

# R645-301-100 GENERAL CONTENTS

## R645-301-112 Identification of Interests

### 112.100 Statement of corporation

C.W. Mining Company is a corporation, incorporated in the state of Utah. C.W. Mining Company is the payer of the abandoned mine reclamation fee. Federal Identification Number: 87-0399230.

### 112.200-230 Names, addresses, and telephone numbers of the applicant, and the applicant's resident agent who will accept service of process.

Applicant: C.W. Mining Company  
53 W Angelo Ave  
Salt Lake City, UT 84115  
(801) 486-5047

Resident Agent Charles Reynolds  
P.O. Box 1245  
Huntington, UT 84528  
(435) 687-2450

### 112.300 For Applicants other than single proprietorships:

### 112.310 Name and address of each officer, partner, principal, principal shareholder, and director or other person performing a function similar to a director

C.O.P Coal Development Company is the fee area and leaseholder of lands within the permit area. C.O.P. Coal Development Company has subleased all fee and federal coal rights to C.W. Mining Company for inclusion in the Bear Canyon LMU.

Corporate Office: C.O.P. Coal Development Co.  
3212 South State Street  
Salt Lake City, Utah 84115

Name	Title	Address
J. O. Kingston	President	53 West Angelo Ave, S.L.C., Ut. 84115
J. D. Kingston Jr.	Vice President	53 West Angelo Ave, S.L.C., Ut. 84115
Luanna Kingston	Sec./Treas.	53 West Angelo Ave, S.L.C., Ut. 84115

### 112.320 Not Applicable

RECEIVED

FEB 23 2006

DIV. OF OIL, GAS & MINING  
1/16/04

B.C.

Mine # C/015/0025  
File # incoming  
Record # 0010  
Doc. Date 2-15-06-0002  
Recd. Date 2-23-06

**112.330 The title of the person's position, date position was assumed, and when submitted under R645-300-147.**

Table 1-1 Officers Authorized to Act on Behalf of C. W. Mining Company

Name	Title	Address	Start Date
B. W. Stoddard	President	P.O. Box 300, Huntington, Ut 84528	01/01/76
C. W. Reynolds	Vice Pres.	P.O. Box 1245, Huntington, UT 84528	07/01/04
D. J. Sanders	Sec./Treas.	53 West Angelo Ave., S.L.C., Ut 84115	06/17/93
C. W. Reynolds	Res. Agent	P.O. Box 1245, Huntington, UT 84528	07/01/04

**112.340 All names under which the applicant operates or previously operated a coal mine and reclamation operation in the United States within the 5 years preceding the date of application.**

C.W. Mining is doing business as (DBA) Co-Op Mining Company

**112.350 Not Applicable**

**112.400 Pending, current, and previous coal mining and reclamation operation permit applications.**

C/015/021 Utah Division of Oil Gas and Mining  
C/015/025 Utah Division of Oil Gas and Mining

**112.410 Federal or State permit numbers and MSHA numbers, the date of issuance, and the regulatory authority.**

See Table 1-2 on the following page.

**112.420 Not Applicable**

**112.500 & 112.600 Surface ownership, subsurface ownership and description of permit area.**

Plate 1-1 shows the Permit Area, Plate 1-2 shows Surface Ownership, Plate 1-3 shows Sub-Surface Ownership. The initials COP on the plates stand for C.O.P. Coal Development Company. Table 1-3 lists the owners of the surface and mineral property rights within the permit area.

Table 1-3 Property Ownership

	<u>Surface</u>	<u>Coal</u>	<u>Minerals</u>	<u>Grazing</u>	<u>Oil &amp; Gas</u>
A	1	1	1	1	1
B	2	3	3	2	3
C	1	3	3	1	3
D	3	3	3	3	3
E	2	1	1	2	1

1. C.O.P. Coal Development Co.  
3212 South State Street  
Salt Lake City, Utah 84115
2. U.S. Forest Service  
599 W. Price River Drive  
Price, Utah 84501
3. Bureau of Land Management  
125 South 600 West  
Price, Utah 84501

See Plate 1-2 for location of areas A, B, C, D, and E.

Plate 1-1 shows the Permit Area, Plate 1-2 shows Surface Ownership, Plate 1-3 shows Sub-Surface Ownership. The initials COP on the plates stand for C.O.P. Coal Development Company. Table 1-3 lists the owners of the surface and mineral property rights within the permit area.

Federal lease U-024316, U-024318, U-020668, U-38727, U-46484, U-61048, and U-61049 are held by C.O.P. Coal Development Co. Fee Surface Area and Fee and Federal Coal Rights are leased by Co-Op Mining Company from C.O.P. Coal Development Co. (See letter from C.O.P. Coal Development Company, Appendix 2-A). Following is a description of the Permit Area.

Permit Area

- |    |                |                |  |                                  |
|----|----------------|----------------|--|----------------------------------|
| A. | T16S, R7E SLBM | Sec.           | 14 S1/2  |                                  |
|    |                | Sec.           | 23 E1/2, E1/2 W1/2   |                                  |
|    |                | Sec.           | 24 W1/2, W1/2 E1/2   |                                  |
|    |                | Sec.           | 25 NW1/4 NW1/4, E1/2 NW1/4, SW1/4 SW1/4,<br>E1/2 SW1/4   |                                  |
|    |                | Sec.           | 26 NE1/4 NE1/4, NW1/4 NE1/4, N1/2 SW1/4<br>NE1/4 and the access/haul road and topsoil<br>storage area as shown on Plate 2-1. |                                  |
| B. | T16S, R7E SLBM | Sec.           | 13 W 1/4   |                                  |
|    |                | Sec.           | 14 NE 1/4  |                                  |
|    |                | Sec.           | 24 E1/2 E1/2   |                                  |
|    | T16S, R8E SLBM | Sec.           | 19 S1/2 NW1/4, SW1/4, SW1/4 SE1/4  |                                  |
| C. | T16S, R7E SLBM | Sec.           | 25 SW1/4 NW1/4, NW1/4 SW1/4  |                                  |
| D. | T16S, R7E SLBM | Sec.           | 25 E1/2  |                                  |
|    |                | T16S, R8E SLBM | Sec.   | 30 W1/2, W1/2 NE1/4, NW1/4 SE1/4 |
|    |                |                | Sec.   | 31 NE1/4 NW1/4, NW1/4 NE1/4      |

Note: Letter corresponds with ownership shown in Table 1-3.

**115.200 Claim of exemption as described in R645-301-333**

No exemption claimed

**115.300 Information regarding owners of nearby buildings**

Waiver letters from the occupants of dwellings located within 300 feet of the coal mining operations are found in Appendix 1-F. The dwelling nearest to the underground workings is the hunting cabin. Pictures of the dwelling were taken in 2004 for the pre-blast survey and are stored at the mine site.

**R645-301-116 Permit Term**

**116.100 Starting and termination dates and the anticipated number of acres to be affected during each phase of mining over the life of the mine.**

The mine started construction in 1981 and was in production by late fall of 1981.

Termination dates anticipated for each phase of mining are nebulous at this time although a detailed estimate of production and reserves are included in the Geology Section and a projection of 33 years appears realistic (from 1990). The final termination date for the mining operation is expected to be 2012.

The actual surface acreage disturbed by the mine operation is identified in Table 1-4 and R645-301-222.300, and R645-301-240. Plate 1-1 shows the permit area and Plates 5-2 show the surface facilities and disturbed area.

**Appendix 1A**  
**Violation Information**

**Bear Canyon Permit # C/015/025**

Below is a list of violations received for the above referenced permit number in the previous three years as of 2/14/06

**N-04-46-1-1**

The violation was issued 4/26/04 because ditches and culverts did not meet their design capacity. Rocks and sediment were removed from the ditches and culverts to restore them to their design capacity.

**N-04-46-2-2**

The violation was issued 6/29/04 because the mine refuse from the rock tunnels was being stored in sediment pond D causing it to not have the required storage capacity. The material was moved to the appropriate storage site to abate the violation.

**N-05-46-1-1**

The violation was issued 4/15/05 because the operator was two weeks late in submitting the fourth quarter water monitoring data for monitoring points SBC-9a, SBC-11, MH-1, and all of the NPDES outfall sites. The sites were all no flow. The amendment was abated by submitting the required information.

**N-06-46-1-1**

The violation was issued 2/1/06 because the operator failed to collect baseline waster monitoring data in August of 2005. The violation will be abated by collecting the baseline samples in August of 2006.

**C.O.P. COAL DEVELOPMENT COMPANY**  
**53 West Angelo Avenue**  
**Salt Lake City, Utah 84115**

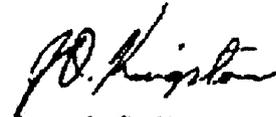
January 21, 2001

State of Utah  
Division of Oil, Gas and Mining  
355 West North Temple  
3 Trad Center, Suite 350  
Salt Lake City, Utah 84180-1203

Gentlemen:

Please be advised that C.O.P. Coal Development Company is the record owner of the fee ground and Federal Coal lease #'s 020668, 024316, 024318, 38727, 46484, and 61049, located in Bear Canyon, Emery County, Utah, which includes all of the real property involved in Permit No. Act/015/025. C.O.P. is currently leasing all of the property to Co-op Mining Company and the lease permits Co-op to use the land for coal mining and related activities. This lease agreement will automatically be extended without amendment unless either party gives 30 days written notice of cancellation.

Very truly yours,



Joseph O. Kingston, President  
C.O.P. Coal Development Company

JOK/lm

**AFFIDAVIT OF PUBLICATION**

STATE OF UTAH)

ss.

County of Emery,)

I, Ken Larson, on oath, say that I am the Publisher of the Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) consecutive issues, and that the first publication was on the 20th day of September, 2005 and that the last publication of such notice was in the issue of such newspaper dated the 11th day of October, 2005.

*Ken G. Larson*

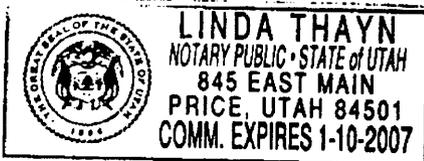
Ken G Larson - Publisher

Subscribed and sworn to before me this 11th day of October, 2005.

*Linda Thayne*

Notary Public My commission expires January 10, 2007 Residing at Price, Utah

Publication fee, \$ 214.56



**NOTICE**

Co-Op Mining Company, P. O. Box 1245, Huntington, Utah, 84528 hereby announces its intent to renew its coal mine and reclamation permit for coal mining activities at the Bear Canyon Mine, Permit No. C/D15/695, issued Nov. 1, 1985. The Bear Canyon Mine is located in Bear Canyon, approximately 12 road miles west of Huntington, Utah. The permit area, found on the USGS Hiawatha Quadrangle map, is described as follows:

- 6S R7E Sec 13: W1/4
- Sec 14: S1/2, NE1/4
- Sec 23: E1/2, E1/2W1/2
- Sec 24: all except the NE1/4NE1/4
- Sec 25: All
- Sec 26: N1/2NE1/4, N1/2SW1/4NE1/4 and the access/haul road as shown on Plate 2-1 of the Bear Canyon Mining and Reclamation Plan.
- T16S R8E Section 19: S1/2NW1/4, SW1/4, SW1/4SE1/4
- Section 30: W1/2, W1/2NE1/4, NW1/4SE1/4
- Section 31: NE1/4NW1/4, NW1/4NE1/4

Written comments, objections, or requests for informal conference should be directed to the Utah Division of Oil, Gas, & Mining, P. O. Box 145801, Salt Lake City, Utah, 84114-5801. Copies of the of the renewal application are available for public inspection at the office of the Utah Division of Oil, Gas & Mining, Salt Lake City, and at the Emery County Recorders office, Emery County Courthouse, Castle Dale, Utah, 84513.  
Published in the Emery County Progress September 20, 27, October 4 and 11, 2005.

**AFFIDAVIT OF PUBLICATION**

STATE OF UTAH)

ss.

County of Emery,)

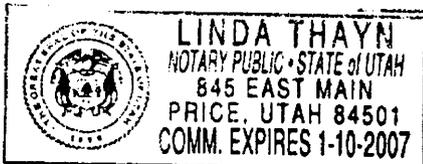
I, Richard Shaw, on oath, say that I am the General Manager of the Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) consecutive issues, and that the first publication was on the 18th day of October, 2005 and that the last publication of such notice was in the issue of such newspaper dated the 8th day of November, 2005.

Richard Shaw - General Manager

Subscribed and sworn to before me this 8th day of November, 2005.

Notary Public My commission expires January 10, 2007 Residing at Price, Utah

Publication fee, \$ 238.40



**NOTICE**

Co-Op Mining Company, P. O. Box 1245, Huntington, Utah, 84528 hereby announces its intent to expand underground coal mining activities at the Bear Canyon Mine, Permit No. C/015/025, issued Nov. 1, 1985. The Bear Canyon Mine is located in Bear Canyon, approximately 12 road miles west of Huntington, Utah. The permit area addition will consist of 2,740.00 private acres and 4,764.36 federal acres within Federal Coal Leases U-024316, U-46484, U-61048, and U-61049. The expansion area can be found on the USGS Hiawatha Quadrangle map and is described as follows:

- T16S R7E Section 01: E1/2
- Section 10: All except the SW1/4SW1/4
- Section 11: All
- Section 12: All
- Section 13: E1/2, E1/2W1/2
- Section 14: E1/2NW1/4
- T16S R8E Section 06: S1/2NW1/4; SW1/4, S1/2SE1/4, W1/2N1/2SE1/4
- Section 07: All
- Section 08: W1/2, W1/2E1/2
- Section 16: All
- Section 17: All
- Section 18: All
- Section 19: N1/2NW1/4, NE1/4, N1/2SE1/4
- Section 20: N1/2, N1/2 SW1/4, NE1/4SE1/4
- Section 21: All except the SW1/4SW1/4

The area is shown on Plate 1-1 of the Mining and Reclamation Plan. Written comments, objections, or requests for informal conference should be directed to the Utah Division of Oil, Gas, & Mining, 1594 West, North Temple, Suite 1210, Salt Lake City, Utah, 84114-5801. Copies of the of the application and the current mining plan are available for public inspection at the office of the Utah Division of Oil, Gas & Mining, Salt Lake City, and at the Emery Court Recorder's office, Emery County Courthouse, Castle Dale, Utah, 84513. Published in the Emery County Progress October 18, 25, November 1 and 8, 2005.

Salt Lake City, Utah 84115

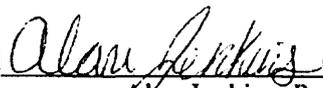
To Whom It May Concern:

C.O.P. Coal Development Company, as the owner of a dwelling within 300 feet of the mining and reclamation operations of Co-op Mining Company at Bear Canyon, Utah, which dwelling is occupied by Sportsmans, is aware of it's legal right to deny mining within 300 feet of the dwelling and has knowingly waived that right and consented to the mining and reclamation activities of Co-op Mining Company at Bear Canyon, Utah.

C.O.P. Coal Development Company

By   
Joseph O Kingston, President  
C.O.P. Coal Development Company

Sportsmans, As occupant of the dwelling above described, herby waives any right he may have to the mining and reclamation actives of Co-op Mining Company within 300 feet of said dwelling and expressly consents to the same.

Signed   
Alan Jenkins, President  
Sportsmans

## **VEGETATION**

### **SCOPE**

A reference area, approximately one acre in size was selected in July 1983, encompassing pinyon-juniper-grass and riparian vegetation types (Plate 3-1). The reference area was selected on the basis of similarity with vegetation types which were believed to have occurred within the disturbed area before mining. This was done in conjunction with Mr. Lynn Kunzler of the Utah Division of Oil, Gas and Mining (DOG M). Further discussion with D.O.G.M has determined that there are better reference areas nearer to the mine site, therefore this area will no longer be used as a reference area.

In 1993, reference areas were selected for the Shower House Pad disturbance and the Tank Seam Access Road disturbance. The areas were selected in conjunction with Susan White of the D.O.G.M. These areas are also shown on Plate 3-1. The Shower House Pad reference area will also be used for the shop, sediment pond A, scale house, and coal storage areas. The tank Seam Access Road reference area will also be used for the mine access road.

In 1996, a reference area was selected by Patrick Collins for the proposed Wild Horse Ridge disturbance. In 2001 he selected an area for the Wild Horse Ridge Tank Seam Pad area. This area is shown on Plate 3-1.

### **METHODOLOGY**

A reconnaissance-type survey was conducted within each vegetation type believed to have been disturbed, then correlated to reference areas in undisturbed areas. Quantitative sampling was conducted by Larry Germain and Paige Waldvogel, under contract with Mel Coonrod in August 1983. Additional species composition information was compiled in 1982 by the Soil Conservation Service (SCS). Specific efforts were made to locate and identify species proposed or listed as threatened or endangered, noxious weeds and selenium indicators.

A summary of the reference areas are presented in Table 3-2.

Table 3-2 Vegetation Reference Areas

<u>Reference Areas</u>	<u>Reference Type</u>
Shower House Pad	Grass-Pinyon-Shrub
Tank Seam Access Road Reference Area	Pinyon-Juniper-Grass-Mt. Mahogany
Wild Horse Ridge Reference Area	Pinyon-Grass-Conifer
Wild Horse Ridge Tank Seam Area	Grass-Conifer-Mt Mahogany

**321.200 Productivity of Land**

See R645-301-321-100

In order to eliminate the potential of coal fines migrating to surface waters, this area was added into the disturbed area boundary in 1992. Runoff will be directed to sediment ponds, see R645-301-742.300. Areas in Bear Canyon surrounding the mine site will be routinely monitored and additional preventative and/or control actions will be taken if additional affected areas are identified.

Waste dumping or other disturbance on undisturbed areas is not permitted. Disturbed area perimeter markers delineate the boundaries of disturbance. Employees are trained not to dump or otherwise disturb areas outside those boundaries.

Renewable vegetative resources exist within the wild Horse Ridge subsidence zone in the form of timber and grasslands which are used for grazing. As discussed in Appendix 3-C, minimal detectable subsidence is expected on the surface. Past experience has shown that tension fractures which result from subsidence are localized and minimal, so these resources should not be impacted. Further discussion is contained in Appendix 3-C.

#### **Mitigating Measures to be Employed to Reduce Impacts on Vegetative Resources**

All recontoured areas will be planted and revegetated during the first appropriate season following grading and redistribution of topsoil. This program will include any necessary addition of remedial treatments to the soil. A suitable, permanent and diverse vegetative cover has been selected on the basis of appropriate land management agency requirements and will be established on all reclaimed areas. The schedule of the program is presented in R645-301-

Appendix 3-L

Wildlife Survey Information

This information was relocated to the confidential binder on 9/18/05.

Confidential files are located at the Division of Oil Gas and Mining 1594 West, North Temple, SLC, Utah.

However, in the event that C. W. Mining is in a position to permit new facilities on disturbed ground, it has committed to a thorough Paleo-Archo Survey prior to any new disturbances. Also, should any evidence of Pale-Archo finds be discovered in the course of present construction, the site will be roped off and construction halted until the Historical Division is contacted. However, a survey was conducted the summer of 1984 and 1990 for those areas which may be adversely impacted by subsidence. This information was submitted as Appendix 4-A. Appendix 4-B contains the results of a survey of the Wild Horse Ridge Area which was conducted in 1982. Appendix 4-C contains the results of a survey of the Wild Horse Ridge Tank Seam Area conducted in 2001.

At the request of the U.S. Forest, an additional thorough literature search will be conducted for any cultural resources within those areas that may be adversely impacted by subsidence. Co-Op Mining Company commits to conducting this literature search prior to any retreat mining within the Wild Horse Ridge area.

Application of the National Register Criteria of Eligibility, as defined under 36 CFR 60.6, indicates that there is one site (Site 42 EM 1572) within the permit area which would be considered a candidate.

#### **411.141 Cultural and Historic Resources Maps**

These maps are located inside the reports on the specific areas.

#### **411.142 Cordination With State Historic Preservation Officer**

During the permitting of the Bear Canyon Mine, Co-Op counseled with the Utah Division of State Historical Preservation Office and agreed to an on-site survey. The survey was conducted by John A. Senulis, an approved archaeologist (Senco-Phenix). The survey and results are included as Appendix 4-A. Co-Op is committed to take all necessary steps to protect any sites deemed necessary in the event any are located. Mr. Senulis also conducted a survey of the Federal Lease U-024316. The results of this survey can also be found in Appendix 4-A. Two surveys of the Wild Horse Ridge area have been conducted. The first was a survey by Kenneth Juell of the University of Utah Archaeological Center in 1982. This survey covered drill sites and access roads both on top of the ridges and in the canyon.

According to Beaver Creek Coal Company, the survey revealed (Site 42 EM 1572) and a single other historic resource. The historic resource (42 EM 1572) was excavated by Nielson & Schleisman in July, 1982. The report of the excavation is included in Appendix 4-B. The other historic resource was found on the ridge while moving from one sample section to another. It was not considered significant or diagnostic.

Appendix 4-A

PALEO-ARCHEOLOGICAL SURVEY

This information was relocated to the confidential binder on 9/18/05.

Confidential files are located at the Division of Oil Gas and Mining 1594 West, North Temple, SLC, Utah.

Appendix 4-B

WHR Resource Survey

This information was relocated to the confidential binder on 9/18/05.

Confidential files are located at the Division of Oil Gas and Mining 1594 West, North Temple, SLC, Utah.

Appendix 4-E

Wild Horse Ridge Tank Seam Resource Survey

This information was relocated to the confidential binder on 9/18/05.

Confidential files are located at the Division of Oil Gas and Mining 1594 West, North Temple, SLC, Utah.

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**Table 5-1 Coal Reserves - Bear Canyon Mine Error! Bookmark not defined.**

Reserve Area	Seam	Coal Reserves (tons)	
		In-Place	Recoverable
Federal Lease (U-024318)	Blind Canyon*	65,363	12,600
	Hiawatha	<u>0</u>	<u>0</u>
	SUBTOTAL	65,363	12,600
(U-024316)	Tank	566,938	283,469
	Blind Canyon	953,566	476,783
	Hiawatha	<u>1,418,178</u>	<u>709,089</u>
	SUBTOTAL	2,938,682	1,468,341
(U-020668)	Tank	448,312	224,156
	Blind Canyon	<u>3,185,699</u>	<u>1,592,850</u>
	SUBTOTAL	3,634,011	1,817,006
(U-38727)	Tank	4,555,325	2,227,662
	Blind Canyon	<u>4,107,041</u>	<u>1,779,413</u>
	SUBTOTAL	8,662,366	4,057,075
Fee Land	Tank	10,661,353	5,330,676
	Blind Canyon	11,244,672	6,635,323
	Hiawatha	<u>12,077,662</u>	<u>6,038,831</u>
	SUBTOTAL	34,815,735	18,839,878
Total Area	Tank	13,002,613	6,501,306
	Blind Canyon	16,570,802	7,991,213
	Hiawatha	2,568,465	1,284,232
TOTAL		32,141,880	15,776,751

- NOTES:
1. Reserves based on latest projections (5/16/01) submitted to the B.L.M. in the L.M.U. Lease Modification Amendment.
  2. Current permit application will allow for mining of Lease U-024316 in the Tank Seam only until additional hydrologic and geologic information can be obtained.

\* Blind Canyon Seam reserves mined out in 1984-1985.

**Protection of Natural Surface Structures & Streams Error! Bookmark not defined.**

C. W. Mining's will maintain a min of 200 ft barrier pillars to outcrops where required by lease stipulations, or protection of streams and wildlife to minimize the possibility of escarpment failure and resulting detrimental impacts to down stream water quality or nesting raptor. Submains under these areas in Bear Canyon will be left unless otherwise approved. No retreat mining will take place under these areas, which are outside of the potential subsidence zones shown on Plate 5-3. The only stream channel which lies over the minable portion of the permit area is Bear Creek, where it flows through Federal Lease U-024316. See Appendix 5-C for an explanation of the protection zone delineation. Adequate barrier zones will be left to protect adjacent stream channels, such as Bear Creek. Downstream channels are protected from disturbed area runoff contamination by utilization of sediment ponds. Temporary sediment controls i.e.; silt fences, straw bail dikes, etc. will be installed and vegetation will be reestablished as required in the event of impacts by escarpment failure.

**542.600 Roads**

See R645-301-240.

**542.700 Final Abandonment of Mine Openings and Disposal Areas**

See R645-301-529 and R645-301-738.

**542.800 Reclamation Costs**

See R645-301-830.100 and R645-301-830.300

**R645-301-550 Reclamation Design Criteria and Plans**

**R645-301-551 Casing and Sealing of Underground Openings**

The Bear Canyon Mine complex has eight existing portals.

The Bear Canyon #3 and #4 mines have a total of six portals (Plate 5-1A and 5-1C), all located in Bear Canyon. The #4 Mine has an auxiliary portal described in Appendix 5P.

All portals will be reclaimed as described in sections R645-301-529, and R645-301-738.

**R645-301-552 Permanent Features**

No response required.

## **SUBSIDENCE CONTROL AND MONITORING PLAN**

### **SUBSIDENCE**

Subsidence can normally be expected to occur over areas where second mining has taken place (pillaring). See R645-301-523 for mining operation. Based on the geologic interruptions within a mine, subsidence becomes very difficult to predict, due to the variable nature of the mining panels. However, Figure 5G-1 will give an estimate of the maximum subsidence that may be expected in mine studied in the Western U.S. Maximum subsidence for an average panel in the Bear Canyon Mine has been estimated from Figure 5C-1, using the criteria shown in Table 5C-1. Subsidence has been estimated based on the number of seams mined in the area.

Past experience in this area shows no indication that subsidence would be this drastic. No actual subsidence has been noted from areas pillared as much as 40 years ago, and the subsidence monitoring network initiated in 1987, has shown only minor (0.47 ft max 1992) variations in elevation. Based on this, little, if any, detectable subsidence is expected to become apparent when mining under these depths. Some minor fracturing and an escarpment rock fall have been noted in the adjacent Trail Canyon Mine area, and although these are assumed to be mine-related, they occurred in areas of relatively low cover and unknown outcrop protection. Only minor fracturing has been noted in relation to the Bear Canyon Mine (see Plate 5-3).

## **Blast Design**

The following blast design pertains to blasting within 1,000 feet of any building used as a dwelling, public building, school, church, or community or institutional building outside the permit area, or within 500 feet of an active or abandoned underground mine. Approval will be obtained from MSHA prior to conducting blasting within 500 feet of an active underground mine. There are no underground mines within 500 feet of the Wild horse Ridge potential blasting areas. This design describes the use of blasting to break large rocks encountered during construction. This design will be used in the construction of the Wild Horse Ridge conveyor access roads in the event rocks are encountered which are too large for the equipment to move, or cutting into bedrock is required. A hunting cabin exists within the permit area approximately 750 feet from the nearest potential blasting zone for the Wild Horse Ridge areas. This building is not used as a dwelling, public building, school, church, or community or institutional building. No other buildings exist outside the permit area within 1,000 feet of the proposed Wild Horse Ridge roads and facilities.

Two types of blasting are anticipated during normal operation and construction, special one time blasting designs will be included as attachments. The first is a situation where large rocks will require breaking up to move. The second type is bench blasting in areas where bedrock is encountered which must be cut into. In both cases, holes to be used will be 1½" diameter, 4' deep and will be spaced 4' apart. Figure 5E-1 shows the typical pattern and the layout for the bench holes. To break up rocks, holes will be drilled into the rock at an adequate depth to fracture the rock, not to exceed 4'. Holes will be spaced approximately 4' apart.

The explosive to be used is Irecoal D 378 permissible explosive, an explosive which uses a non-nitroglycerin base gel dynamite. This explosive is specifically designed for use in drillhole patterns, especially when shooting off solid. Ireco electric 25 ms delay detonators will be used to delay the holes in a pattern which will contain the shot within the cut area created by the previous shot. 1.3 pounds of explosive per each hole will be used, providing a powder factor of 1.2. The following standards will be maintained for all blasts.

Airblast Limits and Ground Vibration (R645-301-524.600). Airblast and ground vibration limits at the location of any building structure outside the permit area will not exceed those outlined in R645-301-524.621 and R645-301-524.642. In an effort to minimize airblast and fly rock, a satchel-type explosive and mud-packing will not be used.

#### **Pre-Blast Survey**

Since each blast will not exceed 5 pounds of explosive weight, the requirements of a pre-blast survey are not applicable to the blasting plan. During the construction of the #4 Mine portals blasting will exceed 5 pounds, this is described in attachment A.

**ATTACHMENT A**  
**#4 MINE ROCK TUNNELS**

This attachment has been included to address the blasting that will occur during the development of the WHR #4 mine portals. All blasting procedures outlined in Appendix 3M will be followed except for the changes that have been outlined below.

### **Blast Design**

Holes will be drilled 10 feet deep. Figures 1,2, and 3 show the typical patterns and the layout for the holes. Eight 0.78lb 1 1/4" diameter by 12" long sticks will be placed in each hole. The explosive to be used is Irecojel B permissible explosive, an explosive which uses a non-nitroglycerin base gel dynamite. Coaldet, Millidet or equivalent electric millisecond delay detonators will be used to delay the holes in the patterns shown. A scorpion HCCR (MSHA LCBU-1) shot firing unit will be used to initiate the detonators.

### **Pre-Blast Survey**

Only two dwellings are located within one-half mile of the blast area. One is the Hunting Cabin owned by Sportsmans and a residential home owned by Kenny Defa the mine superintendent. Both owners have been notified in writing of the blast. A pre-blast survey of both buildings has been conducted and his held on file at the mine site.

### **Blasting Schedule**

Blasting will be conducted between sunrise and sunset. Blasting will generally take place Monday thru Friday, but may include Saturday and Sunday if needed. A detailed time table will be given to local governments, and residents within one-half mile, and will also be published in the local newspaper at least ten days before blasting begins. If the schedule changes, local governments, residents, and the local paper will be notified. The blasting schedule will contain all information required under R645-301-524.460.

I hereby certify that this blasting plan as been prepared under my supervision in accordance with R645-301-524.

  
Signature of Certified Blaster

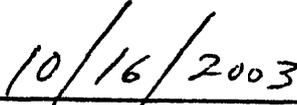
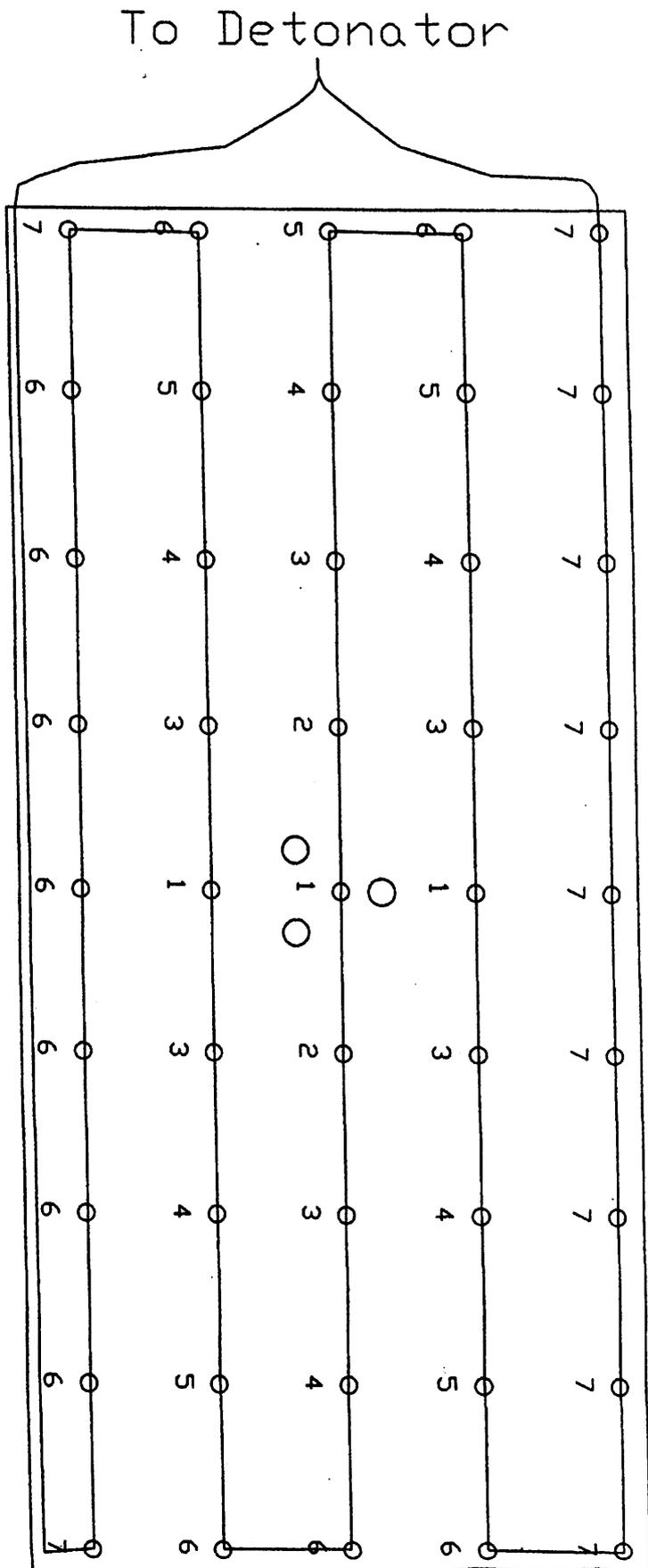
  
Date

Figure 1



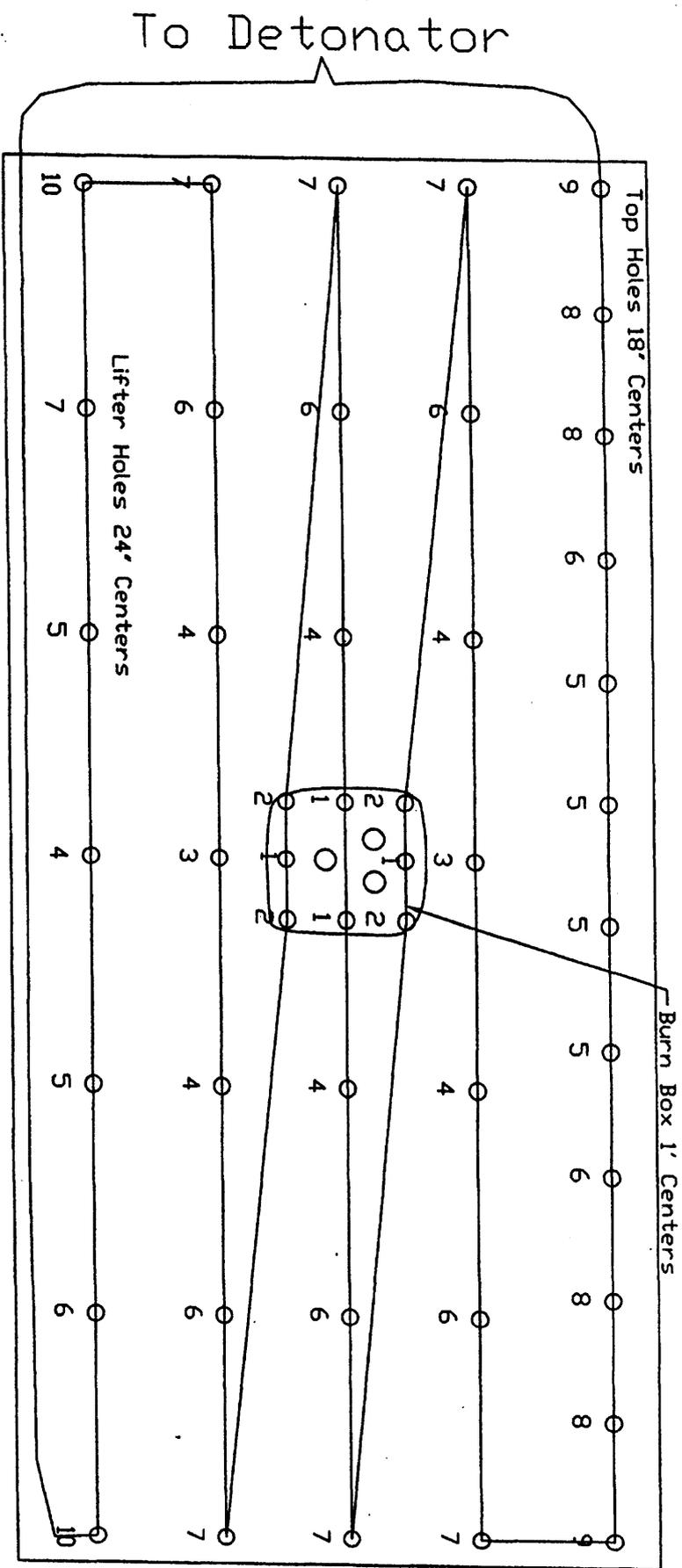
Delay pattern may vary based on conditions  
Minimum spacing in coal 2.4"  
Minimum spacing in rock 18"

5E-10

10/13/03

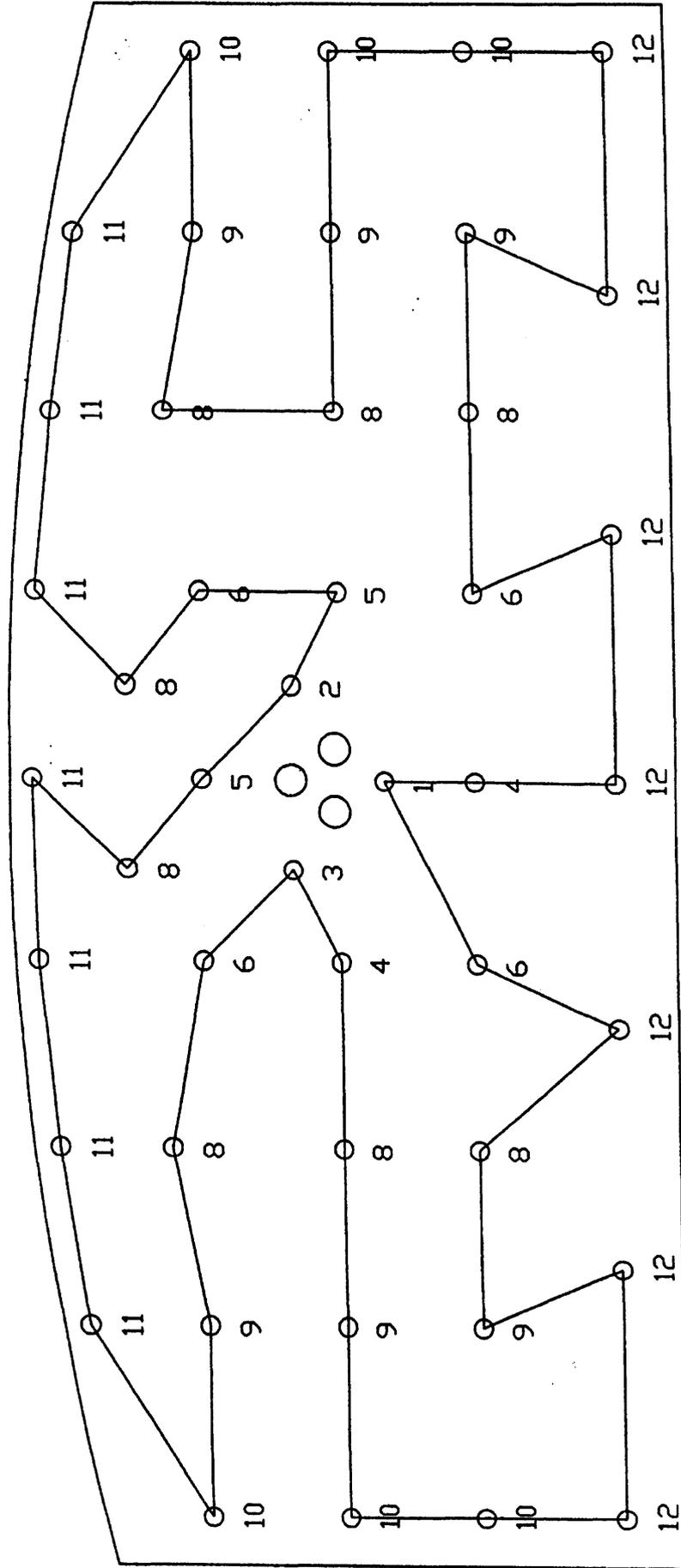
B.C.

Figure 2



Delay pattern may vary based on conditions  
 Minimum spacing in coal 2.4"  
 Minimum spacing in rock 18"

Figure 3



B.C.

5E-12

Delay pattern may vary based on conditions  
 Minimum spacing in coal 2.4"  
 Minimum spacing in rock 18"

10/12/73

Final crowning of the road and installation of permanent ditches will be completed following initial road and pad contouring. The approximate road and pad contours are shown on Plates 5-2.

A slope stability analysis of the cut slopes and fill areas, as well as some discussion on the construction methodology, is on page 5G-44 following the cross sections.

Upon completion of regarding activities, interim stabilization of the cut slopes will be accomplished through hydroseeding as described in R645-301-331. Cut slopes will be seeded using the seed mix and mulch described in Tables 3-3 and 3-4. Downslopes will be seeded by hand prior to the placement of erosion control matting using the permanent seed mix shown in Table 3-3. This seed mix will be used in order to establish shrubs as well as grasses to aid in interim stability.

The final as-built cut and fill material volumes are shown in Table 5G-2 on pg. 5G-71.

During reclamation 1,000 yds<sup>3</sup> of material was hauled from TS-15 as described on page 5J-13. Because of this 1,000 yds<sup>3</sup> of material will be left in TS-8 for use in reclamation in that area.

### **TS-5 Tipple and Load-out Area**

The tipple and load-out area will be reclaimed to match the contours shown on Plate 5-6C, although actual contours may vary somewhat to account for required cut volumes and onsite concrete disposal. The excess coal waste will be used as fill in this area and will be buried a minimum of 4' deep, with a minimum of 12" of substitute topsoil material applied on the surface. In sections 3+00 through 8+00 the existing road on the east side will be left in place for post mining access as shown on Plate 5-6C. Where no re-grading is required, and in areas where the cut leaves at least 12" of substitute topsoil material, the area will be ripped and existing substitute topsoil material will be used in place. 15,428 cu. yd of material can be generated in TS-5 for use in TS-7 and TS-8, which exceeds the volume needed as shown in Table 5I-1. 1,000 yds<sup>3</sup> of this material will go to TS-17 as described on page 5K-7.

The west slope of the tipple area, shown in cross-section 9+00, will be filled to cover the coal waste which exists in the area. Soil and substitute topsoil from the coal storage pad will then be placed over the coal waste as shown in cross-section 9+00. The slope below the tipple pad will consist of removing coal waste material and replacing it with substitute topsoil material. Although the removing and replacing results in a minimal change in the cross-section and contours, the volumes in Table 5I-4 reflect the removal and replacement of this material.

A summary of the cut and fill volumes is shown in Table 5I-4.

### TS-8 Upper Storage Pad

TS-8 will be reclaimed as shown on the following cross-sections. The soil labeled as Tank Seam Access Road fill material was not included in the calculations since it will be used while reclaiming the Tank Seam Access Road (Appendix 5-G). 1,000 yds<sup>3</sup> of this material will remain in place as described on page 5G-10. A volume of 952 cu. yd. of fill material will come from TS-5 or TS-6. A summary of the cut and fill volumes is shown in Table 5I-7.

**Table 5I-7 - Area TS-8 Cut & Fill Summary**

Section	Fill (-) Volumes (cu. yd.)	Cut (+) Volumes (cu. yd.)			Volume Cumulative (cu. yd.)
	Total Fill Volume	Substitute Topsoil	Regular Soil	Total Cut Volume	
0+00	2,100	552	0	552	-574
1+00	1,300	1,463	7	1,470	-404
2+00	2,218	1,537	107	1,644	-1,952
<b>Totals</b>	<b>5,618</b>	<b>3,552</b>	<b>114</b>	<b>3,666</b>	

Figure 5J-3 shows the locations of cross-sections for the No. 3 Mine Portal Pad area. The construction sequence will start with the recovery of the topsoil located on the existing cut bench above the proposed pad area. Initial topsoil on the slopes will be recovered using a track hoe to reach approximately 15' below the bench. A pilot road cut will then be made using the track hoe, and the material will be pulled back onto the bench. As the pilot cut proceeds into the bottom of the canyon, the topsoil will be removed from the lower slopes wherever the track hoe can reach. This process will continue until the pilot cut reaches the drainage area where the pad fill is to be placed.

Once access into the drainage has been constructed, the crews will proceed to recover all of the topsoil, which will be hauled to the topsoil storage area shown on Plate 5-2F. An estimated volume of 5,143 cu yds of topsoil material will be recovered. After the topsoil has been removed, the fill will be placed as described in this Appendix. Table 5J-4 shows the calculated cut and fill volumes. The contours of the pad out slope may vary slightly to account for the shortage in cut volumes shown in the Table.

During construction 1,000 yds<sup>3</sup> of material was excavated and moved from TS-15 to TS-11 to allow for construction of the tunnel. Once construction was completed 1,000 yds<sup>3</sup> of material was hauled from TS-17 to backfill the tunnel in TS-15 and the material in TS-11 was left there for reclamation.

During reclamation, the cut and fill process will be reversed. The reclaimed slopes will be reconstructed to approximate original contour, with the exception that localized ridges between drainages will be varied slightly from the original contours. In addition, a portion of the cut slope, shown on Plate 5-6G, will remain in place due to slope stability requirements. This will provide additional material, which will be used to eliminate to the extent possible the bench cut which existed prior to mining. This variation is shown in portal area cross-sections 1+00, 2+00, and 3+00.

Final crowning of the road, laying of road base and installation of permanent ditches will be completed following the initial road contouring. The approximate road contours are shown on Plate 5-2G.

During reclamation, the cut and fill process described above will be reserved. The reclaimed slopes will be reconstructed to approximate original contour. Subsoil material will be compacted in a minimum of 12 inch lifts. A minimum 8" of topsoil will be placed un-compacted over the regarded area. Topsoil material will be pocked to aid in water retention and runoff control during vegetation establishment (See Appendix 7-K). The 1,000 cu. yds. used in TS-15 and any material used in TS-7 and TS-8 will be replaced by material from TS-5 during reclamation. All material moved will be sampled for toxicity according to table 5O-1

Most areas of the road will remain in place for post-mining access to a hunting cabin. These areas are shown on Plate 2-3G and are labeled "area not requiring recontouring or topsoil within the disturbed boundary". The remaining areas of the road will be completely removed and used for fill material during the cut and fill process and the pre-mining road will be restored as shown on the cross-sections in Attachment A. A more detailed description of the hunting cabin can be found on page 4-4 of the MRP. No culverts will be removed since they are needed for access to the hunting cabin.

During construction 1,000 cu. yds. Of material was hauled to TS-15 as described on page 5J-13. Any additional material generated due to miner variations will be hauled to TS-7 and TS-8 for reclamation in those areas.

**Appendix 5-P**

**#4 MINE AUXILIARY PORTAL**

#### **#4 Mine Auxiliary Portal**

This portal is located in the left fork of the right fork of Bear Canyon. It will primarily be used for water monitoring access to seeps and springs located in the area that are normally inaccessible during winter months. If needed in the future this portal could also be used for intake ventilation to facilitate adequate ventilation across the working faces. Although this is not one of the MSHA required escapeways, in the extremely unlikely event that miners are unable to use either the primary or secondary escapeway, they could be evacuated through this portal. Although C. W. Mining does not anticipate this occurring if it did miners would be transported from the portal opening by helicopter. Access to this portal from the outside is similar to access to the Blind Canyon Portal described in Appendix 3-I and this portal is also strongly supported by C. W. Mining safety personnel as well as M.S.H.A.

#### **Construction**

The construction and reclamation of this portal will be similar to the Blind Canyon portal just the the uses are similar. The portal will extend to a coal outcrop that is covered by soil ranging from 0 to 3 inches in depth. The portals will be 6 to 8 feet tall, 9 to 18 feet wide and will be supported by roof bolts which extend into the sandstone rock above the coal. Where necessary additional support will be used and may include matting, screens, cribs, timber, and metal canopies. The portal will be closed with a stopping which will prevent unauthorized access of people as well as large animals which could theoretically utilize the portal for denning. A "No Trespassing" sign will also be posted outside the portal.

The topsoil will be removed from the area by hand and placed in a pile next to the anticipated opening. It will then be transported to a dry location underground once the portal is established. Surface disturbance will be minimal due to the nature of a continuous mining machine pulling the material into the mine. Any soil material that is pulled into the mine will be placed in a dry area inside the mine and will be stored for reclamation. Any coal or waste material which might crumble and fall down the slope will be retrieved by hand to whatever degree is reasonable.

The drainage from above the portal is minimal due to the size of the impacted area and the fact that the portal opening will be on a natural crest causing the water to flow away from the portal. In the event that any water does flow down in to the portal a berm will be constructed by hand above the portal opening to facility the flow of water around the portal opening.

## **Reclamation**

Reclamation will be accomplished from within the mine similar to the Blind Canyon Portal. The topsoil material being stored in mine will be placed outside next to the portal opening. Fill material will then be hauled through the mine and backed filled to a depth of 25 feet using underground equipment such as skid loaders and scoops. A permanent cement seal will then be built in the portal. The topsoil will be spread with underground equipment as much as possible before the hole is completely sealed. After the portal is sealed the remaining topsoil work will be done by hand. For revegetation seeds and erosion control matting will be hauled in by hand and placed over the disturbed area.

Inter-Mountain Laboratories, Inc.

Soil Analysis Report

C.W. Mining Company  
Bear Canyon Mine  
P.O. Box 1245  
Huntington, UT 84528

1633 Terra Avenue  
Sheridan, WY 82801

Client Project ID: Bear Canyon Mine  
Date Received: 09/30/02

Set #0103S00365  
Report Date: 01/14/03

307 672 6053

Lab Id	Sample Id	pH		Saturation %	EC					SAR
		s.u.			@ 25°C mhos/cm	Calcium meq/L	Magnesium meq/L	Sodium meq/L	Potassium meq/L	
0103S00365	RFM-1 Floor	8.3		28.6	1.64	3.36	10.4	4.01	0.57	1.53
0103S00366	RFM-1 Coal	3.7		73.1	1.27	1.47	3.67	4.81	0.31	3.00
0103S00367	RFM-1 Ceiling	8.2		27.4	2.39	4.55	17.8	6.29	0.89	1.88
0103S00368	Sed Pond A	8.3		39.0	3.15	14.9	14.9	6.71	0.52	1.74

These results only apply to the samples tested.

Abbreviations for extractants: PE = Saturated Paste Extract, H2O:Sol = water soluble, AB-DTPA = Ammonium Bicarbonate-DTPA, AAO = Acid Ammonium Oxalate  
Abbreviations used in acid base accounting: T.S. = Total Sulfur, AB = Acid Base, ABP = Acid Base Potential, Pys = Pyritic Sulfur, Pyr+Org = Pyritic Sulfur + Organic Sulfur, Neur. Pot. = Neutralization Potential  
Miscellaneous Abbreviations: SAR = Sodium Adsorption Ratio, CEC = Cation Exchange Capacity, ESP = Exchangeable Sodium Percentage

Reviewed By:

Joey Srealey, Soils Lab Supervisor

Inter-Mountain Laboratories, Inc.

1633 Terra Avenue  
 Sheridan, WY 82801

01/13/03

Page 2 of 3

Client Project ID: Bear Canyon Mine  
 Date Received: 09/30/02

Soil Analysis Report  
 C.W. Mining Company  
 Bear Canyon Mine  
 P.O. Box 1245  
 Huntington, UT 84528

Set #0103S00365  
 Report Date: 01/14/03

307 672 6053

Lab ID	Sample ID	Very Fine					CO3	Organic Matter	Alkalinity PE
		Sand %	Sand %	Silt %	Clay %	Texture			
0103S00365	RFM-1 Floor	18.9	74.0	18.0	8.0	SANDY LOAM	45.8	0.2	2.20
0103S00366	RFM-1 Coal	<0.1	92.0	6.0	2.0	SAND	<0.5	32.3	8.56
0103S00367	RFM-1 Ceiling	8.0	54.0	32.0	14.0	SANDY LOAM	66.9	0.2	1.40
0103S00368	Sed Pond A	13.2	78.0	14.0	10.0	SANDY LOAM	12.8	1.1	0.80

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OStd= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate  
 Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut Pot= Neutralization Potential  
 Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By:

Joey Sheeley, Soils Lab Supervisor

Inter-Mountain Laboratories, Inc

1633 Terra Avenue  
Shenandoah, WV 262801

01/13/03

Soil Analysis Report  
C.W. Mining Company  
Bear Canyon Mine  
P.O. Box 1245  
Huntington, UT 84528

Page 3 of 3

Client Project ID: Bear Canyon Mine  
Date Received: 09/30/02

Set #0103S00365  
Report Date: 01/14/03

307 672 6053

Lab Id	Sample Id	TOC %	Total Sulfur %	Neutral Pot. V/1000l	Boron PE ppm	Nitrogen Nitrate meq/L	Phosphorus mg/kg	Selenium ppm
0103S00365	RFM-1 Floor	0.1	<0.01	470	0.17	0.66	2.00	<0.02
0103S00366	RFM-1 Coal	18.8	0.44	-2.56	10.6	12.3	4.90	<0.02
0103S00367	RFM-1 Ceiling	0.1	<0.01	691	0.52	0.92	1.70	<0.02
0103S00368	Sed Pond A	0.6	0.29	127	0.86	0.69	3.60	<0.02

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate  
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABF= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential  
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By:

Joey Sheeley, Soils Lab Supervisor

within the coal itself. As discussed in the PHC, the estimated volume of water removed in this manner is 22 acre-feet per year.

The affects of subsidence in the permit area, on regional or local groundwater flow, are expected to be minor and of short duration. Localized diversions or interceptions of short duration only are expected due to the plastic flow of shaley units and to both development and tightening of existing fractures which occur due to unbalanced compressive-tensile forces associated with subsidence. The reclamation plan proposes to control post-mining subsidence which is expected to be a maximum of 5.5 feet assuming all three seams are mined, with no subsidence to occur in a varying 100 to 200 ft wide corridor from outcrop areas and permit boundary areas, as well as under escarpments.

In the portion of Federal Lease U-024316 to be permitted, mining will take place in the Tank Seam only, which will limit any subsidence to a maximum of 1.9 feet. In the event mining reaches far enough North to mine at an elevation below Bear Creek, an adequate barrier will be left to completely prevent any impact on Bear Creek. This barrier is shown on Plate 5-3 and described in Appendix 5-C.

### **Quality**

The potential impacts to water quality include contamination of water due to rock dust usage, abandoned equipment, the usage of hydrocarbons, and contamination from road salting. These potential water quality impacts are discussed in detail in Appendix 7-J, Section 9.0 (PHC) and Appendix 7-P.

Rock dust which is used for the suppression of coal dust may potentially impact the groundwater flowing through the mine by the dissolution of the rock dust constituents into the water. This could result in increase concentrations of TDS or sulfates. Gypsum rock dust has been known to result in high TDS concentrations; therefore Co-Op has implemented the use of limestone rock dust. Mine water discharged into Bear Creek is monitored for TDS, as well as the in-mine water monitoring wells, to ensure increased concentrations do not result for the mining activities.

Hydrocarbons (in the form of fuels, greases, and oils) are stored and used on-site for the mining equipment. Spillage of these materials could potentially contaminate the groundwater in the permit area. Section 9.0 of the PHC (Appendix 7-J) discusses in detail the program, which C. W. Mining has implemented to prevent contamination of the groundwater from these sources. Road salting is also discussed. Abandoned equipment is discussed in Appendix 7-Q.

### **Mitigation and Control Plans**

No treatment of groundwater occurrence or other control measures in the present mine have been required. Interference of the groundwater regime has consisted of interception of local perched zones within the Blackhawk formation, with the significant portion of the flow coming from a sandstone channel located at the North end of the Blind Canyon Seam workings.

No treatment of groundwater occurrence or other control measures have been required or are expected to be required for the permit area. See the discussion on potential impacts in Appendix 7-J.

Springs below the mine will be sampled to determine discharge and water quality parameters and their possible variation with time. These springs include SBC-14, Big Bear Springs, COP Development Springs, and Birch Springs (Plate 7-4). Periodic checks will be made of the mine area to determine any impact not currently expressed at the surface. This data will be used to estimate seasonal fluctuations, aquifer recharge and consistent long-term changes and to ensure that no impacts occur. Springs above the mine will be monitored for field parameters, since the potential for impact to these springs is quantity rather than quality. SBC-9A and SBC-4 will be monitored for lead quality.

Groundwater monitoring will follow the ground water sampling guidelines as shown in Table 7-12 using the water quality parameter list in Table 7-13. These tables follow the recommendations presented in Appendix 7-J. New significant occurrences within the present permit area will be promptly included in the sampling program, as specified by state requirements. Operational ground water monitoring will continue through reclamation to Bond Release.

The sampling matrix for each of the existing monitoring stations during the operational phase of mining is included in Table 7-14. No baseline data is available for SBC-17, but will be collected in 2000 and 2001, prior to mining occurring within the vicinity of this spring. Baseline samples will be collected for SBC-14, SBC-15, SBC-16, MW-114 and MW-117 in 2001.

Table 7-13 Ground Water Quality Parameter List

Field Measurements:

- \* - Water Levels or Flow
- \* - pH
- \* - Specific Conductivity (umhos/cm)
- \* - Temperature (C)

Laboratory Measurements: (mg/l) (Major, minor ions and trace elements are to be analyzed in dissolved form only.)

- \* - Total Dissolved Solids
- \* - Total Hardness (as CaCO<sub>3</sub>)
- Aluminum (Al)
- Arsenic (As)
- \* - Carbonate (CO<sub>3</sub><sup>-2</sup>)
- \* - Cation-anion balance
- Boron (B)
- \* - Bicarbonate (HCO<sub>3</sub><sup>-</sup>)
- Cadmium (Cd)
- \* - Calcium (Ca)
- \* - Chloride (Cl<sup>-</sup>)
- Copper (Cu)
- \* - Iron (Fe) (Total and Dissolved)
- † - Lead (Pb)
- \* - Magnesium (Mg)
- \* - Manganese (Mn) (Total and Dissolved)
- Molybdenum (Mo)
- Nitrogen: Ammonia (NH<sub>3</sub>)
- Nitrite (NO<sub>2</sub><sup>-</sup>)
- Nitrate (NO<sub>3</sub><sup>-</sup>)
- \* - Potassium (K)
- Phosphate (PO<sub>4</sub><sup>-3</sup>)
- Selenium (Se)
- \* - Sodium (Na)
- \* - Specific Conductivity (umhos/cm)
- \* - Sulfate (SO<sub>4</sub><sup>-2</sup>)
- Zinc (Zn)

---

Sampling Period:

- Baseline

\*Operational, Post-mining

†Quarterly for site SBC-9A and SBC-4

Table 7-14 Water Monitoring Matrix: Operational Phase of Mining

Location	Jan	Feb	Mar	Apr	May	June	July	Aug <sup>3</sup>	Sept	Oct	Nov	Dec
<b>Streams</b>												
BC-1 (Upper Bear Creek)		oper			oper	field	field	oper.	field	oper		
BC-2 (Lower Bear Creek)		oper			oper	field	field	oper.	field	oper		
BC-3 (Lower Rt Fork Bear Creek)		oper			oper	field	field	oper.	field	oper		
BC-4 (Upper Rt Fk. Bear Creek)		oper			oper.	field	field	oper.	field	oper		
MH-1 (McCadden Hollow Creek)					field <sup>5</sup>		field	field		field		
FC-1 (Left Fork Fish Creek)					field <sup>5</sup>		field	field		field		
<b>Springs</b>												
SBC-3 (Creek Well)		oper			oper			oper.		oper		
SBC-4 (Big Bear Springs) <sup>4</sup>		oper			oper			oper.		oper		
SBC-5 (Birch Spring) <sup>4</sup>		oper			oper.			oper.		oper		
SBC-9A (Hiawatha Seam portal)		oper			oper			oper		oper		
SBC-12 (16-7-13-1)					field. <sup>5</sup>		field	field		field		
SBC-14 (WHR-6)		oper			oper.			oper.		oper		
SBC-15 (WHR-5)					field <sup>5</sup>		field	field		field		
SBC-16 (WHR-4)					field <sup>5</sup>		field	field		field		
SBC-17 (16-7-24-4)		oper			oper.			oper.		oper		
SMH-1 (FBC-6)					field. <sup>5</sup>		field	field		field		
SMH-2 (FBC-5)					field <sup>5</sup>		field	field		field		
SMH-3 (FBC-13)					field. <sup>5</sup>		field	field		field		
SMH-4 (FBC-4)					field <sup>5</sup>		field	field		field		
<b>Wells</b>												
SDH-2 (Well, Sec. 11, T16S, R7E)					level <sup>5</sup>		level	level	level	level		
SDH-3 (Well, Sec. 10, T16S, R7E)					level <sup>5</sup>		level	level	level	level		
MW-114 (Well, Sec 18, T16S, R8E)					level <sup>5</sup>		level	level	level	level		
MW-117 (Well, Sec 12, T16S, R8E)					level <sup>5</sup>		level	level	level	level		

- Notes: 1. See Tables 7-13 and 7-17 for listing of water quality monitoring parameters.  
 2. oper. = operational base. = baseline  
 3. Baseline parameters taken in August of year 5 prior to each permit renewal.  
 4. SBC-4 and SBC-5 shall also be tested for oil and grease.  
 5. First sample to be taken in May or June, when Gentry Mountain is accessible.

Table 7-15 Past and existing monitoring sites

Site ID	Description	Status
Springs		
SBC-1	Under Ground Seep <sup>1</sup>	Dried up early 1988, and monitoring was discontinued.
SBC-2	Portal Well <sup>2</sup>	Dry from 1987. Caved in, lost (2) quarters and relocated in 1991.
SBC-3	Creek Well	Active
SBC-4	Huntington Spring	Active
SBC-5	Birch Spring	Active
SBC-6	COP Development Spring <sup>3</sup>	Dried up in 1987, with no flow through 2000. Monitoring discontinued in 2000.
SBC-12	Bear Creek Source (16-7-13-1)	Active
SBC-14	Right Fork Spring WHR-6	Active
SBC-15	Right Fork Spring WHR-5	Active
SBC-16	Fish Creek Spring WHR-4	Active
SBC-17	Upper Bear Spring 16-7-24-4	Active
SMH-1	MH Left Fork Spring (FBC-6)	Active
SMH-2	MH Water Trough (FBC-5)	Active
SMH-3	MH/Trail Ridge Spring (FBC-13)	Active
SMH-4	MH Right Fork Spring (FBC-4)	Active
In-Mine Sources		
SBC-7	Sump #1	Dried up and discontinued in 2000.
SBC-8	Sump #2	Dried up and discontinued in 2000.
SBC-9	Sump #3 <sup>46</sup>	Abandoned in 1999 due to retreat mining and replaced by SBC-13.
SBC-9A	Hiawatha Seam 1 <sup>st</sup> North	Activated in Oct. 2002 when a borehole was drilled up to the old SBC9 site. A pipe was laid from this site to the portal when the mine was sealed.
SBC-10	Sump #4	Flow first measured Dec. 1991. Monitoring initiated Jan. 1992. In July, 1995, retreat mining progressed passed this sump, making it inaccessible. Monitoring was discontinued in August 1995. Flows from this area have subsequently flowed through the pillared area and out of the 1 <sup>st</sup> East pillared section.
SBC-11	Hiawatha Seam 1 <sup>st</sup> North	Abandoned in April 2002 due to a roof fall. Water flows to SBC-9A
SBC-13	1 <sup>st</sup> East Pillared Section <sup>5</sup>	Abandoned in April 2002 due to retreat mining and replaced by SBC-9A
Wells		
DH-1A	2nd W. Monitor Well	Abandoned in 2001 due to retreat mining.
DH-2	3rd W. Monitor Well <sup>6</sup>	Abandoned in 1999 due to retreat mining.
DH-3	1st E. Monitor Well <sup>6</sup>	Abandoned in 1993 due to retreat mining and was replaced by DH-4.
DH-4	3rd W. Bleeder Monitor Well <sup>6</sup>	Abandoned in 1999 due to retreat mining.
SDH-2	Well, Sec. 11, T16S, R7E	Active
SDH-3	Well, Sec. 10, T16S, R7E	Active
MW-114	Wild Horse Ridge Monitor Well	Active
MW-117	Gentry Mtn. Monitor Well	Active

Table 7-24 Summary of Division Ditch Calculations (Cont)

Ditch	Bottom Width (Ft)	Top Width (Ft)	Depth (Ft)	Type Side Slope H:V	Measured Slope %	Contributing Watershed	REQ'D Av. Rip-Rap Size (In.)
D-17U	0	2	0.67	1.5:1	13 Av.	AU-1 <sup>a</sup>	Bedrock
D-18U	0	2	0.67	1.5:1	5 Min	AU-1	Soil
D-19U	0	2	0.67	1.5:1	6 Av.	AU-2B	Soil
D-20U	0	1.33	0.67	1:1	16 Av.	AU-42	Soil
D-21U	0	2	1.0	1:1	13 Av.	AU-43	D <sub>50</sub> =3"
D-22U	0	3	1.0	1.5:1	11 Av.	AU-19, AU-25	D <sub>50</sub> =6"
D-23U	0	1.16	0.58	1:1	19 Av.	AU-36	Soil
D-24U	0	1.16	0.58	1:1	14 Av.	AU-35	Soil
D-25U	0	1	0.5	1:1	16 Av.	AD-17	Soil
D-26U	0	1	0.5	1:1	24 Av.	AU-32	Soil
D-27U	0.50	2	0.5	1.5:1	13 Min, 30 Max	AU-31	Soil
D-28U	0	1	0.5	1:1	14 Av.	AU-33	Soil
D-29U	0	1.33	0.67	1:1	8 Av.	AU-34	Soil
D-30U	0	1.16	0.58	1:1	13 Av.	AU-25	Soil
D-31U	0	3	1.0	1.5:1	12 Av.	AU-20, AU-26	Bedrock
D-32U	0	1	0.5	1:1	17 Av.	AU-30	Soil
D-33U	0	1.16	0.58	1:1	18 Av.	AU-29	Soil
D-34U	1	2.74	0.58	1.5:1	11 Av.	AU-24	Soil
D-35U	0	2.0	1.0	1:1	10 Av.	AU-29	Soil
D-36U	0	1.0	0.5	1:1	8 Av.	AU-27	Soil
D-37U	0	1.4	0.7	1:1	8 Av.	AU-26, AU-21	Soil
D-38U	0	1.33	0.67	1:1	12 Min, 20 Max	AU-21	D <sub>50</sub> =3"
D-39U	0	1.0	0.5	1:1	10 Av.	AU-28	Soil

Table 7-25 Culvert Characteristics

Culvert	Diameter (in.)	Type	Contributing Watersheds	Slope (ft/ft)	Outlet Condition
C-21U	36	CMP	Right Fork Drainage	0.06	Bedrock
C-22U	20	CMP	AU-19, AU-25	0.06	Soil
C-23U	36	CMP	AU-36, AU-35, AU-34, AU-20, AU-26, C-24U	0.06	11" rip-rap
C-24U	32	CMP	AU-40, C-25U	0.06	10" rip-rap
C-25U	30	CMP	AD-17, C-26U	0.06	8" rip-rap
C-26U	30	CMP	AU-39, AU-32, AU-33, C-30U, C-34U	0.06	8" rip-rap
C-27U	15	CMP	AU-22, AU-28, AU-29A, AU-31	0.06	4" rip-rap
C-28U	15	CMP	AU-43, C-29U	0.06	4" rip-rap
C-29U	15	CMP	AU-20, AU-25, AU-26	0.06	3" rip-rap
C-30U	15	CMP	AU-21, AU-27, AU-30	0.06	Soil
C-31U	12	CMP	AU-29	0.06	Soil
C-32U	15	CMP	AU-22, AU-28, AU-29A	0.06	3" rip-rap
C-33U	24	CMP	AU-24, AU-28A, AU-37	0.06	8" rip-rap
C-34U	24	CMP	AD-19, AU-31, AU-37, AU-38, C-31U, C-32U	0.06	8" rip-rap
C-35U	84	CMP	Bear Creek	0.06	48" rip-rap
C-36U	15	CMP	AU-27, AU-21	0.11	3" rip-rap
C-37U	15	CMP	Abandoned In Place		
C-38U	15	CMP	AU-28	0.08	Soil
C-39U	15	CMP	AU-22, AU-32A, C-40U	0.18	6" rip-rap
C-40U	12	CMP	AU-23	0.001	Soil

<b>Culvert</b>	<b>Dia (in.)</b>	<b>Type</b>	<b>Contributing Watersheds</b>	<b>Peak Q(cfs)</b>	<b>Slope (ft/ft)</b>	<b>Outlet Condition</b>
C-21U	36	CMP	Right Fork Drainage	43.09	0.06	12" rip-rap
C-22U	20	CMP	AU-19, AU-25	4.33	0.06	4" rip-rap
C-23U	36	CMP	AU-36, AU-35, AU-34, AU-20, AU-26, C-24U	38.80	0.06	11" rip-rap
C-24U	32	CMP	AU-40, C-25U	35.81	0.06	10" rip-rap
C-25U	30	CMP	AD-17, C-26U	19.85	0.06	8" rip-rap
C-26U	30	CMP	AU-39, AU-32, AU-33, C-30U, C-34U	19.69	0.06	8" rip-rap
C-27U	15	CMP	AU-22, AU-28, AU- 29A, AU-31	2.68	0.06	4" rip-rap
C-28U	15	CMP	AU-34, C-29U	3.04	0.06	4" rip-rap
C-29U	15	CMP	AU-20, AU-25, AU- 26,	2.77	0.06	3" rip-rap
C-30U	15	CMP	AU-21, AU-27, AU-30	1.26	0.06	soil
C-31U	12	CMP	AU-29	0.29	0.06	soil
C-32U	15	CMP	AU-22, AU-28, AU-29A	2.36	0.06	3" rip-rap
C-33U	24	CMP	AU-23, AU-37	14.42	0.06	8" rip-rap
C-34U	24	CMP	AD-19, AU-31, AU-37, AU-38, C-31U, C-32U	17.86	0.06	8" rip-rap
C-35U	84	CMP	BEAR CREEK	412.70	0.06	48" rip-rap
C-36U	15	CMP	AU-27, AU-21	1.18	0.11	3" rip-rap
C-37U	15	CMP	Abandoned In Place			
C-38U	15	CMP	AU-28	0.09	0.08	soil
C-39U	15	CMP	AU-22, AU-23A, C-40U	2.27	0.18	6" rip-rap
C-40U	12	CMP	AU-23	0.64	0.001	soil

DITCH	CHANNEL SLOPE %	CONTRIBUTING WATERSHED	PEAK Q (cfs)	BANK AND BOTTOM DESC.	MANNING'S $\eta^{(a)}$
D-23U	19 Av	AU-36	.12	soil	0.03
D-24U	14 Av	AU-35	.13	soil	0.03
D-25U	16 Av	AD-17	.16	soil	0.03
D-26U	24 Av	AU-32	.28	soil	0.03
D-27U	13 Min, 30 Max	AU-31	.32	soil	0.03
D-28U	14 Av	AU-33	.11	soil	0.03
D-29U	8 Av	AU-34	.27	soil	0.03
D-30U	13 Av	AU-25	.30	soil	0.03
D-31U	12 Av	AU-20, AU-26	2.47	bedrock	0.03
D-32U	17 Av	AU-30	.08	soil	0.03
D-33U	18 Av	AU-29	.20	soil	0.03
D-34U	11 Av	AU-24	1.66	soil	0.03
D-35U	10 Av	AU-29	0.29	soil	0.03
D-36U	8 Av	AU-27	0.03	soil	0.03
D-37U	8 Av	AU-21, AU-26	1.25	soil	0.03
D-38U	12 Min, 20 Max	AU-21	1.15	D <sub>50</sub> = 3"	0.03
D-39U	10 Av	AU-28	0.09	soil	0.03
D-40U	9 Av	AU-28A, AU-39U	2.41	D <sub>50</sub> = 3"	0.03
D-41U	15 Av	AU-22, AU-23A, AU-40U	2.27	D <sub>50</sub> = 4"	0.03
D-42U	36 Av, 63 Max	AU-23A	0.04	soil	0.03
D-43U	20 Min, 45 Max	AU-23	0.64	D <sub>50</sub> = 5"	0.03

(a) Based on tables from Barfield et al (1981) and the equation  $\eta = .0395(D_{50})^{1/6}$ ; (D in ft)

(b) Peak Q for misc. road drainage assumed to be 1.0 cfs based on similar disturbed areas.

(c) See table 7.2-10 for summary of diversion ditch calculation

# Worksheet Worksheet for Trapezoidal Channel

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### Project Description

Worksheet	D-37U
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

---

### Input Data

Mannings Coefficient	0.030
Slope	0.080000 ft/ft
Left Side Slope	1.00 V : H
Right Side Slope	1.00 V : H
Bottom Width	0.00 ft
Discharge	1.25 cfs

---

### Results

Depth	0.52 ft
Flow Area	0.3 ft <sup>2</sup>
Wetted Perimeter	1.48 ft
Top Width	1.05 ft
Critical Depth	0.63 ft
Critical Slope	0.030641 ft/ft
Velocity	4.55 ft/s
Velocity Head	0.32 ft
Specific Energy	0.32 ft
Froude Number	1.57
Flow Type	Supercritical

Use Minimum Depth = 1.0 ft Velocity < 5 fps	Minimum Freeboard = 0.30 ft No riprap required
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**Appendix 7-Q Abandoned Equipment**

On January 14, 2003 a roof fall occurred in the Hiawatha seam of the # 1 Bear Canyon Mine. This roof fall buried a coal hauler, a distribution box, and a shop trailer. After the roof fall all remaining equipment was removed from the section and the area was sealed off. This is a concern for ground water contamination since water monitoring site SBC-11 is in the area as well as floor and roof seeps. The entry where the equipment was left is higher than the surrounding entries so water should flow around it. In January of 2004 the portals to the #1 mine were sealed. Prior to sealing the portals C.W. Mining shot a channel through all high spots between the portals and all water sources to insure that the water would gradually flow out the portals. To make sure the water wouldn't seep in to the floor or be blocked by a roof fall a pipeline was laid between the sources and the portals. A heavy duty polyethylene pipe was used because it could withstand the impact and pressures of a roof fall. The only concern was that a sharp edge could puncture the pipe. To prevent this from happening and to further protect the pipe crib blocks were laid on either side of the pipe and crib blocks, sand, and/or crushed coal was laid over the pipe. The location of the pipeline and the roof fall are shown on the figure plate 7-10B. The elevation of the coal seam is also shown on plate 7-10B. A typical cross-section of the pipeline is shown in figure 7P-1. C. W. Mining uses the water for mine and culinary use and will continue to monitor it for the life of the mine. The path of the water is illustrated on the diagram. A copy of the MSHA accident report has also been included. The area of the roof fall is also shown on plate 7-10B.

Potential contaminants to ground water from buried equipment are battery acid, lead, and oil. Current water sampling will detect and quantities are listed below.

- 15 Gallons of R & O 150 in the gear boxes.
- 50-55 Gallons of Hydraulic oil.
- 20-28 gallons of battery acid in the batteries.
- 8,768 lbs of lead.

MSD's for the substances have been included.







FUCHS LUBRICANTS CO.



PRODUCT NAME: RENOLIN AW68

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This product is stable.

---

SECTION 11 - TOXICOLOGICAL INFORMATION

---

EYE EFFECTS:

No further toxicological data known.

SKIN EFFECTS:

No further toxicological data known.

ORAL EFFECTS:

No further toxicological data known.

INHALATION EFFECTS:

No further toxicological data known.

OTHER:

No further data known.

---

SECTION 12 - ECOLOGICAL INFORMATION

---

ECOTOXICOLOGICAL INFORMATION:

This product has not been evaluated for ecotoxicity. As with any industrial chemical, exposure to the environment should be prevented and minimized wherever possible.

ENVIRONMENTAL FATE:

The degree of biodegradability and persistence of this product has not been determined.

---

SECTION 13 - DISPOSAL CONSIDERATIONS

---

WASTE DISPOSAL:

Ensure that collection, transport, treatment, and disposal of waste product, containers and rinsate complies with all applicable laws and regulations. Note that use, mixture, processing, or contamination of the product may cause the material to be classified as a hazardous waste. It is the responsibility of the product user or owner to determine at the time of disposal, whether the product is regulated as a hazardous waste.

---

SECTION 14 - TRANSPORT INFORMATION

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DOT HAZARDOUS MATERIAL INFORMATION:

\* Not otherwise DOT regulated.

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SECTION 15 - REGULATORY INFORMATION

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FEDERAL REGULATIONS:

FUCHS LUBRICANTS CO.



PRODUCT NAME: RENOLIN AW68

SARA 313:

This product contains NONE of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Clean Water Act / Oil Pollution Act:

This product contains mineral oil and is subject to regulation by Section 311 of the Clean Water Act and the Oil Pollution Act. Releases of the product into or leading to surface waters must be reported to the National Response Center at 1-800-424-8802.

CERCLA Reportable Quantity:

Any components listed below have been assigned a reportable quantity (RQ) by the Federal EPA. Releases of the product into the environment that exceed the RQ for a particular component must be reported to the National Response Center at 1-800-424-8802.

Component	RQ
* - * - * - * - * - * - * - * - * - * - * - * - *	

Toxic Substances Control Act:

The components of this product are listed on the TSCA Inventory.

Ozone Depleting Substances:

This product contains no ozone depleting substances as defined by the Clean Air Act.

Hazardous Air Pollutants:

Any components listed below are defined by the Federal EPA as hazardous air pollutants.

Component
* - * - * - * - * - * - * - * - * - * - * - * - *

STATE REGULATIONS:

This product contains mineral oil, and as used, may be regulated by state used oil regulations. Check with the appropriate state agency to determine whether such a regulation exists.

No further data known.

SECTION 16 - OTHER INFORMATION

Prepared by . . . . . : Corporate Regulatory Compliance  
Date of issue . . . . . : 09/13/2002  
Last Revision Date . . . . . : 03/17/2000  
L0175





PRODUCT NAME: POWERGEAR EP5

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symptoms of irritation and redness. In severe cases, prolonged or repeated contact may result in dermatitis accompanied by symptoms of irritation, itching, dryness, cracking and/or inflammation.

- INHALATION -

This product has low volatility and so is not expected to cause respiratory tract irritation during normal conditions of use. Exposure to high mist levels in poorly ventilated areas may cause upper respiratory tract irritation and difficulty breathing.

- INGESTION -

Ingestion may cause slight stomach irritation and discomfort.

POTENTIAL CHRONIC HEALTH EFFECTS:

No further data known.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

No further data known.

CARCINOGENICITY:

This product is not listed as a known or suspected carcinogen by IARC, OSHA, or the NTP.

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SECTION 4 - FIRST AID MEASURES

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EYE CONTACT:

Upon direct eye contact, hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. If irritation is due to exposure to mist or vapors, remove the individual to fresh air. If irritation persists, flush the eyes with clean water until the irritation subsides. If symptoms persist, contact a physician.

SKIN CONTACT:

Remove product from the skin by washing with a mild soap and water. Contaminated clothing should be removed to prevent prolonged exposure. If symptoms of exposure persist, contact a physician.

INHALATION:

Inhalation is not an expected route of exposure. If respiratory irritation or distress occurs, remove the employee to fresh air. Contact a physician or other medical professional if irritation or distress persists.

INGESTION:

If small amounts are ingested, first aid measures are not likely to be necessary. If larger amounts are ingested or if symptoms of ingestion occur, dilute stomach contents with two glasses of water or milk. (NOTE: Do NOT give anything by mouth to an unconscious person.) Do not induce

FUCHS LUBRICANTS CO.



PRODUCT NAME: POWERGEAR EP5

SARA 313:

This product contains NONE of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Clean Water Act / Oil Pollution Act:

This product contains mineral oil and is subject to regulation by Section 311 of the Clean Water Act and the Oil Pollution Act. Releases of the product into or leading to surface waters must be reported to the National Response Center at 1-800-424-8802.

CERCLA Reportable Quantity:

Any components listed below have been assigned a reportable quantity (RQ) by the Federal EPA. Releases of the product into the environment that exceed the RQ for a particular component must be reported to the National Response Center at 1-800-424-8802.

Component	RQ
* - * - * - * - * - * - * - * - * - * - * - * - *	

Toxic Substances Control Act:

The components of this product are listed on the TSCA Inventory.

Ozone Depleting Substances:

This product contains no ozone depleting substances as defined by the Clean Air Act.

Hazardous Air Pollutants:

Any components listed below are defined by the Federal EPA as hazardous air pollutants.

Component
* - * - * - * - * - * - * - * - * - * - * - * - *

STATE REGULATIONS:

This product contains mineral oil, and as used, may be regulated by state used oil regulations. Check with the appropriate state agency to determine whether such a regulation exists.

No further data known.

SECTION 16 - OTHER INFORMATION

Prepared by . . . . . : Corporate Regulatory Compliance  
Date of issue . . . . . : 09/13/2002  
Last Revision Date . . . . . : 07/01/2002  
C3601223



PRODUCT NAME: POWERGEAR EP5

---

This product is stable.

---

SECTION 11 - TOXICOLOGICAL INFORMATION

---

EYE EFFECTS:

No further toxicological data known.

SKIN EFFECTS:

No further toxicological data known.

ORAL EFFECTS:

No further toxicological data known.

INHALATION EFFECTS:

No further toxicological data known.

OTHER:

No further data known.

---

SECTION 12 - ECOLOGICAL INFORMATION

---

ECOTOXICOLOGICAL INFORMATION:

This product has not been evaluated for ecotoxicity. As with any industrial chemical, exposure to the environment should be prevented and minimized wherever possible.

ENVIRONMENTAL FATE:

The degree of biodegradability and persistence of this product has not been determined.

---

SECTION 13 - DISPOSAL CONSIDERATIONS

---

WASTE DISPOSAL:

Ensure that collection, transport, treatment, and disposal of waste product, containers and rinsate complies with all applicable laws and regulations. Note that use, mixture, processing, or contamination of the product may cause the material to be classified as a hazardous waste. It is the responsibility of the product user or owner to determine at the time of disposal, whether the product is regulated as a hazardous waste.

---

SECTION 14 - TRANSPORT INFORMATION

---

DOT HAZARDOUS MATERIAL INFORMATION:

\* Not otherwise DOT regulated.

---

SECTION 15 - REGULATORY INFORMATION

---

FEDERAL REGULATIONS:

Buggy/Scrap Batteries **ATTN: MARK 687-2084**

# EAST PENN manufacturing co., inc.



## - Material Safety Data Sheet -

### Lead Acid Battery Wet, Filled with Acid

#### SECTION I

**Manufacturer's Name:** East Penn Manufacturing Co., Inc.  
**Date:** April 2000  
**Trade Name:** Electric Storage battery, SLI or Industrial battery  
**Classification:** Battery wet, filled with acid, electric storage  
**Address:** Deka Road, Lyon Station, PA 19536  
**Telephone Number for Information:** (610) 682-6361  
**Emergency Telephone Number:** CHEMTREC: 1-800-424-9300, In Washington D.C. or outside continental U.S., call 1-202-483-7616  
**UN2794**

#### SECTION II

#### HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components Specific Chemical Identity (Common Name (s))	OSHA PEL	ACGIH TLV	Range Percent By Weight	Average
Lead, CAS #7439921	0.05 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>	43-70	65
Sulfuric Acid, CAS #77664939	1.00 mg/m <sup>3</sup>	1.00 mg/m <sup>3</sup>	20-44	25
Antimony, CAS #7440360	0.50 mg/m <sup>3</sup>	0.50 mg/m <sup>3</sup>	0-4	<1
Arsenic, CAS #7440382	0.01 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	<0.1	-
Polypropylene, CAS #9003070	-	-	5-10	8
Calcium, CAS #7440702	1.0 mg/m <sup>3</sup>	1.0 mg/m <sup>3</sup>	<1	<1

#### SECTION III

#### PHYSICAL/CHEMICAL CHARACTERISTICS

**Electrolyte (Sulfuric Acid):**  
**Appearance and Odor:** Clear, Odorless, Colorless  
**Boiling Point:** approximately 235° F  
**Evaporation Rate (Butyl Acetate=1):** less than 1.0  
**Melting Point:** N/A  
**Solubility in Water:** Completely  
**Specific Gravity (H<sub>2</sub>O=1):** 1.220 - 1.325  
**Vapor Density (AIR=1):** N/A  
**Vapor Pressure (mm Hg):** 13

#### SECTION IV

#### FIRE AND EXPLOSION HAZARD DATA

**Flash Point (Method Used):** Non-Flammable  
**Extinguishing Media:** Class ABC extinguisher, CO<sub>2</sub>  
**Special Fire Fighting Procedures:** Cool exterior of battery if exposed to fire to prevent rupture. The acid mist and vapors in a fire situation are corrosive. Wear special respiratory protection (SCBA) and clothing.  
**Unusual Fire and Explosion Hazards:** \*Hydrogen gas, which may explode if ignited, is produced by this battery, especially when charging. Use adequate ventilation; avoid open flames, sparks, or other sources of ignition.  
**Flammable Limits:** \*Hydrogen Gas  
 LEL: 4% UEL: 74%

#### SECTION V

#### REACTIVITY DATA

**Stability:** Stable  
**Condition to Avoid:** Prolonged overcharging, sources of ignition  
**Incompatibility (Materials to Avoid):** Sulfuric Acid: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, strong oxidizers and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.  
**Hazardous Decomposition of By-Products:** Sulfuric Acid: Excessive overcharging or fire may create Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen.  
**Lead Compounds:** Contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

NIOSH: Battery Wet, Filled with Acid: Page 2 of 3

## SECTION VI HEALTH HAZARD DATA

**Route(s) of Entry:** Not Applicable under normal use. (Inhalation, skin contact, and ingestion)

**Health Hazards (Acute and Chronic):** Do not open battery, avoid contact with internal components. Internal components are Oxide lead and electrolyte. **Short term exposure:** Sulfuric acid may cause irritation of eyes, nose, and throat. Prolonged contact may cause severe burns. **Long term exposure:** Repeated contact causes irritation and skin burns. Repeated exposure to mist may cause erosion of teeth, chronic eye irritation and/or chronic inflammation of the nose, throat, and bronchial tubes.  
**TARGET ORGAN:** (Electrolyte) respiratory system, eyes, skin, and teeth

### Carcinogenicity:

**Sulfuric Acid:** The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category 1 carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid contained within a battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product such as overcharging, may result in the generation of sulfuric acid mist.

**Lead Compounds:** Lead is listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.

**Artenic:** Listed by National Toxicology Program (NTP), IARC, OSHA and NIOSH as a carcinogen only after prolonged exposure at high levels.

**Signs and Symptoms of Exposure:** Acid contact may cause irritation of eyes, nose and throat. Breathing of mist may produce respiratory difficulty. Contact with eyes and skin causes irritation and skin burns. Sulfuric acid is a CORROSIVE chemical.

**Medical Conditions Generally Aggravated by Exposure:** Sulfuric Acid Mist exposure may aggravate medical conditions such as, pulmonary edema, bronchitis, emphysema, dental erosion, and tracheobronchitis. Pregnant women and children must be protected from lead exposure.

### Emergency and First Aid Procedures: (Sulfuric Acid)

- 1) Flush contacted area with large amounts of water for at least 15 minutes. Remove contaminated clothing and obtain medical attention if necessary. Eye wash and/or emergency shower should be readily available.
- 2) If swallowed, give large volumes of water. DO NOT induce vomiting, obtain medical treatment.

## SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

**Steps to be Taken in Case Material is Released or Spilled:** **SULFURIC ACID:** Dilute spill cautiously with five to six volumes of water and gradually neutralize with sodium bicarbonate, soda ash or lime. When exposure level is not known, wear NIOSH approved positive pressure self-contained breathing apparatus. Reference North American Emergency Response Guidebook, #154.

**Waste Disposal Method:** Lead-acid batteries are completely recyclable. For information on returning batteries to East Penn for recycling, contact your East Penn Representative. Dispose of any collected material in accordance with local, state or applicable federal regulations.

**Precautions to be Taken in Handling and Storing:** Store away from reactive material as defined in Section V, Reactivity Data. Place cardboard between layers of stacked batteries to avoid damage and short circuit. Do not allow metallic materials to simultaneously contact both terminals.

**Other Precautions:** Sodium bicarbonate, soda ash, sand, or lime should be kept in same general area for emergency use. Keep away from sources of ignition during charging see Section IV on generation of hydrogen gas. If battery case is broken, avoid direct contact with internal components.

## SECTION VIII CONTROL MEASURES

**Respiratory Protection (Specific Type):** Respirator required when PEL is exceeded or employee witnesses respiratory irritation. (see Section VI, Health Hazard Data).

**Ventilation:** Must be provided when charging in an enclosed area. (29CFR1910.178(g) and 305(j)(7))

**Mechanical (general):** Acceptable at 1 to 4 air exchanges/hour or to maintain air concentrations below the PEL.

**Local Exhaust:** Preferred

**Other:** Local building/fire codes may require explosion proof fans and equipment

**Protective Gloves:** Acid resistant

**Eye Protection:** Preferred, safety glasses, goggles, face shield

**Other Protective Clothing or Equipment:** Acid resistant aprons, boots, and protective clothing

**Work Hygienic Practices:** Good Personal hygiene and work practices are mandatory.

MSDS: Battery Wet, Filled with Acid; Page 3 of 3

## SECTION IX OTHER REGULATORY INFORMATION

NEPA Hazard Rating	Sulfuric Acid	Lead
Health (Blue)	3	3
Flammability (Red)	0	0
Reactivity (Yellow)	2	0

Note: Sulfuric acid is water-reactive if concentrated.

U.S. DOT: Battery Wet, Filled with Acid  
 Hazard Class/Division 8  
 ID Number UN2794  
 Packing Group III  
 Label Requirement Corrosive

RCRA: Spent lead-acid batteries are not regulated as hazardous waste when recycled. Spilled sulfuric acid is a characteristic hazardous waste, EPA hazardous waste number D002 (corrosivity).

### CERCLA (Superfund) and EPCRA (Emergency Planning and Community Right to Know Act)

- a) Reportable Quantity (RQ) for spilled 100% sulfuric acid is 1000 lbs.
- b) Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA with a Threshold Planning Quantity (TPQ) of 1000 lbs.
- c) EPCRA Section 312 Tier II reporting required for batteries if sulfuric acid is present in quantities of 500 lbs or more and/or lead is present in quantities of 10,000 lbs or more.

California Prop 65: This product contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

For additional information concerning East Penn Manufacturing Co., Inc. products or questions concerning the content of this MSDS please contact your East Penn representative.

This information is accurate to the best of East Penn Mfg. Co.'s knowledge or obtained from sources believed by East Penn to be accurate. Before using any product, read all warnings and directions on the label.

TO: ED EDDINS FROM: BOB FLICKER

FAX NO. (703) 669-8699

MATERIAL SAFETY DATA SHEET

NUMBER OF PAGES -2-

8-919  
91:9203

Material Safety Data Sheet

May be used to comply with  
OSHA's Hazard Communication Standard,  
29 CFR 1910:200 Standard, must be  
consulted for specific requirements.

U.S. Department of Labor  
Occupational Safety and Health Administration  
(Non-Mandatory Form)  
Form Approved  
OMB No. 1218-0072



IDENTITY (As Used on Label and List)

EPM lead alloy parts

Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate this.

Section I

Manufacturer's Name

East Penn Manufacturing Co., Inc.

Emergency Telephone Number

(215)682-6361

Address (Number, Street, City, State, and ZIP Code)

Deka Road

Telephone Number for Information

(215)682-6361

Lyon Station, PA 19536

Date Prepared

June 27, 1989

Signature of Preparer (optional)

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Lead (7439-92-1)	0.05mg/m <sup>3</sup>	0.15mg/m <sup>3</sup>	(SARA III)	94.0%
Antimony (7440-36-0)	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>	(SARA III)	2.8-6.0%
Arsenic (7440-38-2)	0.01mg/m <sup>3</sup>	0.2mg/m <sup>3</sup>		≤ 0.2%
Tin (7440-31-5)	2.0 mg/m <sup>3</sup>	2.0 mg/m <sup>3</sup>		≤ 0.4%

Additional elements such as copper, silver, nickel, etc. may be present, however, their concentration is less than 0.05%.

Section III - Physical/Chemical Characteristics

Boiling Point	lead	1740°C	Specific Gravity (H <sub>2</sub> O = 1)	11.3 (at 20°C)
Vapor Pressure (mm Hg)	1mmHg at 973°C		Melting Point	328°C
Vapor Density (AIR = 1)	not applicable (n/a)		Evaporation Rate (Butyl Acetate = 1)	n/a

Solubility in Water

insoluble

Appearance and Odor

bluish-gray soft metal

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	not available	Flammable Limits	not available	LEL	UEL
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Extinguishing Media

Dry chemical and/or carbon dioxide. Use water fog or alcohol foam for larger fires.

Special Fire Fighting Procedures

Highly toxic lead fumes may evolve when the metal is heated. Wear protective clothing and a self-contained breathing apparatus.

Unusual Fire and Explosion Hazards

Lead dust is a moderate fire and explosion hazard when exposed to heat or flame. Lead pigs and parts may contain cavities of moisture when stored in a wet environment; entrapped moisture may expand explosively when melted or heated.

(Reproduce locally)

OSHA 174, Sept 1985

31 9204

REFERENCE FILE

Section V - Reactivity Data

Stability	Unstable		Conditions to Avoid <b>Lead material is stable under normal conditions.</b>
	Stable	X	
Incompatibility (Materials to Avoid) <b>Avoid oxidizing agents and active metals. Contact with disodium acetyl chloride trifluoride, or fused ammonium nitrate poses an explosion risk. Contact with sodium azide can form a lead azide which is a detonating compound.</b>			
Hazardous Decomposition or Byproduct <b>Thermal oxidation products are highly toxic lead fume.</b>			
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry: inhalation? skin? ingestion?

Health Hazards (Acute and Chronic)

**The handling of lead alloy parts presents few health hazards itself. However, prolonged exposure to lead fume or dust can result in lead poisoning. Lead accumulates in the bone and body organs and is eliminated from the body slowly.**

Carcinogenicity: NTP? IARC Monographs? OSHA Required?  
**29CFR 1910.1025**

Signs and Symptoms of Exposure **Short term: headache, nausea, vomiting, abdominal spasms, fatigue, weight loss, anemia, pain in legs, arms, joints. Long term: CNS damage, kidney dysfunction and potential reproductive hazard. Symptoms of lead exposure may be confined by the presence of elevated levels of lead in the blood.**

Generally Aggravated by Exposure **Pregnant women should be protected from excessive exposure.**

Emergency and First Aid Procedures **EYE & SKIN: Flush contacted area with water for about 15 min. If irritation persists, seek medical attention. INHALATION: Remove victim to fresh air area. If breathing stopped, give artificial respiration. Seek medical attention. INGESTION: Do not induce vomiting. Seek medical attention.**

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled  
**No special precautions are necessary for spills of cast lead alloy parts.**

Waste Disposal Method  
**Scrap metal can be reclaimed for reuse. Follow federal, state and local regulations for disposal.**

Precautions to Be Taken in Handling and Storing  
**Store in dry area.**

Other Precautions **Always use good hygiene practices when handling lead and its compounds. Recommended practice includes showering at the end of each work shift. Lead contaminated clothing should be properly laundered, wash thoroughly after handling and before eating, drinking and smoking.**

Section VIII - Control Measures

Respiratory Protection (Specify Type)  
**When exposure concentrations exceed the PEL, appropriate respiratory protection is required.**

Ventilation	Local Exhaust	Special
	Mechanical (General)	Other

**minimal requirement**

Protective Gloves **Protective clothing, gloves, and respirators are recommended where lead fume or dust is generated.**

Eye Protection **Face shield is recommended for handling molten material.**

Other Protective Clothing or Equipment  
**Good hygiene and housekeeping practices are essential. Avoid breathing lead dust or fumes.**

FUCHS LUBRICANTS CO.



PRODUCT NAME: RENOLIN AW68

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symptoms of irritation and redness. In severe cases, prolonged or repeated contact may result in dermatitis accompanied by symptoms of irritation, itching, dryness, cracking and/or inflammation.

- INHALATION -

This product has low volatility and so is not expected to cause respiratory tract irritation during normal conditions of use. Exposure to high mist levels in poorly ventilated areas may cause upper respiratory tract irritation and difficulty breathing.

- INGESTION -

Ingestion may cause slight stomach irritation and discomfort.

POTENTIAL CHRONIC HEALTH EFFECTS:

No further data known.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

No further data known.

CARCINOGENICITY:

This product is not listed as a known or suspected carcinogen by IARC, OSHA, or the NTP.

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SECTION 4 - FIRST AID MEASURES

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EYE CONTACT:

Upon direct eye contact, hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. If irritation is due to exposure to mist or vapors, remove the individual to fresh air. If irritation persists, flush the eyes with clean water until the irritation subsides. If symptoms persist, contact a physician.

SKIN CONTACT:

Remove product from the skin by washing with a mild soap and water. Contaminated clothing should be removed to prevent prolonged exposure. If symptoms of exposure persist, contact a physician.

INHALATION:

Inhalation is not an expected route of exposure. If respiratory irritation or distress occurs, remove the employee to fresh air. Contact a physician or other medical professional if irritation or distress persists.

INGESTION:

If small amounts are ingested, first aid measures are not likely to be necessary. If larger amounts are ingested or if symptoms of ingestion occur, dilute stomach contents with two glasses of water or milk. (NOTE: Do NOT give anything by mouth to an unconscious person.) Do not induce

### 980 Loader Cycle Time

(From Cat Performance Handbook)

		0.55 min
a.	3/4 inch to 6 inch	0.00 min
b.	Pile (10 ft or less)	+ 0.01 min
c.	3/4 inch to 6 inch	- 0.04 min
		0.52 min

$(60 \text{ min/hr}) / (0.52 \text{ min/cycle}) = 115.4 \text{ cycles/hr}$

Efficiency  $50 \text{ min/hr} - (115.4 \text{ cycles/hr})(6 \text{ cu yd/cycle})(50 \text{ min}/60 \text{ min}) = \underline{577 \text{ cu yd/hr (96 cycles/hr)}}$

### Summary of Reclamation Cost Estimate

#### Direct Costs

a.	Seal Portals and Backfill	\$ 112,500
b.	Removal of Structures	\$ 210,403
c.	Soil Placement and Ripping	\$ 178,617
d.	Channel Restoration	\$ 403,728
e.	Revegetation	\$ 462,968
f.	Monitor Well Plugging	<u>\$ 5,000</u>

Total Direct Costs: \$ 1,373,216

#### Indirect Costs

g.	Maintenance and Monitoring (10%)	\$ 137,322
h.	Contingency (5%)	\$ 68,661
i.	Engineering Redesign (2.5%)	\$ 34,330
j.	Mobilization and Demobilization (5%)	\$ 68,661
k.	Contract Management Fee (2.5%)	<u>\$ 34,330</u>

Total Indirect Costs: \$ 343,304

**Total Reclamation Cost (2001 dollars) \$ 1,716,520**

<u>Escalated Values</u>	<u>Escalation Factor</u>
2002 - 1,770,075	3.12% (est)
2003 - 1,825,302	3.12% (est)
2004 - 1,882,251	3.12% (est)
2005 - 1,940,978	3.12% (est)

The total bond currently posted, rounded to the nearest \$1,000, is **\$1,825,000**.

**Reclamation Costs**

**a. Seal and Backfill Portals**

AMR Costs- \$ 12,500/seal including backfill x 9 seals \$112,500

**b. Removal Structures**

All estimates with 10 digit numbers are from 2001 Means Site Work cost Data. Most of the steel and equipment will be salvaged for scrap or reuse. M&P Enterprises in Huntington, Utah, will pick up and pay \$40.00/ton for scrap iron & equipment if placed in 30 cu yd (8ft wide x 20 ft long x 5 ft high) dumpsters or loaded with crane on their trucks. Reclamation costs assume the steel will be picked up on site, but the mine receives no payment for the steel. D&R Salvage in Castle Dale will accept the steel without a dump fee. Therefore no dump fee is included for steel. Means cost data includes disposal to 20 miles, which is the approximate distance to the Nielson Construction landfill in Emery County. Dump fee for Nielson Construction landfill is \$7.00 typically.

**Sales-Receiving-Scale House Complex**

02220-100-0100 (Mixture type Building, includes disposal)

Volume = (34 ft) (83 ft) (16 ft) = 45,152 cu ft

Cost = (\$ 0.24 /cu ft) (45,152 cu ft) = \$ 10,837

Dump Fee = ((45,152 cu ft) / 27) \* 0.3 rubble volume \* 1.35 tons/cy) (\$7.00/ton) = \$4,741

Time = (45,152 cu ft) / (20,100 cu ft/day) = 2.25 days

**Concrete Demolition**

Total Footing Volume =(0.67 ft)(2 ft)(234 ft) = (313.6 cu ft) / 27 = 11.6 cu yds

Total Foundation Volume = (0.67 ft)(4 ft)(234 ft) = (627.1 cu ft) / 27 = 23.2 cu yds

Floor Volume = (83 ft)(34 ft)(0.33 ft) = (931.3 cu ft) / 27 = 34.5 cu yds

Total Volume = 69.3 cu. yds

Cost = (69.3 CY) (\$12.78/CY) = \$886

Time = (234 L.F.)/(300 L.F./day) + (234 ft)(4 ft)/(140 s.f./day) + (83 ft)(34 ft)/(500 s.f./day) = 13.10 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Cost = (\$10.69/cu. yd.) (69.3 cu yds) (1.3 swell factor) = \$963

Time = 90.1 cu. yds. / (232 cu. yds./day) = 0.40 days

Cost Subtotal \$17,427  
Time Subtotal 15.75 days