the Darwin Hills at elevation 5979 feet. The catchment is rimmed by rocky hills, the center portion consisting of a pediment alluvial plain. The pediment portion of the basin comprises 46 percent of the catchment area.

Lucky Jim Wash intersects Darwin Wash and proceeds northward, approximately 7 miles, to Darwin Falls. Groundwater surfaces as springs in the lower portion of Darwin Wash where the valley narrows and the alluvial fill decreases. A mean annual flow of approximately 190 gallons per minute was recorded from 1962 through 1978 at a U.S.G.S. gauging station located below Darwin Falls.

Due to the desert climate of the area, occurrences of surface water flow are infrequent, as described above. Two important aspects of the surface hydrology in the area have been investigated and include flows in Lucky Jim Wash, and runoff in the heap area. Lucky Jim Wash is a channel 300 to 400 feet wide north of the Darwin Mine site and is approximately 12 to 20 feet deep. There are no historical stream flow records for Lucky Jim Wash. To prevent damage to the heap from infrequent flooding in Lucky Jim Wash, expected levels of flooding were determined prior to construction. An overbank study, using an annual precipitation rate of 4 inches, determined that Lucky Jim Wash can carry a 100-year, 24-hour flood peak without any overbank flooding. The depth of flow for this flood would be less than one-quarter of the total depth of the wash at the site. It was recommended that the heap be set back at least 20 feet from the edge of the bank and that all other waste material that had been stored in Lucky Jim Wash be removed so floods can pass through unimpeded. The heap is currently located between 85 and 196 feet from the bank of Lucky Jim Wash. In addition, several berms and diversion ditch structures adjacent to the heap (Figure 3) prevent surface runoff from contacting the heap. Other than surface runoff from infrequent rain events, there is no measurable effluent discharging from the heap.

Groundwater

Groundwater data shows that subsurface flow occurs within alluvial deposits. Deep observation wells were drilled adjacent to the leach pad to determine if groundwater was present in the alluvial deposits of Lucky Jim Wash. The total depths of these wells ranged between 172 to 220 feet with bottom hole elevations ranging between 4,660 and 4,565 feet. No water was encountered in these wells. This prompted a change in the BO that allowed the mine operators to monitor the wells once a week instead of biweekly. In addition, the mine

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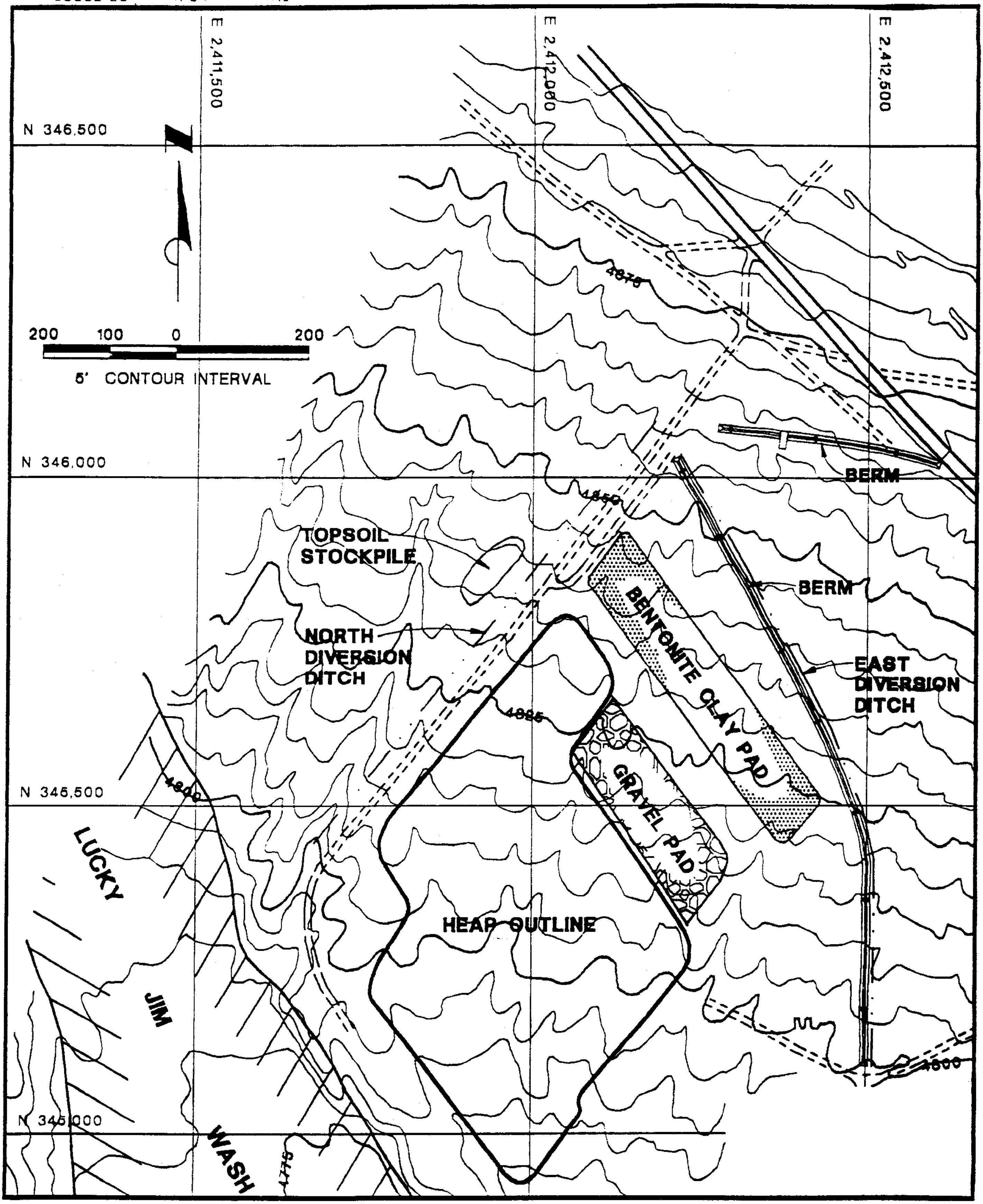

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FIGURE 3

BLUE RANGE MINING CO., L.P.
DARWIN MINE

DARWIN HEAP PRE-CLOSURE CONFIGURATION

workings in the Darwin area have historically been dry. The deepest workings in the Darwin Mine have extended to an elevation of approximately 4400 feet. As it was dry to this level, it can be assumed that water levels are below an elevation of 4400 feet, which is 350 feet below the heap leach facility (4750 feet elevation).

Hydrologic and pedologic conditions suggest no recharge of the apparently deep regional groundwater system by deep infiltration of precipitation through valley fill deposits in the Lucky Jim Wash area. Drill holes and test pits located within the heap pad area demonstrate the presence of intermittent, impermeable caliche layers ranging in thickness from 1/8 in. to 2 feet. These layers were found in the upper 10 feet of subsoil, although they were also found as deep as 30 feet. The occurrence of caliche zones is evidence that the fraction of annual precipitation that infiltrates the soil, rarely penetrates below the root zone prior to consumption by plants or evaporation. In addition, shallow well monitoring results show that the ambient moisture content is less than field capacity, further proof that the occurrence of groundwater from recharge or precipitation falling on valley fill is rare. It is concluded that movement of heap effluent through the alluvium would be limited.

5.0 HEAP LEACH CHARACTERISTICS

This section provides a description of the following issues specific to the heap leach characteristics:

- Heap pad construction/percolation
- Heap solids geochemistry
- Heap stability/air dust

5.1 HEAP PAD CONSTRUCTION/PERCOLATION

A heap liner was constructed to retard infiltration of liquids from the heap to the natural environment and to maximize the recovery of silver from the leaching process. Prior to liner construction, subsoils from several test pits were collected for geotechnical lab testing. Results of the tests showed that alluvial sediments beneath the proposed impoundment were dense, well graded, silty sands and gravels which would function as appropriate foundation material. The coefficient of permeability of these subsoils was reported to be higher than 10^{-6} centimeters/second (cm/sec), which requires that a liner be used to contain seepage from the heap pad.

Several laboratory tests were performed on various mixtures of clay and soil materials to evaluate which material would be best suited as a liner material for the leach pad. The original clay liner proposed and approved by the Water Board under BO # 6-82-06 (January 1982) consisted of three, 6-inch lifts, composed of a mixture of approximately 30% Black Rock clay and 70% *in-situ* soil.

A quality control report prepared during pad construction (SRK, 1982) and the results of the shallow well monitoring program (SRK, 1982) concluded that liner permeabilities were below, and often well below, the required value of 5×10^{-7} cm/sec. The average (arithmetic) coefficients of permeability for 30 lifts tested during construction were satisfactory (ranging from 6.2×10^{-10} to 4.9×10^{-7} cm/sec).

During the period of active leaching, a leach pad investigation was performed in July 1982 (Anaconda, 1982), to verify the liner integrity and extent of moisture movement through the soil below the liner. The results of the investigation showed that the clay liner performed much better than the predicted theoretical calculations. The actual penetration of the moisture front below the bottom of the liner was less than one foot compared to the theoretically calculated six feet.

Based on the results of the 1982 clay liner study (Anaconda, 1982), and with plans to reactivate the heap in 1983, a request by Anaconda to revise the clay liner requirements from three, 6-inch lifts (18 inches) to two, 6-inch lifts (12 inches) was granted by the Water Board. The permeability of the lifts were to be designed not to exceed 1 X 10^{-7} cm/sec as required in the newly revised BO. The results of the quality control report demonstrated that this permeability design specification had been met for 70% of the lifts monitored during construction of the approved three lift design. The total average pad permeability for the 30 lifts monitored was 1.0 X 10^{-7} cm/sec, within the newly defined permeability specifications. Heap leaching operations, however, did not commence as planned.

Although a new standard of four, 6-inch lifts was later adopted by the Water Board, the clay liner remains intact under the approved 1982 three, 6-inch lifts configuration. In addition, the average permeability of the existing liner has been shown to meet the more recent 1.0 X 10^{-7} cm/sec standard.

The heap design also includes diversion berms which limit surface runoff from contacting the heap. Figure 3 shows the aerial extent of the heap, berms, and shallow diversion structures currently in place. The larger of the two berms extends around the eastern side of the heap and is approximately five feet in height. The smaller berm is approximately 2 feet in height and is located to the east of the larger berm. The drainage ditches were designed to carry peak flow from a 100-year, 24-hour rainfall (4 inches) and a 100-year, 1-hour rainfall (0.5 inches) event. Both ditches consist of triangular cross sections and 1H:1V and 1H:3V side slopes, with the east ditch at a depth of 1.5 feet and the north ditch at a depth of 1 foot. Although the east ditch has some erosion and is partially infilled, the berm still provides an effective barrier to surface runoff. The north ditch remains intact. As part of the closure activities, Blue Range will repair and improve all diversion structures around the heap.

5.2 GEOCHEMISTRY

HEAP GEOCHEMISTRY

During the heap leaching process, solution was typically applied to the heap at a maximum rate of 12.5 L/s (200 gpm), with cyanide levels on the order of 0.3 lb cyanide per ton of solution (150 mg/L). Under the waste discharge requirements issued in 1983 (BO NO 6-83-107), after the initial heap leaching program, the heap would be considered detoxified by the Water Board when the solids contained less than 1.0 mg/kg free cyanide. The detoxification method was to be chlorine treatment, with any resulting effluent disposed of by evaporation. Free cyanide levels in any heap effluent were not to exceed the public health drinking water standard of 0.2 mg/L. Total filtrable residue, sodium, or total cyanide in groundwater could not exceed background levels by more than 15%.

Cyanide Analyses

After heap operations ceased in 1982, an inactive heap monitoring program under the 1983 BO guidelines was initiated by Anaconda to evaluate the rate of free or WAD (weak acid dissociable) cyanide destruction in the heap solids. Composite samples from 11 drill holes at 2-foot intervals were collected and water leached to determine the soluble free cyanide content in the entrained solutions. The solution concentrations were then back calculated to represent the amount of cyanide remaining per kilogram of residue. Free cyanide (CN^-) in the heap solids were analyzed over a 15 month period. Free cyanide levels in January 1983, averaged 100 mg/kg and ranged between 8 to 196 mg/kg. After a 15 month period (March 1984), free cyanide levels averaged less than 16 mg/kg and ranged between < 7 to 28 mg/kg. Based on these results, Anaconda estimated that free cyanide would be below the 1983 limit of 1 mg/kg soluble free cyanide within about 4 years. Current data taken in 1994 confirms this assumption to be true (WESTEC, 1994).

The BO containing the waste discharge requirements for the mine site was eventually revised in 1985 (BO 6-85-5) (see Appendix A). Revisions in the waste discharge requirements in 1985 (BO 6-85-5) were similar to those described above, with the exception that heap solids detoxification was to be based on a maximum level of 10 mg/kg total cyanide. Given that there is no effluent discharging from the heap, detoxification concerns were limited to contaminant levels in heap solids only. It was then rescinded by the Water Board as of May 1989.

Blue Range conducted a heap leach material sampling program in 1990 to verify residual cyanide levels. The 1990 work indicated the following:

1. *Soluble WAD cyanide levels in heap solids*, as predicted by Anaconda's testwork in 1983, were less than 0.05 mg/kg (well below the limit of 0.5 mg/kg defined in the 1985 WDR).

2. Concentrations of soluble total cyanide and total cyanide after extraction, however, exceeded regulatory levels and ranged from 84 to 120 mg/kg and 70 to 79 mg/kg respectively.

3. The pH of the heap (7.9 - 8.7) created alkaline conditions which typically reduces the mobility of residual cyanide. Alkaline conditions in the heap were confirmed by a grid sampling program in 1990 in which a pH Isopach map was generated. Laboratory data from the sampling is included as Appendix D, and Figure 4 presents the pH Isopach map.

Subsequent to the 1990 testing program, Blue Range retained WESTEC to collect and analyze heap solids in 1994 to determine the current status of residual (soluble) cyanide in the heap. The 1994 sampling and analyses were performed in accordance with direction received from the Water Board, which was transmitted in November 1989. Appendix C presents the guidance provided by the Water Board.

Two borehole locations originally sampled in 1990, LP2 and LP6, were resampled in 1994 at 25%, 50%, and 75% depths (DH2 and DH6). Samples were analyzed for WAD, soluble total cyanide, and total cyanide after extraction according to Water Board guidelines. Appendix E contains analytical results from the borehole sample analysis.

A comparison of the March 1990, cyanide analyses with March 1994, cyanide analyses (Table 5.1) shows that cyanide levels in the heap solids have decreased to levels below the required threshold standards. This can be attributed to natural biodegradation processes, where residual cyanide has been biologically converted (*in-situ*) either to nitrates under aerobic conditions, or denitrified to gaseous nitrogen compounds under anaerobic conditions.

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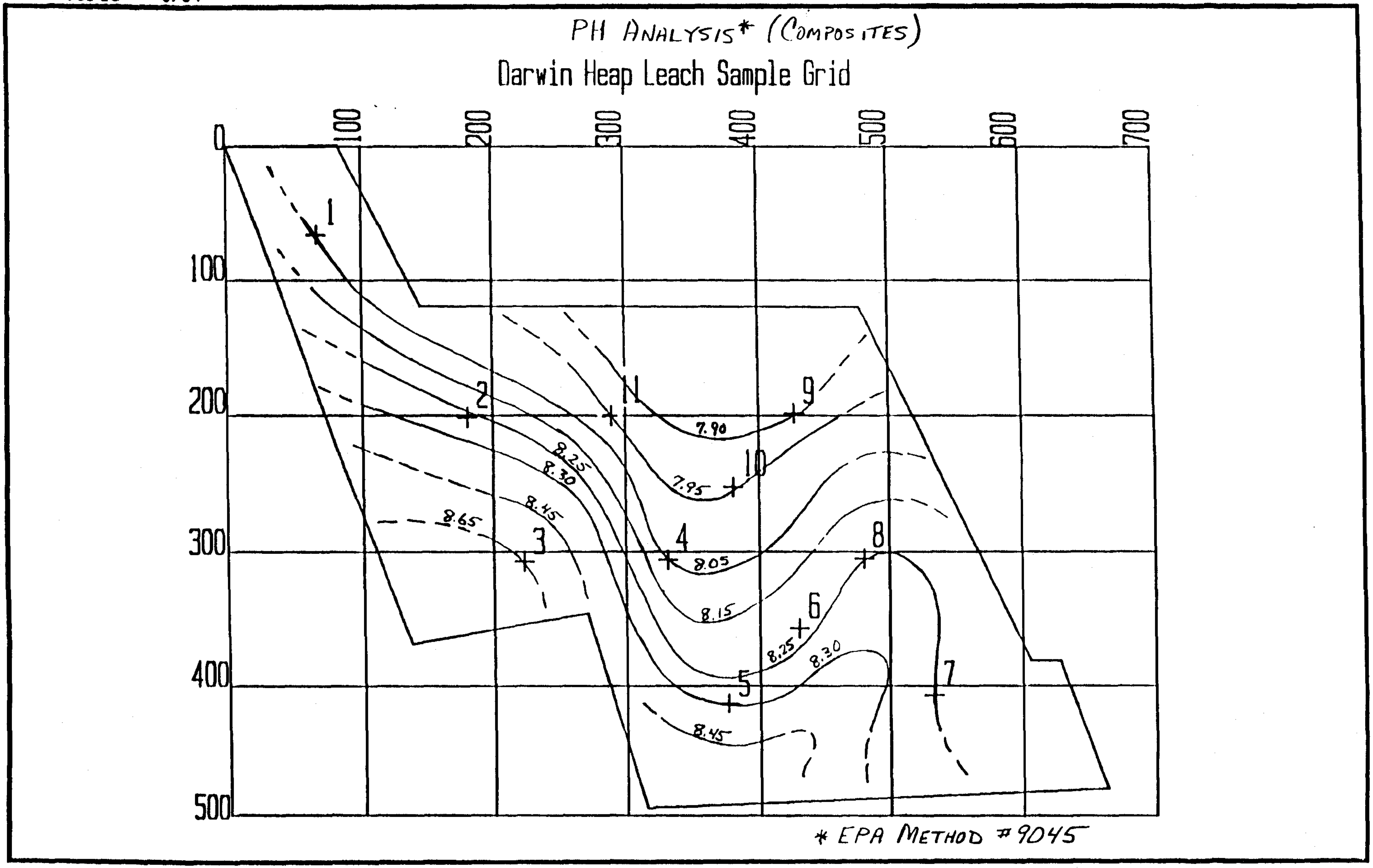

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DARWIN MINE

FIGURE 4

pH ISOPACH MAP
(AFTER BLUE RANGE
MINING CO.)

TABLE 5.1

BIODEGRADATION OF CYANIDE
1990 VS 1994

	Regulatory Limit	25% Depth		50% Depth		75% Depth	
		1990	1994	1990	1994	1990	1994
BOREHOLE LP2 (DH2)							
WAD	0.5	<0.05	0.035	<0.05	<0.005	<0.05	0.006
Soluble Total	2.5	NA	<0.025	NA	<0.025	99	<0.025
Total (After Extraction)	10	NA	1.40	NA	0.90	75	3.0
BOREHOLE LP6 (DH6)							
WAD	0.5	<0.05	0.005	<0.05	0.05	<0.05	0.035
Soluble Total	2.5	NA	0.42	120	0.58	84	0.16
Total (After Extraction)	10	NA	1.20	70	1.80	79	0.94

All Values in Mg/Kg
NA = Not Analyzed

5.3 HEAP STABILITY/AIRBORNE DUST

The heap has been found to be extremely susceptible to wind erosion when disturbed given the fine-grained nature of the heap solids (i.e. trenching, regrading), resulting in reduced visibility in the area. Therefore, minimal disturbance of the heap is desirable to limit the amount of air borne dust. Final regrading of the heap slopes to a 3:1 outslope has been completed by Blue Range with no further disturbance activity anticipated prior to commencement of closure. The closure plan will ensure that minimal disturbance of the heap occurs to prevent problems related to fugitive dust.

6.0 POTENTIAL IMPACTS TO WATER QUALITY

A summary of the site characteristics described in the previous sections are presented for the purpose of evaluating the potential impact the heap may have on water quality in the area.

Climate

The average annual precipitation for the Darwin Mine site is 4.03 inches, generally in the form of snow. Rain and snow represent virtually the only potential pathway for contaminants to disperse (see Section 4.4 for a description of berms and diversion structures). For water quality impacts to occur, contaminants from the heap must first be dissolved in solution and then transported to the surrounding environment. Minimal precipitation levels on site ensure that there is essentially no opportunity for contaminants to be transported into the surrounding area.

In addition to the limited amount of precipitation impacting the heap surface, the compacted nature of the fine-grained solids in the heap will further limit infiltration. The compacted condition of the heap solids, and thus poor infiltration of cyanide solution, was sited as the primary reason why poor silver recovery was obtained during heap leaching. Additionally, precipitation in the form of snow tends to evaporate rapidly. Annual evaporation rate for this area is 81 inches per year.

Surface Water

Surface water flow in the area is ephemeral, as evidenced by the infrequent flow in Lucky Jim Wash. An overbank study confirms that the heap is adequately protected from storm events, and that Lucky Jim Wash can carry a 100-year, 24-hour flood peak without any overbank flooding. There is no effluent discharging from the heap, and the only potential for discharge would be storm event surface runoff.

Groundwater

The potential impact that the heap effluent may have on groundwater is minimal given the low precipitation rate, and that deep wells in and around the heap have yet to intercept the water table. It is estimated from the lack of groundwater intercepted in the underground workings that groundwater occurs at depths of greater than 350 feet below the heap facility. In addition, hydrologic and pedologic conditions suggest little or no recharge of the deep regional groundwater system due to minimal ambient soil moisture content found at shallow depths and the occurrence of caliche zones. WESTEC concluded from analysis of in-house reports provided by Blue Range that movement of heap effluent through the alluvium would be highly unlikely.

It should be noted that the general lack of groundwater present in the area necessitated the transport of water for mining operations via a 3-1/2 mile overland pipeline from two wells in alluvial deposits of the Darwin Wash. Water for the town of Darwin is likewise supplied via an 8 mile pipeline from springs present in the Coso Range to the south (Figure 2).

Heap Cyanide Content

Recent analytical testing show that WAD cyanide, soluble total cyanide, and total cyanide after extraction is present in the heap solids below the regulatory limits. WAD cyanides, the most toxic of the cyanide forms, have degraded over time within the heap and are below the detection limit of 0.05 mg/kg. This is consistent with previous studies showing that cyanide salts of most cations are soluble and only move short distances through the soil before they are biologically converted under aerobic conditions to nitrates or fixed by trace metals through complex formation. Under anaerobic conditions, cyanides can be denitrified to gas as nitrogen compounds.

Heap Pad Configuration

The average clay liner permeability for lifts monitored during construction was reported to be 1.0 X 10^{-7} cm/sec, SK (Anaconda, 1982), within 1994 permeability specifications. QA/QC results have concluded that liner permeabilities were below, and often well below 1.0 X 10^{-7} cm/sec. It is highly unlikely that moisture will percolate through the heap given the climatic conditions of the site and the compacted nature of the heap solids. The risk of contaminating groundwater due to clay liner failure is considered negligible.

In addition to the 18-inch clay liner, the heap configuration includes structures to limit infiltration from surface runoff. The location of the heap pad upslope from Lucky Jim Wash, and the presence of two diversion berms and a north diversion ditch (Figure 3) are considered adequate surface runoff safeguards after their integrity is assured.

7.0 CLOSURE PLAN

The proposed closure approach is based on the regulatory compliance issues, site conditions and heap pad construction details as outlined previously, with the goal of closing the heap leach so that it will not pose a threat to water quality. In developing the closure approach the primary concerns are to minimize contact between heap solids and surface runoff, to prevent the degradation of water quality, and to minimize the long-term maintenance requirements.

7.1 CONCEPTUAL DESIGN

Based on a review of the climatic, hydrologic, geochemical, and design characteristics of the heap and the surrounding area, and test results, the following heap closure approach is proposed:

Task 1 - Heap Compaction/Dust Control
Task 2 - Gravel Removal
Task 3 - Heap Cover
Task 4 - Heap Seeding
Task 5 - Borrow Area Recontouring/Seeding
Task 6 - Monument Installations and Fencing

All closure tasks shall be performed under the supervision of a registered civil engineer or a certified engineering geologist. The following paragraphs provide descriptions of each proposed task.

Task 1 - Heap Compaction/Dust Control

Fugitive dust will be minimized during closure activities by wetting the heap surface during compaction and covering. Compaction of the heap surface will decrease the permeability of the solids, thereby reducing potential infiltration during infrequent storm events. The heap surface will be scarified and moisture conditioned prior to compaction with a drum roller.

Limited regrading of the heap slopes is anticipated because Blue Range has previously regraded the slopes to an overall slope of 3H:1V.

Task 2 - Gravel Removal and Berm Repair

The gravel located on the east side of the heap (Figure 3) will be removed to prevent rain infiltration from potentially contacting the heap. The gravel will be relocated to the north bank of Lucky Jim Wash for repair of the berm at this location. The gravel will further stabilize the embankment of the wash.

Task 3 - Heap Cover

A minimum of one foot growth medium will be placed on the heap surface to prevent wind erosion and water infiltration. Growth medium will be derived either from a local source on-site or hauled from a nearby source. A minimum of 12 inches is recommended because of the high winds in the area, where surface material is readily eroded. Growth medium will be dozer-spread to a uniform depth of 12 inches. The proposed cover for the heap is consistent with reclamation plan requirements outlined by the Planning Department (see Appendix B for a copy of the reclamation plan).

Task 4 - Heap Seeding

Seeding will promote plant establishment for the purpose of stabilizing the cover surface and decreasing heap infiltration by developing plant evapotranspiration processes. A seed mixture containing drought tolerant species requiring 4-6 inches annual precipitation will be applied via tractor and seed drill. Seeding will proceed in late fall immediately following growth medium application.

Task 5 - Borrow Area Recontouring/Seeding

If local growth medium is used, the borrow area where it was excavated will be recontoured and reseeded immediately after placement of cover is completed (as above).

Task 6 - Monument Installations and Fencing

It is the intent of Blue Range to install two (2) permanent monuments upon the surface of the heap leach pad to be used for monitoring during the post-closure maintenance period. If required, the periphery of the heap area will be fenced and signs posted at 200 foot intervals to prevent access to the area.

Maintenance of the north diversion ditch and the eastern berm structures will be conducted on an annual basis to ensure effective water diversion around the heap (Figure 3). Although the east diversion ditch has undergone erosional fill-in over a 12 year period, the five foot berm bordering the ditch provides sufficient protection from surface runoff. Blue Range will repair and reconstruct this ditch.

Figure 5 through 7 show the final configuration of the heap after closure activities are completed. The plan view (Figure 5) shows that the exposed gravel pad for the heap leach has been removed and that the east diversion ditch has been removed, because it has been naturally infilled. In addition, Figure 5 depicts the heap outslope and crest. The cross sectional schematic (Figure 6) is perpendicular to the heap and shows the 3H:1V outslope, the 18-inch clay liner, and the 12-inch cover consisting of local growth medium. Figure 7 shows an expanded schematic of the heap in cross section

7.2 POST-CLOSURE LAND USE

Blue Range has no interests in developing the Darwin site for any other future use at this time. Future site use,if any were anticipated, would be within the commercial or industrial classification. It is highly unlikely that this site, due to its rugged terrain and isolated location, would be used for any other purpose.

7.3 POST-CLOSURE MAINTENANCE

Inspection of the cover, berms, ditches, and monuments will be performed by Blue Range, or its representatives on a semi-annual basis to verify integrity of the closure requirements. Any discrepancies will be addressed and remedied. In addition, the location and elevation of the heap leach will be determined using the installed monuments during the semi-annual inspection to verify stability of the unit. Currently, post-closure care is planned for a one year period. The post-closure maintenance program will be evaluated at the end of the year.

No groundwater or leachate monitoring has been recommended because of the lack of potential risk of contamination from the heap leach. The following summary of information is provided in support of this position:

1. It has already been shown that no available groundwater exists in the current wells within the area, and none has been identified even at the 350 feet subsurface level.

2. The annual precipitation rate is a minimal 4 inches per year and the annual average evaporation rate is approximately 81 inches per year.

3. A liner exists at the base of the heap with a average permeability of 1.0×10^{-7} cm/sec.

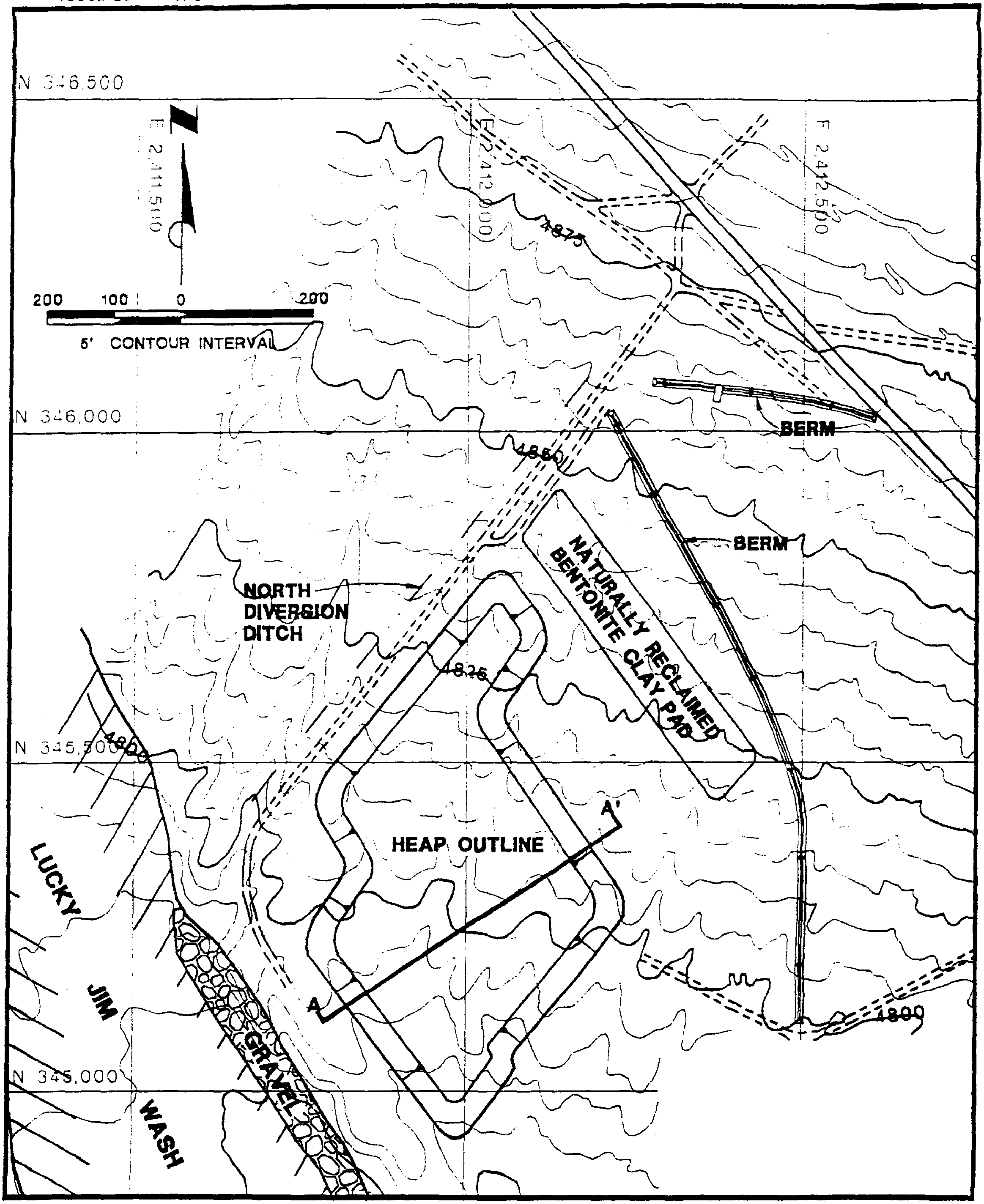

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FIGURE 5

DARWIN HEAP
POST-CLOSURE
CONFIGURATION

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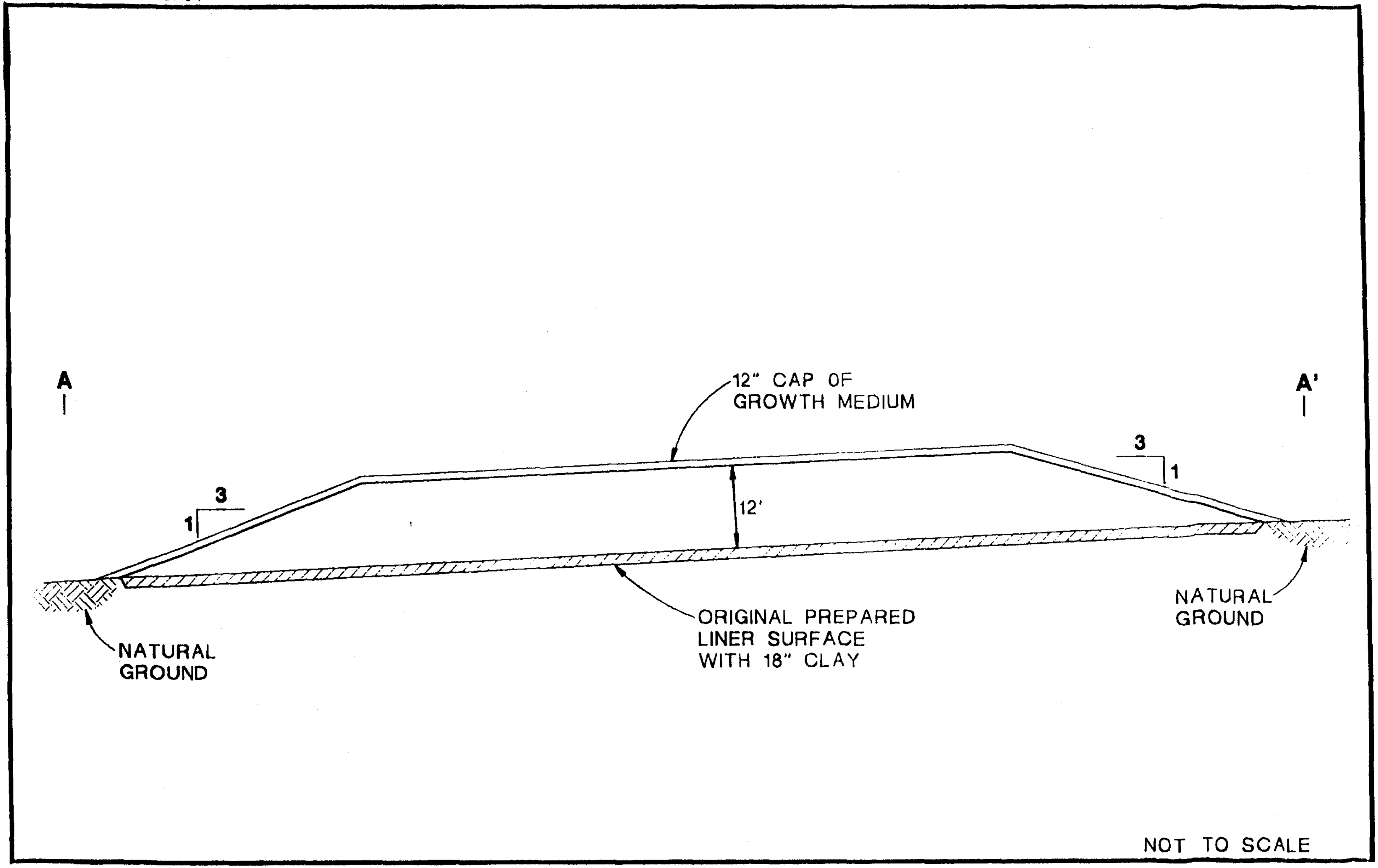

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FIGURE 6

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DARWIN HEAP
POST-CLOSURE
CROSS SECTION A-A'

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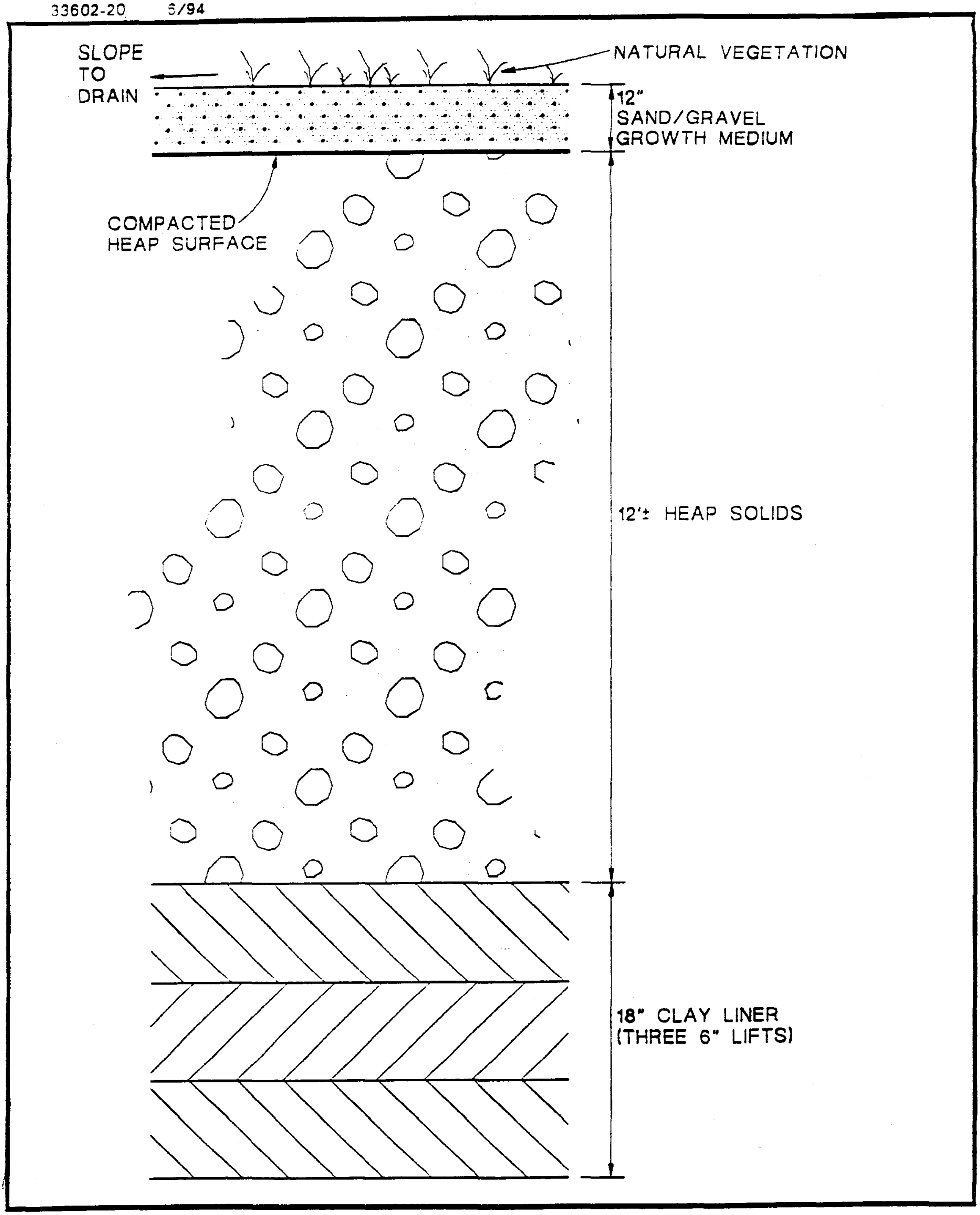

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DARWIN MINE

FIGURE 7

DARWIN HEAP CLOSURE CROSS SECTIONAL SCHEMATIC

4. The closure design details include berms to divert area wide run-off from contacting the heap and a cover which will be graded to prevent ponding.

5. The mine is inactive, and the costs to maintain personnel to monitor for the remote possibility of discharge is not warranted given the site conditions, heap characteristics and protective measure provided by the proposed closure approach.

7.4 COST/SCHEDULING

Tables 7.1 and 7.2 present the estimated costs and scheduling requirements associated with the closure and post-closure plans respectively.

TABLE 7.1
CLOSURE PLAN ESTIMATED COSTS AND SCHEDULING

		COST ESTIMATE ($)	SCHEDULE (days)
TASK 1	HEAP COMPACTION	12,584	2.0
TASK 2	GRAVEL REMOVAL	1,230	2.0
TASK 3	GROWTH MEDIUM	20,400	5.0
TASK 4	HEAP SEEDING		
	Seed Costs	693	NA
	Tractor/Seed Drill	420	2.0
TASK 5	BORROW AREA		
	Recontour	3,146	2.0
	Reseed Borrow Area	527	NA
	Borrow Area Labor (seed) 2175	347	2.0
TASK 6	Monuments/Fencing/Signs	4,320 0	3.0
	TOTAL ESTIMATES	**46,312**	**18.0**

Closure plan estimated cost excludes equipment mobilization/demobilization, construction management, and QA/QC considerations. This table will be updated when a contractor is selected to perform the work

TABLE 7.2
POST CLOSURE MONITORING ESTIMATED COSTS AND SCHEDULING

		COST ESTIMATE $	*Schedule* (days per year)
Task 1	Site Inspection - Semi-annual	4,000	10
Task 2	Monument Survey - Semi-annual	10,000	10
	TOTAL ESTIMATES	14,000	15

Post closure monitoring estimate is inclusive.

8.0 REFERENCES

Anaconda Minerals Company, 1982, Darwin Project Leach Pad Investigation: Report for the California Regional Water Quality Board- Lahontan Region, South Lake Tahoe, October.

Anaconda Minerals Company, 1983a, Hydrogeology of Lucky Jim Wash: Report for the California Regional Water Quality Board- Lahontan Region, South Lake Tahoe, April.

Anaconda Minerals Company, 1983b, Prediction of Percolation Rates through Leach Pad: Report for the California Regional Water Quality Board- Lahontan Region, South Lake Tahoe, April.

Anaconda Minerals Company, 1983c, Darwin Environmental Samples of Inactive Heap Leach, Report No. 1, May.

Anaconda Minerals Company, 1983d, Darwin Environmental Samples of Inactive Heap Leach, Report No. 2, December.

Anaconda Minerals Company, 1984, Darwin Environmental Samples of Inactive Heap Leach, Report No. 3, May.

Steffen, Robertson, and Kirsten (Colorado), Inc., 1981, Report on the Site Investigation and Design of a Heap Leach Impoundment at Darwin, California: Report No. 01204/1 prepared for Anaconda Copper Company, July.

Steffen, Robertson, and Kirsten (Arizona) Inc., 1982. Construction inspection, Darwin project, Anaconda Minerals Company: Letter report submitted to the Lahontan Regional Water Quality Control Board- Victorville, California, April.

APPENDIX A

PERMITS LISTED IN THE CLOSURE PLAN (DRAFT)

APPENDIX A

PERMITS LISTED IN THE CLOSURE PLAN

Abbreviation	Title	Number	Issuing Agency	Date Issued	Date Revised	Date Modified	Date Rescinded
CUP	Conditional Use Permit	80-25	Inyo County Planning Dept.	12/80			
	Revised	81-16	Inyo County Planning Dept.	8/81	8/81		
BO	Board Order	6-82-06	California Regional Water Quality Control Board - Victorville	1/82			
	Modified	6-83-107	California Regional Water Quality Control Board - Victorville			2/83	
	Modified	6-85-5	California Regional Water Quality Control Board - Victorville			2/85	
	Rescinded		California Regional Water Quality Control Board - Victorville				5/89

APPENDIX B

RECLAMATION PLAN
(FROM CONDITIONAL USE PERMIT #81-15)

County/City. Inyo County

SUGGESTED MODEL RECLAMATION PLAN

As a guide to Counties and Cities for Compliance with Section 2772, Surface Mining and Reclamation Act of 1975

OWNER, OPERATOR, AND AGENT

1. Applicant

   Name Anaconda Copper Company, a Division of The Anaconda Company,

   Address 555 17th St., Denver, Colorado 80217,

   Telephone (303) 575-4306

2. Name (if any) of Mineral Property

   Darwin Mine

3. Property Owners, or owners of surface rights (List all owners).

   Applicant - some areas. United States of America, Bureau of Land Management - other areas.

4. Owners of Mineral Rights

   Applicant

5. Lessee

   None

6. Operator

   Applicant

7. Agent of Process (Person designated by operator as his agent for the service of process).

   Name C T Corporation System,

   Address 700 S. Flower St., Suite 1010, Los Angeles, California,

   Telephone (213) 680-1500.

8. Brief description, including legal, of the extent of the mined lands (to be) involved by this operation, including total acreage. 350 acres.

Section(s)	SW 1/4 Sec. 13, SE 1/4 Sec. 14, NE 1/4 Sec. 23, Township T19S
Range	R40E
Meridian	Mt. Diabol

9. Describe the access route to the operation site.

The Darwin road which is to the south of highway 190, approximately 35 miles southeast of Lone Pine, California.

10. Attach Location and Vicinity Map.

See attached maps.

DESCRIPTION

11. Mineral commodity (to be) mined:

Silver and minor amounts of gold from the existing tailing on the site.

12. Geologic description, including brief general geologic setting, more detailed geologic description of the mineral deposit (to be) mined, and principal minerals or rock types present.

This project entails reprocessing tailing that was produced from the mining and milling of a deposit that has the following geologic description:

The Darwin Hills are underlain by a thick sequence of limestone, silty and sandy limestone, shale and siltstone that ranges in age from Devonian on the west side of the Darwin Hills to Permian on the east. Structurally the Darwin Hills are an overturned syncline with an axial plane that dips about 50° W. The Paleozoic rocks in the Darwin district are broken by four sets of faults. These faults are the feeder fissures for the lead-silver-zinc and for the tungsten deposits of the Darwin district.

The western slope of Ophir Mountain is mainly limestone. The present mill site and tailings areas at Darwin is underlain by this limestone, which may be cherty in areas.

13. Brief description of environmental setting of the site and the surrounding areas. Describe existing area land use, soil, vegetation, ground water elevation and surface water characteristics, average annual rainfall and/or other

factors pertaining to environmental impacts and their mitigation and reclamation.

The project area and surrounding areas are situated in the Mojave Desert. Existing land use is mining and milling (an inactive mine and mill). Soil is of a thin desert soil, easily eroded by wind and water and it overlays a thick limestone bedrock. Vegetation is typical Mojave Desert flora with plants adapted to low precipitation and high temperatures and is widely spaced. Vegetation is dominated by shrubs and succulents (cacti) with forbes and grasses evident after rainy periods. Ground water elevation is 50-90 feet below the surface in Darwin Wash and in excess of 115 feet below surface at the leach area. No permanent surface water exists on or near the project site. Some surface water exists for a short time immediately following a heavy rainfall. Average annual rainfall in this area is less than 5 in./year. Environmental impacts of this project will be minor because most of the proposed activites will occur on previously disturbed land, the mill site and old tailing pond. Only about 10 acres of previously undisturbed land will have to be disturbed to accomodate a portion of the pad and leach heaps. The two small tailing ponds between the Darwin Road and the mill will be processed and this area will be returned to original contour. The leach pad and leach heaps will occupy the area now occupied by the large tailing pond situated between Darwin Road and Lucky Jim Wash plus 10 acres adjacent to this pond on the west boundary. When processing is completed this area just described will be covered by agglomerated, leached tailing 15 feet deep. The surface of these treated tailings will be leveled, the sides gently sloped and the entire area covered with waste rock and/or native soils to encourage revegetation and discourage dust generation.

PROPOSED (EXISTING) SURFACE MINING OPERATION:

14. Proposed starting date of operation

Upon receipt of the proper permits construction will commence

Estimated Life of Operation

4 to 5 years;

Duration of First Phase

Engineering Design and Construction will last approximately 6 months but could be somewhat less.

15. Operation will be (is):

Continuous.

16. Operation will be (is):

1,250,000 tons

17. Total anticipated production

Mineral commodities to be removed-	1,250,000 tons,
Waste retained on the site-	1,250,000 tons
Waste disposed off site-	0 tons
Maximum anticipated depth-	15 feet

18. Other

Remove tailing from present site, retreat, and replace in one of the existing disposal sites.

19a. If processing of the ores or minerals mined is planned to be conducted at or adjacent to the site, briefly describe the nature of the processing and explain disposal method of the tailing or waste from processing.

Tailings resulting from the milling operations have a residual silver content of approximately 1.3 oz. per ton. Recent improvements in cyanide leaching techniques and higher prices for silver have made it economically feasible to reprocess these tailings to recover the remaining silver.

Because of the finely ground nature of tailings, the conventional method of leaching has been to slurry the tails and leach them with a dilute cyanide solution in a tank, with agitation to keep the tails in suspension. A recent development by the Bureau of Mines, referred to as "agglomeration", increases the percolation rate of solution through this type of material to such an extent that it can be leached by the heap leaching process. Full scale tests on Darwin tails have demonstrated that this method works very well on this material.

The process selected for Darwin consists of three distinct phases; mining and preparing the material for leaching, applying the cyanide solution and dissolving the silver, and removing the dissolved silver from solution. The first phase also consists of three steps. In the first, mining, the tailings, which have been partially recemented in the form of a weak sandstone, will be ripped and broken by a bulldozer and loaded into the hopper feeding an impact crusher by means of a frontend loader. The crushed material, all minus one half inch size, will be conveyed by conveyor belt to a balling drum. While on the belt, a measured amount of processed lime and portland cement will be added. The mixture will be fed into the drum with a measured amount of water. The balling drum is an open ended revolving cylinder 11 feet in diameter by 30 feet long with the axis inclined from the horizontal a few degrees. The mixture of tails, lime, cement and water, fed into the high end of the revolving drum, is rolled along and discharged as an agglomerate. The agglomerate has the appearance of being composed of mud balls of 1/8" to 3/8" size. The agglomerate is discharged into a pile of about 1500 tons, where it is allowed to cure for 48 hours.

Leaching takes place on a specially prepared pad. The pad consists of a mixture of clay and natural soil combined with the optimum amount of water to allow compaction to 95% plus density. This provides an impervious surface for leaching. The leach surface is on a slope with a collection pond on the down hill side. After the agglomerate has cured for 48 hours, it is moved by frontend loader to the leach pad, and placed in a "heap" approximately 15' high. A pipe and sprinkler system is placed on top of the heap to dispense an aqueous low concentration sodium cyanide solution. The solution percolates through the heap, dissolving the silver, until it reaches the impervious pad. It then flows down the surface of the pad, under the heap, and is collected in the "pregnant" solution pond. From this pond, the solution is pumped to the metal recovery section. This section utilizes the Merrill-Crowe process, an old and thoroughly proven method of removing precious metals from cyanide solution by precipitating them with metallic zinc.

At Darwin, the pregnant solution from the pond will be pumped to a 175,000 gallon surge-clarification tank. This tank is part of the old concentrator. From here it is pumped to the Merrill-Crowe units, which consist of a clarification filter, a deaeration tank, a zinc feeder, and a precipitate filter. Three of these units will be used. They are built as a package, and each will fit in the bed of a pickup truck. They will be installed in a part of the old concentrator building.

The silver precipitate will be pumped to a filter press for de-watering, then to an oven for drying, and the dried product will be sold to a precious metal refiner.

The "barren" solution, from which the silver precipitate has been removed, will have the cyanide concentration increased to the required level, and it will then be returned to the heap for further leaching.

During the life of this operation, all phases of the process will be continuous. Mining and agglomerating, pad and heap construction, leaching and silver recovery will all occur throughout the life of the project. On completion, there will be one large heap containing all the tailings now existing on both sides of the Darwin road. They will occupy an area approximately equal to that now covered by the tailings on the lower side of the road. The heap will be entirely on the impervious pad, and will be covered, after completion of the leaching process, with native soil. The new location will be out of the channel of Lucky Jim Wash, and surface run-off will be diverted by means of diversion ditches. The entire area will be fenced so that wild life, livestock, and casual pedestrians cannot wander into the area.

During the initial operation, test work will be conducted to determine whether or not a second lift can be built on the heap without compacting it to such a degree that percolation is destroyed. If this can be done, it will decrease the final area covered by approximately half.

To date, an effective method of destroying residual cyanide in leached tailings has not been developed. The heap at Darwin will be washed with several displacement volumes of water, and if a satisfactory method of destroying the small remaining quantity of cyanide is developed, this will be done.

The entire system of heaps, pipelines, and tanks is protected by lined ditches leading to a lined emergency pond. This pond is large enough to contain all the solution in the system plus the run-off from a 100 year storm. All parts of the system and the emergency pond are clear of the drain channel in Lucky Jim Wash.

19b. **Estimate quantity (gallons per day) and quality of water required by the proposed operation, specifying proposed sources of this water, of method of its conveyance to this property and the quantity and quality and method of disposal of used and/or surplus water.**

100 or less gpm of water will be required which will be pumped through an existing pipeline from Anaconda's pumpsite located approximately 2 miles from the mine. All of the water will be reused and the plant and leach pad will be zero discharge.

20. If the nature of the deposit and the mining method used will permit, describe and show the steps or phases of the mining operation that allow concurrent reclamation, and include a proposed time schedule for such concurrent activities.

To be done on drawings. See Plot Plan.

21. Attach a map of the mined lands and/or suitable aerial photograph showing:

(a) Boundaries and topographic details of the site;
(b) Location of all streams, roads, railroads, water wells, and utility facilities within 500 feet of the site;
(c) Location of all currently proposed access roads to be constructed in conducting the surface mining operation(s);
(d) Location of areas (to be) mined, and of waste dumps and tailing ponds.
(e) By use of overlay symbol or color, depiction of separate mining phases if applicable. (See Item 20)
(f) The source of map, base, orientation (North arrow), and scale (e.g., 1" = 500', etc.) of the map.

See Plot Plan.

RECLAMATION PLAN:

22. Indicate on an overlay of map of Item 21, or by color symbol on map those areas to be covered by reclamation plan.

Overlay: See Plot Plan
Acreage: Tailing beneath road 50 acres
Tailing above road 10 acres
New tailing disposal area 30 acres total but only 10 acres of presently undisturbed land.

Total: 70 acres

23. Describe the ultimate physical condition of the site and specify proposed use(s), or potential uses, of the mined lands as reclaimed.

Existing tailing area: The area occupied by the two small tailing ponds (above the Darwin Road) will be returned to original contour and seeded with Indian rice grass and rabbit brush. The area now occupied by the large tailing pond (below Darwin Road) will be the site of the new leach pad and leach heaps.

New tailing disposal area: All existing tailing material will be ripped, crushed, agglomerated into small pellets using cement and lime and placed on a clay pad to be built in the area where the large tailing pond now exists. The final tailing material will be placed in a heap that will be 15 ft. deep and occupy an area of about 30 acres. The side slopes will be about 2:1. The top and sideslopes will be covered with soil stripped from the area for pad construction and waste rock from the existing rock waste dump. The reclaimed area will be planted with Indian rice grass and rabbit brush. The area will eventually revert to wildlife habitat.

24. Describe relationship of the interim uses other than mining and the ultimate physical condition to:

(a) Zoning regulations.
(b) General plan and plan elements.

The tailing ponds will be reclaimed and will revert back to open space land use. Mining is permitted under the Inyo County general plan for this area.

25. Provide evidence that all owners of a possessory interest in the land have been notified of the proposed use(s) or potential uses identified in Item 22. (Attach copy of notarized statement of acknowledgement, etc.)

The only owner of a possessory interest in the land other than the Applicant is the United States of America through the Bureau of Land Management. The BLM has approved Anaconda's Plan of Operations as required by regulations under the Federal Land Policy and Management Act.

26. Describe soil conditions and proposed soil salvage plan.

The soil is thin and easily eroded. Soil presently on the area of the proposed new leach pad will be removed and stockpiled to be eventually placed over the new leach heap along with waste rock to encourage plant growth and prevent generation of dust.

27. Describe the methods, their sequence and timing, to be used in bringing the reclamation of the land to its end state. Indicate on the map (Item 21-22) or on diagrams as necessary. Include discussion of the pertinent items listed below.

(a) Backfillig and grading.
(b) Stabilization of slopes.
(c) Stabilization of permanent waste dumps, tailings, etc.

(d) Rehabilitation of pre-mining drainage.
(e) Removal, disposal, or utilization of residual equipment, structures, refuse etc.
(f) Control of contaminants, especially with regard to surface runoff and ground water.
(g) Treatment of streambeds and streambanks to control erosion and sedimentation.
(h) Removal or minimization of residual hazards.
(i) Resoiling, revegetation with evidence that selected plants can survive given the site's topography, soil and climate.

The areas presently covered by tailing will be reclaimed upon removal of the tailing. These areas will be graded and covered with the material presently on top of the tailing. Area (1) will be reclaimed after about 2 years of operation. Area (2) will be reclaimed at the end of operations.

The new tailing area will be covered with topsoil (or borrow material). Wind erosion of the top surface will be limited by covering it with a sufficient thickness of rock from the existing waste rock dump. It is not expected that a dense enough vegetation cover can be established in the climate at Darwin to prevent wind and water erosion. These measures should secure long-term stability.

The tailing and mill will be run as a closed system, no discharge of water will be allowed into the environment. Runoff from the mill area and leach pad will be intercepted during operations and will be evaporated in a prepared pond. The interception ditches and other associated structures will be reclaimed and/or removed at the time of reclamation.

The large depth to the groundwater table (115 ft.) plus the low permeability of the pad on the tailing site will prevent any groundwater contamination.

The leach pad and leach heap will be kept above the flood plain of Lucky Jim Wash to prevent erosion by occasional surface wash. Drainage ditches and surface water collection pond will be designed to collect and hold all surface water that might fall on the leach pad during the 100 year storm.

28. If applicant has selected a short term phasing of his reclamation, describe in detail the specific reclamation to be accomplished during first phase.

NA

29. Describe how reclamation of this site in this manner may affect future mining at this site and in the surrounding area.

No effect on future mining.

APPENDIX C

GUIDELINES FOR SAMPLING HEAP SOLIDS

disk: jwc#3
file: cyanide.pro

California Regional Water Control Board
Lahontan Region

SAMPLING METHODS AND PRACTICES FOR DETERMINIMG CYANIDE LEVELS IN MINING PROCESS WASTES

The Regional Board has established maximum cyanide concentrations for process wastes resulting from precious metals extraction of ore using a cyanide process. At the end of a leaching or milling process, detoxification of the remaining cyanide in the ore is required to meet these maximum levels.

The analytical procedures for quantitative determination of cyanide concentrations in liquids, solids, and slurries are currently in a state of flux. The need to determine cyanide species in a wide variety of situations has resulted in the development of a profusion of methods that are frequently complex and cumbersome to use on a routine basis. Random modifications of analytical procedures has led to confusion in interpretation of various test results. Regional Board staff are frequently unable to properly identify the cyanide species (free, simple, complex) represented in various studies because of the ambiguities in the analytical procedures used. The need has arisen to standardize analytical procedures for quantitative determinations of cyanide concentrations in process wastes.

The Regional Board staff has prescribed a series of analytical procedures that should be used to determine quantitative levels of the specified maximum cyanide concentrations remainimg in the process wastes. This will assist both staff and dischargers in meaningful interpretation of the various sample results.

MAXIMUM REMAINING CYANIDE CONCENTRATIONS

For detoxification to be considered complete; the residual cyanide in any tailings, leach pad, solution pond or tank should not exceed the following limits:

Process Waste Fraction	Parameter	Value
Liquid (Barren solution effluent or the liquid fraction of slurries in any leach pad pond or tanks)	i) Total Cyanide	1.0 mg/L
	ii) WAD[1/] Cyanide	0.2 mg/L

Solid (Heap Leach process tailings or solid fraction of slurries)	i) Soluble WAD[1/2/] Cyanide	0.5 mg/Kg
	ii) Soluble Total Cyanide	2.5 mg/Kg
	iii) Total Cyanide After Extraction of Soluble WAD[1/] and Soluble Total Cyanide	10.0 mg/Kg

[1/] Weak Acid Dissociable or Free Cyanide
[2/] Not required for slurries.

LIQUID FRACTION ANALYSES

The methodology for the liquid fraction cyanide analyses should be as follows:

1. Analyses for Total Cyanide in the liquid should be conducted in accordance with ASTM Method D2036-81 A.

2. Analyses for WAD Cyanide (weak acid dissociable or free cyanide) in the liquid shall be conducted in accordance with ASTM Method D2036-91 C.

SOLID FRACTION ANALYSES (HEAP LEACH)

The methodology for the solid fraction cyanide analyses in **HEAP LEACH** solid wastes should be performed using the following methods.

1. For extraction of **Soluble WAD Cyanide** content use the following:

   a. Take 500 grams of dry tailings and put into 2.5 L de-ionized water at neutral pH in an air-tight capped container. Select the container size to minimize head space.

   b. Stir mildly for 24 hours at room temperature.

   c. Filter entire slurry from Step (b) through No. 42 Whatman paper and immediately analyze an aliquot for WAD Cyanide.

   d. Calculate soluble WAD Cyanide as in Step (2.d) below.

2. **For extraction of the Soluble fraction of Total Cyanide use the following:**

   a. Take 500 grams of dry tailings and put into 2.5 L distilled water; adjust to pH 5 with H_2SO_4.

   b. Stir mildly for 24h at room temperature in an air-tight capped container with no head space.

c. Filter entire slurry from Step (b) through No. 42 Whatman paper and analyze an aliquot of filtrate for Total Cyanide. Use the remaining solid fraction for Total Cyanide in Step (3) below.

d. To calculate soluble mg CN/Kg solids =

$$\text{mg CN/Kg} = \frac{\text{(mg/L CNT in filtrate)} \times 2.5}{0.5}$$

3. For determination of Total Cyanide after extraction of Soluble WAD and Soluble Total Cyanide in the solid fraction use ASTM D2036-81 A, using a minimum of 5 grams of the solid portions remaining from Steps (1 and 2) above.

SOLID FRACTION ANALYSES (MILL SLURRY)

The methodology for the solid fraction cyanide analyses in **MILL SLURRY** solid wastes should be performed using the following methods.

1. For extraction of the Soluble fraction of Total Cyanide content use the following:

a. Sample slurry to get at least 1 L.

b. Filter and wash solids with distilled water.

(1) first wash with 300 ml, letting all water go through;
(2) second wash with 300 ml.

c. Take 590 grams of wet cake (this will contain about 500 grams of dry tailings) and put into 2.5 L distilled water; adjust tp pH 5 with H_2SO_4.

d. Stir mildly for 24h at room temperature in an air-tight capped container.

e. Filter entire slurry from Step (d) through No. 42 Whatman paper and analyze an aliquot of the filtrate for Total Cyanide.

f. To calculate soluble mg CN/Kg solids =

$$\text{mg CN/Kg} = \frac{\text{(mg/L CNT in filtrate)} \times 2.5}{0.5}$$

2. For determination of **Total Cyanide after extraction of Soluble Total Cyanide** in the solid fraction use ASTM D2036-81 A, using a minimum of 5 grams of the solid portions remaining from Step (1) above.

Minor modifications to the ASTM methods to eliminate known interferences and analytical problems due to unique properties in the process wastes are allowed providing such modifications are reported along with the sample results.

MINIMUM NUMBER OF SOLID SAMPLES

For determining if detoxification is complete, the standard deviation from mean of sample results should not exceed 10% from a minimum of 10 samples collected. In the case of leach pads, the number of samples should be per pad or cell, whichever is smallest in area. A larger number of samples may be necessary.

SAMPLE LOCATIONS

Monitoring and reporting programs specify that the sample locations are to be located using a grid system to provide representative sampling of the heap. At each grid loacation, samples should be collected at the 25 percent, 50 percent, and 75 percent depths measured from the top of the heap. If the ore was placed in lifts greater than 10 feet then a larger number of samples may be necessary to determine overall leach pad values of cyanides.

QUESTIONS?

If you have any questions concerning the analytical procedures please call Dr. Ranjit Gill in our Lake Tahoe office at (916) 544-3481. If you have other questions please call Jehiel Cass in our Victorville office at (619) 241-6583.

APPENDIX D

HEAP pH ISOPACH MAP SAMPLING PROGRAM

56 E. Mercury
Butte, MT 59701
(406) 782-1433
(406) 782-6967 FAX

Blue Range Mining Co., LP

HC 87 Box 5225
Lewistown, MT 59457
(406) 538-2575
(406) 538-2214 FAX

July 2, 1990

Mr. Jehiel W. Cass
California Regional Water Quality Control Board
Lahontan Region
15428 Civic Drive, Suite 100
Victorville, CA. 92392-2359

Re: Board Order #6-85-5

Dear Jay:

Enclosed please find an isopach of the Darwin pH Composite Analysis for the heap leach site. Per the data you forwarded to me regarding the testing for pH, we utilized EPA Method #9045. The testing is very time consuming and exacting as you probably already know.

The overall spread in the pH is small. We do see a high in the southwest quadrant of the heap versus the northeast quadrant. I can't really tell you why at this point. A guess might be that the material was more compacted here because of the ramp nearby.

I have exhausted my supply of abandoned heaps in this area regarding final detoxification. Little or no data is available. The heap at Darwin is stable at this point and we may desire to cover as much of the heap with available topsoil as possible to protect it from wind erosion.

With the minute amounts of precipitation and no ground water whatsoever, this may be the best solution. Please consider this action in your deliberations. Let me know if I can provide you with any further information.

Sincerely,

Edward S. Mihelich
Mining Engineer

cc: D. D. Bowler (Darwin)
File - Darwin:Water Quality Control Board

ESM/xwqcb2.6

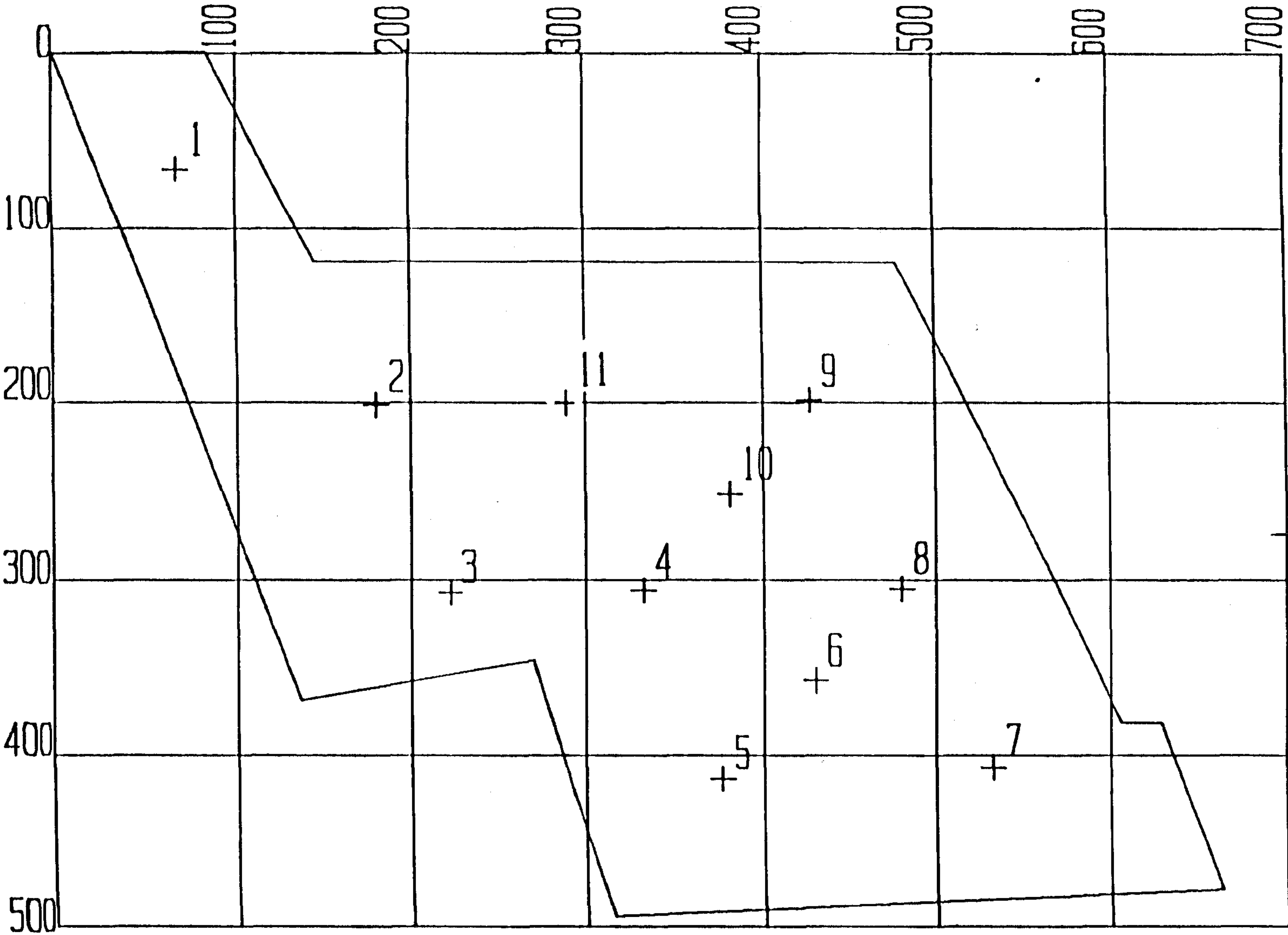
Date: 6-18-[illegible] **Type Run:** pH analysis **Run No.:** 1

Customer/Sample Description	Ticket Control Number	Assay No.	If Rerun	pH											
		Blank													
LP#1 Comp		1		8.05											Darwin Hemp
#3		2		8.65											pH analysis
#4		3		8.05											
#5		4		8.30											
#7		5		8.25											
#8		6		8.25											
#9		7		7.90											
#10		8		7.95											
#11		9		7.95											
		10													
		11													
		12													
		13													
		14													
		15													
		16													
		17													
		18													
		19													
		20													
		21													
		22													
		23													
		24													

Comments:

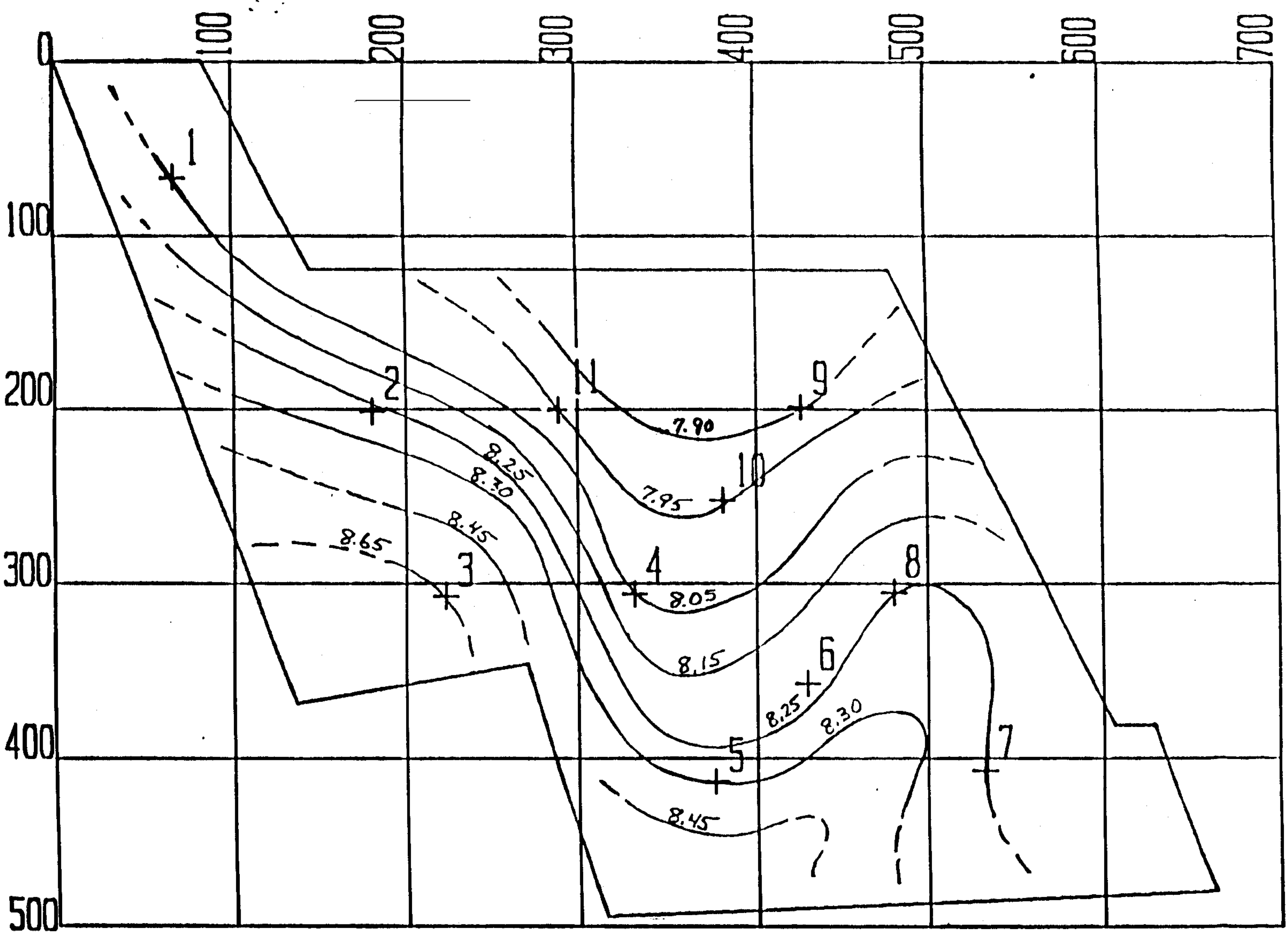
ASSAYER: T.B.

Darwin Heap Leach Sample Grid



PH ANALYSIS* (COMPOSITES)

Darwin Heap Leach Sample Grid



* EPA METHOD #9045

APPENDIX E

ANALYTICAL RESULTS

APR 1 5 1994

Laboratory Analysis Report

Sierra Environmental Monitoring, Inc.

WESTEC
NANCY JACKSON
5250 NEIL RD, SUITE 300
RENO NV 89502

Date : 4/14/94
Client : WET-603
Taken by: WESTEC
Report : 10326
PO# :

Page: 1

Sample	Collected Date	Time	CYANIDE,TOTAL MG/L	CYANIDE,WAD MG/L				
[2-3.0 - SOLUBLE TOTAL	3/26/94	:	<0.025 MG/KG					
D.. 2-3.0 - TOTAL AFTER EXTRACT	3/26/94	:	1.4 MG/KG					
DH-2-3.0 - SOLUBLE WAD	3/26/94	:		0.035 MG/KG				
DH-2-6.0 - SOLUBLE TOTAL	3/26/94	:	<0.025 MG/KG					
[2-6.0 - TOTAL AFTER EXTRACT	3/26/94	:	0.90 MG/KG					
[2-8.0 - SOLUBLE TOTAL	3/26/94	:	<0.025 MG/KG					
DH-2-8.0 - TOTAL AFTER EXTRACT	3/26/94	:	3.0 MG/KG					
DH-6-3.0 - SOLUBLE TOTAL	3/26/94	:	0.42 MG/KG					
[6-3.0 - TOTAL AFTER EXTRACT	3/26/94	:	1.2 MG/KG					
[6-6.0 - SOLUBLE TOTAL	3/26/94	:	0.58 MG/KG					
D.. 6-6.0 - TOTAL AFTER EXTRACT	3/26/94	:	1.8 MG/KG					
DH-6-6.0 - SOLUBLE WAD	3/26/94	:		0.050 MG/KG				
DH-6-9.0 - SOLUBLE TOTAL	3/26/94	:	0.16 MG/KG					
[6-9.0 - TOTAL AFTER EXTRACT	3/26/94	:	0.94 MG/KG					
[6-9.0 - SOLUBLE WAD	3/26/94	:		0.035 MG/KG				

Approved By: ____________________

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

'illiam F. Pillsbury
resident

1135 Financial Blvd.
Reno, NV 89502
Phone (702) 857-2400
FAX (702) 857-2404

John C. Seher
Manager

CHAIN OF CUSTODY RECORD

Client Name: WESTEC / Blue Range Mining
Phone Number: (702) 828-6800 x 114
Client Address: 5250 Neil Rd. #300
P.O. Number: Ø
City, State, Zip: Reno NV 89502
Project Name: Darwin Heap
Project Number: 33602
Sampled By: DANA BROWN
Signature: [signature]

BT = Brass Tubes
A = Analyze
H = Hold

Sample Number	Date Sampled	Time Sampled	Sample Description	Number Of Containers	Analyses Required								Remarks/ Preservative
													- 4°C -
DH-2-3.0	3-26-94	15:00	Soil	3-BT									
DH-2-6.0	↓	↓	↓	↓									
DH-2-8.0	↓	↓	↓	↓									
DH-6-3.0	↓	15:30	↓	↓									
DH-6-6.0	↓	↓	↓	↓									
DH-6-9.0	↓	↓	↓	↓									

	Signature	Company	Date	Time
Relinquished by:	[signature] DANA BROWN	WESTEC	3-28-94	09:20
Received by:	[signature] NANCY JACKSON	WESTEC	3-28-94	9:20
Relinquished by:	[signature]			
Received by:	[signature] S. Parke	SEM	3/28	9:57am
Relinquished by:				
Received by:				

112.FRM
April 15, 1992

PROJECT D.R. 2

CHAIN OF CUSTODY RECORD

Client Name	WESTEC.	PO #	
Address	5250 Neil Road	Phone #	828 6800
City, State, Zip	Reno, NV 89509	Report Attention	N. JACKSON

Sampled by:

	Date Sampled	Time Sampled	Type* See Key Below	Sample Description	Number of Containers	CN - WAD - LAHONTAN	Analyses Required						Remarks
5	52294		SO	CN - WAD - LAHONTAN	11	*	[illegible]						COMPOSITE
5	52294		SO	CN - WAD LAHONTAN	11	*	1						COMPOSITE
5	51294		SO	CN - WAD LAHONTAN	11	*							COMPOSITE
				DH-2 - 9' SAMPLE(TOS)									
				DH-2 6'									
				DH-6-3'									

Retain extra sample freeze!

	Signature	Print Name	Company	Date	Time
Relinquished by	[signature]	N. JACKSON	WESTEC	52794	1450
Received by	/	/	/	/	/
Relinquished by	/	/	/	/	/
Received by Laboratory	[signature]	JOHN SETER	SEM, INC.	52794	14:55

SIERRA ENVIRONMENTAL MONITORING, INC
1135 Financial Boulevard
Reno, Nevada 89502
(702) 857-2400 • FAX (702) 857-2404

Note:
Samples are discarded 60 days after results are reported unless other arrangements are made
Hazardous samples will be returned to client or disposed of at client expense.

* Key: AQ-Aqueous SO-Soil WA-Waste OT-Other

Drinking Water Bacteria ☐ Compliance
☐ Non Compliance