

**RIO ALGOM MINING LLC**  
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505-287-8851

June 21, 2009

Document Control  
U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20852-2738

Subject: Ambrosia Lake Facility  
License SUA-1473, Docket No. 40-8905  
License Condition #22, Annual Surety Update

Dear Mr. McLaughlin,

Rio Algom LLC submits the following 2009 annual surety update to the source material license referenced above. The 2009 surety amount was recalculated consistent with 10 CFR 40, Appendix A, Criteria 9 and 10.

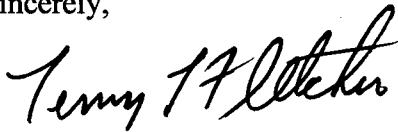
Completed reclamation work totals approximately \$12.146 million. Increases for escalation totaled \$1.254 million, resulting in a net decrease of \$10.891 million.

The present surety is posted in the amount of \$26,703,452, less the decrease of \$10,891,253; leaving remaining amount of \$15,812,199.

Rio Algom requests a revised financial instrument in the amount of \$16,000,000.

Should you have any questions regarding this submittal, please contact me at 505-287-8851 x 11 or by email at [terry.fletcher@bhpbilliton.com](mailto:terry.fletcher@bhpbilliton.com).

Sincerely,



Terry L Fletcher  
President

Attachment  
XC: Chuck Wentz  
Document Control Center  
File

NM5501  
NM55

**Table 1**  
**RIO ALGOM MINING LLC - AMBROSIA LAKE OPERATION**  
**2009 Annual Surety Update**  
**Completed Work Units**

	Itemized	Subtotal	Complete
<b>Pond 1</b>			
Rock cover between trenches	\$39,919		November-05
Pond 1 - Northern diversion channel	\$67,745		June-05
Pond 1 - North Toe Trench - upper portion	\$25,544		June-05
Pond 1 - North Toe Trench - lower portion	\$26,935		June-05
Pond 1 - South Toe Trench	\$291,925		April-05
		\$452,068	
<b>Groundwater</b>			
Shaft Plugging - Section 24	\$6,522		December-04
Ventilation hole Plugging - Section 24	\$9,708		January-05
Injection hole plugging - Section 24	\$11,058		January-05
Surface contour and revegetation - Section 24	\$38,746		January-05
Pumping of Section 30West Mines	\$61,080		February-06
Treatment of Mine Water used for Groundwater Sweep	\$54,780		February-06
Pumping of Interceptor Trench	\$8,612		February-06
Pumping of Evaporation pond 9 to Section 4	\$18,796		February-06
Sampling and Analysis- bedrock	\$41,400		
Sampling and Analysis - alluvium	\$12,096		
Well Plugging and Abandonment	\$12,450		
		\$209,302	
<b>Section 4 Ponds</b>			
Mobilization	\$1,000,000		July-05
Highway crossing	\$403,000		November-05
Removal and transport of materials to Pond 2	\$7,500,000		Nov-07
Removal of pipeline	\$6,800		Apr-09
Radiation Survey of Pond Areas	\$56,927		May-09
Soil Sampling of Pond Areas	\$10,585		May-09
Laboratory Analysis of soil samples	\$129,104		May-09
Geotechnical testing (QA/QC) of placed materials at Pond 2	\$550,000		May-09
Revegetation of section 4 area	\$230,000		
Cost to construct radon barrier	\$750,000		
Pond 2 - Radon Flux tetsting of radon barrier	\$21,825		
Cost to purchase and deliver erosion protection	\$649,013		
Cost to place erosion protection	\$102,600		
		\$9,656,416	
<b>Intercept Trench</b>			
Cost to backfill trench - Earthwork	\$1,733,120		May-07
Trench - Geotechnical QA/QC testing costs	\$16,030		May-07
Cost for geotechnician for backfill project	\$78,318		May-07
		\$1,827,468	
<b>Rio Del Puerto Diversion Channel</b>			
Rock purchase	\$ 2,790,735		Sep-08
Contract price to construct by CRA	\$ 2,548,220		Sep-08
		\$5,338,955	not used in calculation
<b>Cost adjustments</b>			
Construct internal channel and pond rock	\$ 1,000,000		
Revision of DOE LTSM fee	\$ 64,000		
escalation mill building demo	\$ 140,000		
new estimate on well plugging	\$ 50,000	\$ 1,254,000	increase
<b>Subtotal ----&gt;</b>	<b>\$ 12,145,253</b>	<b>Net Decrease</b>	
	<b>\$ 1,254,000</b>	<b>Net Increase</b>	
<b>Total</b>	<b>\$ 10,891,253</b>	<b>Net Decrease</b>	

Note:

Work activities associated with Pond 1, Groundwater, and Section 4 Pond categories were requested in the 2006 submittal.  
Completed work activities indicated by blue numbers for 2006 and 2007.  
Completed work activities indicated by Red numbers for 2008 and 2009.

**Request to Reduce Approved Financial Surety Arrangement  
Ambrosia Lake Facility  
June 2009**

**Introduction**

The Ambrosia Lake Site is a uranium recovery facility that is currently undergoing reclamation and decommissioning. The current status has the tailings areas entirely closed and the erosion protection in place. The mill is demolished with remaining structures being related to ongoing reclamation activities. The site obtained Alternate Concentration Limits in February 2006 (Amendment #56), which has allowed the initiation of further site reclamation that has been deferred pending ACL approval.

The site has completed significant cleanup of windblown tailings and is in the process of completing a soil cleanup verification plan that will address release criteria for the entire site. The site initiated the Lined Pond Closure Project (Amendment #55) and has relocated 100 % of the material from the Section 4 Ponds for disposal in Pond 2.

Recent approvals obtained from NRC have allowed Rio Algom to either complete additional work units or discontinue conducting various work units (e.g., groundwater corrective action plan).

Completion or elimination of these work units, which are itemized in Table 1, total \$12.1 Million.

**Completed Work Units**

The following reclamation and decommissioning work units as outlined within the current approved surety documents have been completed or have been discontinued:

1. Pond 1
  - A. North Toe Trench – upper portion → completed in June 2005
  - B. North Toe Trench – lower portion → completed in June 2005
  - C. South Toe Trench → completed in November 2004
  - D. Northern Diversion Channel → completed in June 2005
  - E. Area Between Trenches → completed in November 2005
2. Groundwater
  - A. Shaft Plugging Section 24 → completed in December 2004
  - B. Ventilation Hole Plugging Section 24 → completed in January 2005
  - C. Injection Hole Plugging Section 24 → completed in January 2005
  - D. Surface Contour and Revegetation Section 24 → completed January 2005
  - E. Pumping of Interceptor Trench → completed in February 2006

- F. Pumping of Evaporation Pond 9 to Section 4 → completed February 2006
- G. Mine Water Treatment Groundwater Sweep→ complete February 2006
- H. Treatment of Mine Water – complete February 2006

### 3. Section 4 Ponds

- A. Mobilization → completed in July 2005
- B. Highway Crossing → completed in November 2005
- C. Transport materials to pond 2 - complete November 2007
- D. Removal of Pipeline – complete May 2009
- E. Radiation survey – completed May, 2009
- F. Soils samples - completed May 2009
- G. Laboratory Analysis – completed May 2009
- H. Geotechnical testing – complete May 2009

### 4. Intercept Trench

- A. Cost to backfill trench – earthwork → completed in May 2007
- B. Trench - Geotechnical QA/QC testing → completed May 2007
- C. Cost for geotechnician for project → completed in May 2007

Rio Algom's January 31, 2005 submittal provided the detailed cost analysis for the individual work units to complete site closure which NRC approved as Amendment 54. Work activities associated with Pond 1, Groundwater, and Section 4 Pond categories were requested in Rio Algom's June 2006 annual surety update submittal. A total of \$3.9 Million dollars of completed work was identified in the 2007 annual surety update. In 2007, Rio completed an additional \$7.5 Million dollars in removal and transport of section 4 material to pond 2. In 2009, sampling on Section 4 was completed for an additional \$750,000.

In 2008, as a result of ongoing engineering evaluations, Rio Algom added additional costs to address the lateral migration of Rio Del Puerto at a cost of \$5,338,955. This work was completed in September of 2008, as verified by Ted Johnson May 7, 2009. This work was not in the 2007 submittal and was covered by the work completed and thus was never part of the present bond. Therefore, it was not used to increase or decrease the present bond calculation.

In 2009 Rio Algom anticipates an additional \$1,000,000 in rock placement on ponds 4, 5 and 6. Well plugging has been increased by \$50,000 based on anticipated more stringent well abandonment requirements by the State of NM. Additionally original Mill

demolition costs have been escalated from 2003 dollars by \$140,000. (See attached inflation schedule.) The DOE Long Term Surveillance fee was increased by \$64,000 to \$814,000. (See attached memo DOE 4/29/2009. The total 2009 increase is \$1,254,000.

The total work completed totals \$12,145,253 and the 2009 increase is \$1,254,000. Subtracting the completed work units to date and adding 2009 revised costs a net decrease in bond amount is \$10,891,253.

To be conservative, Rio has not recalculated site management fees, overhead and profit, or contingency of 15% on the 2007 totals. This was done as a conservative approach in reducing the 2007 bond amount of \$26,703,452. Rio Algom anticipates completion of all major activities by the end of calendar year 2010.

Rio Algom thus requests a reduction of it's 2009 bond fee to \$16,000,000.

As is well known in the financial industry, bond costs have increased many orders of magnitude. Thus Rio can no longer continue to bear the cost of an inflated letter of credit. Our present bond is good through April 2010. This will allow ample time for Rio and NRC to agree on a reduced bond per license condition 22. Time of this review is important, in that Rio can reduce our cost from an approved date of the reduced letter of credit until the April renewal date.

**RIO ALGOM MINING LLC - AMBROSIA LAKE OPERATIONS**

**NRC FINANCIAL ASSURANCE ESTIMATE  
DETAILED COST ANALYSIS**

**REPORT SECTIONS**

Summary Report  
Pond 1  
Pond 2  
Pond 3  
Unlined Evaporation Ponds and Pond 10  
Mill Yard  
Windblown Areas  
Groundwater  
Intercept Trench  
Section 4 Ponds  
Pond 9  
11e2 Disposal Cell  
RSMeans Cost Data  
Contractor Cost Estimates

Rio Algom Mining LLC  
Ambrosia Lake Facility

License SUA-1473  
Docket 40-8905

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WORK ELEMENTS

SUMMARY REPORT

**Contractor Cost Estimates**

**Pond 1 South Toe Construction (includes revegetation)**  
**Radiation Survey and Sampling**  
**Revegetation Seed Mix**  
**Section 4 and Pond 9 Project**  
**Laboratory Analytical Costs**  
**Mill Building Demolition Costs**  
**Erosion Protection Materials Costs**



Rio Algom Mining LLC  
Ambrosia Lake Facility

License SUA-1473  
Docket 40-8905

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**WORK ELEMENTS**

**RS MEANS COST DATA**

Construction Cost Data  
RSMeans - 17th Edition (2003)

Item/Equipment	Unit	Labor Rate	Equipment Rate	Total	volume
Grading - soil	\$/ft2	0.05	0.05	0.10	
Grading - rock on slope	\$/yd3	0.65	1.13	1.78	
Loader - 3 CY bucket	\$/yd3	0.21	0.18	0.39	
Scraper - cover placement - 5000 ft	\$/yd3	0.65	4.09	4.74	
Scraper - cover placement - 7000 ft	\$/yd3	0.74	4.65	5.39	
Scraper - cover placement - 10000 ft	\$/yd3	0.87	5.48	6.35	
Dozer - recountour work	\$/yd3	0.22	0.68	0.90	
Excavator	\$/yd3	1.84	1.79	3.63	
Compactor - sheepsfoot	\$/yd3	0.21	0.44	0.65	
Compactor - vibratory intermediate	\$/yd3	0.16	0.14	0.30	
Compactor - vibratory - smooth	\$/yd3	0.16	0.14	0.30	
Dump truck - belly dump - 22 CY	\$/yd3	1.57	0.34	1.91	
Dump truck - end dump - 12 CY	\$/yd3	1.59	0.71	2.30	
Water wagon	\$/yd3			0.77	
Spotter for rock dump	\$/hr	24.5		0.05	
Geotechnician	\$/day	220			
Radiation survey technician	\$/hr	30			
Radiation survey data processor	\$/hr	65			
Radiation survey project manager	\$/hr	115			
GPS-radiation survey instruments	\$/hr	100			
Survey unit (buggy/truck)	\$/hr	4.35			
Per diem rate for radiation survey crew	\$/day	50			
Dozer - push dumped fill - no compaction	\$/yd3	0.36	0.88	1.24	
Daily output - dozer	yd3/day				1650
Daily output - scraper @ 5000 ft					650
Daily output - scraper @ 7000 ft					500
Daily output - scraper @ 10000 ft					
Scraper - excavation/placement - 3000 ft	\$/yd3	0.54	3.37	3.91	
Site Management - project of \$10 million	%/vol.	3.9			

**TASK -->      Rock cover between trenches**

3.5      Rock thickness (inches)  
2.2      Rock size (D-50 inches)  
20      Area (acres)

9411      Rock Volume needed (CY)

Placement of rock will utilize loader filling belly dump trucks with  
spotter guiding trucks and spread by grader.

Rock for this task has been purchased and is on site.

<u>Rates (\$/CY)</u>	<u>Equipment</u>
0.39	Loader
1.91	Bellydump truck
0.05	Spotter
1.78	Grader - rock
38896	Cost to place rock
	QA/QC on rock placement
	Perform thickness test on 50 foot centers
348	Number of test required
75	Number of tests performed each day
4.6464	Number of days required to perform tests
27.5	Geotech rate (\$/Hr)
1022	Cost to perform tests
39919	Total Costs for task

**TASK --> Pond 1 - Northern diversion channel**

2700 Length of trench (feet)

**Rock requirements**

Material	Thickness (inches)	Length (feet)	Rock Needed (CY)
Rock - D50 1 "	6	2700	2950
Rock - D50 7.8"	15.6	900	1150
Rock - D50 9.2"	18	1770	7200
Rock - D50 17"	51.6	25	300

**Material Placement**

Placement of D50 1" rock will utilize loader filling belly dump trucks with spotter guiding trucks and spread by grader.

Rock for this task has been purchased and is on site.

<u>Rates (\$/CY)</u>	<u>Equipment</u>
0.39	Loader
1.91	Belly dump truck
0.30	Compactor - smooth drum
0.05	Spotter
1.78	Grader - rock

13077 Cost to place D50 1" rock

Placement of D50 7.8", 9.2", and 17" rock will utilize loader filling end dump trucks and spreading material with excavators

<u>Rates (\$/CY)</u>	<u>Equipment</u>
0.39	Loader
2.30	End dump truck
3.63	Excavator

54668 Cost to place sand and D50 7.8", 9.2", and 17" rock

**67745** Total Costs for task

**TASK --> Pond 1 - North Toe Trench - upper portion**

1100 Length of trench - upper portion (feet)

Rock requirements

Material	Thickness (inches)	Rock Needed (CY)
Rock - D50 1 "	6	1200
Rock - D50 7.8"	23	3200

**Material Placement**

Placement of D50 1" rock will utilize loader filling belly dump trucks with spotter guiding trucks and spread by grader.

Rock for this task has been purchased and is on site.

Cost to place D50 1" rock

Rates (\$/CY)	Equipment
0.39	Loader
1.91	Belly dump truck
0.30	Compactor - smooth drum
0.05	Spotter
1.78	Grader - rock
5320	total cost (\$)

Placement of D50 7.8" rock will utilize loader filling end dump trucks and spreading material with excavators

Rates (\$/CY)	Equipment
0.39	Loader
2.30	End dump truck
3.63	Excavator

20224 Cost to place sand and D50 7.8" rock

**25544** Total Costs - upper section

**TASK --> Pond 1 - North Toe Trench - lower portion**

800 Length of trench - lower portion (feet)

Rock requirements

Material	Thickness (inches)	Rock Needed (CY)
Rock - D50 1 "	6	516
Rock - D50 9.2"	28	3900

Material Placement

Placement of D50 1" rock will utilize loader filling belly dump trucks with spotter guiding trucks and spread by grader.

Rock for this task has been purchased and is on site.

Cost to place D50 1" rock

Rates (\$/CY)	Equipment
0.39	Loader
1.91	Belly dump truck
0.30	Compactor - smooth drum
0.05	Spotter
1.78	Grader - rock

2287 Cost to place D50 1" rock

Placement of D50 9.2" rock will utilize loader filling end dump trucks and spreading material with excavators

Rates (\$/CY)	Equipment
0.39	Loader
2.30	End dump truck
3.63	Excavator

24648 Cost to place sand and D50 9.2" rock

26935 Total Costs - lower section

52479 Total cost to complete North Toe trench task

**TASK --> Pond 1 - South Toe Trench**

Rio has obtained a bid for the completion of this work element. Copy of bid is attached. Bid elements are summarized below.

Rock for this task has been purchased and is on site.

Total Cost	Unit Cost	Quantity	Item
52500			Mobilization
156600	72	2175	Install channel and apron (2175')
39375	35	1125	Install discharge channel (1125')
11000	1	11000	Establish design grade
8750	70	125	Install discharge channel apron (125')
18200	70	260	Install toe apron (260')
5500	1100	5	Site clean-up and revegetation (5 acres)
0			Demobilization

291925

Total cost for tasks in bid

**Summary of Costs for Pond 1 Tasks**

39919	Rock cover between trenches
67745	Pond 1 - Northern diversion channel
25544	Pond 1 - North Toe Trench - upper portion
26935	Pond 1 - North Toe Trench - lower portion
291925	Pond 1 - South Toe Trench
<b>452068</b>	<b>Total costs Pond 1 Tasks</b>

WORK ELEMENTS

POND 2



Task --> **Pond 2**

Completion of closure activities for Pond 2 have been eliminated as a result of plans to relocate the lined evaporation pond materials at Pond 2. Closure of this area and costs are addressed under "Section 4 Ponds" section.

WORK ELEMENTS

POND 3

**TASK --> Pond 3 - Cover placement**

RAM uncertain at this time if a radon barrier (engineered design cover) will be required on Pond 3. Need will be based on final soil characterization following placement of remaining residual radioactive materials associated with past milling operations. It is expected that minimal cover (one foot) will be required.

45 Pond area - based on final footprint.  
72600 Volume of cover material required - 1 foot cover (CY)

Rates (\$/CY)	Equipment required for cover placement.
5.39	Scraper for 7000' haul
0.10	Grader - soil
0.65	Compactor - sheepsfoot
0.30	Compactor - vibratory intermediate
0.30	Compactor - vibratroy - smooth
0.77	Water wagon
0.90	Dozer - for clay preparation
8.41	Unit cost for clay and soil cover (\$/CY)
610566	Placement cost for cover (\$)

**Task --> Pond 3 - Geotechnical QA/QC**

Test	Testing Frequency (CY)	Tests required	Unit Cost (\$)	Total Cost
Sand Cone	1000	80	27.15	2389
Moisture	1000	80	9.00	792
1 point Proctor	10000	10	13.50	149
5 pointt Proctor	as needed	3	67.50	223
Atterberg	10000	10	58.50	644
Soil Classification	10000	10	54.00	594

Note: Totals --> 4790  
QA values based on 10% retetst rate.

**Geotechnician salary costs**

500	Daily output - scraper @ 7000 ft
5	number of scrapers for project
29	days to complete placement of cover material Grading and compacting occur simultaneously with dozer and scraper work.
220	daily rate for geotechnician
6389	Cost for geotechnician for project

**TASK --> Pond 3 - Cover placement**

**Radiation surveys - radon flux measurements**

100	Required Tests (minimum)
8	Number of tests per day
90	Cost per analysis
12.5	Number of days to perform required tests
5	Preparation/set-up time (days)
5	Report preparation time (days)
22.5	Total time to perform task (days)
1	Number of technicians to perform task
65	1 - lab technician hourly rate
50	Per diem for technician
21825	Cost to perform task

**TASK --> Pond 3 - Rock Placement - top slope**

26 Pond top surface area (acres)

Rock requirements

Material	Thickness (inches)	Rock Needed (CY)
Rock - D50 1 "	3	13310

Material Placement

Placement of D50 1" rock will utilize loader filling belly dump trucks with spotter guiding trucks and spread by grader.

Rates (\$/CY)	Equipment
0.39	Loader
1.91	Belly dump truck
0.05	Spotter
1.78	Grader - rock

55011 Cost to place D50 1" rock

QA/QC on rock placement

Perform thickness test on 50 foot centers

453	Number of test required
75	Number of tests performed each day
6.0	Number of days required to perform tests
27.50	Geotech rate (\$/Hr)
1329	Cost to perform tests

**56340** Total cost to place rock on Pond 3 top surface

**TASK --> Pond 3 - rock placement on slopes**

7 Pond slope surface area (acres)

**Rock requirements**

Material	Thickness (inches)	Rock Needed (CY)
Rock - D50 1 "	6	5770
Rock - D50 12"	18	17300

**Material Placement**

Cost to place D50 1" rock

Rates (\$/CY)	Equipment
0.39	Loader
1.91	Belly dump truck
0.30	Compactor - smooth drum
0.05	Spotter
1.78	Grader - rock
25579	Cost to place D50 1" rock

Placement of D50 12" rock will utilize loader filling end dump trucks and spreading material with excavators

Rates (\$/CY)	Equipment
0.39	Loader
2.30	End dump truck
3.63	Excavator
109336	Cost to place sand and D50 12" rock

QA/QC on rock placement  
Perform thickness test on 50 foot centers

244	Number of tests required (1" and 12" rock)
75	Number of tests performed each day
3.3	Number of days required to perform tests
27.50	Geotech rate (\$/Hr)
716	Cost to perform tests
135630	Total cost to complete task - slopes

**TASK --> Pond 3 - Pond 1 run-on apron rock placement**

Rock requirements	Material	Thickness (inches)	Rock Needed (CY)
	Rock - D50 1 "	6	1630
	Rock - D50 7.8"	18	3600

Cost to place D50 1" rock

Rates (\$/CY)	Equipment
0.39	Loader
1.91	Belly dump truck
0.30	Compactor - smooth drum
0.05	Spotter
1.78	Grader - rock

7226 Cost to place D50 1" rock

Placement of D50 7.8" rock will utilize loader filling end dump trucks and spreading material with excavators

Rates (\$/CY)	Equipment
0.39	Loader
2.30	End dump truck
3.63	Excavator

22752 Cost to place D50 7.8" rock

QA/QC on rock placement

Perform 3 spot cross sectional thickness test on 50 foot centers

4000	Length of apron (feet)
480	Number of tests required (1" and 7.8" rock)
75	Number of tests performed each day
6.4	Number of days required to perform tests
27.50	Geotech rate (\$/Hr)

1408 Cost to perform tests

**31386** Total cost to complete task - apron

**TASK --> Pond 3 - toe trench rock placement**

Rock requirements		Rock Needed
Material	Thickness (inches)	(CY)
Rock - D50 1"	6	1750
Rock - D50 12"	36	7500

Cost to place D50 1" rock

Rates (\$/CY)	Equipment
0.39	Loader
1.91	Belly dump truck
0.30	Compactor - smooth drum
0.05	Spotter
1.78	Grader - rock

7758 Cost to place D50 1" rock

Placement of D50 12" rock will utilize loader filling end dump trucks and spreading material with excavators

Rates (\$/CY)	Equipment
0.39	Loader
2.30	End dump truck
3.63	Excavator

47400 Cost to place sand and D50 7.8" rock

QA/QC on rock placement

Perform 3 spot cross sectional thickness test on 50 foot centers

4250	Length of apron (feet)
510	Number of tests required (1" and 7.8" rock)
75	Number of tests performed each day
6.8	Number of days required to perform tests
27.50	Geotech rate (\$/Hr)

1496 Cost to perform tests

**56654** Total cost to complete task - toe trench



**WORK ELEMENTS**

**UNLINED EVAPORATION PONDS**

### Unlined Ponds

Unlined ponds 4-8 have been reclaimed and Rio anticipates seeking alternate release criteria for these areas due to the technical and economic infeasibility of attempting to excavate the deep contamination present in these areas. RESRAD modeling has demonstrated that placement of a one foot cover reduces exposures to minimal levels. Ponds have been stabilized and have received one foot of compacted soil cover.

Pond perimeter areas around Ponds 4-6 will require excavation of one foot of soil and backfill of clean soil to maintain desired grade.

Following pond perimeter work, the remaining work elements include performing final surveys over area and revegetation

#### TASK --> **Excavation of pond perimeter areas surrounding Ponds 4-6**

62	Area of Pond 4-6 perimeter (acre)	
	<u>Excavation of soils</u>	
1	Depth to be excavated (ft)	
100027	Volume of soil excavated (yd3)	
3.91	Scraper - excavation/placement - 3000 ft	(\$/yd3)
391104	Cost to excavate soils (\$)	
	<u>Backfill of soil</u>	
1	Depth to be backfilled (ft)	
100027	Volume of soil required (yd3)	
3.91	Scraper - excavation/placement - 3000 ft	(\$/yd3)
0.10	Grader - soil	
0.65	Compactor - sheepsfoot	
0.30	Compactor - vibratory intermediate	
0.30	Compactor - vibratroy - smooth	
0.77	Water wagon	
6.03	Unit cost to place cover (\$/yd3)	
603161	Cost to place cover on pond perimeter (\$)	
994265	Total cost to perform pond perimeter work (\$)	

**TASK --> Radiation Survey of Unlined Pond Areas and Pond 10**

Radiation surveys will be performed by a two person crew. One technician will operate buggy with survey equipment mounted on buggy, while another addresses computer. Survey data will be downloaded into computer programs for processing/analysis.

2 Radiation Survey crew size

Rates (\$/Hr)	Personnel
30	Radiation survey technician
65	Radiation survey data processor
100	GPS-radiation survey instruments
4.35	Survey unit (buggy/truck)
6.25	Per diem rate for radiation survey crew
199	Total hourly rate
1695	Total daily rate (including per diem)
4	Buggy speed (miles/Hr)
6	Survey spacing (feet)
2.9	Area covered per hour (acres/hr)
20.4	Daily area output (based on 7 hours of survey time and 1 hour of computer time)

Area	Acres	# Days	Cost
Pond 4	53	2.6	4411
Pond 5	29	1.4	2414
Pond 6	15	0.7	1248
Pond 7	60	2.9	4994
Pond 8	42	2.1	3496
Pond 10	15	0.7	1248
			17811 <--Total

Assume that 20% of area may require additional clean-up and/or more surveys

39.8	Area requiring additional survey effort
3312	Cost to perform additional surveys
21123	Total estimated cost to perform radiation surveys

**TASK -->    Revegetation of Unlined Pond Areas and Borrow areas**

Revegetation costs based on KGL bid provided for construction of Pond 1 south toe.  
KGL revegetation costs per acre were -->            1100

Area	Acres	Cost
Pond 4	53	58300
Pond 5	29	31900
Pond 6	15	16500
Pond 7	5	5500
Pond 8	5	5500
Pond 10	15	16500
Borrow 1	52	57200
Borrow 2	53	58300

249700

Note: Pond 7 and Pond 8 already revegetated. Minimal area includes possible interseeding

**Total costs for unlined ponds and borrow areas**

\$    994,265 Pond perimeter work  
\$     21,123 Radiation surveys  
\$    249,700 Revegetation

**\$    1,265,088 Total Costs**

rock costs per Final Soils plan

**WORK ELEMENTS**

**MILL YARD**

**Mill Yard Activities**

Values based on contractor bid (Cleveland Wrecking).  
No bids were provided for shop and office areas. Values used based on contractor estimates for comparable buildings.

**Task --> IX Demolition (includes tanks, pump house and water treatment building)**

32472	Abatement work
42256	Demolition of Building and foundation removal
11542	Disposal of materials
86270	Total demolition cost - IX building

**Task --> Shop Demolition (based on warehouse costs)**

5782	Abatement work
38287	Demolition of Building and foundation removal
3553	Disposal of materials
47622	Total demolition cost - shop building

**Task --> Admin. Office Demolition (includes mill changeroom) (based on warehouse)**

5782	Abatement work
38287	Demolition of Building and foundation removal
3553	Disposal of materials
47622	Total demolition cost - office building

**TASK --> Removal of PNM Substation**

540000	Contract cost to remove PNM substation (attached)
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Total demolition costs

86270	IX
47622	Shop
47622	Office
540000	PNM Substation

**721514** Total cost - demolition activities

building demo costs fo \$712K escultated to \$8

825,066

**Task --> Soil clean-up and verification in mill yard**

79 Area associated with millyard (includes northwest corner of Section 31)

Assume maximum of one (1) foot (average) of soil will require removal and disposal in cell. This is based on visual observation of mill demolition project where minimal soil impacts below building footprints were observed.

Material removed from mill yard may be used for final consolidation of the Section 4 pond materials, so placement costs are captured in Section 4 Pond plan contract bid price.

127453 Volume of soil estimated for removal

Rates (\$/CY)	Equipment required for soil removal
3.91	Scraper - excavation/placement - 3000 ft

498343 Total excavation cost

**Task --> Radiation Surveys of mill yard**

Radiation surveys will be performed by a two person crew. One technician will operate buggy with survey equipment mounted on buggy, while another addresses computer and conducts soil sampling of the areas according to approved plan. Survey data will be downloaded into computer programs for processing/analysis.

2 Radiation Survey crew size

Rates (\$/Hr)	Personnel
30	Radiation survey technician
65	Radiation survey data processor
100	GPS-radiation survey instruments
4.35	Survey unit (buggy/truck)
50	Per diem rate for radiation survey crew

199 Total hourly rate

1695 Total daily rate (including per diem)

4	Buggy speed (miles/Hr)
6	Survey spacing (feet)
2.9	Area covered per hour (acres/hr)
20.4	Daily area output (based on 7 hours of survey time and 1 hour of computer time)
104	Area associated with millyard (includes area north of pond 1)
6	Total days to complete required survey area (assumes 10% resurvey)

9521 Total cost to perform radiation surveys



**Task --> Soil Sampling Requirements for verification of clean-up**

NRC will require a percentage of the overall area to be verified through lab analysis. Density of sampling contingent on gamma/soil correlation. NRC has indicated that 2% of grids may require soil sampling. RAM expects this to be high, but cost estimate based on NRC estimate.

Technician performing this task will collect, prepare and ship samples. This individual will perform tasks simultaneously (i.e., on a daily basis, equal number of samples will be collected, prepared, and shipped).

79	Area to be sampled (acres)
3197	Number of 100 m2 grids
64	Number of samples based on 2% density
30	Number of samples collected per day (collected per SOP; i.e. 5-spot composite)
2	Number of days to collect samples
	Note: sample prep, and shipment occur simultaneously, so overall time to perform task is increased by 4 days - 2 in beginning to stock prep area and 2 at end to complete prep of stocked samples.
4	Additional time to prepare samples
6	Total time to perform task (days)
0	Cost to perform task
	This individual is already at site as part of gamma radiation survey (computer technician) and has 7 hours to perform soil sampling tasks. This individual's time is already accounted for above.

**Task --> Laboratory analysis costs (GEL)**

90	Unit cost for gamma spec analysis for Ra-226, Th-230, U-238
132	Unit cost for alpha spec for Th-230
64	Number of samples
5754	Cost for gamma spec
8440	Cost for alpha spec
14194	total analytical costs
75	shipping costs (UPS estimate based on total weight of soil samples shipped to lab)
0.4	Number of work weeks required to ship all samples
32.0	Total shipping costs
14226	Overall laboratory costs

**Task --> Placement of topsoil in millyard**

Topsoil will be required to re-establish vegetation following verification of clean-up.  
Six inches of topsoil over the area will be needed.

<u>Rates (\$/CY)</u>	<u>Equipment required for soil removal</u>
3.91	Scraper - excavation/placement - 3000 ft
0.10	Grading - soil
4.01	Cost to place and spread soil (\$/yd3)
79	Area requiring cover placement (acre)
0.5	cover thickness (ft)
63727	Volume of cover needed (yd3)
255544	Cost to place cover (\$)

**Task --> revegetation of mill yard**

Revegetation costs based on KGL bid provided for construction of Pond 1 south toe.  
KGL revegetation costs per acre were --> 1100

79	Acres to be revegetated
1100	Cost per acre
86900	Total revegetation costs

**Task --> Mill Pond closure**

NRC requires the dam to be breached upon completion of activities. Plan is to drain pond and push in dam face over pond sediments, stabilize area and contour the covered pond area to match topography of area.

Task will use dozer to push in dam, grader to spread material and compactors to consolidate and stabilize area.

<u>Cost (\$/yd3)</u>	<u>Item</u>
0.90	Dozer - recountour work
0.10	Grading - soil
0.65	Compactor - sheepsfoot
0.30	Compactor - vibratory intermediate
0.30	Compactor - vibratory - smooth
2.25	Unit cost

Mill Pond volumes (based on prints 17-2001 through 17-2004)

Pond berm divided into three sections based on x-sectional areas.

<u>Zone</u>	<u>Length</u>	<u>Unit Vol.</u>	<u>total</u>
west end	500	1600	29630
north end	600	4100	91111
east end	400	1600	<u>23704</u>

144444

144444 Volume of material in dam that will be pushed over pond  
325000 Cost to reclaim mill pond

**Total costs - mill yard area**

721514 Total cost - demolition activities  
522090 Total excavation and verificationcost  
86900 Total revegetation costs  
325000 Total cost - mill ponds

**1655504** Total cost

**Task --> excavate area N and E of Pond 1**

25	Size of area (acre)
1	Depth of excavation (ft)
40333	Volume to be excavated (yd3)
3.91	Scraper - excavation/placement - 3000 ft
157703	Cost to excavate soils (\$)

**Task --> Place cover on area N and E of Pond 1**

25	Size of area (acre)
0.5	Depth of cover (ft)
20167	Volume of soil needed (yd3)

<u>Rates (\$/CY)</u>	<u>Equipment required for soil removal</u>
3.91	Scraper - excavation/placement - 3000 ft
0.10	Grading - soil
4.01	Cost to place and spread soil (\$/yd3)

80868	Cost to place cover (\$)
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<b>238572</b>	<b>Cost to excavate and cover are N and E of Pond 1</b>
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**WORK ELEMENTS**

**WINDBLOWN**

**Task --> Radiation Surveys - Surface Gamma**

Additional surveys will occur in areas surrounding the tailings piles and evap. ponds.  
Assume all areas will be resurveyed to obtain current conditions.

554 Area to be surveyed (acres)

Radiation surveys will be performed by a two person crew. One technician will operate buggy with survey equipment mounted on buggy, while another addresses computer and conducts soil sampling of the areas according to approved plan.  
Survey data will be downloaded into computer programs for processing/analysis.

2 Radiation Survey crew size

<u>Rates (\$/Hr)</u>	<u>Personnel</u>	
30	Radiation survey technician	
65	Radiation survey data processor	
100	GPS-radiation survey instruments	
4.35	Survey unit (buggy/truck)	
50	Per diem rate for radiation survey crew	(per day)
199	Total hourly rate	
1695	Total daily rate (including per diem)	
4	Buggy speed (miles/Hr)	
6	Survey spacing (feet)	
2.9	Area covered per hour (acres/hr)	
20.4	Daily area output (based on 7 hours of survey time and 1 hour of computer time)	
30	Total time to complete required survey area (assumes 10% resurvey)	
50718	Total cost to perform radiation surveys	

**Task --> Soil Sampling Requirements for verification of clean-up**

NRC will require a percentage of the overall area to be verified through lab analysis. Density of sampling contingent on gamma/soil correlation. NRC has indicated that 2% of grids may require soil sampling. RAM expects this to be high, but cost estimate based on NRC estimate.

Technician performing this task will collect, prepare and ship samples. This individual will perform tasks simultaneously (i.e., on a daily basis, equal number of samples will be collected, prepared, and shipped).

554	Area to be sampled (acres)
22419	Number of 100 m2 grids
448	Number of samples based on 2% density
30	Number of samples collected per day (collected per SOP; i.e. 5-spot composite)
15	Number of days to collect samples
	Note: sample prep, and shipment occur simultaneously, so overall time to perform task is increased by 4 days - 2 in beginning to stock prep area and 2 at end to complete prep of stocked samples.
4	Additional time to prepare samples
19	Total time to perform task (days)
0	Cost to perform task
	This individual is already at site as part of gamma radiation survey (computer technician) and has 7 hours to perform soil sampling tasks. This individual's time is already accounted for above.

**Task --> Laboratory analysis costs (GEL)**

90	Unit cost for gamma spec analysis for Ra-226, Th-230, U-238
132	Unit cost for alpha spec for Th-230
448	Number of samples
40354	Cost for gamma spec
59186	Cost for alpha spec
99540	total analytical costs
75	shipping costs (UPS estimate based on total weight of soil samples shipped to lab)
4	Number of work weeks on a weekly frequency.)
284	Total shipping costs
99824	Overall laboratory costs

**Task --> Revegetation of windblown areas**

Revegetation costs based on KGL bid provided for construction of Pond 1 south toe.

KGL revegetation costs per acre were -->

1100

554	Acres to be revegetated
1100	Cost per acre
609400	Total revegetation costs

**Total Costs for Remediation of Windblown Areas**

238572	Cost to excavate and cover are N and E of Pond 1
50718	Total cost to perform radiation surveys
99824	Overall laboratory costs
609400	Total revegetation costs
998514	Total Cost



Task --> **Old Stope Leaching Closure Costs - Section 24 Mine**

Costs based on approved plan with State (MMD) to conduct this reclamation activity.

**Shaft Plugging - Section 24**

Materials @ 22 ft diameter plug X 4 ft thick

Volume of cement      $4 \text{ ft} * \pi * r^2$   
                                  $= 4 \text{ ft} * 3.14 * (11 \text{ ft})^2 = 1520 \text{ ft}^3 \text{ or } 56 \text{ yd}^3$   
56 yd<sup>3</sup> \* \$59.50/yd<sup>3</sup> (cement) = \$3,332  
56 yd<sup>3</sup> \* \$54/10 yd<sup>3</sup> (delivery) = \$302

Materials @ 1/2" Steel plate  
Area =  $\pi * r^2 = 3.14 * (7 \text{ ft})^2 = 154 \text{ ft}^2$   
154 ft<sup>2</sup> \* \$8.09/ft<sup>2</sup> \$1,246

Material @ 8 inch I-Beam (3 each)  
14 ft \* 3 each \* \$7.35/ft \$309

Material @ Rebar reinforcement - 20 segments at 20 ft lengths &  
20 crossties at 3 ft lengths

20 rebar segments \* 20 ft + 20 crossties \* 3 ft = 460 ft  
460 ft \* \$0.42/ft = \$193

Labor Crew 2 laborers @ \$20.00 /hr  
1 foreman @ \$25.00 /hr  
\$65.00 /hr @ 16 hours = \$1,040

Equipment 1 backhoe (416 B)  
hourly rental @ \$25.00 /hr  
hourly fuel/maint. @ \$5.00 /hr  
1 Operator @ \$20.00 /hr  
\$50.00 /hr \* 2 hr = \$100

\$6,522

**Ventilation hole Plugging - Section 24**

Materials @ 8 ft plug X 4 ft thick

$$\begin{aligned}\text{Volume of cement} &= 4 \text{ ft} * \pi * r^2 \\ &= 4 \text{ ft} * 3.14 * (4 \text{ ft})^2 = 64 \text{ ft}^3 \text{ or } 2.4 \text{ yd}^3\end{aligned}$$

$$\begin{aligned}2.4 \text{ yd}^3 * \$59.50/\text{yd}^3 \text{ (cement)} &= \$143 \\ 2.4 \text{ yd}^3 * \$54/10 \text{ yd}^3 \text{ (delivery)} &= \$13\end{aligned}$$

Materials @ 1/2" Steel plate

$$\text{Area of 1/2" Steel plate} = \pi * r^2 = 3.14 * (2 \text{ ft})^2 = 12.6 \text{ ft}^2$$

$$12.6 \text{ ft}^2 * \$8.09/\text{ft}^2 = \$102$$

Material @ Rebar reinforcement - 14 segments at 7 ft lengths &  
14 crossies at 3 ft lengths

$$14 \text{ rebar segments} * 7 \text{ ft} + 14 \text{ crossies} * 3 \text{ ft} = 140 \text{ ft}$$

$$140 \text{ ft} * \$0.42/\text{ft} = \$6$$

$$\begin{aligned}\text{Labor Crew 2 laborers @ } & \$20.00 / \text{hr} \\ 1 \text{ foreman @ } & \$25.00 / \text{hr} \\ & \$65.00 / \text{hr @ 8 hours} = \$520\end{aligned}$$

Equipment 1 backhoe (416 B)

$$\begin{aligned}\text{hourly rental @ } & \$25.00 / \text{hr} \\ \text{hourly fuel/maint. @ } & \$5.00 / \text{hr} \\ 1 \text{ Operator @ } & \$20.00 / \text{hr} \\ & \$50.00 / \text{hr} * 0.5 \text{ hr} = \$25\end{aligned}$$

$$\text{cost per ventilation hole} = \$809$$

## Injection hole plugging - Section 24

Materials @ 1 ft<sup>2</sup> X 0.5 ft thick

Volume of cement = 1 ft<sup>2</sup> \* 0.5 ft = 0.5 ft<sup>3</sup> or 0.02 yd<sup>3</sup>

0.02 yd<sup>3</sup> \* \$59.50/yd<sup>3</sup> (cement) = \$2

0.02 yd<sup>3</sup> \* \$54/10 yd<sup>3</sup> (delivery) = \$0

Materials @ 1/8" Steel plate

Area of 1/8" Steel plate = 0.33 ft \* 0.33 ft = 0.11 ft<sup>2</sup>

0.11 ft<sup>2</sup> \* \$8.09/ft<sup>2</sup> = \$1

Labor Crew = 1 laborer @	\$20.00 /hr	
1 foreman @	\$25.00 /hr	
	\$45.00 /hr @ 0.5 hours =	\$23

Equipment = 1 backhoe (416 B)		
hourly rental @	\$25.00 /hr	
hourly fuel/maint. @	\$5.00 /hr	
1 Operator @	\$20.00 /hr	
	\$50.00 /hr * 0.25 hr =	\$13

cost per injection hole \$38

### Hole cost summary

1	Number of Shafts
6522	Cost per shaft
6522	Total cost
12	Number of Ventholes
809	Cost per venthole
9708	Total cost
291	Number of Leach holes
38	Cost per leach hole
11058	Total cost
27288	Total cost for shaft, venthole, and leachhole closure

**Task --> Surface contour and revegetation - old stope leaching**

Surface contour work consists of grading areas disturbed by hole closure activities.  
Grader will smooth out area in preparation for revegetation.

2	Area (acres) disturbed per shaft (300' x 300' per hole)
1	Number of Shafts
2	Total area disturbed (acres)
0	Area (acres) disturbed per venthole (50' x 50' per hole)
12	Number of Ventholes
1	Total area disturbed (acres)
0	Area (acres) disturbed per leach hole (25' x 25' area per hole)
291	Number of Leach holes
4	Total area disturbed (acres)
2.1	Cumulative area disturbed (only shaft areas requires grading.

**cost (\$/ft2)**

0.10	Grading - soil
9148	Total grading cost

**Task --> Revegetation of disturbed area - old stope leaching**

Revegetation costs based on KGL bid provided for construction of Pond 1 south toe.  
KGL revegetation costs per acre were --> 1100

2.1	Total area disturbed (acre)
1100	Revegetation unit cost (\$/acre)
2310	Total revegetation cost (\$)

Summary of costs to reclaim shafts, vents, and leach holes including revegetation

27288	Total cost for shaft, venthole, and leachhole closure
9148	Total grading cost
2310	Total revegetation cost (\$)
38746	Total cost

WORK ELEMENTS

GROUNDWATER

CAP Costs based on costs provided by RAM to NRC in a June 28, 2001 submittal.  
Annual costs are calculated outward until anticipated license termination in 2007.

**Groundwater Program for the Bedrock Units  
(Tres Hermanos A and B, and the Dakota Sandstones)**

Task --> **Pumping of Section 30 West Mines**  
assumes ACLs are approved in 2005.

Cost	Description
47040	Power - Section 30 West (70,000kwh/mo. * \$0.056/kwh * 12 mo.)
10000	Maintenance/Repair of pumps (1 pumps-motors/year * 10,000/pump-motor)
2600	Labor for pump-motor replacement
1440	Labor for operations (\$20/hr * 6 hr/mo. * 1 mine * 12 mo.)
61080	Subtotal

Task --> **Sampling and Analysis**

**TRES HERMANOS B**

Cost	Description
300	Labor - sampling/shipping. (\$20/hr * 1.5 hr/well * 5 wells * 2 times/yr)
4200	Laboratory analysis (5 wells * \$420/well * 2 times/year)
900	Miscellaneous work tasks (20% of items 1 and 2)
5400	Subtotal

**TRES HERMANOS A**

Cost	Description
120	Labor - sampling/shipping. (\$20/hr * 1.5 hr/well * 2 wells * 2 times/yr)
1680	Laboratory analysis (2 wells * \$420/well * 2 times/year)
360	Miscellaneous work tasks (20% of items 1 and 2)
2160	Subtotal

**DAKOTA**

Cost	Description
400	Labor - sampling/shipping. (\$20/hr * 2 hr/well * 5 wells * 2 times/yr)
4800	Laboratory analysis (5 wells * \$480/well * 2 times/year)
1040	Miscellaneous work tasks (20% of items 1 and 2)
6240	Subtotal
13800	Annual sampling costs for Bedrock units
41400	Bedrock groundwater sampling cost through license termination in 2007

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License SUA-1473  
Docket 40-8905

**Groundwater Program for the Alluvium**  
assumes ACLs are approved in 2005.

**Pumping of Interceptor Trench**

Cost	Description
7392	Power (11,000kwh/mo. * \$0.056/kwh * 12 mo.)
500	Maintenance/Repair of pumps
720	Labor for operations (\$20/hr * 3 hr/mo. * 12 mo.)
8612	Subtotal

**Pumping of Evaporation pond 9 to Section 4**

Cost	Description
12096	Power (18,000kwh/mo. * \$0.056/kwh * 12 mo.)
500	Maintenance/Repair of pumps
1200	Labor for operations (\$20/hr * 5 hr/mo. * 12 mo.)
5000	Pond maintenance and repair
18796	Subtotal

**Treatment of Mine Water used for Groundwater Sweep**

54780 IX Treatment and Radium Removal Circuit operating costs

**Sampling and Analysis****ALLUVIUM**

Cost	Description
240	Labor - sampling/shipping. (\$20/hr * 1.5 hr/well * 4 wells * 2 times/yr)
3120	Laboratory analysis (4 wells * \$390/well * 2 times/year)
672	Miscellaneous work tasks (20% of items 1 and 2)
4032	Annual ground water sampling costs for Alluvium
12096	Alluvium groundwater sampling cost through license termination in 2007
	Summary of costs to operate CAP
13800	Annual total for Bedrock units
4032	Annual total for Alluvium units
53496	Total through projected license termination date in 2007

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Docket 40-8905

**Well Plugging and Abandonment**

Cost	Description
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2000	Alluvial well closure (4 wells * \$500/well)
1000	Tres Hermanos A well closure (2 wells * \$500/well)
2500	Tres Hermanos B well closure (5 wells * \$500/well)
3750	Dakota well closure (5 wells * \$500/well)
3200	Site clean-up and revegetation (16 wells * \$200/well)

<b>12450</b>	<b>Total cost</b>
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<b>65946</b>	<b>Cumulative CAP operation and closure costs</b>
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38746	Total cost for shaft, venthole, and leachhole closure
61080	Pumping of Section 30West Mines
41400	Bedrock groundwater sampling cost through license termination in 2007
27408	Alluvium CAP action - trench operation
54780	Operation of IX Plant
12096	Alluvium groundwater sampling cost through license termination in 2007
12450	Well Plugging and Abandonment <span style="border: 1px dashed black; padding: 2px;">Increased by \$50,000 in anticipati</span>
<b>275248</b>	<b>Groundwater Actions total costs</b>



on of more stringent NM plugging requirements

WORK ELEMENTS  
INTERCEPT TRENCH

Task --> **Intercept Trench Closure**

292000	Volume required to backfill trench (1990 R. Powell memo) (yd3)
25	Depth of trench (ft)
4700	Length of trench (ft)
12	bottom width (ft)
121	top width (ft)
100000	volume of fill stockpiled at trench (yd3)

Trench will be filled in by use of a dozer pushing in fill material placed along trench.

Volume of material stored along trench for dozer push is 100,000 yards.

This will be complemented by use of scrapers running down into trench with a grader spreading the material for compaction purposes until trench is filled.

Rates (\$/CY)	Equipment required for trench backfill
4.74	Scraper for 5000' haul
0.10	Grader - soil
0.65	Compactor - sheepsfoot
0.30	Compactor - vibratory intermediate
0.30	Compactor - vibratroy - smooth
0.77	Water wagon
0.90	Dozer spreading fill material in trench
1.24	Dozer pushing stockpiled fill over trench edge

124000	Cost to push stockpiled fill into trench
292000	Cost to spread and compact stockpiled fill in trench
910080	Cost to fill remaining volume with scrapers
407040	Cost to grade and compact this material
1733120	Cost to backfill trench - earthwork

Task --> **Geotechnical QA/QC on backfill material**

Since material placed in trench will be part of final pond 3 footprint, the area will be required to be stable, which will be verified through geotechnical testing of the compacted material.

## Trench - Geotechnical QA/QC

Test	Testing Frequency (CY)	Number of Tests	Unit Cost (\$)	Cost
Sand Cone	1000	292	27.15	8721
Moisture	1000	292	9.00	2891
1 point Proctor	10000	29.2	13.50	434
5 point Proctor	as needed	5	67.50	371
Atterberg	10000	29.2	58.50	1879
Soil Classification	10000	29.2	54.00	1734

Note: Totals --> 16030  
QA values based on 10% retest rate.

## Geotechnician salary costs

1650 dozer production (yd<sup>3</sup>/day)  
 61 days to complete push and spread  
 650 Scraper daily output for 5000 ft haul (yd<sup>3</sup>/day)  
 295 days to complete placement of remaining fill material  
 Grading and compacting occur simultaneously with dozer and scraper work.

356 Days to complete backfill project  
 220 daily rate for geotechnician

**78318** Cost for geotechnician for backfill project

**Total costs to backfill trench**

1733120 Cost to backfill trench - earthwork  
 16030 Trench - Geotechnical QA/QC testing costs  
 78318 Cost for geotechnician for backfill project

**1827468** **Total costs**

**TASK --> Radiation Survey of Pond Areas**

305	Pond footprint (acres)
220	Pond perimeter footprint (acres)
40	Haul road area (acres)
5	Pipeline area (acres)
570	Total area (acres)

Radiation surveys will be performed by a two person crew. One technician will operate buggy with survey equipment mounted on buggy, while another addresses computer. Survey data will be downloaded into computer programs for processing/analysis.

2 Radiation Survey crew size

<u>Rates (\$/Hr)</u>	<u>Personnel</u>
30	Radiation survey technician
65	Radiation survey data processor
100	GPS-radiation survey instruments
4.35	Survey unit (buggy/truck)
6.25	Per diem rate for radiation survey crew
199	Total hourly rate
1695	Total daily rate (including per diem)
4	Buggy speed (miles/Hr)
6	Survey spacing (feet)
2.9	Area covered per hour (acres/hr)
20.4	Daily area output (based on 7 hours of survey time and 1 hour of computer time)
28	Number of days to complete potential area
47439	Cost to perform initial post clean-up radiation surveys Assume that 20% of area may require additional clean-up and/or more surveys
114	Area requiring additional survey effort
9488	Cost to perform additional surveys
56927	Total estimated cost to perform radiation surveys

**TASK --> Soil Sampling of Pond Areas**

305	Pond footprint (acres)
220	Pond perimeter footprint (acres)
40	Haul road area (acres)
5	Pipeline area (acres)
570	Total area (acres)
48	Number of 10 m x 10 m grids per acre
27588	Total number of grids
2	Percent of grids to be sampled
552	Number of samples
	Assume 5% of samples will require an additional analysis to verify clean-up
28	Additional samples
579	Total number of samples

Soil samples will be collected as outlined within site procedures. Samples will be collected on a 5-spot pattern in a 10m x 10m grid. Samples will be prepared by drying, crushing, blending, splitting (QA), and packaging for laboratory use.

<u>Rates (\$/Hr)</u>	<u>Personnel</u>
30	Radiation survey technician
4.35	Survey unit (buggy/truck)
6.25	Per diem rate for radiation survey crew
325	Daily rate
10	Time to collect 1 sample (min) (includes driving, sampling, and paperwork time)
1	Time to dry 1 sample (min) (time to place sample in pans)
3	Time to crush sample (min)
10	Time to blend and/or split sample (min)
2	Time to package sample (min)
1	Time to prepare paperwork (min) (chain of custody, etc)
27	Total time per sample
18	Number of samples per day (8 hour day)
33	Number of days to collect all samples
10585	Total cost to collect and prepare samples

Task --> **Laboratory analysis costs (GEL)**

90	Unit cost for gamma spec analysis for Ra-226, Th-230, U-238
132	Unit cost for alpha spec for Th-230
579	Number of samples
52141	Cost for gamma spec
76474	Cost for alpha spec
128615	total analytical costs
75	shipping costs (UPS estimate based on total weight of soil samples shipped to lab on a weekly frequency.)
7	Number of work weeks required to ship all samples
489	Total shipping costs
129104	Overall laboratory costs

Rio Algom Mining LLC  
Ambrosia Lake Facility

License SUA-1473  
Docket 40-8905

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## WORK ELEMENTS

### SECTION 4 PONDS



**TASK --> Section 4 Pond Reclamation**

Costs associated with the Section 4 Pond closure have been provided through a contractor bid, which was executed within a signed contract between Rio Algom and contractor. The bid includes costs associated with construction of the final disposal cell on Pond 2, including erosion protection.

The prices are for discrete work elements as well as unit rates for other tasks. A copy of the cost schedule is included and is summarized below.

Fixed price	Item
1000000	mobilization
403000	highway crossing
7500000	Removal and transport of materials to Pond 2
550000	Geotechnical testing (QA/QC) of placed materials at Pond 2
6800	removal of pipeline
230000	revegetation of section 4 area
9689800	Subtotal on fixed price elements
	Item
2.50	Placement of radon barrier on Pond 2 (\$/yd)
300000	Estimated quantity of radon barrier (yds)
750000	Cost to construct radon barrier
1.90	Placement of erosion protection (\$/yd)
54000	Estimated quantity of erosion protection (yd)
102600	Cost to place erosion protection
852600	Subtotal on unit cost elements
10542400	Total cost to perform contractor work elements (required elements)

Work elements that may be required and are contingent on condition of soils below the liners at the Section 4 Ponds.

**TASK --> Pond 2 - Radon Flux tetsting of radon barrier**

Radiation surveys - radon flux measurements

100	Required Tests (minimum)
8	Number of tests per day
90	Cost per analysis
12.5	Number of days to perform required tests
5	Preparation/set-up time (days)
5	Report preparation time (days)
22.5	Total time to perform task (days)
1	Number of technicians to perform task
65	1 - lab technician hourly rate
50	Per diem for technician
21825	Cost to perform task

**TASK --> Erosion Protection for disposal cell**

Erosion protection required for this task will need to be purchased and delivered to the site.

Quarry will provide rock and deliver to the site. Bid prices for making rock and price to deliver to site is attached.

Rock volumes based on consulting engineer's proposed design for the cell and associated erosion control structures.

Structure	Material	Length	Width	Thickness	Volume
Apron 1	sand	1200	11.5	0.5	256
	d50 1"	1200	18.5	0.5	411
	D50 9.2"	1200	21	1.5	1400
Channel A	sand	700	51	0.5	661
	d50 1"	700	51	0.5	661
	D50 7.8"	700	51	1.3	1763
outflow A	sand	75	63	0.5	88
	d50 1"	75	63	0.5	88
	D50 7.8"	75	63	1.33	233
outflow C	sand	75	63	0.5	88
	d50 1"	75	63	0.5	88
	D50 7.8"	75	63	1.33	233
Channel B	sand	550	46	0.5	469
	d50 1"	550	46	0.5	469
	D50 7.8"	550	46	1.33	1246
Apron 4 and	sand	1750	23	0.5	745
	d50 1"	1750	23	0.5	745
	D50 9.2"	1750	12	1.5	1167
Channel C	sand	1300	49	0.5	1180
	d50 1"	1300	49	0.5	1180
	D50 7.8"	1300	45	1.33	2882

Location	Material	acres	thickness	Volume
Side Slope	d50 1"	4.3	0.5	3469
	D50 3.2"	4.3	0.5	3469
Top	d50 1"	42.1	0.25	16980

**TASK --> Erosion Protection for disposal cell (continued)**

Totals	Volume	T/yd3	Tons	Unit cost	purchase Total cost	unit haul cost	delivery cost	Total cost
sand	3485	1.3	4531	5.95	26958	6.09	27592	54550
d50 1"	24090	1.3	31317	4.95	155017	6.09	190718	345736
d50 3.2"	3469	1.25	4336	4.95	21462	6.09	26405	47868
D50 7.8"	6356	1.25	7945	6.85	54427	7.25	57605	112031
D50 9.2"	2567	1.25	3208	6.85	21977	7.25	23260	45238

Cost to purchase all rock --> 279841

Cost to deliver all rock --> 325581

39967 <-- Total volume      Total cost for all rock (incl. Tax @ 7.2%) --> **649013**

**Total Costs For Section 4 Pond Closure**

Cost	Item
10542400	Total cost to perform contractor work elements (required elements)
21825	Radon flux testing on Pond 2
56927	Total estimated cost to perform radiation surveys at Section 4
10585	Total estimated cost to perform soil sampling at Section 4
129104	Total analytical costs for soil samples
649013	Erosion protection purchase and delivery
<b>11409854</b>	<b>Total Costs for section 4 related activities</b>

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## WORK ELEMENTS

### POND 9

**Pond 9 closure costs**

Pond 9 sediment removal was bid by contractor (KGL) as part of the Section 4 project.

Total Cost	Unit Cost	Quantity	Item
0	-	-	Mobilization (already addressed in Section 4 costs)
312400	2	156200	Unit cost to relocate sediments/contaminated berms to Pond 2 (\$/yd). Based on sediment thickness data, 6" below liner, and berm materials
312400			Total cost to relocate materials

**Task --> Radiation surveys to verify remediation**

Radiation surveys will be performed by a two person crew. One technician will operate buggy with survey equipment mounted on buggy, while another addresses computer. Survey data will be downloaded into computer programs for processing/analysis.

2 Radiation Survey crew size

Rates (\$/Hr)	Personnel
30	Radiation survey technician
65	Radiation survey data processor
100	GPS-radiation survey instruments
4	Survey unit (buggy/truck)
6	Per diem rate for radiation survey crew
199	Total hourly rate
1695	Total daily rate (including per diem)
4	Buggy speed (miles/Hr)
6	Survey spacing (feet)
2.9	Area covered per hour (acres/hr)
20.4	Daily area output (based on 7 hours of survey time and 1 hour of computer time)
40	Area of pond (including berm and buffer around area)
2	Number of days to complete initial survey
3329	Cost for initial survey
Assume that 20% of area may require additional clean-up and/or more surveys	
8	Area requiring additional survey effort
666	Cost to perform additional surveys

**3995** Total estimated cost to perform radiation surveys

**Task --> Soil Sampling Requirements for verification of clean-up**

NRC will require a percentage of the overall area to be verified through lab analysis. Density of sampling contingent on gamma/soil correlation. NRC has indicated that 2% of grids may require soil sampling. RAM expects this to be high, but cost estimate based on NRC estimate.

Technician performing this task will collect, prepare and ship samples. This individual will perform tasks simultaneously (I.e., on a daily basis, equal number of samples will be collected, prepared, and shipped).

40	Area to be sampled (acres)
1619	Number of 100 m2 grids
32	Number of samples based on 2% density
30	Number of samples collected per day (collected per SOP; i.e. 5-spot composite)
1	Number of days to collect samples
	Note: sample prep, and shipment occur simultaneously, so overall time to perform task is increased by 4 days - 2 in beginning to stock prep area and 2 at end to complete prep of stocked samples.
4	Additional time to prepare samples
5	Total time to perform task (days)
0	Cost to perform task
	This individual is already at site as part of gamma radiation survey (computer technician) and has 7 hours to perform soil sampling tasks. This individual's time is already accounted for above.

**Task --> Laboratory analysis costs (GEL)**

90	Unit cost for gamma spec analysis for Ra-226, Th-230, U-238
132	Unit cost for alpha spec for Th-230
32	Number of samples
2914	Cost for gamma spec
4273	Cost for alpha spec
7187	total analytical costs
75	shipping costs (UPS estimate based on total weight of soil samples shipped to lab)
0.2	Number of work weeks required to ship all samples
16.2	Total shipping costs
7203	Overall laboratory costs

### Revegetation of Pond Area

Revegetation costs based on KGL bid provided for construction of Pond 1 south toe.

KGL revegetation costs per acre were --> 1100

40	Area requiring revegetation (acres)
1100	Cost per acre (\$/acre)
44000	Revegetation cost

### Pond 9 closure costs

312400	Total cost to relocate materials
3995	Total cost to perform radiation surveys
7203	Total cost for laboratory analysis
44000	Revegetation cost
<b>367598</b>	<b>Total cost</b>



WORK ELEMENTS

11.e(2) DISPOSAL CELL

Task --> **11e2 disposal cell closure**

Closure of cell will require placement of an appropriate radon barrier over the waste that was placed in the cell. Waste consisted primarily of mill demolition debris. Projected cover thickness for this waste would be minimal as low radium content is present in these components. However, for bonding purposes, a three foot cover will be placed (2 feet of clay, 1 feet of frost protection layer) followed by rock

5	Area of disposal cell (acres)
16133	Volume of clay cover material required - 2 foot cover (CY)
8067	Volume of soil cover material required - 1 foot protective layer (CY)
24200	Total volume of soil required (CY)

Rates (\$/CY)	Equipment required for cover placement.
4.74	Scraper for 5000' haul
0.10	Grader - soil
0.65	Compactor - sheepsfoot
0.30	Compactor - vibratory intermediate
0.30	Compactor - vibratroy - smooth
0.77	Water wagon
0.90	Dozer - for clay preparation - if clay cover required
6.86	Unit cost for soil cover (\$/CY)
7.76	Unit cost for clay cover (\$/CY)
55337	Placement cost for soil cover (\$)
110675	Placement cost for clay and soil cover (\$)
166012	Cost to place cover (\$)

11e2 - Geotechnical QA/QC

Test	Testing Frequency (CY)	Number of Tests	Unit Cost (\$)	Cost
Sand Cone	1000	26.62	27.15	795
Moisture	1000	26.62	9.00	264
1 point Proctor	10000	2.662	13.50	40
5 point Proctor	as needed	2	67.50	149
Atterberg	10000	2.662	58.50	171
Soil Classification	10000	2.662	54.00	158

Note: Totals --> 1576  
QA values based on 10% retetst rate.

Task --> **Geotechnician salary costs**

650	Scraper daily output for 5000 ft haul (yd3/day)
37	days to complete placement of cover material
	Grading and compacting occur simultaneously with scraper work.
220	daily rate for geotechnician (\$/day)
8191	Cost for geotechnician for performing test for cover construction

Task --> **Radiation surveys - radon flux measurements**

100	Required Tests (minimum)
8	Number of tests per day
90	Cost per analysis
12.5	Number of days to perform required tests
5	Preparation/set-up time (days)
5	Report preparation time (days)
22.5	Total time to perform task (days)
1	Number of technicians to perform task
65	1 - lab technician hourly rate
50	Per diem for technician
21825	Cost to perform task

## Summary of earthwork and QA/QC costs

166012	Cost to place cover (\$)
1576	11e2 - Geotechnical QA/QC
8191	Geotechnician salary costs
21825	Radiation surveys - radon flux measurements
197604	Total

Task --> **Rock Placement - 11e2 cell**

Cell design will limit rock requirement to top slope. This will provide for one rock size over the entire area of the pond.

5 Cell top surface area (acres)

Task --> **Purchase rock from quarry**

Rock will be acquired from a quarry located approximately 70 miles from site. Costs associated with rock purchase based on contractor bid costs to produce rock and to deliver rock to site for direct placement.

Rock requirements

Material	Thickness (inches)	Rock Needed (CY)	Rock Needed (tons)	Price per ton (\$)	Delivery Cost (\$/ton)	Total rock Cost (\$)
Rock - D50 1 "	3	2017	2622	4.95	6.09	28943

Task --> **Spreading rock on cover**

Placement of rock will utilize loader filling belly dump trucks with spotter guiding trucks and spread by grader.

Rates (\$/CY)	Equipment
1.78	Grader - rock
3590	Cost to place rock

Task --> **QA/QC on rock placement**

Perform thickness test on 50 foot centers

87	Number of test required
75	Number of tests performed each day
1.1616	Number of days required to perform tests
220	Geotech rate (\$/day)
256	Cost to perform tests
3845	Total Costs for task

**Total cost associated with 11e2 disposal cell**

166012	Cost to place cover (\$)
1576	11e2 - Geotechnical QA/QC
8191	Geotechnician salary costs
21825	Radiation surveys - radon flux measurements
28943	Rock purchase and delivery
3590	Cost to spread rock
256	QA/QC on Rock
<b>230392</b>	<b>Total</b>



Department of Energy  
Office of Legacy Management

APR 29 2009

Terry Fletcher, President  
Rio Algom Mining, LLC  
P.O. Box 218  
Grants, NM 87020

Subject: Transfer Fee Estimate and Transfer Date Request for Rio Algom Mining Site at  
Lisbon Valley, Utah

Dear Mr. Fletcher:

Your request for an estimate of the transfer fee with a transition date of June 2010 implies that Rio Algom Mining (RAM) is now intending to continue with the transition of the Lisbon Valley site to the U.S. Department of Energy-Office of Legacy Management (DOE-LM). As I indicated in an email last fall, dated October 20, 2008, DOE halted work on this transfer until RAM had reached a decision on the status of the site. DOE can not be in a position of continuing the land withdrawal and possibly owning property that would be sold and used as a production facility.

If RAM has decided to continue the transfer, DOE would appreciate a letter with copies to the appropriate regulators. Due to the work required by other federal agencies, such as the Bureau of Land Management, the U.S. Army Corps of Engineers, and the U.S. Nuclear Regulatory Commission (NRC), we estimate a transition to take 18 months to 2 years. A transition date of 2010 is probably not feasible. Enclosed is a copy of the process used by DOE to transfer a site from the licensee to the DOE. This may be helpful in understanding the actions required for a smooth transition.

The actual guidance on transfer fees from the NRC is in the NRC document: *Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978, NUREG-1620, Rev. 1*. This document is more definitive on when the fee is determined and describes how costs are adjusted for additional months.

The following items are in NUREG 1620 at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1620/>, regarding recent questions about Title II transfer:

- LTSP content: Appendixes D and E
- Termination process: Appendix E
- Long-term fee determination: Appendix E, Section 3.4
- Concurrent jurisdiction: Appendix E Section 4.2, see also Appendix I, RIS 2000-23

2597 B 3/4 Road, Grand Junction, CO 81503

1000 Independence Ave., S.W., Washington, DC 20585

10995 Hamilton-Cleves Highway, Harrison, OH 45030

232 Energy Way, N. Las Vegas, NV 89030

REPLY TO: Grand Junction Office

3600 Collins Ferry Road, Morgantown, WV 26505

11025 Dover St., Suite 1000, Westminster, CO 80021

955 Mound Road, Miamisburg, OH 45342

Terry Fletcher

-2-

APR 29 2009

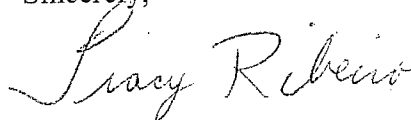
The transfer fee (surveillance charge in the NRC document) is based on \$250,000 in 1978 dollars adjusted to current value. This amount is determined using the Consumer Price Index but may be increased if there are additional costs that would not occur under a normal site transfer. Also enclosed is a presentation prepared several years ago that indicates what some of the possible extra costs might be. This does not imply that additional costs may or may not be applicable for this transition.

The U.S. Department of Labor, Bureau of Labor Statistics website, has a calculator to enter the \$250,000 that will give an approximate calculation adjusting for the Consumer Price Index over time. For 2009 the rough number would be \$813,623. Interestingly, for 2008 the fee would have been \$825,548. When this was run a month or so ago it was \$809,000, so you can see it fluctuates depending on the date and economy.

The link is: [http://www.bls.gov/data/inflation\\_calculator.htm](http://www.bls.gov/data/inflation_calculator.htm)

Please contact me at 970-248-6621 or via e-mail at [tracy.ribeiro@lm.doe.gov](mailto:tracy.ribeiro@lm.doe.gov) if you have any questions.

Sincerely,



Tracy Ribeiro  
Site Manager

Enclosure

cc w/enclosure:

File: LIS 000 (A) (Roberts)

cc w/o enclosure:

D. Finerfrock, UDEQ

D. Traub, Stoller (e)

Rio Algom Mining LLC

Estimate of inflation effect on NRC payment

Base Year 2003

	<u>Est Infl - US</u>	<u>CPI</u>	<u>Payment Amt</u>	
2003 December		184.300	\$ 712,000	12/31/2003
2004 December		190.300	\$ 735,180	12/31/2004
2005 December		196.800	\$ 760,291	12/31/2005
2006 December		201.800	\$ 779,607	12/31/2006
2007 December		210.036	\$ 811,425	12/31/2007
2008 December		210.228	\$ 812,167	12/31/2008
2009 estimate	1.636	213.667	\$ 825,454	12/31/2009
2010 estimate	1.200	216.231	\$ 835,359	12/31/2010
2011 estimate	2.000	220.556	\$ 852,066	12/31/2011

See attached for CPI US City Average used for 03-08 lines above

source: Bureau of Labor Statistics website

<ftp://ftp.bls.gov/pub/special.requests/>

See attached for BHPB's inflation forecast amounts for years after 2008.



5-15-2009

U.S. Department Of Labor  
Bureau of Labor Statistics  
Washington, D.C. 20212  
Consumer Price Index  
All Urban Consumers - (CPI-U)  
U.S. city average  
All items  
1982-84=100

<ftp://ftp.bls.gov/pub>

<u>Year</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug.</u>	<u>Sep.</u>	<u>Oct.</u>
1913	9.800	9.800	9.800	9.800	9.700	9.800	9.900	9.900	10.000	10.000
1914	10.000	9.900	9.900	9.800	9.900	9.900	10.000	10.200	10.200	10.100
1915	10.100	10.000	9.900	10.000	10.100	10.100	10.100	10.100	10.100	10.200
1916	10.400	10.400	10.500	10.600	10.700	10.800	10.800	10.900	11.100	11.300
1917	11.700	12.000	12.000	12.600	12.800	13.000	12.800	13.000	13.300	13.500
1918	14.000	14.100	14.000	14.200	14.500	14.700	15.100	15.400	15.700	16.000
1919	16.500	16.200	16.400	16.700	16.900	16.900	17.400	17.700	17.800	18.100
1920	19.300	19.500	19.700	20.300	20.600	20.900	20.800	20.300	20.000	19.900
1921	19.000	18.400	18.300	18.100	17.700	17.600	17.700	17.700	17.500	17.500
1922	16.900	16.900	16.700	16.700	16.700	16.700	16.800	16.600	16.600	16.700
1923	16.800	16.800	16.800	16.900	16.900	17.000	17.200	17.100	17.200	17.300
1924	17.300	17.200	17.100	17.000	17.000	17.000	17.100	17.000	17.100	17.200
1925	17.300	17.200	17.300	17.200	17.300	17.500	17.700	17.700	17.700	17.700
1926	17.900	17.900	17.800	17.900	17.800	17.700	17.500	17.400	17.500	17.600
1927	17.500	17.400	17.300	17.300	17.400	17.600	17.300	17.200	17.300	17.400
1928	17.300	17.100	17.100	17.100	17.200	17.100	17.100	17.100	17.300	17.200
1929	17.100	17.100	17.000	16.900	17.000	17.100	17.300	17.300	17.300	17.300
1930	17.100	17.000	16.900	17.000	16.900	16.800	16.600	16.500	16.600	16.500
1931	15.900	15.700	15.600	15.500	15.300	15.100	15.100	15.100	15.000	14.900
1932	14.300	14.100	14.000	13.900	13.700	13.600	13.600	13.500	13.400	13.300
1933	12.900	12.700	12.600	12.600	12.600	12.700	13.100	13.200	13.200	13.200
1934	13.200	13.300	13.300	13.300	13.300	13.400	13.400	13.400	13.600	13.500
1935	13.600	13.700	13.700	13.800	13.800	13.700	13.700	13.700	13.700	13.700
1936	13.800	13.800	13.700	13.700	13.700	13.800	13.900	14.000	14.000	14.000
1937	14.100	14.100	14.200	14.300	14.400	14.400	14.500	14.500	14.600	14.600
1938	14.200	14.100	14.100	14.200	14.100	14.100	14.100	14.100	14.100	14.000
1939	14.000	13.900	13.900	13.800	13.800	13.800	13.800	13.800	14.100	14.000
1940	13.900	14.000	14.000	14.000	14.000	14.100	14.000	14.000	14.000	14.000

Percent change				
<u>Nov.</u>	<u>Dec.</u>	<u>Avg.</u>	<u>Dec</u>	<u>Avg</u>
10.100	10.000	9.9		
10.200	10.100	10	1	1
10.300	10.300	10.1	2	1
11.500	11.600	10.9	12.6	7.9
13.500	13.700	12.8	18.1	17.4
16.300	16.500	15.1	20.4	18
18.500	18.900	17.3	14.5	14.6
19.800	19.400	20	2.6	15.6
17.400	17.300	17.9	-10.8	-10.5
16.800	16.900	16.8	-2.3	-6.1
17.300	17.300	17.1	2.4	1.8
17.200	17.300	17.1	0	0
18.000	17.900	17.5	3.5	2.3
17.700	17.700	17.7	-1.1	1.1
17.300	17.300	17.4	-2.3	-1.7
17.200	17.100	17.1	-1.2	-1.7
17.300	17.200	17.1	0.6	0
16.400	16.100	16.7	-6.4	-2.3
14.700	14.600	15.2	-9.3	-9
13.200	13.100	13.7	-10.3	-9.9
13.200	13.200	13	0.8	-5.1
13.500	13.400	13.4	1.5	3.1
13.800	13.800	13.7	3	2.2
14.000	14.000	13.9	1.4	1.5
14.500	14.400	14.4	2.9	3.6
14.000	14.000	14.1	-2.8	-2.1
14.000	14.000	13.9	0	-1.4
14.000	14.100	14	0.7	0.7

1979	68.300	69.100	69.800	70.600	71.500	72.300	73.100	73.800	74.600	75.200
1980	77.800	78.900	80.100	81.000	81.800	82.700	82.700	83.300	84.000	84.800
1981	87.000	87.900	88.500	89.100	89.800	90.600	91.600	92.300	93.200	93.400
1982	94.300	94.600	94.500	94.900	95.800	97.000	97.500	97.700	97.900	98.200
1983	97.800	97.900	97.900	98.600	99.200	99.500	99.900	100.200	100.700	101.000
1984	101.900	102.400	102.600	103.100	103.400	103.700	104.100	104.500	105.000	105.300
1985	105.500	106.000	106.400	106.900	107.300	107.600	107.800	108.000	108.300	108.700
1986	109.600	109.300	108.800	108.600	108.900	109.500	109.500	109.700	110.200	110.300
1987	111.200	111.600	112.100	112.700	113.100	113.500	113.800	114.400	115.000	115.300
1988	115.700	116.000	116.500	117.100	117.500	118.000	118.500	119.000	119.800	120.200
1989	121.100	121.600	122.300	123.100	123.800	124.100	124.400	124.600	125.000	125.600
1990	127.400	128.000	128.700	128.900	129.200	129.900	130.400	131.600	132.700	133.500
1991	134.600	134.800	135.000	135.200	135.600	136.000	136.200	136.600	137.200	137.400
1992	138.100	138.600	139.300	139.500	139.700	140.200	140.500	140.900	141.300	141.800
1993	142.600	143.100	143.600	144.000	144.200	144.400	144.400	144.800	145.100	145.700
1994	146.200	146.700	147.200	147.400	147.500	148.000	148.400	149.000	149.400	149.500
1995	150.300	150.900	151.400	151.900	152.200	152.500	152.500	152.900	153.200	153.700
1996	154.400	154.900	155.700	156.300	156.600	156.700	157.000	157.300	157.800	158.300
1997	159.100	159.600	160.000	160.200	160.100	160.300	160.500	160.800	161.200	161.600
1998	161.600	161.900	162.200	162.500	162.800	163.000	163.200	163.400	163.600	164.000
1999	164.300	164.500	165.000	166.200	166.200	166.200	166.700	167.100	167.900	168.200
2000	168.800	169.800	171.200	171.300	171.500	172.400	172.800	172.800	173.700	174.000
2001	175.100	175.800	176.200	176.900	177.700	178.000	177.500	177.500	178.300	177.700
2002	177.100	177.800	178.800	179.800	179.800	179.900	180.100	180.700	181.000	181.300
2003	181.700	183.100	184.200	183.800	183.500	183.700	183.900	184.600	185.200	185.000
2004	185.200	186.200	187.400	188.000	189.100	189.700	189.400	189.500	189.900	190.900
2005	190.700	191.800	193.300	194.600	194.400	194.500	195.400	196.400	198.800	199.200
2006	198.300	198.700	199.800	201.500	202.500	202.900	203.500	203.900	202.900	201.800

15.400	15.500	14.7	9.9	5
16.800	16.900	16.3	9	10.9
17.400	17.400	17.3	3	6.1
17.700	17.800	17.6	2.3	1.7
18.100	18.200	18	2.2	2.3
21.300	21.500	19.5	18.1	8.3
23.100	23.400	22.3	8.8	14.4
24.200	24.100	24.1	3	8.1
23.800	23.600	23.8	-2.1	-1.2
24.700	25.000	24.1	5.9	1.3
26.400	26.500	26	6	7.9
26.700	26.700	26.5	0.8	1.9
26.900	26.900	26.7	0.7	0.8
26.800	26.700	26.9	-0.7	0.7
26.900	26.800	26.8	0.4	-0.4
27.500	27.600	27.2	3	1.5
28.400	28.400	28.1	2.9	3.3
29.000	28.900	28.9	1.8	2.8
29.400	29.400	29.1	1.7	0.7
29.800	29.800	29.6	1.4	1.7
30.000	30.000	29.9	0.7	1
30.400	30.400	30.2	1.3	1
30.800	30.900	30.6	1.6	1.3
31.200	31.200	31	1	1.3
31.700	31.800	31.5	1.9	1.6
32.900	32.900	32.4	3.5	2.9
33.800	33.900	33.4	3	3.1
35.400	35.500	34.8	4.7	4.2
37.500	37.700	36.7	6.2	5.5
39.600	39.800	38.8	5.6	5.7
40.900	41.100	40.5	3.3	4.4
42.400	42.500	41.8	3.4	3.2
45.900	46.200	44.4	8.7	6.2
51.500	51.900	49.3	12.3	11
55.300	55.500	53.8	6.9	9.1
58.000	58.200	56.9	4.9	5.8
61.900	62.100	60.6	6.7	6.5
67.400	67.700	65.2	9	7.6

1941	14.100	14.100	14.200	14.300	14.400	14.700	14.700	14.900	15.100	15.300
1942	15.700	15.800	16.000	16.100	16.300	16.300	16.400	16.500	16.500	16.700
1943	16.900	16.900	17.200	17.400	17.500	17.500	17.400	17.300	17.400	17.400
1944	17.400	17.400	17.400	17.500	17.500	17.600	17.700	17.700	17.700	17.700
1945	17.800	17.800	17.800	17.800	17.900	18.100	18.100	18.100	18.100	18.100
1946	18.200	18.100	18.300	18.400	18.500	18.700	19.800	20.200	20.400	20.800
1947	21.500	21.500	21.900	21.900	21.900	22.000	22.200	22.500	23.000	23.000
1948	23.700	23.500	23.400	23.800	23.900	24.100	24.400	24.500	24.500	24.400
1949	24.000	23.800	23.800	23.900	23.800	23.900	23.700	23.800	23.900	23.700
1950	23.500	23.500	23.600	23.600	23.700	23.800	24.100	24.300	24.400	24.600
1951	25.400	25.700	25.800	25.800	25.900	25.900	25.900	25.900	26.100	26.200
1952	26.500	26.300	26.300	26.400	26.400	26.500	26.700	26.700	26.700	26.700
1953	26.600	26.500	26.600	26.600	26.700	26.800	26.800	26.900	26.900	27.000
1954	26.900	26.900	26.900	26.800	26.900	26.900	26.900	26.900	26.800	26.800
1955	26.700	26.700	26.700	26.700	26.700	26.700	26.800	26.800	26.900	26.900
1956	26.800	26.800	26.800	26.900	27.000	27.200	27.400	27.300	27.400	27.500
1957	27.600	27.700	27.800	27.900	28.000	28.100	28.300	28.300	28.300	28.300
1958	28.600	28.600	28.800	28.900	28.900	28.900	29.000	28.900	28.900	28.900
1959	29.000	28.900	28.900	29.000	29.000	29.100	29.200	29.200	29.300	29.400
1960	29.300	29.400	29.400	29.500	29.500	29.600	29.600	29.600	29.600	29.800
1961	29.800	29.800	29.800	29.800	29.800	29.800	30.000	29.900	30.000	30.000
1962	30.000	30.100	30.100	30.200	30.200	30.200	30.300	30.300	30.400	30.400
1963	30.400	30.400	30.500	30.500	30.500	30.600	30.700	30.700	30.700	30.800
1964	30.900	30.900	30.900	30.900	30.900	31.000	31.100	31.000	31.100	31.100
1965	31.200	31.200	31.300	31.400	31.400	31.600	31.600	31.600	31.600	31.700
1966	31.800	32.000	32.100	32.300	32.300	32.400	32.500	32.700	32.700	32.900
1967	32.900	32.900	33.000	33.100	33.200	33.300	33.400	33.500	33.600	33.700
1968	34.100	34.200	34.300	34.400	34.500	34.700	34.900	35.000	35.100	35.300
1969	35.600	35.800	36.100	36.300	36.400	36.600	36.800	37.000	37.100	37.300
1970	37.800	38.000	38.200	38.500	38.600	38.800	39.000	39.000	39.200	39.400
1971	39.800	39.900	40.000	40.100	40.300	40.600	40.700	40.800	40.800	40.900
1972	41.100	41.300	41.400	41.500	41.600	41.700	41.900	42.000	42.100	42.300
1973	42.600	42.900	43.300	43.600	43.900	44.200	44.300	45.100	45.200	45.600
1974	46.600	47.200	47.800	48.000	48.600	49.000	49.400	50.000	50.600	51.100
1975	52.100	52.500	52.700	52.900	53.200	53.600	54.200	54.300	54.600	54.900
1976	55.600	55.800	55.900	56.100	56.500	56.800	57.100	57.400	57.600	57.900
1977	58.500	59.100	59.500	60.000	60.300	60.700	61.000	61.200	61.400	61.600
1978	62.500	62.900	63.400	63.900	64.500	65.200	65.700	66.000	66.500	67.100

75.900	76.700	72.6	13.3	11.3
85.500	86.300	82.4	12.5	13.5
93.700	94.000	90.9	8.9	10.3
98.000	97.600	96.5	3.8	6.2
101.200	101.300	99.6	3.8	3.2
105.300	105.300	103.9	3.9	4.3
109.000	109.300	107.6	3.8	3.6
110.400	110.500	109.6	1.1	1.9
115.400	115.400	113.6	4.4	3.6
120.300	120.500	118.3	4.4	4.1
125.900	126.100	124	4.6	4.8
133.800	133.800	130.7	6.1	5.4
137.800	137.900	136.2	3.1	4.2
142.000	141.900	140.3	2.9	3
145.800	145.800	144.5	2.7	3
149.700	149.700	148.2	2.7	2.6
153.600	153.500	152.4	2.5	2.8
158.600	158.600	156.9	3.3	3
161.500	161.300	160.5	1.7	2.3
164.000	163.900	163	1.6	1.6
168.300	168.300	166.6	2.7	2.2
174.100	174.000	172.2	3.4	3.4
177.400	176.700	177.1	1.6	2.8
181.300	180.900	179.9	2.4	1.6
184.500	184.300	184	1.9	2.3
191.000	190.300	188.9	3.3	2.7
197.600	196.800	195.3	3.4	3.4
201.500	201.800	201.6	2.5	3.2
210.177	210.036	207.342	4.1	2.8
212.425	210.228	215.303	0.1	3.8

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