIC	25	1400	10 MIL	1400	LIN FT	$1.96	$2,750	32.5	TON	$6.55	$213	32.5	CY	$4.17	$136	$3,099
48 **72" CULVERT BEDDING MATERIAL REMOVAL BY VACUUM**																	
STREAM BED	SAND	5	1400	5	1296.3	CU YD	$1.20	$1,556	1296.3	CY	$6.55	$8,491	0.0	CY	$4.17	$0	$10,046
CULVERT BED	SAND	10	1400	10	3629.6	CU YD	$1.20	$4,356	3629.6	CY	$6.55	$23,774	0.0	CY	$4.17	$0	$28,130
TOTALS								$505,663				$84,391				$18,008	**$608,063**

BASED UPON MEANS REFERENCES EXCEPT FOR DUMP FEE
DUMP FEE SET BY STATE AGENCY (NIELSON'S LANDFILL)
ITEMS WITH NO DUMP FEE ARE DISPOSED INSIDE OF MINE PORTALS

TABLE 5-20-3

BACKFILLING AND GRADING

	BANK VOLUME	LOOSE VOLUME	PROD RATE	# UNITS	CALC AMOUNT	ESTIM AMOUNT	UNIT	---UNIT COST ---- EQUIP	LABOR	TOTAL
RIPPING (D9 Dozer)										
FILL AREA	33,437	43,468	2350	1	18.50	20	HOURS	$121.81	$38.35	$3,203
FINAL SURFACE	14,500	18,850	2350	1	8.02	9	HOURS	$121.81	$38.35	$1,441
LOADING (7 cy 988 Loader)										
	101,326	131,724	430	1	306.33	300	HOURS	$78.09	$38.35	$34,932
HAULING (34 cy Trucks, Scoops,Tandem Trailers)										
BACKFILL AREA	53,994	70,192	200	3	351.0	360	HOURS	$68.76	$31.14	$35,964
MINE WORKINGS	15,700	20,410	100	3	204.1	210	HOURS	$80.48	$31.14	$23,440
OFFSITE DISPOSAL	31,632	41,122	78	5	527.2	530	HOURS	$43.42	$31.14	$39,517
OFFSITE DUMP FEE	31,632					31,632	CY	$4.17	PER CY	$131,905
GRADING/DOZER (D9 Dozer)										
	14,500	18,850	270	1	69.81	70	HOURS	$121.81	$38.35	$11,211
FINAL PLACING (3 cy 375 Backhoe)										
	8,100	10,530	160	1	65.81	70	HOURS	$150.29	$38.35	$13,205
EXCAVATE STREAM CHANNELS										
	500	650	100		6.50	8	HOURS	$19.77	$38.35	$465
MISCELLANEOUS EXCAVATION										
	1,000	1,300	100		13.00	16	HOURS	$19.77	$36.81	$905
TOTAL BACKFILLING & GRADING										**$296,189**

TABLE 5-20-4

TOPSOIL DISTRIBUTION

	BANK VOLUME	LOOSE VOLUME	PROD RATE	# UNITS	CALC AMOUNT	ESTIM AMOUNT	UNIT	---UNIT COST ---- EQUIP	LABOR	TOTAL
LOADING (4.5 cy 966 Loader)										
FROM STOCKPILES	8,683	9,551	300	1	31.8	36	HOURS	$44.87	$38.35	$2,996
HAULING (12 cy End Dumps)										
TO SITE	8,683	9,551	35	9	272.9	290	HOURS	$31.07	$31.14	$18,041
PLACING										
4.5 CY WM LOADER	5,818	6,400	185	1	34.6	36	HOURS	$44.87	$38.35	$2,996
3 CY BACKHOE	2,865	3,152	160	1	19.7	20	HOURS	$150.29	$38.35	$3,773
GRADING/DOZING (D7 Dozer)										
ON SITE	5,818	6,400	180	1	35.6	36	HOURS	$63.51	$38.35	$3,667
TOTAL TOPSOILING										**$31,473**

TABLE 5-20-5

GENERAL PROJECT COSTS

	ESTIMATED AMOUNT	UNIT	---UNIT COST ---- EQUIP	LABOR	TOTAL
WATER TRUCK					
BACKFILLING & GRADINC	75	HOURS	$34.63	$24.85	$4,461
TOPSOILING	8	HOURS	$34.63	$24.85	$476
PICKUP TRUCKS					
BACKFILLING & GRADINC	300	HOURS	$16.17	n/a	$4,851
TOPSOILING	36	HOURS	$16.17	n/a	$582
LABORERS					
BACKFILLING & GRADINC	150	HOURS	above	$32.20	$4,830
TOPSOILING	18	HOURS	above	$32.20	$580
MECHANICS					
BACKFILLING & GRADINC	60	HOURS	$16.17	$43.50	$3,580
TOPSOILING	8	HOURS	$16.17	$43.50	$477
FOREMEN					
BACKFILLING & GRADINC	300	HOURS	$16.17	$45.45	$18,486
TOPSOILING	36	HOURS	$16.17	$45.45	$2,218
SURVEYING					
BACKFILLING & GRADINC	5	DAYS	$20.67	$595.00	$3,078
TOPSOIL TESTING					
LABOR FOR SAMPLING	18	HOURS	$16.17	$76.25	$1,664
LAB ANALYSIS	18	EACH	$310.00	n/a	$5,580
DRAINAGE CONTROL					
FILTER MATERIAL	3000	LIN FT	$1.04	incl	$3,120
RIP-RAP	2100	TON	$29.50	incl	$61,950
TOTALS					**$115,933**

TABLE 5-20-6

REVEGETATION COSTS

ITEM	TYPE	AREA	RATE	UNIT	AMOUNT	UNITS	----UNIT COST ------- EQUIP	LABOR	TOTAL
1 **HYDROSEEDER**		8.73	1.25	AC/DAY	6.984	DAY	$587.00	INCLD	$4,100
2 **MULCH**		8.73	1	TON/AC	8.73	TONS	$425.00	INCLD	$3,710
3 **FERTILIZER**		8.73	200	LB/AC	1746	LBS	$0.23	INCLD	$395
4 **TACKIFIER**		8.73	125	LB/AC	1091.3	LBS	$2.40	INCLD	$2,619
5 **SEED MIX (Table 4)**		8.73			8.73	AC	$145.00	INCLD	$1,266
6 **SEEDLINGS (Table 4A)**		8.73	610	EA /AC	5325.3	EACH	$0.58	$1.18	$9,373
TOTAL									$21,462
CONTRACTOR OVERHEAD & PROFIT @ 10%									$2,146
GRAND TOTAL									**$23,608**

TABLE 5-20-7

10 YEAR MONITORING COST ESTIMATE

ITEM	BASIS	AMOUNT	UNIT	UNIT COST	TOTAL COST
1 WATER MONITORING					
SAMPLING	TWICE A YEAR	40	DAYS	$210.00	$8,400
PICKUP TRUCK	TWICE A YEAR	40	DAYS	$130.00	$5,200
ANALYSIS	TWICE A YEAR	10	YEAR	$2,750.00	$27,500
2 REVEGETATION MONITORING					
FIELD WORK	3 TIMES IN 10 YEARS	15	DAYS	$630.00	$9,450
REPORT	3 TIMES IN 10 YEARS	15	DAYS	$210.00	$3,150
3 POND INSPECTIONS					
INSPECTOR	MONTHLY FOR 2 YEARS	24	DAYS	$210.00	$5,040
PICKUP TRUCK	ONCE/MONTH/YEAR	24	DAYS	$130.00	$3,120
4 SITE INSPECTION & REPAIRS					
INSPECTOR	ONCE/MONTH/YEAR	120	DAYS	$210.00	$25,200
PICKUP TRUCK	ONCE/MONTH/YEAR	120	DAYS	$130.00	$15,600
GULLY REPAIR	10% AREA	0.87	ACRE	$420.05	$367
5 REVEGETATION					
	20% AREA REDONE	1.75	ACRE	$2,704.24	$4,722
GRAND TOTAL					**$107,748**

TABLE 5-20-8

EQUIPMENT COSTS

EQUIPMENT	MONTHLY RENTAL AMOUNT	MONTHLY RENTAL COST/HR	OPERATING COST/HR	REGIONAL ADJUSTMENT	TOTAL COST/HOUR
DOZER:					
D-6H	$6,440.00	$32.20	$17.45	0.865	$42.95
D-7H	$9,825.00	$49.13	$24.30	0.865	$63.51
D-9N	$14,325.00	$71.63	$50.00	0.865	$105.21
D-9 W/RIPPER	$17,175.00	$85.88	$54.95	0.865	$121.81
BACKHOE:					
375	$22,155.00	$110.78	$57.15	0.895	$150.29
436	$2,950.00	$14.75	$8.10	0.865	$19.77
HAUL TRUCK:					
769C	$9,035.00	$45.18	$31.40	0.898	$68.76
12 CY END DUMP	$3,200.00	$16.00	$18.60	0.898	$31.07
SCOOP (WAGNER ST-13)	$9,750.00	$48.75	$37.70	0.931	$80.48
TRACTOR	$3,135.00	$15.68	$19.80	0.898	$31.86
SEMI-TRAILER	$345.00	$1.73	$1.45	0.853	$2.71
FULL TRAILER (PUP)	$1,255.00	$6.28	$4.10	0.853	$8.85
WHEEL LOADER:					
988B	$10,365.00	$51.83	$38.45	0.865	$78.09
966F	$6,365.00	$31.83	$20.05	0.865	$44.87
MOTOR GRADER					
14G	$6,885.00	$34.43	$19.95	0.865	$47.03
WATER TRUCK					
5000 GALLON	$2,995.00	$14.98	$12.70	0.898	$24.85

NOTE: COSTS BASED ON DATAQUEST'S 1997 RENTAL BLUEBOOK FOR CONSTRUCTION EQUIPMENT
LABOR COSTS ARE NOT INCLUDED

Table 5-20-5

EQUIPMENT PRODUCTION ESTIMATES -- LCY

BULLDOZER PRODUCTION

JOB	EQUIP'T	SIZE	PUSH DISTANCE	MAX PROD	CORRECTION FACTORS OPER	MATERIAL	EFF'CY	OTHER	PRODUCTION
BACKFILL:									
GRADING	D-9	N/A	300	430	0.8	1.1	0.84	0.85	270
TOPSOIL:									
GRADING	D-6	N/A	150	290	0.8	1.1	0.84	0.85	182
	D-7	N/A	200	290	0.8	1.1	0.84	0.85	182

BULLDOZER RIPPING

JOB	EQUIP'T	SIZE	DISTANCE	SPEED	CYCLE	PASSES/HR	WIDTH	DEPTH	PRODUCTION
BACKFILL:									
RIPPING	D-9	N/A	300	308	1.22	41	4	1	2360

BACKHOE PRODUCTION

JOB	EQUIP'T	SIZE	LOAD TIME	MAX PROD	CORRECTION FACTORS BUCKET	MATERIAL	EFF'CY	PRODUCTION
BACKFILL:								
PLACING	375	3 CY	0.67	270	0.9	90%	75%	164
MISC REMOVAL	436	2.5 CY	0.67	225	0.9	90%	75%	137

HAUL TRUCK PRODUCTION

JOB	EQUIP'T	SIZE	DISTANCE	SPEED	TRAVEL	LOAD	DUMP	TOTAL	EFF'CY	PRODUCTION
BACKFILL	769C	40 TON	1200	10	3	3	2	8	83%	200
	SCOOP	13 CY	1500	8	4	1	1	6	83%	103
	Tan. Trailers	37 CY	35000	45	18	4	2	24	83%	78
TOPSOIL:										
#1 STOCKPILE	END DUMP	12 CY	1000	15	2	3	2	7	83%	92
#2 STOCKPILE	END DUMP	12 CY	5000	12	9	3	2	14	83%	41
#3 STOCKPILE	END DUMP	12 CY	8000	10	18	3	2	23	83%	26

LOADER PRODUCTION

JOB	EQUIP'T	SIZE	CYCLE OR LOAD TIME	MAX PROD	CORRECTION FACTORS BUCKET	MATERIAL	EFF'CY	PRODUCTION
BACKFILL	988	7 CY	0.65	645	0.9	90%	83%	434
TOPSOIL								
LOADING	966	4.5 CY	0.6	450	0.9	90%	83%	303
PLACING	988	7 CY	1.6	265	0.9	90%	83%	178

NOTE: ESTIMATES FROM 25TH EDITION CATERPILLAR PERFORMANCE HANDBOOK

TABLE 5-20-10

CRANDALL CYN MINE -- RECLAMATION EARTHWORK VOLUMES

BANK CUBIC YARDS

	CUT			FILL		
STATION	AREA	VOLUME	CUMULATIVE VOLUME	AREA	VOLUME	CUMULATIVE VOLUME
60	0			0		
		271	271		0	0
90	487			0		
		191	461		0	0
100	543			0		
		3,374	3,835		0	0
200	1279			0		
		4,156	7,991		0	0
270	1927			0		
		2,296	10,287		158	158
300	2205			285		
		9,365	19,652		2,593	2,751
400	2852			1115		
		11,156	30,807		8,263	11,014
500	3172			3347		
		7,152	37,959		6,118	17,132
555	3850			2660		
		5,409	43,368		3,965	21,097
600	2641			2098		
		4,668	48,036		4,096	25,193
660	1560			1588		
		2,258	50,294		2,101	27,293
700	1488			1248		
		5,376	55,670		3,687	30,980
800	1415			743		
		7,185	62,855		2,607	33,588
900	2465			665		
		9,124	71,979		4,796	38,384
1000	2462			1925		
		930	72,909		704	39,088
1010	2558			1877		
		2,716	75,625		2,324	41,412
1045	1633			1708		
		3,616	79,241		3,209	44,621
1100	1917			1443		
		8,965	88,206		4,441	49,062
1200	2924			955		
		1,153	89,359		352	49,414
1210	3304			945		
		4,022	93,381		1,537	50,950
1255	1522			899		
		1,609	94,990		1,461	52,411
1300	409			854		
		207	95,197		439	52,850
1315	335			726		
		566	95,763		747	53,598
1350	539			427		
		265	96,028		142	53,740
1360	894			342		
		690	96,718		155	53,895
1375	1589			215		
		1,728	98,446		100	53,994
1400	2144			0		
		1,126	99,573		0	53,994
1415	1910			0		
		831	100,404		0	53,994
1430	1083			0		
		909	101,313		0	53,994
1470	144			0		
		13	101,326		0	53,994
1475	0			0		
TOTALS			101,326			53,994

EXCESS CUT =	47,332	BANK CUBIC YARDS	61,532	LOOSE CUBIC YARDS
CUT MATERIAL USED IN BACKFILL =			70,192	LOOSE CUBIC YARDS
CUT MATERIAL DISPOSED IN MINE =			20,410	LOOSE CUBIC YARDS
CUT MATERIAL HAULED TO LANDFILL =			41,122	LOOSE CUBIC YARDS

TABLE 5-20-11

CRANDALL CYN MINE -- RECLAMATION EARTHWORK VOLUMES - LANDFILL

BANK CUBIC YARDS

		CUT			FILL	
STATION	AREA	VOLUME	CUM'TVE VOLUME	AREA	VOLUME	CUM'TVE VOLUME
60	0			0		
		139	139		0	0
90	250			0		
		87	226		0	0
100	220			0		
		870	1,096		0	0
200	250			0		
		870	1,967		0	0
300	220			0		
		759	2,726		0	0
400	190			0		
		704	3,430		0	0
500	190			0		
		630	4,059		0	0
600	150			0		
		685	4,744		0	0
700	220			0		
		870	5,615		0	0
800	250			0		
		870	6,485		0	0
900	220			0		
		759	7,244		0	0
1000	190			0		
		352	7,596		0	0
1050	190			0		
		176	7,772		0	0
1100	0			0		
TOTALS			7,772			0

EXCESS CUT = 10,104 LOOSE CUBIC YARDS HAULED TO LANDFILL

TABLE 5-20-12

CRANDALL CYN MINE -- RECLAMATION EARTHWORK VOLUMES - PHASE 2

BANK CUBIC YARDS

	CUT			FILL		
STATION	AREA	VOLUME	CUM'TVE VOLUME	AREA	VOLUME	CUM'TVE VOLUME
60	0			0		
		0	0		0	0
90	0			0		
		0	0		0	0
100	0			0		
		0	0		0	0
200	0			0		
		0	0		0	0
300	0			0		
		0	0		0	0
400	0			0		
		0	0		0	0
500	0			0		
		0	0		0	0
600	0			0		
		0	0		0	0
700	0			0		
		0	0		0	0
800	0			0		
		0	0		0	0
900	0			0		
		0	0		0	0
1000	0			0		
		0	0		0	0
1050	0			0		
		1,775	1,775		0	0
1100	1917			0		
		8,965	10,740		0	0
1200	2924			0		
		1,153	11,893		0	0
1210	3304			0		
		4,022	15,915		0	0
1255	1522			0		
		1,609	17,524		0	0
1300	409			0		
		207	17,731		0	0
1315	335			0		
		566	18,297		0	0
1350	539			0		
		265	18,563		0	0
1360	894			0		
		690	19,252		0	0
1375	1589			0		
		1,728	20,980		0	0
1400	2144			0		
		1,126	22,107		0	0
1415	1910			0		
		831	22,938		0	0
1430	1083			0		
		909	23,847		0	0
1470	144			0		
		13	23,860		0	0
1475	0			0		
TOTALS			23,860			0

EXCESS CUT = 31,018 LOOSE CUBIC YARDS HAULED TO LANDFILL

FILL MATERIAL DISPOSAL IN MINE WORKINGS

FROM TABLE 5-2-8, THE VOLUME OF FILL MATERIAL TO BE DISPOSED IN THE MINE WORKINGS CLOSE TO THE PORTAL AREA IS:

20,410 LOOSE CUBIC YARDS

NO COMPACTION WILL BE POSSIBLE FOR THIS STORAGE VOLUME.

THE AVERAGE ENTRY IS 20 FEET WIDE. THE MAXIMUM DISPOSAL HEIGHT WILL BE 5 FEET.

VOLUME OF LOOSE MATERIAL PER 100 FT OF LINEAR ENTRY IS:

370 LOOSE CUBIC YARDS

LINEAR FEET OF ENTRY TO DISPOSE THE FILL MATERIAL IS:

5,511 FEET

FIGURE 1 SHOWS THE AREA OF MINE WORKINGS WHERE THE FILL MATERIAL CAN BE DISPOSED. THE SHADED AREA SHOWS APPROXIMATELY 6800 FEET OF ENTRY. ADDITIONAL AREA CAN BE ADDED INBY THE SHADED AREA IF NEEDED.

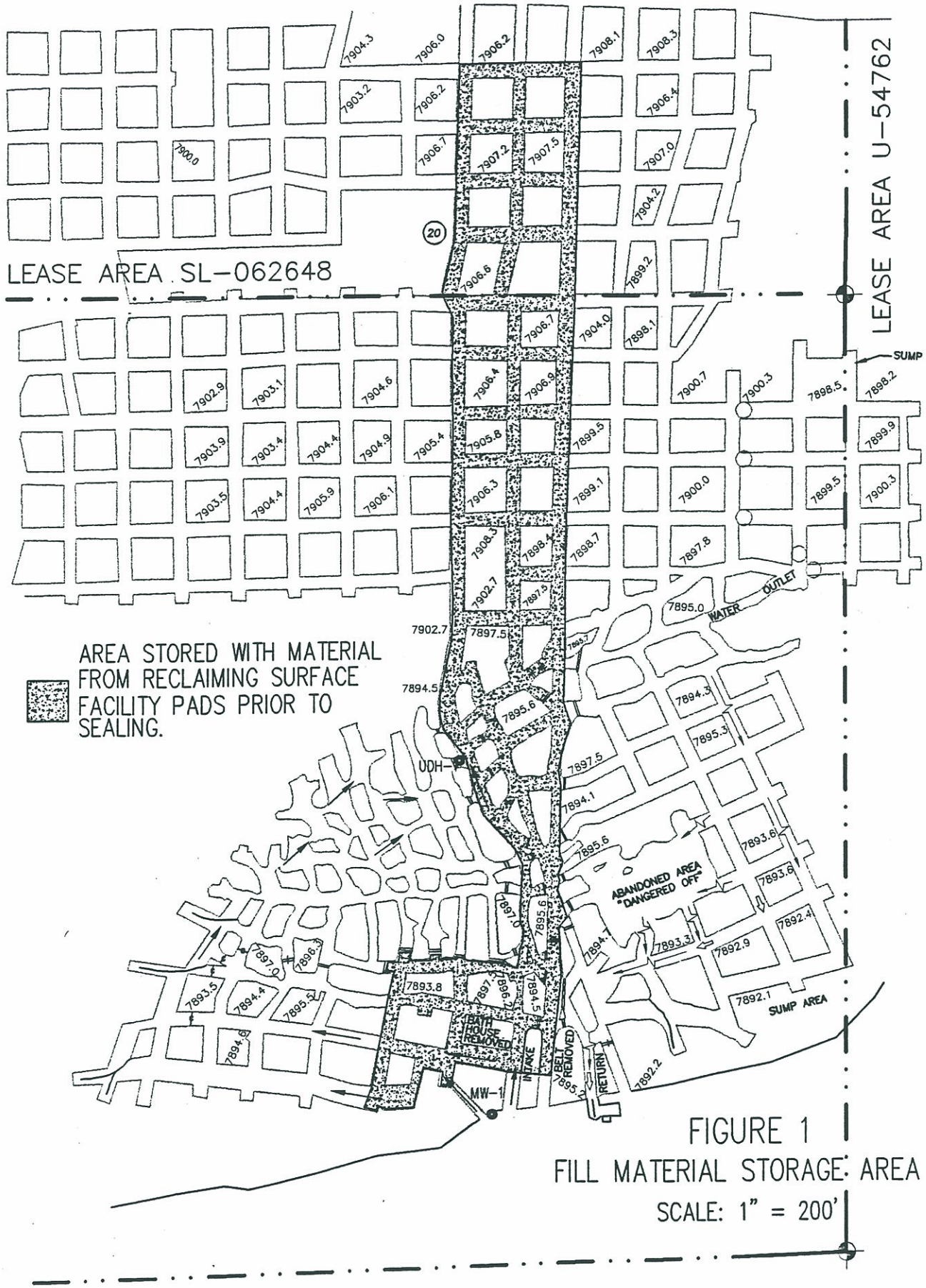


FIGURE 1

FILL MATERIAL STORAGE AREA

SCALE: 1" = 200'

APPENDIX 5-21

Reclamation Fill Stability Analysis At The Crandall Canyon Mine
Emery County, Utah

March 12, 1997

RECLAMATION FILL STABILITY ANALYSIS AT THE CRANDALL CANYON MINE EMERY COUNTY, UTAH

Prepared for

GENWAL RESOURCES, INC.
195 NORTH 100 WEST
HUNTINGTON, UTAH 84528

Prepared by

JME COMPANIES
Engineering, Environmental, and Geologic Services
12211 W. Alameda Parkway, Suite 207
Lakewood, CO 80228-2825
303-969-9759 Fax 303763-9951

March 12, 1997

I certify that the calculations contained in this report were prepared by me and are correct to the best of my knowledge.

COLORADO REGISTERED RICHARD H. FOX 25705 PROFESSIONAL ENGINEER

Richard H. Fox, P.E.

INCORPORATED EFFECTIVE JUL 30 1997

UTAH DIVISION OIL, GAS AND MINING
PRICE FIELD OFFICE

RECLAMATION SOIL SLOPE STABILITY ANALYSIS AT THE CRANDALL CANYON MINE EMERY COUNTY, UTAH

INTRODUCTION

This report presents the results of a slope stability investigation for potential slide areas of reclaimed soils placed on previous disturbance areas. The disturbance areas are at the Crandall Canyon portals and facilities area for Genwal Resources mine that is located in Crandall Canyon, approximately 15 miles west of Huntington, Utah.

The purpose and scope of the study were discussed with Mr. Gary Gray, Reclamation Engineer for Genwal Resources, Inc. Several slope areas were to be investigated for potential failure of the reclamation material placed over slopes disturbed by mine related activities. The investigation included review of previous stability work for the initial portal and pad excavation, road expansion, storage pad expansion, revised sediment pond, sediment pond expansion, and plan and section maps of the proposed reclamation for the area.

PROJECT DESCRIPTION

The project is in the south center portion of Section 5, T. 16 S., R. 7 W, Salt Lake Base and Meridian. Two portal pads, an access road to the pads, a coal stockpile pad, and a sediment pond are being reclaimed. One road will remain unreclaimed as access to US Forest Service land.

The reclamation will be done using existing borrow area materials and previously stockpiled topsoil excavated during site construction.

SURFACE AND SUBSURFACE DESCRIPTION

The site is located close to the bottom of a prominent ridge, just above the Crandall Creek drainage. The slopes are generally steep, varying from 30 to 40 degrees to near vertical where cliff forming sandstones are exposed. The Blackhawk formation form the upper portion of the ridge with alternating cliff forming sandstone units and slope forming materials consisting of soft to hard and sand shale and several coal beds. The lower portion of the slopes is in the Star Point formation which consists of cliff forming sandstone separated by tongues of yellow to gray slope forming shale.

The reclamation soil will be placed over disturbance that is generally on subsoils that can be placed in 4 classifications:

1. Areas of exposed bedrock. This occurs on the upper access cut for the portals and portal pads.
2. Areas where bedrock is covered by 10 to 40 inches ± of silty sand with gravel and cobbles. Parts of the upper access road cut and portal pads are in this classification. The lower access road (U.S.F.S. access road) is also in this classification.
3. Areas where bedrock is covered by 15 feet ±of surficial deposits. The deposits generally consist of silt and fine gravel between 0 and 4 feet; dense silty sand with some gravel and cobbles between 4 and 12 feet; and boulders and silty sand to bedrock. The coal pad and sediment pond embankment were placed over this type of material.

4. Areas over fill placed for pads and embankments. These areas are on the slopes of the coal storage pad and the sediment pond embankment.

SLOPE STABILITY ANALYSIS

The computer program used to evaluate the stability of the reclamation slopes involving a slip circle failure is called REAME (Rotational Equilibrium Analysis of Multilayered Embankments) that is based on a simplified Bishop method of analysis. The program was developed by Dr. Y. H. Huang, Professor of Civil Engineering, University of Kentucky.

SOIL PROPERTIES

A set of conservative soil properties was selected after reviewing data from a report by Earthfax Engineering, Inc., dated November 9, 1990. Sample FS-1 is uncompacted silty gravely sand that may have been a composite of road base and native fill material taken from the fill slope of the surface coal storage pad. Sample SS-1 is a silty gravely sand with calcium carbonate cementation that was taken along the north bank of Crandall Creek. Both samples were subjected to unsaturated and undrained direct shear tests to determine soil strength factors. Both of the samples were nonplastic and were in the the Unified Soil Class SM. The soil samples drained well and, although there was approximately 20 percent passing a #200 sieve, the material contained silt and not clay. The material from FS-1 and SS-1 represent the type of natural material that will be used for reclamation fill.

SOIL MATERIAL PROPERTIES

SAMPLE	DENSITY (pcf)	INTERNAL FRICTION (Degrees)	COHESION (psf)
FS-1	123.5	55	1600
SS-1	110	46	700
Stability Study	135	40	200

The 135 pcf used for density is for a saturated soil. The internal friction angle and cohesion were reduced to represent fill material that is not as highly compacted as an engineered fill such as the sediment pond embankment or the coal storage pad.

A 20 percent pore pressure ratio was used to account for potential saturation and concentration of water at the reclamation soil-bedrock contact. This type of condition would cause seeps at the toe of the reclamation soil slope.

CRITICAL SLIP CIRCLES AND FACTORS OF SAFETY

SECTION	STABILITY METHOD	HORIZONTAL DISTANCE	ELEVATION	CRITICAL RADIUS	FACTOR OF SAFETY
6 North	Static	481.57	8043.79	103.02	1.64
9 North	Static	480.15	7929.55	45.69	2.21
9 South	Static	252.55	7873.85	73.73	2.44
10 North	Static	406.3	7922.5	109.11	1.57
11 North	Static	385.85	7957.75	148.33	1.40

The static stability for all sections were above the minimum 1.3 static factor of safety . required by D.O.G.M. to meet reclamation standards in the MRP for the Crandall Canyon Mine

The data input, output of first and last stability circles and location of critical stability circle for each run are attached. Reduced plan and section maps showing the location of the sections and the critical circle for the sections reviewed are included.

SLOPE STABILITY - SECTION 6 - STATIC
NORTH SIDE OF CRANDALL CREEK

ROTATIONAL EQUILIBRIUM ANALYSIS OF MULTILAYERED EMBANKMENTS
VERSION 1.21 LAST MODIFIED ON JAN-10-91

TODAY'S DATE = 03-05-1997 RUN TIME = 22:06:07

TITLE =GENWAL CRANDALL CANYON RECLAMATION SLOPE FOR SECTION 6+00 STATIC

FILE NAME =\basic\qb\reame\gen-6-1.SLP

READING FROM FILE

NO. OF STATIC AND SEISMIC CASES = 1

CASE NO. 1 SEISMIC COEFFICIENT = 0

NO. OF BOUNDARY LINES = 2

NO. OF POINTS ON BOUNDARY LINE 1 = 13

BOUNDARY LINE - 1

POINT	X-COORD	Y-COORD
1	287.00	7850.00
2	344.00	7850.00
3	359.00	7860.00
4	384.00	7870.00
5	405.00	7870.00
6	418.00	7880.00
7	428.00	7900.00
8	500.00	7942.00
9	531.00	7950.00
10	550.00	7960.00
11	563.00	7970.00
12	564.00	7982.00
13	571.00	7987.00

NO. OF POINTS ON BOUNDARY LINE 2 = 6

BOUNDARY LINE - 2

POINT	X-COORD	Y-COORD
1	287.00	7850.00
2	332.00	7860.00
3	387.00	7880.00
4	428.00	7900.00
5	500.00	7942.00
6	571.00	7987.00

LINE NO. AND SLOPE OF EACH SEGMENT ARE:
1 0 .6666667 .4 0 .7692308 2 .5833333 .2580645 .5263158 .7692308 12 .7142857
2 .2222222 .3636364 .4878049 .5833333 .6338028

MIN. DEPTH OF TALLEST SLICE = 2
NO. OF RADIUS CONTROL ZONES = 1

RADIUS DECREMENT FOR ZONE 1 = 0
NO. OF CIRCLES FOR ZONE 1 = 5
ID NO. OF FIRST CIRCLE FOR ZONE 1 = 1
NO. OF BOTTOM LINES FOR ZONE 1 = 1

FOR ZONE 1 LINE SEQUENCE 1
LINE NO.= 1 BEG. NO.= 1 END NO.= 13

SOIL NO.	COHESION	FRIC. ANGLE	UNIT WEIGHT
1	200	40	135

USE PORE PRESSURE RATIO
USE GRID
NO. OF SLICES= 6 NO. OF ADD. RADII= 3

PORE PRESSURE RATIO= .2
COORDINATES OF GRID POINTS 1, 2, AND 3

POINT 1 X-COORD. = 170 Y-COORD. = 8050
POINT 2 X-COORD. = 272 Y-COORD. = 7848
POINT 3 X-COORD. = 580 Y-COORD. = 8000

X INCREMENT = 5 Y INCREMENT = 5
NO. OF DIVISIONS BETWEEN POINTS 1 AND 2= 36
NO. OF DIVISIONS BETWEEN POINTS 2 AND 3= 25

AT POINT (170 8050) THE RADIUS AND FACTOR OF SAFETY ARE:
231.7089 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 231.7089

AT POINT (172.8333 8044.389) THE RADIUS AND FACTOR OF SAFETY ARE:
225.4351 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 225.4351

DATA REMOVED FOR REPORT SUMMARY

AT POINT (482.817 8042.541) THE RADIUS AND FACTOR OF SAFETY ARE:
101.2713 1.641088
99.84099 1.767204
98.41063 1.988624
96.98027 2.448517
95.54991 1000000
LOWEST FACTOR OF SAFETY = 1.641088 AND OCCURS AT RADIUS = 101.2713

AT POINT (480.317 8042.541) THE RADIUS AND FACTOR OF SAFETY ARE:

102.2699 1.664145
100.9075 1.798382
99.54509 2.032656
98.18269 2.517398
96.82028 1000000
LOWEST FACTOR OF SAFETY = 1.664145 AND OCCURS AT RADIUS = 102.2699

AT POINT (481.567 8043.791) THE RADIUS AND FACTOR OF SAFETY ARE:
103.021 1.637418
101.5857 1.763284
100.1504 1.984129
98.71509 2.442613
97.27979 1000000
LOWEST FACTOR OF SAFETY = 1.637418 AND OCCURS AT RADIUS = 103.021

AT POINT (481.567 8045.041) THE RADIUS AND FACTOR OF SAFETY ARE:
103.7755 1.657748
102.4005 1.79066
101.0254 2.022748
99.6504 2.502934
98.27535 1000000
LOWEST FACTOR OF SAFETY = 1.657748 AND OCCURS AT RADIUS = 103.7755

AT POINT (482.817 8043.791) THE RADIUS AND FACTOR OF SAFETY ARE:
102.0235 1.661688
100.6539 1.795024
99.28426 2.027869
97.91463 2.509894
96.54499 1000000
LOWEST FACTOR OF SAFETY = 1.661688 AND OCCURS AT RADIUS = 102.0235

AT POINT (480.317 8043.791) THE RADIUS AND FACTOR OF SAFETY ARE:
103.4802 1.651432
102.0869 1.782166
100.6936 2.010725
99.30031 2.484257
97.907 1000000
LOWEST FACTOR OF SAFETY = 1.651432 AND OCCURS AT RADIUS = 103.4802

AT POINT (481.567 8043.791)RADIUS 103.021

THE MINIMUM FACTOR OF SAFETY IS 1.637418

SLOPE STABILITY - SECTION 9 - STATIC
NORTH SIDE OF CRANDALL CREEK

ROTATIONAL EQUILIBRIUM ANALYSIS OF MULTILAYERED EMBANKMENTS
VERSION 1.21 LAST MODIFIED ON JAN-10-91

TODAY'S DATE = 03-06-1997 RUN TIME = 21:57:24

TITLE =GENWAL CRANDALL CANYON RECLAMATION STABILITY FOR SECTION 9+00 STATIC

FILE NAME =\basic\qb\reame\gen-9nor.SLP

READING FROM FILE

NO. OF STATIC AND SEISMIC CASES = 1

CASE NO. 1 SEISMIC COEFFICIENT = 0

NO. OF BOUNDARY LINES = 2

NO. OF POINTS ON BOUNDARY LINE 1 = 10

BOUNDARY LINE - 1

POINT	X-COORD	Y-COORD
1	393.00	7827.00
2	414.00	7830.00
3	426.00	7840.00
4	444.00	7857.00
5	470.00	7880.00
6	478.00	7882.00
7	491.00	7885.00
8	507.00	7885.00
9	515.00	7900.00
10	521.00	7906.00

NO. OF POINTS ON BOUNDARY LINE 2 = 6

BOUNDARY LINE - 2

POINT	X-COORD	Y-COORD
1	393.00	7827.00
2	426.00	7840.00
3	444.00	7857.00
4	470.00	7880.00
5	478.00	7882.00
6	521.00	7906.00

LINE NO. AND SLOPE OF EACH SEGMENT ARE:
1 .1428571 .8333333 .9444444 .8846154 .25 .2307692 0 1.875 1
2 .3939394 .9444444 .8846154 .25 .5581396

MIN. DEPTH OF TALLEST SLICE = .5
NO. OF RADIUS CONTROL ZONES = 1

RADIUS DECREMENT FOR ZONE 1 = 0

NO. OF CIRCLES FOR ZONE 1 = 5
ID NO. OF FIRST CIRCLE FOR ZONE 1 = 1
NO. OF BOTTOM LINES FOR ZONE 1 = 1

FOR ZONE 1 LINE SEQUENCE 1
LINE NO.= 1 BEG. NO.= 1 END NO.= 10

SOIL NO.	COHESION	FRIC. ANGLE	UNIT WEIGHT
1	200	40	135

USE PORE PRESSURE RATIO
USE GRID
NO. OF SLICES= 10 NO. OF ADD. RADII= 3

PORE PRESSURE RATIO= .2
COORDINATES OF GRID POINTS 1, 2, AND 3

POINT 1 X-COORD. = 260 Y-COORD. = 7983
POINT 2 X-COORD. = 368 Y-COORD. = 7817
POINT 3 X-COORD. = 530 Y-COORD. = 7925

X INCREMENT = 5 Y INCREMENT = 5
NO. OF DIVISIONS BETWEEN POINTS 1 AND 2= 20
NO. OF DIVISIONS BETWEEN POINTS 2 AND 3= 20

AT POINT (260 7983) THE RADIUS AND FACTOR OF SAFETY ARE:
205 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 205

AT POINT (265.4 7974.7) THE RADIUS AND FACTOR OF SAFETY ARE:
195.1848 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 195.1848

AT POINT (270.8 7966.4) THE RADIUS AND FACTOR OF SAFETY ARE:
185.3788 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 185.3788

DATA REMOVED FOR REPORT SUMMARY

AT POINT (486.4 7928.302) THE RADIUS AND FACTOR OF SAFETY ARE:
40.23618 2.488947
39.45625 2.755804
38.67633 3.21643
37.89641 4.162469
37.11649 7.047863
LOWEST FACTOR OF SAFETY = 2.488947 AND OCCURS AT RADIUS = 40.23618

AT POINT (478.9 7928.302) THE RADIUS AND FACTOR OF SAFETY ARE:

44.91358	2.256868
43.92922	2.459867
42.94487	2.816206
41.96051	3.556435
40.97615	5.834179

LOWEST FACTOR OF SAFETY = 2.256868 AND OCCURS AT RADIUS = 44.91358

AT POINT (480.15 7929.552) THE RADIUS AND FACTOR OF SAFETY ARE:

45.69277	2.210005
44.64904	2.39872
43.6053	2.731908
42.56157	3.427411
41.51783	5.574027

LOWEST FACTOR OF SAFETY = 2.210005 AND OCCURS AT RADIUS = 45.69277

AT POINT (480.15 7930.802) THE RADIUS AND FACTOR OF SAFETY ARE:

46.51098	2.245097
45.5219	2.447822
44.53282	2.803027
43.54374	3.541034
42.55466	5.808965

LOWEST FACTOR OF SAFETY = 2.245097 AND OCCURS AT RADIUS = 46.51098

AT POINT (481.4 7929.552) THE RADIUS AND FACTOR OF SAFETY ARE:

44.7467	2.264048
43.77033	2.469091
42.79397	2.828791
41.8176	3.575498
40.84124	5.872989

LOWEST FACTOR OF SAFETY = 2.264048 AND OCCURS AT RADIUS = 44.7467

AT POINT (478.9 7929.552) THE RADIUS AND FACTOR OF SAFETY ARE:

46.13157	2.231561
45.12191	2.42886
44.11226	2.775535
43.1026	3.496699
42.09295	5.716574

LOWEST FACTOR OF SAFETY = 2.231561 AND OCCURS AT RADIUS = 46.13157

AT POINT (480.15 7929.552)RADIUS 45.69277

THE MINIMUM FACTOR OF SAFETY IS 2.210005

SLOPE STABILITY - SECTION 9 - STATIC
SOUTH SIDE OF CRANDALL CREEK

ROTATIONAL EQUILIBRIUM ANALYSIS OF MULTILAYERED EMBANKMENTS
VERSION 1.21 LAST MODIFIED ON JAN-10-91

TODAY'S DATE = 03-05-1997 RUN TIME = 22:31:19

TITLE =GENWAL CRANDALL CANYON RECLAMATION STABILITY FOR SECTION 9+00 STATIC

FILE NAME =\BASIC\QB\REAME\GEN-9SOU.SLP

READING FROM FILE

NO. OF STATIC AND SEISMIC CASES = 1

CASE NO. 1 SEISMIC COEFFICIENT = 0

NO. OF BOUNDARY LINES = 2

NO. OF POINTS ON BOUNDARY LINE 1 = 3

BOUNDARY LINE - 1

POINT	X-COORD	Y-COORD
1	190.00	7830.00
2	226.00	7800.00
3	262.00	7800.00

NO. OF POINTS ON BOUNDARY LINE 2 = 2

BOUNDARY LINE - 2

POINT	X-COORD	Y-COORD
1	190.00	7830.00
2	262.00	7800.00

LINE NO. AND SLOPE OF EACH SEGMENT ARE:
1 -.8333333 0
2 -.4166667

MIN. DEPTH OF TALLEST SLICE = .5
NO. OF RADIUS CONTROL ZONES = 1

RADIUS DECREMENT FOR ZONE 1 = 0
NO. OF CIRCLES FOR ZONE 1 = 5
ID NO. OF FIRST CIRCLE FOR ZONE 1 = 1
NO. OF BOTTOM LINES FOR ZONE 1 = 1

FOR ZONE 1 LINE SEQUENCE 1
LINE NO.= 1 BEG. NO.= 1 END NO.= 3

SOIL NO.	COHESION	FRIC. ANGLE	UNIT WEIGHT
1	200	40	135

USE PORE PRESSURE RATIO

USE GRID
NO. OF SLICES= 10 NO. OF ADD. RADII= 3

PORE PRESSURE RATIO= .2
COORDINATES OF GRID POINTS 1, 2, AND 3

POINT 1 X-COORD. = 245 Y-COORD. = 7977
POINT 2 X-COORD. = 183 Y-COORD. = 7843
POINT 3 X-COORD. = 275 Y-COORD. = 7800

X INCREMENT = 5 Y INCREMENT = 5
NO. OF DIVISIONS BETWEEN POINTS 1 AND 2= 20
NO. OF DIVISIONS BETWEEN POINTS 2 AND 3= 20

AT POINT (245 7977) THE RADIUS AND FACTOR OF SAFETY ARE:
156.9522 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 156.9522

AT POINT (241.9 7970.3) THE RADIUS AND FACTOR OF SAFETY ARE:
149.5916 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 149.5916

AT POINT (238.8 7963.6) THE RADIUS AND FACTOR OF SAFETY ARE:
142.2332 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 142.2332

DATA REMOVED FOR SUMMARY REPORT

AT POINT (251.3 7875.099) THE RADIUS AND FACTOR OF SAFETY ARE:
73.8889 2.458972
72.15244 2.5884
70.41597 2.82747
68.6795 3.34189
66.94304 4.959418
LOWEST FACTOR OF SAFETY = 2.458972 AND OCCURS AT RADIUS = 73.8889

AT POINT (252.55 7876.349) THE RADIUS AND FACTOR OF SAFETY ARE:
75.64941 2.446155
73.88776 2.573485
72.12612 2.808969
70.36448 3.315836
68.60284 4.910172
LOWEST FACTOR OF SAFETY = 2.446155 AND OCCURS AT RADIUS = 75.64941

AT POINT (252.55 7873.849) THE RADIUS AND FACTOR OF SAFETY ARE:
73.72885 2.435149
71.88978 2.553092
70.0507 2.774391
68.21163 3.255505
66.37256 4.778462
LOWEST FACTOR OF SAFETY = 2.435149 AND OCCURS AT RADIUS = 73.72885

AT POINT (252.55 7872.599) THE RADIUS AND FACTOR OF SAFETY ARE:
72.59863 2.438661
70.75484 2.55547
68.91104 2.775415
67.06725 3.254317
65.22345 4.772328
LOWEST FACTOR OF SAFETY = 2.438661 AND OCCURS AT RADIUS = 72.59863

AT POINT (253.8 7873.849) THE RADIUS AND FACTOR OF SAFETY ARE:
73.84863 2.451451
72.08176 2.577386
70.31488 2.810982
68.548 3.315103
66.78113 4.903771
LOWEST FACTOR OF SAFETY = 2.451451 AND OCCURS AT RADIUS = 73.84863

AT POINT (251.3 7873.849) THE RADIUS AND FACTOR OF SAFETY ARE:
72.92862 2.452916
71.15344 2.577445
69.37827 2.809133
67.60309 3.30995
65.82791 4.890348
LOWEST FACTOR OF SAFETY = 2.452916 AND OCCURS AT RADIUS = 72.92862

AT POINT (252.55 7873.849)RADIUS 73.72885

THE MINIMUM FACTOR OF SAFETY IS 2.435149

SLOPE STABILITY - SECTION 10 - STATIC
NORTH SIDE OF CRANDALL CREEK

ROTATIONAL EQUILIBRIUM ANALYSIS OF MULTILAYERED EMBANKMENTS
VERSION 1.21 LAST MODIFIED ON JAN-10-91

TODAY'S DATE = 03-05-1997 RUN TIME = 22:13:10

TITLE =GENWAL CRANDALL CANYON RECLAMATION STABILITY FOR SECTION 10+00 STATIC

FILE NAME =\BASIC\QB\REAME\GEN-10-1.SLP

READING FROM FILE

NO. OF STATIC AND SEISMIC CASES = 1

CASE NO. 1 SEISMIC COEFFICIENT = 0

NO. OF BOUNDARY LINES = 2

NO. OF POINTS ON BOUNDARY LINE 1 = 11

BOUNDARY LINE - 1

POINT	X-COORD	Y-COORD
1	402.00	7812.00
2	466.00	7820.00
3	477.00	7830.00
4	480.00	7840.00
5	492.00	7850.00
6	498.00	7860.00
7	502.00	7870.00
8	511.00	7880.00
9	528.00	7890.00
10	567.00	7890.00
11	573.00	7910.00

NO. OF POINTS ON BOUNDARY LINE 2 = 5

BOUNDARY LINE - 2

POINT	X-COORD	Y-COORD
1	402.00	7812.00
2	502.00	7870.00
3	511.00	7880.00
4	528.00	7890.00
5	573.00	7910.00

LINE NO. AND SLOPE OF EACH SEGMENT ARE:
1 .125 .9090909 3.333333 .8333333 1.666667 2.5 1.111111 .5882353 0 3.333333
2 .58 1.111111 .5882353 .4444444

MIN. DEPTH OF TALLEST SLICE = .5
NO. OF RADIUS CONTROL ZONES = 1

RADIUS DECREMENT FOR ZONE 1 = 0
NO. OF CIRCLES FOR ZONE 1 = 5
ID NO. OF FIRST CIRCLE FOR ZONE 1 = 1
NO. OF BOTTOM LINES FOR ZONE 1 = 1

FOR ZONE 1 LINE SEQUENCE 1
LINE NO.= 1 BEG. NO.= 1 END NO.= 11

SOIL NO.	COHESION	FRIC. ANGLE	UNIT WEIGHT
1	200	40	135

USE PORE PRESSURE RATIO
USE GRID
NO. OF SLICES= 10 NO. OF ADD. RADII= 3

PORE PRESSURE RATIO= .2
COORDINATES OF GRID POINTS 1, 2, AND 3

POINT 1 X-COORD. = 190 Y-COORD. = 8150
POINT 2 X-COORD. = 375 Y-COORD. = 7810
POINT 3 X-COORD. = 588 Y-COORD. = 7930

X INCREMENT = 5 Y INCREMENT = 5
NO. OF DIVISIONS BETWEEN POINTS 1 AND 2= 20
NO. OF DIVISIONS BETWEEN POINTS 2 AND 3= 20

AT POINT (190 8150) THE RADIUS AND FACTOR OF SAFETY ARE:
398.9837 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 398.9837

AT POINT (199.25 8133) THE RADIUS AND FACTOR OF SAFETY ARE:
379.669 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 379.669

AT POINT (208.5 8116) THE RADIUS AND FACTOR OF SAFETY ARE:
360.3585 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 360.3585

DATA REMOVED FOR SUMMARY REPORT

AT POINT (406.3 7922.5) THE RADIUS AND FACTOR OF SAFETY ARE:
109.1134 1.568819
105.9764 1.602489
102.8395 1.681782

99.70258 1.877028
96.56566 2.53976
LOWEST FACTOR OF SAFETY = 1.568819 AND OCCURS AT RADIUS = 109.1134

AT POINT (406.3 7923.75) THE RADIUS AND FACTOR OF SAFETY ARE:
109.7614 1.569471
106.7111 1.60635
103.6608 1.690252
100.6105 1.893496
97.56027 2.577722
LOWEST FACTOR OF SAFETY = 1.569471 AND OCCURS AT RADIUS = 109.7614

AT POINT (407.55 7922.5) THE RADIUS AND FACTOR OF SAFETY ARE:
108.0604 1.573135
105.0087 1.609432
101.9569 1.692682
98.90513 1.895195
95.85336 2.578268
LOWEST FACTOR OF SAFETY = 1.573135 AND OCCURS AT RADIUS = 108.0604

AT POINT (405.05 7922.5) THE RADIUS AND FACTOR OF SAFETY ARE:
109.2684 1.570748
106.2259 1.607752
103.1834 1.691897
100.1409 1.895677
97.09839 2.581679
LOWEST FACTOR OF SAFETY = 1.570748 AND OCCURS AT RADIUS = 109.2684

AT POINT (406.3 7922.5)RADIUS 109.1134

THE MINIMUM FACTOR OF SAFETY IS 1.568819

SLOPE STABILITY - SECTION 11 - STATIC
NORTH SIDE OF CRANDALL CREEK

ROTATIONAL EQUILIBRIUM ANALYSIS OF MULTILAYERED EMBANKMENTS
VERSION 1.21 LAST MODIFIED ON JAN-10-91

TODAY'S DATE = 03-05-1997 RUN TIME = 22:18:37

TITLE =GENWAL CRANDALL CANYON RECLAMATION STABILITY FOR SECTION 11+00 STATIC

FILE NAME =\BASIC\QB\REAME\GEN-11-1.SLP

READING FROM FILE

NO. OF STATIC AND SEISMIC CASES = 1

CASE NO. 1 SEISMIC COEFFICIENT = 0

NO. OF BOUNDARY LINES = 2

NO. OF POINTS ON BOUNDARY LINE 1 = 7

BOUNDARY LINE - 1

POINT	X-COORD	Y-COORD
1	419.00	7813.00
2	450.00	7820.00
3	467.00	7830.00
4	519.00	7880.00
5	562.00	7890.00
6	568.00	7900.00
7	580.00	7918.00

NO. OF POINTS ON BOUNDARY LINE 2 = 3

BOUNDARY LINE - 2

POINT	X-COORD	Y-COORD
1	419.00	7813.00
2	519.00	7880.00
3	580.00	7918.00

LINE NO. AND SLOPE OF EACH SEGMENT ARE:
1 .2258064 .5882353 .9615384 .2325581 1.666667 1.5
2 .67 .6229508

MIN. DEPTH OF TALLEST SLICE = .5
NO. OF RADIUS CONTROL ZONES = 1

RADIUS DECREMENT FOR ZONE 1 = 0
NO. OF CIRCLES FOR ZONE 1 = 5
ID NO. OF FIRST CIRCLE FOR ZONE 1 = 1
NO. OF BOTTOM LINES FOR ZONE 1 = 1

FOR ZONE 1 LINE SEQUENCE 1
LINE NO.= 1 BEG. NO.= 1 END NO.= 7

SOIL NO. COHESION FRIC. ANGLE UNIT WEIGHT
1 200 40 135

USE PORE PRESSURE RATIO
USE GRID
NO. OF SLICES= 10 NO. OF ADD. RADII= 3

PORE PRESSURE RATIO= .2
COORDINATES OF GRID POINTS 1, 2, AND 3

POINT 1 X-COORD. = 282 Y-COORD. = 8000
POINT 2 X-COORD. = 400 Y-COORD. = 7813
POINT 3 X-COORD. = 590 Y-COORD. = 7936

X INCREMENT = 5 Y INCREMENT = 5
NO. OF DIVISIONS BETWEEN POINTS 1 AND 2= 20
NO. OF DIVISIONS BETWEEN POINTS 2 AND 3= 20

AT POINT (282 8000) THE RADIUS AND FACTOR OF SAFETY ARE:
231.8146 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 231.8146

AT POINT (287.9 7990.65) THE RADIUS AND FACTOR OF SAFETY ARE:
220.7865 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 220.7865

AT POINT (293.8 7981.3) THE RADIUS AND FACTOR OF SAFETY ARE:
209.7615 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 209.7615

AT POINT (299.7 7971.95) THE RADIUS AND FACTOR OF SAFETY ARE:
198.7398 1000000
LOWEST FACTOR OF SAFETY = 1000000 AND OCCURS AT RADIUS = 198.7398

DATA REMOVED FOR SUMMARY REPORT

AT POINT (382.0999 7957.749) THE RADIUS AND FACTOR OF SAFETY ARE:
149.3779 1.441406
147.6607 1.543221
145.9435 1.722038
144.2263 2.093626
142.509 3.236786
LOWEST FACTOR OF SAFETY = 1.441406 AND OCCURS AT RADIUS = 149.3779

AT POINT (388.3499 7957.749) THE RADIUS AND FACTOR OF SAFETY ARE:

146.5985	1.414483
144.7414	1.506162
142.8843	1.668985
141.0272	2.010027
139.1701	3.064745

LOWEST FACTOR OF SAFETY = 1.414483 AND OCCURS AT RADIUS = 146.5985

AT POINT (385.8499 7957.749) THE RADIUS AND FACTOR OF SAFETY ARE:

148.3313	1.401142
146.4059	1.488633
144.4806	1.644723
142.5553	1.972763
140.6299	2.988877

LOWEST FACTOR OF SAFETY = 1.401142 AND OCCURS AT RADIUS = 148.3313

AT POINT (384.5999 7957.749) THE RADIUS AND FACTOR OF SAFETY ARE:

148.78	1.40953
146.9041	1.5002
145.0282	1.661315
143.1522	1.998844
141.2763	3.042746

LOWEST FACTOR OF SAFETY = 1.40953 AND OCCURS AT RADIUS = 148.78

AT POINT (385.8499 7958.999) THE RADIUS AND FACTOR OF SAFETY ARE:

149.2323	1.405294
147.3345	1.494601
145.4366	1.653584
143.5387	1.986839
141.6409	3.018396

LOWEST FACTOR OF SAFETY = 1.405294 AND OCCURS AT RADIUS = 149.2323

AT POINT (385.8499 7956.499) THE RADIUS AND FACTOR OF SAFETY ARE:

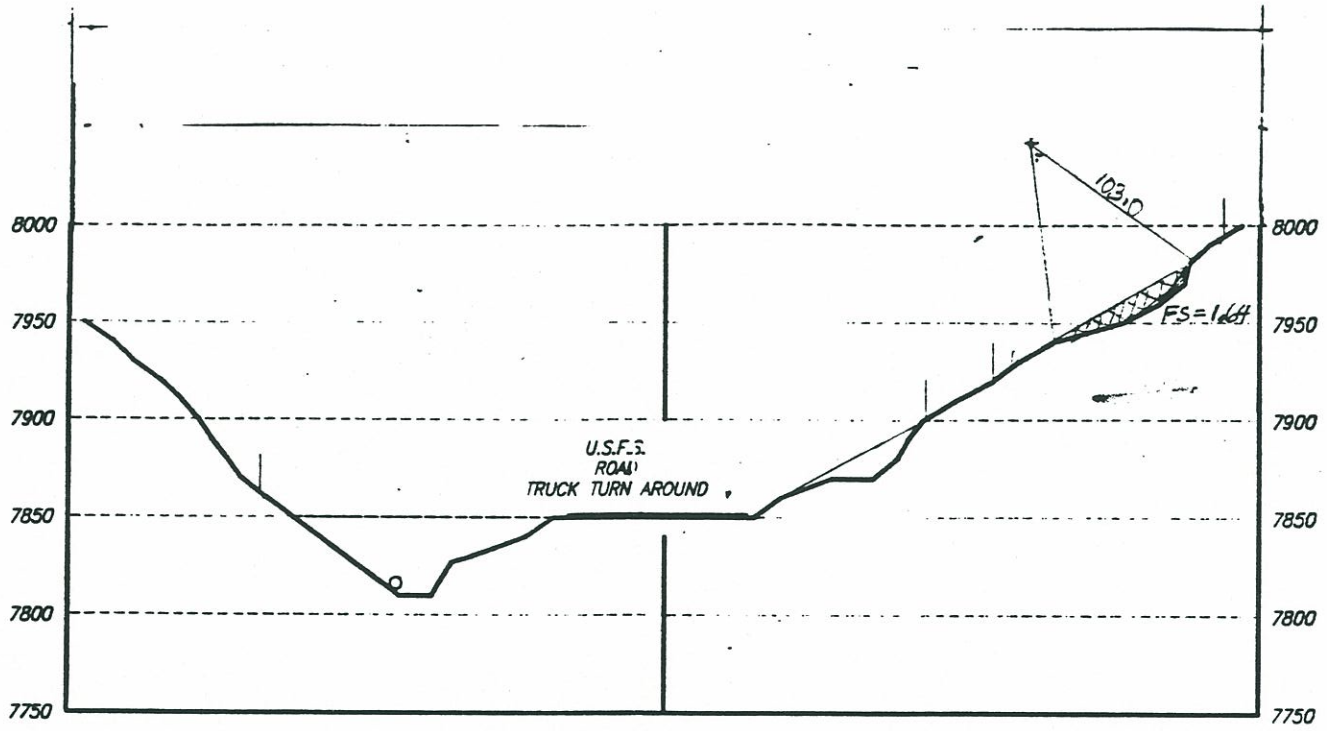
147.2778	1.402374
145.3555	1.489947
143.4331	1.646249
141.5108	1.974739
139.5884	2.992398

LOWEST FACTOR OF SAFETY = 1.402374 AND OCCURS AT RADIUS = 147.2778

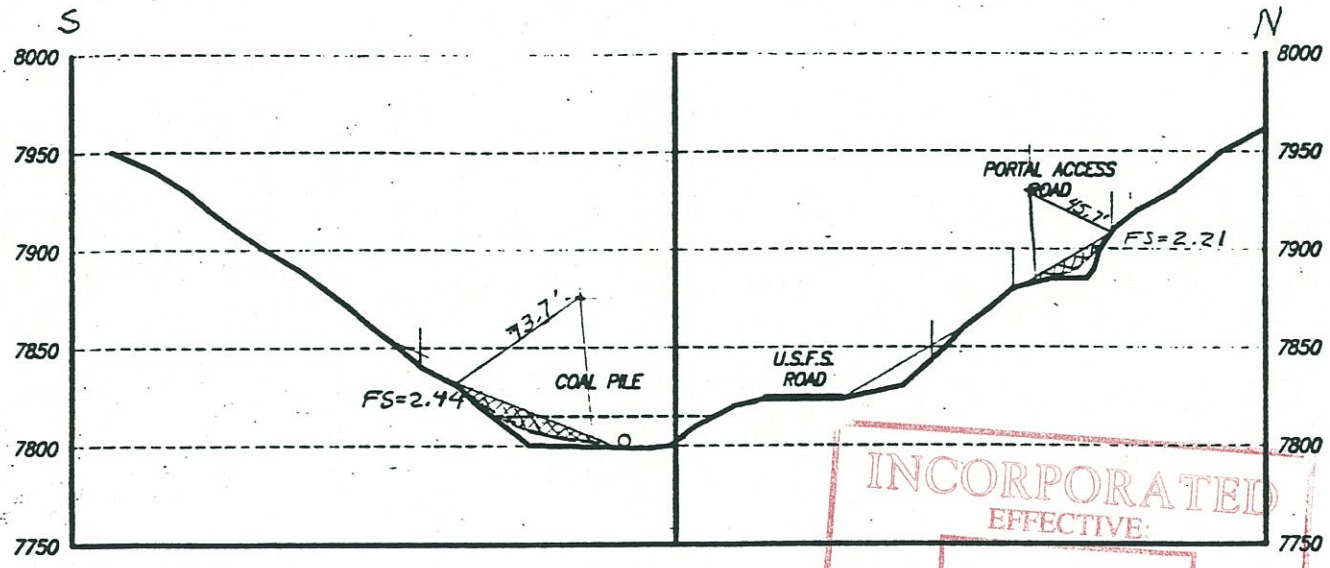
AT POINT (385.8499 7957.749)RADIUS 148.3313

THE MINIMUM FACTOR OF SAFETY IS 1.401142

CRANDALL CANYON MINE
RECLAMATION STABILITY SECTIONS

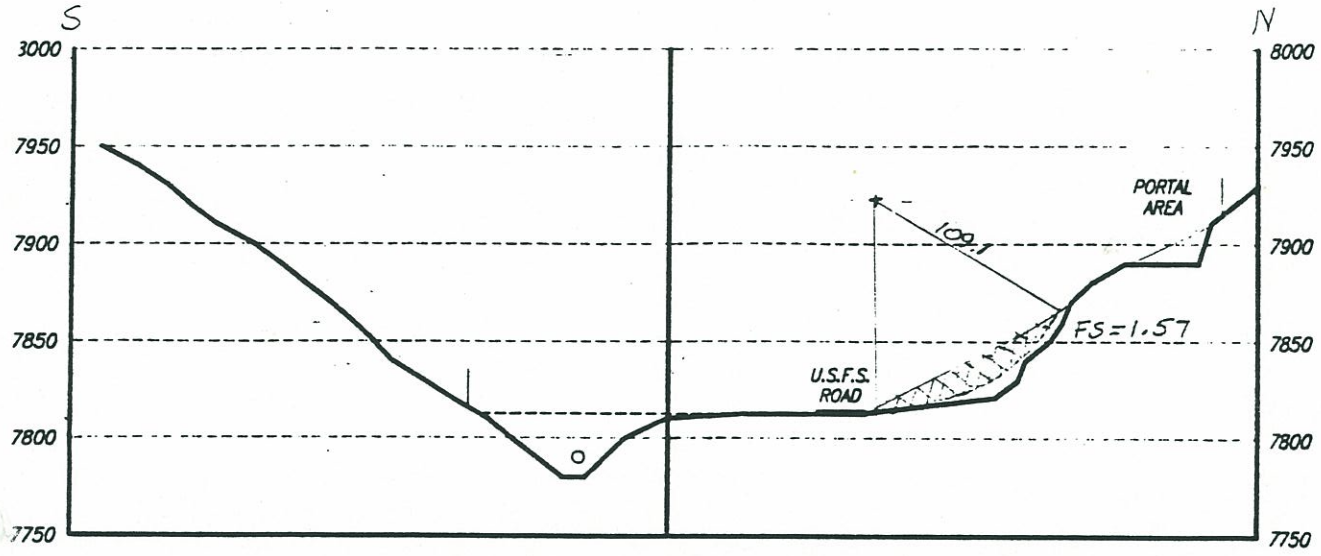


6+00



9+00

CRANDALL CANYON MINE
RECLAMATION STABILITY SECTIONS



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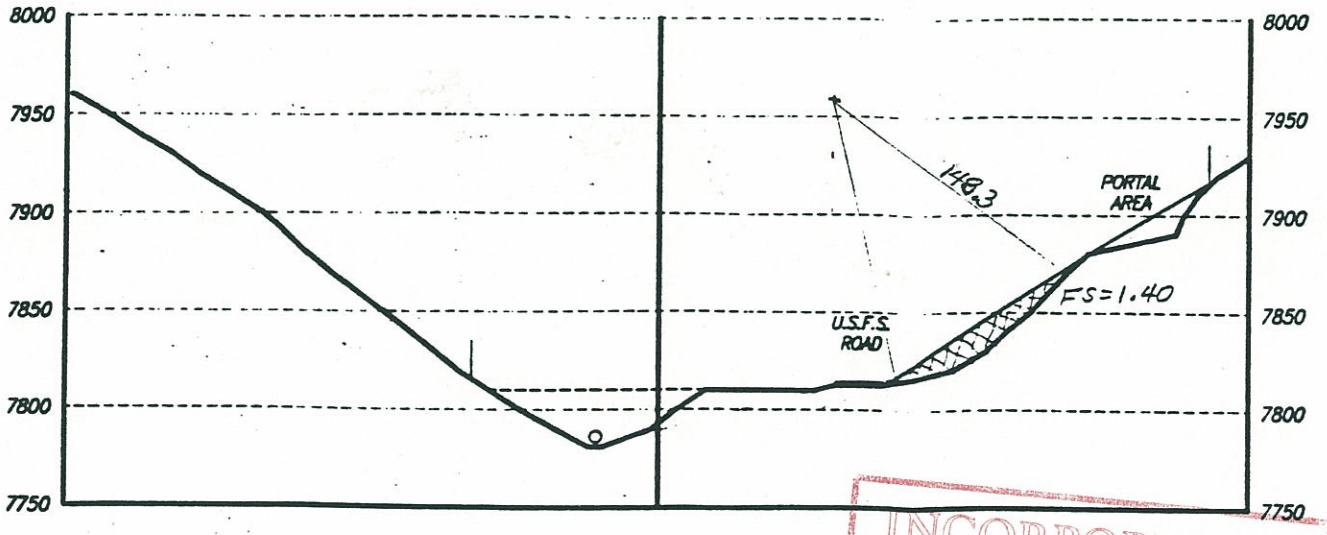
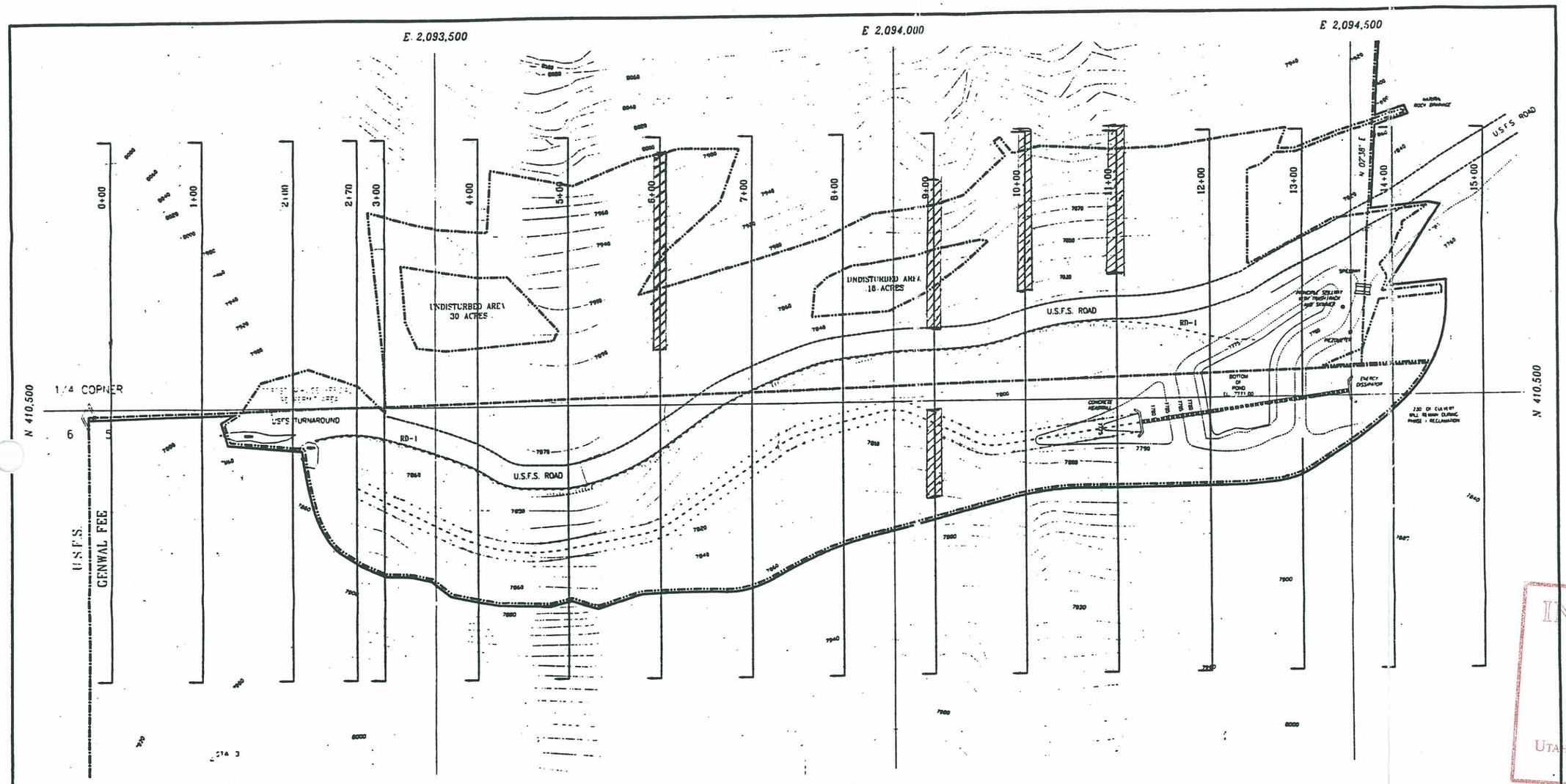


11+00



LEGEND:

- DISTURBED AREA
- PERMIT AREA
- 10' CONTOUR
- CROSS-SECTION
- RECLAMATION DIVERSION DITCH — RD-1
- BERM
- ALTERNATE SEDIMENT CONTROL
- 6" Ø CULVERT

Slope Area Analyzed for Reclamation Material Failure

25' 0' 50' 100'

CONTOUR INTERVAL = 10'
PHOTOGRAPHY DATE = OCTOBER 25, 1989

UTAH REGISTERED 17933 PROFESSIONAL ENGINEER

I hereby certify that the design and/or map contained herein was prepared by me or under my supervision and is true and correct to the best of my knowledge.

NOTE:

1) SEDIMENT POND WILL STAY IN PLACE DURING PHASE I RECLAMATION.
2) STREAM BED WILL BE RETURNED AS IT PRESENTLY EXISTS.

<REVISIONS>

01/15/96	D.B.
12/11/96	D.B.

GENWAL RESOURCES, INC.

P.O. Box 1420 195 North 100 West Huntington, Utah
Telephone (801) 687-9813

CRANDALL CANYON MINE RECLAMATION (PHASE I)

DRAWN BY: WOLF DRAFTING	ACAD REF: PHASE1
DATE: 01/01/96	PLATE #: 5-16
SCALE: AS SHOWN	

APPENDIX 5-22

CRANDALL CANYON MINE SITE RECLAMATION PLAN

4/97 Revised 5/97

CRANDALL CANYON MINE SITE RECLAMATION PLAN

Phase 1

The reclamation of the disturbed areas of the Crandall Canyon mine site is described in outline and detail below. This description is based upon discussions in the text of Chapters 2, 3, 4, 5, 7 which address the regulations regarding reclamation requirements. In the interest of clarity, the following discussion describes the reclamation process in terms of several general areas within the mine yard. Refer to Figure 1 in this Appendix. Within each of these general areas, reclamation will follow a general sequence of 1) demolition, 2) backfilling, grading and topsoil application, 3) reclamation and revegetation. However, in practice, reclamation will be performed in several of these areas simultaneously. **The final step, reclamation and revegetation, for all the areas will not be done until the fall.**

Following Phase 1 reclamation, the only structures to remain will be the sedimentation pond and associated spillway and discharge structure as well as the conveyance ditches, berms and culverts necessary to route drainage to the pond. Refer to Plates 5-16 and 7-5 for location of these structures.

Genwal recognizes that development of a feasible reclamation plan for final reclamation of the expansion area containing the best available reclamation methodology is an essential part of this permitting process. Therefore, Genwal has contacted consultants with revegetation and reclamation experience to gather together the best reclamation techniques for reclamation of the steep-slope area. JBR Environmental Consultants, who has had prior experience with reclamation in difficult areas, has provided a letter detailing reclamation methodology that they believe will contribute to the successful reclamation of this area. This letter, included as Attachment 1, was written in response to Genwal's discussions held with JBR as the reclamation plan was being revised. Genwal feels that incorporation of the various reclamation techniques that JBR has identified as being successful in past situations will greatly enhance the success of this reclamation effort. Genwal also recognizes that in the time between now and when final reclamation is actually done, technology may evolve new and better reclamation ideas. Genwal commits to modifying the reclamation plan prior to final reclamation should better reclamation products and methodology become available. This reclamation plan will be reviewed prior to implementation to incorporate applicable methodology and techniques which are considered best technology currently available (BTCA) at the time of reclamation.

Area Descriptions

The reclamation plan has been divided into several general areas for the purpose of explanation. It is likely that reclamation efforts will occur in multiple areas during the same time interval. These areas are depicted on Figure 1 and described in summary below.

Portal Area: The Portal Area consists of an inclined access road, the mine portals leading into the underground mine, and structures in this area.

Expansion Area: In 1997, the surface facilities will have been expanded to the area south of the Forest Service road by culverting approximately 1,500' of Crandall Canyon through a 72" bypass culvert. Earthen fill material will have been trucked in to construct the Expansion Area. The truck loadout facilities will have been relocated to the Expansion Area along with the Overhead Conveyor, Stacking tube, Reclaim Tunnel and Conveyor, Crusher Building, MCC Building, Substation, and other associated structures. The fill from the Expansion Area will be utilized during final reclamation to restore approximate original contour in areas of cuts and highwalls. This fill will consist of 8" x 0" earth and rock material obtained from an approved off-site borrow area.

The Expansion Area has been divided into a North Slope Expansion Area and South Slope Expansion Area for the purposes of the reclamation discussion. The North Slope Expansion Area is that area north of the existing Crandall Creek and south of the existing Forest Service road. The South Slope Expansion Area includes the steeper hillside located south of the existing Crandall Creek. Due to the steep slopes encountered on the South Slope, special reclamation procedures have been prescribed for this area. Much of the reclamation plan designed for the South Slope is based on input from reclamation specialists who have experience in steep-slope reclamation situations.

Old Substation Area: The Old Substation Area the pad that was originally constructed in the northern part of the mine yard above the shop for a substation. However, the substation was never constructed at this location. Other than an existing powerline, there are no facilities on this site to be removed and the area has had interim revegetation.

Old Loadout Area: The Old Loadout Area is located adjacent to and just north of the Forest Service road and the new loadout. This is the area where coal was previously stockpiled and loaded into trucks prior to construction of the 1997 expansion area.

Forest Service Road: The Forest Service Road runs east-west through the mine site. The road is to be kept in place following reclamation activities but will undergo a change in width.

Shop Area: The Shop Area is located west of the mine portal area and north of the Forest Service Road. Facilities to be removed from the Shop area include: Shop/Warehouse building, Substation, Rock Dust Bin, Oil Shed and parking lot asphalt.

RECLAMATION PLAN OUTLINE

1. Demolition and Removal of Surface Facilities - Portal Area
2. Removal and Disposal of Expansion Area Fill Material inside Mine Portals
3. Seal and Backfill Portals
4. Backfill, Grade and Topsoil - Portal Area
5. Revegetation - Portal Area
6. Demolition - Old Substation Area
7. Backfill, Grade and Topsoil - Old Substation Area
8. Revegetation - Old Substation Area
9. Demolition and Removal of Surface Facilities - Shop Area
10. Backfill, Grade and Topsoil - Shop Area
11. Revegetation - Shop Area
12. Demolition and Removal of Surface Facilities - Old Loadout Area
13. Backfill, Grade and Topsoil - Old Loadout Area
14. Revegetate - Old Loadout Area
15. Reclaim Forest Service Road North of Expansion Area
16. Demolition and Removal of Surface Facilities - Expansion Area
17. Removal of Fill Material and Recontouring - Expansion Area
18. Restoration of South and North Hillside Slopes - Expansion Area
19. Revegetation - South Slope of Expansion Area
20. Removal and Disposal of 72" Culvert
21. Topsoiling - North Slope of the Expansion Area
22. Revegetation - North Slope of the Expansion Area
23. Restoration of the Stream Channel
24. Revegetation of the Stream Channel
25. Sediment Control and Treatment
26. Topsoil Stockpile Reclamation
27. Phase 2 Reclamation

Note: A Reclamation Timetable has been provided at the end of this discussion.

RECLAMATION PLAN DETAIL

1. Demolition and Removal of Surface Facilities - Portal Area

When mining operations have been permanently ceased and the portals and surface facilities are no longer needed to support the mine, all buildings and other structures will be dismantled and hauled off site to an approved landfill. Reusable materials will be salvaged and recycled to the extent possible.

At the Portal Area, facilities to be removed are: underground bath house, mine fan, fan transformer (portable), belt transfer station, guard rail at top and along access road, water pipelines, and the diversion culvert above portals.

The existing shotcrete above the portal road, above the portals and above the old coal loadout area, along with wire mesh, clips and other similar materials will be removed and disposed of in an appropriate state approved landfill.

All combustible materials will be removed from the underground bathhouse and hauled to an approved solid waste landfill. Any structures that would interfere with sealing of the portals, such as beltline structure, would also be removed.

Equipment used in the demolition and disposal of the facilities include: a front end loader, a backhoe, highway end dump trucks, a trackhoe, a crane, truck with flat bed trailer, oxy-acetylene torches, air compressor and power tools, etc.

2. Removal and Disposal of Expansion Area Fill Material inside Mine Portals

At the same time the structures in the portal area are being demolished and removed, the other surface facility structures located on the Expansion Area (truck loadout, conveyors, crusher building, etc.) will also be removed. After the removal of these structures from the Expansion Area, excess fill material from this area will be taken inside the mine entries for permanent placement [note: reclamation of the Expansion Area is described in greater detail later in this plan]. Fill material, in excess of that needed for backfilling the Portal Area, Shop Area and Old Loadout Area (an estimated 20,410 loose cubic yards, Table 5-20-10 in Appendix 5-20) will be loaded, hauled and disposed of underground in the mine workings (see Figure 1 in Appendix 5-20 for the disposal area in the mine workings.)

The equipment used in the performance of this step would be a l-h-d unit (scoop), dozer w/ripper, and a front end loader.

3. Seal and Backfill Portals

Upon the completion of the disposal of the excess Expansion Area fill material in the mine workings, the portals will be sealed and backfilled. The four portals on the north side are: bath house entrance, intake air entry, belt entry and fan (return air) entry. The three portals on the south side are the intake, belt and fan entries. The seals will be constructed approximately 25-35 feet inby from the portal openings and will be built according to MSHA regulations. Equipment necessary for sealing would be a cement mixer and hand tools. After finishing the construction of the seals, the 25 to 35 feet of entry from the portals to the seals will be backfilled with additional fill material from the Expansion Area.

4. Backfill, Grade and Topsoil - Portal Area

Once the portals have been sealed and backfilled, reclamation work can then commence on the Portal Area. This work consists of backfilling the cuts to approximate original contour, placing topsoil on the backfilled area and seeding the topsoiled area. Since the Portal Area (and the associated access road) is on a slope, this work will be done in short segments starting at the eastern-most (upper-most) portion of the area and working westward across the portal area and thence down the access road to the Shop Area. Fill material from the Expansion Area will be utilized to backfill and reclaim the highwall area. The fill material will contain rock fragments of all sizes, including a significant amount of 6" to 8" rock fragments. These rocks will assist in providing slope stability and aid revegetation by helping to retain moisture. The fill material will be topped with 12" of topsoil material to promote plant growth.

Mobile heavy equipment will be utilized to move and place fill in highwall and yard areas and the south portal pocket cuts. A front end loader and end dumps will be used to remove fill material from the Expansion Area and haul the material up to the Portal Area. The lifts will be built up horizontally with a slight slope on each lift toward the highwall. Material will be spread into lifts of 18 to 24 inches deep. The loader will compact each lift as the next lift is put in. A backhoe will be used to place and compact the final lift. Before placing topsoil on the final backfilled surface, that surface will be roughened with the backhoe bucket. This will help prevent slippage of the topsoil layer and promote root penetration.

Genwal has committed to adding nutrients as determined by laboratory analysis conducted on topsoil samples taken before topsoil redistribution and during final reclamation. The method used to ensure adequate and representative samples from different locations and depths within the topsoil stockpile include: taking two soil samples per stockpile and collecting samples with a soil auger at two foot increments. Samples of the undisturbed soil adjacent to the regraded site will also be taken for a baseline chemical reference. **Fertilizer will be added to the redistributed topsoil, prior to seeding, if a need is indicated by laboratory results. The fertilizer will be spread on the redistributed topsoil and either disked or hand-raked into the soil (depending on the steepness of the slope).**

Areas to receive topsoil will be marked with stakes indicating the depth of application. A

reclamation supervisor will oversee the topsoil redistribution operation. Topsoil will be left in a roughened condition prior to seeding to minimize compaction and erosion as well as promote infiltration of precipitation.

5. Revegetation - Portal Area

Revegetation procedures for the Portal Area and the south portal pocket cuts involves a **four step** program: **1) application of fertilizer (if laboratory testing indicates a need),** 2) hydroseed, 3) hydromulch the entire area with a wood fiber mulch to stabilize soil during vegetative growth and control runoff, 4) plant containerized stock to further stabilize the soil and provide vegetative diversity. **Hydroseeding will combine the tackifier and small amount of mulch with the seed mix (to mark the area of coverage) during application to the redistributed topsoil.** All seed utilized on the site will be certified pure live seed. After the seeding step, the mulch (wood fiber and hay/straw) and tackifier will be applied to the seedbed surface. The plant containerized stock will be planted in the second year of reclamation. **Revegetation work will not be done until fall (September-October).**

6. Demolition - Old Substation Area

The only structures existing at the Old Substation Area is the termination structure for the mine powerline. This powerline will be dismantled and removed from the site prior to completion of final reclamation.

7. Backfill, Grade and Topsoil - Old Substation Area

As excess fill from the Expansion Area is placed in the underground mine workings, additional fill from the Expansion Area will be hauled to the Old Substation Area for backfilling. The cut slope above the pad will be backfilled to the approximate original contour. The area will then be topsoiled and revegetated.

Genwal has committed to adding nutrients as determined by laboratory analysis conducted on topsoil samples taken before topsoil redistribution and during final reclamation. The method used to ensure adequate and representative samples from different locations and depths within the topsoil stockpile include: taking two soil samples per stockpile and collecting samples with a soil auger at two foot increments. Samples of the undisturbed soil adjacent to the regraded site will also be taken for a baseline chemical reference. Fertilizer will be added to the redistributed topsoil as indicated by laboratory results of the most needful increment.

The areas to be topsoiled will be marked with stakes indicating the depth of application. A reclamation supervisor will oversee the topsoil redistribution operation. Topsoil will be left in a roughened condition prior to seeding to minimize compaction and erosion as well as promote infiltration of precipitation.

Revised 4/05/2003

8. Revegetation - Old Substation Area

Revegetation procedures for the Old Substation Area involves a **four step** program: **1) application of fertilizer (if laboratory testing indicates a need),** 2) hydroseed, 3) hydromulch the entire area with a wood fiber mulch to stabilize soil during vegetative growth and control runoff, **4)** plant containerized stock to further stabilize the soil and provide vegetative diversity. **Hydroseeding will combine the tackifier and small amount of mulch with the seed mix (to mark the area of coverage) during application to the redistributed topsoil.** All seed utilized on the site will be certified pure live seed. After the seeding step, the mulch (wood fiber and hay/straw) and tackifier will be applied to the seedbed surface. The plant containerized stock will be planted in the second year of reclamation. **Revegetation work will not be done until fall (September-October).**

9. Demolition and Removal of Surface Facilities - Shop Area

Facilities to be removed from the Shop area include: Shop/Warehouse building, Substation, Rock Dust Bin, Oil Shed and parking lot asphalt. All structures will be removed from the site. Some components will be salvaged and recycled. Non-salvageable material will be disposed of in an approved solid waste landfill. All asphalt removed from the site will be disposed on in an approved RCRA disposal site.

A portion of the retaining wall which separates the Shop Area from the Forest Service Road will be removed, loaded onto trucks and hauled to an approved landfill. That portion not removed will be buried under a minimum of four feet of backfill material.

Equipment used in the demolition and disposal of the facilities include: a front end loader, a backhoe, highway end dump trucks, a trackhoe, crane, truck with flat bed trailer, oxy-acetylene torches, air compressor and power tools, etc.

10. Backfill, Grade and Topsoil - Shop Area

With the Portal Area and Old Substation Area reclamation completed, and the retaining wall removed, the reclamation activities can continue at the Shop Area. Although this area is not as steep as the previous areas, the same reclamation procedures will be used. The cut slope behind the shop will be backfilled to approximate original contour using fill material from the Expansion Area. The lifts will be built up horizontally with a slight incline on each lift toward the existing cut slope. The dozer/loader will spread the material in lifts of 18 to 24 inches deep. The mobile equipment will compact each lift as the next lift is put in. Near the top of the slope, a backhoe will be used to place and compact the final lift. Before placing topsoil on the final backfilled surface, the surface will be roughened with the backhoe bucket to prevent slippage of the topsoil layer and promote root penetration.

Genwal has committed to adding nutrients as determined by laboratory analysis

conducted on topsoil samples taken before topsoil redistribution and during final reclamation. The method used to ensure adequate and representative samples from different locations and depths within the topsoil stockpile include: taking two soil samples per stockpile and collecting samples with a soil auger at two foot increments. Samples of the undisturbed soil adjacent to the regraded site will also be taken for a baseline chemical reference. Fertilizer will be added to the redistributed topsoil as indicated by laboratory results of the most needful increment.

The areas to be topsoiled will be marked with stakes indicating the depth of application. A reclamation supervisor will oversee the topsoil redistribution operation. Topsoil will be left in a roughened condition prior to seeding to minimize compaction and erosion as well as promote infiltration of precipitation.

11. Revegetation - Shop Area

Revegetation procedures for the Shop Area involves a **four step** program: **1) application of fertilizer (if laboratory testing indicates a need),** 2) hydroseed, 3) hydromulch the entire area with a wood fiber mulch to stabilize soil during vegetative growth and control runoff, **4)** plant containerized stock to further stabilize the soil and provide vegetative diversity. **Hydroseeding will combine the tackifier and small amount of mulch with the seed mix (to mark the area of coverage) during application to the redistributed topsoil.** All seed utilized on the site will be certified pure live seed. After the seeding step, the mulch (wood fiber and hay/straw) and tackifier will be applied to the seedbed surface. The plant containerized stock will be planted in the second year of reclamation. **Revegetation work will not be done until fall (September-October).**

12. Demolition and Removal of Surface Facilities - Old Loadout Area

At the time of final reclamation, the facilities at the Old Loadout Area will have already been removed and disposed of as part of the 1997 Surface Expansion Project. All asphalt removed from the site will be disposed on in an approved RCRA disposal site. A portion of the existing coal pile retaining wall will be removed, loaded onto trucks and hauled to an approved landfill. That portion not removed will be buried under a minimum of four feet of backfill material.

Equipment used in the demolition and disposal of the facilities include: a front end loader, a backhoe, highway end dump trucks, a trackhoe, crane, and truck with flat bed trailer.

13. Backfill, Grade and Topsoil - Old Loadout Area

With the retaining wall removed, reclamation activities can continue at the Old Loadout Area. The same reclamation procedures will be used as described previously. The cut slope behind the retaining wall will be backfilled to approximate original contour using fill material

from the Expansion Area. The lifts will be built up horizontally with a slight incline on each lift toward the existing cut slope. The dozer/loader will spread the material in lifts of 18 to 24 inches deep. The mobile equipment will compact each lift as the next lift is put in. Near the top of the slope, a backhoe will be used to place and compact the final lift. Before placing topsoil on the final backfilled surface, the surface will be roughened with the backhoe bucket to prevent slippage of the topsoil layer and promote root penetration.

Genwal has committed to adding nutrients as determined by laboratory analysis conducted on topsoil samples taken before topsoil redistribution and during final reclamation. The method used to ensure adequate and representative samples from different locations and depths within the topsoil stockpile include: taking two soil samples per stockpile and collecting samples with a soil auger at two foot increments. Samples of the undisturbed soil adjacent to the regraded site will also be taken for a baseline chemical reference. Fertilizer will be added to the redistributed topsoil as indicated by laboratory results of the most needful increment.

The areas to be topsoiled will be marked with stakes indicating the depth of application. A reclamation supervisor will oversee the topsoil redistribution operation. Topsoil will be left in a roughened condition prior to seeding to minimize compaction and erosion as well as promote infiltration of precipitation.

14. Revegetation - Old Loadout Area

Revegetation procedures for the Old Loadout Area involves a **four step** program: **1) application of fertilizer (if laboratory testing indicates a need),** 2) hydroseed, 3) hydromulch the entire area with a wood fiber mulch to stabilize soil during vegetative growth and control runoff, **4)** plant containerized stock to further stabilize the soil and provide vegetative diversity. **Hydroseeding will combine the tackifier and small amount of mulch with the seed mix (to mark the area of coverage) during application to the redistributed topsoil.** All seed utilized on the site will be certified pure live seed. After the seeding step, the mulch (wood fiber and hay/straw) and tackifier will be applied to the seedbed surface. The plant containerized stock will be planted in the second year of reclamation. **Revegetation work will not be done until fall (September-October).**

15. Reclaim Forest Service Road North of Expansion Area

The Forest Service road from the trailhead/turnaround will be reclaimed according to the Special Use Permit. As stipulated in the existing Forest Service special use permit (8/26/89) covering the road, during final reclamation the width of the asphalt road surface within the permit area will be reduced from a 27 foot subgrade and 22 foot running surface to a 20 foot subgrade and 14 foot running surface. Asphalt removed from the permit area as part of this road narrowing will be taken to a approved RCRA disposal site. The reclaimed area will be topsoiled and revegetated as described above.

Based on recent correspondence, the Forest Service now indicates that it prefers to have the asphalt totally removed from the road surface upon final reclamation. This position differs from the stipulations of the existing Forest Service Special Use Permit that requires that a 14' asphalt running surface be left in place upon final reclamation. Genwal commits to reclaiming the road through the minesite to any standard desired by the Forest Service at the time of final reclamation. At the present time, however, it is difficult for Genwal to commit to a reclamation standard for the road that is contrary to the existing Forest Service Special Use Permit.

16. Demolition and Removal of Surface Facilities - Expansion Area

The facilities to be removed from the Expansion Area are: the overhead conveyor, stacking tube, reclaim vault and tunnel/escapeway tube, crusher building, MCC building, loadout conveyor, truck loadout and loading platform. Removal of these facilities will take place simultaneously with removal of facilities from the aforementioned areas. After these surface facilities are removed, the only structures that will remain will be the sedimentation pond and associated spillway and discharge structure as well as the conveyance ditches, berms and culverts necessary to route drainage to the pond. Refer to Plates 5-16 and 7-5 for location of these structures.

Equipment used in the demolition and disposal of the facilities include: a front end loader, a backhoe, highway end dump trucks, a trackhoe, a crane, truck with flat bed trailer, oxy-acetylene torches, air compressor and power tools, etc.

17. Removal of Fill Material and Recontouring - Expansion Area

Reclamation of the Expansion Area (which includes the south portal access ramp) is different from the other reclaimed areas because restoration of the approximate original contour involves removal of fill material rather than placement of backfill material. As described in the preceding sections, fill material removed from the Expansion Area will be used to regrade and restore approximate original contour at the Portal Area, Old Substation Area, Shop Area, and the Old Loadout Area. Therefore, these reclamation operations will be accomplished simultaneously. Expansion Area fill that is not slated for use as backfill for the aforementioned areas (i.e. excess fill) will be disposed of in the underground mine workings as described previously.

Reclamation of the Expansion Area involves three separate procedures involving three separate areas: the North Slope of the Expansion Area, the Crandall Creek Channel Area, and the South Slope of the Expansion Area. As described previously, the North Slope Expansion Area is that area north of the existing Crandall Creek and south of the existing Forest Service road. The South Slope Expansion Area includes the steeper hillside located south of the existing Crandall Creek and the south portal area. The Crandall Creek Channel Area is the area within and immediately on either side of the existing creek channel.

Reclamation of the North Slope Expansion Area will follow the normal reclamation procedures described above for the other general areas (i.e. regrading, topsoiling and revegetation). Reclamation on the steeper than normal slopes of the South Slope Expansion Area will involve a different reclamation technique which is designed to revitalize the existing left-in-place topsoil. Reclamation of the Crandall Creek Channel Area is also designed to revitalize the existing left-in-place topsoil and restore the previous channel morphology.

18. Restoration of South and North Hillside Slopes - Expansion Area

Five years prior to beginning reclamation operations, Genwal will consult with the Division to re-evaluate the techniques and practices being proposed for the Expansion Area. This consultation will include forming a task force of members with various areas of reclamation expertise to review the reclamation plan and recommend the best and most suitable reclamation techniques and products available at that time. The review and consultation will re-assess and revise, where needed, the existing reclamation plan to provide the best and most appropriate reclamation measures for the site.

At the time of final reclamation, all surface facilities located on the Expansion Area pad will be dissassembled and removed from the site. In the area of the (then removed) coal stockpile, all coal will be removed from the small adjacent slope area where the south flank of the coal pile had previously rested. Prior to reclaiming this area, all coal fines will be vacuumed from the surface. Using the existing pad as a work surface, a 12" layer of topsoil will then be reapplied to the disturbed area. Areas to receive topsoil will be marked with stakes indicating the depth of application. A reclamation supervisor will oversee the topsoil redistribution operation. Topsoil will be left in a roughened condition prior to seeding to minimize compaction and erosion as well as promote infiltration of precipitation.

Genwal has committed to adding nutrients as determined by laboratory analysis conducted on topsoil samples taken before topsoil redistribution and during final reclamation. The method used to ensure adequate and representative samples from different locations and depths within the topsoil stockpile include: taking two soil samples per stockpile and collecting samples with a soil auger at two foot increments. Samples of the undisturbed soil adjacent to the regraded site will also be taken for a baseline chemical reference. Fertilizer will be added to the redistributed topsoil, prior to seeding, if a need is indicated by laboratory results. The fertilizer will be spread on the redistributed topsoil and hand-raked into the soil.

Revegetation procedures for this area will involve a four step program: 1) application of fertilizer (if laboratory testing indicates a need), 2) hydroseed, 3) hydromulch the entire area with a wood fiber mulch to stabilize soil during vegetative growth and control runoff, 4) plant containerized stock to further stabilize the soil and provide vegetative diversity. Hydroseeding will combine the tackifier and small amount of mulch with the seed mix (to mark the area of coverage) during application to the redistributed topsoil. All seed utilized on the site will be certified pure live seed. After the seeding step, the mulch (wood fiber and hay/straw) and tackifier will be applied to the seedbed surface. The plant containerized stock

will be planted in the second year of reclamation.

Following the surface facility demolition activities, fill material will be removed from the Expansion Area in approximately 5'-10' lifts. During the fill removal process, the culvert inlet structure will be left in place on the west end of the yard to continue the diversion of water through the 72" culvert. A 40 foot wide berm will be left intact at the culvert inlet to continue to serve as the culvert headwall and to continue to divert water into the 72" culvert.

The sequence for removing the fill material, culvert, and underdrain system from the Expansion Area will be essentially the same as during the 1997 construction process but in reverse order. (See construction details in Appendix 7-50).

Fill will be removed from the Expansion Area in 5'-10' lifts starting from the west end of the yard and proceeding to the east end. At the intersection of the South Slope and the pad fill the marker soil/geotextile fabric will be located. The marker soil will be carefully removed from on top of the geotextile fabric on the South Slope as the yard fill is being removed. This will allow reclamation to be done on vertical increments of the hillside that will be easy to access from the adjacent yard level. Removal of fill material adjacent to the South Slope will be done very carefully in order not to disturb the in-place soil resources. Fill removal in this area will be done with small earth-moving equipment (Bobcats, backhoes, etc.) and/or by hand if necessary in order to minimize disturbance of the topsoil. Once the geotextile fabric has been exposed, the fabric will be carefully peeled away from the soil and the condition of the underlying soil materials observed at this time. The soil will be reclaimed and revegetated in 5-10 foot horizontal zones that can be easily accessed and worked by hand from the adjacent pad fill level. After each level has been reclaimed as described below, another lift (5-10 feet of fill) will be removed from the fill. Revegetation work will continue on the next increment of hillside below the previously reclaimed level. This work will be done in continued successive lifts, involving fill removal, peeling away the geotextile, revitalization of the in-place topsoil, and revegetation of the newly exposed increment.

It should be noted that approximate original contour of the North Slope of the Expansion Area will also be re-established as the Expansion Area fill is being removed in lifts as described previously. As the fill is being removed in vertical lifts, the adjacent North Slope surface will be regraded and prepared for subsequent topsoil application.

Sediment control during fill excavation will be met by continued use of the sediment pond east and downstream from the yard area. The main 72" culvert inlet and an adequate amount of fill to maintain the existing headwall will be left intact during this phase of the fill retrieval process.

19. Revegetation - South Slope of the Expansion Area

Reclamation of the South Slope will take place in vertical increments (lifts) simultaneously with the removal of the fill material in corresponding lifts. As fill lifts are being

removed, the adjacent newly exposed hillside will be reclaimed and revegetated.

It is anticipated that after the Expansion Area fill is removed in lifts and the geotextile fabric is peeled away in vertical increments, the underlying soil material could be somewhat compacted. To enhance the ability of the soil to absorb moisture, a mixture of PAM (Polyacrylamide) or best technology currently available at the time of reclamation, will be applied to the soil surface. PAM is designed to relieve compaction of the soil and open up channels for air and water penetration. This treatment will be applied in successive 5-10' lifts as the fill is removed and the hillside is exposed.

The re-exposed soil structure will most likely be undamaged but lacking in microbes and nutrients. In order to regenerate naturally existing soil organisms and assist in reactivating soil activity, an inoculum will be applied to the soil to reestablish soil bacteria, microhorizia and mycelium. To enhance soil microbial establishment and promote more rapid stabilization of the soil the non-riparian seed mixture (as listed in Appendix 3-6) will be hand broadcast over the area and raked into the soil surface. A wood fiber mulch will be applied over the seed bed then the surface will be sprayed with a bonded fiber matrix tackifier. This type of tackifier has appeared to have a much greater ability than regular tackifier to hold and stabilize the soil surface. The bonded fiber matrix tackifier will be applied at a rate of 3,500 pounds per acre (or manufacturer's recommended application if greater).

By removing the fill in 5'-10' lifts and simultaneously reclaiming the adjacent South Slope in corresponding lifts, the pad area can then serve as convenient operating platform for the machinery and supplies used during the reclamation effort. In this manner heavy machinery will not be required to maneuver on the steep slopes. All reclamation work performed directly on the steep slopes will be done with hand labor and tools. The reclamation process will be supported by heavy equipment staged on the adjacent pad level.

20. Removal and Disposal of 72" Culvert

During the 1997 construction of the expanded surface facilities, the creek channel configuration was left intact throughout the entire length of the Expansion Area. This was accomplished by covered the channel in situ with a geotextile fabric during initial construction period. The geotextile was placed over the channel to preserve the indigenous soil and morphology of the existing creek bed. The fabric was placed along the bottom and 5 feet above the channel embankment. A colored marker material was placed on top of the geotextile to serve as a visual marker horizon during reclamation operations.

Fill removal (and South Slope reclamation) will proceed vertical lifts until the 72" culvert has been exposed. Prior to removing the culvert, the stream flow will be diverted into the 18" underdrain system by removing the cap from the drain pipe located at the upstream end of the culvert. This will be done during a low flow period of the year, such as July or August. Once the streamflow has been successfully diverted into the underdrain system, removal of the 72" culvert can begin. Removal of the culvert will be done in 20' segments starting from the

upstream end and working downstream. All culvert material will be removed from the site and disposed of in an approved landfill. The remaining culvert bedding material (2" x 0" gravel), which is located on top of the underdrain system, will be left in place at this time to provide a stable work area for heavy equipment involved in subsequent reclamation of the North Slope as described later in this discussion.

The 72" culvert will be removed downstream to an elevation just above the sediment pond. At this time, a new culvert inlet and headwall will be re-established for the remaining 72" culvert segment. The headwall will be rebuilt at this location according to original headwall design and will be rip rapped in a similar manner. At this stage of the reclamation process, approximately 1,100' of 72" culvert will have been removed and approximately 400' still remains inplace below and around the left-in-place sediment pond. However, stream flow will still continue to flow temporarily through the underdrain system at this time until the North Slope reclamation has been completed.

21. Topsoiling - North Slope of the Expansion Area

After the Expansion Area fill and the 72" culvert have been removed, the underdrain system will still remain intact. Because this phase of work will be done during low flow, the stream will be adequately carried through the underdrain system. Mobile earthmoving equipment will still be able to operate on top of the 2" x 0" bedding material located over the underdrain system. Reclamation of the North Slope, which is not as steep as the south slope, will be done with the standard protocol for reclamation involving topsoiling and revegetation.

Topsoil will be reapplied to the North Slope in the conventional manner. Topsoil will be hauled in by truck and spread with a front end loader and/or backhoe. Areas to receive topsoil will be marked with stakes indicating the depth of application. A reclamation supervisor will oversee the topsoil redistribution operation. Topsoil will be left in a roughened condition prior to seeding to minimize compaction and erosion as well as promote infiltration of precipitation.

Genwal has committed to adding nutrients as determined by laboratory analysis conducted on topsoil samples taken before topsoil redistribution and during final reclamation. The method used to ensure adequate and representative samples from different locations and depths within the topsoil stockpile include: taking two soil samples per stockpile and collecting samples with a soil auger at two foot increments. Samples of the undisturbed soil adjacent to the regraded site will also be taken for a baseline chemical reference. Fertilizer will be added to the redistributed topsoil as indicated by laboratory results.

22. Revegetation - North Slope of the Expansion Area

Revegetation procedures for the North Slope of the Expansion Area involves a **four step** program: **1) application of fertilizer (if laboratory testing indicates a need),** 2) hydroseed, 3) hydromulch the entire area with a wood fiber mulch to stabilize soil during vegetative growth and control runoff, **4)** plant containerized stock to further stabilize the soil and provide vegetative diversity. **Hydroseeding will combine the tackifier and small amount of mulch with the seed mix (to mark the area of coverage) during application to the redistributed topsoil.** All seed utilized on the site will be certified pure live seed. After the seeding step, the mulch (wood fiber and hay/straw) and tackifier will be applied to the seedbed surface. The plant containerized stock will be planted in the second year of reclamation. **Revegetation work will not be done until fall (September-October).**

23. Restoration of the Stream Channel

After the north slope has been topsoiled, the underdrain system will then be removed and the stream channel morphology restored. Prior to removal of the underdrain, silt fences will be established in Crandall Creek downstream from the existing 72" culvert outlet. These silt fences will be located in an area convenient for maintenance and cleanout.

Removal of the underdrain system will be done during low flow conditions and will be completed in reverse order from the way it was originally installed. Using small mobile equipment, such as a backhoe, the remaining culvert bedding material, drain rock and 18" drain pipe will be removed in 20' segments starting from the upper end and working downstream. After the drain rock and drain pipe are removed, the lower layer of geotextile can be carefully peeled back, re-establishing the "natural" streambed in the process. All drain rock, drain pipe and geotextile material removed during this process will be disposed of at an approved landfill. As each 20' segment of the underdrain system is removed, silt fencing will be installed on either side of the newly restored stream channel. The purpose of this silt fencing is to treat drainage from the adjacent recently reclaimed areas.

After the underdrain system has been removed and the stream channel re-established downstream past UD-1, a rip rapped ditchway will be installed to carry drainage from the side culvert outlet down the North Slope to the restored stream channel. Refer to Plate 5-16.

The underdrain system will be removed downstream to an elevation just above the sediment pond at the location of the new 72" culvert inlet and headwall. At this time, the remaining 18" drain pipe will be recapped and the stream flow rediverted back into the 72" culvert. [Note: this new sediment pond/culvert/underdrain configuration will remain in place until Phase 2 reclamation, as described later]. At this stage of the reclamation process, approximately 1,100' of 72" culvert and underdrain system will have been removed and approximately 400' will still remain inplace to divert channel flow below and around the left-in-place sediment pond.

24. Revegetation of the Stream Channel

It is anticipated that after the underdrain system is removed and the geotextile fabric is peeled away, the underlying soil material along the stream banks will be somewhat compacted. To enhance the ability of the soil to absorb moisture, a mixture of PAM (Polyacrylamide) or best technology currently available at the time of reclamation, will be applied to the soil surface. PAM is designed to relieve compaction of the soil and open up channels for air and water penetration.

The re-exposed soil structure will most likely be undamaged but lacking in microbes and nutrients. In order to regenerate naturally existing soil organisms and assist in reactivating soil activity, an inoculum will be applied to the soil to reestablish soil bacteria, microhorizia and mycelium. To enhance soil microbial establishment and promote more rapid stabilization of the soil, the riparian seed mixture (as listed in Appendix 3-6) will be hand broadcast over the area and raked into the soil surface. A wood fiber mulch will be applied over the seed bed then the surface will be sprayed with a bonded fiber matrix tackifier. This type of tackifier has appeared to have a much greater ability than regular tackifier to hold and stabilize the soil surface. The bonded fiber matrix tackifier will be applied at a rate of 3,500 pounds per acre (or manufacturer's recommended application if greater).

25. Sediment Control and Treatment

In practice, many of the reclamation procedures outlined above will be conducted simultaneously. However, the sediment pond will provide complete sediment control during all phases of the reclamation process until such time as the upper 1,100' segment of 72" culvert has been removed and removal of the underdrain system begins. Sediment control during removal of the underdrain will consist of silt fences constructed on either side of the newly restored stream channel and silt fences constructed within Crandall Creek below the outlet of the 72" culvert.

26. Topsoil Stockpile Location Reclamation

Following the removal of the topsoil stockpiles from the storage sites (during final reclamation retopsoiling activities), the topsoil pile locations will be reclaimed. (Enough topsoil will remain stockpiled for Phase 2 reclamation. Refer to the Phase 2 reclamation discussion in item #27 below.) The topsoil stockpile locations will not require soil redistribution since the native topsoil is still in place. At these locations, the ground will be lightly scarified and then reclaimed according to the standard reclamation protocol.

Revegetation procedures for the stockpile locations will involve a **four step** program: **1) application of fertilizer (if laboratory testing indicates a need),** 2) hydroseed, 3) hydromulch the entire area with a wood fiber mulch to stabilize soil during vegetative growth and control runoff, **4)** plant containerized stock to further stabilize the soil and provide vegetative diversity. **Hydroseeding will combine the tackifier and small amount of mulch with the seed mix (to**

mark the area of coverage) during application to the redistributed topsoil. All seed utilized on the site will be certified pure live seed. After the seeding step, the mulch (wood fiber and hay/straw) and tackifier will be applied to the seedbed surface. The plant containerized stock will be planted in the second year of reclamation. **Revegetation work will not be done until fall (September-October).**

Phase 2

27. Phase 2 Reclamation - Removal of Sedimentation Pond

During Phase 2 reclamation, prior to any earthwork activity, silt fences will be installed across the entire length of the downstream at the east end of the sediment pond embankment to filter any sediment resulting from removal of the pond. Additional silt fences will be installed in Crandall Creek below the culvert outlet to provide additional sediment control.

Removal of the sediment pond and the remaining 72" culvert/underdrain system will follow the same procedures described previously for the removal of the expansion area fill. The pond embankment will be removed in lifts down to the 72" pipe. Reclamation (grading, topsoiling and revegetation) of the North and South Slopes will be done in the same manner as described for the Expansion Area in Phase 1 reclamation. After the 72" culvert has been exposed the end cap will be removed from the 18" drain pipe located in the underdrain system. Flow will then be diverted through the underdrain system in the drain rock below the 72" pipe. The 72" pipe will be completely removed at this time.

After the 72" pipe has been completely removed, the geotextile fabric will be removed from the top of the underdrain system. The drain rock and 18" drain pipe will be removed with a small backhoe and hauled off-site for disposal. The drain rock beneath the drain pipe will be shoveled out of the channel and the geotextile that was placed over the original channel will be removed by hand, restoring the original stream channel morphology. The disturbed area will be revegetated in the manner previously described for the previously reclaimed areas. In many ways Phase 2 reclamation of the sediment pond embankment will be nearly identical to the Expansion Area reclamation described previously for Phase 1. Both areas involve the steeper South Slope, the stream channel culvert/underdrain system, and the less steep North Slope. Therefore, all pertinent aspects of reclamation which apply to Phase 1 as described in this appendix will also apply to Phase 2. This includes the special steep-slope reclamation techniques for the South Slope, the left-in-place soil revitalization for the channel area, and the standard reclamation procedures for the North Slope.

RECLAMATION TIME TABLE
CRANDALL CANYON MINE

RECLAMATION OPERATION	MAY				JUNE				JULY				AUGUST				SEPTEMBER				OCTOBER			
	WK1	WK2	WK3	WK4	WK1	WK2	WK3	WK4	WK1	WK2	WK3	WK4	WK1	WK2	WK3	WK4	WK1	WK2	WK3	WK4	WK1	WK2	WK3	WK4
PORTAL AREA																								
Remove structures																								
Remove asphalt																								
Haul earthfill into mine workings																								
Seal portals																								
Backfill, regrade, recontour																								
Topsoil																								
Seeding/mulching																								
OLD SUBSTATION AREA																								
Remove structures																								
Backfill/regrade/recontour																								
Topsoil																								
Seeding/mulching																								
OLD SHOP																								
Remove structures																								
Remove asphalt																								
Backfill/regrade/recontour																								
Topsoil																								
Seeding/mulching																								
OLD LOADOUT AREA																								
Remove structures																								
Remove asphalt																								
Backfill/regrade/recontour																								
Topsoil																								
Seeding/mulching																								
FOREST SERVICE ROAD																								
Remove asphalt																								
Topsoil																								
Seeding/mulching																								
EXPANSION AREA - NORTH SIDE																								
Remove structures																								
Remove asphalt (if any)																								
Remove fill (haul to mine workings)																								
Re-establish drainage ditches and rip rap																								
Topsoil																								
Seeding/mulching																								
EXPANSION AREA - SOUTH SIDE																								
Remove structures																								
Remove asphalt (if any)																								
Remove fill (haul to mine workings)																								
Remove marker material, geotextile																								
Revitalize existing topsoil																								
Seeding/mulching																								
EXPANSION AREA - STREAM CHANNEL																								
Remove 72" CMP																								
Remove underdrain and geotextile																								
Revitalize existing topsoil																								
Re-establish culvert inlet/headwall																								
Seeding/mulching																								

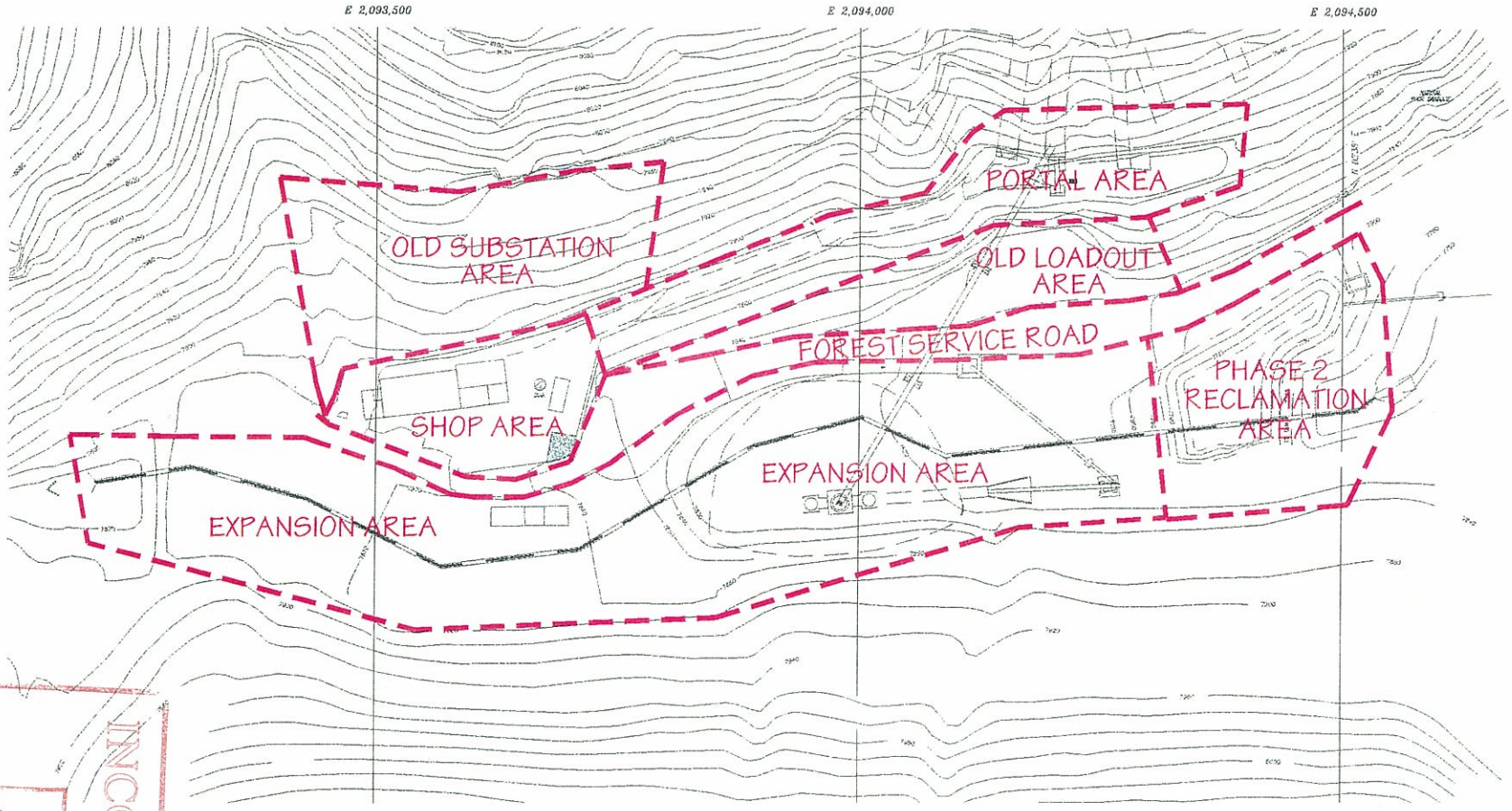


FIGURE 1
CRANDALL CANYON MINE RECLAMATION AREAS

ATTACHMENT 1

JBR ENVIRONMENTAL CONSULTANTS, INC.
RECLAMATION RECOMMENDATION LETTER

jbr
environmental consultants, inc.
8160 South Highland Drive • Sandy, Utah 84093 • (801) 943-4144 • Fax (801) 942-1852

Jean M. Semborski
Andalex Resources Inc.
Project Engineer
P.O. Box 902
Price, UT 84501

May 22, 1997

RE: Crandall Canyon Culvert Reclamation Plan ACT/015/032

Dear Ms. Semborski:

This is to your request of May 16, 1997 regarding the reclamation plans for the site of Genwal's proposed fill and culvert in Crandall Canyon. Based on our discussions, and my review of your reclamation plan on May 15, 1997, I believe the main topics of interest in the proposed reclamation plan are:

1) The existing soil horizon in the canyon that would be covered by the fill will be removed from the surface environment for a number of years as well as being compacted to various degrees by the overlying fill. Extended burial of the soil may affect its density by compaction and may reduce the viability of the soil micro fauna by compaction and reduction of oxygen.

2) The north-facing slope under the fill is steep and erosion may be a problem if normal, mechanized seedbed preparation (scarifying and gouging) is conducted which disturbs the soil and may make it more prone to erosion.

3) Use of sewage sludge or chemical fertilizer to amend the soil must be done carefully or it may result in contamination of the adjacent stream.

4) Prevention of erosion of the soil after seeding is important because of the nearby stream channel.

My general recommendation is that Genwal should propose to reclaim the subject slope in sections as it is being exhumed from under the fill. It is my understanding that the fill will be removed in lifts to allow careful removal of the marker soil and geotextile. This will allow convenient access to all areas of the treated slope from the adjacent fill surface as the fill elevation is gradually reduced.

The seedbed preparation and seeding should be done with hand labor using hand rakes to lightly scarify the top inch or so of the soil surface, broadcast seed and fertilizer. This light hand work will produce a suitable seedbed for the seed and will thoroughly allow incorporation of the fertilizer into the seedbed. The hand raking should not be so deep as to destabilize the overall soil horizon.

Material such as polyacrylamide (PAM) can be added to the soil to chemically open up the soil for air and water penetration. However, I do not think that the compacted density of the soil immediately after it is exhumed should be much of a hindrance to long-term revegetation success. First of all, most of the soil will be buried under less than the full height of the fill thus the degree of compaction will not be uniform. The soil on the upper portions of the slope will be much less compacted than the soil at the bottom of the slope. Secondly, assuming that the reclamation and reseeding is done in the fall, the soil will be loosened over the winter and early spring by the effects of the weather before germination of the seeds. I would expect the combined effects of frost heave, moisture penetration, and burrowing animals during that first fall, winter, and early spring to naturally mitigate much of the original compacted density.

Erosion control material should be applied after preparation of the seedbed is completed. Hydraulically applied fiber mulch with tackifier and/or bonded fiber matrix should be effective in controlling erosion and may be more cost effective than stapled fiber matting.

With regard to the potential lack of viability of the soil because of its burial, I am not sure that this effect will materially affect the potential revegetation success, using the methods described above. I am familiar with successful revegetation of disturbed mining surfaces where there is no topsoil present. I am aware of materials such as mill tailings, waste rock, alluvium, road base, and heap leach waste that have been successfully revegetated without application of topsoil. These materials are typically enhanced with the use of fertilizer to help support the initial vegetation growth. In these cases, the material used as growth medium did not have the soil micro-fauna typically associated with topsoil, yet the vegetation became well established with chemical fertilizer addition. I have also observed many highway road cut sites where the seedbed was recently exhumed from its previous burial under significant overburden and these slopes have subsequently been revegetated.

In my experience, the main limitations to successful revegetation are lack of suitable soil texture, inadequate chemical nutrients in the growth material, and lack of moisture. In your case, the initial soil texture (gradation) should be unchanged by the burial. Lack of nutrients in the exhumed soil could be determined with sampling and mitigated with chemical fertilizer but its application would have to be carefully planned and carried out to reduce the potential for contamination of the nearby stream from the fertilizer. The location of the soil in question on a north-facing slope at higher elevations should indicate that sufficient moisture for vegetation growth is likely.

The micro-fauna of the topsoil in question at the Crandall Canyon site may be reduced in numbers and diversity by burial but the soil should still possess suitable gradation, chemical nutrient content and moisture for the above-described reasons. This material should therefore provide a suitable growth material for revegetation. The compacted soil may benefit from use of a mycorrhizal inoculum but even this may not be necessary for the initial establishment of a vegetation cover. The soil micro-fauna will eventually be naturally re-established by the affects of the growing vegetation and exposure to the surface environment. This may be accelerated up with use of a suitable cover crop.

I believe that future revegetation of the slope in question at the Crandall Canyon site should be readily feasible if the recommendations contained in this letter are followed.

Thank you for calling on JBR to assist you with this project. Please call if you have any questions on my recommendations.

Best Regards,

Brian W. Buck
Vice President

APPENDIX 5-23

AIR QUALITY PERMIT AMENDMENT
SOUTH PORTALS

4/05/2003

Appendix 5-23

Utah!
Where ideas connect
Department of Environmental Quality
Division of Air Quality

Michael O. Leavitt
Governor
Dianne R. Nielson, Ph.D.
Executive Director
Richard W. Sprott
Director

150 North 1950 West
P.O. Box 144820
Salt Lake City, Utah 84114-4820
(801) 536-4099 Fax
(801) 536-4414 T.D.D.
www.deq.utah.gov

DAQE-AN0225003-03

March 20, 2003

Dave Shaver
Genwal Resources Incorporated
P. O. Box 1077
Price, Utah 84526

Dear Mr. Shaver:

Re: Approval Order: Modification of Existing Approval Order DAQE-827-01 to Add Equipment, Emery County - CDS B; ATT; NSPS, HAPs, TITLE V
Project Code: N0225003

The attached document is the Approval Order (AO) for the above-referenced project.

Future correspondence on this Approval Order should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. Please direct any technical questions you may have on this project to Mr. M. Maung. He may be reached at (801) 536-4153.

Sincerely,

Richard W. Sprott, Executive Secretary
Utah Air Quality Board

RWS:MM:re

cc: Southeastern Utah District Health Department

STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

APPROVAL ORDER: MODIFICATION OF EXISTING APPROVAL ORDER DAQE-827-01, TO ADD EQUIPMENT

Prepared By: Maung Maung, Engineer
(801) 536-4153
Email: mmaung@utah.gov

APPROVAL ORDER NUMBER

DAQE-AN0225003-03

Date: March 20, 2003

Genwal Resources Incorporated
Source Contact
Dave Shaver
(435) 564-4000

Richard W. Sprott
Executive Secretary
Utah Air Quality Board

Abstract

Genwal Resources, Inc. located in Emery County has proposed to modify their existing Approval Order DAQE-827-01, to add new equipment and to reduce coal output to 4.3 million tons per year. The company has proposed to construct a portal from the south seam, and to install an additional truss-supported covered conveyor to transfer the coal from the south portal to the location of the existing stacking tube. The equipment currently used from the north portal will remain unchanged.

Emery County is an attainment area of the National Ambient Air Quality Standards (NAAQS) for all pollutants. This source is subject to New Source Performance Standards (NSPS) under 40 CFR Part 60 Subpart Y- Standards of Performance for Coal Preparation Plants. Because this source is a NSPS source, it also falls under the 40 CFR Part 70 or CAA Title V regulations. The emissions, in tons per year, will change as follows: PM_{10} = - 0.12.

The change in emissions will result in the following potential to emit totals: PM_{10} = 6.86, NO_x = 4.57, SO_2 = 0.31, CO = 3.57, VOC = 0.80.

The project has been evaluated and found to be consistent with the requirements of the Utah Administrative Code Rule 307 (UAC R307). A public comment period was held in accordance with UAC R307-401-4 and no comments were received. This air quality Approval Order (AO) authorizes the project with the following conditions, and failure to comply with any of the conditions may constitute a violation of this order.

General Conditions:

1. This Approval Order (AO) applies to the following company:

Facility Location	Corporate Office Location
Genwal Resources, Inc.	Genwal Resources, Inc.
SR 31 Mile Post 33	794 North C Canyon Road
Huntington Canyon	East Carbon, Utah 84520
Huntington, Utah 84528	PHONE NUMBER: (435) 564-4000
PHONE NUMBER: (435) 687-5420	FAX NUMBER: (435) 564-4002

The equipment listed below in this AO shall be operated at the following location:

PLANT LOCATION:

SR 31 Mile Post 33, Huntington Canyon, Huntington, Utah 84528, Emery County

Direction: Take SR 31 northwest from Huntington, Utah. Follow SR 31 for 33 miles and turn left (west) on to the Forest Service Road. Follow Forest Service Road for two miles up Crandall Canyon to Genwal mine.

Universal Transverse Mercator (UTM) Coordinate System: UTM Datum NAD27
4,369.0 kilometers Northing, 483.0 kilometers Easting, Zone 12

2. All definitions, terms, abbreviations, and references used in this AO conform to those used in the Utah Administrative Code (UAC) Rule 307 (R307), and Title 40 of the Code of Federal Regulations (40 CFR). Unless noted otherwise, references cited in the AO conditions refer to those rules.

3. The limits set forth in this AO shall not be exceeded without prior approval in accordance with R307-401.

4. Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be approved in accordance with R307-401-1.

5. All records referenced in this AO or in applicable NSPS, which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or Executive Secretary's representative upon request, and the records shall include the two-year period prior to the date of the request. All records shall be kept for the following minimum periods:

A.	All Records	Two years
B.	Emission inventories	Five years from the due date of each emission statement or until the next inventory is due, whichever is longer.

6. Genwal Resources, Inc. shall install the covered conveyor and conduct its operations of the mining activities in accordance with the terms and conditions of this AO, which was written pursuant to the Notice of Intent submitted to the Division of Air Quality (DAQ) on December 19, 2002.

7. This AO shall replace the AO (DAQE-827-01) dated October 1, 2001.

8. The approved installations shall consist of the following equipment or equivalent. Equivalency shall mean identical performance, including any emission discharge, if emissions are involved. It shall be verified and approved by the Executive Secretary before the equipment or the process is changed.

A. One Jeffrey 56 feet crusher rated at 800 tons per hour
B. One concrete stacking tube, 12 feet in diameter, 85 feet high
C. One wheeled loader, one dozer
D. Two covered conveyor systems (one new)
E. One truck-loadout station, completely enclosed, (for highway vehicles) with surge bin and telescopic chute

Limitations

9. Genwal Resources Incorporated shall notify the Executive Secretary in writing when the installation of the equipment listed in Condition #8.D has been completed and is operational, as an initial compliance inspection is required. To insure proper credit when notifying the Executive Secretary, send your correspondence to the Executive Secretary, attn: Compliance Section.

If construction and/or installation has not been completed within eighteen months from the date of this AO, the Executive Secretary shall be notified in writing on the status of the construction and/or installation. At that time, the Executive Secretary shall require documentation of the continuous construction and/or installation of the operation and may revoke the AO in accordance with R307-401-11.

10. Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity. Visible emissions determinations for traffic sources shall use procedures similar to Method 9, but the requirement for observations to be made at 15-second intervals over a six-minute period shall not apply. Six points, distributed along the length of the haul road or in the operational area, shall be chosen by the Executive Secretary or the Executive Secretary's representative. An opacity reading shall be made at each point when a vehicle passes the selected points. Opacity readings shall be made ½ vehicle length or greater behind the vehicle and at approximately ½ the height of the vehicle or greater. The accumulated six readings shall be averaged for the compliance value.

11. The following production limit shall not be exceeded:

    A. 4,300,000 tons of coal per rolling 12-month period

    To determine compliance with a rolling 12-month total the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. The records of production shall be kept on a daily basis. Production shall be determined by examination of company sales records and production records.

Roads and Fugitive Dust

12. All unpaved roads and other unpaved operational areas which are used by mobile equipment shall be water sprayed and/or chemically treated to reduce fugitive dust. Control is required at all times (24 hours per day every day) for the duration of the project/operation. Records of water treatment shall be kept for all periods when the plant is in operation. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition or unless it is below freezing. The opacity shall not exceed 20% during all times the areas are in use. The records shall include the following items:

    A. Date
    B. Number of treatments made
    C. Rainfall received, if any, and approximate amount
    D. Time of day treatments were made

    Records of treatment shall be made available to the Executive Secretary upon request and shall include a period of two years ending with the date of the request.

13. The haul road shall be paved and shall be periodically swept or sprayed clean as dry conditions warrant or as determined necessary by the Executive Secretary. Records of cleaning of the paved road shall be kept.

14. Water sprays shall be installed at the following points to control fugitive emissions if the opacity limit can not be maintained:

    A. All crushers
    B. All screens
    C. All conveyor transfer points
    D. All stockpiles
    E. All operation areas

    The sprays shall operate whenever dry conditions warrant or as determined necessary by the Executive Secretary.

15. The following limit shall apply to the storage pile:

    A. Size not to exceed - 1.5 acres

    The storage piles shall be watered to minimize generation of fugitive dusts as dry conditions warrant or as determined necessary by the Executive Secretary.

Federal Limitations and Requirements

16. In addition to the requirements of this AO, all provisions of 40 CFR 60, New Source Performance Standards (NSPS) Subparts A and Y, 40 CFR 60.1 to 60.18 and 40 CFR 60.250 to 60.254 (Standards of Performance for Coal Preparation Plants) apply to this installation.

Records & Miscellaneous

17. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this Approval Order including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Executive Secretary which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded.

18. The owner/operator shall comply with R307-150 Series. Inventories, Testing and Monitoring.

19. The owner/operator shall comply with R307-107. General Requirements: Unavoidable Breakdowns.

The Executive Secretary shall be notified in writing if the company is sold or changes its name.

This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including R307.

A copy of the rules, regulations and/or attachments addressed in this AO may be obtained by contacting the Division of Air Quality. The Utah Administrative Code R307 rules used by DAQ, the Notice of Intent (NOI) guide, and other air quality documents and forms may also be obtained on the Internet at the following web site: http://www.eq.state.ut.us/eqair/aq_home.htm

The Potential To Emit (PTE) emissions for this source (the entire plant) are currently calculated at the following values:

Pollutant	Tons/yr
PM_{10}	6.86
SO_2	0.31
NO_x	4.57
CO	3.57
VOC	0.80

Approved By:

Richard W. Sprott, Executive Secretary
Utah Air Quality Board

APPENDIX 5-24

RESOURCE AND RECOVERY PROTECTION PLAN

APPROVAL LETTER

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155
http://www.blm.gov

TAKE PRIDE IN AMERICA

IN REPLY PLEASE REFER TO:
UTU-78953
(UT-924)

NOV 12 2004

Pamela Grubaugh-Littig
Permit Supervisor
State of Utah
Division of Oil Gas and Mining
1594 West North Temple Street, Suite 1210
Salt Lake City, Utah 84114-5801

Re: Resource Recovery and Protection Plan (R2P2), Federal Coal Lease Addition, UTU-78953, South Crandall Mine, GENWAL Resources, Inc., C/015/0032

Pam

Dear ~~Ms. Grubaugh-Littig~~:

The Bureau of Land Management (BLM) has received and reviewed the subject R2P2 as part of the permit application package for adding Federal coal lease UTU-78953 to the approved Crandall Canyon Mine Permit. This letter documents the BLM's finding for the R2P2. The surface lands associated with the coal lease are National Forest lands.

GENWAL Resources, Inc. has submitted the Permit Application Package (the R2P2 being part of the submission) to add the new South Crandall coal lease (UTU-78953) to the existing Crandall Canyon Mine. New portals to access this lease have been driven into the coal seam on private land on the south side of the canyon. Coal processing and handling will use existing facilities. The addition of the Federal lease constitutes the bulk of the minable coal reserves on the south side of Crandall Canyon and will extend the life of this mine for about 8 years. All mining on this new lease will be by underground mining methods and by access gained from adjacent underground mine workings on private land. The R2P2 mining plans will extend potential longwall and room and pillar panels into the new lease. The R2P2 has been reviewed by this office and has been determined to be complete and a logical plan to mine the Federal coal.

The BLM finds the submitted R2P2 (as conditioned below) is in compliance with the Mineral Leasing Act of 1920, as amended, the lease terms and conditions, the regulations at 43 CFR 3480, and will achieve Maximum Economic Recovery of the Federal coal.

Concern has been raised by the Forest Service about loss of surface waters in areas where two seam full-extraction mining is proposed within Little Bear Canyon with less than 600 feet of overburden. They have expressed their concern that mining in Little Bear Canyon where the

overburden is less than 600 feet could divert surface waters into the mine workings. This concern has been raised because Little Bear Canyon is designated as a municipal watershed in the Forest Plan.

The BLM recommends the Assistant Secretary approve the R2P2 as proposed by the company, except that full extraction mining in the both seams not be authorized in Little Bear Canyon with less than 600 feet of overburden (in the second panel from the south) until it is determined that both seams can be mined without adverse impacts to the Little Bear Canyon municipal watershed. We will continue to work with the Forest Service to address their concerns. Final approval of which coal seams will be mined in the area in question will be addressed as a modification to the approved R2P2.

If you have any questions, please contact Jeff McKenzie of my staff at (801) 539-4038 or Stephen Falk at the Price Field Office (435) 636-3605.

Sincerely,

James F. Kohler
Chief, Solid Minerals Branch

cc: Office of Surface Mining
1999 Broadway, Suite 3320
Denver, Colorado 80202-5733

Price Field Office/UT-070

APPENDIX 5-24A

R2P2 (RESOURCE RECOVERY AND PROTECTION PLAN)

APPROVAL LETTER

(120 ACRE MODIFICATION, FEDERAL LEASE UTU-68082)

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155
http://www.blm.gov

TAKE PRIDE IN AMERICA

FEB 2 3 2005

IN REPLY REFER TO:
UTU-68082
U-54762
(UT-923)

Certified Mail--Return Receipt Requested

Mr. John C. Lewis
Mining Engineer
Genwal Resources, Inc.
P. O. Box 1077
Price, Utah 84501

Re: Minor Modification, Resource Recovery and Protection Plan (R2P2), Revised Life of Mine Plan, Low-Seam Longwall Panels, East and North Mining Areas, Crandall Canyon Mine

Dear Mr. Lewis:

The Bureau of Land Management (BLM) has received from Genwal Resources, a modification to the subject R2P2. The proposed modification revises mining plans for low-seam areas with the acquisition of low-seam longwall machinery, and updates timing for life of mine recovery. The changes are for Federal coal leases UTU-68082, U-54762, and adjacent State of Utah coal leases.

Genwal plans a number of revisions to the approved R2P2.

1. Convert a previously approved area for room and pillar mining to mine two small longwall panels, #'s 20 and 21. This area is south of West Mains and directly between the old longwall panel # 3 on the west and old works on lease SL-062648 to the east. The area had projected coal heights less than what the previous longwall equipment could mine. The acquisition of low-seam longwall equipment is Genwal's justification for the change.

2. Develop and mine longwall panel # 22 parallel to West Mains and east of old longwall panel # 2. Again, this area originally was projected with seam heights. In addition, Genwal has requested a lease modification for additional coal lands at the eastern boundary of UTU-86082, just west of the outcrop in Huntington Canyon. With the acquisition of low-seam longwall equipment, Genwal will attempt to develop and extend longwall panels into this area.

3. Probe/develop the area north of planned longwall panel # 22, as shown on Genwal's map of Oct 12, 2004, to ascertain if coal heights will support coal recovery. If probing/development proves a recoverable reserve, a panel plan will be submitted for approval. Any coal to be left unmined must be approved by BLM prior to abandoning the area.

4. Revise planned recovery of coal remnants in mains and sub-mains. Genwal plans retreat recovery of some pillars and barriers remaining in main entries and sub-main entries and updates timing and sequencing of this recovery.

The BLM has reviewed and analyzed the proposed revisions. Starting with the proposed longwall panels # 20 and # 21, we agree with the plan. When Genwal had earlier completed longwall panel # 19 and had developed Main East directly north of panel # 19, the BLM had given verbal approval to develop 3 ¼ East (a three entry development set) into this low coal block that was previously planned for room and pillar mining if coal heights were high enough. Subsequent quarterly inspections (June 29 and September 14, 2004) confirm coal heights above 5 feet thick and in the range of the new low-seam longwall equipment. Though the apparent and projected coal heights are near the minimum limits for operating the longwall equipment, the BLM encourages full recovery.

The area north of Main West and east of old longwall panel # 2 is also approved with similar conditions as in area one. This area was not previously scheduled for mining as the back end of old panel # 2 stopped due to coal below 6 feet which was the limits of the previous longwall machinery. With the acquisition of a low-seam continuous miner and longwall equipment, BLM gave verbal approval to connect up the Main West entries with the back end bleeder entries of old longwall panel # 2 (now called 3rd North off Main West) and then drive development entries east (called 1st Right Gate off of 3rd North) to ascertain coal heights for a low-seam longwall panel. In addition, Genwal applied for a lease modification for the east end of lease UTU-68082 to acquire unleased coal (if it exists with minable thickness) between the boundary and the outcrop to Huntington Canyon. An inspection on September 14, 2004, verified that the beginnings of 1st Right Gate had thicknesses of greater than 5 feet. We agree with the proposal and also the general plan to develop north of this proposed panel # 22 to recover minable coal with the new low-seam mining equipment. The requirements for the R2P2 for this lease modification area are met with your submission. However, Genwal is not authorized to mine in the lease modification area (west quarter of section 32, township 15 south, range 7 east) until a permit under the Surface Mining Control and Reclamation Act (administered by Utah Division of Oil Gas and Mining) is issued. This letter will be copied to Utah Division of Oil Gas and Mining (UDOGM) and will serve as our concurrence to them for requirements under the Mineral Leasing Act.

The fourth part of the proposed revisions depicts new sequencing and timing of mining remnant pillars left in the mains and sub-mains as part of final retreat mining. We agree and find the plan for recovering pillars in the mains and sub-mains a good attempt to recover remnant coal surrounded by mined out areas. We note that no retreat mining of Main West inby crosscut 116 is depicted on the latest submission. Genwal informed the BLM in late October, 2004, that they were planning to seal Main West due to adverse loading and the inability to maintain passage back to the end of Main West. BLM inspected the area on November 4, 2004, and noted the conditions. Heavy pillar loading was noted from crosscut 125 all the way back to near the end of Main West. Two large intersection caves were noted and heavy rib sloughage on the intake entry for most of this length. In addition, the rib line to the north barrier was pushing out coal well into the entry. It is apparent that pillar recovery will not be possible. First, before any additional mining can occur, all entries must be made travelable which will require all caves and failures clean up and secured. The depth for most of Main West is over 1500 feet with the middle area (where the worst conditions were noted) is over 2000 feet deep. Main West perform its function of

longwall gob return air courses for the life of the north and south longwall block near Joe's Valley fault but cannot be used for final pillar recovery. We agree that the pillars in Main West inby crosscut 116 cannot be recovered safely or practically. We also concur with sealing the area as the coal is not recoverable, return ventilation is no longer needed and equipment and any hazardous materials have been removed.

Our approval for these revisions to the R2P2 is conditioned on Genwal updating the recoverable reserve base for the Federal leases at the Crandall Canyon Mine within 30 days. Should extra time be necessary to finalize these numbers, please inform us at the contacts listed below. This is not a punitive measure, just an acknowledgement that reserve figures were not tracked in the past by all concerned. We wish to rectify recoverable reserves for all leases and lessees.

This approval of a minor modification to an existing R2P2 is Categorically Excluded from National Environmental Policy Act (NEPA) analysis in that no new surface disturbance will occur from this action as stated in Overview of BLM's NEPA Process, February 1997, Appendix 2, page 2-7 (F)(7). NEPA analysis was conducted for the lease modification area, and a Finding of No Significant Impact (FONSI) was signed in November 2004.

Genwal's proposed changes to the R2P2 complies with the Mineral Leasing Act of 1920, as amended, the regulations at 43 CFR 3480, the lease terms and conditions, and will achieve maximum economic recovery of the Federal coal. The mining plans as depicted on the October 12, 2004 submission (ACAD REF: R2P2 CRANDALL) is approved as submitted with the mentioned condition for reserves update. A copy of the approved mine map is enclosed. This approval constitutes our concurrence for R2P2 requirements for UDOGM on the area of the lease modification.

If you have any questions, please contact Stephen Falk in Price at (435) 636-3605 or Jeff McKenzie of my staff at (801) 539-4038.

Sincerely,

James F. Kohler
Chief, Solid Minerals Branch

Enclosure
Approved Mine Map

cc: Price Field Office (w/encl.)

Utah Division of Oil Gas and Mining (w/encl)
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801

APPENDIX 5-25

SUBSIDENCE SURVEY LETTERS OF NOTIFICATION

GENWAL™ RESOURCES, INC.

P.O. BOX 1077
PRICE, UTAH 84501
PHONE: (435) 564-4000
FAX: (435) 564-4002

May 18, 2004

Castle Valley Special Service District
86 S 100 E
Castledale, UT 84513

Re: Subsidence Survey Notification, Crandall Canyon Mine, C/015/0032

Dear Sirs:

GENWAL Resources, Inc. has conducted a subsidence survey at its Crandall Canyon and South Crandall Mines under Permit C/015/0032 filed with the Division of Oil, Gas and Mining in Salt Lake City, Utah. The survey has shown that you have surface rights and water rights within the possible subsidence zone of the approved mine plans in the permit.

This notice is in accordance with regulation R645-301-525.700, which is enforced by the Division of Oil, Gas and Mining.

Call me at 435-564-4015 if you have any questions.

Sincerely

Gary E. Gray
Agent/Engineer

GENWAL™ RESOURCES, INC.

P.O. BOX 1077
PRICE, UTAH 84501
PHONE: (435) 564-4000
FAX: (435) 564-4002

May 18, 2004

National Forest Service
Manti LaSal National Forest
599 West Price River Road
Price, UT 84501

Re: Subsidence Survey Notification, Crandall Canyon Mine, C/015/0032

Dear Sirs:

GENWAL Resources, Inc. has conducted a subsidence survey at its Crandall Canyon and South Crandall Mines under Permit C/015/0032 filed with the Division of Oil, Gas and Mining in Salt Lake City, Utah. The survey has shown that you have surface rights and water rights within the possible subsidence zone of the approved mine plans in the permit.

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Sincerely

Gary E. Gray
Agent/Engineer

GENWAL™ RESOURCES, INC.

P.O. BOX 1077
PRICE, UTAH 84501
PHONE: (435) 564-4000
FAX: (435) 564-4002

May 18, 2004

SITLA
675 east 500 South, Suite 500
Salt Lake City, UT 84102

Re: Subsidence Survey Notification, Crandall Canyon Mine, C/015/0032

Dear Sirs:

GENWAL Resources, Inc. has conducted a subsidence survey at its Crandall Canyon and South Crandall Mines under Permit C/015/0032 filed with the Division of Oil, Gas and Mining in Salt Lake City, Utah. The survey has shown that you have surface rights and water rights within the possible subsidence zone of the approved mine plans in the permit.

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Sincerely

Gary E. Gray
Agent/Engineer

GENWAL™ RESOURCES, INC.

P.O. BOX 1077
PRICE, UTAH 84501
PHONE: (435) 564-4000
FAX: (435) 564-4002

May 18, 2004

Huntington-Cleveland Irrigation Company
71 North Main
Huntington, UT 84528

Re: Subsidence Survey Notification, Crandall Canyon Mine, C/015/0032

Dear Sirs:

GENWAL Resources, Inc. has conducted a subsidence survey at its Crandall Canyon and South Crandall Mines under Permit C/015/0032 filed with the Division of Oil, Gas and Mining in Salt Lake City, Utah. The survey has shown that you have surface rights and water rights within the possible subsidence zone of the approved mine plans in the permit.

This notice is in accordance with regulation R645-301-525.700, which is enforced by the Division of Oil, Gas and Mining.

Call me at 435-564-4015 if you have any questions.

Sincerely

Gary E. Gray
Agent/Engineer

APPENDIX 5-26

FOREST SERVICE TRAILHEAD PARKING ARRANGEMENT

GENWAL™
RESOURCES, INC.

P.O. Box 1077, Price, Utah 84501 794 North "C" Canyon Rd, East Carbon, Utah 84520
Telephone (435) 888-4000 Fax (435) 888-4002

April 27, 2005

Alice Carlson
Forest Supervisor
Manti-LaSal National Forest
599 West Price River Dr.
Price, Utah 84501

Dear Ms. Carlson:

GENWAL Resources, Inc. presently holds a Forest Service special use permit for a trailhead parking lot at the Crandall Canyon Mine (copy attached). We hereby request to amend this special use permit to allow GENWAL to utilize part of this trailhead for employee parking as shown on the accompanying drawing. Under this proposal, the outer 20' wide perimeter of the trailhead would continue to be used for public parking associated with usage of the trail. This would accommodate up to five vehicle/horse-trailer combinations, with ample room for run-around. Vehicles could exit the trailhead through a permanent break in the material storage yard which would allow unrestricted egress from the parking lot. GENWAL also seeks permission to excavate a small part of the existing bank near the upper end of the trailhead (see drawing) to allow increased utilization of the parking area.

We appreciate your consideration of this matter.

Sincerely,

David Shaver
Manager of Technical Services

Authorization ID: PRI42
Contact ID: GENWAL
Expiration Date: 12/31/2022
Use Code: 522

FS-2700-4 (8/99)
OMB 0596-0082

U.S. DEPARTMENT OF AGRICULTURE
Forest Service
SPECIAL USE PERMIT
AUTHORITY:
ORGANIC ADMINISTRATION ACT June 4, 1897

GENWAL RESOURCES, INCORPORATED of P.O. BOX 1077, PRICE, UT 84501 (hereinafter called the Holder) is hereby authorized to use or occupy National Forest System lands, to use subject to the conditions set out below, on the Manti-La Sal National Forest, Price Ranger District.

This permit covers .1 acres, and/or 0 miles and is described as: Sec. 6, T16S, R7E, SALT LAKE as shown on the location map attached to and made a part of this permit, and is issued for the purpose of:

Snow storage and summer parking. Permittee will be responsible for noxious weed control on the permitted area.

The above described or defined area shall be referred to herein as the "permit area".

TERMS AND CONDITIONS

I. AUTHORITY AND GENERAL TERMS OF THE PERMIT

A. Authority. This permit is issued pursuant to the authorities enumerated at Title 36, Code of Federal Regulations, Section 251 Subpart B, as amended. This permit, and the activities or use authorized, shall be subject to the terms and conditions of the Secretary's regulations and any subsequent amendment to them.

B. Authorized Officer. The authorized officer is the Forest Supervisor or a delegated subordinate officer.

C. License. This permit is a license for the use of federally owned land and does not grant any permanent, possessory interest in real property, nor shall this permit constitute a contract for purposes of the Contract Disputes Act of 1978 (41 U.S.C. 611). Loss of the privileges granted by this permit by revocation, termination, or suspension is not compensable to the holder.

D. Amendment. This permit may be amended in whole or in part by the Forest Service when, at the discretion of the authorized officer, such action is deemed necessary or desirable to incorporate new terms, conditions, and stipulations as may be required by law, regulation, land management plans, or other management decisions.

E. Existing Rights. This permit is subject to all valid rights and claims of third parties. The United States is not liable to the holder for the exercise of any such right or claim.

F. Nonexclusive Use and Public Access. Unless expressly provided for in additional terms, use of the permit area is not exclusive. The Forest Service reserves the right to use or allow others to use any part of the permit area, including roads, for any purpose, provided, such use does not materially interfere with the holder's authorized use. A final determination of conflicting uses is reserved to the Forest Service.

G. Forest Service Right of Entry and Inspection. The Forest Service has the right of unrestricted access of the permitted area or facility to ensure compliance with laws, regulations, and ordinances and the terms and conditions of this permit.

H. Assignability. This permit is not assignable or transferable. If the holder through death, voluntary sale or transfer, enforcement of contract, foreclosure, or other valid legal proceeding ceases to be the owner of the improvements, this permit shall terminate.

I. Permit Limitations. Nothing in this permit allows or implies permission to build or maintain any structure or facility, or to conduct any activity unless specifically provided for in this permit. Any use not specifically identified in this permit must be approved by the authorized officer in the form of a new permit or permit amendment.

II. TENURE AND ISSUANCE OF A NEW PERMIT

A. Expiration at the End of the Authorized Period. This permit will expire at midnight on **12/31/2022**. Expiration shall occur by operation of law and shall not require notice, any decision document, or any environmental analysis or other documentation.

B. Minimum Use or Occupancy of the Permit Area. Use or occupancy of the permit area shall be exercised at least 365 days each year, unless otherwise authorized in writing under additional terms of this permit.

C. Notification to Authorized Officer. If the holder desires issuance of a new permit after expiration, the holder shall notify the authorized officer in writing not less than six (6) months prior to the expiration date of this permit.

D. Conditions for Issuance of a New Permit. At the expiration or termination of an existing permit, a new permit may be issued to the holder of the previous permit or to a new holder subject to the following conditions:

1. The authorized use is compatible with the land use allocation in the Forest Land and Resource Management Plan.
2. The permit area is being used for the purposes previously authorized.
3. The permit area is being operated and maintained in accordance with the provisions of the permit.
4. The holder has shown previous good faith compliance with the terms and conditions of all prior or other existing permits, and has not engaged in any activity or transaction contrary to Federal contracts, permits laws, or regulations.

E. Discretion of Forest Service. Notwithstanding any provisions of any prior or other permit, the authorized officer may prescribe new terms, conditions, and stipulations when a new permit is issued. The decision whether to issue a new permit to a holder or successor in interest is at the absolute discretion of the Forest Service.

F. Construction. Any construction authorized by this permit may commence by N/A and shall be completed by N/A. If construction is not completed within the prescribed time, this permit may be revoked or suspended.

III. RESPONSIBILITIES OF THE HOLDER

A. Compliance with Laws, Regulations, and other Legal Requirements. The holder shall comply with all applicable Federal, State, and local laws, regulations, and standards, including but not limited to, the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., the Resource Conservation and Recovery Act, 42 U.S.C. 6901 et seq., the Comprehensive Environmental Response, Control, and Liability Act, 42 U.S. C. 9601 et seq., and other relevant environmental laws, as well as public health and safety laws and other laws relating to the siting, construction, operation, and maintenance of any facility, improvement, or equipment on the property.

B. Plans. Plans for development, layout, construction, reconstruction, or alteration of improvements on the permit area, as well as revisions of such plans, must be prepared by a qualified individual acceptable to the authorized officer and shall be approved in writing prior to commencement of work. The holder may be required to furnish as-built plans, maps, or surveys, or other similar information, upon completion of construction.

C. Maintenance. The holder shall maintain the improvements and permit area to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the authorized officer and consistent with other provisions of this authorization. If requested, the holder shall comply with inspection requirements deemed appropriate by the authorized officer.

D. Hazard Analysis. The holder has a continuing responsibility to identify all hazardous conditions on the permit area which would affect the improvements, resources, or pose a risk of injury to individuals. Any non-emergency actions to abate such hazards shall be performed after consultation with the authorized officer. In emergency situations, the holder shall notify the authorized officer of its actions as soon as possible, but not more than 48 hours, after such actions have been taken.

E. Change of Address. The holder shall immediately notify the authorized officer of a change in address.

F. Change in Ownership. This permit is not assignable and terminates upon change of ownership of the improvements or control of the business entity. The holder shall immediately notify the authorized officer when a change in ownership or control of business entity is pending. Notification by the present holder and potential owner shall be executed using Form SF-299 Application for Transportation and Utility Systems and Facilities of Federal Lands, or Form FS-2700-3a, Holder Initiated Revocation of Existing Authorization, Request for a Special Use Permit. Upon receipt of the proper documentation, the authorized officer may issue a permit to the party who acquires ownership of, or a controlling interest in, the improvements or business entity.

IV. LIABILITY

For purposes of this section, "holder" includes the holder's heirs, assigns, agents, employees, and contractors.

A. The holder assumes all risk of loss to the authorized improvements.

B. The holder shall indemnify, defend, and hold the United States harmless for any violations incurred under any such laws and regulations or for judgments, claims, or demands assessed against the United States in connection with the holder's use or occupancy of the property. The holder's indemnification of the United States shall include any loss by personal injury, loss of life or damage to property in connection with the occupancy or use of the property during the term of this permit. Indemnification shall include, but is not limited to, the value of resources damaged or destroyed; the costs of restoration, cleanup, or other mitigation; fire suppression or other types of abatement costs; third party claims and judgments; and all administrative, interest, and other legal costs. This paragraph shall survive the termination or revocation of this authorization, regardless of cause.

C. The holder has an affirmative duty to protect from damage the land, property, and interests of the United States.

D. In the event of any breach of the conditions of this authorization by the holder, the authorized officer may, on reasonable notice, cure the breach for the account at the expense of the holder. If the Forest Service at any time pays any sum of money or does any act which will require payment of money, or incurs any expense, including reasonable attorney's fees, in instituting, prosecuting, and/or defending any action or proceeding to enforce the United States rights hereunder, the sum or sums so paid by the United States, with all interests, costs and damages shall, at the election of the Forest Service, be deemed to be additional fees hereunder and shall be due from the holder to the Forest Service on the first day of the month following such election.

E. With respect to roads, the holder shall be proportionally liable for damages to all roads and trails of the United States open to public use caused by the holder's use to the same extent as provided above, except that liability shall not include reasonable and ordinary wear and tear.

F. The Forest Service has no duty to inspect the permit area or to warn of hazards and, if the Forest Service does inspect the permit area, it shall incur no additional duty nor liability for identified or non-identified hazards. This covenant may be enforced by the United States in a court of competent jurisdiction.

V. TERMINATION, REVOCATION, AND SUSPENSION

A. General. For purposes of this permit, "termination", "revocation", and "suspension" refer to the cessation of uses and privileges under the permit.

"Termination" refers to the cessation of the permit under its own terms without the necessity for any decision or action by the authorized officer. Termination occurs automatically when, by the terms of the permit, a fixed or agreed upon condition, event, or time occurs. For example, the permit terminates at expiration. Terminations are not appealable.

"Revocation" refers to an action by the authorized officer to end the permit because of noncompliance with any of the prescribed terms, or for reasons in the public interest. Revocations are appealable.

"Suspension" refers to a revocation which is temporary and the privileges may be restored upon the occurrence of prescribed actions or conditions. Suspensions are appealable.

B. Revocation or Suspension. The Forest Service may suspend or revoke this permit in whole or part for:

1. Noncompliance with Federal, State, or local laws and regulations.
2. Noncompliance with the terms and conditions of this permit.
3. Reasons in the public interest.
4. Abandonment or other failure of the holder to otherwise exercise the privileges granted.

C. Opportunity to Take Corrective Action. Prior to revocation or suspension for cause pursuant to Section V (B), the authorized officer shall give the holder written notice of the grounds for each action and a reasonable time, not to exceed 90 days, to complete the corrective action prescribed by the authorized officer.

D. Removal of Improvements. Prior to abandonment of the improvements or within a reasonable time following revocation or termination of this authorization, the holder shall prepare, for approval by the authorized officer, an abandonment plan for the permit area. The abandonment plan shall address removal of improvements and restoration of the permit area and prescribed time frames for these actions. If the holder fails to remove the improvements or restore the site within the prescribed time period, they become the property of the United States and may be sold, destroyed or otherwise disposed of without any liability to the United States. However, the holder shall remain liable for all cost associated with their removal, including costs of sale and impoundment, cleanup, and restoration of the site.

VI. FEES

A. Termination for Nonpayment. This permit shall automatically terminate without the necessity of prior notice when land use rental fees are 90 calendar days from the due date in arrears.

B. The holder shall pay One Hundred Eighty Dollars $180.00 for the period from January 1, 2004, to December 31, 2007, and thereafter at the beginning of each 5-year period a lump sum payment for 5 years rent of Two Hundred Twenty Five Dollars $225.00: Provided, charges for this use shall be made or readjusted whenever necessary to place the charges on a basis commensurate with the fair market value of the authorized use.

C. Payment Due Date. The payment due date shall be the close of business on January 1st of each calendar year payment is due. Payments due the United States for this use shall be deposited at USDA Forest Service, File 71652, P.O. Box 60000, San Francisco, CA 94160-1652, in the form of a check, draft, or money order payable to "Forest Service, USDA." Payments shall be credited on the date received by the designated Forest Service collection officer or deposit location. If the due date for the fee or fee calculation statement falls on a non-workday, the charges shall not apply until the close of business on the next workday.

D. Late Payment Interest, Administrative Costs and Penalties Pursuant to 31 U.S.C. 3717, et seq., interest shall be charged on any fee amount not paid within 30 days from the date the fee or fee calculation financial statement specified in this authorization becomes due. The rate of interest assessed shall be the higher of the rate of the current value of funds to the U.S. Treasury (i.e., Treasury tax and loan account rate), as prescribed and published by the Secretary of the Treasury in the Federal Register and the Treasury Fiscal Requirements Manual Bulletins annually or quarterly or at the Prompt Payment Act rate. Interest on the principal shall accrue from the date the fee or fee calculation financial statement is due.

In the event the account becomes delinquent, administrative costs to cover processing and handling of the delinquency will be assessed.

A penalty of 6 percent per annum shall be assessed on the total amount delinquent in excess of 90 days and shall accrue from the same date on which interest charges begin to accrue.

Payments will be credited on the date received by the designated collection officer or deposit location. If the due date for the fee or fee calculation statement falls on a non-workday, the charges shall not apply until the close of business on the next workday.

Disputed fees are due and payable by the due date. No appeal of fees will be considered by the Forest Service without full payment of the disputed amount. Adjustments, if necessary, will be made in accordance with settlement terms or the appeal decision.

If the fees become delinquent, the Forest Service will:

Liquidate any security or collateral provided by the authorization.

If no security or collateral is provided, the authorization will terminate and the holder will be responsible for delinquent fees as well as any other costs of restoring the site to it's original condition including hazardous waste cleanup.

Upon termination or revocation of the authorization, delinquent fees and other charges associated with the authorization will be subject to all rights and remedies afforded the United States pursuant to 31 U.S.C. 3711 *et seq.* Delinquencies may be subject to any or all of the following conditions:

Administrative offset of payments due the holder from the Forest Service.

Delinquencies in excess of 60 days shall be referred to United States Department of Treasury for appropriate collection action as provided by 31 U.S.C. 3711 (g), (1).

The Secretary of the Treasury may offset an amount due the debtor for any delinquency as provided by 31 U.S.C. 3720, *et seq.*)

VII. OTHER PROVISIONS

A. Members of Congress. No Member of or Delegate to Congress or Resident Commissioner shall benefit from this permit either directly or indirectly, except when the authorized use provides a general benefit to a corporation.

B. Appeals and Remedies. Any discretionary decisions or determinations by the authorized officer are subject to the appeal regulations at 36 CFR 251, Subpart C, or revisions thereto.

C. Superior Clauses. In the event of any conflict between any of the preceding printed clauses or any provision thereof and any of the following clauses or any provision thereof, the preceding printed clauses shall control.

D. Nondiscrimination in Employment and Services (B1). During the performance of this authorization, the holder agrees:

1. In connection with the performance of work under this authorization, including construction, maintenance, and operation of the facility, the holder shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, age, or disability. (Ref. Title VII of the Civil Rights Act of 1964, as amended).

2. The holder and employees shall not discriminate by segregation or otherwise against any person on the basis of race, color, religion, sex national origin, age, or disability, by curtailing or refusing to furnish accommodations, facilities, services, or use privileges offered to the public generally. (Ref. Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; Title IX of the Education Amendments, and the Age Discrimination Act of 1975).

3. The holder shall include and require compliance with the above nondiscrimination provisions in any subcontract made with respect to the operations under this authorization.

4. When furnished by the Forest Service, signs setting forth this policy of nondiscrimination will be conspicuously displayed at the public entrance to the premises, and at other exterior or interior locations as directed by the Forest Service.

5. The Forest Service shall have the right to enforce the foregoing nondiscrimination provisions by suit for specific performance or by any other available remedy under the laws of the United States of the State in which the breach or violation occurs.

E. Operating Plan (C8). The holder shall provide an Operating Plan. The plan shall be prepared in consultation with the authorized officer or designated representative and cover operation and maintenance of facilities, dates or season of operations, and other information required by the authorized officer to manage and evaluate the occupation and/or use of National Forest System lands. The provisions of the Operating Plan and the annual revisions shall become a part of this authorization and shall be submitted by the holder and approved by the authorized officer or their designated representative(s). This Operating Plan is hereby made a part of the authorization.

F. Removal and Planting of Vegetation and Other Resources (D5). The holder shall obtain prior written approval from the authorized officer before removing or altering vegetation or other resources. The holder shall obtain prior written approval from the authorized officer before planting trees, shrubs, or other vegetation within the authorized area.

G. Revegetation of Ground Cover and Surface Restoration (D9). The holder shall be responsible for prevention and control of soil erosion and gullying on lands covered by this authorization and adjacent thereto, resulting from construction, operation, maintenance, and termination of the authorized use. The holder shall so construct permitted improvements to avoid the accumulation of excessive heads of water and to avoid encroachment on streams. The holder shall revegetate or otherwise stabilize all ground where the soil has been exposed as a result of the holder's construction, maintenance, operation, or termination of the authorized use and shall construct and maintain necessary preventive measures to supplement the vegetation.

H. Pesticide Use (D23). Pesticides may not be used to control undesirable woody and herbaceous vegetation, aquatic plants, insects, rodents, trash fish, etc., without the prior written approval of the Forest Service. A request for approval of planned uses of pesticides will be submitted annually by the holder on the due date established by the authorized officer. The report will cover a 12-month period of planned use beginning 3 months after the reporting date. Information essential for review will be provided in the form specified. Exceptions to this schedule may be allowed, subject to emergency request and approval, only when unexpected outbreaks of pests require control measures which were not anticipated at the time an annual report was submitted.

I. Superseded Authorization (X18). This authorization supersedes a special-use authorization designated: PRI409002, dated 8/13/87 for snow storage and summer parking, termination date 12/31/02.

J. Corporation Status Notification (X46). The holder shall furnish the authorized officer with the names and addresses of shareholders owning three (3) percent or more of the shares, and number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote. In addition, the holder shall notify the authorized officer within fifteen (15) days of the following changes:

1. Names of officers appointed or terminated.

2. Names of stockholders who acquire stock shares causing their ownership to exceed 50 percent of shares issued or who otherwise acquire controlling interest in the corporation.

3. A copy of the articles of incorporation and bylaws.

4. An authenticated copy of a resolution of the board of directors specifically authorizing a certain individual or individuals to represent the holder in dealing with the Forest Service.

5. A list of officers and directors of the corporation and their addresses.

6. Upon request, a certified list of stockholders and amount of stock owned by each.

7. The authorized officer may, when necessary, require the holder to furnish additional information as set forth in 36 CFR 251.54 (e)(1)(iv).

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082.

This information is needed by the Forest Service to evaluate requests to use National Forest System lands and manage those lands to protect natural resources, administer the use, and ensure public health and safety. This information is required to obtain or retain a benefit. The authority for that requirement is provided by the Organic Act of 1897 and the Federal Land Policy and Management Act of 1976, which authorize the Secretary of Agriculture to promulgate rules and regulations for authorizing and managing National Forest System lands. These statutes, along with the Term Permit Act, National Forest Ski Area Permit Act, Granger-Thye Act, Mineral Leasing Act, Alaska Term Permit Act, Act of September 3, 1954, Wilderness Act, National Forest Roads and Trails Act, Act of November 16, 1973, Archaeological Resources Protection Act, and Alaska National Interest Lands Conservation Act, authorize the Secretary of Agriculture to issue authorizations for the use and occupancy of National Forest System lands. The Secretary of Agriculture's regulations at 36 CFR Part 251, Subpart B, establish procedures for issuing those authorizations.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service Public reporting burden for collection of information, if requested, is estimated to average 1 hour per response for annual financial information; average 1 hour per response to prepare or update operation and/or maintenance plan; average 1 hour per response for inspection reports; and an average of 1 hour for each request that may include such things as reports, logs, facility and user information, sublease information, and other similar miscellaneous information requests. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

This permit is accepted subject to the conditions set out above.

Date 6/9/03 GENWAL RESOURCES, INC.

(CORPORATE SEAL)

By: Samuel C Dudley
(Vice) President Operations

ATTEST: _____

_____

_____
(Assistant) Secretary

The following certificate shall be executed by the Secretary or Assistant Secretary of the Corporation:

I _____ certify that I am the _____ Secretary of the Corporation that executed the above permit; that _____ who signed said permit on behalf of said Corporation was then _____ of said Corporation; that I know his/her signature on said permit is genuine; and that said permit was duly signed, sealed, and attested to for and on behalf of said Corporation by authority of its governing body

(CORPORATE SEAL)

_____
(Assistant Secretary)

U. S. DEPARTMENT OF AGRICULTURE
Forest Service

By: _____
(Authorized Officer Signature)

for Elaine J. Zieroth, Forest Supervisor
(Name and Title)

6/10/2003
(Date)

INCORPORATED
JUL 28 2005
DIV OF OIL GAS & MINING

THIS AREA TO BE EXCAVATED (0.01 acres)

FS TRAILHEAD PERIMETER PARKING AND RUN AROUND (30 FT. WIDE)

SHOP

U.S.F.S.

GENWAL FEE TRAIL

EMPLOYEE PARKING

NO PARKING SIGN

DEAD TREE

DEAD TREE

PARTIALLY DEAD TREE

DEAD TREE

EXIT

MATERIAL STORAGE AREA

TRAVEL WAY

MATERIAL STORAGE AREA

INCORPORATED

JUL 2 6 2005

DIV OF OIL GAS & MINING

GENWAL RESOURCES, INC.

P.O. Box 1077 Price, UT
Telephone (435) 888-4000

CRANDALL CANYON MINE
Forest Service Trailhead

DRAWN BY: JDS	ACAD REF: parking lot setupb
DATE: 05/09/05	PLATE #: APP 5-26
SCALE: 1" = 20'	