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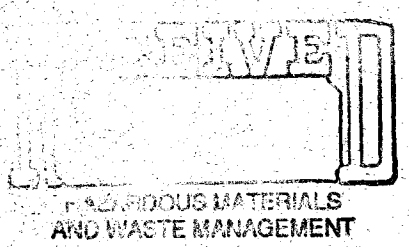
1998 DURITA SITE RECLAMATION
AND
CONSTRUCTION VERIFICATION REPORT



Prepared for:

Hecla Mining Company
6500 Mineral Drive
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Prepared by:

Monster Engineering, Inc.
3031 Bonner Spring Ranch Road
Laporte, Colorado 80535

September 21, 1998

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November 5, 1998

EXECUTIVE SUMMARY

This report documents reclamation work completed during the 1998 construction season at Hecla Mining Company's Durita Site near Naturita, Colorado. Verification that all work was conducted according to specifications, plans, license conditions, and regulations is also contained in this report and the Appendices.

The Durita Site was a uranium and vanadium, secondary-extraction heap leach facility that utilized uranium mill tailings originally processed through the Naturita Mill. All reclamation at the Durita Site was carried out with Colorado Department of Public Health and Environment (CDPHE) approval and authority, and was directed by Hecla according to their existing Colorado Radioactive Materials License and CDPHE regulations.

Overall site reclamation is divided into six separate work projects. Reclamation was completed under one project (Contamination Clean-up) during 1997, and under three projects in 1998 (Leach Tank Stabilization, Evaporation Pond Stabilization, and Surface Water Diversion). 1998 Reclamation work included:

- **Leach Tank Stabilization** - completed regrading on the tops of all three leach tanks to ensure that ponding will be minimized and that surface water runoff will not concentrate
- **Evaporation Pond Stabilization** - continued to monitor facility settlement and top surface erosion
- **Surface Water Diversion** - completed minor repairs from erosion to main diversions and several minor tributaries, and completed minor regrading
- **Erosion Protection** - completed placement of top and outslope rock cover, and scour protection on and at the base of the Closure Cell; placed a majority of the riprap and scour protection in the East and Central Diversions; placed additional rock cover on leach tank outslopes; completed rock placement in minor diversions and tributary areas showing potential for erosion
- **Surface Restoration** - completed regrading in the Evaporation Pond area; regraded transition areas where erosion had occurred since the 1997 construction season

Hecla completed the above reclamation activities on June 12, 1998.

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1.0 INTRODUCTION

1.1 Document Background

This report was written to document reclamation work completed during the 1998 construction season at Hecla Mining Company's Durita Site near Naturita, Colorado. Information for this report was provided by the following:

- On-site project manager and erosion protection testing - Douglas O. Gibbs, P.E.
- Design engineer of record - Alan Kuhn, P.E.
- Independent testing laboratories - Lambert and Associates
- Site surveyors - Del-Mont Consultants, Inc.

This report provides a description of work accomplished, and provides verification that all work was completed according to specifications, plans, license conditions, and regulations as outlined in the following documents:

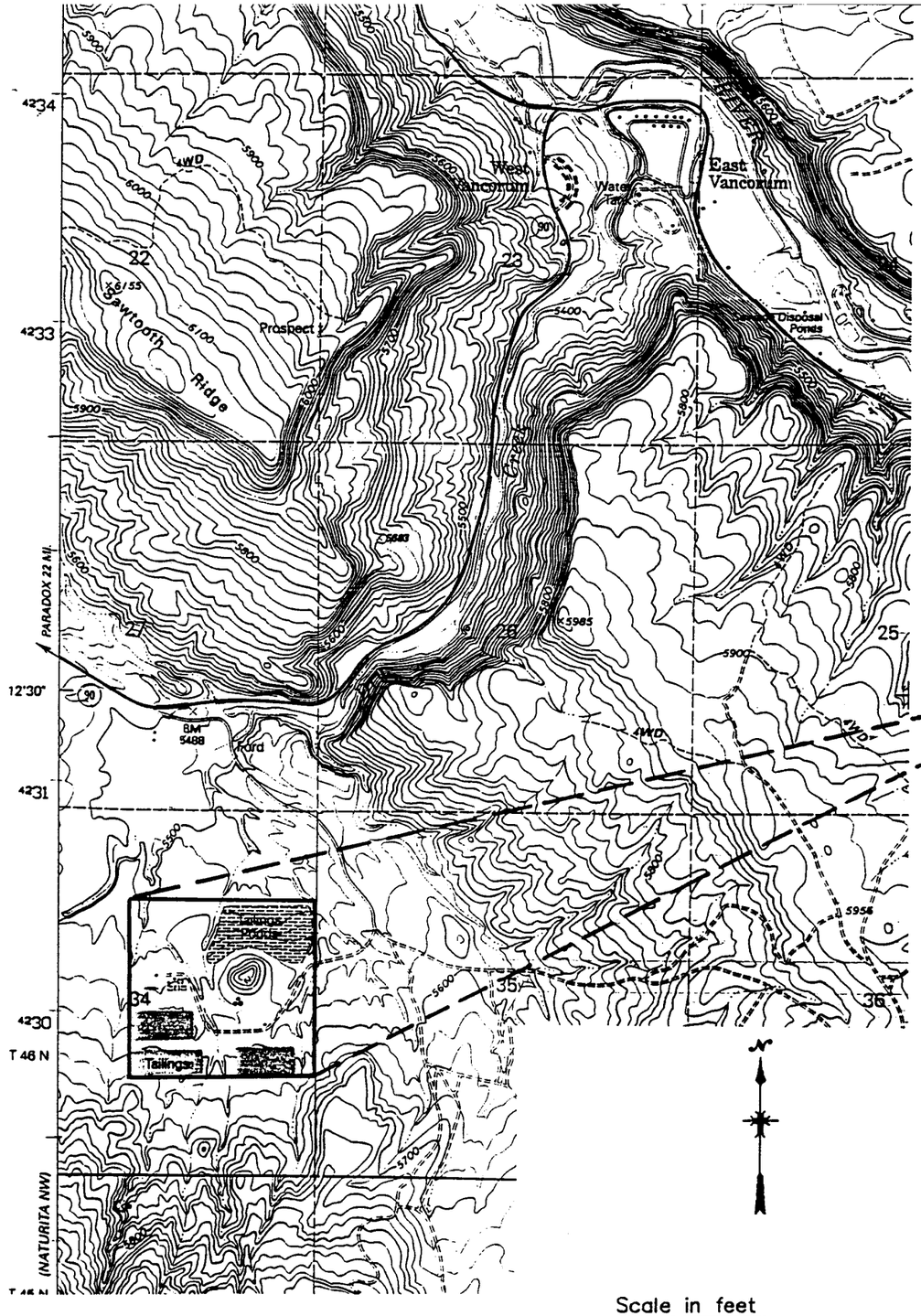
- Final Reclamation Plan for the Durita Site (AKG, 1991)
- Colorado Department of Public Health and Environment (CDPHE) approved Construction Verification Program (CVP) for the Durita Site Reclamation (Hecla, 1995a)
- Colorado Department of Public Health and Environment (CDPHE) approved Quality Control Procedures (QCP) for the Durita Site Reclamation (Hecla, 1995b)
- Durita Site, 1997 and 1998 Reclamation Plan (MEI, 1997a)
- Colorado Radioactive Materials License (No. 317-02, Amendment #11) (CDPHE, 1997) for the Durita Site
- CDPHE Regulations, Part XVIII, Appendix A, Criteria #2, 4C, 4D, 5, 6, and 7A

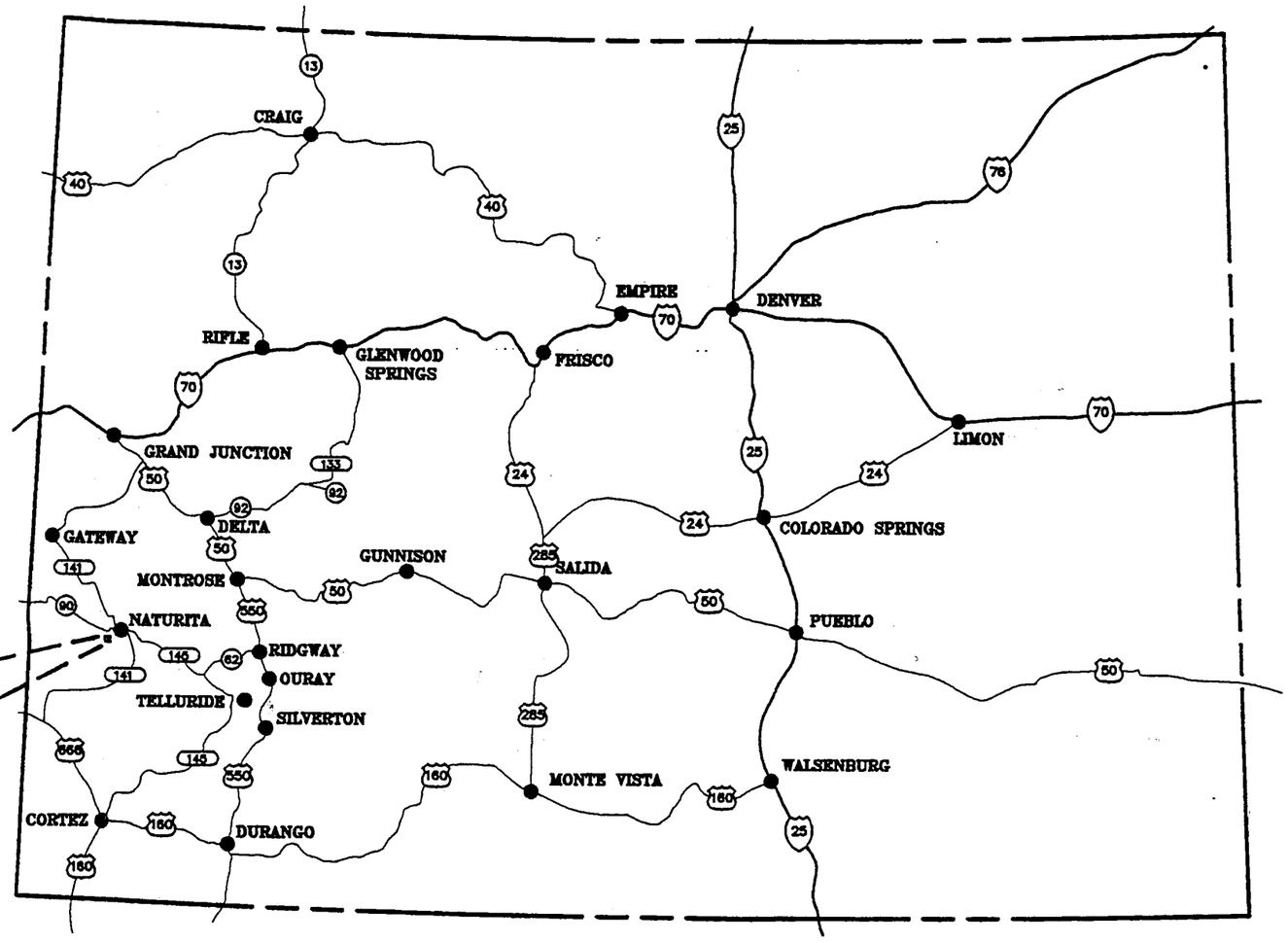
1.2 Site Background and Location

The Durita Site (the Site) is located approximately 3 miles southwest of Naturita, Colorado (Figure 1). It operated from the fourth quarter of 1977 to the second quarter of 1979. The Site contained a secondary-extraction heap leach facility that recovered uranium and vanadium from uranium mill tailings originally processed through the Naturita Mill. Tailings were trucked to the Site, processed at the Ore Preparation Area, and conveyed and trucked to the Leach Tanks. Pregnant solutions were collected in the tank bottoms and allowed to gravity feed to the extraction plant (Mill Area). Additional details concerning processing, operations, and original facilities will not be repeated in this report, as this information can be located in the following documents:

- 1997 Durita Site Reclamation and Construction Verification Report (MEI, 1998)
- Soil Clean-up Verification Report (Hecla, 1997)
- 1996 Durita Site Annual Reclamation Report (MEI, 1997b).
- 1995 Durita Site Reclamation and Construction Verification Report (Monster, 1996)
- 1995 Health and Safety Handbook (Hecla, 1995c)
- Final Reclamation Plan for the Durita Site (AKG, 1991)

Figure 2 shows the site layout and each facility as it existed on June 12, 1998, the end of the construction season.





STATE OF COLORADO

NO SCALE

SITE VICINITY MAP

SOURCE: U.S.G.S. 7.5 MINUTE QUAD MAP, NATURITA, 1994

Scale in feet

0 2000 4000

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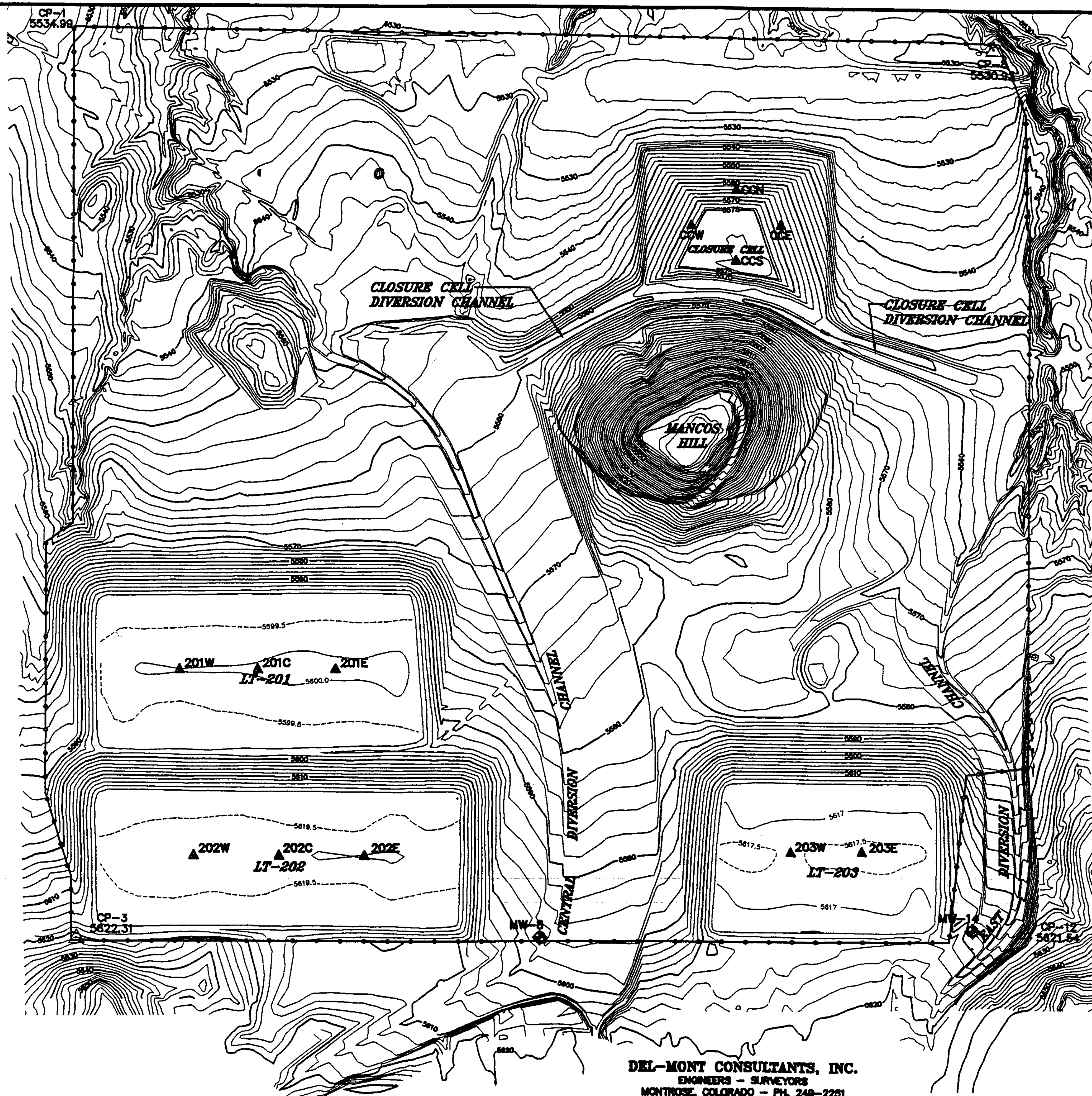
ENGINEERS - SURVEYORS
MONTROSE, COLORADO - PH. 249-2251

FIGURE 1

LOCATION MAP

DURITA SITE RECLAMATION
FOR
HELCA MINING COMPANY

DATE: 3/3/88 FILE: V-MAP
DRAWN BY: D.L.C. DM NO.: 9528



Scale in feet

300 0 300 600

LEGEND

- SETTLEMENT MONUMENTS
- MONITORING WELL

FIGURE 2

SITE MAP
1998

DURITA SITE RECLAMATION
FOR
HELCA MINING COMPANY

1.3 Basis for Reclamation

All reclamation at the Site was carried out with CDPHE approval and authority. Hecla is completing the reclamation work according to their existing Colorado Radioactive Materials License (CDPHE, 1998) and CDPHE regulations (as listed in Section 1.1).

Reclamation activities were designed to achieve the following:
- Contain and stabilize radioactive materials
- Limit the release of radon
- Provide for long-term containment facility protection (Leach Tanks and Closure Cell)

The Site Reclamation Plan (AKG, 1991) breaks down all work for complete reclamation into six projects as follows:
- Contamination Clean-up
- Leach Tank Stabilization
- Evaporation Pond Stabilization
- Surface Water Diversion
- Erosion Protection
- Surface Restoration

Complete details concerning the breakdown of these six projects into their specific tasks and activities are contained in these CDPHE approved documents:
- Quality Control Procedures (QCP) (Hecla, 1995b)
- Durita Site Reclamation Specifications (AKG, 1994a through 1994f)
- Durita Site, 1997 and 1998 Reclamation Plan (MEI, 1997a)

Comprehensive details concerning work completed on the six projects during the 1995, 1996, and 1997 construction seasons are contained in the following documents:
- 1995 Durita Site Reclamation and Construction Verification Report (Monster, 1996)
- 1996 Durita Site Annual Reclamation Report (MEI, 1997b).
- 1997 Durita Site Reclamation and Construction Verification Report (MEI, 1998)

As project specific task and activity breakdown information, and comprehensive details of work completed for each specific project is contained in the six above mentioned documents, this information will not be repeated in this report.

1.4 1998 Reclamation Work Participants

All reclamation work was organized by and accomplished under the authority of Hecla. Hecla's field representative, on-site project manager, and erosion protection (rock gradation and placement thickness) testing engineer was Douglas O. Gibbs, P.E., owner of Monster Engineering, Inc. (MEI). Rock durability testing was conducted by Lambert and Associates (Montrose, Colorado).

All earthmoving, rock production, and rock placement was completed by Reams Construction Company (Reams), of Naturita, Colorado. Radiation Health and Safety responsibilities were managed by Gary Gamble (Hecla Environmental Director - Metals Division). Other parties involved throughout the season included:
- CDPHE - Art Burnham, Paul Oliver, Jeff Hines - periodic site inspections
- Bureau of Land Management - oversight of work conducted on BLM property
- Del-Mont Consultants, Inc. - surveying, grade setting, AutoCAD services

2.0 1998 RECLAMATION WORK

2.1 Overview of Work

In general, work was completed under the following reclamation projects during 1998:
- Leach Tank Stabilization - work completed
- Evaporation Pond Stabilization - work completed
- Surface Water Diversion - work completed
- Erosion Protection
- Surface Restoration

Work conducted during 1998 was a continuation of work undertaken during 1997. A majority of the work undertaken during 1998 season was within the Erosion Protection project. Although not all work was completed for the this project, all rock required for the leach tanks, Closure Cell, and minor tributaries, and a majority of the rock required for the main diversions was produced, delivered, and in-place by the end of the 1998 season. Only a small portion of rock remains to be produced and placed within the main diversions.

A majority of the Surface Restoration project was also completed in 1998 with the completion of regrading in the Evaporation Pond area. The only remaining project work will be seeding in the areas not seeded in 1995, fence removal and reinstallation, and site monument and boundary marker installation.

2.2 1998 Work Periods

Reclamation work was conducted during two periods in 1998. Dates during which work was conducted and general work completed during those periods included:

January 21 through January 30
During this period Reams continued with Erosion Protection project work they had started in 1997. They produced, delivered, and placed the last of the D_{50} = 3.6 inch rock. This rock was spread on the west outslope (3:1) of the Closure Cell. Reams also delivered, placed, and spread the last of the D_{50} = 2.0 inch rock. This rock was spread on top, and the north and east outslopes of the Closure Cell, and in several "spot" areas where less than 6 inches had been placed during 1997.

April 1 through June 12
During this period Reams completed many tasks under the Surface Water Diversion, Evaporation Pond Stabilization, Leach Tank Stabilization, Erosion Protection, and Surface Restoration Projects.

Surface Water Diversion work included:
- repairs to the LT-201/LT-202 Diversion where it intersected the Central Diversion
- regrading of the minor swale immediately south of LT-202
- regrading of the transition between the 203 Swale and the East Diversion normal flow channel
- regrading at the northwest toe of LT-201 where it is adjacent to the arroyo
- repairs to erosion areas and regrading of the transition area between the west toe of LT-202 and the Central Diversion, and the west toe of LT-201 and the Central Diversion
- excavation and finish grading for the outlet at the northeast corner of the site

Evaporation Pond Stabilization work included:
- repairs to uncovered Closure Cell outslopes (erosion damage from rains)

Leach Tank Stabilization work included:
- regrading the tops of all three leach tanks to uniform and smooth draining surfaces (0.5% slopes)

Erosion Protection work included:
- placement of rock cover on the Closure Cell
- placement of scour protection at the base of the Closure Cell
- placement of scour protection and riprap within the Main Diversions
- placement of riprap in several tributary diversions

Surface Restoration work included:
- removal of power poles and lines, and Hecla's office trailer
- cutting and filling, and finish grading for the Evaporation Pond area and washdown pond
- regrading of the temporary rock storage area immediately west of the Evaporation Pond area
- regrading in the trailer area and adjacent areas which transition into the Closure Cell Diversion and East Diversion

2.3 Remaining Work

In general, work required to complete all reclamation includes:
- Leach Tank tops - seeding
- East and Central Diversions - production and placement of minor amount of scour protection and riprap
- Evaporation Ponds - seeding
- Removal of existing site fence and construction of new stock fence
- Installation of site monument and boundary markers

Details concerning work accomplished on each reclamation project are contained in sections 3 through 7 of this report.

2.4 Construction Verification Program and Quality Control Procedures

Work at the Durita Site was managed according to specifications listed in the CVP (Hecla, 1995a). The CVP outlined how reclamation activities were to be monitored and verified. Specifically, the CVP contained the following information:
- How each reclamation project was to be divided organizationally
- The organizational structure and assignment of responsibilities for verification work
- Required documentation for verification of reclamation activities

Documentation required by the CVP included the following:
- Daily activity journal
- Nonconformance and Corrective Action Reports
- Regulatory requirement violations
- Stop Work Orders
- All quality control/materials testing results

All daily activity journals are included in Appendix A. There were no Nonconformance Reports or Stop Work Orders issued, and no regulatory requirement violations were noted during the 1998 season. Materials testing information is discussed in Appendix B.

Reclamation work at the Durita Site was monitored according to specifications in the QCP (Hecla, 1995b) to assure the following :

- That work was performed according to the approved plans, specifications, and practices
- That any deviations from the approved plans, specifications, and practices were identified and corrected promptly
- That variances from the approved plans, specifications, and practices were evaluated and justified sufficiently to support acceptance prior to implementation
- That documentation would provide a complete and factual record that would be easily retrievable

2.5 Materials Testing Results

Appendix B contains all field and laboratory material test results collected during the 1998 season. Results were utilized to either verify that work was completed according to the specifications, or delineate areas/materials requiring additional work, removal, or correction.

2.6 Reclamation Plan Modifications

No minor modifications were required during the course of the 1998 construction season.

3.0 LEACH TANK STABILIZATION PROJECT

Leach tank stabilization work was necessary to:

- Increase the long-term stability through sideslope recontouring
- Limit emanation of radon to less than 20 pCi/m^2/second
- Protect against infiltration and erosion
- Allow for measurement of tailings settlement and top surface erosion

Specific work included in this project was leach tank sideslope recontouring and construction of a compacted clay radon barrier over the entire surface of each tank. Leach Tank Stabilization project requirements are provided in Reclamation Plan Specifications B2, B3, and B4 (AKG, 1991), and portions of Construction Specification 9014-S4 (AKG, 1994d).

3.1 Work Completed

The Leach Tank Stabilization Project was completed during 1998. All work was completed according to the specifications, and was verified and checked by Doug Gibbs and Del-Mont. 1998 work consisted of cutting, filling, and finish grading materials already in-place on tops of the three leach tanks. The work was necessary to fill in low areas (prevent ponding and infiltration) and provide for uniform (0.5% slopes), sheet flow off the tops of the tanks (protect against erosion). Reams utilized a laser level and full-time grade setter to ensure uniform slopes. Although the specified slopes were mainly achieved by cutting and filling, LT-202 contained excess cover soils placed during the last part of the 1995 construction season. These soils (less than 1,000 cubic yards) were removed and placed at the east toe of LT-202, between the toe of the leach tank and the Central Diversion. Figures 3 and 4 show the final configurations of all leach tanks as of June 12, 1998.

3.2 Work Remaining

No additional work is required on this project.

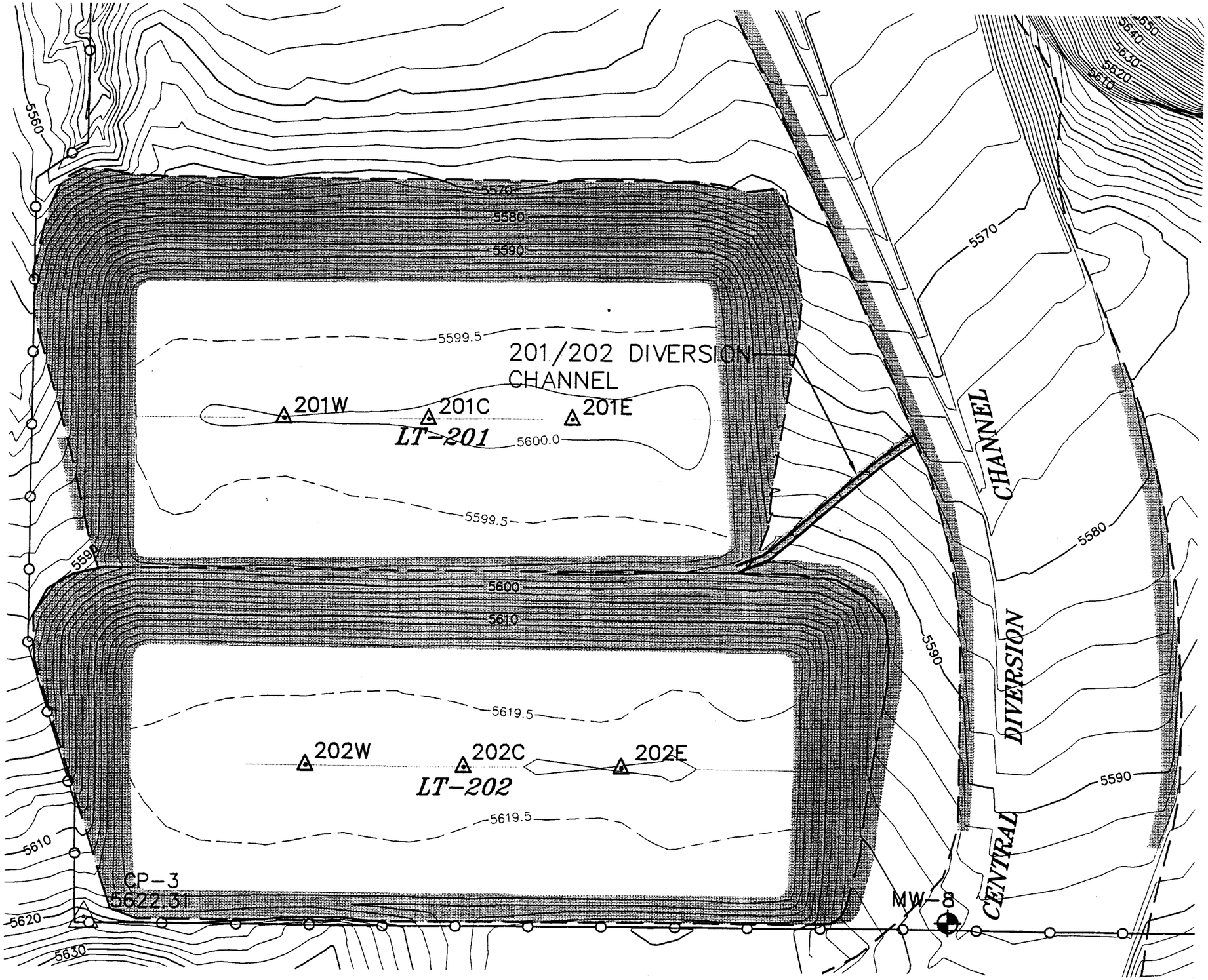


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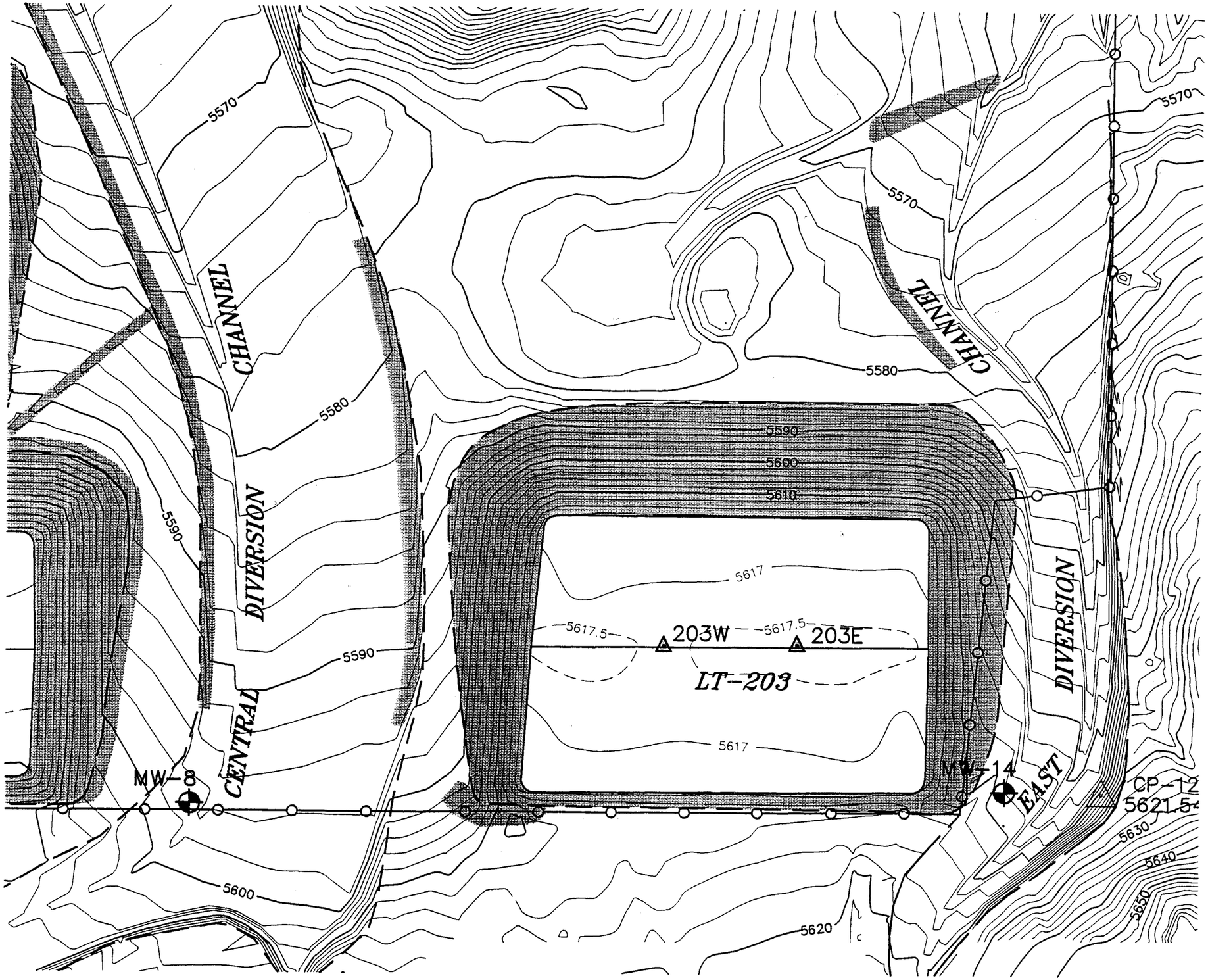
FIGURE 3
LT-201 / LT-202 EROSION PROTECTION PLAN VIEW
DURITA SITE RECLAMATION
FOR
HELCA MINING COMPANY
DATE: 10/28/88 FILE: LTROCK-3B
DRAWN BY: D.L.C. DM NO.: 9828-08



N

Scale in feet

150 0 150 300

LEGEND

- = EROSION PROTECTION PLACED
- = SETTLEMENT MONUMENTS
- = MONITORING WELL

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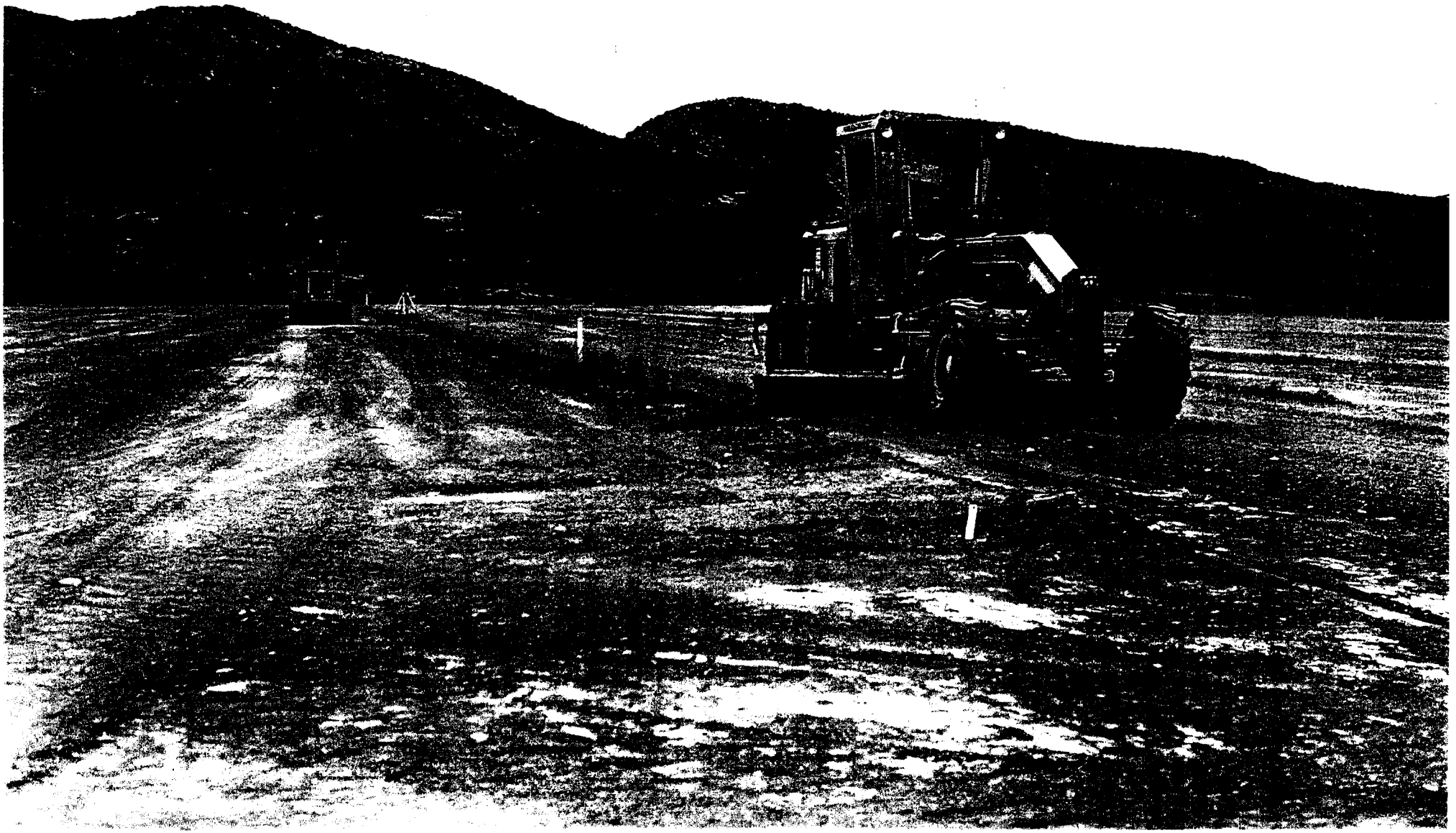
FIGURE 4
LT-203 *PLAN VIEW*
DURITA SITE RECLAMATION
FOR HELCA MINING COMPANY
DATE: 10/28/94 FILE: LT203-SE
DRAWN BY: D.L.G. DM NO. 9528-98

LEACH TANK STABILIZATION PROJECT PHOTOGRAPHS

The photograph on the following page shows the Leach Tank Stabilization work activity conducted during 1998. The photo was taken on top of LT-201 looking towards the west from the east end of the tank.



4.0 EVAPORATION POND STABILIZATION PROJECT

Evaporation pond stabilization work was necessary to:

- Reduce the areal extent and volume of SPM and contaminated debris/soils
- Minimize disposal locations for on-site contaminated materials
- Limit emanation of radon from the cell to less than 20 pCi/m^2/second
- Protect against infiltration and erosion
- Allow for measurement of settlement of SPM/contaminated materials within the cell and top surface erosion

Specific work included in this project was construction of a clay lined and covered containment cell for contaminated materials from the Evaporation Ponds and Raffinate Ponds (SPM), and contaminated on-site soils and debris. Evaporation Pond Stabilization project requirements are provided in Reclamation Plan Specification B5 (AKG, 1991) and Construction Specification 9014-S1 and 9014-S2 (AKG, 1994a and 1994b).

4.1 Work Completed

The only work required, and completed, on the Evaporation Pond Stabilization Project during 1998 was the continued measurement of settlement monitors. Actual settlement data will be provided in a separate document.

4.2 Work Remaining

No additional work is required on this project. One additional set of settlement monument data will be collected in the Fall of 1998 to ascertain if appreciable settlement within the Closure Cell has stopped.

5.0 SURFACE WATER DIVERSION PROJECT

Surface water diversion work was necessary to:

- re-establish flow gradients and alignments which existed prior to any site disturbance, to the greatest extent possible
- protect all containment facilities from erosion due to normal and extreme (PMF) precipitation events

Specific work included in this project was construction of two main diversions (Central and East) and several minor tributaries and transition areas. Surface Water Diversion project requirements are discussed in greater detail in Reclamation Plan Specification B6 (AKG, 1991), Construction Specification 9014-S3 (AKG, 1994c), and portions of Construction Specification 9014-S1 (1994a).

5.1 Work Completed

The Surface Water Diversion project was completed during 1998. All work was completed according to the specifications, and was verified and checked by Doug Gibbs and Del-Mont. In general, 1998 work consisted of minor repairs and regrading to previously constructed and completed diversion facilities, and regrading of several minor tributaries on-site. Erosion in these areas occurred between construction seasons.

Specific repair and regrading work included:

- **LT-201/LT-202 Diversion** - This diversion, constructed between LT-201 and LT-202, transfers runoff from the north half of LT-202 and the south half of LT-201 into the Central Diversion. The transition area immediately west, and into the floodplain of the Central Diversion, was regraded in preparation for placement of erosion protection and riprap.

- **Area south of LT-202** - The existing swale located immediately south of LT-202 was enlarged to redirect runoff northward into the Central Diversion, away from the south side and southeast toe of LT-202.

- **203 Borrow Area Swale to East Diversion** - This swale conveys surface runoff from the north side of LT-203, the 203 Borrow Area, and the south side of Mancos Hill into the East Diversion. Minor regrading was completed from the outlet of the swale, across the East Diversion flood plain, and into the East Diversion normal flow channel to fill in erosion channels and prepare the area for placement of erosion protection.

- **Northwest toe of LT-201** - Off-site surface water (west of LT-201) and on-site surface water (west and northwest side slopes of LT-201) combine at the northwest toe of LT-201. The transition area at the toe of LT-201, where these runoff areas combine was regraded to fill erosional channels in preparation for erosion protection placement.

- **Transition Area between LT-201 and the Central Diversion** - After the stockpiled D_{50} = 6 inch rock was removed from this area, remaining low areas were filled and graded to provide for a uniform grade between the east toe of LT-201 and the Central Diversion flood plain.

- **Transition Area between LT-202 and the Central Diversion** - Excess soils from the top of LT-202 were utilized in low and eroded areas to provide for uniform grades between the east toe of LT-202 and the Central Diversion flood plain.

- **Northeast Corner Surface Water Exit** - The northeast corner of the Evaporation Pond area was excavated and finish graded to provide an outlet for surface water runoff from the Closure Cell and Evaporation Pond area.

5.2 Work Remaining

No additional work is required on this project.

6.0 EROSION PROTECTION PROJECT

Erosion protection work was necessary to:

- Limit extent of normal flow channel erosion during high flow periods
- Protect floodplain banks during PMF discharge
- Protect leach tank outslopes and cell cover from erosion

Specific work included in this project was placement of rock cover on the containment facilities (leach tanks and Closure Cell), placement of scour protection and riprap within the main and tributary diversions, and placement of scour protection at the base of the Closure Cell. Erosion Protection project requirements are provided in Reclamation Plan Specification B7 (AKG, 1991), and Construction Specifications 9014-S3 and 9014-S5 (AKG, 1994c and 1994e).

6.1 Erosion Protection Size Modifications

Hecla modified the Reclamation Plan (AKG, 1991) rock size requirements during the 1995 construction season due to the difficulty and cost involved with producing the large number of different sizes of rock originally specified. The Reclamation Plan's original 15 sizes were reduced to five by grouping several individual smaller sizes into the next larger size. Details concerning this modification are included in the 1995 Reclamation and Construction Verification Report (Monster, 1996). The five modified sizes had design D_{50}'s of 2.0, 6.0, 9.0, 10.0, and 12.0 inches. Table 2 on the following page provides a comparison of the original and modified sizes.

Rock sizes were modified again during 1998 to enable Reams to produce sufficient volume of the 9.0 inch rock from their Tomcat Pit. The remaining larger sizes (10 and 12 inch) do not appear to be available from Reams pit. Table 1 also includes information on the 1998 modification.

TABLE 1
Erosion Protection - Size Modifications

Original Size (D_{50} inches) (AKG, 1991)	Modified Size (D_{50} inches) (Monster, 1996)	1998 Size (D_{50} inches)	Original Material Designation (AKG, 1991) - Area to be Placed
1.7	2.0	**2.0**	Rock Cover - Leach tank outslopes, Closure Cell, and Closure Cell Diversion
2.0			Riprap - Closure Cell (3:1) outslopes[1]
3.8	6.0	**6.0**	Scour Protection - East Diversion - 14+82 to 20+92[2]
4.3			Scour Protection - East Diversion - 20+92 to edge of property boundary
5.6			Scour Protection - Central Diversion - 22+43 to 26+43 & Closure Cell - W. Side Scour Protection
5.8			Scour Protection - Central Diversion - 15+43 to 22+43 (west side) to 16+23 (east side)
5.9			Scour Protection - East Diversion - 10+89 to 12+40[2]
6.9	9.0	**8.2**	Scour Protection - Central Diversion - 6+78 to 9+79
7.2			Scour Protection - Central Diversion - 9+79 to 13+25
8.0			Scour Protection - Central Diversion - 13+25 to 15+43
8.2			Scour Protection - East Diversion - 2+05 to 4+62
9.1	10.0	10.0	Scour Protection - East Diversion - 4+62 to 7+12
9.6			Scour Protection - East Diversion - 7+12 to 10+89
10.2	12.0	12.0	Scour Protection - East Diversion - 0+00 to 2+05
12.0			Scour Protection - Central Diversion - 0+00 to 6+78

1 - Closure Cell (3:1) outslope rock size was increased to 3.6 inches during the 1995 construction season (Monster, 1996).
2 - No scour protection required for this reach (AKG, 1991).
3 - No scour protection required from 12+40 to 14+82 (AKG, 1991).

6.2 Work Completed

Reams completed most of the Erosion Protection project work during 1998. All work was completed according to the specifications, and was verified and checked by Doug Gibbs and Del-Mont. Results of erosion protection testing is included in Appendix B. Table 2 summarizes where erosion protection was placed during 1998.

Table 2
Erosion Protection - Placement Summary 1998

D_{50} (inches)	Rock Origin	Area Placed
2	Off-site (Southwest) stockpiles and on-site stockpiles from 1995 construction season	Off-site (clean) rock went to the top and outslopes of the Closure Cell. On-site (dirty) rock went to transition areas (east end of Closure Cell Diversion to the property line and northwest corner toe of LT-201 where it joins the existing arroyo).
3.6	Stockpile at Reams' pit	Delivered and placed on the Closure Cell outslopes (except north side).
6.0	On-site stockpile from 1995 construction season	Clean rock went to the Closure Cell scour protection and north outslope (3:1) and for East and Central Diversion scour protection and riprap. "Dirty" rock was placed in the transition from 203 Swale to the East Diversion normal flow channel.
8.2	Produced in 1998 from Reams' pit	All placed as Central Diversion scour protection and riprap.
Oversize (<4')	Remains off on-site regrading work	Stacked at the northwest corner toe of LT-201 as a transition between the toe of the leach tank and the existing arroyo.

Table 3 summarizes rock delivery and placement status as of June 12, 1998.

TABLE 3
Erosion Protection - Production and Placement Status

Facility	Status		
	All Placed	Majority Placed	Quantity to be Produced and Placed (cy)
Leach Tank Outslopes		X	<100[1]
Closure Cell Top and Outslopes	X		0
Closure Cell Diversion	X		0
Closure Cell Scour Protection	X		0
Central Diversion Riprap & Scour Protection		X	<1,350[2]
East Diversion Riprap & Scour Protection		X	<1,150[3]
Tributary Areas	X		

1 - To be placed on all leach tank top access roads.
2 - 10 and 12 inch still to be placed.
3 - 8.2, 10, and 12 inch still to be placed.

Work was divided into containment facility rock cover placement, and riprap and scour protection placement. Details for specific work areas are summarized below.

Containment facility rock cover placement included:

- **Leach Tank Outslopes** - A minimum of 6 inches of rock cover was placed over all outslopes on all three leach tanks. All areas where rock had not been placed in sufficient quantity prior to 1998 were identified and completed. The remaining areas to be covered are access ramps up to the tops of each leach tank. This work will be completed after revegetation of the leach tank tops is completed.
- **Closure Cell Top and Outslopes** - A minimum of 6 inches of rock cover was placed on all Closure Cell slopes (top and outslopes). The top surface and flatter outslopes (20% and 13%) were covered with D_{50} = 2 inch rock. The steeper outslopes (3:1) were covered with D_{50} = 3.6 inch rock (MEI, 1998).

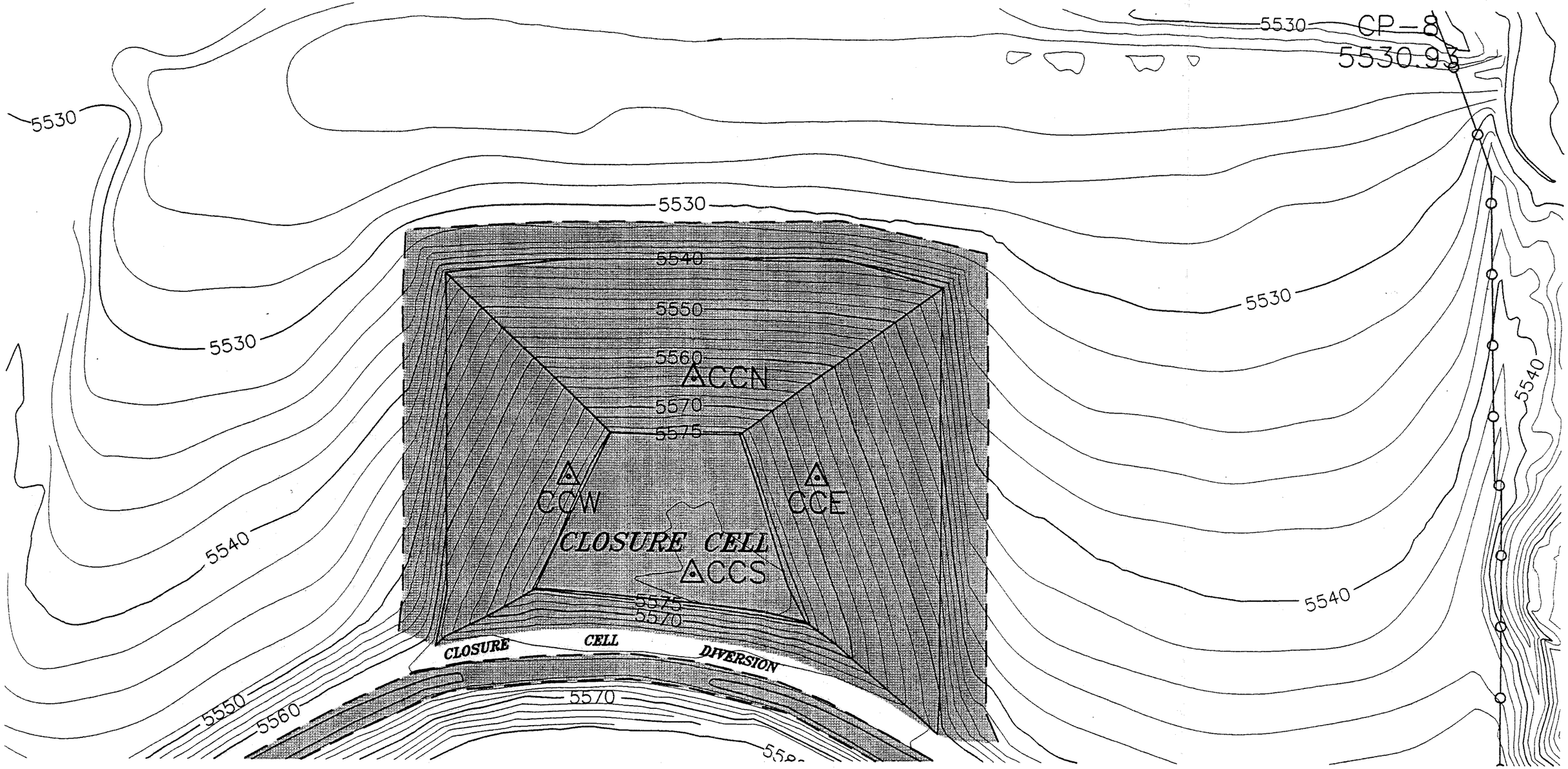
Riprap and scour protection placement work was divided into the Closure Cell, the Main Diversions, and Tributary areas as follows:

- **Closure Cell Scour Protection** - A minimum of 12 inches of scour protection rock was placed along the Cell's west, north, and east outslope toes. Figure 5 shows a plan view of the completed facility and Figure 6 shows a cross section of the north side riprap and scour protection.
- **Main Diversion Riprap and Scour Protection** - Riprap and scour protection rock sizing varies based on location (station) within each of the diversions. In general, rock size decreases with increasing stationing (going downstream), as the width of the diversions increases, and as the slope decreases. Figure 7 shows a cross-section of in-place riprap and scour protection along the Central Diversion. Figures 8 and 9 show plan views of both the Central and East Diversions. Areas where riprap and scour protection were placed are identified on these two figures.
- **Tributary Area Riprap** - Areas where significant erosion had occurred since work was completed in 1995 were regraded (Section 5.1) and covered with riprap. These areas included:
  - LT-201/LT-202 Diversion - This transition between the LT-201/LT-202 Diversion and the Central Diversion floodplain was covered with approximately 1 foot of rock (D_{50} = 6 inch).
  - 203 Borrow Area Swale to East Diversion - This transition between the 203 Borrow Area Swale and the East Diversion normal flow channel was also covered with approximately 1 foot of rock (D_{50} = 6 inch).
  - Northwest toe of LT-201 - This transition between the northwest toe of LT-201 and the arroyo immediately north of the toe was ripraped with two types of rock. The bottom of the slope (and narrowest area where flows concentrate) was covered with on-site boulders and rock (maximum diameter of approximately 4 feet). Immediately above this area, where the slope flattened to a 5:1, riprap transitioned to D_{50} = 2 inch rock.

6.3 Work Remaining

As mentioned above, the two areas still requiring minor amounts of rock cover, riprap, or scour protection are:

- access roads to the tops of the leach tanks (<100 cubic yards of rock cover)
- East and Central Diversion riprap and scour protection (<2,500 cubic yards of riprap and scour protection)



LEGEND

- = EROSION PROTECTION PLACED
- = SETTLEMENT MONUMENTS
- = MONITORING WELL

Scale in feet

100 0 100 200

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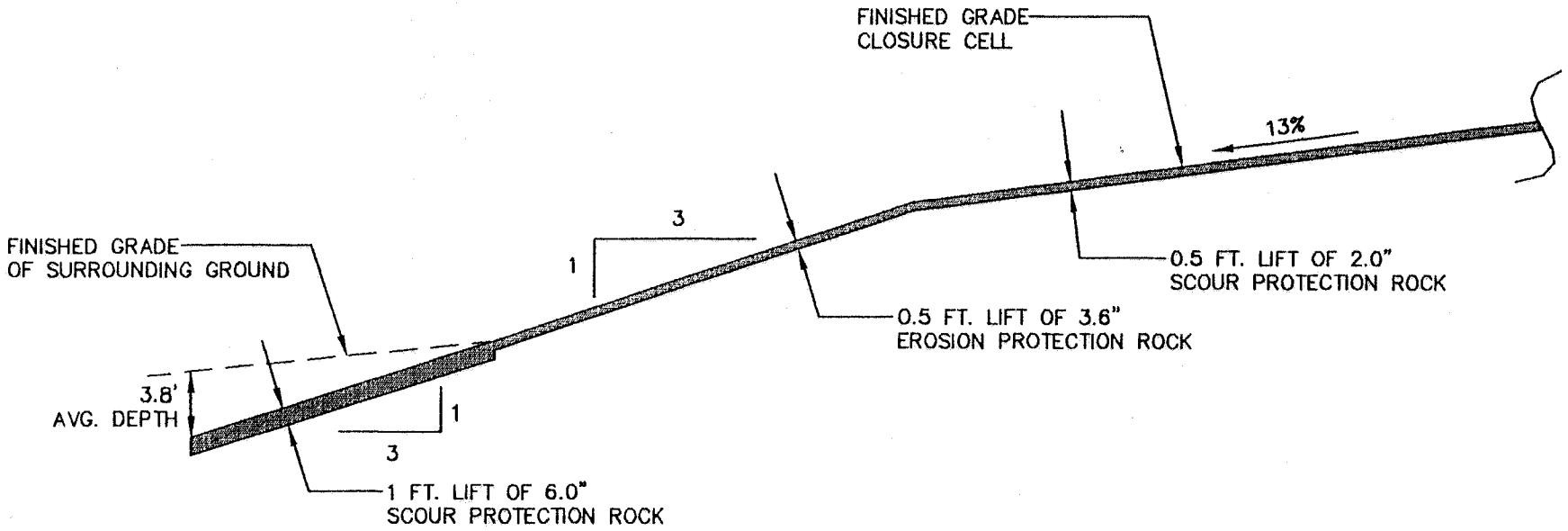
FIGURE 5

CLOSURE CELL EROSION PROTECTION PLAN VIEW

DURITA SITE RECLAMATION
FOR
HELCA MINING COMPANY

DATE: 10/28/98 FILE: CDROCK-98
DRAWN BY: D.L.G. DM NO.: 9828-98



TYPICAL CLOSURE CELL SECTION

NORTH SIDE LOOKING EAST

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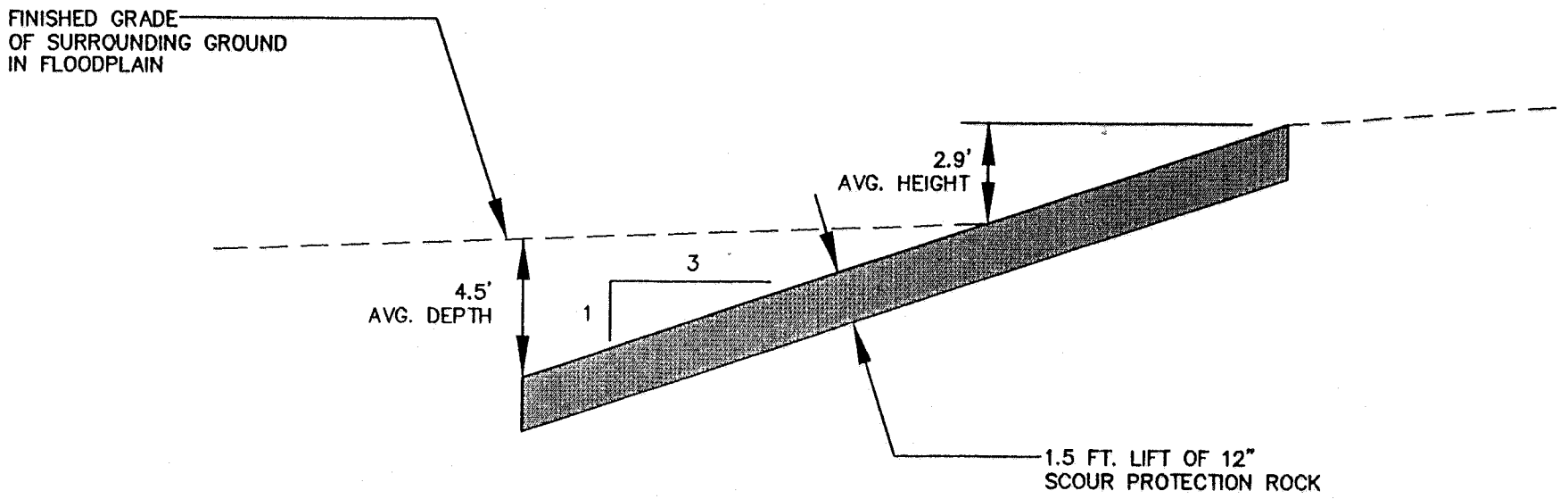
FIGURE 6
CLOSURE CELL EROSION PROTECTION CROSS SECTION
DURITA SITE RECLAMATION
FOR HELCA MINING COMPANY
DATE: 10/28/98 FILE: CC-X-98
DRAWN BY: D.L.C. DM NO.: 9528-98



TYPICAL CENTRAL DIVERSION SECTION

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FIGURE 7
CENTRAL DIVERSION EROSION PROTECTION CROSS SECTION
DURITA SITE RECLAMATION
FOR
HELCA MINING COMPANY
DATE: 10/28/98 FILE: EDC-X-98
DRAWN BY: D.L.C. DM NO.: 9628-98

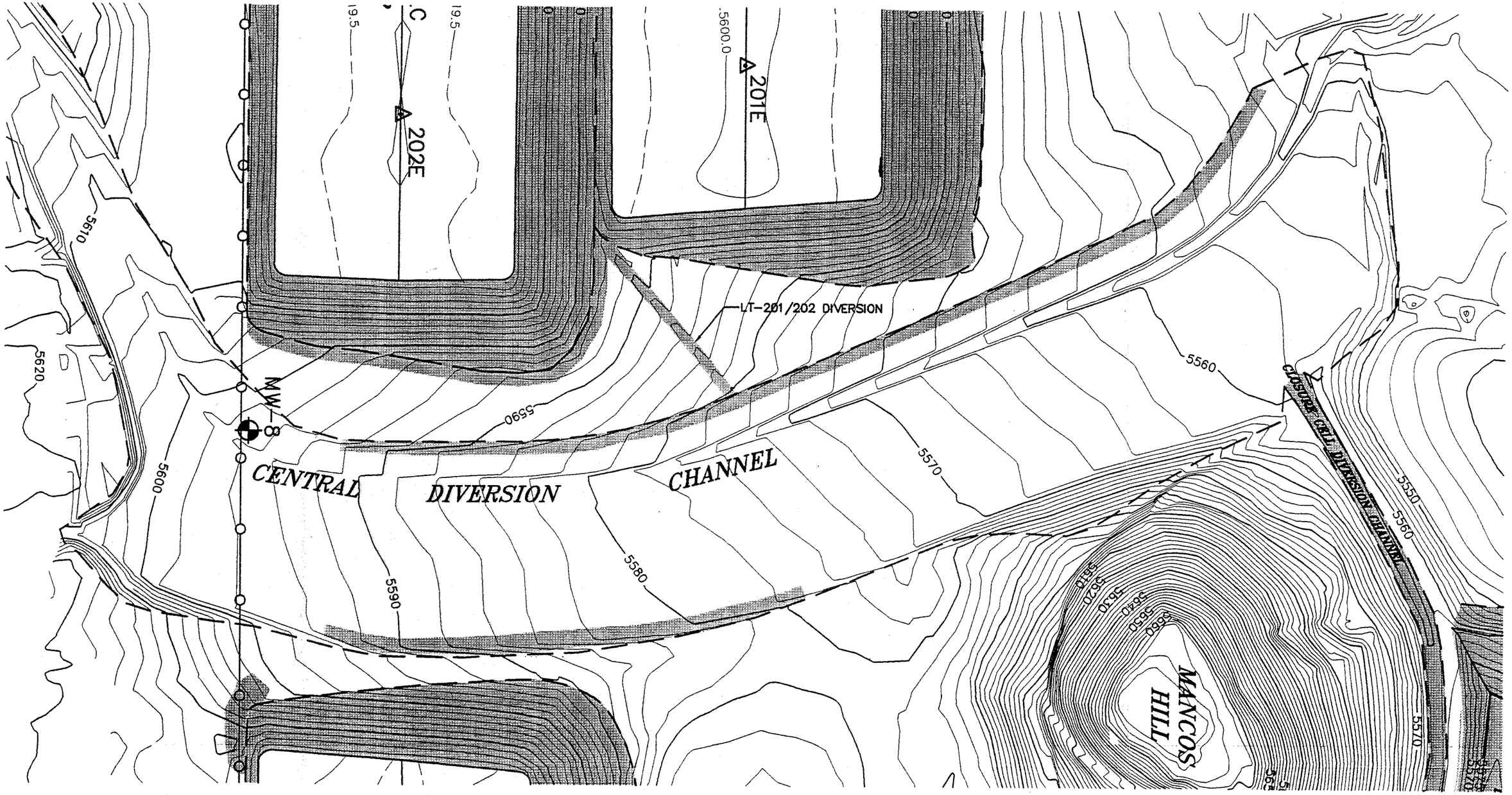

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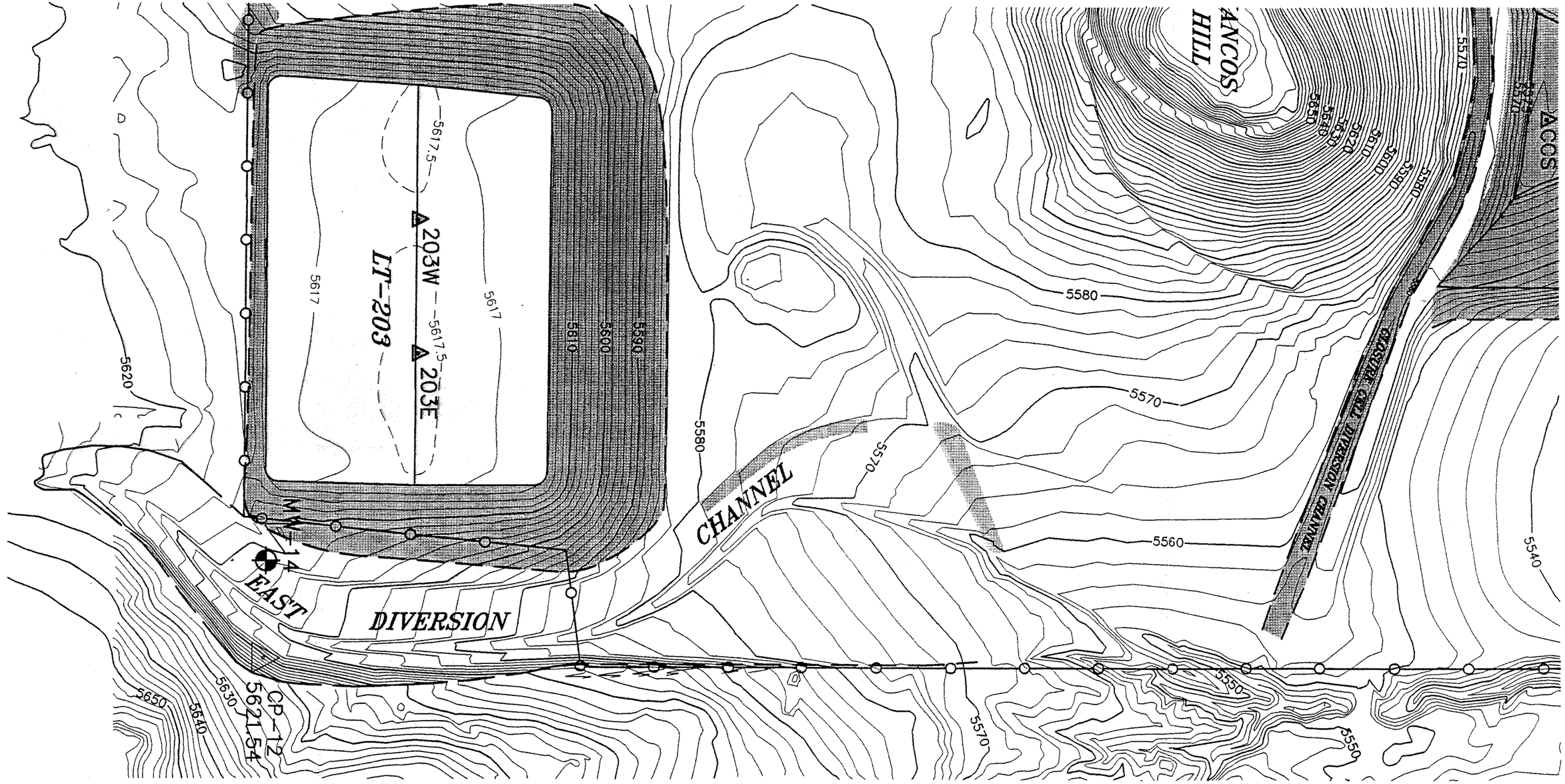
FIGURE 8
CENTRAL DIVERSION EROSION PROTECTION PLAN VIEW
DURITA SITE RECLAMATION
FOR
HELCA MINING COMPANY
DATE: 10/28/98 FILE: CDCROSS-98
DRAWN BY: D.L.C. DM NO.: 9528-98



LEGEND

- = EROSION PROTECTION PLACED
- = SETTLEMENT MONUMENTS
- = MONITORING WELL

Scale in feet

150 0 150 300

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FIGURE 9
EAST DIVERSION EROSION PROTECTION PLAN VIEW
DURITA SITE RECLAMATION
FOR
HELCA MINING COMPANY
DATE: 10/28/98 FILE: EDCROSS-98
DRAWN BY: D.L.C. DM NO.: 9529-98

EROSION PROTECTION PROJECT PHOTOGRAPHS

Photographs on the following pages show typical Erosion Protection project work activities conducted during the 1998 construction season. The list below provides descriptions for each photograph (photograph direction is noted at the beginning of each description).

1. Looking west - east side of the Closure Cell outslopes - 3:1 with 3.6 inch rock in foreground and 13% with 2.0 inch in background

2. Looking southwest - north side of the Closure Cell outslopes - 3:1 with 6.0 inch rock in foreground and 13% with 2.0 inch in background

3. Looking north - east side of the Closure Cell - 3:1 outslope (prior to rock cover placement) and scour protection trench

4. Looking north - east side of the Closure Cell - 3:1 outslope (prior to rock cover placement) and scour protection trench (filled with 6.0 inch rock)

5. Looking north - west side of the Central Diversion - scour trench and placement of scour protection and riprap (6.0 inch)

6. Looking north - west side of the East Diversion - scour trench, scour protection, and riprap (6.0 inch)

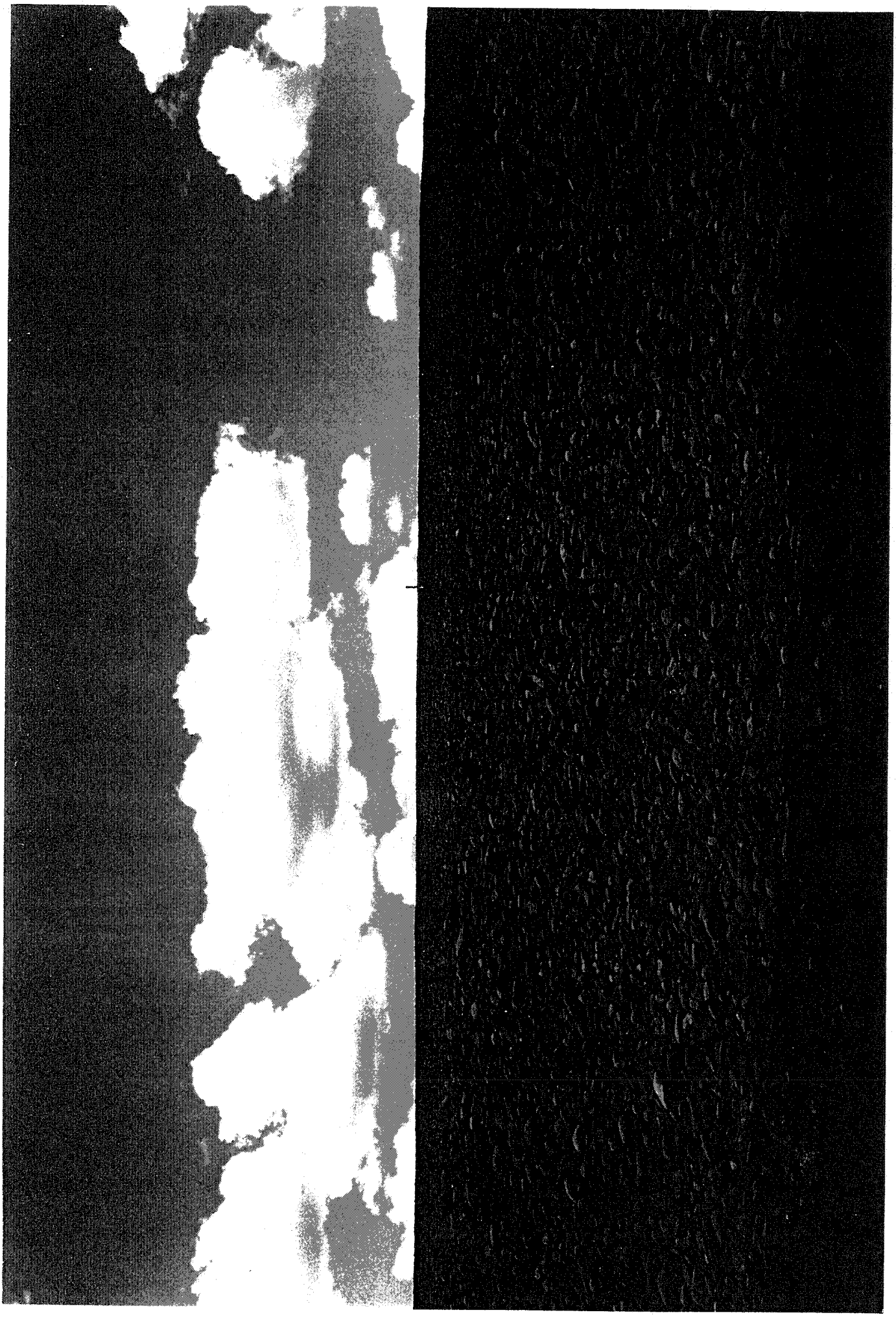
7. Looking south - west side of the East Diversion - scour trench, scour protection, and riprap (6.0 inch)

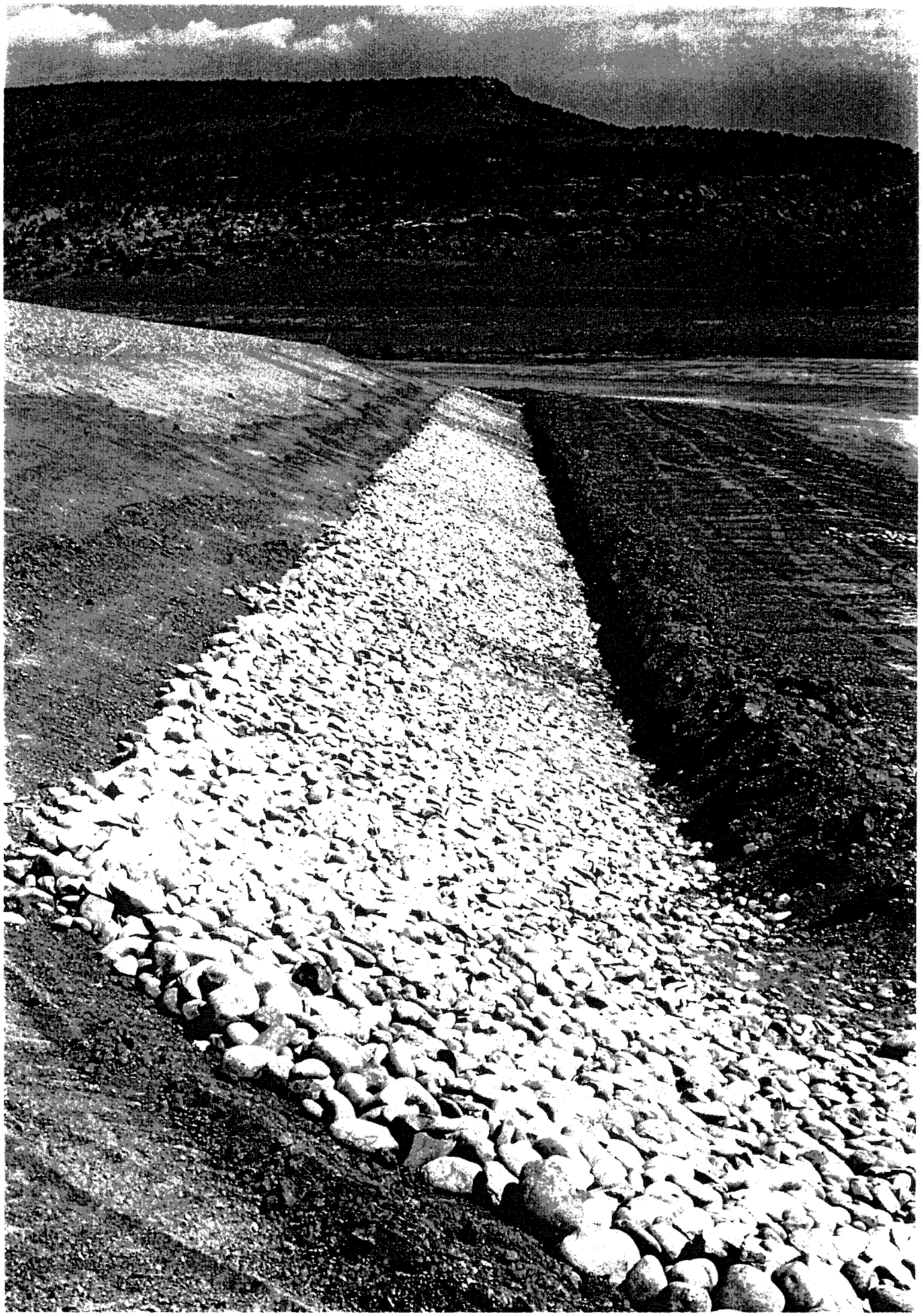
8. Looking west - northwest toe of LT-201 - tributary area rock cover (4 foot transition to 2.0 inch "dirty" rock to existing leach tank rock cover)

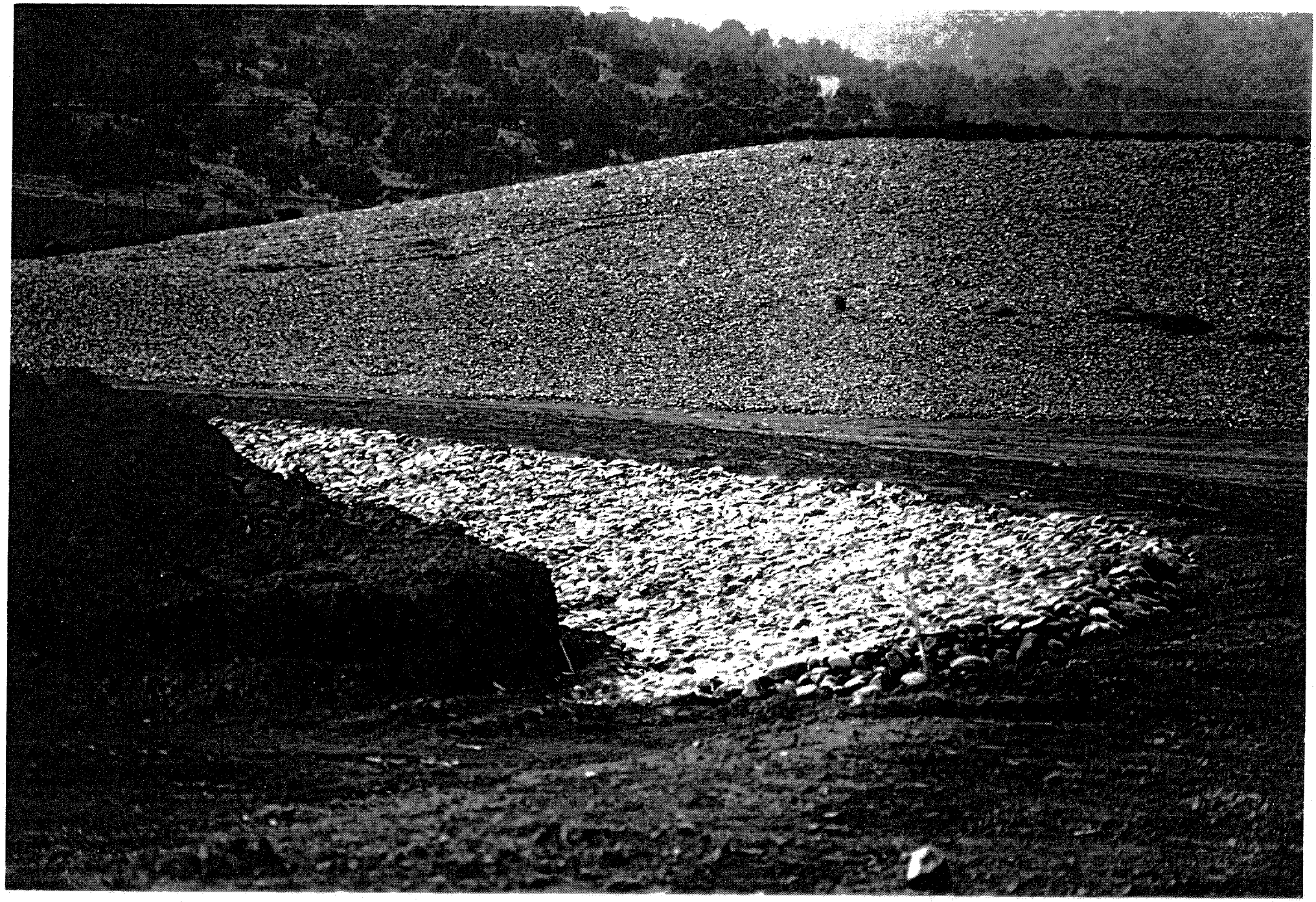
9. Looking southwest - tributary area - transition from 203 Borrow Area Swale through the East Diversion floodplain (6.0 inch)

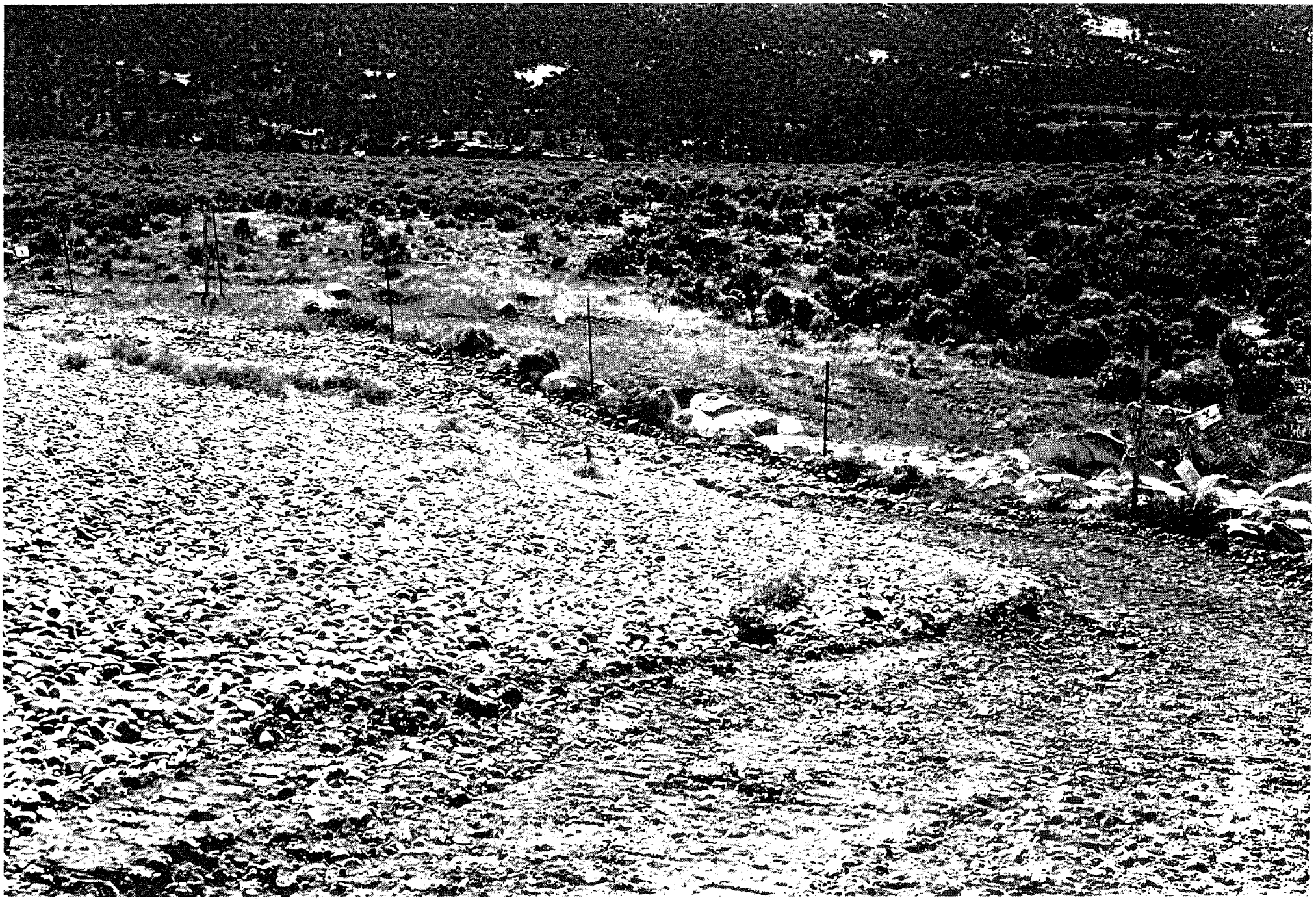
10. Reams' pit - preparing for 8.2 inch rock gradation

11. Reams' pit - producing 8.2 inch rock - home-made grizzly (the Road Warrior)









7.0 SURFACE RESTORATION PROJECT

Surface restoration work was necessary to:

- Minimize surface irregularities and establish positive drainage away from each containment facility
- Create the flattest possible surface gradients compatible with positive drainage
- Provide for long-term erosional stability for the reclaimed, non-rock covered areas
- Secure the site from human intrusion and provide radiation warning signs along the site security fence

Specific work included in this project was regrading of the Evaporation Pond area and in other tributary areas to the Evaporation Pond and East Diversion areas.

7.1 Work Completed

Surface Restoration Project work completed during 1998 consisted of:

- regrading of the entire Evaporation Pond area to provide positive, uniform drainage away from the Closure Cell and towards the northeast corner of the project site
- construction of an outlet at the northeast corner of the project site to allow surface water runoff to exit the site and transition smoothly into the existing arroyo
- regrading at and near the trailer area to provide positive, uniform grades away from Mancos Hill and the Closure Cell Diversion and towards the East Diversion
- filling and regrading in the wash down pond area
- regrading in the temporary rock storage area (west of the Evaporation Ponds) to provide for surface water drainage of the area into the Evaporation Pond area

All work was completed according to the specifications (AKG, 1991), and was verified and checked by Doug Gibbs and Del-Mont. Figure 10 outlines areas restored during 1998.

7.2 Work Remaining

Remaining Surface Restoration project work includes the following:

- construction of a new stock fence at the Closure Cell toe and across the northern toe of leach tanks LT-201 and LT-203
- revegetation in areas disturbed by construction during the 1997 and 1998 construction seasons (revegetation will be addressed in a separate report)

As a condition of transfer, the following items will be completed:

- removal of existing chain-link fence along the north property boundary and along portions of the east and west property boundaries
- installation of site monument and boundary markers

CP-1
5534.99

CLOSURE CELL
DIVERSION CHANNEL

CLOSURE CELL
DIVERSION CHANNEL

MANCOS
HILL

CLOSURE CELL
▲CCS

▲CCW

▲CCE

201W 201C 201E
LT-201
5600.0

202W 202C 202E
LT-202

203W 203E
LT-203

CENTRAL DIVERSION CHANNEL

EAST DIVERSION CHANNEL

CP-3
5622.31

CP-12
5621.54

MW-5

MW-14

Scale in feet

300 0 300 600

LEGEND

= AREAS REGRADED IN 1998

▲ = SETTLEMENT MONUMENTS

= MONITORING WELL

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ENGINEERS - SURVEYORS
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FIGURE 10

SURFACE RESTORATION PLAN VIEW

DURITA SITE RECLAMATION
FOR
HELCA MINING COMPANY

DATE: 10/16/98 FILE: GRADE-98
DRAWN BY: D.L.S. DM NO.: 9528

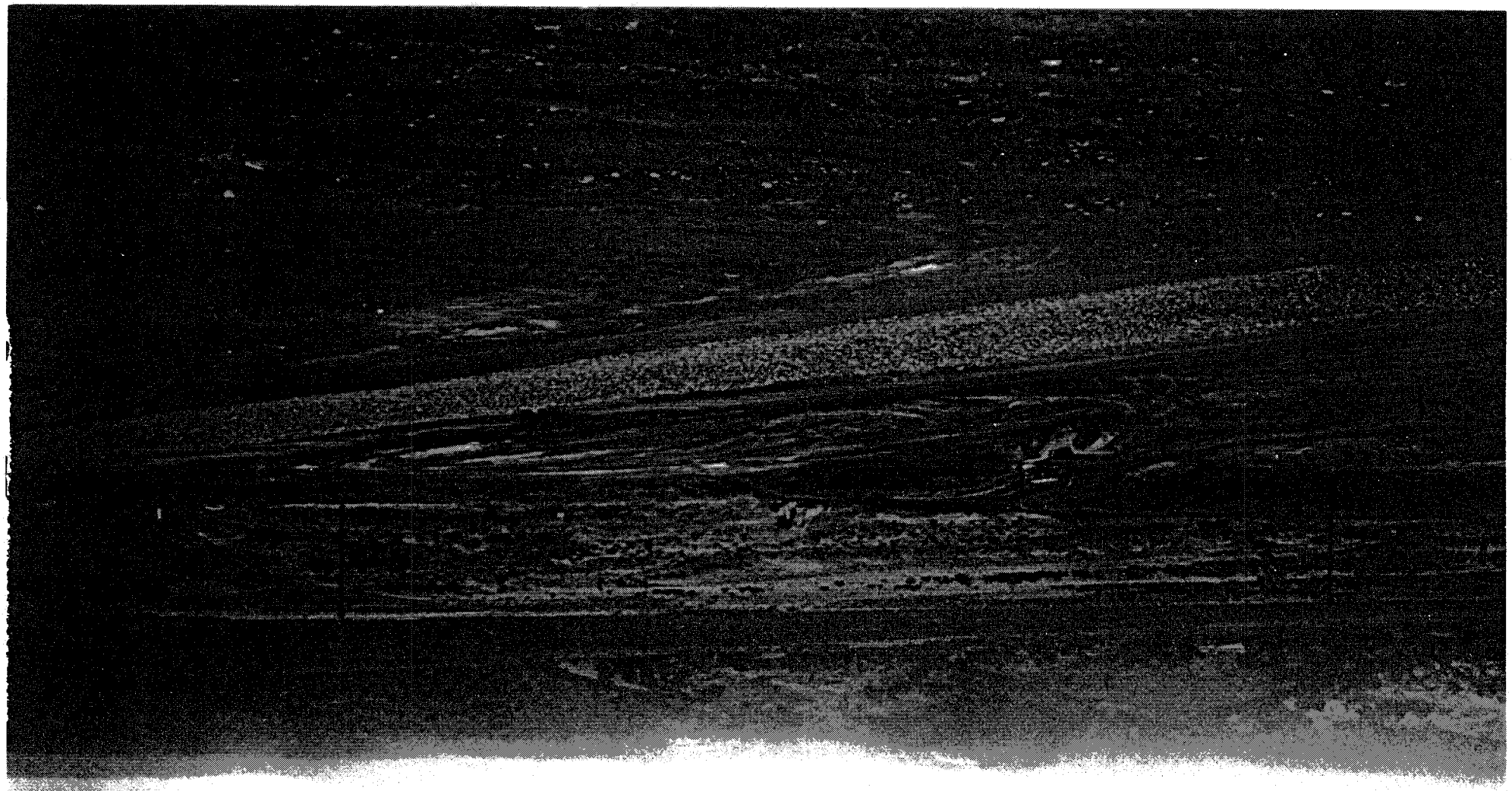
SURFACE RESTORATION PROJECT PHOTOGRAPH

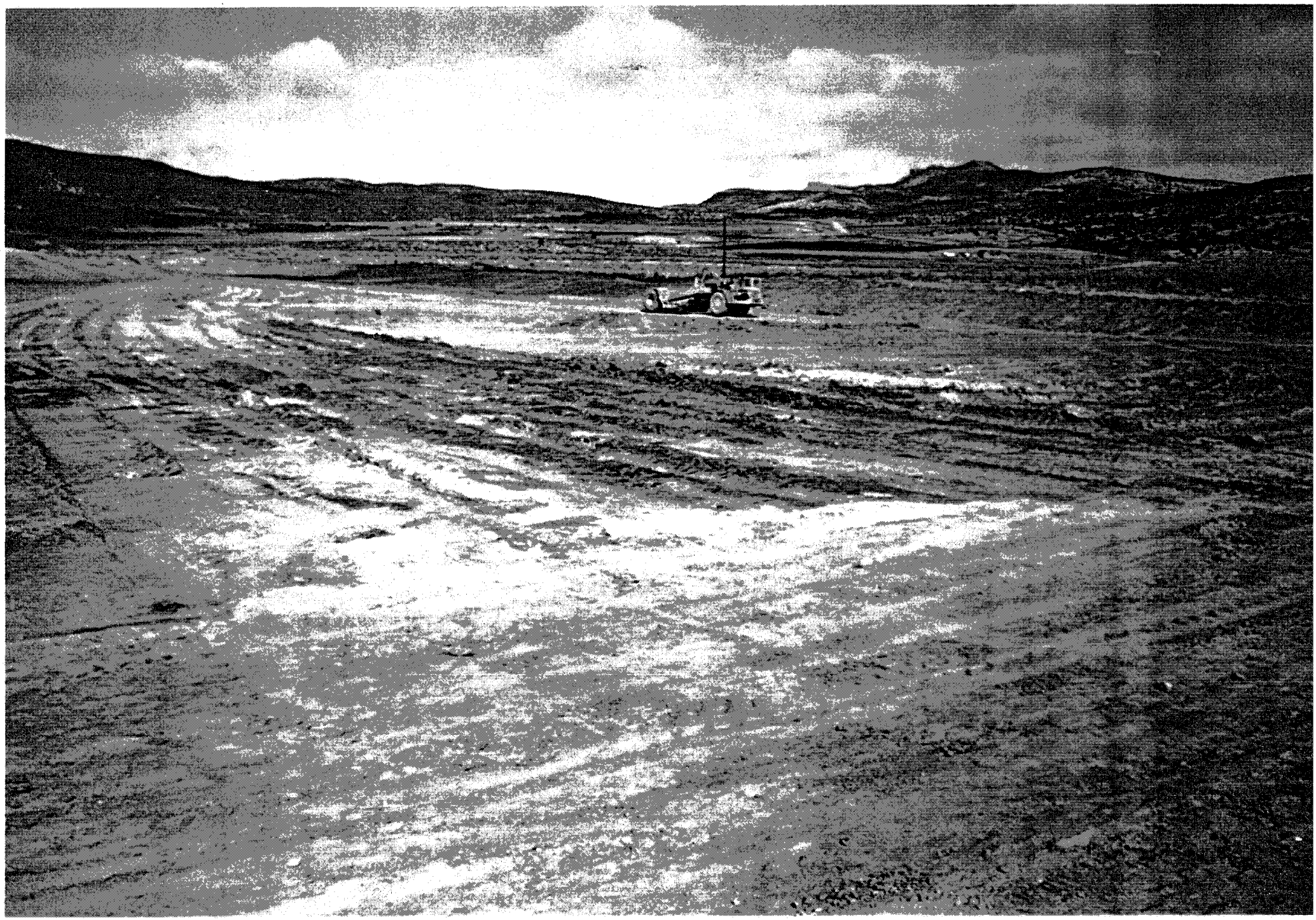
Photographs on the following page show typical Surface Restoration project work completed during the 1998 construction season. The list below provides descriptions for each photograph (photograph direction is noted at the beginning of each description).

1. looking northeast from Mancos Hill - Evaporation Pond area and washdown pond regrading - east side

2. looking south from near the northeast corner of the property - Evaporation Pond area regrading - east side

3. looking northwest - Evaporation Pond area regrading





8.0 REFERENCES

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Appendix A

Daily Activity Journals

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day **1A** -Wednesday, January 21, 1998

Weather AM/PM: Partly cloudy cool/same

Contractor Work

No work today. Tour site with Ray and discuss progress.

Other Activities

Communications/Meetings: Discussed schedule, progress, and billing with Ray. Toured site and gravel pit to see progress.

Rock Production: Started to do gradations on 3.6 inch rock and assist with changes at the screening plant to get rock into specification. Conducted 5 or 6 large (>1400 pound samples) gradations. Rock had to be washed prior to grading due to mud and snow on rock.

Additional Issues

On-site Equipment: None

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day **1B** -Thursday, January 22, 1998

Weather AM/PM

Partly cloudy cold/same

Contractor Work

Task: Erosion Protection

Activity: Screening
Type of Work: Screening at the pit
Observations: Reams continued to work on the 3.6 inch rock.

Task: Erosion Protection

Activity: Hauling, Placement
Type of Work: Haul rock to Closure Cell and place on top
Observations: Reams started hauling last of 2 inch rock from Southwest to the site. They placed it on top of the Cell, in areas where more was needed (< 6 inches), and on the outslopes (north and east).

Other Activities

Communications/Meetings: Discussed schedule, progress, and screening with Ray. Toured site and gravel pit to check progress.

Rock Production: Continued with gradations on 3.6 inch rock.

Additional Issues

On-site Equipment: D3 and 12G

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day **1C** -Friday, January 23, 1998

Weather AM/PM

Partly cloudy cold/same

Contractor Work

Task: Erosion Protection
Activity: Screening
Type of Work: Screening at the pit
Observations: Reams continued to work on the 3.6 inch rock.

Task: Erosion Protection
Activity: Hauling, Placement
Type of Work: Haul rock to Closure Cell and place on top
Observations: Reams continued hauling last of 2 inch rock from Southwest to the site. They placed it on top of the Cell, in areas where more was needed (< 6 inches), and on the outslopes (north and east).

Other Activities

Communications/Meetings: Discussed schedule, progress, and screening operation with Ray. Toured site and gravel pit to check progress.

Rock Production: Continued with gradations on 3.6 inch rock.

Additional Issues

On-site Equipment: D3, 12G, 950 Loader

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day **1D** -Saturday, January 24, 1998

Weather AM/PM

Partly cloudy cold/same

Contractor Work

Task: Erosion Protection
Activity: Screening
Type of Work: Screening at the pit
Observations: Reams continued to work on the 3.6 inch rock.

Task: Erosion Protection
Activity: Hauling, Placement
Type of Work: Haul rock to Closure Cell and place on top
Observations: Reams continued hauling last of 2 inch rock from Southwest to the site. They placed it on top of the Cell, in areas where more was needed (< 6 inches), and on the outslopes (north and east).

Other Activities

Communications/Meetings: Not on site.

Rock Production: Continued screening operations.

Additional Issues

On-site Equipment: D3, 12G, 950 Loader

Visitors: None

Construction Manager Douglas O. Gibbs

Weather AM/PM — Partly cloudy cold/same

Contractor Work

Task: Erosion Protection
Activity: Screening
Type of Work: Screening at the pit
Observations: Reams continued to work on the 3.6 inch rock.

Task: Erosion Protection
Activity: Blade Road
Type of Work: Blade road at site for delivery of rock
Observations: Reams continued working on the road to and at the site so that the 2 inch rock can be delivered.

Other Activities

Communications/Meetings: Not on site.

Rock Production: Continued screening operations.

Additional Issues

On-site Equipment: 12G

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day **1F** -Wednesday, January 28, 1998

Weather AM/PM

Partly cloudy cold/same

Contractor Work

Task: Miscellaneous

Activity: Remove air monitors
Type of Work: Remove air monitors and take Hecla materials to Reams trailer
Observations: Reams had two workers move Hecla's materials from Doc's trailer to their trailer.

Other Activities

Communications/Meetings: Not on site.

Rock Production: Continued screening operations.

Additional Issues

On-site Equipment: None

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day **1G** -Friday, January 30, 1998

Weather AM/PM

Partly cloudy cold/same

Contractor Work

Task: Erosion Protection

Activity: Screening
Type of Work: Screening at the pit
Observations: Reams continued to work on the 3.6 inch rock.

Task: Erosion Protection

Activity: Hauling, Placement
Type of Work: Haul 3.6 inch rock to Closure Cell and place on ~~top~~ outslopes
Observations: Reams started hauling 3.6 inch rock from their pit to the site. They placed it on the west 3:1 outslope of the Cell.

Other Activities

Communications/Meetings: Conducted gradation yesterday on rock from Ream's latest effort (3.6 inch sample collected from screening operation). It passed the specifications. Gave Ray approval to start hauling and placing rock.

Rock Production: Continued screening operations.

Additional Issues

On-site Equipment: D3, E120 Excavator

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 1 - Wednesday, April 1, 1998

Weather AM/PM: Partly cloudy, cool, low 35/Mostly cloudy, breezy, sprinkles, cool, high 55

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments

Type of Work: Excavation and fill at southeast corner Evaporation Pond embankments.

Observations: Reams began working today. They used the 621 scraper and D7 to remove the far southeast embankment (EP-601) and placed the soils along the steep north facing embankment near the Closure Cell. The 97/98 Reclamation Plan calls for maximum of 2:1 slopes.

Other Activities

Communications/Meetings: First face to face meeting this construction season with Ray. We discussed the following:

- Work schedule (4 ten hour days for now) and workers
- Equipment to be used (2 scrapers, only 1 on site now, and the D7)
- Required surveying (leach tank tops, Evap Pond outlet, erosion protection transition locations along the diversion and at the toe of the Cell)
- Reclamation Plan specifications for dirt work, health and safety, documentation
- Required work approvals and documentation (daily work summary forms)
- Fence, power line, trailer removal
- Seeding and weed control schedule for 1998
- Weather/ground (working) conditions for the Spring
- Status of durability sample for 3.6 inch rock sample sent to Lambert earlier in the winter (Ray to check this out)
- Approved start of work on sediment control dams (cows have eaten most of the straw bales set out last Fall) and silt fences

Materials Testing: No soils testing required. Erosion protection (9, 10, 12 inch) not ready for gradation tests.

General: Mobilized to the site and set up my office at the Ray Motel. Talked with Doc concerning their trailer. Asked him to have it removed within the next week or two.

Additional Issues

On-site Equipment: 621 scraper, D7 dozer

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 2 - Thursday, April 2, 1998

Weather AM/PM

Snow, cold, low 25/Snow showers, cold, high 35

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill at southeast corner of the Evaporation Pond embankments
Observations: Reams continued to use the 621 scraper and D7 to regrade the far southeast embankment (EP-601). Snow slowed work down some due to slippery conditions.

Other Activities

Communications/Meetings: Ray and I discussed the following:

- Weather and work conditions
- Estimated time to complete regrading (Evap Ponds)
- Status of Tom Jensen's 631 scraper (will be on site next Monday)
- Status of erosion protection production at the pit (too wet and muddy to work today)
- Removing fence and power poles/lines

Erosion Protection Testing: No testing undertaken.

General: Daily reports, site visit (photos), discussions with Dean and Ron (Del-Mont) concerning construction staking needs and schedule, and Marvin Walisky (SMPA - power poles/lines)

Additional Issues

On-site Equipment: 621 scraper, D7 dozer

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 3 - Friday, April 3, 1998

Weather AM/PM: Clear, cool, low 35/Partly cloudy, warm, high 55

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill at southeast corner of the Evaporation Pond embankments
Observations: Reams continued to use the 621 scraper and D7 to regrade the far southeast embankment (EP-601). Work only ½ day.

Other Activities

Communications/Meetings: Not on site today

Erosion Protection Testing: No testing undertaken.

General: Doc removes trailer and dumpster from site. Complete estimated 98 budget

Additional Issues

On-site Equipment: 621 scraper, D7 dozer

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 4 - Monday, April 6, 1998

Weather AM/PM: Snow/Rain showers, cool, low 30/same, warm, high 45

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in eastern side of Evaporation Ponds
Observations: Reams continued to use the 621 and 631 scrapers and the D7 to regrade the ponds. Rain/snow slows progress slightly. They continued working on the east side of the ponds, towards EP-603 and EP-604.

Other Activities

Communications/Meetings: Ray and I discussed the following:

- Equipment: Excavator availability, 631 mobilization, removal of fence
- Surveying: Del-Mont on site Wednesday to set construction stakes (leach tanks, evap pond outlet, scour protection transition locations)
- Work: Laser level methods for leach tank regrading, excavation start date for scour protection, weather conditions, scour protection screening process
- Fence and power pole/line removal

Erosion Protection Testing: No testing undertaken. Ray to call concerning 3.6 inch durability sample at Lambert's lab in Montrose.

General: Met with Marvin Walisky and agreed upon Hecla removing power poles and lines. SMPA will remove transformers this week.

Additional Issues

On-site Equipment: 621 and 631 scrapers, D7 dozer

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 5 - Tuesday, April 7, 1998

Weather AM/PM

Rain showers, cool, low 35/same, breezy, high 50

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in eastern side of Evaporation Ponds
Observations: Reams continued to use the 621 and 631 scrapers and the D7 to regrade the ponds. They continued working on the east side of the ponds, towards EP-605 and EP-606.

Task: Erosion Protection

Activity: Screening
Type of Work: Primary screening of pit materials
Observations: Reams continued to work in the pit. Although the soils are very wet, they are not frozen. They have approximately 3500 cy of large (+5 inch) material stockpiled. They have not sorted it into the 9, 10, or 12 inch D_{50}'s yet.

Other Activities

Communications/Meetings: Ray and I discussed the following:

- Equipment: Progress with the erosion protection and testing results from Lambert, excavator availability, 621 break-down, fence removal (start tomorrow), possible power pole and line removal (by Reams if for salvage materials only), Evap Pond outlet construction (slopes, width, sideslopes, limits), and HECLA/BLM property boundaries
- Surveying: re-confirmed Del-Mont's schedule (on site Wednesday). They will save the leach tank construction stakes for next week, or for whenever the tanks dry out.
- Work: Again - laser level methods for leach tank regrading
- Site Health and Safety issues

Spring Rates: John Reams and I agreed that Reams would charge spring rates (90% of normal rates) for the month of April. They are much busier this year than last.

Erosion Protection: Inspected pit and screening operations. No rock ready for testing yet. Discussed testing methods, quantities, location, timing for large rock (9, 10, and 12 inch).

General: Discussed schedule with Art Burnham and CDPHE site visit dates.

Additional Issues

On-site Equipment: 621 and 631 scrapers, D7 dozer. The 621 broke down in the early afternoon. No diagnosis yet, downtime unknown.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 6 - Wednesday, April 8, 1998

Weather AM/PM: Partly cloudy, cool, low 30/same, breezy, high 55

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in eastern and northern Evaporation Ponds
Observations: Reams continued to use the 631 scraper, 12G grader, 315 Excavator, and D7 dozer to regrade the ponds. They continued working on the east side, through EP-605 and EP-606, towards the northwest side of the ponds. Finish grading was started on the east side, and the Excavator started on the northeast corner outlet.

Task: Erosion Protection

Activity: Screening
Type of Work: Primary screening of pit materials
Observations: Reams continued to work in the pit producing large erosion protection (9,10, 12 inch D_{50}).

Task: Miscellaneous Work

Activity: Fence Removal
Type of Work: Remove fence for Evap Pond outlet
Observations: Reams began removing the fence on the east side of the Evap Ponds. They will begin removing the power poles and lines as soon as Hecla provides SMPA with a waiver letter.

Other Activities

Communications/Meetings: Ray, John, and I discussed the following:

- Equipment: Excavator schedule (evap pond outlet first), 621 break-down (hopefully fixed on Friday), methods of excavating the scour trenches, delivering 6 inch rock, and placing rock around the Closure Cells.
- Surveying: Del-Mont on site in the AM. Evap Pond outlet staked (bottom, sideslopes, limits), and HECLA/BLM property boundaries re-confirmed.
- Work: Regrade slopes in EP-606 (cuts and fills to achieve slope towards outlet), fence removal, timing for removal of power poles and lines
- Site Health and Safety meeting with on-site Reams employees
- Seeding/Sediment Control: Types of weeds and grasses sprouting this Spring, spraying program, sediment control structure placement and construction

Erosion Protection: No rock ready for testing yet.

Additional Issues

On-site Equipment: 621 and 631 scrapers, 315 excavator, 12G grader, and D7 dozer. The 621 will be down until next week.

Visitors: None

Construction Manager Douglas O. Gibbs

Weather AM/PM: Fog/Clouds, cool, low 30/Partly cloudy, breezy, high 55

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in eastern and northern Evaporation Ponds
Observations: Reams continued to use the 631 and D7 to re-contour the pond areas. They also started on the pond outlet in the northeast corner of the property.

Task: Erosion Protection

Activity: Screening
Type of Work: Primary screening of pit materials
Observations: Reams continued to work in the pit producing large erosion protection (9,10, 12 inch D_{50}). Current large rock pile will have to be re-screened to separate small rock (minus 6 inch). They are still screening new material: it is very wet and contains approximately 80% < 4 inch.

Task: Miscellaneous Work

Activity: Fence Removal
Type of Work: Remove fence for Evap Pond outlet and east boundary of Ponds
Observations: Reams completed removing the fence along the east boundary where it interfered with regrading activities.

Other Activities

Communications/Meetings: Ray and I discussed the following:

- Equipment: 621 will be repaired today (new seal)
- Surveying: Ray checked out and understood the transition points set by Del-Mont yesterday
- Work: Areas to be cut and filled within the ponds and BLM property boundary location, schedule for this and next week (limit overtime to weeks when weather is good and work is critical - 3:1 Closure Cell slopes).
- SMPA: Removed transformers, ready for removal of power lines and poles

Erosion Protection: No rock ready for testing yet. Dustin worked on the fence in the AM and did not work at the pit.

Additional Issues

On-site Equipment: 621 and 631 scrapers, 315 excavator, 12G grader, and D7 dozer.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 8 - Monday, April 13, 1998

Weather AM/PM: Partly cloudy, breezy, cool, low 30/Same, high 50

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in northern Evaporation Ponds
Observations: Reams continued to use the 631 and D7 to re-contour the pond and pond outlet in the northeast corner of the property.

Task: Erosion Protection

Activity: Screening
Type of Work: Primary screening of pit materials
Observations: Reams continued to work in the pit producing large erosion protection (9,10, 12 inch D_{50}). They completed screening new material.

Other Activities

Communications/Meetings: Ray and I discussed the following:

- Equipment: 621 taken back to the shop. Reams is trying to get rid of it. Ray is looking into the cost for a short term scraper rental from Wagner. Reams rental excavator will be going to Aspen tomorrow and their excavator will not be ready until next week (probably)
- Surveying: Ray will be ready for grade stakes on the Leach Tanks this week.
- Work: Rock production, work to be completed on west side of Ponds, schedule and equipment for scour protection

Erosion Protection: No rock ready for testing yet. Dustin and Ray worked on Reams "Road Warrior" screen most of the day.

Additional Issues

On-site Equipment: 631 scrapers, 315 excavator, 12G grader, and D7 dozer. Demob'd 621 scraper.

Visitors: Gary G.

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 9 - Tuesday, April 14, 1998

Weather AM/PM: Mostly cloudy, breezy, cool, low 30/Same, high 45

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in northern Evaporation Ponds
Observations: Reams continued to use the 631, D7, and 12G to re-contour the pond and pond outlet in the northeast corner of the property. They started on the east side of the pond late in the PM.

Task: Erosion Protection

Activity: Screening
Type of Work: Primary screening of pit materials
Observations: Reams continued to work in the pit producing large erosion protection (9,10, 12 inch D_{50}). They completed repairs to the "Road Warrior" and started secondary screening of the large rock. They may be ready for a gradation tomorrow.

Other Activities

Communications/Meetings: Ray, John Reams, and I discussed the following:

- Equipment: Rental costs for a 621 (weekly rate + operator + fuel + SME taxes) = too expensive for 1 weeks worth of work. Reams new excavator should be in next Tuesday, if not, they will ship the 315 back from Ilium to start the scour trenches.
- Surveying: Del-Mont will be on site tomorrow to set Leach Tank stakes and hubs. No additional hubs are needed in the Evap Pond outlet area. Reams progress on purchasing a laser level to finish grade the tops of the Leach Tanks.
- Work: Rock production and timing for first gradation test. Finished grades, and cut and fill areas on the west side of the Ponds. Schedule and equipment for excavating scour trench, placing scour protection, and placing erosion protection on the 3:1 Cell slopes. Comparative costs for removing the existing chain-link fence and recycling I, and purchasing new (and installing) barbed wire fence around Cell and Tanks. Schedule for screening "dirty" 2 inch rock stockpiled on the site (approx 500 cy).
- Reams providing a waiver to SMPA for removal of the poles and lines.

Erosion Protection: No rock ready for testing yet. Dustin and Ray worked on repairs to Reams' "Road Warrior" screen most of the day.

Additional Issues

On-site Equipment: 631 scraper, 315 excavator, 12G grader, and D7 dozer. Demob'd 315 at the end of the day (to Ilium until next Tuesday).

Visitors: Gary G.

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 10 - Wednesday, April 15, 1998

Weather AM/PM: Mostly cloudy, snow showers, low 30/Same, high 40

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in north and west Evaporation Ponds
Observations: Reams continued to use the 631, D7, and 12G to re-contour the north and west ponds. Started finish grading (12G) on the east pond. Discussed with operators areas to be cut and filled, and efficient equipment use (minimizing haul distances, utilization of equipment).

Task: Erosion Protection

Activity: Screening
Type of Work: Secondary screening at pit
Observations: Reams continued secondary screening of the large erosion protection (9,10, 12 inch D_{50}). Should be ready for the first gradation test tomorrow. I guesstimate the D_{50} at 6 to 7 inches, Ray guesstimates 10 inches.

Other Activities

Communications/Meetings: Ray and I discussed the following:

- Equipment: Minimizing use of 12G and more efficient use of equipment/manpower (they don't need to put so much effort into finish grading until most of the high volume dirt work is completed). Reams sold their D5 and has no other dozer large enough to use on the embankment berms. Karl Stephens (operator) may have to work at the pit until more finish grading is required.
- Surveying: Del-Mont set stakes on LT-203 today. I will mark stakes last week with transition information (rock size, scour depth, erosion protection height)
- Work: Cut and fill areas within the west ponds. Methods and rates for rock production.
- Power poles and lines: Reams provided a waiver to SMPA for removal of the poles and lines. OK to start power pole and line removal tomorrow.

Erosion Protection Testing: Inspected pit and screening operation. Discussed testing volumes/weights, screening and weighing methods with Dennis Lambert.

Surveying: Del-Mont on site at about 10:00. Using GPS system. Started on LT-203.

Seeding/Fencing: Discussed germination progress and upcoming spraying program with Earl Reams. When grass reaches point where it has 4 blades it will be safe to use "2-4-D" (a herbicide). I will call Sheila Grother to discuss licensed aerial applicators and costs. Called the Nucla COOP to get cost estimates on "T" posts, barbed wire, wire stays, corners. Earl will provide fence specifications they used at the Rifle (DOE) site.

Additional Issues

On-site Equipment: 631 scraper ,12G grader, and D7 dozer.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 11 - Thursday, April 16, 1998

Weather AM/PM: Partly cloudy, snow showers, low 28/Same, high 45

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in north and west Evaporation Ponds
Observations: Reams continued to use the 631 and D7 to re-contour the north and west ponds.

Task: Erosion Protection

Activity: Screening
Type of Work: Secondary screening at pit
Observations: Reams continued secondary screening of the large erosion protection (9,10, 12 inch D_{50}). Worked on repairs to one of the conveyor belts in the AM.

Other Activities

Communications/Meetings: Ray and I discussed the following:

- Equipment: Using excavator to remove power poles. Not using grader on ponds until majority of dozer/scraper work is completed. Excavator to be back on site Tuesday.
- Surveying: Del-Mont set stakes on LT-202 and LT-203, and collected Cell settlement data. Dean to send data to me ASAP.
- Work: Areas to be cut and filled on top of LT-202 and methods to complete work. Progress on Evap Ponds and rock production.

Erosion Protection Testing: Inspected pit and screening operation. Reams is not ready for a gradation (still have to manufacture testing screens).

Surveying: Del-Mont on site at about 8:00. Using GPS system. Started on LT-202.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, and D7 dozer.

Visitors: None

Construction Manager Douglas O. Gibbs

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Weather AM/PM: Partly cloudy, low 35/Same, high 60

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in west Evaporation Ponds
Observations: Reams continued to use the 631 and D7 to re-contour the west ponds.

Task: Erosion Protection

Activity: Screening
Type of Work: Secondary screening at pit
Observations: Reams continued secondary screening of the large erosion protection (9, 10, 12 inch D_{50}). Moved large grizzly to large stockpile in the AM.

Other Activities

Communications/Meetings: Ray and I discussed the following:

- Equipment: Excavator may not be back tonight (Ray will find out why it is being held up). Only two workers are on site as without the excavator they are limited in work which can be accomplished. As soon as the 631 completes work on the Evap Ponds it will work on the trailer area and the top of LT-202. Reams has decided to use their current laser level system (requires a full-time rod person) as a new automatic system would cost approximately $10,000.
- Work: Areas to be cut and filled in the Evap Ponds. Screening operation changes - Ray would like to re-run some of the rock over the smaller grizzly to capture more of the 6 inch rock. The current system (large grizzly) allows too much 6 inch to pass.

Erosion Protection Testing: Inspected pit and screening operation. Ray is still not ready for a gradation (still have to manufacture testing screens). He should be ready tomorrow. Passed on ASTM specs for sampling weights and methods for large diameter rock. Discussed testing procedures with Dennis Lambert (Lambert and Assoc, Montrose).

Site Gamma Check: Walked many of the areas recently excavated to check for high levels of gamma radiation. No high readings, all <20μR/hr.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, and D7 dozer.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 13 - Tuesday, April 21, 1998

Weather AM/PM: Clear, low 35/Same, high 65

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in west Evaporation Ponds
Observations: Reams continued to use the 631 and D7 to re-contour the west ponds.

Task: Erosion Protection

Activity: Screening
Type of Work: Secondary screening at pit
Observations: Reams continued secondary screening of the large erosion protection (9, 10, 12 inch D_{50}).

Other Activities

Communications/Meetings: Ray and I discussed the following:

- Equipment: The excavator should be back on site tonight if work in Ilium has been completed.
- Work: Reams to remove the power poles tomorrow (if excavator is available). Work to continue on the Evap Ponds until they are completed.

Erosion Protection Testing: Inspected pit and screening operation. Conducted first large scale gradation of rock. D50 was approximately 6.5 inches. They will have to remove additional small rock to increase the D50. Ray increased the spacing between bars in the grizzly and will re-run the portion of rock already run.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, and D7 dozer.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 14 - Wednesday, April 22, 1998

Weather AM/PM: Partly cloudy, low 35/Same, high 65

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in west Evaporation Ponds
Observations: Reams continued to use the 631, D7, 12G, and 315 to re-contour all pond areas.

Task: Erosion Protection

Activity: Screening
Type of Work: Secondary screening at pit
Observations: Reams continued secondary screening of the large erosion protection (9, 10, 12 inch D_{50}).

Other Activities

Communications/Meetings: Not on site today.

Erosion Protection Testing: None conducted.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, and D7 dozer.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 15 - Thursday, April 23, 1998

Weather AM/PM: Partly cloudy, low 35/Same, high 65

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in west Evaporation Ponds
Observations: Reams continued to use the 631, D7, and 12G to re-contour all pond areas.

Task: Erosion Protection

Activity: Screening
Type of Work: Secondary screening at pit
Observations: Reams continued secondary screening of the large erosion protection (9, 10, 12 inch D_{50}).

Other Activities

Communications/Meetings: Not on site today.

Erosion Protection Testing: None conducted.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, and D7 dozer.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 16 - Monday, April 27, 1998

Weather AM/PM

Partly cloudy, low 40/Same, high 70

Contractor Work

Task: Surface Restoration

Activity: Recontouring Evaporation Pond Embankments
Type of Work: Excavation and fill in west Evaporation Ponds
Observations: Reams continued to use the D7 to re-contour all pond areas.

Task: Erosion Protection

Activity: Screening
Type of Work: Secondary screening at pit
Observations: Reams continued secondary screening of the large erosion protection (9, 10, 12 inch D_{50}).

Other Activities

Communications/Meetings: Not on site today.

Erosion Protection Testing: None conducted.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, and D7 dozer.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 17 - Tuesday, April 28, 1998

Weather AM/PM: Partly cloudy, low 40/Same, high 70

Contractor Work

Task: Surface Restoration
- **Activity:** Recontouring Evaporation Pond Embankments
- **Type of Work:** Excavation and fill in west Evaporation Ponds
- **Observations:** Reams completed work in the Evap Ponds.

Task: Surface Restoration
- **Activity:** Recontouring Trailer Area/North End of East Diversion
- **Type of Work:** Excavation and fill
- **Observations:** Reams completed work in the area.

Task: Erosion Protection
- **Activity:** Screening
- **Type of Work:** Secondary screening at pit
- **Observations:** Grizzly transfer case failure. Grizzly moved to shop and parts ordered.

Other Activities

Communications/Meetings: Not on site today.

Erosion Protection Testing: None conducted.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, and D7 dozer.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 18 - Wednesday, April 29, 1998

Weather AM/PM: Partly cloudy, low 45/Same, high 70

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-202
Observations: Reams started work on top of LT-202. They used the 631 scraper to remove high spots and haul to low spots, and the 12G the finish grade. They will set up the laser level tomorrow after the obvious high and low spots have been regraded.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Work last week: Progress last week on Evap Ponds, Trailer Area, north end of the East Diversion, removal of power poles and lines.
- Rock Production: Reams didn't produce enough rock to conduct another large scale gradation. Ray is concerned that they may have insufficient large rock. John Reams has committed to locating the large rock in sufficient quantity to meet Hecla's needs. May have to re-look at Cotter's supply.
- Work for this week: Start regrading on Leach Tank tops, excavating and placing scour protection in East Diversion (tomorrow), hauling remainder of 3.6 inch rock to site (for Closure Cell 3:1 slopes).
- CDPHE inspection tomorrow
- Timing for next gradation test (after grizzly is repaired)
- I set grade for the grader and scraper in the PM on LT-202.

- **Weed Control** - Sheila and I discussed current condition of the grass and weeds, and possible spraying options (herbicides, spray methods, dates). She will provide me with a list of contractors that the have used. She suggests spraying in late May or early June depending on weed height, weather conditions, and soil moisture. She recommended that we use "Curtail" instead of "2-4-D" as it has a residual effect on weeds sprouting throughout the summer. If we get additional wet weather after this spring, the Russian Thistle would sprout again. Of course, Curtail costs more (factor of 2 or 3) than the 2-4-D ($30 to $40/acre versus $12 to $15/acre). That is materials only, not application.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, and D7 dozer.

Visitors: Sheila Grother (San Miguel Weed Board)

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 19 - Thursday, April 30, 1998

Weather AM/PM: Partly cloudy, low 45/Same, high 75

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-202
Observations: Reams continued to work on top of LT-202. They set up the laser level today.

Task: Erosion Protection

Activity: Excavate Scour Trench
Type of Work: Excavate/Grade scour protection trench
Observations: Reams started on the East Diversion (where the D50 = 6 inch rock is to be placed) with the 315. We are checking grades/depths as we go and before rock is placed. Reams is using the rock which was stockpiled at the well.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Work for next week: Regrading on Leach Tank tops, excavating and placing scour protection in the Diversions and Closure Cell, hauling remainder of 3.6 inch rock to site (for Closure Cell 3:1 slopes).
- CDPHE inspection
- Timing for next gradation test (after grizzly is repaired)
- Scour protection depths, riprap heights, slopes and grade setting for the Diversion Channels.

- **CDPHE Inspection** - Art Burnham and Jeff Hines were on-site this morning. We inspected the Evaporation Ponds, Diversion Channels, Leach Tank 201, and the swales and minor diversions. We also examined the northwest toe of LT-201 and the west side toe of LT-201 and 202. Jeff suggested several ideas for "longer" term remediation for the erosion concerns.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, 950 loader, and D7 dozer.

Visitors: Art Burnham and Jeff Hines

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 20 - Monday, May 4, 1998

Weather AM/PM: Partly cloudy, breezy, low 45/Same, high 80

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-202
Observations: Reams continued to work on top of LT-202 with the 631 and 12G. Dustin set grade most of the day utilizing the laser level.

Task: Erosion Protection

Activity: Excavate Scour Trench
Type of Work: Excavate/Grade scour protection trench
Observations: Reams started on the Central Diversion (where the D50 = 6 inch rock is to be placed) with the 315 and the D3. Karl set grade and operated the D3. All grades/depths are verified prior to rock placement. Reams will use the rock stockpiled east of LT-201.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Work for this week: I requested that the 631 finish up regrading work on top of LT-202 and/or limit work (it is not very busy, but is needed to pick up the windrows created by the 12G). Regrading on LT-201 and LT-203 should start at the end of this week or beginning of next week. Progress on scour protection in the East and Central Diversions. May have Tom work part time at hauling remainder of 3.6 inch rock to site (for Closure Cell 3:1 slopes) and part time operating the 631.
- Rock Production: Grizzly is still down. Reams is expecting the rest of the required parts to be in this week.
- Dust Suppression: Reams started the water truck today. They may have to get a generator and start using the well (the river has too much sediment and rock).
- Scour protection depths, riprap heights, slopes and grade setting for the Diversion Channels.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, 980 loader, and D7 and D3 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 21 - Tuesday, May 5, 1998

Weather AM/PM: Partly cloudy, breezy, low 45/Same, high 80

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-202
Observations: Reams continued to work on top of LT-202 with the 631 and 12G. Dustin set grade all day utilizing the laser level. They continued to cut high areas on the south and west corners of the tank top. Excess was moved to the east toe of LT-202.

Task: Erosion Protection

Activity: Excavate Scour Trench
Type of Work: Excavate/Grade scour protection trench
Observations: Reams completed the Central Diversion on the west side (where the D50 = 6 inch rock is to be placed) with the 315 and the D3. Ray set grade.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Upcoming work: Delivery and placement locations for the 9, 10, and 12 inch rock. Scheduling for production, delivery, placement of the remaining rock (3.6, 6, 9, 10, 12). Use of D3 and 315 for excavation
- Rock Production: Grizzly is still down. This may delay placement of large rock during May.
- Dust Suppression: Generator for well pump should be in tonight and installed tomorrow.

- Earl and I discussed weed spraying (timing and applicators). He will meet with Sheila today and Dean should be able to tour the site on Thursday.

Visitors: Gary Gamble

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, 980 loader, water truck, and D7 and D3 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
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Durita Site Reclamation
Day 22 - Wednesday, May 6, 1998

Weather AM/PM: Cloudy, showers, low 45/Cloudy, rain, high 60

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-202
Observations: Between showers, Reams continued to work on top of LT-202 with the 631 and 12G. Dustin set grade all day utilizing the laser level. They continued to cut high areas on the southwest and west ends of the tank top. Excess was moved to the east toe of LT-202. I continued to monitor their progress and offer suggestions to speed up the work. They should be done tomorrow.

Task: Erosion Protection

Activity: Place Rock
Type of Work: Place Scour Protection and Rip Rap
Observations: Reams started on rock placement (D_{50} = 6 inch) in the Central Diversion with the 315 and the 930. Ray and I worked on verification of slope and placement thickness. All areas OK.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Upcoming work: Time required to excavate the remaining trenches for the 6 inch rock (Closure Cell and Central Diversion). Decision on removal of weeds from top of LT-201 (yes) and LT-203 (no) prior to final grading. The large quantity of weeds on 201 will slow down the final grading process if they are not removed. Areas to place on-site 2 inch rock (end of Closure Cell Diversion, 203 Swale into and through East Diversion Flood Plain), and rock placement/stabilization of northwest corner toe of LT-201 (oversized saved from Mill Site regrading from last year).
- Rock Production: When grizzly will most likely be repaired and when to conduct next rock gradation. Ray and I will test a sample tomorrow (Reams did produce a small amount of larger rock prior to the grizzly break down). We should be able to tell if they need to adjust the grizzly spacing again prior to start-up. All parts for the grizzly should be in tomorrow.
- Dust Suppression: No problem today with the rain. Generator is in and will be operational tomorrow.
- Weed Spraying: Earl and I discussed spraying methods and times. Dean and Sheila may come to the site tomorrow to examine the weeds.

Visitors: None

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, 930 loader, water truck, and D7 and D3 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 23 - Thursday, May 7, 1998

Weather AM/PM

Partly cloudy, low 35/Same, high 60

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-202
Observations: Reams continued to finish grade the top of LT-202. They almost completed the west and south ends of the tank. Excess was moved to the east toe of LT-201, between 201 and the Central Diversion.

Activity: Remove Weeds
Type of Work: Remove weeds of the top of LT-201
Observations: Tom started to remove weeds off the top of LT-201 so that finish grading work could begin.

Task: Erosion Protection

Activity: Place Rock
Type of Work: Place Scour Protection and Rip Rap
Observations: Reams continued to place rock (D_{50} = 6 inch) in the Central Diversion with the 315 and the 930. They started on the east side of the Central Diversion (excavating) in the PM.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Upcoming work: Ray will set grade stakes Friday on LT-201 and LT-203. We should move to the tops of the other tanks early next week. We will re-set the finish grade to minimize the earth moving.
- Rock Production: Ray and I conducted a large scale rock gradation in the AM (3300 lbs). Although the sample failed (D_{50} = approx. 8"), they should be able to change the grizzly next week when it is brought back to the pit and produce the 9 inch rock. If we remove about 10% of the 6 inch minus it should pass.
- Scour Protection Placement: Ray and I continued to check grade on the rock and discussed placement around the Closure Cell and within the Diversions.
- Weed Spraying: Earl and I discussed various herbicides and spray methods (availability/cost/quantities/restricted vs. unrestricted chemicals).

Visitors: None

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, 930 loader, water truck, and D7 and D3 dozers.

Visitors: None

Construction Manager Douglas A Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 24 - Friday, May 8, 1998

Weather AM/PM: Partly cloudy, low 35/Same, high 60

Contractor Work

Task: Leach Tank Stabilization

Activity: Grade Setting
Type of Work: Set Grade on top of LT-201 and LT-203
Observations: Joe and Dustin set grade stakes on the tops of LT-201 and LT-203 (to fill in areas where Del-Mont did not set stakes).

Other Activities

Communications/Meetings: Not on site today

Visitors: None

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, 930 loader, water truck, and D7 and D3 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 25 - Monday, May 11, 1998

Weather AM/PM: Partly cloudy, breezy, low 35/Same, high 60

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-202
Observations: Reams continued to finish grade the top of LT-202. They completed the west and south ends of the tank, and started on the north side (which will take much less work). Excess was moved to the east toe of LT-201, between 201 and the Central Diversion. The 12G completed the transition between the finished tank top and the rock already placed on the 5:2 outslopes on the south side of the tank.

Activity: Remove Weeds
Type of Work: Remove weeds of the top of LT-201
Observations: Tom continued to remove weeds off the top of LT-201 so that finish grading work could begin.

Task: Erosion Protection

Activity: Excavate Trench/Place Rock
Type of Work: Excavation/Rock Placement
Observations: Reams completed the trench for the D_{50} = 6 inch rock (on the east side of the Central Diversion). They also completed placement of the riprap and scour protection. They utilized the 315, D3, and Tom hauled rock to the area with the 631.

Task: Erosion Protection

Activity: Excavate Trench/Place Rock
Type of Work: Excavation/Rock Placement
Observations: Reams started on the west side of the Closure Cell ~~Diversion~~ in the PM. They again used the 315 and D3 to excavate the trench, and will use a loader to transport and dump the rock.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Upcoming work: Ray and I checked the grade stakes on 201 and 203. We decided on the amount to raise 201 (0.13 feet) and the amount to lower 203 (0.13 feet). This should allow the cuts and fills to balance. The overall slopes (0.5%) will remain the same. We also looked and at decided on a way to complete the transition between the top of the tank and the rock covered slope (as the top has been lowered, the break point between the two slopes has changed).
- Rock Production: Talked to both Ray and the mechanic today. The grizzly parts are all in and the motor should be repaired by tomorrow. Ray and I talked about possible other sources of large rock (Skelton/United from Norwood, Cotter from LaSal).
- Scour Protection Placement: Thicknesses, remaining quantities of 6 inch rock, methods of measuring the slope distance on the Closure Cell.

- **Weed Spraying**: Earl and I decided that 2-4-D would be the best option for the site. 2-4-D is an unrestricted herbicide, therefore Earl should be able to apply it at the site. I will contact Sheila Grother concerning this issue.

- **Monitoring Well Sampling**: Al Miller was on site today from about 6:30 AM until 2:30 PM He sampled all of the monitoring wells. I observed and recorded (video/pictures) his work.

Additional Issues

On-site Equipment: 631 scraper, 12G grader, 315 excavator, 930 loader, water truck, and D7 and D3 dozers.

Visitors: Al Miller

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 26 - Tuesday, May 12, 1998

Weather AM/PM: Mostly high clouds, breezy, low 45/Same, high 70

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-202
Observations: Reams continued to finish grade the north side top of LT-202 with the 12G and 950 loader. Excess was moved to the east toe of LT-201, between 201 and the Central Diversion.

Task: Erosion Protection

Activity: Excavate Trench
Type of Work: Excavation
Observations: Reams continued on to the north side of the Closure Cell ~~Diversion~~. They again used the 315 and D3 to excavate the trench. Scruffy set grade all day to maintain the 3:1 slope and correct depth.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Upcoming work: LT-202 almost completed, 201 and 203 should go much faster. Ray will use two loaders to haul and place rock in the Closure Cell scour trench. We examined Alan Kuhn's original rock sizing specifications to determine which rock sizes could be adjusted (to account for Reams' small rock sizes in the pit). We toured the site and removed remaining trash and debris (tire, pipes, trash). Discussed placement of hay bales and silt fences prior to thunderstorm season starting.
- Rock Production: Grizzly still not operational. Maybe tomorrow.
- Scour Protection Placement: Overall methods and associated costs for moving rock into the trench.

- **Weed Spraying**: Left message for Sheila Grother concerning using 2,4-D and Earl as applicator.

Additional Issues

On-site Equipment: 12G grader, 315 excavator, 950 loader, water truck, and D7 and D3 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 27 - Wednesday, May 13, 1998

Weather AM/PM: High clouds, breezy, low 45/Cloudy, high winds, high 65

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of the Leach Tanks
Observations: Reams completed the north side and all of the transitions on the outside top of LT-202 today. Used the 12G only. Ron re-graded the flat area at the east toe of 202 as this is where most of the excess soil from the top of 202 was placed. Reams started, and completed, the north side of LT-201 in the PM. They started on the south side of LT-201 in the late PM. I assisted with the laser level and setting grade. Ray started spraying the tanks in the PM due to high winds.

Task: Erosion Protection

Activity: Excavate Trench
Type of Work: Excavation
Observations: Reams continued on the Closure Cell scour protection trench. They turned the northeast corner and completed approximately ½ of the east side today. Used the D3 and 315. Karl set grade today as Scruffy was unavailable. Reams should complete excavation tomorrow and begin to place the rock. Surveyors will survey the top of the rock after it has all been placed.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Upcoming work: Estimated time required to complete the Closure Cell scour protection trench. Methods and time required to place scour protection. Scheduling with the surveyors.
- Rock Production: Grizzly is still down. Maybe it will be completed by the end of the week.
- Leach Tank Work: Due to high winds the laser level continued to move throughout the afternoon (out of level). Ray and I decided to have someone stay on the level and continue to adjust as necessary to maintain the level. As we thought LT-202 finish grading went much quicker, as should LT-203.

- **Weed Spraying**: Earl and I are going to meet with Dean Stindt and one other County official tomorrow at the site to discuss the use of 2,4-D and optimum time to apply. Earl can do the work next week.

Additional Issues

On-site Equipment: 12G grader, 315 excavator, 950 and 980 loaders, water truck, and D7 and D3 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 28 - Thursday, May 14, 1998

Weather AM/PM: Mostly cloudy, windy, low 45/Same, high 60

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-201
Observations: Reams continued to finish grade the top of LT-201. The 12G and water truck worked the top surface to fill in holes and cut high areas.

Task: Erosion Protection

Activity: Excavate Scour Protection Trench
Type of Work: Excavation and Finish Grading on slope
Observations: Reams continued to excavate the Closure Cell scour protection trench. They utilized the 315 and D3. Karl and Scruffy continued to set grade to ensure the 3:1 slope and correct depth.

Activity: Place Scour Protection Rock
Type of Work: Haul and Place Rock
Observations: Reams started to haul rock from the on-site stockpile to the trench. They utilized the 950 loader.

Other Activities

Communications/Meetings: Discussed the following with Ray:

- Upcoming work
- Rock Production
- Scour Protection Placement

- **Weed Spraying**: Met with Earl Reams, Dean Stindt and Charlie Holcomb (NRCS) concerning weed and grass growth, spraying, and other issues concerning revegetation (see attached memo from Charlie). Charlie, Dean, and Earl agreed that we should not spray until after a significant rain, when the application would work best. Charlie also suggested that we use "Tordon" or similar on the three small stands of Knapweed (noxious weed) currently on-site in the Mill Area. The Knapweed should be sprayed immediately.

Additional Issues

On-site Equipment: 12G grader, 315 excavator, 950 loader, water truck, and D3 dozer. Demobilized the D7 dozer today and worked on the 980 (on-site but down).

Visitors: Earl Reams, Dean Stindt, Charlie Holcomb

Construction Manager Douglas O. Gibbs

UNITED STATES
DEPARTMENT OF
AGRICULTURE

NATURAL
RESOURCES
CONSERVATION
SERVICE

743 HORIZON COURT
Room 111
GRAND JCT., CO 81506
(970) 243-5068

Subject: TRIP REPORT - San Miguel Basin SCD May 14, 1998

Date: May 15, 1998

To: Dean Stindt
Resource Conservationist
Norwood, Colorado

File Code: 190-11-7

Purpose: Provide technical assistance and site review

Accomplishments: I met you at Naturita and we travelled together to the Ranchers Site which is operated by Hecla mining. Currently, the mine is engaged in erosion control and reclamation efforts on uranium tailings.

At the site we met Doug Gibbs, a engineering consultant and Earl Reams, a contractor. We walked over the site evaluating the seeding and weed pressure. Some grass seedlings were coming but we noticed that they were mainly in areas where there was depressions or extra runoff. There were small broadleaf weeds present such as kochia and Russian thistle. Possibly due to the cool spring the weeds were not actively growing and were showing symptoms of stress. I recommended that they hold off on the planned spray treatment (Buctril or similar compound) until they get a measurable rain to stimulate the weeds. Right now the weeds are stressed and more than likely would not be controlled very well. (Note: Buctril is a RESTRICTED USE pesticide and will require a Certified Applicator.)

In general the efforts of erosion control and reclamation look fairly good. I asked about the possibility of applying 2 to 4 inches of topsoil to improve the plant growth medium which they were planting into. They informed me that no such material was available for their use. The exiting material that they are seeding into lacks organic matter and probably has a very slow infiltration rate. I believe stand establishment could be improved if they could come up with a means to correct these deficiencies. I offered the following suggestions:

1. During site preparation incorporate straw mulch or old hay. This could be done by disking one or two times before final site prep. Fertilizer would also be necessary and I would recommend a minimum of 40 lbs./Acre of available N.

2. Increase the random roughness after drilling would minimize surface runoff and increase infiltration. If they stay with drilling they can come back with a piece of equipment such as a ripper or chisel with a 20 to 24 inch shank spacing and roughen the surface perpendicular to the expected water flow.

After seeing the areas that had good seedling germination it's obvious that moisture is one of the most limiting factors effecting stand establishment on the site. The incorporation of residue to increase organic matter, moisture retention and infiltration and the surface roughing should help to minimize this problem.

Agreed Items: none at this time

Follow-up: If they choose to implement any of my suggestions and need further assistance or guidance please call.

Charles A. Holcomb
Area Agronomist, NRCS, Grd. Jct.

cc: David L. Doty, AC, NRCS

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 29 - Monday, May 18, 1998

Weather AM/PM

Partly cloudy, breezy, low 50/Same, high 82

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-203/LT-201
Observations: Reams started to finish grade the top of LT-203 and completed outside (slope break) on LT-201. Dustin continued to use the laser level to ensure the 0.5% slope.

Task: Erosion Protection

Activity: Excavate Closure Cell Scour Protection Trench
Type of Work: Excavation and Finish Grading on slope
Observations: Reams completed excavating the Closure Cell scour protection trench. They utilized the 315 and D3. Karl and Scruffy continued to set grade to ensure the 3:1 slope and correct depth.

Activity: Place Closure Cell Scour Protection Rock
Type of Work: Haul and Place Rock
Observations: Reams continued to haul rock from the on-site stockpile to the trench. They utilized the 950 loader. The 980 was repaired late in the day and used for a short period. They used the 315 to smooth rock dumped in the trench (with a modified bucket - smoothing blade).

Activity: Excavate Central Diversion Scour Protection Trench
Type of Work: Excavation and Finish Grading on slope
Observations: Reams returned to excavation in the Central Diversion (east side). They utilized the 315 and D3. Karl continued to set grade to ensure the 3:1 slope and correct depth.

Other Activities

Communications/Meetings: Discussed upcoming work, rock production, scour protection placement, and Knapweed spraying with Ray: The grizzly is still down.

Weed Spraying: Met with Earl to discuss Knapweed spraying, chemicals, effectiveness and timing.

Additional Issues

On-site Equipment: 12G grader, 315 excavator, 950 loader, water truck, and D3 dozer. Repaired the 980 today.

Visitors: None

Construction Manager Douglas A Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 30 - Tuesday, May 19, 1998

Weather AM/PM: Partly cloudy, calm, low 55/Same, high 85

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-203
Observations: Reams continued to finish grade the top of LT-203. Dustin continued to use the laser level to ensure the 0.5% slope. Dustin also ran the water truck to minimize dust. They completed the north side in the AM and moved to the south in the PM.

Task: Erosion Protection

Activity: Place Closure Cell Scour Protection Rock
Type of Work: Haul and Place Rock
Observations: Reams continued to haul rock from the on-site stockpile to the trench. They utilized the 950 loader. The 980 was used some during the day. They used the 315 to smooth rock dumped in the trench (with a modified bucket - smoothing blade). Scruffy and Joe checked rock thickness as they progressed to ensure the correct thickness.

Activity: Excavate Central Diversion Scour Protection Trench
Type of Work: Excavation and Finish Grading on slope
Observations: Reams continued to excavate the Central Diversion scour protection trench (east side). They utilized the 315, 950, and D3. Karl continued to set grade to ensure the 3:1 slope and correct depth.

Other Activities

Communications/Meetings: Discussed upcoming work, rock production, scour protection placement, and Knapweed spraying with Ray. The grizzly is still down.

Weed Spraying: Met with Earl to discuss Knapweed spraying, chemicals, effectiveness and timing.

Additional Issues

On-site Equipment: 12G grader, 315 excavator, 950 loader, water truck, and D3 dozer. Completed minor repairs to the 980 and 315 today.

Visitors: Wagner mechanic

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 31 - Wednesday, May 20, 1998

Weather AM/PM: Partly cloudy, breezy, low 50/Same, windy high 80

Contractor Work

Task: Leach Tank Stabilization

Activity: Grading/Remove Excess
Type of Work: Regrade top of LT-203
Observations: Reams completed finish grading on top of LT-203.

Task: Erosion Protection

Activity: Place Closure Cell Scour Protection Rock
Type of Work: Haul and Place Rock
Observations: The Closure Cell scour protection was completed today. Reams used rock from the on-site stockpile (6-inch). They utilized both loaders. They used the 315 to smooth rock dumped in the trench (with a modified bucket - smoothing blade). Ray and Joe checked rock thickness as they progressed to ensure the correct thickness.

Activity: Place Central Diversion Scour Protection
Type of Work: Haul and Place Rock
Observations: Reams returned to the Central Diversion scour protection in the PM. They utilized the 315 and both loaders. Ray and Joe checked rock thickness as they progressed to ensure the correct thickness.

Activity: Place Erosion Protection Rock
Type of Work: Haul and Place Rock
Observations: Reams used both loaders to haul rock to the northwest toe of LT-201 at the property boundary. The 315 placed the rock. On-site sandstone (max diameter of 4 feet) was used. The rock was stacked from the toe (in the existing arroyo) to the edge of the existing erosion protection rock (2 inch). Additional 2 inch was also used on the both flanks of the northwest toe in areas where slight erosion has occurred over the past seasons.

Other Activities

Communications/Meetings: Discussed upcoming work, rock production, scour protection placement, and grizzly repair progress with Ray.

Surveying: Del-Mont surveyed tops of Leach Tanks, monitoring well tops, East Diversion rock, Central Diversion rock, and re-shot the south settlement monument on the Closure Cell.

Additional Issues

On-site Equipment: 12G grader, 315 excavator, 950 and 980 loaders, water truck, and D3 dozer.

Visitors: Del-Mont

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 32 - Thursday, May 21, 1998

Weather AM/PM: Partly cloudy, breezy, low 55/Same, high 85

Contractor Work

Task: Leach Tank Stabilization

Activity: Finish Grading
Type of Work: Finish grade around toes and outslopes of all leach tanks
Observations: Reams completed finish grading.

Task: Erosion Protection

Activity: Place Central Diversion Scour Protection Rock
Type of Work: Haul and Place Rock
Observations: Reams returned to the Central Diversion scour protection today. They used on-site rock from the stockpile (6-inch). They utilized both loaders. They used the 315 to smooth rock dumped in the trench (with a modified bucket - smoothing blade). Ray, Joe, and Kelly checked rock thickness as they progressed to ensure the correct thickness.

Activity: Backfill Central Diversion Scour Protection
Type of Work: Place and Compact Backfill
Observations: Reams continued to backfill the scour protection trench in the Central Diversion. They utilized the D7 and the loaders. Lifts were approximately 1 foot thick and were compacted before the next lift was placed.

Other Activities

Communications/Meetings: None today

Additional Issues

On-site Equipment: 12G grader, 315 excavator, 950 and 980 loaders, water truck, and D3 and D7 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 33 - Tuesday, May 26, 1998

Weather AM/PM: Partly cloudy, calm, low 60/Same, high 85

Contractor Work

Task: Erosion Protection

Activity: Backfill Closure Cell Scour Protection Trench

Type of Work: Place and Compact Backfill

Observations: Reams continued to backfill the Closure Cell scour protection trench. They utilized the 315, D3 and D7 dozers, and the 950 loader. Lifts were approximately 1 foot thick and were compacted before the next lift was placed.

Other Activities

Communications/Meetings: Weeds - Earl and I agreed that if the site is to be sprayed, then a private contractor would be the wisest option (liability concerns) as Bucktril and all other suitable chemicals are regulated.

Rock Production - Ray continued to work at the pit with the screening operation. They are almost ready for a gradation test on the largest rock (approximately 8.4 inch D_{50}).

Additional Issues

On-site Equipment: 315 excavator, 950 loader, water truck, dump truck, and D3 and D7 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 34 - Wednesday, May 27, 1998

Weather AM/PM

Partly cloudy, calm, low 60/Same, high 85

Contractor Work

Task: Erosion Protection

Activity: Place Erosion Protection on Closure Cell

Type of Work: Transport, Place, and Grade 6 inch rock

Observations: Reams started to place the 6 inch rock (from on-site stockpile) on the north outslope of the Closure Cell. The remaining 6 inch rock on site was used on the north outslope of the Cell. This slope requires at least a 3.6 inch rock. As all of the 3.6 inch rock made by Reams was already used, and in order to not produce more 3,6 inch, the 6 inch already on site was used.

Other Activities

Communications/Meetings: Rock Production - Ray and I toured the pit and screening operation. They started to make rock today. I checked out Reams' Naturita Creek rock (sandstone). It appeared to be very hard and was anywhere from 4 inches to 10 feet in diameter.

Additional Issues

On-site Equipment: 315 excavator, 950 loader, and D3 and D7 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 35 - Thursday, May 28, 1998

Weather AM/PM: Partly cloudy, calm, low 60/Same, high 85

Contractor Work

Task: Erosion Protection

Activity: Place Erosion Protection on Closure Cell
Type of Work: Transport, Place, and Grade 6 inch rock
Observations: Reams continued with placement of the 6 inch rock (from on-site stockpile) on the north outslope of the Closure Cell.

Activity: Finish Grade Erosion Protection on Closure Cell
Type of Work: Finish Grading
Observations: Reams continued with finish grading of the 2 inch rock on top and side slopes, 3.6 inch rock on the outslopes, and the 6 inch rock on the outslopes of the Cell. They used the D3 and 315.

Activity: Backfill Scour Protection Trench
Type of Work: Place and Compact Backfill
Observations: Reams continued to place and compact the scour protect trench backfill in the Central Diversion. They used the D7 and placed the material in lifts < than 1 foot.

Other Activities

Communications/Meetings: None

Additional Issues

On-site Equipment: 315 excavator, D3 and D7 dozers.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 36 - Friday, May 29, 1998

Weather AM/PM

Partly cloudy, calm, low 60/Same, high 85

Contractor Work

Task: Erosion Protection

Activity: Finish Grade Erosion Protection on Closure Cell
Type of Work: Finish Grading
Observations: Reams continued finish grading of the 6 inch rock on the Cell outslopes. They used the 315.

Activity: Backfill Scour Protection Trench
Type of Work: Place and Compact Backfill
Observations: Reams continued to place and compact the scour protect trench backfill in the Central Diversion. They used the D7 and 950. Material was placed in lifts < than 1 foot.

Other Activities

Communications/Meetings: None

Additional Issues

On-site Equipment: 315 excavator, D7 dozer, 950 loader.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 37 - Monday, June 1, 1998

Weather AM/PM

Partly cloudy, calm, low 65/Same, high 90

Contractor Work

Task: Erosion Protection

Activity: Finish Grade Erosion Protection on Closure Cell
Type of Work: Finish Grading
Observations: Reams continued finish grading on the top and outslopes of the Cell. They used the D3, 12G, and 315.

Other Activities

Communications/Meetings: None

Additional Issues

On-site Equipment: 315 excavator, D3 dozer, 12G grader, water truck.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 38 - Tuesday, June 2, 1998

Weather AM/PM: Partly cloudy, calm, low 65/Same, high 90

Contractor Work

Task: Erosion Protection

Activity: Finish Grade Erosion Protection on Closure Cell
Type of Work: Finish Grading
Observations: Reams continued finish grading on the top and outslopes of the Cell. They used the D3, 12G, and 315.

Other Activities

Communications/Meetings: None

Additional Issues

On-site Equipment: 315 excavator, D3 dozer, 12G grader, water truck.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 39 - Wednesday, June 3, 1998

Weather AM/PM: Partly cloudy, calm, low 65/Same, high 90

Contractor Work

Task: Erosion Protection

Activity: Finish Grade Erosion Protection on Closure Cell
Type of Work: Finish Grading
Observations: Reams continued finish grading on the top and outslopes of the Cell. They used the D3, 12G, and 315.

Activity: Backfill Scour Protection Trench
Type of Work: Place and Compact Backfill
Observations: Reams started to place and compact the scour protect trench backfill in the East Diversion. They used the D7 and placed the material in lifts < than 1 foot.

Other Activities

Communications/Meetings: None

Additional Issues

On-site Equipment: 315 excavator, D3 and D7 dozers, 12G grader, 950 loader, water truck.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 40 - Thursday, June 4, 1998

Weather AM/PM

Partly cloudy, calm, low 65/Same, high 90

Contractor Work

Task: Erosion Protection

Activity: Finish Grade Erosion Protection on Closure Cell
Type of Work: Finish Grading
Observations: Reams continued finish grading on the top and outslopes of the Cell. They used the D3, 12G, and 315.

Activity: Backfill Scour Protection Trench
Type of Work: Place and Compact Backfill
Observations: Reams continued to finish grade the scour protection trench backfill in the East and Central Diversions. They used the 12G.

Other Activities

Communications/Meetings: None

Additional Issues

On-site Equipment: 315 excavator, D3 dozer, 12G grader.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 41 - Tuesday, June 9, 1998

Weather AM/PM

Partly cloudy, calm, low 65/Same, high 90

Contractor Work

Task: Erosion Protection

Activity: Place Rock in Scour Protection Trench

Type of Work: Place and Grade Rock

Observations: Reams continued to transport and place 8.2 inch rock in the Central Diversion scour protection trench.

Other Activities

Communications/Meetings: None

Additional Issues

On-site Equipment: 315 excavator.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 42 - Wednesday, June 10, 1998

Weather AM/PM: Partly cloudy, calm, low 65/Same, high 90

Contractor Work

Task: Erosion Protection

Activity: Place Rock in Scour Protection Trench

Type of Work: Place and Grade Rock

Observations: Reams continued to transport and place 8.2 inch rock in the Central Diversion scour protection trench.

Other Activities

Communications/Meetings: None

Additional Issues

On-site Equipment: 315 excavator.

Visitors: None

Construction Manager Douglas O. Gibbs

Hecla Mining Company
Daily Construction Report

Durita Site Reclamation
Day 43 - Friday, June 12, 1998

Weather AM/PM

Partly cloudy, calm, low 65/Same, high 90

Contractor Work

Task: Erosion Protection

Activity: Place Erosion Protection on Closure Cell
Type of Work: Transport, Place, and Grade 8.2 inch rock
Observations: Reams continued with placement of the 8.2 inch rock in the Central Diversion.

Activity: Backfill Scour Protection Trench
Type of Work: Place and Compact Backfill
Observations: Reams continued to finish grade the scour protection trench backfill in the Central Diversion. They used the 12G.

Other Activities

Communications/Meetings: None

Additional Issues

On-site Equipment: 315 excavator.

Visitors: None

Construction Manager Douglas O. Gibbs

Appendix B

Summary of Materials Testing

1.0 Introduction

The Durita Site Reclamation materials testing program was maintained during the 1998 construction season to:

- monitor materials quality and placement methods utilized by the contractor
- ensure that soils placed and erosion protection produced and placed met Reclamation Plan specifications.

This appendix provides a summary of materials test data collected during 1998. Testing was conducted on-site by Douglas O. Gibbs, P.E. the on-site project manager, and Lambert and Associates of Montrose, Colorado (erosion protection durability).

Field and lab testing frequencies were based on those required by the 1997/1998 Reclamation Plan (MEI, 1997a), and will not be repeated here. Sufficient tests were conducted to satisfy each frequency specification.

Erosion protection was tested by ASTM methods C136 and D1559 (gradation), C88 (sodium sulfate soundness), and C97 (specific gravity and absorption).

Copies of all test data are included in this appendix and are organized in the following order:

- Table 1 - Summary of Erosion Protection Gradation and Durability Tests - 1998
- Erosion Protection Gradation Test Data
- Erosion Protection Durability Test Data

Table 1
Summary of Erosion Protection Gradation and Durability Tests - 1998

Sample ID	D_{100}	D_{50}	D_{25}	D_{15}	D_0	Bulk Specific Gravity (SSD) (g/cc)	Absorption (%)	Sodium Sulfate Loss (%)	Rating[1]
3.6" spec.[2]	**4.5 - 6.2**	**3.6 - 4.1**	**2.5 - 3.2**	**>1.7**	**<1.7**	**NA**	**NA**	**NA**	**NA**
SV0130	6.1	3.7	2.9	2.3	1.5	2.669	1.01	0.19	88.3
8.2" spec.[3]	**10.3 - 14.0**	**8.2 - 9.3**	**5.7 - 7.3**	**>4.0**	**<4.0**	**NA**	**NA**	**NA**	**NA**
SV0605	13.5	8.3	6.5	>4.0	<4.0	2.627	1.15	0.12	84.6
SV0609	13.8	8.6	6.9	>4.0	<4.0	2.598	0.77	0.08	83.9

1 - Average percentage of rock types in samples was 97% igneous, 1.5% limestone, 1.5% sandstone.
2 - Approximately 820 cubic yards produced, delivered, and placed during 1998.
3 - Approximately 1257 cubic yards produced, delivered, and placed during 1998.

ROCK QUALITY SCORING

Durability Sample From Reams' Screening Operation: 3.6" rock **Sample: Lambert 6944**

Sample Number	Rock Type (1 = igneous) (2 = limestone) (3 = sandstone)		Specific Gravity (SSD) (g/cc)	Absorption (%)	Sulfate Soundness (% loss)	LA Abrasion (% loss)	Schmidt Hammer (SRU)	Tensile Strength (psi)	Total Scores	**Composite Rating For Sample (%)**
Lambert 6944	1	WF =	9	2	11					
		TV =	2.669	1.010	0.190					
		Score =	8.380	4.980	10.000					
		Rating =	75.420	9.960	110.000				195.4	**88.8**
		Max. Possible =	90	20	110				220	
	2	WF =	12	13	4					
		TV =	2.669	1.010	0.190					
		Score =	8.380	4.980	10.000					
		Rating =	100.560	64.740	40.000				205.3	**70.8**
		Max. Possible =	120	130	40				290	
	3	WF =	6	5	3					
		TV =	2.669	1.010	0.190					
		Score =	8.380	4.980	10.000					
		Rating =	50.280	24.900	30.000				105.2	**75.1**
		Max. Possible =	60	50	30				140	

average rating = **88.3**

required % increase over design size = **-8.3**

WF = Weighting Factor TV = Test Value

LAMBERT1.WB2

SULFATE SOUNDNESS TEST
ASTM C88

Sieve Size	Weight of Sample Before Test	Percent Loss On Sieve	Sample Grading	Weighted % loss
2 1/2"-2"	314.4			
2"-1 1/2"	3033.7	0.18	94.5	0.17
1 1/2"-1"	1224.0	0.48	5.2	0.02
TOTAL				0.19

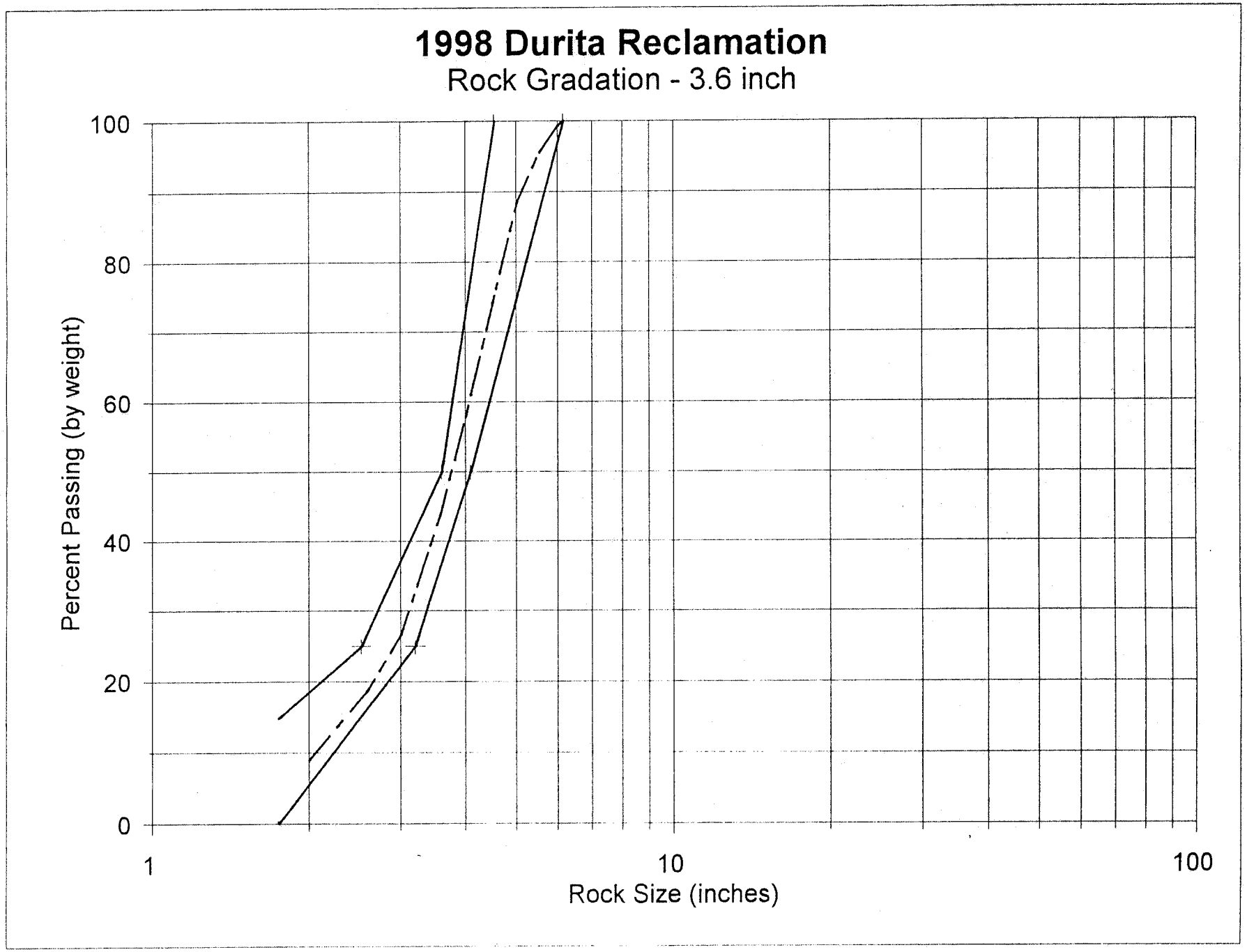
SIEVE ANALYSIS
ASTM C136

Sieve Size	Cumulative % Passing
2 1/2"	100
2"	99
1 1/2"	5.5
1"	0.3

ABSORPTION & SPECIFIC GRAVITY
ASTM C127 & C128

Average Absorption	=	1.01
Bulk Specific Gravity	=	2.642
Bulk Specific Gravity (SSD)	=	2.669

LABORATORY NUMBER: 6944
ENGINEERING TECHNICIAN: Conner


1998 Durita Reclamation
Rock Gradation - 3.6 inch
100
80
60
40
20
0
Percent Passing (by weight)
1
10
100
Rock Size (inches)

SIEVE ANALYSIS

PROJECT: Durita Reclamation Project **DATE:** 1/30/98

TESTED BY: D. GIBBS **SAMPLE ID:** SV0130

Sieve Size (inches)	Weight Retained (lbs)	Percent Retained (%)	Percent Passing (%)
6.5			100
6.0	11.06	1.10	98.90
5.5	32.25	3.20	95.71
5.0	76.91	7.63	88.08
4.5	147.47	14.62	73.46
4.0	158.21	15.69	57.77
3.5	144.85	14.36	43.41
3.0	172.02	17.05	26.36
2.5	78.05	7.74	18.62
2.0	96.04	9.52	9.10
1.5	91.78	9.10	0.0
Total Weight (lbs) =	1,008.64	100	= Total % Retained

Measured D_{100} (inches)	6.1
Sample Median Diameter (D_{50}) (inches)	3.7

$$\frac{4}{4}\ \frac{2.5 - D_{50}}{2.5 - 2.0} = \frac{57.77 - 50}{57.77 - 43.41}$$

$$\frac{3.5}{}$$

D_{50} = 3.73 > 3.6 OK

D_{25} = 2.91

D_{15} = 2.31

ROCK QUALITY SCORING

Durability Sample From Reams' Screening Operation: 8.2" rock **Sample: Lambert 6916**

Sample Number	Rock Type (1 = igneous) (2 = limestone) (3 = sandstone)		Specific Gravity (SSD) (g/cc)	Absorption (%)	Sulfate Soundness (% loss)	LA Abrasion (% loss)	Schmidt Hammer (SRU)	Tensile Strength (psi)	Total Scores	**Composite Rating For Sample (%)**
Lambert 6916	1	WF =	9	2	11					
		TV =	2.627	1.150	0.120					
		Score =	7.540	4.700	10.000					
		Rating =	67.860	9.400	110.000				187.3	**85.1**
		Max. Possible =	90	20	110				220	
	2	WF =	12	13	4					
		TV =	2.627	1.150	0.120					
		Score =	7.540	4.700	10.000					
		Rating =	90.480	61.100	40.000				191.6	**66.1**
		Max. Possible =	120	130	40				290	
	3	WF =	6	5	3					
		TV =	2.627	1.150	0.120					
		Score =	7.540	4.700	10.000					
		Rating =	45.240	23.500	30.000				98.7	**70.5**
		Max. Possible =	60	50	30				140	

average rating = 84.6

required % increase over design size = -4.6

WF = Weighting Factor TV = Test Value

LAMBERT1.WB2

ROCK QUALITY SCORING

Durability Sample From Reams' Screening Operation: 8.2" rock — Sample: Lambert 7195

Sample Number	Rock Type (1 = igneous) (2 = limestone) (3 = sandstone)		Specific Gravity (SSD) (g/cc)	Absorption (%)	Sulfate Soundness (% loss)	LA Abrasion (% loss)	Schmidt Hammer (SRU)	Tensile Strength (psi)	Total Scores	Composite Rating For Sample (%)
Lambert 7195	1	WF =	9	2	11					
		TV =	2.598	0.766	0.080					
		Score =	6.960	6.376	10.000					
		Rating =	62.640	12.753	110.000				185.4	**84.3**
		Max. Possible =	90	20	110				220	
	2	WF =	12	13	4					
		TV =	2.598	0.766	0.080					
		Score =	6.960	6.376	10.000					
		Rating =	83.520	82.894	40.000				206.4	**71.2**
		Max. Possible =	120	130	40				290	
	3	WF =	6	5	3					
		TV =	2.598	0.766	0.080					
		Score =	6.960	6.376	10.000					
		Rating =	41.760	31.882	30.000				103.6	**74.0**
		Max. Possible =	60	50	30				140	

average rating = 83.9

required % increase over design size = -3.9

WF = Weighting Factor TV = Test Value

LAMBERT1.WB2

SULFATE SOUNDNESS TEST
ASTM C88

Sieve Size	Weight of Sample Before Test	Percent Loss On Sieve	Sample Grading	Weighted % loss
2 1/2"-1 1/2"	5500.7	.2	*73% **36.9	*.146% **.074%
1 1/2"-3/4"	1156.0	.9	*11% ** 5.6%	*.099% **.050%
TOTAL				*.245% **.124%

*Based on total sample
**Based on minus 3 inch portion of sample only

SIEVE ANALYSIS
ASTM C136

Sieve Size	Cumulative % Passing
16"	100
10"	92
8"	80
6"	69
3"	51
2 1/2"	44
2"	31
1 1/2"	7.1
1"	1.5
3/4"	1.2

ABSORPTION & SPECIFIC GRAVITY
ASTM C127 & C128

Average Absorption	=	1.15%
Bulk Specific Gravity	=	2.597
Bulk Specific Gravity (SSD)	=	2.627

LABORATORY NUMBER: 6916
ENGINEERING TECHNICIAN: Conner, Hayes
Sample Id Number: Large scale sieve analysis-rip rap

SULFATE SOUNDNESS TEST
ASTM C88

Sieve Size	Weight of Sample Before Test	Percent Loss On Sieve	Sample Grading	Weighted % loss
2 1/2 - 3"	2260.6	0.1	9.0	.009
2 1/2 - 1 1/2	3591.2	0.3	23.8	.07
		0.3	23.8	.07
TOTAL				.08

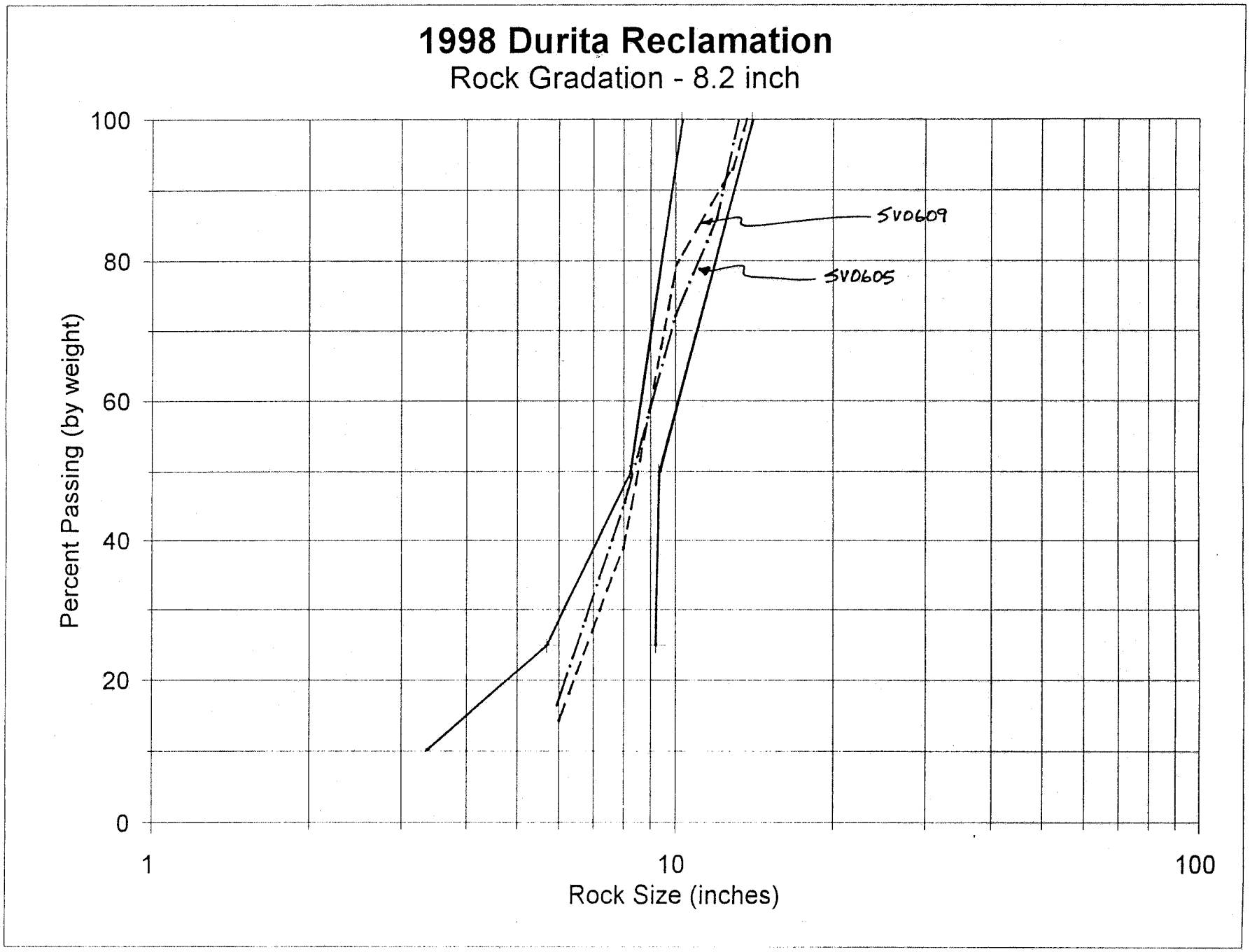
SIEVE ANALYSIS
ASTM C136

Sieve Size	Cumulative % Passing
5"	100
4"	91
3"	33
2 1/2"	24
2"	2.1
1 1/2"	0.2

ABSORPTION & SPECIFIC GRAVITY
ASTM C127 & C128

Average Absorption	=	.766
Bulk Specific Gravity	=	2.579
Bulk Specific Gravity (SSD)	=	2.598

LABORATORY NUMBER: 7195
ENGINEERING TECHNICIAN: Hayes


1998 Durita Reclamation
Rock Gradation - 8.2 inch
100
80
60
40
20
0
Percent Passing (by weight)
1
10
100
Rock Size (inches)
SV0609
SV0605

SIEVE ANALYSIS

PROJECT: Durita Reclamation Project **DATE:** 6/5/98

TESTED BY: D. Gibbs/L. Davis **SAMPLE ID:** SV0605

Sieve Size (inches)	Weight Retained (lbs)	Percent Retained (%)	Percent Passing (%)
12	385	13.75	86.25
10	388	13.86	72.39
8	747	26.68	45.71
6	791	28.25	17.46
-6	489	17.46	0
Total Weight (lbs) =	2800	100	**= Total % Retained**

Measured D_{100} (inches)	13.5
Sample Median Diameter (D_{50}) (inches)	8.32

$$\frac{10}{10}\ \frac{25 - D_{50}}{25 - 20.8} = \frac{72.39 - 50}{72.39 - 45.71}$$

D_{50} = 8.32

D_{25} = 6.53

D_{15} = 5.6

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SIEVE ANALYSIS

PROJECT: Durita Reclamation Project **DATE:** 6/9/98

TESTED BY: R. DAVIS / D. GIBBS **SAMPLE ID:** SV0609

Sieve Size (inches)	Weight Retained (lbs)	Percent Retained (%)	Percent Passing (%)
13.5	195.5	6.79	93.21
12	85	2.95	90.26
10	313	10.86	79.40
8	1176	40.82	38.58
6	700	24.30	14.28
-6	411.5	14.28	0
Total Weight (lbs) =	2,881	100	**= Total % Retained**

Measured D_{100} (inches)	13.8
Sample Median Diameter (D_{50}) (inches)	8.56

$\log \frac{2.5 - D_{50}}{2.5 - 2.08} =$	$\frac{79.4 - 50}{79.4 - 38.58}$
$D_{50} =$	8.56
$D_{25} =$	6.88
$D_{15} \approx$	6.1