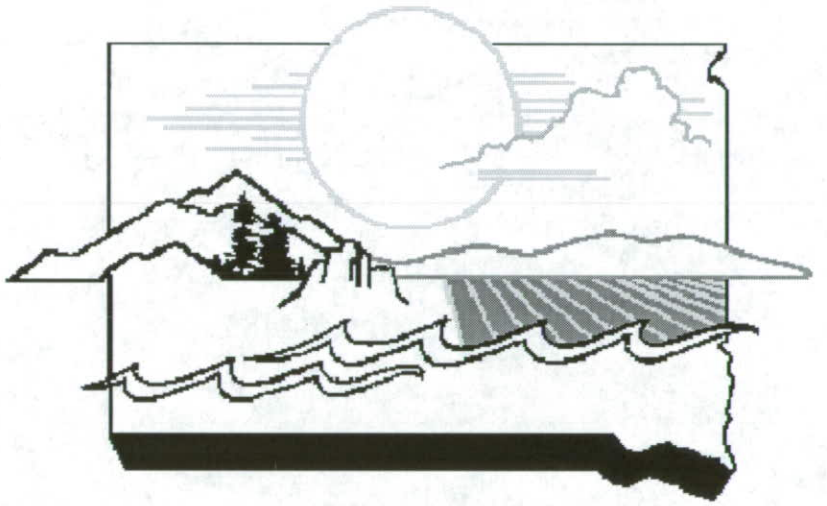
SUMMARY OF
THE MINING INDUSTRY IN SOUTH DAKOTA

1998



Protecting South Dakota's Tomorrow ... Today

PREPARED BY
THE MINERALS AND MINING PROGRAM
SD DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
MARCH 1999

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INTRODUCTION

The Department of Environment and Natural Resources is required by state law to prepare a "Summary of the Large Scale Gold Surface Mining Industry in the Black Hills" and a "Publication of Surface Mined Disturbed Land and Reclamation Acreages under Chapter 45-6B." These two reports have been combined into a single report entitled "Status of the Mining Industry in South Dakota." This report covers mining activities from January 1 to December 31, 1998. The information in this report is based on mine operators' annual reports and other information submitted by permitted large and small scale mine operators.

1998 Summary

The major mining story for 1998 was the on-going financial and environmental difficulties of Dakota/Brohm Mining Corporation. In February 1998 the Forest Service withdrew its approval of the Anchor Hill Phase II Project citing deficiencies in the Environmental Impact Statement (EIS) that was required for the project. Addressing these deficiencies and submitting a supplement to the EIS delayed the project. Unable to finance continuing operations at the site, Dakota announced in May that it would abandon the mine site. Governor William J. Janklow responded by going to the eighth circuit court and obtaining a temporary restraining order and a Preliminary Injunction to prevent Dakota/Brohm from abandoning the mine. To date, the company has complied with the restraining order and injunction. In July 1998 the Forest Service issued a new Record of Decision (ROD) approving the expansion of the Anchor Hill Mine. In September, Earthlaw filed an appeal of the ROD on behalf of several parties. On October 29, the Forest Service denied the Earthlaw appeal. At year-end, Dakota was pursuing financing for the Anchor Hill Project and finalizing operating and reclamation plans.

There was also a major decline in gold production in 1998. Large scale gold mines produced 389,875 ounces of gold in 1998, a decrease of 137,525 ounces from 1997. Most of the decrease was the result of lost production from the Homestake underground mine. Homestake announced in early 1998 that it was temporarily shutting down the underground portion of the mine to institute a new mining plan. The new plan would help Homestake withstand low gold prices without permanently shutting down the mine. When operations resumed in April, the workforce was reduced from 850 to 380 employees and production decreased from 397,298 ounces in 1997 to 277,402 ounces in 1998. In September, Homestake completed mining in the Open Cut.

Brohm's gold production dropped by almost 25,000 ounces in 1998 since it could not mine the remaining Anchor Hill deposit. Golden Reward remained under temporary cessation and produced no gold. LAC is no longer producing gold since the mine site is now undergoing final reclamation.

\S/

Nettie H. Myers
Secretary

SUMMARY OF THE LARGE SCALE GOLD MINING INDUSTRY IN THE BLACK HILLS

1998

Photo 1.1 – Reclaimed Hannibal Pit Area at the Golden Reward Mine. Boulders, logs, and stumps have been placed around the reclaimed area to create wildlife habitat.

MAJOR EVENTS IN 1998

Brohm Update

Brohm Mining began 1998 with plans to mine Phase II of the Anchor Hill Pit. In November 1997, the US Forest Service issued the final Environmental Impact Statement (EIS) and a favorable Record of Decision (ROD) that would allow Brohm to proceed with the Phase II expansion of the Anchor Hill project. The EIS was required before Brohm could expand Phase II of the Anchor Hill Pit onto US Forest Service land. In early January 1998, several environmental and citizens groups appealed the Forest Service decision. The US Forest Service reviewed the appeals, and on February 18, 1998, withdrew its approval of the Anchor Hill Expansion Project because of several deficiencies in the EIS that were identified. Since Brohm was required to address these deficiencies, the commencement of Phase II operations was delayed.

On May 21, 1998, Dakota Mining Corporation (Brohm's parent corporation) notified the department that, because of ongoing financial difficulties, it would abandon the Gilt Edge Mine site on May 29, 1998. On May 29, 1998, Governor Janklow, on behalf of the state, filed for and was granted a temporary restraining order by Judge Scott Moses that prevented Brohm from abandoning the site. After a second hearing in Deadwood on June 5, 1998, Judge Warren Johnson executed a Preliminary Injunction that extended the terms of the temporary restraining order.

Since the injunction was issued, Brohm was able to find financing to maintain the mine site through the end of 1998. In July 1998, the Forest Service issued a new Record of Decision approving the Phase II Project. In September, Earthlaw appealed the Forest Service decision on behalf of several parties. On October 29, the Forest Service denied the Earthlaw appeal. No subsequent appeals were filed for the remainder of 1998. At the end of 1998, Brohm was pursuing financing to resume mining in the spring of 1999.

Acid Mine Drainage Mitigation Update

LAC Minerals (USA), Inc./Richmond Hill Mine

The pit impoundment, backfilled with acid generating rock, continued its better than expected performance in 1998. Only minimum amounts of oxygen and water were detected in the impoundment which indicates the cap is effective in limiting oxygen and water infiltration. No signs of settling or slumping were found during several inspections of the pit impoundment by the department and LAC contractors. Only minor erosion was noted on a few portions of the impoundment. Vegetative cover on the pit impoundment and waste dump area improved during the year.

Ground and surface water quality around the pit impoundment and former waste dump area is slowly continuing to improve. Biological assessments of Squaw Creek below the mine show that macroinvertebrates and the trout populations have recovered to pre-1992 levels.

LAC took measures in 1998 to improve erosion control below an area west of the leach pad. Several high precipitation events eroded a large unstable channel below the area and caused sedimentation problems further downstream. LAC regraded the channel to stabilize the slope and installed several settling dams in the reconstructed channel. The area was then hydroseeded.

Photo 1.2 - Reclaimed LAC Pit Impoundment

Brohm Mining Corp./Gilt Edge Mine

As the mine was shut down, no reclamation work was completed. However, Brohm continued to collect and treat acidic water generated at the mine in 1998. The water treatment plant continued to treat water periodically through the year, and Brohm continued to evaporate acidic water in the Dakota Maid and Sunday Pits. Unfortunately, the treatment and evaporation system could not keep up with inflows from several high precipitation events during the summer and fall of 1998. After reducing the amount of water stored in the pits to about 65 million gallons at the end of 1997, the amount of water stored at the end of 1998 increased to about 90 million gallons.

Due to its financial problems, Brohm was unable to cap the bottom lifts of the Ruby Waste Rock Depository that have been regraded and compacted. Brohm is hopeful that, if it can mine Phase II of the Anchor Hill Pit in 1999, capping of the waste dump can be initiated.

New Permits

On June 18, 1998, the Board of Minerals and Environment approved a permit application submitted by Wharf Resources for its expansion project north and east of the present Wharf Mine. This followed 2 ½ days of testimony from Wharf, the department, and environmental interests during the May board meeting.

During the next 10 years, Wharf will mine two new pits in phases in conjunction with the Foley Pit. By mining in phases, Wharf will be able to reclaim one pit while mining another. The Portland Pit will be developed in 1999 and will be backfilled after mining is completed. The Trojan Pit will be mined in three phases and portions of the pit will be backfilled. The project

involves 616 acres, of which a total of 279 acres will be affected by the operation and 337 acres will be undisturbed.

Total production is estimated at 21,354,000 tons of ore (average grade 0.032 ounces of gold per ton, containing about 679,000 ounces) and 54,969,000 tons of overburden and waste rock. Waste rock from the Trojan Pit will be used to encapsulate the upper portion of the relic Bald Mountain Tailings area. Ore from the expansion project will be processed at the existing facilities at the Wharf Mine covered under Permit Numbers 356, 434, and 435.

Once mining is completed, the area will be reclaimed to woodland grazing which is the present post-mining land use for the current Wharf Mine.

Permit Amendments

There were no permit amendments issued to large scale gold and silver mining operations in 1998.

Preliminary Work Started on Abandoned Mine Reclamation

The department worked with the US Forest Service, the Bureau of Land Management (BLM), and EPA to begin the process of reclaiming two abandoned mine sites in the northern Black Hills. Federal Superfund (CERCLA) funds are being used to reclaim both mine sites. Both of these mines have open adits and shafts, acid mine drainage, eroding streamside tailings, and small sulfide waste rock piles.

A draft final site characterization report funded by EPA has recently been completed for the Minnesota Ridge Mine located about four miles northeast of Rochford. The next step in the process will be an engineering evaluation/cost analysis conducted by the US Forest Service to evaluate and select remedial alternatives. Once a remedial action is selected, the mine site may be reclaimed as early as next summer. Because the Minnesota Ridge Mine is located on public and private land, the EPA and the Forest Service will share in the clean-up costs.

BLM has funded and completed a site characterization and engineering evaluation/cost analysis of the Belle Eldridge Mine located about 1.5 miles southeast of Deadwood. The current proposal is to remove tailings from the stream channel of Spruce Gulch, regrade and vegetate the waste rock depository, construct runoff controls, and construct two wetlands to passively treat acid water discharging from the mine opening and an acid seep.

The department has a web page on Inactive and Abandoned Mines in the Black Hills located at http://www.state.sd.us/denr/DES/mining/acidmine.htm.

Homestake Reorganizes Underground Mine, Completes Open Cut Mining

1998 brought major changes to the Homestake underground and Open Cut mining operations. Homestake temporarily ceased production from the underground mine on January 26, 1998 to implement a major restructuring. During the shutdown, Homestake developed a new operating plan to reduce costs significantly and to position the mine for future operations. On March 26, 1998, Homestake resumed underground mining and began implementing the new plan. Under the new plan, gold production will be reduced from about 400,000 ounces per year to about 170,000 ounces per year. There was also a substantial reduction in the workforce, going from 850 employees to 380 employees. Homestake expects to invest up to $30 million in the mine over the next several years to increase efficiency and decrease costs.

Photo 1.3 – Mining near completion in the Open Cut

Mining in the Open Cut was temporarily suspended because of a major slide on March 21, 1998. After reviewing geotechnical instrument data that ensured pit highwall stability, a decision was made in early April to resume mining at a limited scale. Mining in the Open Cut continued until mid-September.

Notices of Violation

The department issued one Notice of Violation to large scale gold mines in 1998. Homestake Mining was issued one notice of violation and order under the water pollution control laws for a tailings release into Gold Run Creek. This notice of violation also covered a release in November 1997.

On November 26 and 27, 1997, a slurry line to the underground mine plugged. The slurry backed up and escaped through a vent line onto adjacent soils and into Whitewood Creek. It is estimated that less than 100 gallons of slurry entered the creek. Cyanide and heavy metals in the slurry killed about 65 brown trout.

On May 29, 1998, tailings from the west sand plant, which contained heavy metals and cyanide, escaped containment by eroding a concrete steel plug that separated an abandoned historic storm drain from the current tailings sluicing system. The tailings entered an old sewer line, which was combined with the City of Lead sewer system, and eventually flowed into Gold Run Creek and Whitewood Creek. The discharge contributed to a fish kill downstream in the Deadwood

area. It was estimated that 10,000 gallons of tailings containing 10 pounds of cyanide were discharged into the creek. Homestake took immediate steps to mitigate the effects of the discharge. The leak was plugged and sealed to prevent future discharges. Additionally, Homestake performed an immediate biological assessment on Whitewood Creek to assess the impact of the spill while simultaneously removing 12 to 15 tons of tailings from Gold Run Creek.

In a settlement agreement signed in December 1998, Homestake agreed to:

1. Pay a penalty of $150,000 to the department's emergency response fund;
2. Pay the city of Lead $50,000 to separate stormwater flows from the Lead sewer system;
3. Complete a thorough assessment of the processing facility to identify and correct any structural problems that could cause future releases; and
4. Complete biannual aquatic assessments of Whitewood Creek for at least the next three years.

At the time of this report, Homestake paid the $150,000 penalty to the emergency response fund and paid the city of Lead $50,000 for the sewer separation project.

Homestake Wins ABEX Award for Reclamation, Wharf Nominated for Bio-Denitrification Plants

Homestake Mining Company was awarded the ABEX award in environmental awareness by the South Dakota Chamber of Commerce. The Department of Environment and Natural Resources and the Department of Game, Fish, and Parks nominated Homestake for the award for its reclamation work on the Sawpit Waste Rock Disposal facility and its voluntary reclamation projects at the Red-Ex Mine and the Wasp No. 2 tailings area. The revised reclamation plan for

Photo 1.4 – Reclaimed Wasp #2 Tailings

Photo 1.5 – Reclaimed Sawpit Waste Rock Depository

the Sawpit facility greatly enhanced wildlife habitat features and created a more natural looking topography that blends in with the surrounding area. The reclamation and stream rehabilitation

plan initiated by Homestake at the Red-Ex Mine significantly exceeded the reclamation standards and requirements in Dakota Placer's reclamation plan covered under Mine Permit No. 208. Homestake's removal of the Wasp # 2 tailings and revegetation of the native ground under the tailings will improve the water quality in Whitewood Creek.

Wharf Resources was also nominated for the ABEX Award for its bio-denitrification plants. The plants are one of the first nitrate treatment plants to use biotechnology to treat mine water. They were constructed to reduce excess nitrate levels in spent ore on the leach pads and in the Ross Valley Spent Ore Depository. The excess nitrate levels are the result of residual nitrate from blasting and the breakdown of cyanide. Bacteria in the plants break the nitrates down into harmless by-products. The plants are proving to be successful in reducing nitrate levels.

Technical Revisions Conditionally Approved by the Department

January 26	Golden Reward – Modify final reclamation topsoil depth and final angle of repose slopes, establish seed mix for angle of repose slopes, and establish a vegetative monitoring plan.
February 24	LAC Minerals – Modify hydrologic monitoring plan.
March 23	Homestake Mining – Eliminate Iverson Field PM-10 station and temperature and precipitation monitoring at Open Cut.
April 8	Brohm Mining – Modify hydrologic monitoring requirements at Gilt Edge Mine.
April 14	Wharf Resources – Construct and use a biological denitrification plant in Ross Valley.
May 1	Golden Reward – Relocate game fence and cease monitoring of heap leach pad leak detection system.
May 12	Homestake Mining – Modify hydrologic monitoring plan.
June 2	Wharf Resources – Allow waste rock to be placed in the land application area.
June 9	LAC Minerals – Modify performance monitoring plan for pit impoundment.
June 24	Wharf Resources – Relocate powder and cap magazines.

July 14	LAC Minerals – Modify approved grass, tree, and shrub seed mix and establish vegetative monitoring plan.
October 29	Wharf Resources – Relocate diesel and gasoline storage areas.
November 9	Golden Reward – Continue diverting runoff from the neutralized heap leach pad to the spent ore depository.

Note: This list includes all technical revisions issued in 1998.

Special or Unique Land Determinations

The department did not receive any requests for determination of Special, Exceptional, Critical, or Unique Lands for potential large scale gold mines in 1998. However, on September 18, 1998, the seven year "clearance" designation along portions of Whitewood Creek for the Homestake/Goldstake special and unique lands determination expired. The "clearance designation was issued on September 18, 1991 and would have been valid if a permit application for the Whitewood Creek Tailings Project had been submitted within seven years after the designation. Since no permit application was submitted by either Homestake or Goldstake, the "clearance" period expired. If either company plans to proceed with the project, the department will need to conduct a new determination of special and unique lands for the project area before a mine permit application can be submitted.

ACREAGE AND PRODUCTION TABLES

The following tables were developed by compiling information from annual reports and supplemental information submitted to the department by the large scale gold mines. The department also used inspection reports and other records in completing these tables.

Various charts and graphs comparing total affected and reclaimed acreage can be found in Appendix 1. The bar chart on page A-2 compares affected acreage versus reclaimed acreage for each company. The graph on page A-3 shows the trend of total affected acres and total reclaimed acres for the large scale gold industry from 1990 to 1998. As can be seen in the graph, the gap between total affected and total reclaimed acres is beginning to narrow. The pie chart on the same page shows total reclaimed acres versus total unreclaimed acres for the large scale gold mine industry in 1998.

Photo 1.6 – Reclaimed portion of the Reliance buckwall at Wharf.

TABLE 1.1 - AFFECTED MINED LAND ACREAGE

Permit Number	Operator	Permitted Affected Acres	Additional Acres Affected Past Year	Total Acres Affected as of Dec. 31, 1998
439 & 462	Brohm Mining Corp.	564.00	0.00	263.00
208	Dakota Placers, Inc.	81.00	0.00	16.10
450	Golden Reward Mining Co., L.P.	493.62	0.00	397.00
332 & 456	Homestake Mining Company	658.23	0.00	549.74
445	LAC Minerals (USA), Inc.	439.10	0.00	320.70
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	122.00	0.00	0.00
356, 434, 435, & 464	Wharf Resources	972.42	29.89	655.44
TOTALS		3330.37	29.89	2201.98

Definitions:

Permitted Affected Acres - As defined in SDCL 45-6B-3(1), permitted affected land involves all lands permitted to be affected by a mining operation. This includes land from which overburden is to be or has been removed; land upon which overburden, waste rock, mine spoil, or mill tailings are to be or have been deposited; land disturbed by the building of access roads, railroad loops, warehouses, storage areas or other support facilities for the purpose of mining; and land affected by surface subsidence, unstable slopes, and other surface effects caused by underground mine workings.

Additional Acres Affected Past Year - Previously unaffected acres disturbed from January 1 to December 31, 1998. This acreage is also included in "Total Acres Affected as of Dec. 31, 1998."

Total Acres Affected as of Dec. 31, 1998 - All land currently affected by the large scale gold and silver operations under permit as of December 31, 1998. This includes all lands described above in "Permitted Affected Acres."

TABLE 1.2 – SURFACE MINING DISTURBED LAND ACREAGE

Permit Number	Operator	Additional Surface Mining Acres Disturbed Past Year	Total Surface Mining Disturbed Acres as of Dec. 31, 1998
439 & 462	Brohm Mining Corp.	0.00	202.10
208	Dakota Placers, Inc.	0.00	15.90
450	Golden Reward Mining Co., L.P.	0.00	258.50
332 & 456	Homestake Mining Company	0.00	520.64
445	LAC Minerals (USA), Inc.	0.00	192.90
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, 435, & 464	Wharf Resources	29.89	530.02
TOTALS		29.89	1720.06

Definitions:

Additional Surface Mining Acres Disturbed Past Year - Previously unaffected surface mining land disturbed from January 1 to December 31, 1998. This acreage is also included in "Total Surface Mining Disturbed Acres as of Dec. 31, 1998."

Total Surface Mining Disturbed Acres as of Dec. 31, 1998 - As defined in SDCL 45-6B-3(15), surface mining disturbed land is land from which overburden has been removed; land upon which overburden, waste rock, mine spoil, or mill tailings have been deposited; land mined which has no overburden; heap leach pads; and process ponds. Surface Mining Disturbed Lands include overburden and waste rock dumps, spent ore dumps, tailings impoundments, heap leach pads, open pits, process ponds, and haul roads in pit areas or constructed largely of waste rock, spent ore, or overburden. Surface Mining Disturbed Lands **do not** include access roads, haul roads constructed from normal cut and fill methods, railroad loops, utility corridors, buildings including process plants, land application areas, topsoil stockpiles, ore stockpiles, crusher areas, storage areas, sediment and erosion control structures, and land affected by surface subsidence, unstable slopes, and other surface effects caused by underground mine workings.

TABLE 1.3 – INTERIM RECLAIMED ACREAGE			
Permit Number	**Operator**	**Additional Interim Reclaimed Acres Past Year**	**Total Interim Reclaimed Acres as of Dec. 31, 1998**
439 & 462	Brohm Mining Corp.	0.00	0.95
208	Dakota Placers, Inc.	0.00	0.00
450	Golden Reward Mining Co., L.P.	0.00	7.21
332 & 456	Homestake Mining Company	0.00	0.00
445	LAC Minerals (USA), Inc.	0.00	31.00
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, 435, & 464	Wharf Resources	0.00	19.42
TOTALS		0.00	58.58

Definitions:

Interim Reclamation - As defined in ARSD 74:29:01:01(17), interim reclamation is reclamation performed during a mining operation or between mining phases to stabilize affected land by regrading and revegetating to control erosion, improve aesthetics and minimize hazards. It can be construed to be temporary reclamation or soil stabilization for affected land that will be disturbed again.

Additional Interim Reclaimed Acres Past Year - Acres under interim reclamation from January 1 to December 31, 1998. These acres are also included in "Total Interim Reclaimed Acres."

Total Interim Reclaimed Acres as of Dec. 31, 1998 - The total number of acres under interim reclamation as of December 31, 1998. Acres redisturbed or now considered as final reclamation are not included in these totals.

TABLE 1.4 - FINAL RECLAIMED ACREAGE FOR PAST YEAR

Permit Number	Operator	Final Reclaimed Acres Past Year that Meet Post-Mine Land Use[1]	Final Reclaimed Acres Past Year that Do Not Meet Post-Mine Land Use
439 & 462	Brohm Mining Corp.	0.00	0.00
208	Dakota Placers, Inc.	0.00	0.00
450	Golden Reward Mining Co., L.P.	36.10	0.00
332 & 456	Homestake Mining Company	38.44	12.78
445	LAC Minerals (USA), Inc.	38.30	5.00
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, 435, & 464	Wharf Resources	14.61	10.73
TOTALS		127.45	28.51

[1]The final reclaimed acres during the past year that meet the post-mining land use in this table are industry figures. The department may not necessarily agree with the reported acreage and will need to confirm in the field that these acres do meet the post-mine land use criteria.

Definitions:

Final Reclaimed Acres Past Year That Meet Post-Mine Land Use - Affected land under final reclamation from January 1 to December 31, 1998, that has a permanent, self-sustaining vegetative cover which meets the requirements of the approved reclamation plan and meets the reclamation requirements of SDCL 45-6B and ARSD 74:29. These acres can be considered for bond release.

Final Reclaimed Acres Past Year That Do Not Meet Post-Mine Land Use - Affected land under final reclamation from January 1 to December 31, 1998, that does not meet the requirements of the approved reclamation plan and the reclamation requirements of SDCL 45-6B and ARSD 74:29. Final grading, topsoil placement, erosion and drainage control, and seeding and planting have been conducted on these acres. However, these acres cannot be considered for bond release since they have not met the post-mining land use criteria.

TABLE 1.5 – TOTAL FINAL RECLAIMED ACREAGE
As of December 31, 1998

Permit Number	Operator	Final Reclaimed Acres that Meet Post-Mine Land Use[1]	Final Reclaimed Acres that Do Not Meet Post-Mine Land Use
439 & 462	Brohm Mining Corp.	0.00	17.50
208	Dakota Placers, Inc.	0.00	16.10
450	Golden Reward Mining Co., L.P.	57.38	113.96
332 & 456	Homestake Mining Company	244.57	143.02
445	LAC Minerals (USA), Inc.	69.70	147.70
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, 435, & 464	Wharf Resources	42.08	100.82
TOTALS		413.73	539.10

[1]The final reclaimed acres that meet the post-mining land use in this table are industry figures. The department may not necessarily agree with the reported acreage and will need to confirm in the field that these acres do meet the post-mine land use criteria.

Definitions:

Final Reclaimed Acres That Meet Post-Mine Land Use - Affected land under final reclamation as of December 31, 1998, that has a permanent, self-sustaining vegetative cover which meets the requirements of the approved reclamation plan and meets the reclamation requirements of SDCL 45-6B and ARSD 74:29. These acres can be considered for bond release.

Final Reclaimed Acres That Do Not Meet Post-Mine Land Use - Affected land under final reclamation as of December 31, 1998, that does not meet the requirements of the approved reclamation plan and the reclamation requirements of SDCL 45-6B and ARSD 74:29. Final grading, topsoil placement, erosion and drainage control, and seeding and planting have been conducted on these acres. However, these acres cannot be considered for bond release since they have not met the post-mining land use criteria.

TABLE 1.6 – SURFACE MINED RECLAMATION ACREAGE AND RECLAMATION CREDITS
As of December 31, 1998

Permit Number	Operator	Surface Mined Acres Reclaimed (SDCL 45-6B-86)	Total Affected Acres Reclaimed that Apply as Reclamation Credit in 1992 Mining Initiative (SDCL 45-6B-97)
439 & 462	Brohm Mining Corp.	3.00	11.20
208	Dakota Placers, Inc.	16.10	16.10
450	Golden Reward Mining Co., L.P.	129.44	145.25
332 & 456	Homestake Mining Company	377.98	387.59
445	LAC Minerals (USA), Inc.	157.70	217.40
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, 435, & 464	Wharf Resources	140.43	142.90
TOTALS		824.65	920.44

Definitions:

Surface Mined Acres Reclaimed - Total amount of surface mining disturbed acres under final reclamation as of December 31, 1998. The department is required to report these acres under SDCL 45-6B-86. Final grading, topsoil replacement, erosion and drainage control, and seeding and planting have been conducted on these acres.

Total Affected Acres Reclaimed That Apply as Reclamation Credit in 1992 Mining Initiative - Affected land under final reclamation as of December 31, 1998, that can be considered for reclaimed acreage credit as provided under SDCL 45-6B-97. Pursuant to SDCL 45-6B-97, reclamation is performed when the operator completes required grading, topsoil placement, erosion and drainage control, and seeding and planting.

TABLE 1.7 - ORE AND WASTE ROCK PRODUCTION FIGURES
January 1 to December 31, 1998

Permit Number	Operator	Tons of Ore Mined Past Year	Tons of Ore Processed Past Year	Tons of Waste Rock and Overburden Mined Past Year
439 & 462	Brohm Mining Corp.	0.00	0.00	0.00
208	Dakota Placers, Inc.	0.00	0.00	0.00
450	Golden Reward Mining Co., L.P.	0.00	0.00	0.00
332 & 456	Homestake Mining Company (Open Cut)	633,931.00	1,579,674.00	939,380.00
445	LAC Minerals (USA), Inc.	0.00	0.00	0.00
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00	0.00
356, 434, 435, & 462	Wharf Resources	4,136,599.00	4,216,760.00	7,093,757.00
TOTALS		4,770,530.00	5,796,434.00	8,033,137.00

TABLE 1.8 – GOLD AND SILVER PRODUCTION
January 1 to December 31, 1998

Permit Number	Operator	Ounces of Gold Produced Past Year	Ounces of Silver Produced Past Year
439 & 462	Brohm Mining Corp.	2,297	5,281
208	Dakota Placers, Inc.	0	0
450	Golden Reward Mining Co., L.P.	0	0
332 & 456	Homestake Mining Company[1]	159,956	38,089
445	LAC Minerals (USA), Inc.	0	0
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0	0
356, 434, 435, & 462	Wharf Resources	110,176	24,429
SUBTOTAL		272,429	67,799
N.A.	Homestake Underground	117,446	22,810
TOTALS		389,875	90,609
ESTIMATED VALUE[2]		$114,658,339	$501,974

[1] Reflects production from the Open Cut only and does not include production from under/ground operation which is listed below

[2] Based on 1998 average gold price of $294.09 and 1998 average silver price of $5.54

TABLE 1.9 – WATER AND CYANIDE USE
January 1 to December 31, 1998

Permit Number	Operator	Gallons Ground Water Withdrawn Past Year	Gallons Surface Water Withdrawn Past Year	Pounds of Cyanide Used Past Year
439 & 462	Brohm Mining Corp.	1,000,000.00	0.00	36,048.00
208	Dakota Placers, Inc.	0.00	0.00	0.00
450	Golden Reward Mining Co., L.P.	27,162,200.00[3]	5,390,400.00	0.00
332 & 456	Homestake Mining Company[1]	0.00	11,349,283.00[2]	2,356,052.00
445	LAC Minerals (USA), Inc.	3,500,000.00	27,358,340.00	0.00
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00	0.00
356, 434, 435, & 462	Wharf Resources	26,759,623.00	0.00	396,540.00
TOTALS		58,421,823.00	44,098,023.00	2,788,640.00

[1] Water and cyanide use by Homestake's underground mine is not included in this table.

[2] Homestake used 656,000 gallons of fresh water and 10,693,283 gallons of recycled treated water from its waste water treatment plant for its Open Cut operations in 1998.

[3] Golden Reward dewatered its Bonanza well and discharged the water. None of the water was used at the mine.

TABLE 1.10 – RECLAMATION BOND AMOUNTS FOR LARGE SCALE GOLD MINES

Permit Number	Operator	Original Bond Amount	Current Bond Amount	Type of Bond
439 & 462	Brohm Mining Corp.	$672,376	$12,850,000[1]	See Note 1
208	Dakota Placers, Inc.	$32,715	$27,000	Certificate of Deposit
450	Golden Reward Mining Co., L.P.	$954,384	$1,405,035	Certificates of Deposit
332 & 456	Homestake Mining (Open Cut)	$928,790	$1,737,000	Surety Bond
445	LAC Minerals (USA), Inc.	$656,000	$10,700,000	Irrevocable Letter of Credit
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	$661,800	$0[2]	See Note 2
356, 434, 435, & 464	Wharf Resources	$732,800	$2,884,973[3]	Surety Bond, Certificates of Deposit (See Note 3)

[1] As of December 31, 1998, the $12,850,000 bond for Mine Permit No. 439 and 462 consists of the following:

Permit 439 and 462 Reclamation Surety:	$4,136,676 certificates of deposit
Environmental Surety:	$1,982,350 certificates of deposit (cash portion)
	$6,730,974 demand note based on net worth

The reclamation surety covers basic site reclamation costs. The environmental surety covers costs of the acid rock drainage mitigation plan. Interest from the certificates of deposit is applied toward the cash portion of the environmental bond. The demand note amount will decrease over time as the cash portion of the environmental bond increases.

[2] Naneco Minerals is required to submit a reclamation bond in the amount of $661,800 before the commencement of mining

[3] Under permit conditions, Wharf is allowed to submit the reclamation bond in phases. The $2,884,973 bond covers the current Foley Ridge Mine and the first phase of the Clinton Mine (Portland Pit). Additional bonding will be submitted as additional phases are affected. Wharf also submitted a $500,000 post closure bond which is not part of the reclamation bond.

OPERATIONAL PLANS FOR 1999

Brohm Mining Corp.

Pending the outcome of financing and the approval of an operating plan by the US Forest Service, Brohm plans to start full production of the Anchor Hill Phase II Pit in 1999. A proposal to slightly increase the size of the pit may be submitted to the department for approval. Brohm will also continue with environmental compliance activities at the mine.

Reclamation activities will continue as financing becomes available. This will include the backfilling of the Dakota Maid Pit and the capping of the Ruby Waste Rock Depository. A revised reclamation plan will be submitted to the department for approval.

Dakota Placers, Inc.

Homestake Mining Company, in cooperation with Brightwater Inc., an affiliate of the Dunbar Resort, reclaimed the Red Placer Claim previously mined by Dakota Placers under Mine Permit No. 208. Once a self-sustaining vegetative cover is established, reclamation will be deemed complete and the permit will be closed.

Golden Reward Mining Company, L.P.

Golden Reward plans to remain under temporary cessation in 1999. No mining or ore processing is expected to be conducted. However, Golden Reward plans to continue environmental monitoring, asset protection, water balance control, reclamation, and potential exploration and evaluation on its properties.

Homestake Mining Company

Although Homestake has completed mining in the Open Cut, it will continue to crush and process stockpiled ore in 1999. Stockpiled ore from the Open Cut is expected to produce 13,855 ounces of gold during the first quarter. The length of crushing and processing will depend on the gold price, economics, and operational considerations.

Open Cut reclamation activities in 1999 will focus on the remaining ancillary facilities and access roads as they are removed from service. The south slope of the test pit in the Open Cut is scheduled to be regraded and seeded this spring. Reclamation has been completed on the Sawpit, Bobtail, Highland, and East Waste Rock Facilities, and monitoring and maintenance

will continue at these and other reclaimed facilities. Homestake also plans to continue voluntary improvement of existing reclamation.

LAC Minerals (USA), Inc./Richmond Hill Mine

LAC Minerals plans to continue active water treatment and environmental monitoring in 1999. Testing will be undertaken to evaluate options for passive treatment of the leach pad effluent. A technical revision may be submitted to the department for approval if an effective passive treatment method for the leach pad effluent can be developed.

Naneco Minerals, Inc.

Naneco Minerals is planning to find and develop a feasible processing site for the Ragged Top project in 1999. This, as well as possible joint ventures and development capital, is dependent on the price of gold.

Wharf Resources

Wharf Resources plans to mine the Vulcan, Maria, and Portland Pits in 1999. Mining in the Maria Pit will be completed, and the Portland Pit will be the first pit developed in the expansion area. About 4.2 million tons of ore and 7.3 million tons of waste rock will be mined and 4.2 million tons of material will be moved to the heap leach pads.

Reclamation activities in 1999 will consist of reclaiming about 33 acres of disturbed land in the land application, Juno Pit backfill, and Maria Pit ramp areas.

Photo 1.7 - Reclaimed Squaw Creek Depository at Wharf

SUMMARY OF SURFACE MINE DISTURBED AND RECLAMATION ACRES UNDER SDCL 45-6B-86

1998

Photo 2.1 – Former bentonite mining area reclaimed by American Colloid

SUMMARY OF ALL MINE PERMITS

In accordance with SDCL 45-6B-86, the Department of Environment and Natural Resources has compiled information regarding the number of acres of surface mining disturbed land and the amount of such land that has undergone reclamation as defined in Chapter 45-6B and in section 45-6B-83.1 for the period January 1 to December 31, 1998. This does not include acreages for mining operations regulated under SDCL Chapter 45-6 (510 active licensed mine operators, 2,015 active licensed sites), mineral exploration regulated under SDCL Chapter 45-6C (14 operators, 121 permits, excluding oil and gas), or uranium exploration regulated under SDCL Chapter 45-6D (no current operators or permits.) Sources for these statistics are permit applications, operating and reclamation plans, annual reports, department inspections, and operator information.

Hills Materials Sold to Old Castle

After being part of Northwestern Engineering for almost 60 years, Hills Materials was sold in October 1998 to Old Castle Materials South Dakota. Old Castle is a subsidiary of CRH, an international building materials company headquartered in Dublin, Ireland. The new company was incorporated in South Dakota on September 11, 1998, and plans to keep Hills Materials active in South Dakota. The company will continue to be operated as Hills Materials.

Granite Quarry Provides Material for Day County Road Project

Last summer, Cold Spring Granite helped with the flood relief efforts in Day County. It provided material for the project to raise the elevation of a portion of Highway 12 near Waubay. Fisher Sand and Gravel asked Cold Spring if some of the waste granite could be crushed and used for the road project. Cold Spring agreed, and Fisher began crushing the large granite blocks. A hydraulic hammer was used to break the large blocks into smaller blocks before they were crushed. Since the crushing project has been successful, it is possible that crushed waste granite could be used for road and other construction projects in the future.

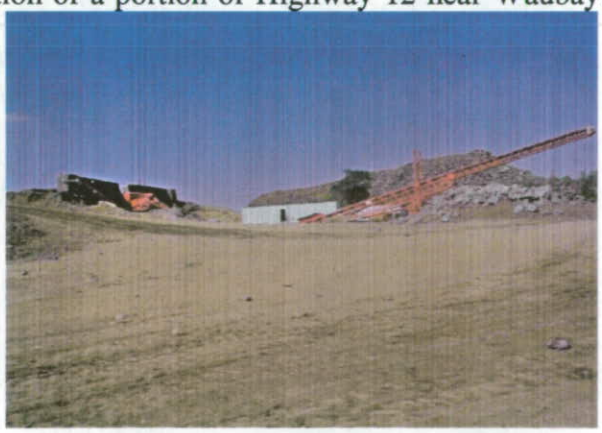

Photo 2.2 – Waste Granite Crushing Operation

Several Sites Reclaimed with Forfeited Reclamation Bonds

Over the past few years, several mine operators have forfeited bonds to the state for failure to complete required reclamation work. Most of the forfeited bonds covered sand and gravel or pegmatite operations. As of December 31, 1998, a total of seven sites have been reclaimed and three sites have been partially reclaimed. These sites are listed in Table 2.1.

Table 2.1 – Mine Sites Reclaimed with Forfeited Reclamation Bonds

Permit or License #	Operator	Location	Acres Reclaimed	Year Reclaimed	Land Use
83-220*	Tyrone Peters	1 mile N of Wagner	3.00	1993	Grazing
None	North American Accounts	5 miles SE of Custer	2.50	1994	Grazing
88-373	Rambo Mining	6 miles SE of Custer	1.00	1995	Grazing
448	North American Accounts	3 miles NW of Custer	1.50	1995	Grazing
452	Frank Wolbaum	2 miles E of Keystone	1.00	1995	Grazing
83-181*	Wick Const.	3 miles E of Canova	1.00	1997	Grazing
399	Rolland Longden	2 miles SW of Mystic	0.55	1998	Forest
91-426	International Rose Quartz	7 miles W of Custer	2.00	1998	Grazing
83-181*	Wick Const.	5 miles S of Salem	1.00	1998	Grazing
85-290*	Custer Gravel By-Products	9 miles SW of Custer	3.00	1998	Grazing/ Pond
91-426*	International Rose Quartz	3 miles E of Custer	2.50	1998	Grazing/ Forest

*Partial Reclamation

Bonds for unreclaimed mine sites on US Forest Service lands have been given to the Forest Service to complete reclamation work. These bonds are held jointly by the department and the Forest Service in accordance with a Memorandum of Understanding that has been in place for several years. The Forest Service has reclaimed one site and partially reclaimed two other sites. This arrangement has worked well for the department and the Forest Service and is an example of what can be accomplished if federal and state agencies work together.

Table 2.2 – Number of Mine Permits and Permitted Affected, Affected, and Surface Mined Disturbed Acreage				
	All Small Scale Permits	All Non-Gold Large Scale Permits	Large Scale Gold Permits[1]	All Mine Permits
Number of Permits	21	19	12	52
Permitted Affected Acres	777	3,018	3,330	7,125
Total Affected Acres	68	1,542	2,202	3,812
Surface Mining Disturbed Land Acres	62	1,307	1,720	3,089

[1] The acreage figures for large scale gold mines are separated for clarification purposes. The large scale gold mine statistics are not included in the figures for all non-gold large scale permits.

Definitions:

Small Scale Mining Permit - Permit for operations that extract less than 25,000 tons of ore or overburden per calendar year and disturb less than 10 acres of land.

Large Scale Mining Permit - Permit for operations that extract more than 25,000 tons of ore or overburden per calendar year and disturb more than 10 acres.

Permitted Affected Acres - Pursuant to SDCL 45-6B-3(1), this involves all lands permitted to be disturbed by a mining operation, including land from which overburden is to be or has been removed and land upon which overburden, waste rock, mine spoil, or mill tailings is to be or has been deposited; land which is disturbed by the building of access roads, railroad loops, warehouses, storage areas or other support facilities for the purpose of mining; and land affected by surface subsidence, unstable slopes, and other surface effects caused by underground mine workings.

Total Affected Acres - This includes all the land currently affected by the mining operations under permit. The total affected acres statistics are included in the figures for permitted affected acres.

Surface Mining Disturbed Land Acres - Pursuant to SDCL 45-6B-3(15), this includes all the land from which overburden has been removed, land upon which overburden, waste rock, mine spoil or mill tailings have been deposited, land mined which has no overburden, heap leach pads, and process ponds. The surface mining disturbed land statistics are included in the figures for total affected acres.

Table 2.3 - Reclaimed and Released Reclaimed Acres				
	All Small Scale Permits	**All Non-Gold Large Scale Permits**	**Large Scale Gold Permits[1]**	**All Mine Permits**
Total Reclaimed Acres	39	890	953	1,882
Reclaimed Surface Mining Disturbed Acres	31	808	825	1,664
Releasable Reclaimed Acres	29	69	414	512
Released Reclaimed Acres in 1998	0.75	0	0	0.75

[1] The acreage figures for large scale gold mines are separated for clarification purposes. The large scale gold mine statistics are not included in the figures for all non-gold large scale permits.

Definitions:

Total Reclaimed Acres - This includes all the land for which the operator completes required grading, topsoil replacement, erosion and drainage control and any required planting and seeding that the department finds has resulted or will later result in final reclamation. For large scale gold mines, these acres can be applied toward reclamation acreage credit as provided under SDCL 45-6B-97.

Reclaimed Surface Mining Disturbed Acres - Pursuant to SDCL 45-6B-86, this includes all surface mining disturbed lands for which the operator has completed required grading, topsoil replacement, erosion and drainage control and any required planting and seeding that the department finds will later result in final reclamation.

Releasable Reclaimed Acres - This includes all the reclaimed land for which reclamation surety and liability can be released as determined by the department. Such land must meet the minimum reclamation standards pursuant to ARSD 74:29:07. These figures do not include any acreage for which release of surety or liability has been granted by the Board of Minerals and Environment. The releasable reclaimed acres statistics are included in the figures for total reclaimed acres.

Released Reclaimed Acres - This includes all the reclaimed land for which reclamation surety and liability has been released by the Board of Minerals and Environment in 1998. This land has met the minimum reclamation standards pursuant to ARSD 74:29:07. The released reclaimed acres statistics are included in the figures for total reclaimed acres.

APPENDIX 1

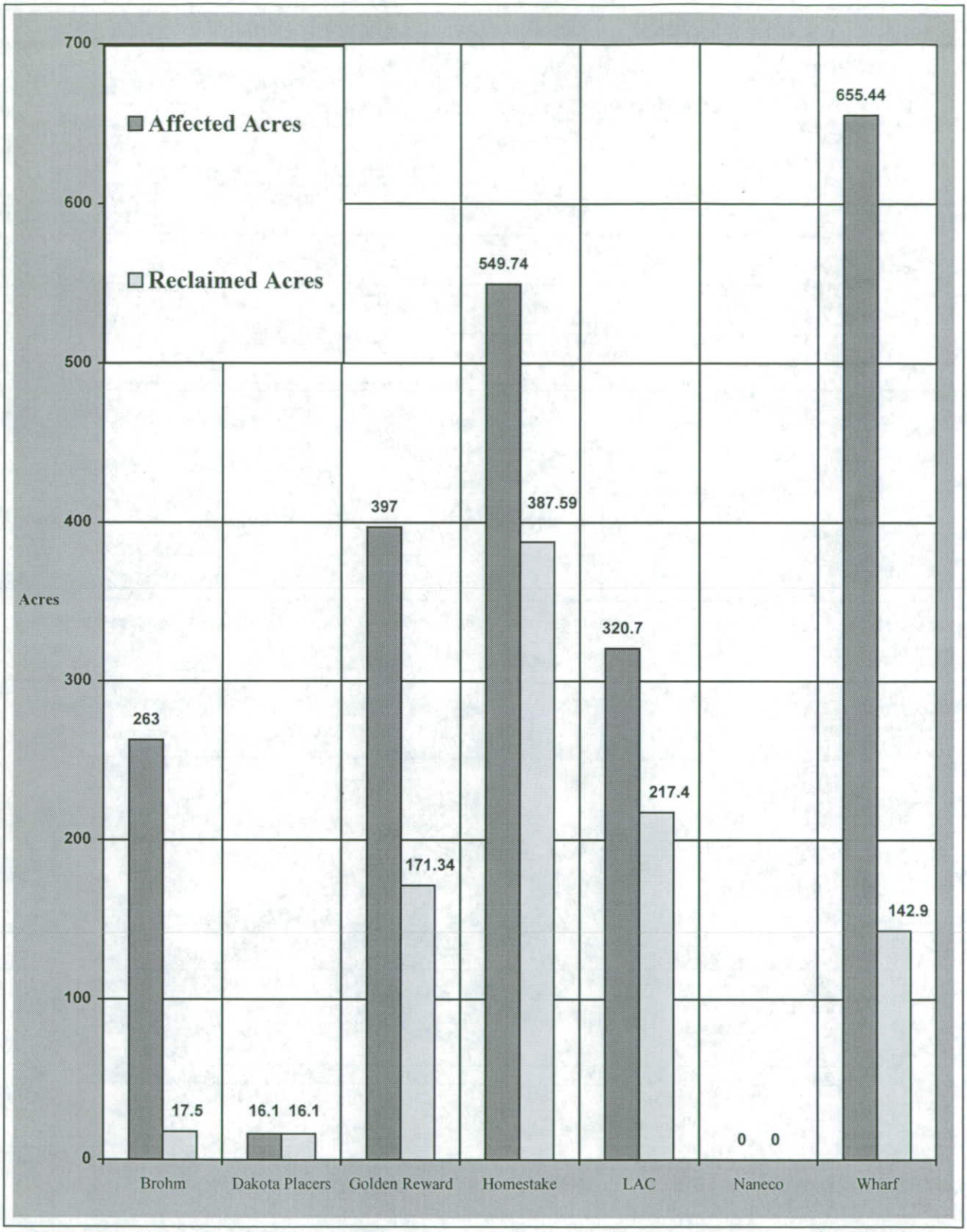

Figure 1A – Affected vs. Reclaimed Acreage at Large Scale Surface Gold Mines as of December 31, 1998.

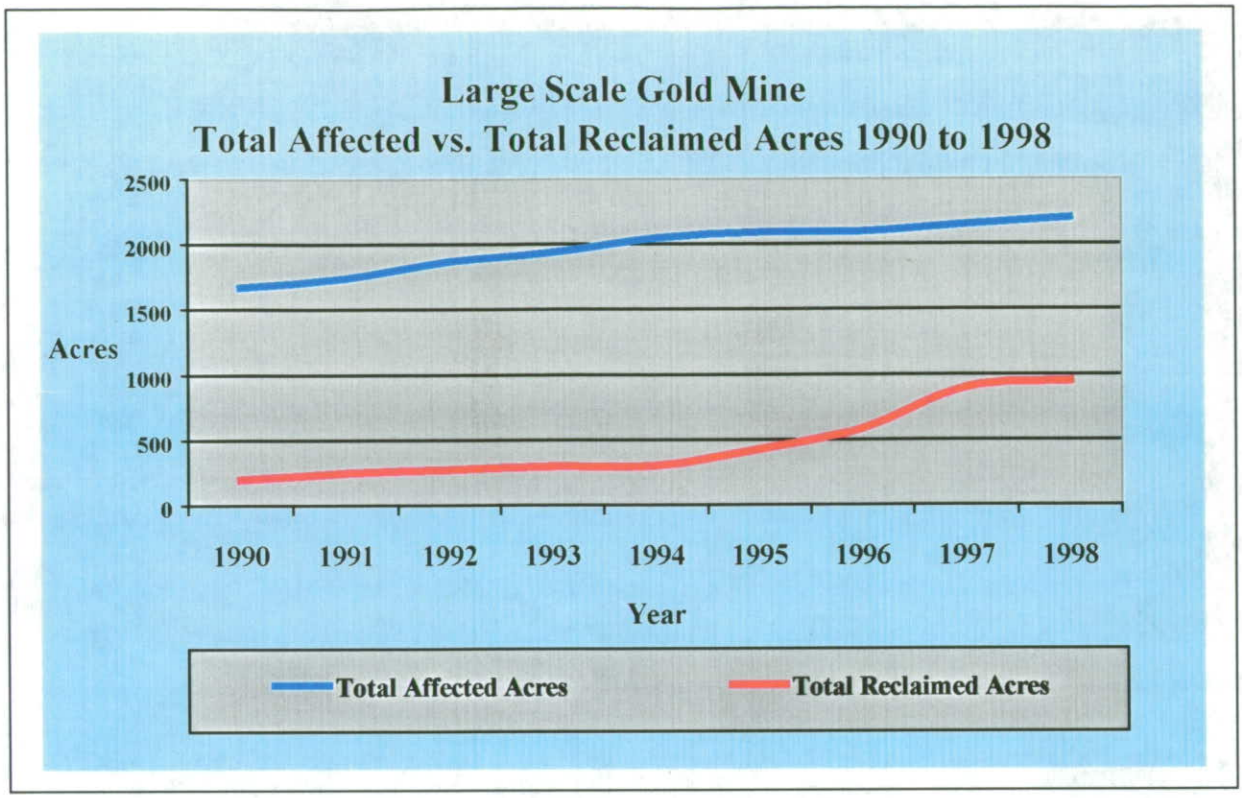

Figure 2A – Total Affected vs. Total Reclaimed Acreage at Large Scale Surface Gold Mines from 1990 to 1998.

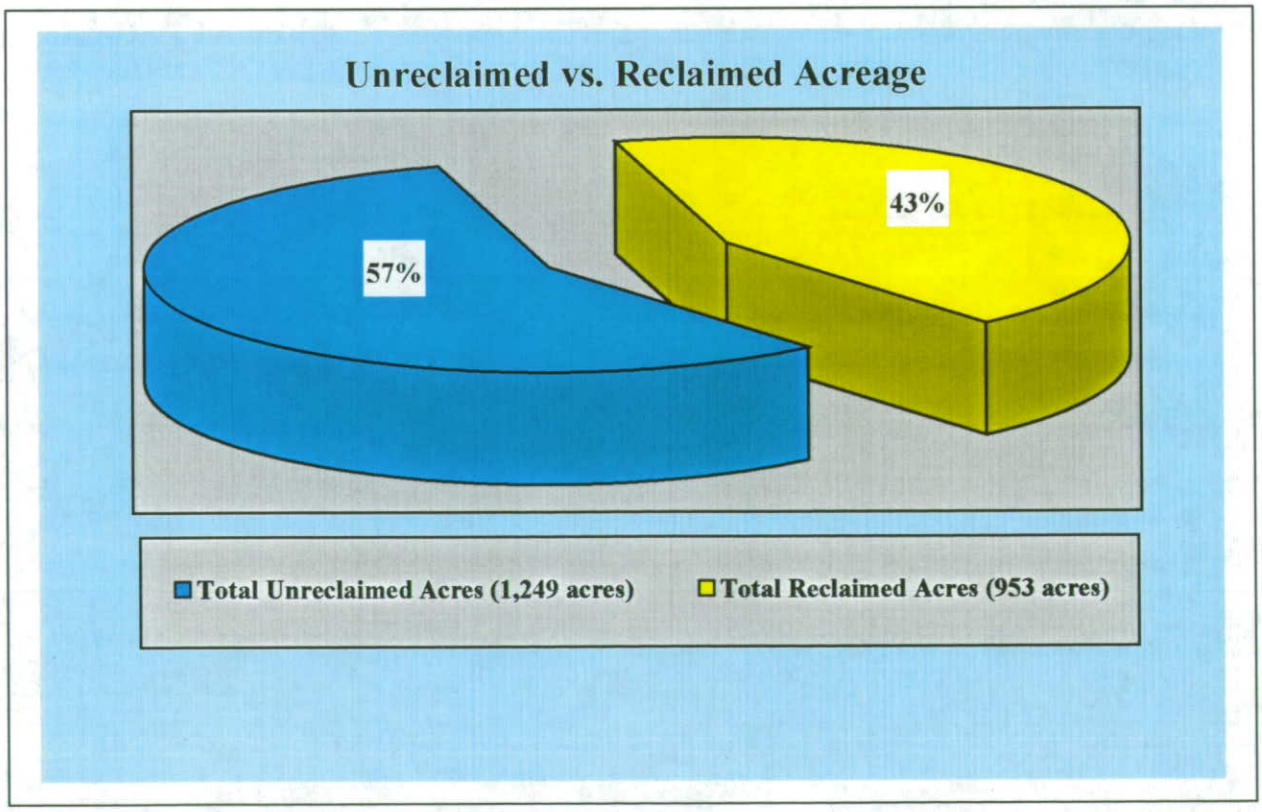

Figure 3A – Comparison of Unreclaimed vs. Reclaimed Acreage at Large Scale Surface Gold Mines in 1998.