

**RIO ALGOM MINING LLC. - SMITH RANCH FACILITY
ANNUAL REPORT - PERMIT TO MINE NO. 633
YEAR 2001-2002**

1. (a) Name of Permittee - **RIO ALGOM MINING LLC.**
 (b) Address - **P.O. Box 1390, Glenrock, Wyoming 82637**
 (c) Mining Permit No. - **Permit To Mine #633 (Permit Map - Figure 1, Appendix C)**
 (d) Date of Permit Issuance (and any amendments) - **June 18, 1991**
 (e) Material Mined - **Uranium**
 (f) State and Federal Lease Numbers - **No Federal Lease Number, State Lease Numbers #48-057-087 and #48-057-0009-1**
2. Report Period - **April 1, 2001 to March 31, 2002**
3. (a) Tabulate acreage disturbed (by pits roads, facilities, etc.) during the report period and illustrate on map.

The following table presents those areas which were disturbed during the report period and may require future reclamation activities:

**TABLE 1
AREAS DISTURBED DURING 2001-2002 REVIEW PERIOD**

Area	Acreage
Wellfield #4/Pipeline for HH4-10 & 11 ⁽¹⁾	2.3
Deep Disposal Well #2 Pipeline ⁽¹⁾	0.1
Wellfield #4 Booster Station ⁽¹⁾	0.1
Wellfield #2 ⁽¹⁾	52.0
Total	54.5

(1) Disturbance already included in bond.

During the next reporting period, work is scheduled only for surface areas already covered by the bond. Therefore, Table 2 shows no areas scheduled for disturbance.

**TABLE 2
AREAS PLANNED TO BE DISTURBED DURING
NEXT REVIEW PERIOD (2002-2003)**

Area	Acreage
None	---

(b) Tabulate acreage affected to date by years and illustrate on map.

**TABLE 3
ACREAGE TO BE RECLAIMED/RELEASED**

Area	Year	Acreage
Bill Smith Surface Plant, Yard, Spoil	1971	10.57
Bill Smith Storage Yard (50% of 10.18 acres)	1971	5.09
Access Road (1/2 roadbed)	1968	4.75
Settling Ponds, Treatment Plant Area	1968	8.60
Topsoil Piles (pre-1996)	1968	3.36
Other Roads (Access to ISL Wellfield)	1982	5.00
Miscellaneous (Area around evap. ponds, settling ponds)	1981	3.61
Wellfield #1 (Inclusive of header houses and roads)	1996	27.1
Oxygen Storage Facility	1997	0.2
Chemical Storage Facility⁽¹⁾	1997	0.0
Disposal Well Area (Pad, Road & Spoil Pile)	1996	2.9
Drill Mud Storage Area	1996	0.25
Wellfield #1 Storage Area	1996	1.5
Topsoil #8	1996	0.2
Topsoil #9⁽²⁾	1997	0.3
Wellfield #2 Storage Area	1998	1.24
Wellfield #3 (Inclusive of header houses and roads)	1998	37.52
Wellfield #3 Southern Storage Area	1998	1.2
Satellite #1	1998	2.05
Wellfield #4 Storage Area	1998	1.64
Wellfield #4 (Inclusive of header houses and roads)	1998	29.59
Topsoil Pile #10	1998	0.40
Topsoil Pile #11	1998	0.08
Topsoil Pile #12	1998	0.29
Topsoil Pile #13	1998	0.72
Topsoil Pile #14	1998	0.16
Shop Building ⁽¹⁾	1997	0.00
Office Addition Building	1998	0.23
Trunkline #1	1998	3.1
Topsoil Pile #15	1999	0.1

Area	Year	Acreage
Topsoil Pile #16	1999	0.2
Trunkline #2	1999	11.7
Topsoil Pile #6	1997	0.78
Office Parking Lot	1999	0.4
Trunkline #2 Pipeline Laydown Area	1999	1.1
Wellfield #4/Phase #2	1999/00	27.0
Wellfield #4A/Phase #2 Staging Area	2000	0.3
Drill Water Facility Including Topsoil Pile #18	1999	0.1
Topsoil Pile #17	1999	0.2
Facility Fire Water System Tank	2000	0.1
Deep Disposal Well #2 Pad	1999	1.9
Topsoil Pile #18	2000	0.1
Wellfield #4/Phase #2 Pipeline	2000	5.9
Topsoil Pile #19	2001	0.1
Topsoil Pile #20⁽³⁾	2001	0
Wellfield #4 HH4-5,6 Booster	2001	0.1
Wellfield #4/Phase #2 Pipeline for HH4-10, 11	2001	2.3
Deep Disposal Well #2 Pipeline	2001	0.1
Wellfield #4 Booster Station	2001	0.1
Wellfield #2 (Inclusive of roads and header houses)	2001	52
Topsoil Pile #21⁽³⁾	2002	0
Unreclaimed Areas	---	256.23
Areas Previously Reclaimed (See Table 4)	---	18.88
Total Acres	---	237.35

(1) Included within "Bill Smith Surface Plant, Yard and Spill"

(2) Previous topsoil pile #9 was moved and combined several smaller topsoil piles to make new topsoil pile.

(3) Topsoil located in areas already covered by bond.

TABLE 4
AREAS PREVIOUSLY RECLAIMED

Area	Year	Acreage
Bill Smith Mine Test Well Sites	1968	2.80
Miscellaneous - Bill Smith Mine	1968	4.19
ISL Pilot Pipeline and Wellfield	1983	5.80
Mine Settling Pond #1 and #2	1997	2.8
Drill Mud Storage Area	1999	0.25
Wellfield #1 Staging Area	1999	1.5
Wellfield #3 North Staging Area	2001	1.54
Total Acres	---	18.88

TABLE 5
AREAS THAT WILL NOT BE FULLY RECLAIMED

Area	Year	Acres
Bill Smith Mine Access (reduced to previous existing road)	1968	4.75
Total Acres	---	4.75

(c) Tabulate all topsoil stockpile volumes, date of stockpiling and illustrate on map.

**TABLE 6
ESTIMATED TOPSOIL INVENTORY**

Topsoil Pile No.	Year	Volume (yd³)	Amount Used	Remaining
1	1968	14,300	0	14,300
2	1968	15,800	13,550	2,250
3	1968	12,100	0	12,100
4	1968	520	0	520
5	1983	3,350	0	3,350
6	1983 & 1998	1,621	0	1,621
7	1983	300	0	300
8	1996	1,820	0	1,820
9	1997	60	0	60
10	1998 & 1999	3,217	0	3,217
11	1998	495	0	495
12	1998 & 1999	1,872	0	1,872
13	1998	4,653	0	4,653
14	1998	751	0	751
15	1999	490	0	490
16	1999	3,500	0	3,500
17	2000	300	0	300
18	1999	170	0	170
19	2001	247	0	247
20	2001	72	0	72
21	2001	147	0	147
Total	---	65,785	13,550	52,235

- (d) Tabulate all out-of-pit spoil volumes, dates of placement and illustrate on map.

**TABLE 7
OUT OF PIT SPOIL INVENTORY**

Spoil	Year	Volume (yd³)	Amount Used	Remaining
1	1997	2,120	2,120	0

(1) Note - The material is from the construction of the disposal well lined drilling ponds. The material is used as needed in the construction of the facility as fill and grade material.

- (e) Tabulate quantity of commodity mined by years.

The following presents the quantity of U₃O₈ mined to date:

**TABLE 8
U₃O₈ Pounds**

Year	Amount (Pounds)
Pre-1982⁽¹⁾	24,800
1982-1989⁽²⁾	284,000
1990-Present⁽³⁾	24,529
1997⁽⁴⁾	174,139
1998⁽⁴⁾	863,857
1999⁽⁴⁾	1,633,780
2000⁽⁴⁾	1,137,630
2001⁽⁴⁾	907,938
Total	5,050,673

(1) Underground conventional mining production.

(2) ISL Pilot Plants production.

(3) ISL Pilot Plants standby production.

(4) Eluted commercial ISL production (calendar year)

- (f) Describe any new construction during the report period and illustrate on map; include:

1. Shop facilities, erection sites
2. Roads
3. Culverts
4. Diversion ditches, collector ditches, interceptor ditches
5. Sediment ponds, containment ponds
6. Monitoring sites

During the review period, various construction activities were completed that had been initiated during the prior report period. These are discussed below along with new construction activities initiated during this report period. No sediment or containment ponds were created during the report period. Nor were any new culverts installed.

These items are noted in Figure 3-11 found in Appendix C of this submittal.

Please note that Rio Algom, pursuant to WDEQ/LQD letter dated February 11, 1999, specifically at Item 2.2, requested that the facility map in the annual report be labeled as Figure 3-11 for inclusion into the permit. In previous annual reports, these maps had been numerically numbered.

Wellfield #1

Activities in Wellfield #1 were limited to maintenance.

Wellfield #2

Construction of 81 monitor wells was completed and two hydrologic tests were performed. Installation of production and injection wells in HH2-7 was initiated during the report period. All roads in the wellfield are still two track since permanent roadways have not been established.

Wellfield #3

Uranium recovery continued in Wellfield #3. In addition to the first completions, the second completions in HH3-4 and HH3-6 were brought on-line on February 13th and March 8th respectively.

Wellfield #4/Phase #2

Construction of header houses 4-8 through 4-11 was completed and production was initiated during the report period (see Figure 3-11).

Miscellaneous

Consistent with Rio Algom's letter dated February 20, 1997, Rio Algom is providing the number, location, and abandonment procedures for delineation drill holes within the permit area. Please note that during the reporting period, there were a total of 356 delineation holes drilled within the permit area. A total of 72 injection or production wells were drilled (twelve of which were for second completions in Wellfield 3). Maps indicating their locations and identification are presented as figures in Appendix C. Contained in Appendix B are the drill hole location tables.

The abandonment and plugging procedures for delineation holes utilized by Rio Algom include filling the drill hole to surface with an abandonment fluid which meets or exceeds the following specifications as required by WDEQ/LQD-Noncoal Rules, Chapter VIII:

- * Ten minute gel strength of at least 20 lbs per 100 ft²;**
- * Filtrate volume not to exceed 13.5 cc;**
- * Mud weight not less than 9 lbs per gallon.**

The holes, which are filled within two (2) feet below the original land surface are followed with the placement of a 5" by 8" pre-cast concrete plug. The plug is tamped into the hole with the area above the cement plug backfilled with topsoil to the original ground level helping to assure that a minimum of at least 2 feet of fill is between the cement cap and the original land surface. Holes are generally surface capped the same day as drilling is completed.

(g) Describe any environmental problem areas and a proposed plan for mitigating them - illustrate on map; include:

1. Pit stability problems
2. Subsidence
3. Accidental water discharge, dam failure, etc.
4. Slumping or sliding
5. Revegetation problem areas

There were no pit stability problems as this is not applicable to the in-situ leaching operations associated with the Smith Ranch operation. In regards to items #2 and #4, subsidence and slumping respectively, there have been no observed problems associated with either of these items at the facility.

Provided in the table below are the dates, volumes, and comments regarding accidental spills. Each of these items have been reported by phone and in writing to WDEQ. None of these spills were reportable for any other reason than the volume exceeded 420 gallons. There were no significant environmental effects, and none will effect the final reclamation plans. All spills were mitigated immediately by repairing the failed equipment and/or by vacuuming the fluids or by additional training of employees.

TABLE 9
ACCIDENTAL SPILLS, 2001-2002 REVIEW PERIOD

Date	Location	Volume	Notation
6/18/01	Disposal Well #1	1,100	Stainless steel tubing leading to a flow meter sheared due to excessive vibration when a bearing failed
10/14/01	WF#3/CPP Pipeline	3,600	A polyethylene pipe failed due to cold fusion
10/22/01	HH3-2	62,400	Failure of glue joint
10/5/01	Well 3I44 and 3I53	3,600	Operator turned on wells that were disconnected at the surface.
1/4/02	Well 3P163	1,800	Corrosion of galvanized nipple

4. (a) Tabulate the reclaimed acreage completed during the report period and illustrate on map. Distinguish between:
1. Backfilled, graded, and contoured. Include date of approval for coal permits.
 2. Topsoiled
 3. Seeded
 4. Reseeded
 5. Indicate where special construction or reclamation practices were used such as for sand bodies or alluvial material.

Wellfield #1

There was no disturbance in Wellfield I during the report period.

Wellfield #3

Reseeding in WF 3 will follow installation of second completions.

Wellfield 4

Areas around header houses 4-5 and 4-6 were seeded with long-term seed during April.

Wellfield #4/Phase #2

Areas around header house 4-7 and 4-8 were seeded with perennial grasses.

Miscellaneous

Delineation drill pits in sections 10 and 11 of T35N R74W were seeded with the permanent seed mixture prescribed by the permit during early May.

For the purposes of this report, the items noted in the discussions above are considered "interim reclamation" activities and are provided to

WDEQ/LQD as information pertaining to on-going operations. Interim reclamation means the regrading, contouring, topsoiling and revegetation, as may be applicable, on disturbed areas that are associated with on-going or active mine construction and/or production activities. This is to be distinguished from "final reclamation" activities which will commence and be completed upon cessation of mining activities for that particular area. Accordingly, as noted in Table 10, no areas were affected by final reclamation during the report period.

**TABLE 10
2001-2002 RECLAIMED ACREAGE - FINAL (acres)**

Area	Backfilled, Graded, Contoured	Topsoiled	Seeded	Reseed	Special Practices
None	---	---	---	---	---

- (b) Submit a map showing the reconstruction contours. The map must be the same scale and contour interval as the PMT map in the approved permit.

Not applicable during the 2001-2002 review period.

- (c) Tabulate acreage reclaimed (seeded with permanent seed mix) to date by years and illustrate on map.

As previously noted in item 4(a), no final reclamation occurred during the report period.

- (d) Describe reclamation procedures used during the report period:

1. Depth of topsoil applied. Indicate whether from stockpile or directly applied.
2. Type of seed used for seeding during the report period.
3. Dates of seeding during the report period.
4. Seeding procedures used.
5. Rate of seed application.
6. Type and rate of any fertilizer applied.
7. Type and rate of mulch applied.
8. Rate of irrigation water applied.
9. Any deviations to the approved reclamation plan including, in addition to the items above, changes to the contours or location of post mining features.

**TABLE 11
2001-2002 RECLAMATION PROCEDURES**

Area	Depth of Topsoil	Seed Type	Seeding Date	Seed Proc.	Rate of Appl.	Type/Rate of Fertilizer	Type/Rate of Mulch	Rate of Irrigation	Deviation from Plan
None	---	---	---	---	---	---	---	---	---

(e) Describe results of previous revegetation efforts; include:

1. Types of seed that have germinated and are growing.
2. Types of seed that are not growing successfully.
3. Areas experiencing problems with weeds and weed types.
4. Significant erosional problems.
5. Areas of unsuitable overburden on the surface.
6. Procedures used or proposed to correct these problems.

**TABLE 12
RECLAMATION RESULTS**

Area	Type of Seed Germinated	Type of Seed Not Growing	Weed Problems	Areas of Unsuitable Overburden	Procedures To Correct Unsuitable Overburden
BIII Smith Mine Test Well Sites	(1)	All Growing	---	N.A.	N.A.
Misc. - BIII Smith Mine	(1)	All Growing	---	N.A.	N.A.
ISL Pilot Pipeline & Wellfield	(1)	All Growing	---	N.A.	N.A.
Mine Settling Ponds #1/#2	(1)	All Growing	---	N.A.	N.A.

(1) Streambank wheatgrass, western wheatgrass, thickspike wheatgrass, green needlegrass, indian ricegrass, blue grama, fourwig saltbush.

- (f) Summarize the actual reclamation costs incurred during the report period. Costs should be itemized for each operation (i.e. grading, topsoil replacement, seeding, etc.) and for each type of disturbance (i.e. spoil, haul roads, facilities removal, etc.) on a per-acre basis.

No final reclamation occurred during the report period.

5. Describe in detail mining plans for the coming year including revised time schedules and all proposed deviations from previously approved plans. Acreage should be tabulated and illustrated on a map.

Production from Wellfield #1 continued throughout the report period. Restoration activities are tentatively scheduled to begin during the fall of 2002 pending the cessation of economic product recovery.

Production from Wellfield #3 will continue throughout the next reporting period. The second completion intervals for Header Houses 3-2, 3-5, and 3-7 are scheduled to be brought on-line during the 2002-2003 reporting period.

Production will continue in Wellfield #4 throughout the next report period. Construction of second completion intervals in Wellfield 4, Header Houses 4-3 and 4-4 are scheduled for the next report period. Production from the second completions is also scheduled for the next report period.

The mine plan also includes development of Wellfield #2 with production scheduled to commence in late 2002. Wellfield #2 is located in portions of sections 25, 26, and 36, T36N R74W.

Wellfield #7, which is located in sections 26 and 27 of T36N R74W, is being reviewed for optimal mining and resource enhancement. Wellfield installation is tentatively scheduled for 2004 with production to follow in 2005.

Activities planned for the next report year are shown in Figure 3-11 which is enclosed within Appendix C of this report.

6. Describe in detail reclamation plans for the coming year including revised time schedules and deviations from previously approved plans. Acreage should be tabulated and illustrated on a map.

Rio Algom will continue to initiate interim reclamation practices associated with re-vegetation of disturbed areas for topsoil stabilization including all topsoil piles, culvert maintenance, other mine related disturbances along with other items such as road maintenance.

7. Describe in detail all monitoring activities during the report period, summarize the data, describe procedures to correct any noted problems and deviations from previously approved methods, including:

- (a) Groundwater Analyses
- (b) Surface water analyses and discharge data
- (c) Precipitation data
- (d) Subsidence monitoring
- (e) Overburden analyses
- (f) Topsoil quantities - compare calculated and actual

- (g) Vegetation data
- (h) Wildlife data
- (i) A map showing and identifying monitoring locations

(a) Groundwater Analysis

(1) Wellfield #1 - operation for this wellfield commenced on June 20, 1997. During the report period a hydrologic bleed was maintained for the wellfield although there was no active production. Restoration is tentatively scheduled to begin in the fall of 2002 cessation of economic product recovery. Provided in Table 13 is the water balance for this wellfield.

**TABLE 13
WELLFIELD #1 - WATER BALANCE (Calendar Year 2001)**

Item	Gallons (unless noted)
Recovery Volume	248,547,110
Injection Volume	246,670,474
Overrecovery Volume	1,876,636
Ave. Production Rate (gpm)	472.9

(2) Wellfield #3 - operation for this wellfield commenced on August 10, 1998. Production activities continued during the report and is scheduled to continue in the next report period. Provided in Table 14 is the water balance for this wellfield.

**TABLE 14
WELLFIELD #3 - WATER BALANCE (Calendar Year 2001)**

Item	Gallons (unless noted)
Recovery Volume	712,574,021
Injection Volume	705,373,085
Overrecovery Volume	7,200,936
Ave. Production Rate (gpm)	1,355.7

(3) Wellfield #4 - operation for this wellfield commenced on September 9, 1999. Production activities continued during the report and are scheduled to continue in the next report period. Provided in Table 14 is the water balance for this wellfield.

**TABLE 15
WELLFIELD #4 - WATER BALANCE (Calendar Year 2001)**

Item	Gallons (unless noted)
Recovery Volume	1,477,534,723
Injection Volume	1,467,223,690
Overrecovery Volume	10,311,033
Ave. Production Rate (gpm)	2,811.1

(4) Wastewater routed to disposal well during the report period: 29,469,689 gallons.

(5) Water and Excursion Monitoring:

During the report period, the mechanical integrity tests (MIT) and monitor well results were completed and forwarded to WDEQ/LQD in reports dated April 20, 2001; July 27, 2001; October 22, 2001; January 29, 2002; and April 29, 2002. Rio Algom wishes to incorporate these submittals "by reference" for inclusion into this report. There were no excursions or UCL parameters exceeding any of their established UCL levels.

(b) Surface water analyses and discharge data

(1) NPDES Discharge

Water quality monitoring for the facility's NPDES permit No. WY-0022411 continues. These analyses were previously submitted to LQD within the semi-annual effluent report dated August 29, 2001, and February 28, 2002. These results are referenced for this report.

(2) Evaporation Ponds:

With the initiation of commercial operations, the evaporation ponds are sampled semi-annually. Accordingly, the evaporation pond samples were submitted as part of the semi-annual effluent reports dated August 29, 2001, and February 28, 2002. These submittals are referenced for this report.

- (c) Precipitation data

Not Applicable

- (d) Subsidence monitoring

Not Applicable

- (e) Overburden analyses

Not Applicable

- (f) Topsoil quantities - compare calculated and actual

See Table 6 for topsoil quantities.

- (g) Vegetation data

RAM wishes to reference the Semi-annual Effluent Report dated February 28, 2002.

- (h) Wildlife data

During operational monitoring, no threatened or endangered species were seen within the permit boundary or the immediate area surrounding the permit area. See Figure 7 in Appendix E for results of raptor monitoring.

- (i) A map showing and identifying monitoring locations

This is included within Appendix C as Figure 2.

- (j) Environmental Radiological Monitoring Data

- (l) Radon Survey:

Radon-222 is measured downwind from the facility at three (3) locations identified as Vollman Ranch, Fenceline, and Dave's Water Well. These measurements are made using a continuous passive radon detector. The detector is exchanged for analysis on a quarterly basis with the results having been submitted as part of the semi-annual effluent reports dated August 29, 2001, and February 28, 2002. Rio Algom wishes to incorporate this information by reference. The first quarter radon results will be submitted as part of the 1st half 2002 semi-annual effluent report.

(k) Gamma Radiation Survey:

Direct gamma radiation is measured quarterly at a number of locations and submitted as part of the semi-annual effluent report. Rio Algom wishes to incorporate by reference the reports dated August 29, 2001, and February 28, 2002, for incorporation into this report. The first quarter gamma results will be submitted as part of the 1st half 2002 semi-annual effluent report.

(l) Sediment/Soil Surveys:

Soil samples are collected on an annual basis and are reported with the semi-annual effluent report. Accordingly, Rio Algom would like to reference the February 28, 2002, "Semi-annual Effluent Report" for inclusion into this report.

8. Operator's Reclamation Performance Bond Estimate as required by Wyoming Statute §35-11-417. Reclamation cost estimate should be itemized in detail to reflect the actual estimated costs of reclaiming all lands which have been affected to date and those lands to be affected during the next report period. Costs must reflect procedures as specified in the approved mine and reclamation plan. The estimated cost of dismantling and disposal of all facilities and structures must be included. Salvage value will not be used to offset bonding requirements. Reclamation costs must reflect actual yardages to be moved. Actual yardages to be moved will reflect the removal or placement of additional material to correct any deviations between the PMT map and the map submitted for part 4.(b).

Attached in Appendix A is the 2002-2003 proposed surety showing the WDEQ one (1) year forward reclamation costs.

The proposed 2002-2003 annual surety adjustment continues to use the WDEQ approved reclamation surety basis for this year's revised surety. Based on this analysis, the one (1) year forward WDEQ reclamation cost for the Smith Ranch permit facility is \$12.177 million. Provided within Appendix A of this report are; (1) bond calculations incorporating additional surface disturbances from commercial construction activities (see Table 1) using the WDEQ approved bond basis contained within Appendix 4 "Existing Facilities", Section 4.5 "Site Reclamation"; and (2) bond calculations for reclamation of delineation holes within the permit area.

9. Supply any additional information as requested by the Division related to:
 - (a) Notices of violation
 - (b) Order
 - (c) Permit stipulations; and
 - (d) Other special conditions

There were no notices of violations, orders, permit stipulations, or other special conditions requiring further information issued to Rio Algom.

10. All drill holes used for immediate developmental expansion of the advancing pit(s) shall be tabulated by location and depth and shown on the mining plan map. Pursuant to W.S. §35-11-404(e), all drill holes used for exploration shall be reported to the LQD Abandoned Drill Hole Program Supervisor and the State Engineer.

Please note that during the review period, there were a total of 356 such holes drilled within the permit with an average depth of 746 feet. Maps indicating their locations are presented as Figures 4-1 through 4-2 in Appendix C with the Drill Hole tabulation included in Appendix B.

Annual Report Attachment

A. Billiton Ltd merged with BHP on June 29, 2001 to form BHP Billiton. To date, this merger has had no affect on the Rio Algom Mining LLC. organization which owns and operates the Smith Ranch Facility.

B. The General Manager - Bill Ferdinand: P.O. Box 1390, Glenrock, WY 82637

The party to receive notice is John Cash: P.O. Box 1390, Glenrock, WY 82637

**C. Rio Algom Mining LLC. President - Bruce Law
Rio Algom Mining LLC. Manager, Radiation Safety, Regulatory Compliance and Licensing - Paul Goranson**

All the above officers can be reached at :

**Rio Algom Mining LLC.
6305 Waterford Blvd.
Suite 400
Oklahoma City, OK 73118**

Attachments:

**Appendix A - Proposed Bond
Appendix B - Drill Hole Tables
Appendix C - Maps
Appendix D - Topsoil Profile Map and Pictures
Appendix E - Raptor Monitoring Results**

TABLE 3-1
PROJECTED DEVELOPMENT SCHEDULE BY WELLFIELD

[illegible]

Total 414



DEVELOPMENT
PRODUCTION
RESTORATION

APPENDIX A

RIO ALGOM MINING LLC.

SMITH RANCH FACILITY

SURETY BOND

2002-2003

**RIO ALGOM MINING LLC.
ANNUAL ADJUSTMENT OF RECLAMATION SURETY
2002-2003**

Shown below is the 2002-2003 proposed annual surety adjustment for the Smith Ranch facility. The 2002-2003 annual surety adjustment continues to use the WDEQ and NRC approved reclamation surety basis for this year's revised surety.

This annual surety proposal is presented in three (3) sections. The first section, entitled "Part I - Surety Bond Summary", is a summary of the itemized reclamation costs. The second section which is labeled "Part II - Surety Bond Detail", presents the detailed calculations of the summaries noted in Part I. The final section, "Part III - Cost Basis", contains the basis that were used in the bond calculations in Part II.

It should be noted that during the 1997-1998 annual surety review, Rio Algom was requested by the WDEQ to present the bond in 1997 dollars. Accordingly, Rio Algom will continue to use the August 4, 1997, review as its surety basis although there is no difference monetarily between the earlier surety reviews which were expressed in 1993 dollars and adjusted to present, constant dollars using the Consumer Price Index (CPI). The surety however, has been modified to reflect disturbances due to construction activities associated with the 1999 commercial operations along with the projected one (1) year forward commercial operation activities.

The adjustments to the proposed WDEQ 2002-2003 surety includes new disturbances resulting from commercial construction activities as shown in Table 2, along with the anticipated one year (1) forward reclamation costs associated with installation and operation of wellfield #1, wellfield #3, wellfield #4, wellfield #4a, wellfield #3 extension, wellfield #2, wellfield #4 extension, main facility, and Satellite #1 plant. Additionally, pursuant to discussions with WDEQ, Rio Algom is including the cost of bonding delineation holes within the permit area rather than including these reclamation bonding costs within the Company's exploration drilling Permit 236DN.

Accordingly, the surety recognizes these items and where applicable, utilizes the inflation rate of 12.2% from April 1997 (CPI 160.2) through April 2002 (CPI 179.7). The proposed 2002-2003 reclamation surety amount for the WDEQ is \$12.177 million.

PART I - SURETY BOND SUMMARY

Presented below in Table 1, is the summary of the itemized bond calculations for the review period of 2002-2003. The proposed adjustment to the WDEQ surety includes existing disturbances and new disturbances from commercial construction activities which are presented in Table 2, and the scheduled operation of wellfield #1, wellfield #3, wellfield #4, wellfield #4a, 4 headerhouses in wellfield #2 and Satellite #1 plant.

Groundwater Restoration Cost Estimate

In October 2001, Rio Algom submitted its restoration plan for Wellfield #1. That restoration plan varied from the plan provided in the Application for Permit to Mine #633 due to changes in the classification of the groundwater restoration discharges from in-situ leach uranium recovery facilities by the NRC in Regulatory Issues Summary 2000-23. The most significant change is the replacement of groundwater sweep with continued treatment by reverse osmosis to minimize the discharge volume to meet disposal well capacity. This increased the cost of restoration for the wellfields included in the 2001-2002 surety estimate by \$884,671 (\$1997). For detail on the restoration plan, please refer to the submittal dated October 18, 2001.

TABLE 1
RIO ALGOM MINING LLC. - SMITH RANCH FACILITY
2002-2003 PROPOSED WDEQ/LQD BOND

WORK UNIT		ONE YEAR FORWARD WDEQ/LQD & NRC 2002-2003 BOND AMOUNT
Ion Exchange Plant⁽¹⁾ (NRC Related Activity)		
1.1	Building	40,116
1.2	Tankage and Vessels	39,913
1.3	Piping	12,924
1.4	Pumps	6,094
1.5	Electrical	9,470
1.6	Foundations	48,588
1.7	Plant Site	2,058
1.8	Access Road	1,054
1.9	SUB-TOTAL	160,217
Central Processing Plant (NRC Related Activity)		
2.1	Buildings	57,548
2.2	Tankage and Vessels	60,246
2.3	Piping	10,846
2.4	Pumps	10,965
2.5	Electrical	19,682
2.6	Foundations	70,019
	SUB-TOTAL	229,306
Dryer Area (NRC Related Activity)		
3.1	Buildings	16,222
3.2	Equipment	14,739
3.3	Foundations	16,802
	SUB-TOTAL	47,763
Existing Facilities		
4.1	Buildings (NRC Related Activity)	95,635
4.2	Structures ⁽²⁾ (NRC Related Activity)	18,187
4.3	Pilot Plant Equipment (NRC Related Activity)	22,620
4.4	Foundations (NRC Related Activity)	139,333
4.5	Site Reclamation	84,070
4.6	O-Sand Pilot (NRC Related Activity)	41,435
4.7	Q-Sand Pilot (NRC Related Activity)	N/A

WORK UNIT		ONE YEAR FORWARD WDEQ/LQD & NRC 2002-2003 BOND AMOUNT
4.8	Mine Water Treatment Ponds	19,878
	SUB-TOTAL	421,158
	Unit Header Site & Wellfields ⁽³⁾ (NRC Related Activity)	
5.1	Buildings	92,630
5.2	Header Piping	163,553
5.3	Secondary Electrical	157,453
5.4	Wells-Totals	629,813
5.5	Monitor Wells-Total	86,710
5.6	Site Reclamation	60,936
	SUB-TOTAL	1,191,095
	Associated Structures	
6.1	#1 Trunkline (5,000 ft ea) (NRC Related Activity)	52,108
6.2	#2 Trunkline (10,000 ft ea) (NRC Related Activity)	104,216
6.3	Radium Settling Ponds (NRC Related Activity)	70,077
6.4a	Plugging & Aband. Disposal Well #1 (NRC Related Activity)	77,735
6.4b	Plugging & Aband. Disposal Well #2 (NRC Related Activity)	77,735
6.5	Sand Mining Area	13,173
6.6	Land Fill	1,500
6.7	Fire Protection System	11,623
	SUB-TOTAL	408,167
	Groundwater Reclamation & RO Units (NRC Related Activity)	
7.1	Restoration	6,033,134
	Health Physics and Radiation Surveys (NRC Related Activity)	
8.1	Monitoring	168,470
	Whole Trucking (Remaining Fractional Units) (NRC Related Activity)	
9.1	Contaminated Trucking	523

WORK UNIT	ONE YEAR FORWARD WDEQ/LQD & NRC 2002-2003 BOND AMOUNT
9.2 Non-contaminated Trucking	157
10.1 Delineation Hole Reclamation	22,068
SUB-TOTAL OF ALL ABOVE	8,682,058
Overhead and Profit at 10%	868,206
Contingency at 15%	1,302,309
SUB-TOTAL OF ALL ABOVE	10,852,573
Inflation - 12.2% (4/97 CPI-160.2 through 4/02 CPI-179.7)	1,324,014
TOTAL (in 2002\$)	12,176,587
Proposed Bonding	12,176,587

- (1) Represents the construction of one (1) satellite during 1997-1998
- (2) Incorporates additional surface disturbances (10.46 acres) from commercial construction activities along with new items including fencing, water wells, and fuel storage area.
- (3) Represents 1 year forward of 598 patterns to be restored.

**TABLE 2
AREAS DISTURBED DURING 2001-2002 REVIEW PERIOD**

Area	Acreage
Wellfield #4/Phase #2 Pipeline for HH4-10 & 11	2.3 ⁽²⁾
Deep Disposal Well #2 Pipeline	0.1 ⁽²⁾
Wellfield #4 Booster Station	0.1 ⁽²⁾
Wellfield #2	52.0 ⁽²⁾
Total	54.5

(1) New disturbances not previously included within the bond.

(2) Disturbance already included in bond.

Presented in Table 3, are the disturbances planned during the next reporting period resulting from Smith Ranch mining activities and may require future reclamation activities:

**TABLE 3
AREAS PLANNED TO BE DISTURBED DURING
NEXT REVIEW PERIOD (2002-2003)**

Area	Est. Acreage
None	N/A
Total	0.0

**TABLE 4
ACREAGE TO BE RECLAIMED/RELEASED**

Area	Year	Acreage
Bill Smith Surface Plant, Yard, Spoil	1971	10.57
Bill Smith Storage Yard (50% of 10.18 acres)	1971	5.09
Access Road (1/2 roadbed)	1968	4.75
Settling Ponds, Treatment Plant Area	1968	8.60
Topsoil Piles (pre-1996)	1968	3.36
Other Roads (Access to ISL Wellfield)	1982	5.00
Miscellaneous (Area around evap. ponds, settling ponds)	1981	3.61
Wellfield #1 (inclusive of header houses and roads)	1996	27.1
Oxygen Storage Facility	1997	0.2
Chemical Storage Facility ⁽¹⁾	1997	0.0
Disposal Well Area (Pad, Road & Spoil Pile)	1996	2.9
Drill Mud Storage Area	1996	0.25
Wellfield #1 Storage Area	1996	1.5
Topsoil #8	1996	0.2
Topsoil #9 ⁽²⁾	1997	0.3

Area	Year	Acreage
Wellfield #2 Storage Area	1998	1.24
Wellfield #3 (inclusive of header houses and roads)	1998	37.52
Wellfield #3 Southern Storage Area	1998	1.2
Satellite #1	1998	2.05
Wellfield #4 Storage Area	1998	1.64
Wellfield #4 (inclusive of header houses and roads)	1998	29.59
Topsoil Pile #10	1998	0.40
Topsoil Pile #11	1998	0.08
Topsoil Pile #12	1998	0.29
Topsoil Pile #13	1998	0.72
Topsoil Pile #14	1998	0.16
Shop Building ⁽¹⁾	1997	0.00
Office Addition Building	1998	0.23
Trunkline #1	1998	3.1
Topsoil Pile #15	1999	0.1
Topsoil Pile #16	1999	0.2
Trunkline #2	1999	11.7
Topsoil Pile #6	1997	0.78
Office Parking Lot	1999	0.4
Trunkline #2 Pipeline Laydown Area	1999	1.1
Wellfield #4/Phase #2	1999/00	27.0
Wellfield #4A/Phase #2 Staging Area	2000	0.3
Drill Water Facility	1999	0.1
Topsoil Pile #17	1999	0.2
Facility Fire Water System Tank	2000	0.1
Deep Disposal Well #2 Pad	1999	1.9
Topsoil Pile #18	2000	0.1
Wellfield #4 / Phase #2 Pipeline	2000	5.9
Topsoil Pile #19	2001	0.1
Topsoil Pile #20 ⁽³⁾	2001	0
Wellfield #4 HH4-5,6 Booster	2001	0.1
Wellfield #4/Phase #2 Pipeline for HH4-10, 11	2001	2.3

Area	Year	Acreage
Wellfield #4 Booster Station	2001	0.1
Deep Disposal Well #2 Pipeline	2001	0.1
Wellfield #2 (Inclusive of header houses and roads)	2001	52
Topsoil Pile #21 ⁽³⁾	2002	0
Unreclaimed Areas	---	256.23
Areas Previously Reclaimed (See Table 5)	---	18.88
Total Acres	---	237.35

(1) Included within "Bill Smith Surface Plant, Yard and Spoil"

(2) Previous topsoil pile #9 was moved and combined several smaller topsoil piles to make new topsoil pile.

(3) Topsoil located in areas already covered by bond.

**TABLE 5
AREAS PREVIOUSLY RECLAIMED**

Area	Year	Acreage
Bill Smith Mine Test Well Sites	1968	2.80
Miscellaneous - Bill Smith Mine	1968	4.19
ISL Pilot Pipeline and Wellfield	1983	5.80
Mine Settling Pond #1 and #2	1997	2.8
Drill Mud Storage Area	1999	0.25
Wellfield #1 Staging Area	1999	1.5
Wellfield #3 North Staging Area	2001	1.54
Total Acres	---	18.88

**TABLE 6
AREAS THAT WILL NOT BE FULLY RECLAIMED**

Area	Year	Acreage
Bill Smith Mine Access (reduced to previous existing road)	1968	4.75
Total Acres	---	4.75

PART II - SURETY BOND DETAIL

This section presents the support details for the summary totals included in Table 1. Within this part, the bond detail is divided into ten (10) sections that encompass the mining activities at the Smith Ranch facility. These 10 divisions match each of the summary sections that are presented in Table 1.

These bond division areas include; ion exchange plants, central processing plant, dryer area, existing facilities, header sites and wellfields, associated structures, groundwater reclamation and RO Units, whole trucking, and delineation hole reclamation. The cost basis for these calculations are from contractor quotes. These quotes are presented in "Part III - Cost Basis".

SECTION 1
ION EXCHANGE PLANT RECLAMATION COSTS
Cost Summary

ITEM	COSTS (\$97)
1.1 Building	40,116
1.2 Tankage and Vessels	39,913
1.3 Piping	12,924
1.4 Pumps	6,094
1.5 Electrical	9,470
1.6 Foundations	48,588
1.7 Plant Site	2,058
1.8 Access Road	1,054
Total Cost	160,217

1.1 Building

Calculation Basis: 70 Ft. x 165 Ft. with 23 Ft. Eave
Floor Area = 11,550 Ft²
Skin Area = 10,810 Ft²

A. Washdown Building - 6 Days:

Wash 10,810 Ft² @ 1 Gal/Ft² = 10,818 Gal

Wash 10,810 Ft² @ 450 Ft²/Man-Day = 24 Man-Days
= 6 Crew-Days

• Labor Crew = 1 - Foreman @ \$21.58/Hr		
4 - Laborers @ \$13.02/Hr		
	\$73.66/Hr x 48 Hr	= \$ 3,536
• Travel = \$73.66/Hr x 6 Day x 1 Hr/Day		= \$ 442
• Eq. Rental = 4 - Pressure Washers @ \$ 8.71/ Hr		
	\$ 34.84/Hr x 48 Hr	= \$ 1,672
• Materials = Soap @ \$1.09/BBL		
10,810 Gal x BBL x \$1.09/BBL		= \$ 281
	42 Gal	
• Dispose of Fluid @ \$0.11/BBL		
10,810 Gal x BBL x \$0.11/BBL		= \$ 28
	42 Gal	
Sub-total		= \$ 5,959

B. Dismantle and Load - 15 Days:

11,550 Ft² @ 100 Ft²/Man-Day = 115.5 Man-Days
= 15.0 Crew-Days

• Labor Crew = 1 - Foreman	@ \$ 21.58/Hr		
2 - Welders	@ \$ 19.35/Hr		
2 - Operators	@ \$ 17.71/Hr		
4 - Laborers	@ \$ 13.02/Hr		
	\$147.78/Hr x 120 Hr	=	\$ 17,734
• Travel = \$147.78/Hr x 15 Days x 1 Hr/Day		=	\$ 2,217
• Eq. Rental = 2 - 20 Ton Cranes	@ \$37.39/Hr		
2 - Welders/Torches	@ \$10.90/Hr		
	\$96.58/Hr x 120 Hr	=	\$ 11,590
Sub-total		=	\$ 31,541

C. Haul and Dispose - On-Site Land Fill:			
Building = 235,000# = 5 Truck Loads** @ 47,000#			
• Haul = 5 Trucks x 8 Hrs/Truck x \$65.39/Hr		=	<u>\$ 2,616</u>
• Dispose = Cost Included in Section 6.5			

** 5 Trucks required to move building in 1988

Building Total		=	<u>\$ 40,116</u>
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1.2 Tankage and Vessels

Basis: See Table 1.1

A. Decontaminate - 0 Days: (Assume No Decontamination)

B. Remove and Load - 11 Days:

• Labor Crew = 1 - Foreman	@ \$21.58/Hr*		
1 - Operator	@ \$17.71/Hr		
2 - Laborers	@ \$13.02/Hr		
	\$65.33/Hr x 88 Hr	=	\$ 5,749
• Travel = \$65.33/Hr x 11 Days x 1 Hr/Day		=	\$ 719
• Eq. Rental = 1 - 20 Ton Crane	@ \$37.39/Hr		
	\$37.39/Hr x 88 Hr	=	<u>\$ 3,290</u>
* This foreman will also supervise 1.2 C.			
Sub-total		=	\$ 9,758

C. Dismantle, Cut, or Crush - 11 Days:

Cut Steel @ 30 Ft.³/Man-Day @ 631.4 Ft³ = 21 Man-Day
Crush FRP @ 60 Ft.³/Man-Day @ 240.5 Ft³ = 4 Man-Day

• Labor Crew = 1 - Foreman	@ Foreman supervises both 1.2 (B) & (C)		
2 - Welders	@ \$19.35/Hr		
2 - Laborers	@ \$13.02/Hr		
	\$64.74/Hr x 88 Hr	=	\$ 5,697
• Travel = \$64.74/Hr x 11 Days x 1 Hr/Day		=	\$ 712

• Eq. Rental = 1 - D8N Dozer	@ \$117.71/Hr for 4 Days	=	\$ 3,767
	\$117.71/Hr x 32 Hr		
2 - Welders/Torches	@ \$ 10.90/Hr	=	\$ 1,918
	\$ 21.80/Hr x 88 Hr		
Sub-total			\$ 12,094
D.	Haul and Dispose - Licensed (NRC SUA - #1473) Site:		
	100% of Contaminated Service = 835.4 Ft. ³ @ 198,380#		
	Total = 30.9 Cu.Yd. @ 198,380# = 5 Truck Loads @ 40,000#		
• Haul = 5 Truck x 800 Mile x \$3.27/Mile		=	\$ 13,080
• Dispose = 198,380# = 99.1 tons		=	\$ 4,955
	@ \$50/ton disposal cost ¹		
E.	Haul and Dispose - On-Site Land Fill:		
	100% of Non-Contaminated Service = 36.5 Ft. ³ @ 2,320#		
	Total = 1.4 Cu.Yd. @ 2,230# = 0.05 Truck Loads @ 47,000#		
• Haul = 0.05 Trucks x 8 Hrs/Truck x \$65.39/Hr		=	\$ 26
• Dispose = Cost Included in Section 6.5			
Tankage and Vessel Total		=	\$ 39,913

1.3 Piping

Basis: See Table 1.2

A.	Remove, Cut or Crush and Load - 5 Days:		
	PVC & Poly - 2,800 Ft @ 140 Ft/Man-Day = 20 Man-Day		
	= 5 Crew-Day		
	Steel - 1,100 Ft @ 110 Ft/Man-Day = 10 Man-Day		
	= 5 Crew-Day		
• Labor Crew = 1 - Foreman	@ \$ 21.58/Hr		
2 - Welders	@ \$ 19.35/Hr		
1 - Operator	@ \$ 17.71/Hr		
4 - Laborers	@ \$ 13.02/Hr		
	\$130.07/Hr x 40 Hr	=	\$ 5,203
• Travel = \$130.07/Hr x 5 Days x 1 Hr/Day		=	\$ 650
• Eq. Rental = 1 - 20 Ton Crane	@ \$37.39/Hr		
2 - Welders/Torches	@ \$10.90/Hr		
	\$59.19/Hr x 40 Hr	=	\$ 2,368
Sub-total		=	\$ 8,221

¹ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

B. Decontaminate - 0 Days: \$ 0

C. Haul and Dispose - Licensed (NRC SUA #1473) Site:
100% Piping = 886.7 Ft³ @ 52,080#
Total = 32.8 Cu.Yd. @ 52,080# = 1.3 Truck Load @ 40,000#

• Haul = 1.3 Truck x 800 Mile x \$3.27/Mile = \$ 3,401
• Dispose = 52,080# = 26.04 tons
@ \$50/ton disposal cost² = \$ 1,302

Piping Total = **\$ 12,924**

1.4 Pumps

Basis: See Table 1.3

A. Removal and Loading - 6 Days:
21 Pumps @ 2 Pumps/Man-Day = 10.5 Man-Days
= 6.0 Crew-Days

• Labor Crew = 1 - Foreman @ \$21.58/Hr
1 - Operator @ \$17.71/Hr
2 - Laborers @ \$13.02/Hr
\$65.33/Hr x 48 Hrs = \$ 3,136

• Travel = \$65.33/Hr x 6 Days x 1 Hr/Day = \$ 392

• Eq. Rental = 1 - 20 Ton Crane @ \$37.39/Hr
\$37.39/Hr x 48 Hrs = \$ 1,795

Sub-total = **\$ 5,323**

B. Haul and Dispose - Licensed (NRC SUA #1473) Site:
Contaminated Pumps = 77.9 Ft.³ @ 5,700#
Total = 2.9 Cu. Yd. @ 5,700# = 0.2 Truck Loads @ 40,000#

• Haul = 0.2 Truck x 800 Mile x \$3.27/Mile = \$ 523

• Dispose = 5,700# = 2.85 tons
@ \$50/ton disposal cost³ = \$ 143

C. Haul and Dispose - On-Site Land Fill:
Non-Contaminated Motors = 69.9 Ft.³ @ 8,445#
Non-Contaminated Pumps = 2 Ft.³ @ 100#
Total = 71.9 Ft.³ @ 8,545# = 0.2 Truck Loads @ 47,000#

² See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

³ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

- Haul = 0.2 Trucks x 8 Hrs/Truck x \$65.39/Hr = \$ 105
- Dispose = Cost Included in Section 6.5

Pump Total = **\$ 6,094**

1.5 Electrical

A. Remove, Cut and Load - 5 Days:

- Labor Crew = 1 - Journeyman Elect. @ \$ 34.88/Hr
- 2 - Helpers @ \$ 30.51/Hr
- 1 - Welder @ \$ 19.35/Hr
- 1 - Operator @ \$ 17.71/Hr
- \$132.96/Hr x 40 Hr = \$ 5,318

- Elec. Travel = \$95.90/Hr x 5 Days x 2 Hr/Day = \$ 959
- + \$0.54/Mile x 5 Days x 120 Mile/Day = \$ 324

- Travel = \$37.06/Hr x 5 Days x 1 Hr/Day = \$ 185

- Eq. Rental = 1 - 20 Ton Crane @ \$37.39/Hr
- 1 - Truck @ \$12.26/Hr*
- 1 - Welder/Torch @ \$10.90/Hr
- \$60.55/Hr x 40 Hr = \$ 2,422

Sub-total = **\$ 9,208**

B. Haul and Dispose - On-Site Land Fill:

MCC = 11.75 Ft. x 1.25 Ft. x 7.5 Ft. = 110.2 Ft.³ @ 4,550#
 Cable = 110.2 Ft.³ x 0.5 = 55.1 Ft.³ @ 18,400# (@ 40% Voids)
 Total = 165.1 Ft.³ @ 22,950#
 = 6.1 Cu. Yd. @ 22,950# = 0.5 Truck Loads @ 47,000#

- Haul = 0.5 Trucks x 8 Hrs/Truck x \$65.39/Hr = \$ 262
- Dispose = Cost Included in Section 6.5

Electrical Total = **\$ 9,470**

1.6 Foundation

A. Decontaminate Slab - 3 Days:

11,550 Ft² @ 1,000 Ft³/Man-Day = 11.6 Man-Days
 = 3.0 Crew-Days

- Labor Crew = 1 - Foreman @ \$21.58/Hr
- 4 - Laborers @ \$13.02/Hr
- \$73.66/Hr x 24 Hr = \$ 1,768

- Travel = \$73.66/Hr x 3 Days x 1 Hr/Day = \$ 221

- Eq. Rental = Hand Tools @ \$10.90/Hr
- (Brooms, Squeegee) \$10.90/Hr x 24 Hr = \$ 262

- 10% HCl = $2 \text{ Gal/Ft}^2 \times 11,550 \text{ Ft}^2$
= 23,100 Gal.

Make-Up from 20° Be HCl Stock @ \$0.55/Gal
Require 288 Gal. Stock per 1,000 Gal. - 10%

23,100 gal x 0.288 x \$0.55/Gal	=	\$ 3,659
• Dispose of Fluid @ \$0.11/BBL 23,100 Gal x BBL x \$0.11/BBL 42 Gal	=	\$ 61
Sub-total	=	\$ 5,971

- B. Break and Remove 25% of Slab - 10 Days:
 $11,550 \text{ Ft}^2 \times 0.25 = 2,888 \text{ Ft}^2$
 $2,888 \text{ Ft}^2 @ 37.5 \text{ Ft}^2/\text{Hr} = 77 \text{ Hrs}$

• Labor Crew = 1 - Operator @ \$17.71/Hr 17.71/Hr x 77 Hrs	=	\$ 1,364
• Travel = \$17.71/Hr x 10 Days x 1 Hr/Day	=	\$ 177
• Eq. Rental = 1 - Pavement Breaker @ \$31.33/Hr \$31.33/Hr x 77 Hrs	=	\$ 2,412
1 - Cat 980C Loader @ \$92.64/Hr \$92.64/Hr x 40 Hrs	=	\$ 3,706
Sub-total	=	\$ 7,659

- C. Haul and Dispose - Licensed (NRC SUA #1473) Site:

$$\begin{aligned} \text{Concrete} &= 2,888 \text{ Ft}^2 \times \frac{8 \text{ In}}{12 \text{ In/Ft}} = 1925 \text{ Ft}^3 \text{ Set} \\ &= 377,365\# @ 196\# \text{ Ft}^3 \\ &= 3,209 \text{ Ft}^3 \text{ Loose (40\% voids)} \end{aligned}$$

Total = 11.9 Cu.Yd. @ 377,365# = 9.4 Truck Loads @ 40,000#

• Haul = 9.4 Truck x 800 Miles x \$3.27/Mile	=	\$ 24,590
• Dispose = 377,365# = 188.7 tons @ \$50/ton disposal cost ⁴	=	\$ 9,435

- D. Bury Area w/2 Ft Cover:
 • Materials = 856 Cu.Yd. Cover @ \$1.09/Cu.Yd.

Foundation Total = **\$ 48,588**

⁴ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

1.7 Plant Site

Basis: 200 Ft. x 300 Ft. = 60,000 Ft.² = 1.4 Acres

A.	Rip and Contour:			
	• Basis: See Table 1.4			
	• Rip and Contour @ \$166.68/Acre	=	\$	233
B.	Topsoil Placement:			
	Replace 6 in. Topsoil = 60,000 Ft. ² x 0.5 = 30,000 Ft. ³ = 1,111 Cu.Yd.			
	• Topsoil Placement @ \$1.09/Cu.Yd.	=	\$	1,211
C.	Revegetate:			
	• Grade and Contour Topsoil @ \$ 87.19/Acre x 1.4 Acre	=	\$	122
	• Seedbed Prep.			
	(Disc. + Harrow) @ \$ 21.80/Acre x 1.4 Acre	=	\$	31
	• Mulch (Drill + Seed + Mow) @ \$ 49/Acre x 1.4 Acre	=	\$	69
	• Drill Seed and Fertilize @ \$163/Acre x 1.4 Acre	=	\$	228
	(Drill + Seed + Fertilizer)			
	• Revegetation Contingency @ \$233.80/Acre* x 0.7 Acre	=	\$	164
	(All items excluding grading)			
	*Assume only 50% of acreage requires reseeding			
	Sub-total	=	\$	614
	Plant Site Total	=	\$	<u>2,058</u>

1.8 Access Road

Basis: Gravel Road = 21 Ft. x 1320 Ft. = 27,720 Ft.² = 0.6 Acres

A.	Rip and Contour:			
	• Basis: See Table 1.4			
	• Rip and Contour @ \$166.68/Acre	=	\$	233
B.	Topsoil Placement:			
	Replace 6 in. Topsoil = 27,720 Ft. ² x 0.5 = 13,860 Ft. ³ = 513 Cu.Yd			
	• Topsoil Placement @ \$1.09/Cu.Yd.	=	\$	559
C.	Revegetate:			
	• Grade and Contour @ \$ 87.19/Acre x 0.6 Acre	=	\$	52
	• Seedbed Prep.			
	(Disc. + Harrow) @ \$ 21.80/Acre x 0.6 Acre	=	\$	13
	• Mulch (Drill + Seed + Mow) @ \$ 49/Acre x 0.6 Acre	=	\$	29
	• Drill Seed and Fertilize @ \$163/Acre x 0.6 Acre	=	\$	98
	(Drill + Seed + Fertilizer)			
	• Revegetation Contingency @ \$233.80/Acre* x 0.3 Acre	=	\$	70
	(All items excluding grading)			

Sub-total = \$ 262

*Assume only 50% of acreage requires reseeding

Access Road = \$ 1,054

TABLE 1.4
IX PLANT
SCARIFY (RIP) COMPACTED SURFACE

Equipment = Cat. 140G Motor Grader @ \$65.39/Hr - Complete
 Speed = 3.9 mph (2nd gear)
 Width = 9 Ft/Pass

$$\text{Productivity} = \frac{3.9 \text{ Mile}}{\text{Hr}} \times \frac{5280 \text{ Ft}}{\text{Mile}} \times \frac{9 \text{ Ft}}{\text{Pass}} \times 0.83 \text{ Eff.}$$

$$= \frac{153,822 \text{ Ft}^2}{\text{Hr}}$$

$$= \frac{3.53 \text{ Acre}}{\text{Hr}}$$

$$\$/\text{Acre} = \frac{\$65.39}{\text{Hr}} \times \frac{\text{Hr}}{3.53 \text{ Acre}} = \underline{\$18.52/\text{Acre}}$$

From Above - Ripping @ \$166.68/Acre Allows for 9 Passes

**SECTION 2
CENTRAL PROCESSING PLANT RECLAMATION COSTS**

Cost Summary

ITEM	COSTS (\$97)
2.1 Building	57,548
2.2 Tankage and Vessels	60,246
2.3 Piping	10,846
2.4 Pumps	10,965
2.5 Electrical	19,682
2.6 Foundations	70,019
Total Cost	229,306

2.1 Building

Basis: 100 Ft. x 165 Ft. with 30 Ft. Eave
 Floor Area = 16,500 Ft²
 Skin Area = 15,900 Ft²

A. Washdown Building - 9 days:

Wash 15,900 Ft² @ 1 Gal/Ft² = 15,900 Gal
 Wash 15,900 Ft² @ 450 Ft²/Man-Day = 35 Man-Days
 = 9 Crew-Days

- Labor Crew = 1 - Foreman @ \$21.58/Hr
 4 - Laborers @ \$13.02/Hr
 \$73.66/Hr x 72 Hr = \$ 5,303
- Travel = \$73.66/Hr x 9 Days x 1 Hr/Day = \$ 663
- Eq. Rental = 4 - Pressure Washers @ \$ 8.71/Hr
 \$ 34.84/Hr x 80 Hr = \$ 2,787
- Materials = Soap @ \$1.09/BBL
 15,900 Gal x $\frac{\text{BBL}}{42 \text{ Gal}}$ x \$1.09/BBL = \$ 413
- Dispose of Fluid @ \$0.11/BBL
 15,900 Gal x $\frac{\text{BBL}}{42 \text{ Gal}}$ x \$0.11/BBL = \$ 42
- Sub-total = \$ 9,208**

B. Dismantle and Load - 21 Days:

Dismantle and Load @ 100 Ft²/Man-Day
 16,500 Ft² @ 100 Ft²/Man-Day = 165 Man-Days
 = 21 Crew-Days

- Labor Crew = 1 - Foreman @ \$ 21.58/Hr
2 - Welders @ \$ 19.35/Hr
2 - Operators @ \$ 17.71/Hr
4 - Laborers @ \$ 13.02/Hr
\$147.78/Hr x 168 Hr = \$24,827

- Travel = \$147.78 Hrs x 21 Days x 1 Hr/Day = \$ 3,103

- Eq. Rental = 2 - 20 Ton Cranes @ \$ 37.39/Hr
2 - Welders/Torches @ \$ 10.90/Hr
\$ 96.58/Hr x 168 Hr = \$16,225

Sub-total = **\$ 44,155**

C. Haul and Dispose - On-Site Land Fill:

Building = 376,000# = 8 Truck Loads* @ 47,000#

- Haul = 8 Trucks x 8 Hrs/Truck x \$65.39/Hr = \$ 4,185

- Dispose = See Appendix 6.5

Building Total = **\$ 57,548**

2.2 Tankage and Vessels

Basis: See Table 2.1

A. Decontaminate - 0 Days: = \$ 0

B. Remove and Load - 19 Days:

- Labor Crew = 1 - Foreman @ \$ 21.58/Hr
1 - Operator @ \$ 17.71/Hr
2 - Laborers @ \$ 13.02/Hr
\$ 65.33/Hr x 152 Hr = \$ 9,930

- Travel = \$65.33/Hr x 19 Days x 1 Hr/Day = \$ 1,241

- Eq. Rental = 1 - 20 Ton Crane @ \$ 37.39/Hr
\$ 37.39/Hr x 152 Hrs = \$ 5,683

Sub-total = **\$ 16,854**

C. Dismantle, Cut, or Crush - 19 Days:

Cut Steel @ 30 Ft³/Man-Day @ 518.5 Ft³ = 17 Man-Days

Crush FRP @ 60 Ft³/Man-Day @ 111.4 Ft³ = 1.9 Man-Days

- Labor Crew = 1 - Foreman @ \$ Foreman Supervises both 2.2(A) & (B)
1 - Welder @ \$ 19.35/Hr
2 - Laborers @ \$ 13.02/Hr
\$ 45.39/Hr x 152 Hrs = \$ 6,899

- Travel = \$45.39/Hr x 19 Days x 1 Hr/Day = \$ 862

• Eq. Rental = 1 - D8N Dozer @ \$117.71/Hr
 1 - Welder/Torch @ \$10.90/Hr
 \$128.61/Hr x 152 Hrs = \$ 19,549

Sub-total = \$ 27,310

D. **Haul and Dispose - Licensed (NRC SUA #1473) Site:**
 100% of Contaminated Service = 1236.7 Ft.³ @ 172,420#
 Total = 45.8 Cu.Yd. @ 172,420# = 4.3 Truckloads @ 40,000#

• Haul = 4.3 Trucks x 800 Mile x \$3.27/Mile = \$ 11,249

• Dispose = 172,420# = 86.2 tons
 @ \$50/ton disposal cost⁵ = \$ 4,310

E. **Haul and Dispose - On-Site Land Fill:**
 100% of Non-Contaminated Service = 393.2 Ft.³ @ 45,010#
 Total = 14.6 Cu.Yd. @ 45,010# = 1 Truckloads @ 47,000#

• Haul = 1 Truck x 8 Hrs/Truck x \$65.39/Hr = \$ 523

• Dispose = See Appendix 6.5

Tankage and Vessel Total = \$ 60,246

2.3 Piping

Basis: See Table 2.2

A. **Remove, Cut or Crush and Load - 9 days:**

PVC and Poly @ 140 Ft/Man-Day @ 5,000 Ft = 36 Man-Days
 = 9 Crew-Days

• Labor Crew = 1 - Foreman @ \$ 21.58/Hr
 1 - Operator @ \$ 17.71/Hr
 4 - Laborers @ \$ 13.02/Hr
 \$ 91.37/Hr x 72 Hr = \$ 6,579

• Travel = \$91.37/Hr x 9 Days x 1 Hr/Day = \$ 822

• Eq. Rental = 1 - 20 Ton Crane @ \$ 37.39/Hr
 \$ 37.39/Hr x 72 Hr = \$ 2,692

Sub-total = \$ 10,093

B. **Decontaminate - 0 Days:** = \$ 0

C. **Haul and Dispose - Licensed (NRC SUA #1473) Site:**
 100% Pipe = 244 Ft.³ @ 9,136#
 Total = 9 Cu. Yd. @ 9,136# = 0.2 Truckloads @ 40,000#

• Haul = 0.2 Trucks x 800 Mile x \$3.27/Mile = \$ 523

⁵ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

• Dispose = 9,136# = 4.6 tons
@ \$50/ton disposal cost⁶ = \$ 230

Piping Total = \$ 10,846

2.4 Pumps

Basis: See Table 2.3

A. Removal and Loading - 11 Days:

2 Pumps/Man-Day @ 43 Pumps = 21.5 Man-Days
= 11.0 Crew-Days

• Labor Crew = 1 - Foreman @ \$21.58/Hr
1 - Operator @ \$17.71/Hr
2 - Laborers @ \$13.02/Hr
\$65.33/Hr x 88 Hr = \$ 5,749

• Travel = \$65.33/Hr x 11 Days x 1 Hr/Day = \$ 719

• Eq. Rental = 1 - 20 Ton Crane @ \$37.39/Hr
\$37.39/Hr x 88 Hr = \$ 3,290

Sub-total = \$ 9,758

B. Haul and Dispose - Licensed (NRC SUA #1473) Site:

100% Contaminated = 164.3 Ft.³ @ 10,612#
Total = 6.1 Cu. Yd. @ 10,612# = 0.3 Truck Load @ 40,000#

• Haul = 0.3 Truck x 800 Mile x \$3.27/Mile = \$ 785

• Dispose = 10,612# = 5.3 tons
@ \$50/ton disposal cost⁷ = \$ 265

C. Haul and Dispose - On-Site Land Fill:

100% Non-Contaminated = 106.5 Ft.³ @ 10,723#
Total = 3.9 Cu. Yd. @ 10,723# = 0.3 Truck Load @ 47,000#

• Haul = 0.3 Truck x 8 Hrs/Truck x \$65.39/Hr = \$ 157

• Dispose = See Appendix 6.5

Pump Total = \$ 10,965

⁶ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

⁷ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

2.5 Electrical

A. Remove, Cut and Load - 10 Days:

• Labor Crew = 1 - Journeyman Elect. @ \$ 34.88/Hr		
2 - Helpers @ \$ 30.51/Hr		
1 - Welder @ \$ 19.35/Hr		
1 - Operator @ \$ 17.71/Hr		
\$132.96/Hr x 80 Hr	=	\$ 10,637
• Elec. Travel = \$132.96/Hr x 10 Days x 2 Hr/Day	=	\$ 2,659
+ \$0.54/Mile x 10 Days x 120 Mile/Day	=	\$ 648
• Other Travel = \$37.06/Hr x 10 Days x 1 Hr/Day	=	\$ 371
• Eq. Rental = 1 - 20 Ton Crane @ \$ 37.39/Hr		
1 - Truck @ \$ 12.26/Hr		
1 - Welder/Torch @ \$ 10.90/Hr		
\$ 60.55/Hr x 80 Hr	=	\$ 4,844
Sub-total	=	\$ 19,159

B. Haul and Dispose - On-Site Land Fill:

MCC#1 = 11.75 Ft. x 1.25 Ft. x 7.5 Ft. = 110.2 Ft.³ @ 4,550#
MCC#2 = 11.75 Ft. x 1.25 Ft. x 7.5 Ft. = 110.2 Ft.³ @ 4,550#
Cable = 220.4 Ft.³ x 0.5* = 110.2 Ft.³ @ 36,700#
(555#/Ft.³ @ 40% Void = 333#/Ft.²)
Total = 330.6 Ft.³ @ 45,800#
= 12.2 Cu. Yd. @ 45,800# = 1 Truck @ 47,000#

• Haul = 1 Truck x 8 Hrs/Truck x \$65.39/Hr	=	\$ 523
• Dispose = See Appendix 6.5		
* Cable Volume = 1/2 MCC Volume		

Electrical Total = **\$ 19,682**

2.6 Foundation

A. Decontaminate Slab - 5 Days:

16,500 Ft.² @ 1000 Ft.²/Man-Day = 17 Man-Days
= 5 Crew-Days

• Labor Crew = 1 - Foreman @ \$ 21.58/Hr		
4 - Laborers @ \$ 13.02/Hr		
\$ 73.66/Hr x 40 Hr	=	\$ 2,946
• Travel = \$73.66/Hr x 5 Days x 1 Hr/Day	=	\$ 368
• Eq. Rental = Hand Tools @ \$ 10.90/Hr		
(Broom, Squeegee) \$ 10.90/Hr x 40 Hr	=	\$ 436

- 10% HCl = $2 \text{ Gal/Ft}^2 \times 16,500 \text{ Ft}^2$
= 33,000 Gal.

make-up from 20° Be HCl Stock @ \$0.508/Gal
Require 288 Gal. Stock per 1,000 Gal. - 10%

$$33,000 \times 0.288 \times \$0.55/\text{Gal} = \$ 5,227$$

- Dispose of Fluid @ \$0.11/BBL
33,000 Gal x $\frac{\text{BBL}}{42 \text{ Gal}}$ x \$0.11/BBL = \$ 86

$$\text{Sub-total} = \$ 9,063$$

B. Break and Remove 25% of Slab - 14 Days:

$$16,500 \text{ Ft}^2 \times 0.25 = 4,125 \text{ Ft}^2$$

$$4,125 \text{ Ft}^2 @ 37.5 \text{ Ft}^2/\text{Hr} = 110 \text{ Hrs}$$

- Labor Crew = 1 - Operator @ \$17.71/Hr
\$17.71/Hr x 110 Hrs = \$ 1,948

- Travel = \$17.71/Hr x 14 Days x 1 Hr/Day = \$ 248

- Eq. Rental = 1 - Pavement Breaker @ \$31.33/Hr
\$31.33/Hr x 110 Hrs = \$ 3,446

- 1- Cat 980C Loader @ \$92.64/Hr
\$92.64/Hr x 56 Hrs = \$ 5,188

$$\text{Sub-total} = \$ 10,830$$

C. Haul and Dispose - Licensed (NRC SUA #1743) Site:

$$\text{Concrete} = 4,125 \text{ Ft}^2 \times \frac{8 \text{ In.}}{12 \text{ In/Ft}} = 2,750 \text{ Ft}^3 \text{ Set}$$

$$= 539,000\# @ 196\#/\text{Ft}^3$$

$$= 4,583 \text{ Ft}^3 \text{ Loose (40\% Voids)}$$

$$\text{Total} = 170 \text{ Cu.Yd.} @ 539,000\# = 13.5 \text{ Truckloads} @ 40,000\#$$

- Haul = 13.5 Truckloads x 800 Miles x \$3.27/Mile = \$ 35,316

- Dispose = 539,000# = 269.5 tons
@ \$50/ton disposal cost⁸ = \$ 13,475

D. Bury Area with 2 Ft. Cover:

- Material = 1,225 Cu.Yd. Cover @ \$1.09/Cu.Yd. = \$ 1,335

$$\text{Foundation Total} = \$ 70,019$$

⁸ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

**SECTION 3
DRYER AREA RECLAMATION COSTS**

Cost Summary

ITEM	COSTS (\$97)
3.1 Building	16,222
3.2 Equipment	14,739
3.3 Foundations	16,802
Total Cost	47,763

3.1 Building

Basis: 100 Ft. x 35 Ft. with 30 Ft. Eave

Floor Area = 3,500 Ft²

Skin Area = 8,100 Ft²

A. Washdown Building - 0 Days = \$ 0

B. Dismantle and Load - 5 Days:

3500 Ft² @ 100 Ft²/Man-Day = 35 Man-Days
= 5 Crew-Days

• Labor Crew = 1 - Foreman @ \$ 21.58/Hr
2 - Welders @ \$ 19.35/Hr
2 - Operators @ \$ 17.71/Hr
4 - Laborers @ \$ 13.02/Hr
\$147.78/Hr x 40 Hr = \$ 5,911

• Travel = \$147.78/Hr x 5 Days x 1 Hr/Day = \$ 739

• Eq. Rental = 2 - 20 Ton Cranes @ \$37.39/Hr
2 - Welder/Torch @ \$10.90/Hr
\$96.58/Hr x 40 Hr = \$ 3,863

Sub-total = \$ 10,513

C. Haul and Dispose - Licensed (NRC SUA - #1473) Site:

Buildings = 71,212#* = 1.8 Truck Loads @ 40,000#

• Haul = 1.8 Trucks x 800 Mile x \$3.27/Mile = \$ 4,709

• Dispose = 40,000# = 20 tons
@ \$50/ton disposal cost⁹ = \$ 1,000

*5 Trucks x 47,000#/Truck x $\frac{3500 \text{ Ft}^2}{11550 \text{ Ft}^2}$ = 71,212#

Building Total = \$ 16,222

⁹ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

3.2 Equipment

Basis: See Table 3.1

A. Remove and Load - 7 Days:

• Labor Crew = 1 - Foreman @ \$21.58/Hr 1 - Operator @ \$17.71/Hr 4 - Laborers @ \$13.02/Hr 91.37/Hr x 56 Hrs	=	\$ 5,117
• Travel = \$91.37/Hr x 7 Days x 1 Hr/Day	=	\$ 640
• Eq. Rental = 1 - 20 Ton Crane @ \$37.39/Hr \$37.39/Hr x 56 Hrs	=	\$ 2,094
Sub-total	=	\$ 7,851

B. Dismantle and Cut - 7 Days:

Cut Steel @ 30 Ft³/Man-Day @ 198.6 Ft³ = 7 Man-Days

• Labor Crew = 1 - Foreman @ \$ Foreman supervises 3.2(A) & (B) 1 - Welders @ \$19.35/Hr \$19.35/Hr x 56 Hr	=	\$ 1,084
• Travel = \$19.35/Hr x 7 Days x 1 Hr/Day	=	\$ 135
• Eq. Rental = 1 - Welder/Torch @ \$10.90/Hr \$10.90/Hr x 56 Hr	=	\$ 610
Sub-total	=	\$ 1,829

C. Haul and Dispose - Licensed (NRC SUA #1473) Site:

100% of Contaminated = 183.6 Ft.³ @ 53,800#

Total = 6.8 Cu. Yd. @ 53,800# = 1.4 Truck Loads @ 40,000#

• Haul = 1.4 Truck x 800 Mile x \$3.27/Mile	=	\$ 3,662
• Dispose = 53,800# = 26.9 tons @ \$50/ton disposal cost ¹⁰	=	\$ 1,345

D. Haul and Dispose - Land Fill:

100% Non-Contaminated = 15 Ft.³ @ 4,400#

Total = 0.6 Cu. Yd. @ 4,400# = 0.1 Truck Loads @ 47,000#

• Haul = 0.1 Truck x 8 Hrs/Truck x \$65.39/Hr	=	\$ 52
• Dispose = See Appendix 6.5		

Equipment Total = **\$ 14,739**

¹⁰ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

3.3 Foundation

A. Decontaminate Slab - 2 Day:

3500 Ft² @ 1000 Ft²/Man-Day Twice = 7 Man-Days
= 2 Crew-Days

• Labor Crew = 1 - Foreman @ \$21.58/Hr
4 - Laborers @ \$13.02/Hr
\$73.66/Hr x 16 Hrs = \$ 1,179

• Travel = \$73.66/Hr x 2 Days x 1 Hr/Day = \$ 147

• Eq. Rental = Hand Tools @ \$10.90/Hr
(Broom, Squeegee) \$10.90/Hr x 16 Hrs = \$ 174

• 10% HCl = 2 Gal x 3500 Ft² x 2
Ft²
= 14,000 Gal.

Make-Up from 20° Be HCl Stock @ \$0.55/Gal
Require 288 Gal. Stock per 1,000 Gal. - 10%

14,000 x 0.288 x \$0.55/Gal = \$ 2,218

• Dispose of Fluid @ \$0.11/BBL
14,000 Gal x $\frac{\text{BBL}}{42 \text{ Gal}}$ x \$0.11/BBL = \$ 37

Sub-Total = \$ 3,755

B. Break and Remove 25% of Slab - 3 Day:

3500 Ft² x 0.25 = 875 Ft²
875 Ft² @ 37.5 Ft²/Hr = 23 Hrs

• Labor Crew = 1 - Operator @ \$17.71/Hr
\$17.71/Hr x 23 Hrs = \$ 407

• Travel = \$17.71/Hr x 3 Days x 1Hr/Day = \$ 53

• Eq. Rental = 1 - Pavement Breaker @ \$31.33/Hr
\$31.33/Hr x 24 Hrs = \$ 752

1- Cat 980C Loader @ \$92.64/Hr
\$92.64/Hr x 12 Hr = \$ 1,112

Sub-total = \$ 2,324

C. Haul and Dispose - Licensed (NRC SUA #1743) Site:

Concrete = 875 Ft² x 8 In = 583 Ft³ Set
12 In/Ft = 114,268# @ 196#/Ft³
= 972 Ft³ Loose (40% Voids)

Total = 36 Cu.Yd. @ 114,268# = 2.9 Truckloads @ 40,000#

- Haul = 2.9 Truck x 800 Mile x \$3.27/Mile = \$ 7,586
- Dispose = 114,268# = 57.1 tons
@ \$50/ton disposal cost¹¹ = \$ 2,855

D. Bury Area with 2 Ft Cover:

- Materials = 259 Cu.Yd. Cover @ \$1.09/Cu.Yd. = \$ 282

Foundation Total = **\$ 16,802**

¹¹ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

SECTION 4
EXISTING FACILITIES RECLAMATION COSTS
Cost Summary

ITEM	COSTS (\$97)
4.1 Buildings	95,635
4.2 Structures	18,187
4.3 Pilot Plant Equipment	22,620
4.4 Foundation	139,333
4.5 Site Reclamation	84,070
4.6 O-Sand Pilot	41,435
4.7 Q-Sand Pilot	N.A.
4.8 Mine Water Trt Ponds	19,878
Total Cost	421,158

4.1 Buildings

Basis: Floor Area = 33,248 Ft²
Skin Area = 22,828 Ft² (13 Ft Eave)

1 @ 200 Ft. x 60 Ft. = 12,000 Ft² (Pilot ISL Building)
0 @ 70 Ft. x 48 Ft. - Demolished & Removed Sept. 1991
1 @ 70 Ft. x 68 Ft. = 4,760 Ft² (Existing Office Building)
1 @ 48 Ft. x 24 Ft. = 1,152 Ft² (Storage Building)
1 @ 24 Ft. x 24 Ft. = 576 Ft² (Water Treatment Plant)
1 @ 40 Ft. x 120 Ft. = 4,826 Ft² (Shop Building)
1 @ Building = 9,934 Ft² (New Office Annex Building)

A. Washdown Building - 8 Days

22,828 Ft² @ 1 Gal/Ft² = 22,828 Gal
22,828 Ft² @ 450 Ft²/Man = 51 Man-Days
= 13 Crew-Days

• Labor Crew = 1 - Foreman @ \$ 21.58/Hr 4 - Laborers @ \$ 13.02/Hr \$ 73.66/Hr x 104 Hr	=	\$ 7,661
• Travel = \$73.66/Hr x 13 Days x 1 Hr/Day	=	\$ 958
• Eq. Rental = 4 - Pressure Washers @ \$ 8.71/Hr \$ 34.84/Hr x 104 Hr	=	\$ 3,623
• Materials = Soap @ \$1.09/BBL 22,828 Gal x BBL x \$1.09/BBL 42 Gal	=	\$ 592
• Dispose of Fluid @ \$0.11/BBL 22,828 Gal x BBL x \$0.11/BBL 42 Gal	=	\$ 60
Sub-total	=	\$ 12,894

B. Dismantle and Load - 24 Days:

33,248 Ft² @ 100 Ft²/Man-Day = 332 Man-Days
= 42 Crew-Days

• Labor Crew	= 1 - Foreman @ \$ 21.58/Hr		
	2 - Welders @ \$ 19.35/Hr		
	2 - Operators @ \$ 17.71/Hr		
	4 - Laborers @ \$ 13.02/Hr		
	\$147.78/Hr x 336 Hrs	=	\$ 49,654
• Travel	= \$147.78/Hr x 42 Days x 1 Hr/Day	=	\$ 6,207
• Eq. Rental	= 2 - 20 Ton Cranes @ \$37.39/Hr		
	2- Welder/Torches @ \$10.90/Hr		
	\$96.58/Hr x 336 Hrs	=	\$ 32,450
Sub-total		=	\$ 88,311

C. Haul and Dispose - On-Site Land Fill:

Buildings = 676,800# = 14 Truck Loads* @ 47,000#

• Haul	= 14 Trucks x 8 Hrs/Truck x \$65.39/Hr	=	\$ 7,324
• Dispose	= See Appendix 6.5		

* 5 Trucks x $\frac{18,488 \text{ Ft.}^2}{11,550 \text{ Ft.}^2}$ = 14 Trucks

Buildings Total = **\$ 95,635**

4.2 Structures

A. Plug Shaft - Completed in 1994 = \$ 0

B. Plug Venthole

• Backfill 335 ft. of hole			
(270 c.y. @ \$1.09/yd)	=	\$	294
• Backhoe 16 hrs @ \$27.25/hr	=	\$	436
• Steel plate and rebar	=	\$	300
• Cement - 10 c.y. @ \$76/c.y. delivered	=	\$	760
• 40 man hours @ \$13.02/hr	=	\$	521
• Dirt cover - 100 c.y. @ \$1.09/c.y.	=	\$	109

Sub-total = **\$ 2,420**

C. Mine Water Treatment Ponds
See Section 4.8

D. Evaporation Ponds

Total Area = 200 Ft. x 100 Ft. = 20,000 Ft.² = 0.5 Acres

• Total = 0.5 Acres x $\frac{\$65,392^*}{5 \text{ Acres}}$ = \$ 6,539

* See Section 6 - part 6.2 for the cost on a 5 acre basis

E. Headframe Removal

• Dismantle - Completed in 1991 = \$ 0

• Haul & Dispose - Completed in 1993 = \$ 0

F. Fencing (includes delineation posts)

Facility Fence - 5,900 ft
Wellfield #1 - 6,600 ft
Wellfield #3 - 7,500 ft
Wellfield #4/4A-25,000 ft
Wellfield #2 - 6,000 ft
51,000 ft

• Cost to remove fencing = \$0.15/ft¹² = \$ 7,650

G. Water Wells

• Water wells (2) are 5 inch diameter wells with depth of 750 feet.

• Cost Basis - \$285/well (\$7705 per 27 wells, see "Section 5.4 - Wells")
= \$ 570

H. Fuel Area

• Size - 15 ft x 25 ft = 375 Ft.².
375 Ft.² @ 37.5 Ft.²/Hr = 10 Hrs

• Labor Crew = 1 - Operators @ $\frac{\$17.71}{\text{Hr}}$
 $\frac{\$17.71}{\text{Hr}} \times 10 \text{ Hrs}$ = \$ 177

• Travel = \$17.71/Hr x 2 Days x 1 Hr/Day = \$ 35

• Eq. Rental = 1- Pavement Breaker @ \$31.33/Hr
 $\$31.33/\text{Hr} \times 10 \text{ hrs}$ = \$ 313

1- Cat 980C Loader @ 92.64/Hr
 $\$96.58/\text{Hr} \times 5 \text{ hr}$ = \$ 483

Sub-total = \$ 1008

Structures Total = \$ 18,187

¹² Cost per linear foot based on Third Party Cost Quote dated 6/11/99

4.3 Pilot Plant Equipment

A. Tanks:

15 Tanks

$$\bullet \text{ Total} = 15 \text{ Tanks} \times \frac{\$55,926^*}{51 \text{ Tanks}} = \$ 16,449$$

B. Piping:

1500 Ft. @ 6" Dia. or Less

$$\bullet \text{ Total} = 1500 \text{ Ft.} \times \frac{\$10,616^*}{5,000 \text{ Ft.}} = \$ 3,185$$

C. Pumps:

12 Pumps

$$\bullet \text{ Total} = 12 \text{ Pumps} \times \frac{\$10,700^*}{43 \text{ Pumps}} = \$ 2,986$$

* Reference Section 2 - parts 2.2, 2.3 & 2.4

$$\text{Pilot Plant Total} = \$ 22,620$$

4.4 Foundation

A. Decontaminate Slab - 5 Days:

$$33,248 \text{ Ft}^2 @ 1000 \text{ Ft}^2/\text{Man-Day} = 33.2 \text{ Man-Days} \\ = 8.3 \text{ Crew-Days}$$

$$\bullet \text{ Labor Crew} = 1 - \text{Foreman} @ \$ 21.58/\text{Hr} \\ 4 - \text{Laborers} @ \$ 13.02/\text{Hr} \\ \$ 73.66/\text{Hr} \times 66.4 \text{ Hrs} = \$ 4,891$$

$$\bullet \text{ Travel} = \$ 73.66/\text{Hr} \times 9 \text{ Days} \times 1 \text{ Hr/Day} = \$ 663$$

$$\bullet \text{ Eq. Rental} = \text{Hand Tools} @ \$ 10.90/\text{Hr} \\ (\text{Brooms, Squeegee}) @ \$ 10.90/\text{Hr} \times 66.4 \text{ Hrs} = \$ 724$$

$$\bullet 10\% \text{ HCl} = 2 \text{ Gal}/\text{Ft}^2 \times 33,248 \text{ Ft.}^2 \\ = 66,496 \text{ Gal.}$$

Make-Up from 20° Be HCl Stock @ \$0.55/Gal
Require 288 Gal. Stock per 1,000 Gal. - 10%

$$66,496 \times 0.288 \times \$ 0.55/\text{Gal} = \$ 10,532$$

$$\bullet \text{ Dispose of Fluid} @ \$ 0.11/\text{BBL} \\ 66,496 \text{ Gal} \times \frac{\text{BBL}}{42 \text{ Gal}} \times \$ 0.11 \text{ BBL} = \$ 174$$

$$\text{Sub-total} = \$ 16,984$$

B. Break and Remove 25% of Slab - 28 Days:

$$33,248 \text{ Ft}^2 \times 0.25 = 8,312 \text{ Ft}^2 \\ 8,312 \text{ Ft}^2 @ 37.5 \text{ Ft}^2/\text{Hr} = 221 \text{ Hrs}$$

$$\bullet \text{ Labor Crew} = 1 - \text{Operator} @ \$ 17.71/\text{Hr} \\ \$ 17.71/\text{Hr} \times 221 \text{ Hrs} = \$ 3,914$$

• Travel = \$17.71/Hr x 28 Days x 1 Hr/Day	=	\$ 496
• Eq. Rental = 1 - Pavement Breaker @ <u>\$31.33/Hr</u> \$31.33/Hr x 221 Hrs	=	\$ 6,923
1 - Cat 980C Loader @ <u>\$92.64/Hr</u> \$92.64/Hr x 111 Hrs	=	\$ 10,283
Sub-total	=	\$ 21,616

C. Haul and Dispose - Licensed (NRC SUA #1743) Site:

$$\begin{aligned} \text{Concrete} &= 8,312 \text{ Ft}^2 \times 8 \text{ In.} = 5,541 \text{ Ft}^3 \text{ Set} \\ &\quad 12 \text{ In/Ft} \\ &= 1,086,101\# @ 196\#/\text{Ft}^3 \\ &= 9,235 \text{ Ft}^3 \text{ Loose (40\% Voids)} \end{aligned}$$

$$\text{Total} = 342 \text{ Cu.Yd.} @ 1,086,101\# = 27.1 \text{ Truckloads} @ 40,000\#$$

• Haul = 27.1 Truckloads x 800 Miles x \$3.27/Mile	=	\$ 70,894
• Dispose = 1,086,101# = 543.1 tons @ \$50/ton disposal cost ¹³	=	\$ 27,155

D. Bury Area with 2 Ft Cover:

• Materials = 2,462 Cu. Yd. Cover @ \$1.09/Cu. Yd.	=	\$ 2,684
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Foundation Total	=	<u>\$ 139,333</u>
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4.5 Site Reclamation

Basis: 47.35 Acres = 2,062,130 Ft.²

(Costs associated with the reclamation of the access road, central processing plant, wellfield pattern areas, and trunklines 1 and 2 are covered in other areas.)

A. Rip & Contour:

• Rip & Contour @ \$166.68/Acre x 47.35 Acre	=	\$ 7,891
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B. Topsoil Placement:

Replace 8 In. Topsoil = 50,866 Cu.Yd.

• Topsoil @ \$1.09/Cu. Yd.	=	\$ 55,444
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* 8 In. Topsoil Removed in Previous Years

C. Revegetate:

• Grade and Contour @ \$87.19/Acre x 47.34 Acre	=	\$ 4,128
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• Seedbed Prep. (Disc. + Harrow) @ \$ 21.80/Acre x 47.34 Acre	=	\$ 1,032
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¹³ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

- Mulch (Drill + Seed + Mow) @ \$ 49/Acre x 47.34 Acre = \$ 2,320
- Drill Seed and Fertilize
(Drill + Seed + Fertilizer)@ \$163/Acre x 47.34 Acre = \$ 7,716
- Revegetation Contingency* @ \$234/Acre x 23.67 Acre = \$ 5,539
(All items excluding grading)

* Assume only 50% of acreage requires reseeding

Sub-total = \$ 20,735

Site Reclamation Total = **\$ 84,070**

4.6 O-Sand Pilot

A. Surface Reclamation:

Basis = 6 Patterns

- Total = 6 Patterns x $\frac{\$16,669^*}{10 \text{ Patterns}}$ = \$ 10,001

* Reference Section 5 - Summary Table Cost Per Pattern

B. Groundwater Restoration:

Basis = 6 Patterns

- Total = 6 Patterns x $\frac{\$5,239^*}{\text{Pattern}}$ = \$ 31,434

* Reference Appendix #7

Sub-Total = \$ 41,435

4.7 Q-Sand Pilot

Basis - 6 Patterns

- Building - Removed in 1992 = \$ 0
- Plug & Abandon 10 Wells - Completed in 1992 = \$ 0
- Reclaim Surface = To Be Completed With
WF1 Operations = \$ 0

Sub-total = \$ 0

4.8 Mine Water Treatment Ponds

A. Burial In-Place

- Settled solids to Pond 3 for Burial In-Place

D8N Dozer - 40 Hrs @ \$117.71/Hr = \$ 4,708

- Backfill and Contour Settling Ponds

D8N Dozer - 120 Hrs @ \$117.71/Hr	=	\$ 14,125
Motor Grader - 16 Hrs @ \$65.34/Hr	=	\$ <u>1,045</u>
Sub-total	=	\$ 19,878
<i>Mine Water Treatment Total</i>	=	<u><u>\$ 19,878</u></u>

SECTION 5
UNIT HEADER SITE AND ASSOCIATED WELLFIELD RECLAMATION COSTS

Cost Summary

ITEM	Cost (\$97) per 10 Patterns	Cost (\$97) 598 Patterns 2002-2003
5.1 Buildings	1,549	92,630
5.2 Header Piping	2,735	163,553
5.3 Secondary Electrical	2,633	157,453
5.4 Wells-Total	10,532	629,813
5.5 Monitor Wells - Total	1,450	86,710*
5.6 Site Reclamation	1,019	60,936
Total Cost	19,918	1,191,095

* In period 2002-2003, the second completion to Wellfield #4 will be opened with 6 new patterns. These will be in-fill patterns and will not increase the area of Wellfield #4 or necessitate the addition of monitor wells. The first four headerhouses of Wellfield #2 will add 85 patterns in 2002-2003.

5.1 Building

Basis: 12 Ft. x 24 Ft. with 10 Ft. Eave

Floor Area = 288 Ft²

Skin Area = 720 Ft²

A. Washdown Building - 1 Day:

Wash 720 Ft² @ 1 Gal/Ft² = 720 Gal

Wash 720 Ft² @ 450 Ft²/Man-Day = 1.6 Man-Days
= 0.8 Crew-Days

• Labor Crew = 1 - Foreman	@ \$ 21.58/Hr		
2 - Laborers	@ \$ 13.02/Hr		
	\$ 47.62/Hr x 8 Hr	=	\$ 381
• Travel = \$47.62/Hr x 1 Day x 1 Hr/Day		=	\$ 48
• Eq. Rental = 2 - Pressure Washers	@ \$ 8.71/Hr		
	\$ 17.42/Hr x 8 Hr	=	\$ 139
• Materials = Soap @ \$1.09/BBL			
720 Gal x BBL x \$1.09/BBL		=	\$ 19
42 Gal			
• Dispose of Fluid @ \$0.11/BBL			
720 Gal x BBL x \$0.11/BBL		=	\$ 2
42 Gal			
Sub-total		=	\$ 589

B. Dismantle and Load - 1 Day:

Dismantle and Load @ 100 Ft²/Man-Day

288 Ft² @ 100 Ft²/Man-Day = 2.9 Man-Day
= 1.0 Crew-Day

• Labor Crew = 1 - Foreman	@ \$ 21.58/Hr		
1 - Welders	@ \$ 19.35/Hr		
2 - Laborers	@ \$ 13.02/Hr		
	\$66.97/Hr x 8 Hr	=	\$ 536
• Travel = \$66.97/Hr x 1 Day x 1 Hr/Day		=	\$ 67
• Eq. Rental = 1 - Backhoe	@ \$ 27.25/Hr		
1 - Welder/Torch	@ \$ 10.90/Hr		
	\$ 38.15/Hr x 8 Hr	=	\$ 305
Sub-total		=	\$ 908

C. Haul and Dispose - On-Site Land Fill:

Building = 4,700# = 0.1 Truck Loads* @ 47,000#

• Haul = 0.1 Truck x 8 Hrs/Truck x \$65.39/Hr	=	\$ 52
• Dispose = See Appendix 6.5		
* 5 Truck x $\frac{288 \text{ Ft.}^2}{11,550 \text{ Ft.}^2} = 0.1 \text{ Trucks}$		
Sub-total	=	\$ 52

Building Total = **\$ 1,549**

5.2 Header Piping

Basis: 2000 Ft. - 1½" Piping Buried @6 Ft.

Trench = 6 Ft. x 2 Ft. = 45 Cu. Yd./100 Ft.

Excavation = 26 Cu. Yd./Hr (Case 580 Backhoe - 24 in. Bucket)

A. Open Trenches - 5 Days:

(2000 Ft.) x (45 Cu. Yd.) x (Hr.) = 35 Hrs
100 Ft. 26 Cu. Yd..

• Eq. Rental = 1 - Backhoe	@ \$ 27.25/Hr		
	\$ 27.25/Hr x 40 Hr	=	\$ 1,090

B. Remove, Cut and Load - 2.5 Days:

Trenches Opened at 400 Ft/Man-Day

Piping = 2000 Ft @ 400 Ft/Man-Day = 5 Man-Days
= 2.5 Crew-Days

• Labor Crew = 1 - Foreman	@ \$ 21.58/Hr		
2 - Laborers	@ \$ 13.02/Hr		
	\$ 47.62/Hr x 20 Hr	=	\$ 952
• Travel = \$47.62 x 3 Days x 1 Hr/Day		=	\$ 143
• Eq. Rental = 2 - Chainsaws	@ \$ 2.40/Hr		
	\$ 4.8/Hr x 20 Hrs	=	\$ 96
Sub-total		=	\$ 1,191

C. Backfill Trenches - 2 Day:

Backfill @ 2.5 Time Excavation Rate or
Backfill @ 26 Cu.Yd./Hr. x 2.5 = 65 Cu.Yd./Hr

(2000 Ft) x (45 Cu.Yd.) x (Hr) = 13.8 Hrs or 14 hours
100 Ft 65 Cu.Yd.

• Eq. Rental = 1 - Backhoe @ \$ 27.25/Hr
\$ 27.25/Hr x 14 Hrs = \$ 382

D. Haul and Dispose - Licensed (NRC SUA #1473) Site:

1 1/4" Poly Pipe = 43 #/100 Ft. = 2,000 Ft. x 0.43#/Ft. = 860#

Volume = $\frac{2,000 \text{ Ft} \times (43 \text{ \#/100 Ft.})}{62.4 \frac{\text{\#}}{\text{Ft.}^3} \times 0.6}$ = 23 Ft.³

Total = 0.9 Cu. Yd. @ 860# = 0.02 Truck Loads @ 40,000#

• Haul = 0.02 Trucks x 800 Mile x \$3.27/Mile = \$ 52
• Dispose = 860# = 0.4 tons @ \$50/ton disposal cost¹⁴ = \$ 20

Header Piping Total = \$ 2,735

5.3 Secondary Electrical

Basis: Remove 2,000 ft - #10 AWG, Power Cable
Remove Pole and Motor Starters

A. Remove Tray Cable - 1 Day:

• Labor Crew = 1 - Journeyman @ \$ 34.88/Hr
1 - Helper @ \$ 30.51/Hr
\$ 65.39/Hr x 8 Hr = \$ 523

• Travel = \$65.39/Hr x 1 Day x 2 Hr/Day = \$ 131
+ \$0.54/Mile x 1 Day x 120 Mile/Day = \$ 65

• Eq. Rental = 1 - Truck @ \$12.26/Hr
\$12.26/Hr x 8 Hr = \$ 98

Sub-total = \$ 817

B. Remove Motor Starters - 1 Day:

• Labor Crew = 1 - Journeyman @ \$ 34.88/Hr
1 - Helper @ \$ 30.51/Hr
\$ 65.39/Hr x 8 Hr = \$ 523

• Travel = \$65.39/Hr x 1 Day x 2 Hr/Day = \$ 131
+ \$0.54/Mile x 1 Day x 120 Mile/Day = \$ 65

¹⁴ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

• Eq. Rental = 1 - Truck @ \$12.26/Hr
\$12.26/Hr x 8 Hr = \$ 98

Sub-total	=	\$ 817
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C. Disconnect Power Cable from Pole - 0.5 Days:

• Labor Crew = 1 - Journeyman @ \$ 34.88/Hr
1 - Helper @ \$ 30.51/Hr
\$ 65.39/Hr x 4 Hr = \$ 262

- **Travel** = \$65.39/Hr x 0.5 Day x 2 Hr/Day = \$ 65
- + \$0.54/Mile x 0.5 Day x 120 Mile/Day = \$ 32

• Eq. Rental = 1 - Bucket Truck @ \$ 37.36/Hr
1 - Truck @ \$ 12.26/Hr
\$ 49.62/Hr x 4 Hr = \$ 198

Sub-total = \$ 557

D. Remove Pole - 0.5 Day:

- Labor Crew = 1 - Foreman @ \$ 21.58/Hr
 1 - Operator @ \$ 17.71/Hr
 1 - Laborer @ \$ 13.02/Hr
 \$ 52.31/Hr x 4 Hr = \$ 209

- Travel = \$52.31/Hr x 1 Day x 1 Hr/Day = \$ 52

- Eq. Rental = 1 - 20 Ton Crane @ $\frac{\$ 37.39/\text{Hr}}{\$ 37.39/\text{Hr} \times 4 \text{ Hr}} = \$ 150$

Sub-total = \$ 411

E. Haul and Dispose - On-Site Land Fill:

$$\text{Cable} = \frac{3.14 \times (0.5)^2 \times 2,000}{4 \times 144 \times 0.6} = 4.5 \text{ Ft.}^3 @ 1499\#$$

$$(555\#/\text{Ft.}^3 @ 40\% \text{ Void})$$

Motor Starter =

$$\frac{10 \times (24 \text{ in.} \times 10 \text{ in.} \times 8 \text{ in.})}{1728} = 11.1 \text{ Ft.}^3 @ 260\# \text{ (@ } 26\# \text{ Each)}$$

Pole = 1 Ft. Diam. x 35 Ft. = 27.5 Ft.³ @ 825# (@ 30#/Ft³)

Total = 43.1 Ft.³ @ 2,585#
= 1.6 Cu. Yd. @ 2,585# = 0.06 Trucks @ 47,000#

- Haul = 0.06 Trucks x 8 Hr/Truck x \$65.39/Hr = \$ 31

- **Dispose** = See Appendix 6.5

Secondary Electrical Total = **\$ 2,633**

5.4 Wells

Basis: 27 Wells per 10 Patterns
5 in. Casing, 750 Ft. TD
Pumps and Tubing Set @ 550 Ft.

A. Pull Pumps and Tubing - 2 Days:

10 Pumps @ 5 Pumps/Crew-Day = 2 Days

• Eq. Rental = 1 - Pulling Unit w/2-Man Crew @ $\$32.70/\text{Hr}$
 $\$32.70/\text{Hr} \times 16 \text{ Hrs} = \$ 523$

B. Plug and Abandon - 4.5 Days:

27 Wells @ 6 Wells/Crew-Day = 4.5 Days

10 - Sack Cement/Well

800# - 'Shur-Gel'/Well

• Labor Crew = 1 - Foreman @ $\$21.58/\text{Hr}$
1 - Operator @ $\$17.71/\text{Hr}$
2 - Laborers @ $\$13.02/\text{Hr}$
 $\$65.33/\text{Hr} \times 36 \text{ Hrs} = \$ 2,352$

• Travel = $\$65.33 \times 5 \text{ Days} \times 1 \text{ Hr/Day} = \$ 327$

• Eq. Rental = 1 - Backhoe @ $\$27.25/\text{Hr}$
1 - 6000# Forklift @ $\$13.12/\text{Hr}^*$
2 - Skid Tanks @ $\$2.40/\text{Hr}$
 $\$45.17/\text{Hr} \times 36 \text{ Hrs} = \$ 1,626$

* $\$1927/\text{Month} @ 160 \text{ Hr/Month} \times 1.899 \text{ (CPI inflator)} = \$13.12/\text{Hr}$

• Materials - 270 - Sacks Cement @ $\$5.45/\text{each}$
21,600 - # 'Shur Gel' @ $\$16.34/100\#$
 $\$5,001 = \$ 5,001$

Sub-total = \$ 9,306

C. Haul and Dispose - Licensed (NRC SUA #1473) Site:

Pumps = $10 \times 5 \text{ in. Dia.} \times 8 \text{ Ft. Long} = 10.9 \text{ Ft.}^3$
@ 850# (@ 85# Each)

Tubing = $27 \times \frac{550 \text{ Ft} \times 43\#}{100 \text{ Ft.}} = 170.6 \text{ Ft.}^3 @ 6386\#$
 $62.4 \#/\text{Ft.}^3 \times 0.6$

Total = $181.5 \text{ Ft.}^3 @ 7,236\#$
= $6.7 \text{ Cu. Yd.} @ 7,236\# = 0.2 \text{ Trucks} @ 40,000\#$

• Haul = $0.2 \text{ Truck} \times 800 \text{ Mile} \times \$3.27/\text{Mile} = \$ 523$

• Dispose = $7,236\# = 3.6 \text{ tons}$
@ $\$50/\text{ton disposal cost}^{15} = \$ 180$

¹⁵ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

Wells Total = **\$ 10,532**

5.5 Monitor Wells

Basis: 3.21 Per 10 Patterns
5 in. Casing, 750 Ft. T.D.
Pumps and Tubing Set @ 550 Ft.

A. Pull Pumps and Tubing - 1 Day:

3.21 Pumps @ 5 Pumps/Crew-Day = 1 Day

• Eq. Rental = 1 - Pulling Unit w/2-Man Crew @ \$ 32.70/Hr
\$ 32.70/Hr x 8 Hrs = \$ 262

B. Plug and Abandon - 0.5 Days:

3.21 Wells @ 6 Wells/Crew-Day = 0.5 Crew-Days
10 Sacks Cement/Well
200# 'Shur-Gel'/Well

• Labor Crew = 1 - Foreman @ \$ 21.58/Hr
1 - Operator @ \$ 19.35/Hr
2 - Laborers @ \$ 13.02/Hr
\$ 66.97/Hr x 4 Hrs = \$ 268

• Travel = \$66.97/Hr x 1 Day x 1 Hr/Day = \$ 67

• Eq. Rental = 1 - Backhoe @ \$ 27.25/Hr
1 - 6000# Forklift @ \$ 13.12/Hr
2 - Skid Tanks @ \$ 2.40/Hr
\$ 45.17/Hrs x 4 Hrs = \$ 181

• Materials - 32 Sacks Cement @ \$ 5.45/each
2,568 - # 'Shur Gel' @ \$ 16.34/100#
\$ 594 = \$ 594

Sub-total = **\$ 1,110**

C. Haul and Dispose - Licensed (NRC SUA #1473) Site:

Pumps = 3.21 @ 5 In. Dia. x 8 Ft. Long = 3.5 Ft.³ @ 273#
(83# Each)

Tubing = 3.21 x 550 Ft x 43#/100 Ft. = 20.3 Ft.³ @ 759#
62.4 #/Ft.³ x 0.6

Total = 23.8 Ft.³ @ 1032#
= 0.8 Cu. Yd. @ 1032# = 0.03 Truck @ 40,000#

• Haul = 0.03 Truck x 800 Mile x \$3.27/Mile = \$ 78

Monitor Well Total = **\$ 1,450**

5.6 Site Reclamation

Basis: Revegetate 2.3 Acres (500 Ft. x 200 Ft.)
Replace 10 Cu.Yd. Topsoil (540 Ft.² x 6 In.) @ Building Pad

A. Topsoil Placement:

• 10 Cu.Yd. @ 1.09/Cu.Yd. = \$ 11

B. Revegetate:

• Grade and Contour Topsoil	@ \$ 87.19/Acre x 2.3 Acres	=	\$ 201
• Seedbed Prep. (Disc. + Harrow)	@ \$ 21.80/Acre x 2.3 Acres	=	\$ 50
• Mulch (Drill + Seed + Mow)	@ \$ 49/Acre x 2.3 Acres	=	\$ 113
• Drill Seed and Fertilize (Drill + Seed + Fertilizer)	@ \$163/Acre x 2.3 Acres	=	\$ 375
• Revegetation Contingency* (All items excluding grading)	@ \$234/Acre x 1.15 Acres	=	\$ 269

Sub-total = \$ 1,008

* Assume only 50% of acreage requires reseeding

Site Reclamation Total = \$ 1,019

**SECTION 6
ASSOCIATED STRUCTURES RECLAMATION COSTS**

Cost Summary

ITEM	COSTS (\$97)
6.1 Trunkline #1 (5000 ft)	52,108
6.2 Trunkline #2 (10000 ft)	104,216
6.3 Radium Settling Ponds	70,077
6.4a P/A Disposal Well #1	77,735
6.4b P/A Disposal Well #2	77,735
6.5 Sand Mining Area	13,173
6.6 Land Fill	1,500
6.7 Fire Protection System	11,623
Total Cost	408,167

6.1 Trunkline

Basis: 2 - 16 in. Trunklines Buried @6 Ft.

Length = 5,000 Ft.
Trench = 6 Ft. x 4 Ft. = 89 Cu. Yd./100 Ft
Excavation = 150 Cu. Yd. (Cat. 225 1.25 Cu. Yd. Bucket)
Hr

A. Open Trench - 4 Days:

(5000 Ft.) x (89 Cu. Yd.) x (Hr.) = 30 Hrs - Round to 32 Hrs
100 Ft. 150 Cu. Yd.

• Eq. Rental = 1 - Cat. 225 Trackhoe @ \$112.26/Hr
\$112.26/Hr x 32 Hr = \$ 3,592

B. Remove, Cut and Load - 18 Days:

2 - 5000 Ft Trunklines @ 140 Ft/Man-Day = 71.4 Man-Day
= 18 Crew-Day

• Labor Crew = 1 - Foreman @ \$21.58/Hr
4 - Laborers @ \$13.02/Hr
\$73.66/Hrs x 144 Hr = \$ 10,607

• Travel = \$73.66/Hr x 18 Days x 1 Hr/Day = \$ 1,326

• Eq. Rental = 2 - Backhoe @ \$27.25/Hr
2 - Chainsaw @ \$ 2.40/Hr
\$59.30/Hr x 144 Hr = \$ 8,539

Sub-total = \$ 20,472

C. Backfill Trench - 5 Days:

Backfill @ 65 Cu.Yd./Hr Per Backhoe or
Backfill @ 130 Cu.Yd./Hr with 2 Backhoes

$$(5000 \text{ Ft.}) \times (89 \text{ Cu. Yd.}) \left(\frac{\text{Hr.}}{100 \text{ Ft.} \quad 130 \text{ Cu. Yd.}} \right) = 34 \text{ Hrs}$$

- Eq. Rental = 2 - Backhoes @ $\$27.25/\text{Hr}$
 $\$54.50/\text{Hr} \times 40 \text{ Hrs} = \$ 2,180$

D. Decontaminate - 0 Days: = \$ 0

E. Haul and Dispose - Licensed (NRC SUA #1473) Site:
 100% of Pipe = 2 x 5,000 Ft. x 28.27#/Ft = 282,700#

$$= \frac{282,700\#}{62.4\#/\text{Ft.}^3} \times 0.6 = 7551 \text{ Ft.}^3$$

Total = 279.7 Cu. Yd. @ 282,700# = 7.1 Truckloads @ 40,000#

- Haul = 7.1 Trucks x 800 Mile x \$3.27/Mile = \$ 18,574

- Dispose = 282,700# = 141.4 tons
 @ \$50/ton disposal cost¹⁶ = \$ 7,070

F. Haul & Dispose - Land Fill: = \$ 0

G. Surface Reclamation:
 4 Ft. x 5000 Ft. = 20,000 Ft.² = 0.5 Acres

- Grade and Contour @ \$ 87.19/Acre x 0.5 Acre = \$ 43

- Seedbed Prep.
 (Disc. + Harrow) @ \$ 21.80/Acre x 0.5 Acre = \$ 11

- Mulch (Drill + Seed + Mow) @ \$ 49/Acre x 0.5 Acre = \$ 25

- Drill Seed and Fertilize
 (Drill + Seed + Fertilizer) @ \$163/Acre x 0.5 Acre = \$ 82

- Revegetation Contingency* @ \$234/Acre x 0.25 Acre = \$ 59
 (All items excluding grading)

* Assume only 50% of acreage requires reseeding

Sub-total = \$ 220

Trunkline Total = \$ 52,108

6.2 Trunkline #2

Cost for 5000 ft line is \$52,108. Trunkline #2 is 10,000 ft.
 @ \$52,108 x 2 = \$ 104,216

¹⁶ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

6.3 Radium Settling Ponds

Basis: 2 Ponds
9 Ft. Deep Below Grade plus 3 Ft. Freeboard Above Grade
Bottom = 180 Ft. x 360 Ft. (Per Pond)
Top = 252 Ft. x 432 Ft. (Per Pond)
Liner = 106,000 Ft² x 30 MIL (Per Pond)
Solids = 200 Ft.³/Yr (Both Ponds)

A. Remove Solids and Liner - 8 Days:

Liner = 2 Ponds x 106,000 Ft.² x 0.03 In/12 = 530 Ft.³
= 33,072# @ 62.4#/Ft³
= 883 Ft³ @ 40% Voids

Solids = 200 ft³/yr = 200 Ft.³/Yr Yr #1 - 1998
= 800 Ft.³ In Yr #5 - 2002

Remove @ 55 Gal/Man-Hr or 60 Ft³/Man-Day

Yr #5 = 1683 Ft³ @ 60 Ft³/Man-Day = 28 Man-Days
= 7 Crew-Days

• Labor Crew = 1 - Foreman @ \$21.58/Hr 4 - Laborers @ \$13.02/Hr \$73.66/Hr x 56 Hrs	=	\$ 4,125
• Travel = \$73.66/Hr x 7 Days x 1 Hr/Day	=	\$ 516
• Eq. Rental = 2 - Backhoes @ \$27.25/Hr \$54.50/Hr x 56 Hrs	=	\$ 3,052
Sub-total	=	\$ 7,693

B. Backfill Ponds - 27 Days:

Volume @ Grade = 180 Ft x 360 Ft x 9 Ft = 583,200 Ft³
+ 27 Ft x 180 Ft x 9 Ft = 43,740 Ft³
+ 27 ft X 360 ft X 9 Ft = 87,480 Ft³
714,420 Ft³ (Per Pond)

Total Volume = 714,420 Ft³/Pond x 2 Ponds = 1,428,840 Ft³ = 52,920 Cu.Yd.

Backfill @ 250 Cu.Yd./Hr = 212 Hrs

• Eq. Rental = 1 - D8N Dozer @ \$117.71/Hr 1- Grader @ \$ 65.39/Hr \$183.10/Hr x 212 Hr	=	\$ 38,817
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C. Replace 6 In. Topsoil:

2 Ponds x 0.5 Ft. x 252 Ft. x 432 Ft. = 108,864 Ft.³ = 4032 Cu. Yd.

• Topsoil = 4032 Cu. Yd x \$1.09/Cu. Yd.	=	\$ 4,395
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D. Revegetate:

2 Ponds x 252 Ft. x 432 Ft. = 217,728 Ft.² = 5 Acres

• Grade and Contour @ \$ 87.19/Acre x 5 Acre	=	\$ 436
• Seedbed Prep. (Disc. + Harrow) @ \$ 21.80/Acre x 5 Acre	=	\$ 109
• Mulch (Drill + Seed + Mow) @ \$ 49/Acre x 5 Acre	=	\$ 245
• Drill Seed and Fertilize (Drill + Seed + Fertilizer)@ \$163/Acre x 5 Acre	=	\$ 817
• Revegetation Contingency* @ \$234/Acre x 2.5 Acre (All items excluding grading)	=	<u>\$ 585</u>

Assume only 50% of acreage requires reseeding

Sub-total = **\$ 2,192**

E. Haul and Dispose - Licensed (NRC SUA #1473) Site:

Solids = 800 Ft.³ @ 154,400# (60% @ 280#/Ft.³ + 40% @ 62.4#/Ft.³ = 193#/Ft.³)
 Liner = 883 Ft.³ @ 33,072# (62.4#/Ft.³ @ 40% Voids)
 Total = 1683 Ft.³ @ 187,472#
 62.3 Cu. Yd. @ 187,472# = 4.7 Truckloads @ 40,000#

• Haul = 4.7 Trucks x 800 Mile x \$3.27/Mile	=	<u>\$ 2,295</u>
• Dispose = 187,472# = 93.7 tons @ \$50/ton disposal cost ¹⁷	=	<u>\$ 4,685</u>

Radium Settling Pond Total = **\$ 70,077**

6.4a Plugging and Abandoning Deep Disposal Well #1

Oilfield Workover Unit, 6 Days @ \$1,634.85/Day	=	\$ 9,809
Circulating Pump & Tank, 2 Days @ \$545/Day	=	\$ 1,090
Power Swivel, 1 Day @ \$436/Day	=	\$ 436
Water Hauling & Water, 3 Days @ \$354/Day	=	\$ 1,062
Frac Tank Rental	=	\$ 109
Slickline Services, 2 Days @ \$599/Day	=	\$ 1,198
2 - 7/8 Inch "R" Nipple	=	\$ 1,417
Mud Materials	=	\$ 545
2 - 7/8 Inch Tubing Rental, 8610' @ \$0.54/Ft-Day	=	\$ 2,325
Rental Tubing Inspection, 278 Jnts @ \$10.90/Jnt	=	\$ 3,030
Cement & Services, 3 Squeeze Jobs @ 4374 each	=	\$ 13,122
Squeeze Manifold, Retainer, Swivel, Setting Tool @ \$1,820/Squeeze Job	=	\$ 5,460
Cement & Services, 2 Stabilizers & Surface Plugs	=	\$ 4,711
Welder, Dirtwork & Roustabouts	=	\$ 13,624
Trucking	=	\$ 2,725

¹⁷ See 1997-1998 Permit to Mine 633 2nd Round Responses. Cost is provided in 1998 NRC Surety for SUA-1548, and determined acceptable by NRC and it is based on actual fees charged by Quivira Mining Co., NRC license SUA-1473

Supervision, 8 Days @ \$545/Day	=	\$ 4,360
Miscellaneous, Contingencies, & Sales Tax (10% Above)	=	\$ 6,502
Sub-Total	=	\$ 71,525
Year 1991 & 1992 CPI Escalation	=	\$ 6,210
Sub-Total (\$1997)	=	\$ 77,735
<i>Plug and Abandoning Disposal Well</i>	=	<u>\$ 77,735</u>

6.4b Plugging and Abandoning Deep Disposal Well #2

Oilfield Workover Unit, 6 Days @ \$1,634.85/Day	=	\$ 9,809
Circulating Pump & Tank, 2 Days @ \$545/Day	=	\$ 1,090
Power Swivel, 1 Day @ \$436/Day	=	\$ 436
Water Hauling & Water, 3 Days @ \$354/Day	=	\$ 1,062
Frac Tank Rental	=	\$ 109
Slickline Services, 2 Days @ \$599/Day	=	\$ 1,198
2 - 7/8 Inch "R" Nipple	=	\$ 1,417
Mud Materials	=	\$ 545
2 - 7/8 Inch Tubing Rental, 8610' @ \$0.54/Ft-Day	=	\$ 2,325
Rental Tubing Inspection, 278 Jnts @ \$10.90/Jnt	=	\$ 3,030
Cement & Services, 3 Squeeze Jobs @ 4374 each	=	\$ 13,122
Squeeze Manifold, Retainer, Swivel, Setting Tool	=	\$ 5,460
@ \$1,820/Squeeze Job	=	\$ 4,711
Cement & Services, 2 Stabilizers & Surface Plugs	=	\$ 13,624
Welder, Dirtwork & Roustabouts	=	\$ 2,725
Trucking	=	\$ 4,360
Supervision, 8 Days @ \$545/Day	=	\$ 6,502
Miscellaneous, Contingencies, & Sales Tax (10% Above)	=	\$ 71,525
Sub-Total	=	\$ 6,210
Year 1991 & 1992 CPI Escalation	=	\$ 77,735
Sub-Total (\$1997)	=	\$ 77,735
<i>Plug and Abandoning Disposal Well</i>	=	<u>\$ 77,735</u>

6.5 Reclamation of Sand Mining Area

10 acres of disturbed area on sand outcrop

Grade and contour @ \$ 87.19/acre x 10 Acre	=	\$ 872
Replace 6 inch topsoil = 217,800 ft. ³ = 8,067 Cu.Yd. topsoil = \$1.09/Cu.Yd.	=	\$ 8,793
Seedbed Prep. (Disc. + Harrow) @ \$ 21.80/acre x 10 Acre	=	\$ 218
Mulch (Drill + Seed + Mow) @ \$ 49/acre x 10 Acre	=	\$ 490
Drill Seed and Fertilizer @ \$163/acre x 10 Acre	=	\$ 1,630
Revegetation Contingency* (All items excluding grading) @ \$234/acre x 5 Acre	=	\$ 1,170

Assume only 50% of acreage requires reseeding

Sand Mining Area Total

= \$ 13,173

6.6 Land Fill

Basis: Depth = 6 Ft. total with 4 Ft. active strg. plus 2 ft. cover.
Bottom = 30 Ft. x 70 Ft. = 2,100 Ft.²
Top = 54 Ft. x 94 Ft. = 5,076 Ft.²
Grade = 66 Ft. x 106 Ft. = 6,996 Ft.²

4 Ft. Active Strg. Volume = 30 Ft. x 70 Ft. x 4 Ft. = 8,400 Ft.³
+ 12 Ft. x 30 Ft. x 4 Ft. = 1,440 Ft.³
+ 12 Ft. x 70 Ft. x 4 Ft. = 3,360 Ft.³
13,200 Ft.³

2 Ft. Cover Volume = 54 Ft. x 94 Ft. x 2 Ft. = 10,152 Ft.³
+ 6 Ft. x 54 Ft. x 2 Ft. = 648 Ft.³
+ 6 Ft. x 94 Ft. x 2 Ft. = 1,128 Ft.³
11,928 Ft.³

Total Volume = 13,200 Ft.³ + 11,928 Ft.³ = 25,120 Ft.³ = 931 Cu.Yd.

A. Open Pit - 1 Day:

Productivity = 167 Cu.Yd. (Cat. 627E Scraper)
Hr

(931 Cu. Yd.) x (Hr) = 5.6 Hrs round to 6 Hrs
167 Cu.Yd.

• Eq. Rental = 1 - Cat. 627E Scraper @ \$121/Hr
\$121/Hr x 6 Hrs = \$ 726

B. Backfill Non-Contaminated Material - 1 Day:

Basis: See Table 6.1

Yr. 5 Total Volume = 8448 Ft.³ = 312.9 Cu.Yd.

Backfill @ 65 Cu.Yd./Hr. = 4.8 Hrs. round to 5 Hrs

• Eq. Rental = 1 - Backhoe @ \$27.25/Hr
\$27.25/Hr x 8 Hrs = \$ 218

C. Backfill to Grade - 2 Days:

Voids = 312.9 Cu.Yd. x 0.4 = 125 Cu.Yd.

Remainder of Active Strg. = 13,200 Ft.³ - 8,203 Ft.³
= 5,103 Ft.³ = 189 Cu.Yd.

Cover = 11,928 Ft.³ = 442 Cu.Yd.
Total = 756 Cu.Yd.

Backfill @ 65 Cu.Yd./Hr = 11.6 Hrs round to 12 Hrs

• Eq. Rental = 1 - Backhoe @ \$27.25/Hr		
\$27.25/Hr x 12 Hrs	=	\$ 327

D. Surface Reclamation:

Basis: 6996 Ft.² = 0.2 Acre

Replace 6 in. Topsoil = 6996 Ft.² x 0.5 Ft. = 3498 Ft³ = 130 Cu.Yd.

• Topsoil Placement @ 1.09/Cu.Yd.	=	\$ 142
• Grade and Contour @ \$87.19/Acre x 0.2 Acre	=	\$ 17
• Seedbed Prep. (Disc. + Harrow) @ \$21.80/Acre x 0.2 Acre	=	\$ 4
• Mulch (Drill + Seed + Mow) @ \$49/Acre x 0.2 Acre	=	\$ 10
• Drill Seed & Fertilize @ \$163/Acre x 0.2 Acre	=	\$ 33
• Revegetation Contingency* @ \$234/Acre x 0.1 Acre	=	\$ 23
(All items excluding grading)	=	\$ 23

* Assume only 50% of acreage requires reseeding.

Sub-total	=	\$ 229
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Land Fill Total	=	\$ 1,500
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6.7 Fire Protection System

Basis = 32 ft dia. x 26 ft ht. x 0.25 = 43,400 # = 148 ft³ (40% void)

A. Decontaminate - 0 Days:	=	\$ 0
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B. Remove and Load - 5 Days:

• Labor Crew =	1 - Foreman @ \$ 21.58/Hr	
	1 - Operator @ \$ 17.71/Hr	
	2 - Laborers @ \$ 13.02/Hr	
	\$ 65.33/Hr x 40 Hr	= \$ 2,613

• Travel = \$65.33/Hr x 5 Days x 1 Hr/Day	=	\$ 327
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• Eq. Rental = 1 - 20 Ton Crane @ \$ 37.39/Hr		
\$ 37.39/Hr x 40 Hrs	=	\$ 1,496

Sub-total	=	\$ 4,436
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C. Dismantle, Cut, or Crush - 5 Days:

Cut Steel @ 30 Ft ³ /Man-Day @ 518.5 Ft ³	=	5 Man-Days
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• Labor Crew = 1 - Foreman	@ \$ Foreman Supervises both 2.2(A) & (B)		
1 - Welder	@ \$ 19.35/Hr		
2 - Laborers	@ \$ 13.02/Hr		
	\$ 45.39/Hr x 40 Hrs	=	\$ 1,816
• Travel = \$45.39/Hr x 5 Days x 1 Hr/Day		=	\$ 227
• Eq. Rental = 1 - D8N Dozer	@ \$117.71/Hr		
1 - Welder/Torch	@ \$ 10.90/Hr		
	\$128.61/Hr x 40 Hrs	=	\$ 5,144
Sub-total		=	\$ 7,187

D. Haul and Dispose - On-Site Land Fill:
 100% of Non-Contaminated Service = 148 Ft³ @ 43,400#
 Total = 5.5 Cu.Yd. @ 43,400# = 1 Truckloads @ 47,000#

• Haul = 1 Truck x 8 Hrs/Truck x \$65.39/Hr	=	\$ 523
• Dispose = See Appendix 6.5		

Tankage and Vessel Total = \$ 11,623

TABLE 6.1

Non-Contaminated Disposal Volume

SOURCE	UNIT WEIGHT (#)	UNIT VOLUME (Ft. ³)	YR. #1 1998 (Ft. ³)	YR. #5 2003 (Ft. ³)
1. IX Plant:				
A. Building	235,000	801.6*	801.6	1,603.2
B. Tankage & Vessels	2,320	36.5	0	73.0
C. Piping	0	0	0	0
D. Pumps	8,545	71.9	0	43.8
E. Electrical	22,950	165.1	<u>0</u>	<u>30.2</u>
			801.6	2,150.2
2. Central Processing Plant:				
A. Building	376,000	1,282.6*	0	1,282.6
B. Tankage & Vessels	45,010	393.2	0	393.2
C. Piping	0	0	0	0
D. Pumps	10,723	106.5	0	106.5
E. Electrical	45,800	330.6	<u>0</u>	<u>330.6</u>
			0	2,112.9
3. Driver Area:				
A. Building	0	0	0	0
B. Equipment	4,400	15.0	0	15.0
4. Existing Facilities:				
A. Building	676,800	2,308.6	2,308.6	2,308.6
B. Structures	0	0	0	0
C. Pilot Plant Equip.	16,230	145.3	<u>145.3</u>	<u>145.3</u>
			2,453.9	2,453.9
5. Header Site & Associated Wellfield:				
A. Building	4,700	16.0*	0	742.4
B. Header Piping	0	0	0	0
C. Secondary Elect.	2,585	43.1	0	1,999.8
D. Wells - Total	0	0	0	0
E. Mon. Wells - Total	0	0	<u>0</u>	<u>0</u>
			0	2,742.2
6. Associated Structures				
A. Storage Tank				
B. Pump				
C. Pump House				
D. Piping				
TOTAL			<u>3,255.5</u>	<u>9,474.2</u>

*Building Unit Volume = $\frac{\text{Unit Weight}}{62.4 \times 7.83 \times 0.6}$

SECTION 7
GROUNDWATER RESTORATION COSTS
Cost Summary

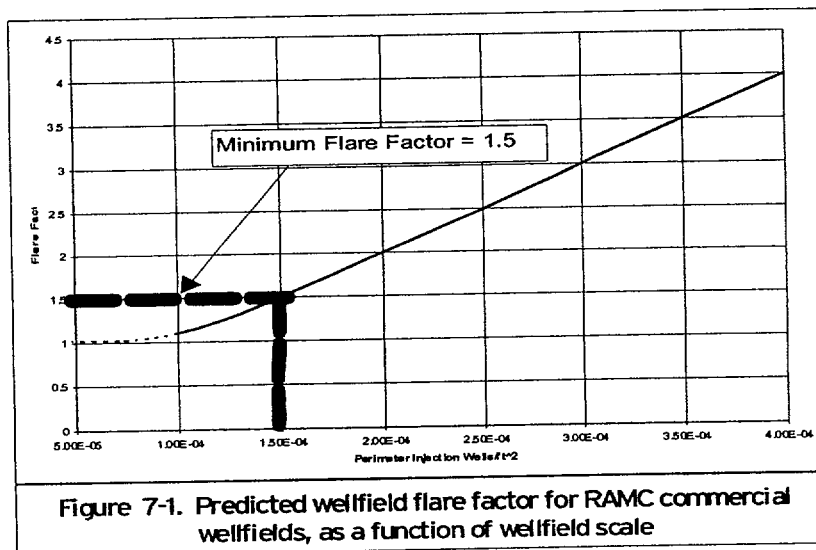
ITEM	COSTS (\$97)
7.1 Groundwater Restoration	\$6,033,134
Total Cost	\$6,033,134

7.1 Groundwater Restoration Costs

Basis: Table 7.1, Table 7.2 & Table 7.3, 7.4, 7.5 and 7.6 - Groundwater Restoration Basis

Table 7.1
Affected Pore Volume Estimate

Wellfield	Number of Perimeter Injection Wells	Measured Pattern Area (ft ²)	Perimeter Inj Wells per Unit Area	Number of Patterns	Average Open Interval (ft)	Effective Porosity	Flare Factor from Fig 7-1	Pattern Affected Pore Volume (gal/pattern)	Wellfield Affected Pore Volume (gallons)
1	170	1115229	1.52E-004	116	18	0.27	1.7	594,146	68,920,890
3	147	1622462	9.06E-005	162	20	0.27	1.5	606,801	98,301,728
3 ext	97	782800	1.24E-004	76	14	0.27	1.5	436,839	33,199,800
4	163	1334798	1.22E-004	128	18	0.27	1.5	568,636	72,785,467
4A	142	1050576	1.35E-004	101	18	0.27	1.5	567,199	57,287,069
2	103	1060460	9.71E-005	85	24	0.27	1.5	907,075	77,101,381
4 ext	60	340421	1.76E-004	35	17	0.27	1.76	587,726	20,570,426



Methodology for Flare Factor Determination

Figure 7-1 is derived from Figure 3-16 in "Evaluation and Simulation of Wellfield Restoration at the RAMC Smith Ranch Facility" dated October 29, 1999. This document was submitted to the Wyoming DEQ - Land Quality Division with a letter dated December 13, 1999 for review. In that document, RAMC proposes a methodology developed through hydraulic and geochemical modeling that uses the geometry of the wellfield to estimate a Flare Factor. In this case, the number of perimeter injection wells are counted, the surface area of the wellfield pattern is measured using a CAD based map, a ratio is developed of the # of perimeter injection wells to the surface area of the wellfield patterns. That ratio is located on the horizontal axis of figure 7-1 (above). From that intercept, a vertical line is projected to intersect the curve. At that

intersection, a horizontal line is projected to intercept the vertical axis. The estimated flare factor is derived from that intercept.

On May 11, 2000, RAMC met with LQD to discuss the review of the document and RAMC's proposed approach for estimating groundwater restoration costs. RAMC verified that the curve shown on Figure 7-1 had been validated using modeling for flare factors of 1.5 and higher, but it had not been verified for Flare Factors lower than 1.5. RAMC stated that for bonding purposes only, it would not use a Flare Factor lower than 1.5 for estimating the predicted costs for groundwater restoration.

Wellfield 3 ext. represents the 2nd completion within the existing patterns in Wellfield #3. The 2nd completion represents an opening of an upper interval of the patterns in Wellfield #3 which effects 76 patterns and will result in a net increase of 6 patterns.

Table 7.2
SMITH RANCH PROJECT
Mining Unit Groundwater Restoration Costs
Wellfield #1

1 APV = 68,920,890 gallons

		Total Gallons Treated	Operating Flow Rate GPM	Total Cost	Number of Days
RESTORATION COST COMPONENT					
1.	Wellfield Pumping Costs				
a)	Groundwater Treatment (IX treatment Only) (100% of flow)	(\$0.117/1,000 gal.)	413,525,340	1400 *	\$48,382 287
b)	Treated Groundwater Re-injection (bypass RO/EDR Treatment)	(\$0.117/1,000 gal.)	248,115,204	600 *	\$29,029 287
c)	RO/EDR Treatment (800 GPM Feed 600 GPM Permeate)	(\$0.289/1,000 gal.)	330,820,272	800	\$95,607 287
e)	Groundwater Sweep (GW Inflow to replace water sent to disposal)	(\$0.117/1,000 gal.)	82,705,068	200	\$9,676 287
	Total Treated Volume:	413525340	1000	\$182,695	287
	SUBTOTAL				
2.	Chemical Treatment Power Costs				
a)	Reverse Osmosis Unit	\$0.10/gpm/day (\$0.07/1,000 gal.)	330,820,272	800	\$23,157
b)	Disposal Well Operation	\$0.05/1,000 gal	82,705,068	200	\$4,135
	SUBTOTAL			\$27,293	
3.	Chemicals				
a)	Waste Water Treatment (Resin Elut. Chem) @\$400/elution, Waste Water @ 2 mg/L U3O8 500 ft3 resin, 2 lb./ft3 loading, Annualized Waste Water Flow; 1400 gpm 1 elution every 29.7 days or 12.3 elutions per year	Elution Costs (12.3 Elutions/year * \$400/ Elution)			\$3,871 287
b)	Chemical Reductant (H2S or alternative)	\$1.80/gpm/day (\$1.25/1,000 gal.)	68,920,890	1200	\$86,151
c)	RO Chemicals (H2SO4, Antiscalants, Oxygen Scavenger)	\$0.57/gpm/day (\$0.40/1,000 gal.)	330,820,272	800	\$132,328
	SUBTOTAL			\$222,350	
	Repairs and Maintenance				
a)	Wellfield and Waste Water Treatment	\$10,000/mo	9.4	months	\$94,154
b)	RO and process equipment	\$5,000/mo	9.4	months	\$47,077
	SUBTOTAL			\$141,231	
5.	Labor				
	Supervisor @ \$20.00 per hour		9.4	months	\$30,129
	4 Operators @ \$13.00 per hour		9.4	months	\$78,336
	2 Maintenance @ \$13.00 per hour		9.4	months	\$39,168
	SUBTOTAL			\$147,634	
6.	Contract Laboratory Analysis				
	70 Monitor Wells (140 UCL samples per year @\$100)		0.8		\$10,985
	Stabilization Samples				10,500
	10 Wells - 3 complete Assays @\$350				22,500
	- 9 abbreviated assays @ \$250				\$43,985
	SUBTOTAL				
7.	Operating Expenses				
	Supplies @\$3,000/mo		9.4		28,246
	Heating @\$5,000/mo		4.7		23,539
	Vehicle Fuel @\$1,000/mo		9.4		9,415
	Office Utilities @\$1,000/mo		9.4		9,415
	SUBTOTAL				\$70,616
	TOTAL OPERATING COST TO RESTORE GROUNDWATER AT FULL PRODUCTION (Nominal Mine Unit)				\$835,804 (1993\$)
	UNIT RESTORATION OPERATING COST		116 Patterns		\$7,205 /Pattern
	1993 -1997 inflation (CPI-U) = 160.6/143.6 =	11.84%			\$98,946
			Total		\$934,750 (1997\$)

Table 7.3
SMITH RANCH PROJECT
Mining Unit Groundwater Restoration Costs
Wellfield #3

1 APV = 98,301,728 gallons		Total Gallons Treated	Operating Flow Rate GPM		Total Cost	Number of Days
RESTORATION COST COMPONENT						
1.	<u>Wellfield Pumping Costs</u>					
a)	Groundwater Treatment (IX treatment Only) (100% of flow) (\$0.117/1,000 gal.)	589,810,366	1400	*	\$69,008	410
b)	Treated Groundwater Re-injection (bypass RO/EDR Treatn) (\$0.117/1,000 gal.)	353,886,220	600	*	\$41,405	410
c)	RO/EDR Treatment (800 GPM Feed 600 GPM Permeate) (\$0.289/1,000 gal.)	471,848,293	800		\$136,364	410
e)	Groundwater Sweep (GW Inflow to replace water sent to dis) (\$0.117/1,000 gal.)	117,962,073	200		\$13,802	410
	Total Treated Volume:	589,810,365.9	1000		\$260,578	410
	SUBTOTAL					
2.	<u>Chemical Treatment Power Costs</u>					
a)	Reverse Osmosis Unit \$0.10/gpm/day (\$0.07/1,000 gal.)	471,848,293	800		\$33,029	
b)	Disposal Well Operation \$0.05/1,000 gal	117,962,073	200		\$5,898	
	SUBTOTAL					
3.	<u>Chemicals</u>					
a)	Waste Water Treatment (Resin Elut. Chem) @\$400/elution, Waste Water @ 2 mg/L U3O8 500 ft3 resin, 2 lb./ft3 loading, Annualized Waste Water Flow; 1400 gpm 1 elution every 29.7 days or 12.3 elutions per year	Elution Costs (12.3 Elutions/year * \$400/ Elution)			\$5,521	410
b)	Chemical Reductant (H2S or alternative) \$1.80/gpm/day (\$1.25/1,000 gal.)	98,301,728	1200		\$122,877	
c)	RO Chemicals (H2SO4, Antiscalants, Oxygen Scavenger) \$0.57/gpm/day (\$0.40/1,000 gal.)	471,848,293	800		\$188,739	
	SUBTOTAL					
	<u>Repairs and Maintenance</u>					
a)	Wellfield and Waste Water Treatment \$10,000/mo	13.4	months		\$134,292	
b)	RO and process equipment \$5,000/mo	13.4	months		\$67,146	
	SUBTOTAL					
5.	<u>Labor</u>					
	Supervisor @ \$20.00 per hour	13.4	months		\$42,973	
	4 Operators @ \$13.00 per hour	13.4	months		\$111,731	
	2 Maintenance @ \$13.00 per hour	13.4	months		\$55,865	
	SUBTOTAL					
6.	<u>Contract Laboratory Analysis</u>					
	70 Monitor Wells (140 UCL samples per year @\$100)	1.1			\$15,667	
	Stabilization Samples				10,500	
	10 Wells - 3 complete Assays @\$350				22,500	
	- 9 abbreviated assays @ \$250				\$48,667	
	SUBTOTAL					
7.	<u>Operating Expenses</u>					
	Supplies @\$3,000/mo	13.4			40,288	
	Heating @\$5,000/mo	6.7			33,573	
	Vehicle Fuel @\$1,000/mo	13.4			13,429	
	Office Utilities @\$1,000/mo	13.4			13,429	
	SUBTOTAL					
	TOTAL OPERATING COST TO RESTORE GROUNDWATER AT FULL PRODUCTION (Nominal Mine Unit)					
		162 Patterns			\$1,178,037 (1993\$)	
	UNIT RESTORATION OPERATING COST					
					\$7,272 /Pattern	
	1993 -1997 inflation (CPI-U) = 160.6/143.	11.84%			\$139,461	
			Total		\$1,317,499 (1997\$)	

Table 7.4
SMITH RANCH PROJECT
Mining Unit Groundwater Restoration Costs
Wellfield #4

1 APV = 72,785,467 gallons

RESTORATION COST COMPONENT		Total Gallons Treated	Operating Flow Rate GPM	Total Cost	Number of Days
1. Wellfield Pumping Costs					
a) Groundwater Treatment (IX treatment Only) (100% of flow)	(\$0.117/1,000 gal.)	436,712,803	1400 *	\$51,095	303
b) Treated Groundwater Re-Injection (bypass RO/EDR Treatment)	(\$0.117/1,000 gal.)	262,027,682	600 *	\$30,657	303
c) RO/EDR Treatment (800 GPM Feed 600 GPM Permeate)	(\$0.289/1,000 gal.)	349,370,242	800	\$100,968	303
e) Groundwater Sweep (GW Inflow to replace water sent to disposal)	(\$0.117/1,000 gal.)	87,342,561	200	\$10,219	303
SUBTOTAL		Total Treated Volume: 436712802.6	1000	\$192,940	303
2. Chemical Treatment Power Costs					
a) Reverse Osmosis Unit	\$0.10/gpm/day (\$0.07/1,000 gal.)	349,370,242	800	\$24,456	
b) Disposal Well Operation	\$0.05/1,000 gal	87,342,561	200	\$4,367	
SUBTOTAL				\$28,823	
3. Chemicals					
a) Waste Water Treatment (Resin Elut. Chem) @ \$400/elution, Waste Water @ 2 mg/L U308 500 ft3 resin, 2 lb./ft3 loading, Annualized Waste Water Flow; 1400 gpm 1 elution every 29.7 days or 12.3 elutions per year	Elution Costs (12.3 Elutions/year * \$400/ Elution)			\$4,088	303
b) Chemical Reductant (H2S or alternative)	\$1.80/gpm/day (\$1.25/1,000 gal.)	72,785,467	1200	\$90,982	
c) RO Chemicals (H2SO4, Antiscalants, Oxygen Scavenger)	\$0.57/gpm/day (\$0.40/1,000 gal.)	349,370,242	800	\$139,748	
SUBTOTAL				\$234,818	
Repairs and Maintenance					
a) Wellfield and Waste Water Treatment	\$10,000/mo	9.9	months	\$99,434	
b) RO and process equipment	\$5,000/mo	9.9	months	\$49,717	
SUBTOTAL				\$149,151	
5. Labor					
Supervisor @ \$20.00 per hour		9.9	months	\$31,819	
4 Operators @ \$13.00 per hour		9.9	months	\$82,729	
2 Maintenance @ \$13.00 per hour		9.9	months	\$41,364	
SUBTOTAL				\$155,912	
6. Contract Laboratory Analysis					
70 Monitor Wells (140 UCL samples per year @ \$100)		0.8		\$11,601	
Stabilization Samples				10,500	
10 Wells - 3 complete Assays @ \$350				22,500	
- 9 abbreviated assays @ \$250				\$44,601	
SUBTOTAL					
7. Operating Expenses					
Supplies @ \$3,000/mo		9.9		29,830	
Heating @ \$5,000/mo		5.0		24,858	
Vehicle Fuel @ \$1,000/mo		9.9		9,943	
Office Utilities @ \$1,000/mo		9.9		9,943	
SUBTOTAL				\$74,575	
TOTAL OPERATING COST TO RESTORE GROUNDWATER AT FULL PRODUCTION (Nominal Mine Unit)				\$880,819 (1993\$)	
UNIT RESTORATION OPERATING COST				128 Patterns	\$6,881 /Pattern
1993 -1997 inflation (CPI-U) = 160.6/143.6 =				11.84%	\$104,275
				Total	\$985,094 (1997\$)

Table 7.5
SMITH RANCH PROJECT
Mining Unit Groundwater Restoration Costs
Wellfield #4A

1 APV = 57,287,069 gallons

1 APV =	57,287,069 gallons	Total Gallons Treated	Operating Flow Rate GPM	Total Cost	Number of Days		
RESTORATION COST COMPONENT							
1.	<u>Wellfield Pumping Costs</u>						
a)	Groundwater Treatment (IX treatment Only) (100% of flow)	(\$0.117/1,000 gal.)	343,722,413	1400	*	\$40,216	239
b)	Treated Groundwater Re-injection (bypass RO/EDR Treatment)	(\$0.117/1,000 gal.)	206,233,448	600	*	\$24,129	239
c)	RO/EDR Treatment (800 GPM Feed 600 GPM Permeate)	(\$0.289/1,000 gal.)	274,977,930	800		\$79,469	239
e)	Groundwater Sweep (GW Inflow to replace water sent to disposal)	(\$0.117/1,000 gal.)	68,744,483	200		\$8,043	239
		Total Treated Volume:	343722412.9	1000		\$151,857	239
	SUBTOTAL						
2.	<u>Chemical Treatment Power Costs</u>						
a)	Reverse Osmosis Unit	\$0.10/gpm/day (\$0.07/1,000 gal.)	274,977,930	800		\$19,248	
b)	Disposal Well Operation	\$0.05/1,000 gal	68,744,483	200		\$3,437	
	SUBTOTAL						
3.	<u>Chemicals</u>						
a)	Waste Water Treatment (Resin Elut. Chem)						
	@\$400/elution, Waste Water @ 2 mg/L U3O8	Elution Costs (12.3 Elutions/year * \$400/ Elution)				\$3,217	239
	500 ft3 resin, 2 lb./ft3 loading,						
	Annualized Waste Water Flow; 1400 gpm						
	1 elution every 29.7 days or 12.3 elutions per year						
b)	Chemical Reductant (H2S or alternative)	\$1.80/gpm/day (\$1.25/1,000 gal.)	57,287,069	1200		\$71,609	
c)	RO Chemicals (H2SO4, Antiscalants, Oxygen Scavenger)	\$0.57/gpm/day (\$0.40/1,000 gal.)	274,977,930	800		\$109,991	
	SUBTOTAL						
4.	<u>Repairs and Maintenance</u>						
a)	Wellfield and Waste Water Treatment	\$10,000/mo	7.8	months		\$78,261	
b)	RO and process equipment	\$5,000/mo	7.8	months		\$39,131	
	SUBTOTAL						
5.	<u>Labor</u>						
	Supervisor @ \$20.00 per hour		7.8	months		\$25,044	
	4 Operators @ \$13.00 per hour		7.8	months		\$65,113	
	2 Maintenance @ \$13.00 per hour		7.8	months		\$32,557	
	SUBTOTAL						
6.	<u>Contract Laboratory Analysis</u>						
	70 Monitor Wells (140 UCL samples per year @ \$100)		0.7			\$9,130	
	Stabilization Samples					10,500	
	10 Wells - 3 complete Assays @ \$350					22,500	
	- 9 abbreviated assays @ \$250					\$42,130	
	SUBTOTAL						
7.	<u>Operating Expenses</u>						
	Supplies @ \$3,000/mo		7.8			23,478	
	Heating @ \$5,000/mo		3.9			19,565	
	Vehicle Fuel @ \$1,000/mo		7.8			7,826	
	Office Utilities @ \$1,000/mo		7.8			7,826	
	SUBTOTAL						
TOTAL OPERATING COST TO RESTORE GROUNDWATER AT FULL PRODUCTION (Nominal Mine Unit)						\$700,291 (1993\$)	
UNIT RESTORATION OPERATING COST						101 Patterns	\$6,934 /Pattern
1993 -1997 inflation (CPI-U) = 160.6/143.6 =						11.84%	\$82,904
						Total	\$783,194 (1997\$)

Table 7.6
SMITH RANCH PROJECT
Mining Unit Groundwater Restoration Costs
Wellfield #3 Extension

		Total		Operating		Total	Number of
1 APV = 33,199,800 gallons		Gallons	Flow Rate	Flow Rate	Cost		
RESTORATION COST COMPONENT		Treated	GPM				Days
1.	Wellfield Pumping Costs						
a)	Groundwater Treatment (IX treatment Only) (100% of flow) (\$0.117/1,000 gal.)	199,198,803	1400	*	\$23,306		138
b)	Treated Groundwater Re-Injection (bypass RO/EDR Treatment) (\$0.117/1,000 gal.)	119,519,282	600	*	\$13,984		138
c)	RO/EDR Treatment (800 GPM Feed 600 GPM Permeate) (\$0.289/1,000 gal.)	159,359,042	800		\$46,055		138
e)	Groundwater Sweep (GW Inflow to replace water sent to disposal)(\$0.117/1,000 gal.)	39,839,761	200		\$4,661		138
	SUBTOTAL	Total Treated Volume: 199198802.9	1000		\$88,006		138
2.	Chemical Treatment Power Costs						
a)	Reverse Osmosis Unit \$0.10/gpm/day (\$0.07/1,000 gal.)	159,359,042	800		\$11,155		
b)	Disposal Well Operation \$0.05/1,000 gal	39,839,761	200		\$1,992		
	SUBTOTAL				\$13,147		
3.	Chemicals						
a)	Waste Water Treatment (Resin Elut. Chem) @\$400/elution, Waste Water @ 2 mg/L U3O8 500 ft3 resin, 2 lb./ft3 loading, Annualized Waste Water Flow; 1400 gpm 1 elution every 29.7 days or 12.3 elutions per year	Elution Costs (12.3 Elutions/year * \$400/ Elution)			\$1,865		138
b)	Chemical Reductant (H2S or alternative) \$1.80/gpm/day (\$1.25/1,000 gal.)	33,199,800	1200		\$41,500		
c)	RO Chemicals (H2SO4, Antiscalants, Oxygen Scavenger) \$0.57/gpm/day (\$0.40/1,000 gal.)	159,359,042	800		\$63,744		
	SUBTOTAL				\$107,108		
4.	Repairs and Maintenance						
a)	Wellfield and Waste Water Treatment \$10,000/mo	4.5	months		\$45,355		
b)	RO and process equipment \$5,000/mo	4.5	months		\$22,677		
	SUBTOTAL				\$68,032		
5.	Labor						
	Supervisor @ \$20.00 per hour	4.5	months		\$14,514		
	4 Operators @ \$13.00 per hour	4.5	months		\$37,735		
	2 Maintenance @ \$13.00 per hour	4.5	months		\$18,868		
	SUBTOTAL				\$71,117		
6.	Contract Laboratory Analysis						
	70 Monitor Wells (140 UCL samples per year @\$100)	0.4			\$5,291		
	Stabilization Samples						
	10 Wells - 3 complete Assays @\$350				10,500		
	- 9 abbreviated assays @ \$250				22,500		
	SUBTOTAL				\$38,291		
7.	Operating Expenses						
	Supplies @\$3,000/mo	4.5			13,606		
	Heating @\$5,000/mo	2.3			11,339		
	Vehicle Fuel @\$1,000/mo	4.5			4,535		
	Office Utilities @\$1,000/mo	4.5			4,535		
	SUBTOTAL				\$34,016		
TOTAL OPERATING COST TO RESTORE GROUNDWATER AT FULL PRODUCTION (Nominal Mine Unit)					\$419,718 (1993\$)		
UNIT RESTORATION OPERATING COST					76 Patterns	\$5,523 /Pattern	
1993 -1997 inflation (CPI-U) = 160.6/143.6 = 11.84%						\$49,688	
RECOMPLETION COSTS (\$640/well)(2.7 wells/pattern)(79 patterns)						\$136,512	
					Total	\$605,918 (1997\$)	

Table 7.7
SMITH RANCH PROJECT
Mining Unit Groundwater Restoration Costs
Wellfield #2

1 APV = 77,101,381 gallons		Total Gallons Treated	Operating Flow Rate GPM	Total Cost	Number of Days
RESTORATION COST COMPONENT					
1.	Wellfield Pumping Costs				
a)	Groundwater Treatment (IX treatment Only) (100% of flow)	(\$0.117/1,000 gal.)	462,608,283	1400 *	\$54,125 321
b)	Treated Groundwater Re-injection (bypass RO/EDR Treatment)	(\$0.117/1,000 gal.)	277,564,970	600 *	\$32,475 321
c)	RO/EDR Treatment (800 GPM Feed 600 GPM Permeate)	(\$0.289/1,000 gal.)	370,086,627	800	\$106,955 321
e)	Groundwater Sweep (GW Inflow to replace water sent to disposal)	(\$0.117/1,000 gal.)	92,521,657	200	\$10,825 321
	SUBTOTAL	Total Treated Volume: 462608283.5	1000	\$204,380	321
2.	Chemical Treatment Power Costs				
a)	Reverse Osmosis Unit	\$0.10/gpm/day (\$0.07/1,000 gal.)	370,086,627	800	\$25,906
b)	Disposal Well Operation	\$0.05/1,000 gal	92,521,657	200	\$4,626
	SUBTOTAL			\$30,532	
3.	Chemicals				
a)	Waste Water Treatment (Resin Elut. Chem) @ \$400/elution, Waste Water @ 2 mg/L U308 500 ft3 resin, 2 lb./ft3 loading, Annualized Waste Water Flow; 1400 gpm 1 elution every 29.7 days or 12.3 elutions per year	Elution Costs (12.3 Elutions/year * \$400/ Elution)		\$4,330	321
b)	Chemical Reductant (H2S or alternative)	\$1.80/gpm/day (\$1.25/1,000 gal.)	77,101,381	1200	\$96,377
c)	RO Chemicals (H2SO4, Antiscalants, Oxygen Scavenger)	\$0.57/gpm/day (\$0.40/1,000 gal.)	370,086,627	800	\$148,035
	SUBTOTAL			\$248,742	
4.	Repairs and Maintenance				
a)	Wellfield and Waste Water Treatment	\$10,000/mo	10.5	months	\$105,330
b)	RO and process equipment	\$5,000/mo	10.5	months	\$52,665
	SUBTOTAL			\$157,995	
5.	Labor				
	Supervisor @ \$20.00 per hour		10.5	months	\$33,706
	4 Operators @ \$13.00 per hour		10.5	months	\$87,634
	2 Maintenance @ \$13.00 per hour		10.5	months	\$43,817
	SUBTOTAL			\$165,157	
6.	Contract Laboratory Analysis				
	70 Monitor Wells (140 UCL samples per year @ \$100)		0.9		\$12,288
	Stabilization Samples				10,500
	10 Wells	- 3 complete Assays @ \$350			22,500
		- 9 abbreviated assays @ \$250			\$45,288
	SUBTOTAL				
7.	Operating Expenses				
	Supplies @ \$3,000/mo		10.5		31,599
	Heating @ \$5,000/mo		5.3		26,332
	Vehicle Fuel @ \$1,000/mo		10.5		10,533
	Office Utilities @ \$1,000/mo		10.5		10,533
	SUBTOTAL				\$78,997
	TOTAL OPERATING COST TO RESTORE GROUNDWATER AT FULL PRODUCTION (Nominal Mine Unit)				\$931,092 (1993\$)
	UNIT RESTORATION OPERATING COST		85 Patterns		\$10,954 /Pattern
	1993 -1997 inflation (CPI-U) = 160.6/14	11.84%			\$110,227
			Total		\$1,041,318 (1997\$)

Table 7.8
SMITH RANCH PROJECT
Mining Unit Groundwater Restoration Costs
Wellfield #4 Extension

1 APV = 20,570,426 gallons		Total Gallons	Operating Flow Rate		Total Cost	Number of Days
RESTORATION COST COMPONENT		Treated	GPM			
1.	<u>Wellfield Pumping Costs</u>					
	a) Groundwater Treatment (IX treatment @ (\$0.117/1,000 gal.)	123,422,558	1400	*	\$14,440	86
	b) Treated Groundwater Re-injection (byp (\$0.117/1,000 gal.)	74,053,535	600	*	\$8,664	86
	c) RO/EDR Treatment (800 GPM Feed 60 (\$0.289/1,000 gal.)	98,738,047	800		\$28,535	86
	e) Groundwater Sweep (GW Inflow to repl. (\$0.117/1,000 gal.)	24,684,512	200		\$2,888	86
	SUBTOTAL	Total Treated Volume: 123422558.45	1000		\$54,528	86
2.	<u>Chemical Treatment Power Costs</u>					
	a) Reverse Osmosis Unit \$0.10/gpm/day (\$0.07/1,000 gal.)	98,738,047	800		\$6,912	
	b) Disposal Well Operation \$0.05/1,000 gal	24,684,512	200		\$1,234	
	SUBTOTAL				\$8,146	
3.	<u>Chemicals</u>					
	a) Waste Water Treatment (Resin Elut. Chem) @ \$400/elution, Waste Water @ 2 mg/L Elution Costs (12.3 Elutions/year * \$400/ Elution) 500 ft ³ resin, 2 lb./ft ³ loading, Annualized Waste Water Flow; 1400 gpm 1 elution every 29.7 days or 12.3 elutions per year				\$1,155	86
	b) Chemical Reductant (H ₂ S or alternative \$1.80/gpm/day (\$1.25/1,000 gal.)	20,570,426	1200		\$25,713	
	c) RO Chemicals (H ₂ SO ₄ , Antiscalants, O \$0.57/gpm/day (\$0.40/1,000 gal.)	98,738,047	800		\$39,495	
	SUBTOTAL				\$66,364	
4.	<u>Repairs and Maintenance</u>					
	a) Wellfield and Waste Water Treatment \$10,000/mo	2.8	months		\$28,102	
	b) RO and process equipment \$5,000/mo	2.8	months		\$14,051	
	SUBTOTAL				\$42,153	
5.	<u>Labor</u>					
	Supervisor @ \$20.00 per hour	2.8	months		\$8,993	
	4 Operators @ \$13.00 per hour	2.8	months		\$23,381	
	2 Maintenance @ \$13.00 per hour	2.8	months		\$11,690	
	SUBTOTAL				\$44,063	
6.	<u>Contract Laboratory Analysis</u>					
	70 Monitor Wells (140 UCL samples per year @ \$100)	0.2			\$3,279	
	Stabilization Samples				10,500	
	10 Wells - 3 complete Assays @ \$350				22,500	
	- 9 abbreviated assays @ \$250				\$36,279	
	SUBTOTAL					
7.	<u>Operating Expenses</u>					
	Supplies @ \$3,000/mo	2.8			8,431	
	Heating @ \$5,000/mo	1.4			7,025	
	Vehicle Fuel @ \$1,000/mo	2.8			2,810	
	Office Utilities @ \$1,000/mo	2.8			2,810	
	SUBTOTAL				\$21,076	
TOTAL OPERATING COST TO RESTORE GROUNDWATER AT FULL PRODUCTION (Nominal Mine Unit)					\$272,608 (1993\$)	
UNIT RESTORATION OPERATING COST					35 Patterns	\$7,789 /Pattern
1993 -1997 Inflation 11.84%						\$32,273
RECOMPLETION COST: (\$640/well)(2.7 wells/pattern)(35 patterns)						\$60,480
Total						\$365,361 (1997\$)

Costs Associated with Groundwater Restoration

Using the Affected Pore Volumes developed on Table 7.1, the detail cost for groundwater restoration is provided for each wellfield on Tables 7.2, 7.3, 7.4, 7.5, 7.6, 7.7 and 7.8. The estimated cost for groundwater restoration is shown below on Table 7.9.

TABLE 7.9
Estimated Groundwater Restoration Costs
By Wellfield

Wellfield #	Estimated Cost (\$1997)
#1	\$934,750
#3	\$1,317,499
#4	\$985,094
#4A	\$783,194
#3ext	\$605,918
#2	\$1,041,318
#4ext	\$365,361
Total	\$6,033,134

SECTION 8

HEALTH PHYSICS COSTS

Cost Summary

ITEM	COSTS (\$97)
8.1 Health Physics	168,470
Total Cost	168,470

Health Physics

Basis: Year #1 - 223 Days:
See Table 8.1

- Labor Crew = 1 - RSO @ \$32.70/Hr
0.5 - RST @ \$21.80/Hr
\$43.60/Hr x 1784 Hr = \$ 77,782

Basis: Year #5 - 483 Days
See Table 8.1

- Labor Crew = 1 - RSO @ \$32.70/Hr
0.5 - RST @ \$22.80/Hr
\$43.60/Hr x 3864 Hr = \$168,470

To provide consistency with Rio Algom Mining Corp.'s U.S. Nuclear Regulatory Commission (NRC) surety, Rio Algom has elected at this time to continue to use the five (5) forward bond amount utilized for NRC purposes.

**SECTION 9
WHOLE TRUCKING COSTS**

Cost Summary

ITEM	COSTS (\$97)
9.1 Contaminated Trucking	523
9.2 Uncontam. Trucking	157
Total Cost	680

9.1 Contaminated Trucking

Basis: See Table 9.1

$$\bullet \text{ Haul} = 0.2 \text{ Trucks} \times 800 \text{ Miles} \times \$3.27/\text{Mile} = \$ 523$$

9.2 Non-Contaminated Trucking

Basis: See Table 9.2

$$\bullet \text{ Haul} = 0.5 \text{ Trucks} \times 8 \text{ Hrs/Truck} \times \$65.39/\text{Hr} = \$ 157$$

TABLE 9.1
YR #1 - 1994
CONTAMINATED TRUCKING SCHEDULE

	UNIT QTY. (TRUCKS)	EXTENDED QTY. (TRUCKS)	SHIPPED QTY. (TRUCKS)
6) Wellfields - 0 Units			
A. Pumps & Tubing	0.2	0	
B. Monitor Wells	0.03	0	
C. Header Piping	0.02	0	
5) Associated Structures			
A. #1 Trunkline	7.1	0	
B. #2 Trunkline	14.2	0	
C. Radium Ponds	4.7	0	
4) Existing Facilities			
A. Evap. Ponds	0.5	0.5	
B. Pilot Eq.	1.4	1.4	
C. Foundations	15.1	15.1	17
3) Dryer			
A. Building	1.8	0	
B. Equipment	1.4	0	
C. Foundations	2.9	2.9	
2) Central Processing Plant			
A. Tanks & Vessels	4.3	0	
B. Piping	0.2	0	
C. Pumps	0.3	0	
D. Foundations	13.5	13.5	
1) Ion Exchange Plants - 1			
A. Tanks & Vessels	5.0	0	
B. Piping	1.3	0	
C. Pumps	0.2	0	
D. Foundations	9.4	9.4	25.8
		42.8	42.8
Entry for Whole Trucks	0.2	0.2	43.0

TABLE 9.2
YR #1 - 1994
NON-CONTAMINATED TRUCKING SCHEDULE

	UNIT QTY. (TRUCKS)	EXTENDED QTY. (TRUCKS)	SHIPPED QTY. (TRUCKS)
6) Wellfields - 0 Units			
A. Secondary Electrical	0.06	0	
B. Buildings	0.1	0	
5) Associated Structures	0	0	
4) Existing Facilities			
A. Buildings	8.0	8.0	8.0
B. Headframe	0	0	
C. Pilot Equipment	0.4	0.4	
3) Dryer			
A. Building	0	0	
B. Equipment	0.1	0.1	0.5
2) Central Processing Plant			
A. Building	8.0	0	
B. Tanks and Vessels	1.0	0	
C. Pumps	0.3	0	
D. Electrical	1.0	0	
1) Ion Exchange Plants - 1			
A. Building	5.0	5	5
B. Tanks and Vessels	0.05	0	
C. Pumps	0.2	0	
D. Electrical	0.5	0	
		13.5	13.5
Entry for Whole Trucks	0.5	0.5	14.0

**SECTION 10
DELINEATION DRILLING RECLAMATION COSTS**

Cost Summary

ITEM	COSTS (\$97)
10.1 Delineation Drilling	22,068
Total Cost	22,068

Delineation Drilling Costs

Basis:	Delineation Holes drilled in 1998-2002	0
	Delineation Holes to be drilled in 2002-2003	162
	Total Delineation Holes to be Bonded	162

Per hole cost for reclamation of delineation is based on bonding estimate for exploration holes under DN 236. (see attached table)

Reclamation costs per hole = \$136.22/hole

Cost for plugging and abandonment: 162 holes x \$136.22/hole

Delineation Drilling Costs

= **\$ 22,068**

1999 Reclamation Bond Estimate			
Well Abandonment and Topsoil Replacement and Re-vegetation			
I.	Assumptions		
	A.	Well Abandonment	
		# of Monitoring wells	
		Average Depth (ft.)	
		\$/foot	\$2.00
		Abandonment Costs	\$0
	B.	Drill Hole Abandonment	
		# of Drill holes	1
		Bentonite chips cost	\$12.50
		Personnel - \$/hr	\$17.50
		Transportation - \$/hr	\$6.54
		Water truck - \$/hr	\$10.00
		Holes/day	5
		# of Days	0
		# of Hours	2
		Drill Hole Abandonment Cost	\$80.58
	C.	Survey Crew Cost	
		Hours/hole	0.3
		\$/hour	\$75.00
		Subtotal	\$22.50
		Survey Crew Cost	\$22.50
II.	Equipment		
	A.	Abandonment Equipment	
		Drill Rig Mobilization Cost	\$103.08
		ABANDONMENT COST	\$103.08
Total Cost per Well or Drill Hole			
III.	Backfill & Topsoil Replacement		
	A.	Assumptions	
	1.	General	
		Affected Area/hole (ft2)	400
		Affected area/hole (acres)	0.01
		Pit area/pit (ft2)	120
		Backfill depth	9
		Modified Pit Volume	800
		Number of wells and drill holes	1
		Topsoil Replacement Depth (ft)	0.33
		Pit Topsoil Volume (yd3)	1.47
		yd3 backfill	29.63
		total yd3 backfill	29.63
		Total yd3 topsoil	1.47
		Total affected area (acres)	0.01
	2.	Equipment with operator	
		Productivity backhoe w/trailer (yd3/hr)	32.39
		\$/hour	\$33.24
		Total replacement costs	\$31.92

IV.	Reseeding			
	1.	Equipment		
		Drill Seeder w/trailer (\$/acre)		\$100.00
		Subtotal Equipment Cost		\$0.92
	2.	Seed		
		\$/acre		\$33.00
		Subtotal Seed Cost		\$0.30
		Subtotal Re-Seeding Cost		\$1.22
V.	Mulching & Crimping			
	1.	Equipment		
		Mulcher & Crimper w/trailer (\$/acre)		
		Subtotal Equipment Cost		\$0.00
	2.	Mulch		
		Mulch \$/ton		
		Tons/acre		1
		\$/acre		\$0.00
		Subtotal Mulch Cost		\$0.00
		Subtotal Mulching & Crimping Cost		\$0.00
		Subtotal Reseeding Cost		\$1.22
		TOTAL		\$136.22

PART III - SURETY BOND SUMMARY

This section contains the cost basis that were used in the bond calculations provided within Part II. The basis for the bond calculations are from contractor bids to perform the work with the costs then adjusted to constant 1997 dollars as requested by WDEQ/LQD. Provided in the summary table below are the initial bids in the dollars of their day and the adjustment to 1997 dollars. The individual contractor bids follow the summary table.

BID RATES FOR LABOR AND EQUIPMENT

ITEM	HOURLY BID RATE- YEAR (\$/HR)	ADJUSTED 1997 DOLLARS (\$/HR)
Foreman	19.80 (1993)	21.58
Certified Welder	17.75 (1993)	19.35
Operator	16.25 (1993)	17.71
Laborer	11.95 (1993)	13.02
Journeyman Electrician	32.00 (1993)	34.88
Apprentice Electrician	28.00 (1993)	30.51
20 Ton Crane (**)	34.31 (1993)	37.39
6000# Forklift (**)	12.04 (1993)	13.12
Welding/Torch (**)	10.00 (1993)	10.90
D8N Dozer (*)	108.00 (1993)	117.71
140G Blade (*)	60.00 (1993)	65.34
Pavement Breaker, Fuel/Maint	28.75 (1993)	31.33
980C Loader (*)	85.00 (1993)	92.64
235 Trackhoe (*)	103.00 (1993)	112.25
627 Scraper (*)	111.00 (1993)	120.98
Pulling Unit (*)	30.00 (1993)	32.70
Backhoe (*)	25.00 (1993)	27.25
2000 PSI Spray Washer	8.00 (1993)	8.71
Chainsaw (**)	2.20 (1993)	2.40

Note - (*) includes operator, fuel, and maintenance. Others include fuel and maintenance unless shown otherwise.. (**) bid obtained by telephone. Adjustment to 1997 dollars were made using GNP-IPD inflation rate of 8.99% [1st quarter 1993 (101.8) through 1st quarter 1997 (110.95)].

APPENDIX B

Total Footage Drilled

SEC-TWN-RGE	TOTAL HOLES	TOTAL DEPTH
2-35-74 - Production	2	1525
9-35-74	1	520
10-35-74	72	40050
11-35-74	100	60761
25-36-74 - Production	48	43351
26-36-74	49	42265
26-36-74 Production	22	15922
27-36-74	133	121632
36-36-74	1	405
TOTAL	428	326431

SECTION	TOWNSHIP	RANGE	HOLE NUMBER
2	35	74	4I-323R
2	35	74	4P-210A
9	35	74	9-158
10	35	74	10-741
10	35	74	10-554
10	35	74	10-556
10	35	74	10-557
10	35	74	10-560
10	35	74	10-561
10	35	74	10-562
10	35	74	10-566
10	35	74	10-567
10	35	74	10-569
10	35	74	10-570
10	35	74	10-571
10	35	74	10-572
10	35	74	10-573
10	35	74	10-574
10	35	74	10-575
10	35	74	10-576
10	35	74	10-577
10	35	74	10-578
10	35	74	10-579
10	35	74	10-580
10	35	74	10-581
10	35	74	10-582
10	35	74	10-583
10	35	74	10-584
10	35	74	10-585
10	35	74	10-586
10	35	74	10-587
10	35	74	10-588
10	35	74	10-589
10	35	74	10-590
10	35	74	10-674
10	35	74	10-675
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10	35	74	10-682
10	35	74	10-685
10	35	74	10-689
10	35	74	10-695
10	35	74	10-699
10	35	74	10-700

SECTION	TOWNSHIP	RANGE	HOLE NUMBER
10	35	74	10-701
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10	35	74	10-740
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11	35	74	11-568
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11	35	74	11-575

SECTION	TOWNSHIP	RANGE	HOLE NUMBER
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11	35	74	11-651
11	35	74	11-657
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11	35	74	11-662
11	35	74	11-663

SECTION	TOWNSHIP	RANGE	HOLE NUMBER
11	35	74	11-664
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11	35	74	11-713
11	35	74	11-714
11	35	74	11-715
11	35	74	11-716
11	35	74	11-717
25	36	74	2P-182
25	36	74	2I-228
25	36	74	2I-229
25	36	74	2I-230
25	36	74	2I-231
25	36	74	2I-235
25	36	74	2I-236
25	36	74	2I-237
25	36	74	2I-238
25	36	74	2I-239
25	36	74	2I-241
25	36	74	2I-245
25	36	74	2I-247

SECTION	TOWNSHIP	RANGE	HOLE NUMBER
25	36	74	2I-248
25	36	74	2I-249
25	36	74	2I-250
25	36	74	2I-251
25	36	74	2I-252
25	36	74	2I-253
25	36	74	2I-254
25	36	74	2I-255
25	36	74	2I-257
25	36	74	2I-258
25	36	74	2I-259
25	36	74	2I-260
25	36	74	2I-261
25	36	74	2I-262
25	36	74	2I-263
25	36	74	2I-264
25	36	74	2I-265
25	36	74	2I-267
25	36	74	2I-269
25	36	74	2P-141
25	36	74	2P-142
25	36	74	2P-144
25	36	74	2P-145
25	36	74	2P-146
25	36	74	2P-147
25	36	74	2P-147A
25	36	74	2P-148
25	36	74	2P-149
25	36	74	2P-149A
25	36	74	2P-150
25	36	74	2P-151
25	36	74	2P-154
25	36	74	2P-155
25	36	74	2P-156
25	36	74	2P-157
26	36	74	3P2-95A
26	36	74	26-2400
26	36	74	26-2401
26	36	74	26-2402
26	36	74	26-2403
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26	36	74	26-2405
26	36	74	26-2405A
26	36	74	26-2406
26	36	74	26-2407
26	36	74	26-2408
26	36	74	26-2409

SECTION	TOWNSHIP	RANGE	HOLE NUMBER
26	36	74	26-2410
26	36	74	26-2411
26	36	74	26-2412
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26	36	74	26-2441
26	36	74	26-2441C
26	36	74	26-2442
26	36	74	26-2443
26	36	74	26-2443C
26	36	74	26-2444C
26	36	74	26-2445C
26	36	74	26-2447C
26	36	74	26-2448C
26	36	74	3I-276
26	36	74	3I-277
26	36	74	3I-278
26	36	74	3I-279
26	36	74	3I-281
26	36	74	3I2-181D
26	36	74	3I2-280
26	36	74	3I2-282
26	36	74	3I2-283

SECTION	TOWNSHIP	RANGE	HOLE NUMBER
26	36	74	3I2-284
26	36	74	3I2-76A
26	36	74	3P-177
26	36	74	3P-178
26	36	74	3P-179
26	36	74	3P-180
26	36	74	3P-181
26	36	74	3P2-182
26	36	74	3P2-183
26	36	74	3P2-184A
26	36	74	3P2-284
26	36	74	3P2-84A
27	36	74	27-629
27	36	74	27-493
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27	36	74	27-527

SECTION	TOWNSHIP	RANGE	HOLE NUMBER
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SECTION	TOWNSHIP	RANGE	HOLE NUMBER
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27	36	74	27-621
27	36	74	27-622
27	36	74	27-623
27	36	74	27-624

SECTION	TOWNSHIP	RANGE	HOLE NUMBER
27	36	74	27-625
27	36	74	27-626
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27	36	74	27-628
36	36	74	WW-36-3