

MK004PR
SECTION 13
MINE

HOMESTAKE MINING COMPANY

P.O. BOX 98
GRANTS, NEW MEXICO 87020
(505) 287-4456

August 30, 1994



UPS TRACKING LABEL: 1078 5568 745

State of New Mexico
Energy, Minerals and Natural
Resources Department
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Attn.: Mr. Holland W. Shepherd, Bureau Chief

Re: Prior Reclamation of Mine Sites

Dear Mr. Shepherd:

Enclosed are the five prior reclamation reports for Homestake Mining Company of California mines. The mines are Section 13, 15, 23, 25, all in Township 14 North, Range 10 West, and Section 32 in Township 14 North, Range 9 West. These reports comply with the New Mexico Mining Act to satisfy prior reclamation activities. Also enclosed is a check for \$1250 for fees at \$250 per mine site.

If you have any questions please contact me at the Grants office.

Sincerely,

HOMESTAKE MINING COMPANY

A handwritten signature in cursive script, appearing to read "F. R. Craft".

F. R. Craft
Resident Manager

FRC:jg

Enclosures

No. 0008959

DATE: 25-AUG-94 CUST. ACCT. NO.

VENDOR NAME State of New Mexico VENDOR NO: 3096

INVOICE NO.	INVOICE DATE	DESCRIPTION	DISCOUNT AMOUNT	NET AMOUNT
Inspection	19-AUG-94		.00	1,250.00

RECEIVED
 AUG 31 1994
 MINING & MINERALS
 DIVISION

PLEASE DETACH AND RETAIN THIS STATEMENT AS YOUR RECORD OF PAYMENT. *Thank You* .00 1,250.00

HOMESTAKE MINING COMPANY
 650 CALIFORNIA STREET, 11th FLOOR
 SAN FRANCISCO, CALIFORNIA 94108-2788

Drawn on
 Pittsburgh National Bank Jeannette, Pennsylvania
 in Cooperation With Wells Fargo Bank, N.A.
 #4759-008618 60-162/433

No. 0008959

CHECK DATE	CHECK NUMBER	CHECK AMOUNT
25-AUG-94	8959	1,250.00

PAY One Thousand Two Hundred Fifty Dollars and No Cents*****

TO THE
 ORDER OF State of New Mexico
 Energy, Minerals & Natural Resource
 2040 South Pacheco Street
 Santa Fe NM 87505

RECEIVED
 AUG 31 1994
 MINING & MINERALS
 DIVISION

BY _____
 BY _____

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505



BRUCE KING
GOVERNOR

December 14, 1994

ANITA LOCKWOOD
CABINET SECRETARY

Mr. Fred Craft
HomeStake Mining Co
P. O. Box 98
Grants, New Mexico 87020

RE: Evaluation Guidelines for Prior Reclamation Sites.

Dear Mr. Craft:

The Mining and Minerals Division (MMD) will be conducting inspections for the purposes of prior reclamation for the site(s) you have requested release. Based on Section 69-36-5 E. of the New Mexico Mining Act, the MMD has developed inventory of items to determine whether the completed reclamation satisfies the requirements of the New Mexico Mining Act and the substantive requirements for reclamation pursuant to the applicable regulatory standards.

This checklist is included for your use to determine if your site meets all of the ten criteria. Based on site-specific information, the MMD will be using this checklist to establish criterion based decisions to release the site from further responsibilities under the Act or not.

MMD will begin inspection of prior reclamation sites in early 1995 and will make a determination by September 30, 1995. If you have any questions regarding the checklist or questions regarding the inspection of your reclamation sites, please contact me or Joe DeAgüero at 505\827-5970.

Sincerely,

A handwritten signature in dark ink, appearing to read "H. Shepherd".

Holland Shepherd
Bureau Chief
Mine Act Reclamation Bureau
Mining and Minerals Division

VILLAGRA BUILDING - 408 Gallisteo
Forestry and Resources Conservation Division
P.O. Box 1948 87504-1948
827-5830

Park and Recreation Division
P.O. Box 1147 87504-1147
827-7465

2040 South Pacheco
Office of the Secretary
827-5950

Administrative Services
827-5925

Energy Conservation & Management
827-5900

Mining and Minerals
827-5970

LAND OFFICE BUILDING - 310 Old Santa Fe Trail
Oil Conservation Division
P.O. Box 2088 87504-2088
827-5800

Introduction

Purpose of Study

The purpose of this study is to determine if further measures are required to protect water resources from degradation following mining operations at Homestake Mining Company and United Nuclear Corporation Mines prior reclamation sites near Ambrosia Lake, New Mexico and Kerr-McGee Corporation sites near Church Rock, New Mexico. The sites are tabulated in Table I. These companies are applying for release from further obligations pursuant to Section 69-36-7 of the New Mexico Mining Act and Section 5.10 of the New Mexico Mining Act Rules.

According to Section 69-36-7 U of the New Mexico Mining Act and Section 5.10 of the New Mexico Mining Act Rules an operator may apply for release from further requirements of the Act if the director of the State of New Mexico Mining and Minerals Division determines that reclamation measures satisfy requirements of the Act and substantive requirements for reclamation pursuant to applicable regulatory standards. "Reclamation" is defined by the Act as "the employment during and after a mining operation of measures designed to mitigate disturbance of effected areas and permit areas and to the extent practicable, provide for the stabilization of a permit area following closure that will minimize future impacts to the environment from the mining operation and protect air and water resources."

Surface Water Resources

There are no perennial or intermittent streams in the area of Ambrosia Lake. All surface runoff drains to ephemeral water courses and eventually into the San Mateo Drainage (Homestake, 1994). While uranium mines were operating in the area the San Mateo Creek, a tributary of the Rio San Jose, gained flow as a response of mine discharge. This water seldom reached the Rio San Jose because of seepage into the alluvium. The San Mateo Creek is now directly recharged from ground water (Brod, 1979). Before uranium mining the Puerco River was also an ephemeral stream. During mining operations the Puerco River flowed at rates as high as 10 cu ft/sec. The Puerco River is now perennial principally because of municipal effluent discharge (Stone *et al.*, 1983). Water from mine dewatering operations contained elevated levels of radiochemicals and toxic metals. However, there are no lasting impacts on surface water resources because of mine water discharge (Kaufmann *et al.*, 1976). The shallow alluvium in the Ambrosia Lake Area is separated from underlying sandstone units by the impermeable Mancos Shale (Stone, 1983).

Protection of surface water resources with respect to erosion and sediment was accomplished by regrading the area to a stable configuration and reestablishment of permanent vegetation. Post mining topography and vegetation were inspected by Mining and Minerals Division personnel July 13-14, 1995 and will be addressed in a separate report. There were no waste piles of radioactive material left on the surface with the potential to contaminate surface water.

Table I
Prior Reclamation Study Site

Operator	Site	Wet Mine
Homestake Mining Company	Section 13 Mine	Dry
"	Section 15 Mine	Wet
"	Section 23 Mine	Wet
"	Section 25 Mine	Wet (Solution Mined)
"	Section 32 Mine	Wet
United Nuclear Corporation	Anna Lee Mine	Mostly Dry
"	John Bill Mine	Wet
"	Sandstone Mine (Section 34 Mine)	Wet
Kerr-McGee	Church Rock 1 Mine	Wet
"	Church Rock 1 East Mine	Wet
"	Church Rock 2 Mine	Wet

Groundwater Resources

Regional Aquifer's

Figure 1 (Stone *et al.*, 1983) shows the geologic section in the Raton Basin. The City of Gallup derives most of its drinking water from the Gallup Sandstone. The San Andres Limestone and Glorieta Sandstone combine to form a significant aquifer along the southern margin of the San Juan Basin between Grants and Gallup. The Cities of Grants and Milan obtain water from this Aquifer. The Village of San Mateo relies primarily on the Point Lookout Sandstone for its drinking water supply. The Morrison Formation, in which uranium mining took place, is the source of the public water supply for the Village of Crownpoint (Stone *et al.*, 1983).

Regional Groundwater Flow

The geology of the San Juan Basin is characterized by alternating strata of high and low hydraulic conductivities and, therefore, the major component of ground water flow in the San Juan Basin is through the higher conductivity units. The amount of vertical movement between aquifers is difficult to determine using available data. However, differences between vertically adjacent aquifers suggest that leakage rates through intervening shale beds are very low in most areas (Stone *et al.*, 1983). The geologic section in Figure 1 shows the probable direction of flow through confining beds. Note that the flow direction of leakage from the Morrison Formation is downward.

Generally, ground water flow within aquifers is from topographically high outcrop areas toward lower outcrop areas. Much of the recharge to aquifers in the basin occurs on the flanks of the Zuni, Chuska and Cebolleta Mountains. Also contributing to the regional flow systems is recharge from high areas along the northern and northeastern basin margins, including the San Juan Mountains in Colorado. The San Juan valley in the northwest part of the basin and tributaries of the Rio Grande such as the Rio Salado, Rio Puerco and Rio San Jose in the southeast parts of the basin are the main discharge areas for the basin. Less important in terms of volume of outflow is the Puerco River near Gallup. Ephemeral stream channels filled with alluvium are the principal sources of groundwater recharge at higher elevations and the principal locations of discharge at lower elevations. The alluvial cover usually conceals evidence of discharge. Occasionally, white salt or alkali deposits associated with small-yield springs reveal groundwater discharge. Most discharge to alluvial channels is lost by evapotranspiration. However, some also moves as subsurface flow (Stone *et al.*, 1983).

The stratigraphic units of the prior reclamation sites in the vicinity of Ambrosia Lake are shown in Figure 2 (Kelly, 1963). This figure shows the Cretaceous system of the Mancos Shale and Dakota Sandstone overlying the Jurassic System of the Morrison Formation. Uranium ore was found in the "A" through "D" units of the Westwater Canyon member of the Morrison Formation (Homestake, 1994). Figure 2 shows that the Gallup Sandstone and Point Lookout Sandstone Aquifers do not exist in the area of the Homestake and United Nuclear sites (except the northeast corner of United Nuclear's Section 28) and that the Mancos Shale Aquitard isolates the Morrison formation from overlying formations down dip.

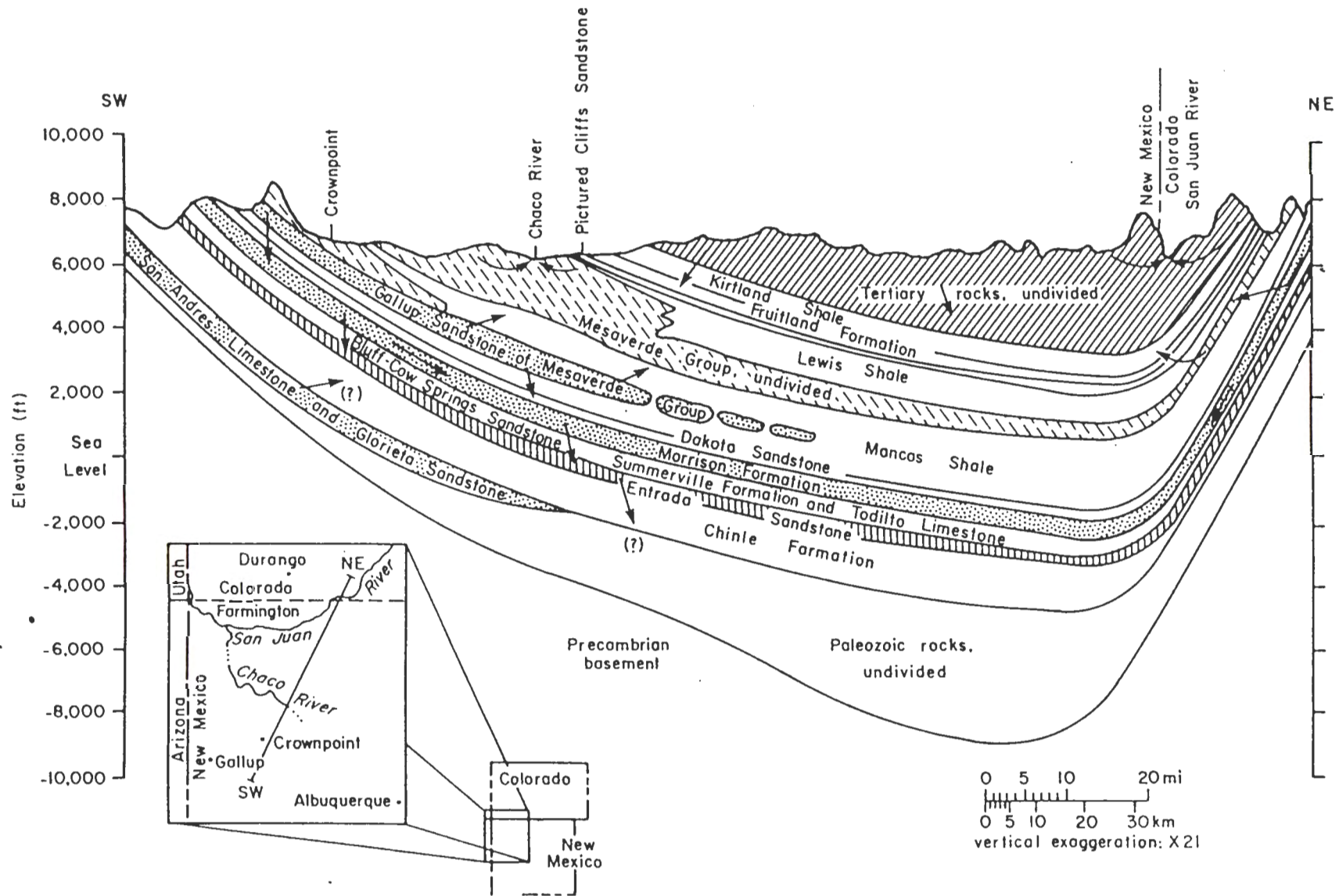


Figure 1 - Generalized Hydrologic Cross Section of San Juan Basin showing major aquifers (stipped), confining beds (blank), and directions of groundwater flow (arrows). From Stone et al., 1983

SYSTEM	STRATIGRAPHIC UNIT	
CRETACEOUS	MANCOS SHALE	
	DAKOTA SANDSTONE	
JURASSIC	MORRISON FORMATION	BRUSHY BASIN MEMBER
		WESTWATER CANYON MEMBER
	"A" SANDSTONE	
	"K" SHALE	
	"B" SANDSTONE	
	"K ₁ " SHALE	
	"C" SANDSTONE	
	"K ₂ " SHALE	
	"D" SANDSTONE	
	RECAPTURE MEMBER	

Figure 2 - Divisions of Morrison Formation in the vicinity of Homestake Mining Company prior reclamation sites. From Kelly, 1963

Figure 3 (Stone *et al.*, 1983) shows the potentiometric surface for the Westwater Canyon member of the Morrison Formation. The Morrison Formation is the formation in which mining for uranium took place. This figure shows that the Westwater is recharged from the Nacimiento Mountains to the northeast and the Zuni Mountains to the southwest. Figure 4 (Stone *et al.*, 1983) depicts transmissivity within the Morrison Formation. From Figures 3 and 4 it is intuitive that groundwater within the Morrison Formation in the area of Ambrosia Lake flows primarily to the Rio Puerco discharge area in the southeast, away from Crownpoint. Groundwater within the Morrison Formation in the Church Rock Area flows north, away from Crownpoint, where it discharges into the San Juan River.

Figure 5 (Stone *et al.*, 1983) delineates elevations of the top of the overlying Dakota Sandstone. Figures 3 and Figure 5, show that the potentiometric surface in the Ambrosia Lake and Church Rock areas is well below the top of the Dakota Sandstone. Potentially contaminated water from the Morrison Formation, therefore, lacks potential to migrate to aquifers above. Also, according to Bill Ganus (1995) water levels within the Morrison Formation appeared to be stabilizing at an elevation of approximately 6600 feet (below the top of the Dakota Sandstone) after the cessation of mining operations in the Church Rock Area. In addition, if one considers the thickness and impermeability of the Mancos Shale that overlies both the Morrison Formation and the Dakota Sandstone it becomes oblivious that water within the Morrison Formation is confined to the Morrison Formation.

Mining Impacts on Ground Water Quality

Regional impacts of uranium mining on groundwater were associated with mine discharge, tailings pond effluent, solution mining and collapse of underground workings. Water quality was altered near mining operations because oxidation at the mine face makes some radionuclides soluble. As water levels in the mines return to their original levels it is expected that oxidation of uranium will cease and that water quality will return to pre-mining levels. The mines in which mining occurred in zones of saturated ground are indicated in Table I. All prior reclamation site vertical shafts were backfilled and capped with concrete to prevent contamination of groundwater by surface drainage. The Gallup Sandstone was sealed from the shaft at the Kerr-McGee sites near Church Rock (Ganus, 1995).

Mine discharge from mine dewatering operations was sometimes injected underground as well as discharged in surface drainages. Water pumped from mines often contained elevated levels of radiochemicals and toxic metals (Kaufmann *et al.*, 1976). Although some water pumped from the mines was used for milling, much of the water was injected underground, used for other purposes, or discharged into arroyos. The quality of mine water discharged underground has been monitored by the U.S. Environmental Agency and the New Mexico Environment Department for impacts to groundwater resources since 1977. However, natural groundwater flowing into mine workings and which reenters the ground by gravity flow is exempt from WQCC discharge plan requirements.

Water discharged with mill tailings contained high levels of radioactive and other chemicals added or mobilized during the extraction process. The quality of discharged process water was monitored by the U.S. Environmental Protection Agency and the New Mexico Environment Department for adherence to National Pollutant Discharge Elimination System and the New Mexico Water Quality

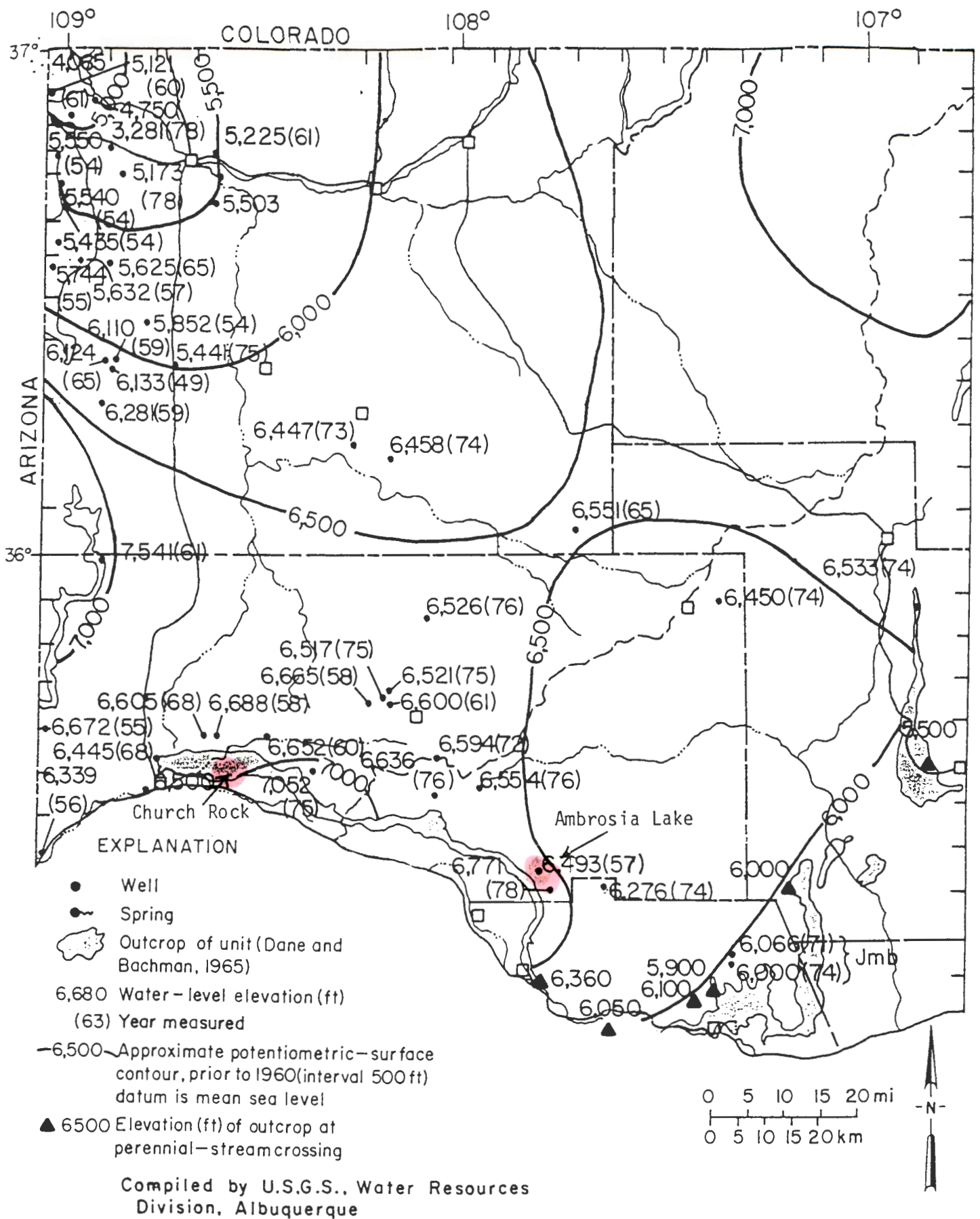


Figure 3 - Water level altitudes and potentiometric surface for Westwater Canyon Member of Morrison Formation. From Stone, et al., 1983

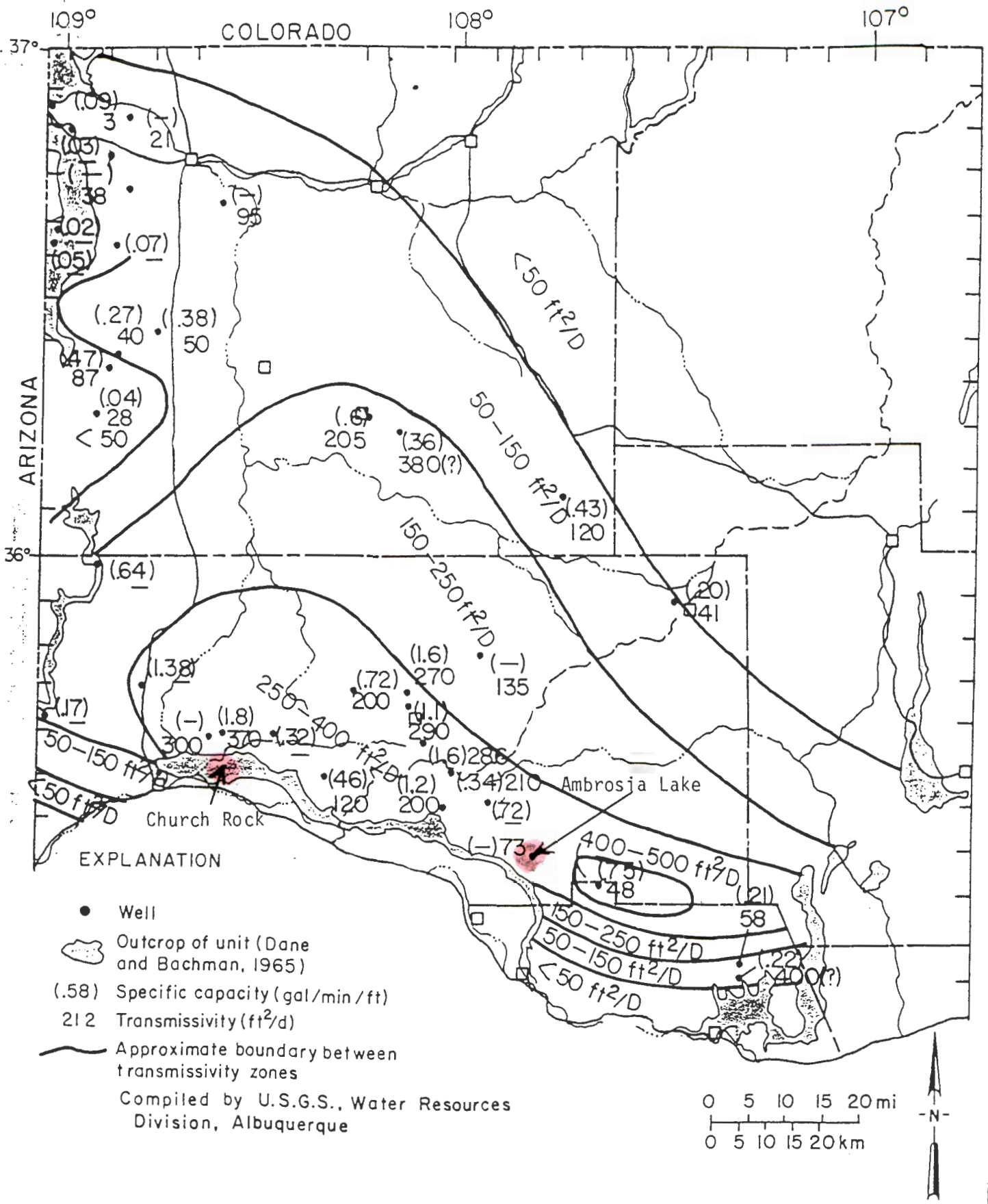


Figure 4 - Transmissivity and Specific Capacity of wells in Morrison Formation. Frone Stone, et al., 1983

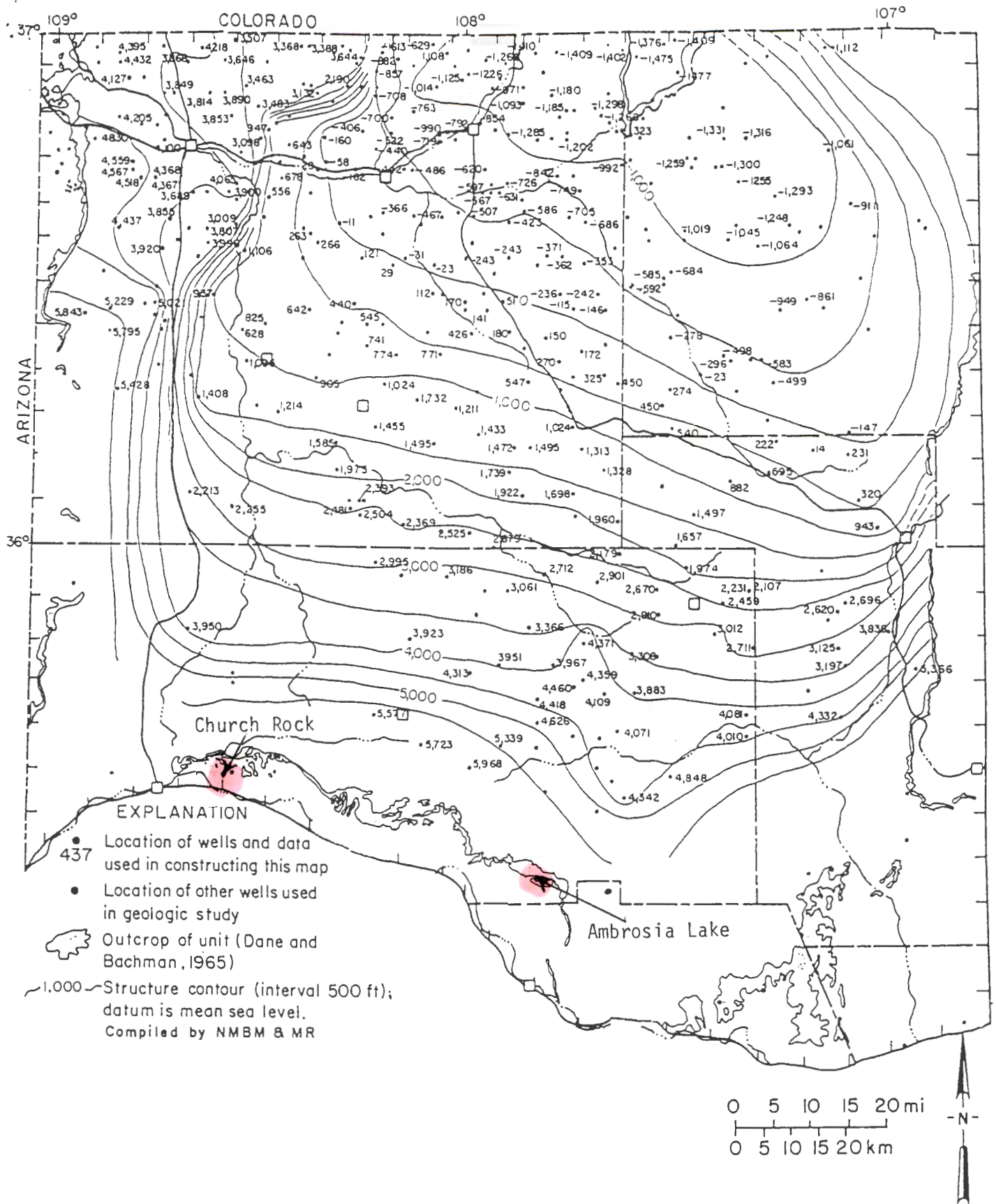


Figure 5 - Elevation of top of Dakota Sandstone structure. From Stone, From Stone, et al., 1983

Control Commission discharge regulations after 1977. Water used in the milling process and discharged with the mill tailings either evaporated or infiltrated to recharge shallow aquifers. Kaufman et al. (1976) said that about 30% of the tailings water in the Ambrosia Lake area infiltrated causing high levels of selenium in shallow groundwater near the tailings piles. Groundwater contamination associated with tailings dams is regulated by the Nuclear Regulatory Commission and is, therefore, beyond the scope of this study.

Collapse of underground workings has probably caused some deterioration of water quality in the Morrison Formation near Ambrosia Lake by providing a connection to the overlying Dakota Sandstone. In the Ambrosia Lake Area the Dakota Sandstone contains higher concentrations of dissolved solids than the Morrison (Cooper and John, 1968). There nothing mine operators can do to prevent further collapse of underground workings. However, sandstone has an especially high swell factor of 66 percent (Caterpillar, 1991). Consequently, it is unlikely that subsurface subsidence will extend to aquifers above the Dakota Sandstone.

At the Homestake Section 23 Mine uranium was extracted by in situ leaching. Although this method eliminated many water resource impacts associated with conventional mining, it caused some new ones, such as control of the leaching fluid and cleanup of the Morrison Aquifer after leaching ceased. Impacts on groundwater by solution mining are regulated via groundwater discharge plans by the New Mexico Environment Department.

Continental Oil Company personnel, after conducting a literature search on the mobility of radium in groundwater systems, concluded that dispersion, ion exchange, and radioactive decay prevents extensive migration of excessive radium concentrations that might persist in the immediate area of a mine (Jensen W.M., 1978). These geochemical processes, by which uranium minerals were deposited in the first place, probably limit migration of uranium as well as other toxic substances.

Mining Impacts to Ground Water Quantity

During mining operations a large quantity of freshwater was pumped to keep the mines dewatered. Much of the water needed for uranium mining and milling was provided by mine water discharge. In addition water for milling was produced from wells completed in the Glorieta Sandstone - San Andres Limestone near Grants and wells tapping the Morrison Formation north of Laguna. Dewatering caused large declines in water levels in the Morrison Formation (Lyford *et al.*, 1980). Pumpage of water for uranium exploration drilling also caused water-level declines in the Gallup Sandstone. It is expected, however, that water levels will return to premining levels with the cessation of mining operations.

Summary and Conclusions

Protection of surface water resources with respect to erosion and sediment was accomplished by regrading the area to a stable configuration and reestablishment of permanent vegetation. Post mining topography and vegetation were inspected by Mining and Minerals Division personnel July 13-14, 1995 and will be addressed in a separate report. There are no waste piles of radioactive material left on the surface with the potential to contaminate surface water.

Uranium mining took place within the Morrison Formation and the Morrison Formation is the source of the public water supply for the Village of Crownpoint. However, water within the Morrison potentially contaminated by mining operations would most likely be confined to the Morrison Formation. The flow of groundwater within the Morrison Formation in the area of Ambrosia Lake is to the southeast and in the area of Church Rock to the north, away from the community of Crownpoint.

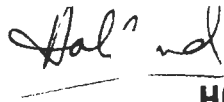
The quality of water discharged into surface arroyos has been regulated by the U.S. Environmental Protection Agency and the New Mexico Environment Department for adherence to National Pollutant Discharge Elimination System and the New Mexico Water Quality Control Commission discharge regulations after 1977. The quality of water discharged underground has been regulated since 1977 by the New Mexico Environment Department according to respective groundwater discharge plans. Mine dewatering has caused large declines in water levels in the Morrison Formation and the Gallup Sandstone. It is expected, however, that water levels will return to premining levels with the cessation of mining operations.

It is expected that oxidation of uranium minerals will cease and water will return to premining quality as groundwater recovers to premining levels. Geochemical processes such as dispersion, ion exchange, and radioactive decay may prevent extensive migration of excessive radium concentrations that might persist and limit migration of other toxic substances.

No further reclamation measures, that fall within the regulatory authority of the New Mexico Mining Act, are required to protect water resources from degradation following uranium mining at Homestake Mining Company and United Nuclear Corporation Mines prior reclamation sites near Ambrosia Lake, New Mexico and Kerr-McGee Corporation sites near Church Rock, New Mexico.

References

- Brod, R.C. 1979, Hydrogeology and Water Resources of the Ambrosia lake - San Mateo Area, McKinley and Valencia Counties, New Mexico: M.S. thesis, New Mexico Institute of Mining and Technology.
- Caterpillar (Caterpillar Inc.) 1991, Caterpillar Performance Handbook, Caterpillar Inc., Peoria, Illinois.
- Cooper, J. B. and John, E.C. 1968, Geology and Groundwater Occurrence in Southeastern McKinley County, New Mexico: New Mexico State Engineer, Technical Report 35.
- Homestake (Homestake Mining Company of California) 1994, Reclamation Report, Section 23 Mine.
- Jensen, W.M. 1978, Continental Oil Company, Personal Communication
- Kaufman et al. (R.F., Eadie G.G. and Russell, C.R. 1976, Effects of Uranium Mining and Milling on Ground Water in the Grants Mineral Belt, New Mexico and Colorado: New Mexico Geological Society, Guidebook 28th Field Conference.
- Kelly Vincent C. 1963, Geology and Technology of the Grants Uranium Region, New Mexico Bureau of Mines and Mineral Resources, Memoir 15.
- Ganus, B. 1995, Hydrologist, Kerr-McGee Corporation, Personal Communication.
- Lyford and Stone (Lyford, F.P. and Stone, W.J.) 1978, Groundwater Resources of Northwestern New Mexico, Geological Society of America, Abstracts with Programs, Volume 10, Number 5.
- Stone et al. (Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizell, N.H. and Padgett, E.T.) 1983, Hydrology and Water Resources of the San Juan Basin, New Mexico, New Mexico Bureau of Mines and Mineral Resources, Hydrologic Report 6.



HOMESTAKE MINING COMPANY

P.O. BOX 98
GRANTS, NEW MEXICO 87020
(505) 287-4456

December 19, 1995

20

Ms. Kathleen A. Garland, Director
Mining and Minerals Division
of New Mexico Energy, Minerals and Natural
Resources Department
P.O. Box 6429
Santa Fe, New Mexico 87505-6429

Re: Prior Reclamation Release, Sections 13, 15, 23, 25 and 32 Mines, McKinley
County

Dear Ms. Garland:

I received your Prior Reclamation Release letter dated September 29, 1995 on
November 16, 1995. In this letter I found some areas that need clarification or
changed to match the recorded documents already in the file. The following is a
list of the corrections:

Page	Paragraph	Comment
2	1st under Inspection Procedures	Inspections occurred on June 29 and July 13, 1995 not June 28
3	1st under Section 13, T14N, R10W	United Nuclear-Homestake Partners began operation of Section 13 Mine in October, 1977
5	1st under Section 15, T14N, R10W	Section 15 Mine had approximately 30 acres disturbed
7	1st under Section 23 (T14N, R10W)	This section was reclaimed in June of 1992
9	1st under Photograph of Homestake's Section 23 Mine	Site inspection on June 29, 1995
9	1st under Section 25, T14N, R10W	Inspection began on June 29, 1995
11	1st under Maintenance Item(s)	I did not receive report until November 16, 1995. A report will be sent to Director of MMD 60 days from November 16, 1995

Ms. Kathleen A. Garland, Director

December 19, 1995

Page 2

14	1st under Summary and Conclusion	Staff recommends that Section 15, Section 13, Section 25 and Section 32 mine sites be released from further requirements of the New Mexico Mining Act.
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Should you have any questions please contact me at (505) 287-4456.

Sincerely,



F. R. Craft
Resident Manager

FRC:jg

September 29, 1995

Mr. Fred Craft, Resident Manager
Homestake Mining Company of California
P.O. Box 98
Grants, NM 87020

RE: Prior Reclamation Release, Section 13, 15, 23, 25 and 32 Mines, McKinley County, New Mexico

Dear Mr. Craft:

The Mining and Minerals Division (MMD) has completed the inspection of reclamation measures at the following mines as requested by Homestake Mining Company of California (HMC):

Section 13 T14N R10W
Section 15 T14N R10W
Section 25 T14N R10W
Section 32 T14N R9W

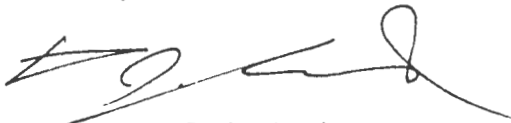
Based on findings in the enclosed inspection reports, reclamation measures at the above mines satisfy the requirements of the New Mexico Mining Act (NMMA) and the substantive requirements for reclamation pursuant to the NMMA Rules. Therefore, HMC is hereby released from further requirements of the NMMA on the mines listed above. However, the Section 25 Mine was identified by staff as having one maintenance item which will need to be addressed. The release for this site will be conditional on Homestake performing the work discussed in the Section 25 report and meeting the deadline provided in the report.

The enclosed prior reclamation inspection report details the findings of the inspection but does not include the photos/slides contained in the MMD file copy.

The Section 23 Mine was identified by staff as having insufficient cover to meet release. However, since Homestake has completed most reclamation measures at the mine, Homestake may apply for a variance from the provisions of the NMMA Rules pursuant to Rule 10. Otherwise Homestake must apply for a permit under the provisions of Rule 5.10.B.

MMD appreciates HMC's efforts to comply with the NMMA and commends them for their safeguarding and reclamation efforts. If you have any questions please contact Holland Shepherd of the Mining Act Bureau, (505) 827-5971.

Sincerely,

A handwritten signature in black ink, appearing to read 'K. Garland', with a long horizontal flourish extending to the right.

Kathleen A. Garland, Director
Mining and Minerals Division

cc: Ms. Maxine Goad, New Mexico Environment Department
Mr. Mark Schmidt, State Land Office
Mr. Jerry Elkins, Surface Owner

Enclosures

**PRIOR RECLAMATION INSPECTION REPORT
AND
RECOMMENDATION FOR RELEASE OR PERMIT REQUIREMENT**

Homestake Mining Company -- California

**Section 13, (T 14N R 10W), Section 15 (T 14N, R 10W), Section 23 (T 14N, R 10W),
Section 25 (T 14N, R 10W) and Section 32 (T 14N, R 10W) Mines**

**Submitted in Partial Fulfillment of the New Mexico Mining Act
Section 69-36-7 U., Prior Reclamation**

**New Mexico Energy, Minerals and Natural Resources Department
Mining and Minerals Division
Mining Act Reclamation Bureau**

September 26, 1995

Introduction

The purpose of these inspections was to determine if reclamation measures at Homestake Mining Company's Section 13, Section 15, Section 23, Section 25, and Section 32 Mines satisfy the requirements of the New Mexico Mining Act (Section 69-36-7, Prior Reclamation) and other substantive requirements for prior reclamation pursuant to the New Mexico Mining Act Rules. The sites, their locations, and dates of inspections by the New Mexico Mining and Minerals Division are presented in Table 1.

Table 1. Homestake Mining Company's Prior Reclamation Sites.

Name of Mine	Location	Date of Inspection
Section 13	T 14N, R 10W	July 13, 1995
Section 15	T 14N, R 10W	July 13, 1995
Section 23	T 14N, R 10W	June 28, 1995
Section 25	T 14N, R 10W	June 28, 1995
Section 32	T 14N, R 10W	July 13, 1995

Inspection Procedures

Inspections by the Mining and Minerals Division of prior reclamation sites were conducted on the following mine sites: Section 13 (T 14N, R 10W), Section 15 (T 14N, R 10W), Section 23 (T 14N, R 10W), Section 25 (T 14N, R 10W), and Section 32 (T 14N, R 10W). All inspections were conducted and completed on June 28 and July 13, 1995. Persons present during the June 28, 1995 inspections of the Section 23 and Section 25 mines included: Mr. Joe DeAgüero, Mr. Robert Garcia, Ms. Tacy Harling, and Ms. Robyn Tierney of the New Mexico Mining and Minerals Division; and Mr. Fred Craft, representing Homestake Mining Company (HMC). Persons present during the July 13, 1995 inspection of the Section 13, Section 15, and Section 32 mines included: Mr. Fred Craft, representing Homestake Mining Company; and Ms. Tacy Harling, and Mr. Robert Young of the New Mexico Mining and Minerals Division (MMD). The authors of this inspection report were Ms. Robyn Tierney and Mr. Robert Young.

Inspections of each mine site consisted of a review of information submitted by the mine operator, subsequent discussion with the operator pertaining to mining and reclamation at each site, inspection of the condition of the reclaimed mine sites, line-intercept sampling for estimates of vegetative cover, compilation of plant species lists, measurement of reclaimed soil depths, and photo-documentation. Each of the mine sites was visually inspected for erosion features and hydrologic stability. During a walkover of each site, all slopes and areas of water concentration (ponds, diversions and areas where disturbed areas enter undisturbed lands) were visually inspected for stability. Topsoil placement and distribution were evaluated at each site. Sampling for topsoil depth consisted of randomly digging a series of holes to identify the depth of topsoil and the presence or absence of potentially toxic wasterock at rooting depth. Grading of all wasterock piles and

borrow areas was visually inspected. Placement and closure of portals and vent shafts were verified in the field.

The establishment and relative percent cover of reseeded and native plant species were evaluated in randomly placed transects. Fifty foot transects were evaluated at each mine site using the line intercept method (Bonham 1989). These transects were used to estimate the relative percent cover of each plant species intercepted at 3' intervals along a transect. Seventeen points per transect were recorded. In addition, a list of species present within a 50' X 6' belt transect adjacent to each transect was compiled. These sampling procedures, however, do not meet sample adequacy. Rather, these procedures were conducted to estimate the relative percent cover and to evaluate the diversity of species present at each of the eight mine sites. Additional resources would be needed to fully evaluate the vegetation of these prior reclamation sites to a level of sample adequacy and would require at least 24 additional man-hours of inspection time per site.

Results and Discussion

Maps and reports describing the conditions at the five mine sites were submitted by Homestake in 1994. The detail in these reports and maps is sufficient to describe conditions and facilities that were present on each site prior to reclamation and provide information on the reclamation of each site. Details of the reclamation activities at each site were further verified in discussions with Mr. Craft of Homestake Mining Company and by the on-site inspections conducted on June 29 and July 13, 1995.

Section 13, T 14N, R 10W

The present owner of the surface rights to Section 13 is Mr. Jerry Elkins. The owner of the mineral rights is Cerrillos Land Company (Santa Fe Pacific Railroad). Homestake-Sapin Partners began operation of the HMC Section 13 Mine in October 1977 as United Nuclear-Homestake Partners under a lease from Santa Fe Pacific Railroad. The partnership was dissolved February 1981 with Homestake Mining Company-Grants remaining as the operator. The company was later renamed Homestake Mining Company of California.

The Section 13 Mine lies within the Ambrosia Lake valley. Appendix A (Kelly 1963) depicts the stratigraphic column underlying the formations at this and the four other mine sites (Section 15, Section 23, Section 25, and Section 32) discussed in this report. Uranium ore was found in the "A" through "D" sandstone units of the Westwater Canyon member of the Morrison Formation (HMC, 1994). This mine was a dry mine (Craft, 1995). There are no surface water features in the section. Surface drainage is to an unnamed tributary of Arroyo del Puerto that, in turn, drains into San Mateo Creek. Structures which existed at the Section 13 Mine while it was in operation included an access road, a vertical shaft, a ventilation shaft, an equipment storage area, two waste rock piles, a compressor building and a office/hoist/compressor building. Homestake regraded and topsoiled the site in early 1992 and reseeded in June of the same year. The seed mixture used in the reclamation of the Section 13 Mine and the other mine sites is shown in Appendix B. Photographs of reclamation activities were provided in the request for prior reclamation inspection (HMC, 1994).

A barbed wire fence surrounded the site. All structures, trash or junk had been removed from the site. There were no visible piles or accumulations of toxic or waste material on the site. There were no apparent hazards

or erosion features that could affect public health and safety. The slopes of the reclaimed waste rock piles appeared stable with respect to erosion and mass movement. The reclaimed waste rock piles blended in with the surrounding terrain and provided topographic diversity. Shaft boreholes were backfilled with nontoxic mine waste material and capped with concrete slabs that were, in turn, covered with a foot of soil (HMC, 1994). Top soil depths across the site ranged from 5 to 14 inches. There was some evidence of grazing by wildlife. Perennial species identified on the site included blue grama, galleta, snakeweed, western wheatgrass, alkali sacaton and globemallow (Table 2). The area had had little precipitation during the course of the summer and vegetation was drought stressed. Line-intercept transects (Table 3) indicated that there was approximately 18 percent perennial vegetative cover and 30 percent litter cover (DeAgüero, 1995).

Table 2. List of Species at Homestake's Section 13 Mine

COMMON NAME	<i>Genus & species</i> ¹
Alkali sacaton	<i>Sporobolus airoides</i>
Western wheatgrass	<i>Agropyron smithii</i>
Crested wheatgrass	<i>Agropyron cristatum</i>
Blue grama grass	<i>Bouteloua gracilis</i>
Galleta	<i>Hilaria jamesii</i>
Ragweed	<i>Kochia scoparium</i>
Daisy fleabane	<i>Erigeron sp.</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Yellow snakeweed	<i>Gutierrezia sarothrae</i>

	Value (%)
Perennial Cover:	6
Litter Cover	53
Rock Cover	0
Bare Ground	35
Number of perennial species present in belt transect	5
Transect #2	Value (%)
Perennial Cover	24

Litter Cover	12
Rock Cover	0
Bare Ground	65
Number of perennial species present in belt transect	4
Transect #3	Value (%)
Perennial Cover:	24
Litter Cover	24
Rock Cover	6
Bare Ground	47
Number of perennial species present in belt transect	7

Maintenance Items:

None

Photographs of HMC's Section 13 Mine

1. This photograph is of the stockpile area following reclamation.
2. Photograph #2 documents the characteristic wasterock material found at the Section 13 mine site.
3. These two photographs (#3 and #4) are panoramic views of the borrow area.

Section 15, T 14N, R 10W

The Section 15 Mine prior reclamation site is located in the Ambrosia Lake valley, 27 miles northwest of Grants, New Mexico. Approximately 40 acres of Section 15 (where the headframe existed) were disturbed. The rest of the mine was restricted to underground workings. Homestake, however, has asked for release of the entire section and mine site from further requirements of the Act (Craft, 1995). The owner of the surface estate is Mr. Jerry Elkins. Mineral rights are owned by Cerrillos Land Company (Santa Fe Pacific Railroad).

Operation of the HMC Section 15 Mine was initiated by Homestake-Sapin Partners in February 1958 under a lease from Santa Fe Pacific Railroad. In 1968 Homestake-Sapin Partners became United Nuclear-Homestake Partners. This partnership was dissolved in February 1981 and Homestake Mining Company, later renamed Homestake Mining Company of California, became the operator. The Section 15 mine closed in 1981

(HMC, 1994). The mine was wet and water was pumped from the mine into a pond (Craft, 1995). There are no surface water features in the section. As in the case of Homestake's Section 13 Mine, surface drainage is to an unnamed tributary of Arroyo del Puerto which, in turn, drains into San Mateo Creek. Structures which existed while the Section 15 Mine was in operation included vertical shafts, a declined shaft, 3 ventilation boreholes, 2 waste rock piles, a dewatering pond and a office/hoist building. Homestake reclaimed this site in early 1992 and reseeded (Appendix B) it in June 1992. Photographs of the reclamation activities at this site are provided in the HMC report (1994).

The entire section and mine site have been fenced with barbed wire. All structures, trash, and debris have been removed from the mine site. There were no apparent accumulations of waste materials or hazards that could affect public health or safety on the site. The reclaimed wasterock piles were stable with no erosion or rill formation. These piles also blended in with the surrounding terrain and provided topographic relief. The mine and air shafts were backfilled with nontoxic mine waste materials, capped with concrete slabs, then covered with a foot of soil (HMC, 1994). Topsoil depths across the site ranged from 4.5 to 10 inches. There was some evidence of grazing by domestic cattle and wildlife. The vegetation (Table 4) also showed signs of drought stress. Litter cover and perennial vegetative cover (Table 5) were approximately 29 percent and 31 percent, respectively (DeAguero, 1995).

Table 4. List of Species at Homestake's Section 15 Mine

COMMON NAME	Genus & species ¹
Alkali sacaton	<i>Sporobolus airoides</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>
Western wheatgrass	<i>Agropyron smithii</i>
Blue grama grass	<i>Bouteloua gracilis</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Galleta	<i>Hilaria jamesii</i>
Foxtail barley	<i>Hordeum jubatum</i>
Yellow snakeweed	<i>Gutierrezia sarothrae</i>

¹ Nomenclature after: Martin, W. C. and C. R. Hutchins. 1980. A Flora of New Mexico. J. Cramer, Vaduz, Germany.
Welsh, S.L., et al. 1987. A Utah Flora. Great Basin Naturalist Memoir No. 9.

Table 5. Summary of Relative Cover Data at Homestake's Section 15 Mine

Transect #1	Value (%)
Perennial Cover	32
Litter Cover	29
Rock Cover	0

Bare Ground	32
Number of perennial species present in belt transect	5
Transect #2	Value (%)
Perennial Cover:	29
Litter Cover	29
Rock Cover	0
Bare Ground	35
Number of perennial species present in belt transect	8

Maintenance Items:

None.

Photographs of Homestake's Section 15 Mine

The photographs on the following page were taken during site inspection of the Section 15 Mine on July 13, 1995.

Section 23, (T 14N, R 10W)

This section was reclaimed in June of 1994. The seed mixture used in the reclamation of the Section 23 Mine is presented in Appendix A of this document. Most of the reclaimed mine site is covered with the annual weeds ragweed (*Kochia scoparium*) and Russian thistle (*Salsola kali*). The following table (Table 4) contains a list of all species identified on the reclaimed Section 23 mine site. This list is not inclusive of all the plant species that may be present on this site at other times of the year.

Table 6. List of Species at Homestake's Section 23 Mine

COMMON NAME	<i>Genus & species'</i>
Alkali sacaton	<i>Sporobolus airoides</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>
Crested wheatgrass	<i>Agropyron cristatum</i>

COMMON NAME	Genus & species ¹
Western wheatgrass	<i>Agropyron smithii</i>
Blue grama grass	<i>Bouteloua gracilis</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Galleta	<i>Hilaria jamesii</i>
Foxtail barley	<i>Hordeum jubatum</i>
Mountain brome	<i>Bromus mollis</i>
Cheatgrass	<i>Bromus tectorum</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Winterfat	<i>Ceratoides lanata</i>
Mexican hat	<i>Ratibida columnifera</i>
Dock sp.	<i>Rumex sp.</i>
Fourwing saltbush	<i>Atriplex canescens</i>
Yellow snakeweed	<i>Gutierrezia sarothrae</i>

¹ Nomenclature after: Martin, W. C. and C. R. Hutchins. 1980. A Flora of New Mexico. J. Cramer, Vaduz, Germany.
Welsh, S.L. et al. 1987. A Utah Flora. Great Basin Naturalist Memoir No. 9.

Table 7. Summary of Relative Cover Data at Homestake's Section 23 Mine.

Transect #1	Value (%)
Perennial Cover	0
Litter Cover	0
Rock Cover	0
Bare Ground	29
Number of perennial present in belt transect	0

Maintenance Items:

Homestake may need to consider reseeding this site or wait to see if an adequate cover can be achieved in another season or two of growth.

Photographs of Homestake's Section 23 Mine

The following photographs were taken during the site inspection on June 28, 1995 to document conditions at the Section 23 Mine. These represent a panoramic view of the mine.

Section 25, T 14N, R 10W

Inspection of the Section 25 Mine reclaimed by Homestake Mining Company began on June 28, 1995, and concluded (due to inclement weather) on July 13, 1995. Persons present during both portions of the inspection included: Mr. Fred Craft representing Homestake, the lead inspector for this prior reclamation inspection was Joe DeAgüero. Other inspectors representing MMD included: Ms. Robyn Tierney, Mr. Robert Garcia, Mr. Robert Young, and Ms. Tacy Harling.

The Section 25 Mine sits on an a flat area southwest of the New Mexico highway 509 spur. A prior reclamation report submitted by Homestake in 1994 for the Section 25 mine, describes the reclamation activities completed at the mine. Included in the report are maps of the reclaimed features (photos and field surveys), a discussion of the geology, ecology, topography and hydrology, detailed description of the reclamation conducted at the site and a description of achievement of Reclamation Requirements. The prior reclamation report submitted by HMC is a comprehensive summary of the reclamation conducted at the site. There is sufficient detail contained in the report to describe conditions and facilities that occurred at the site prior to reclamation and where these facilities were located. Further, the details of the reclamation conducted on site were verified on site during the inspections.

Table 8 lists of all plant species identified on the reclaimed site. This list is not inclusive of all species that may be present at other times of the year. Many of the forb species are dormant during the drought season.

Table 8. List of Species at Homestake's Section 25 Mine

COMMON NAME	<i>Genus & species'</i>
Alkali sacaton	<i>Sporobolus airoides</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>
Western wheatgrass	<i>Agropyron smithii</i>
Blue grama grass	<i>Bouteloua gracilis</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>

COMMON NAME	Genus & species ¹
Tumblegrass	<i>Schedonardus paniculatus</i>
Galleta	<i>Hilaria jamesii</i>
Curlycup gumweed	<i>Grindelia squarosa</i>
Bigelow's aster	<i>Aster bigelovii</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Milkweed	<i>Aesclepias sp.</i>
Winterfat	<i>Ceratoides lanata</i>
Yellow snakeweed	<i>Gutierrezia sarothrae</i>

¹ Nomenclature after: Martin, W. C. and C. R. Hutchins. 1980. *A Flora of New Mexico*. J. Cramer, Vaduz, Germany.
 Welsh, S.L., et al. 1987. *A Utah Flora*. Great Basin Naturalist Memoir No. 9.

The entire site was surveyed for erosion features. During a walkover of the mine site, slopes and areas of water concentration (ponds, diversions and areas where disturbed areas enter undisturbed lands) were evaluated for erosion. Most of the site appeared to be stable with little potential for development of erosion features. Disturbed portions of the section were graded and slopes were configured to minimize soil. This site, however, is largely flat with small, irregular undulations. The entire reclaimed area ties in well with the surrounding undisturbed landscape. Contoured slopes of the wasterock dumps have been designed, constructed and topsoiled. The south edge of the first (closest to highway 509) of two wasterock piles has some wind erosion damage. This area was regraded to reduce the slope and was re-topsoiled with alluvial soils from a local borrow area. The above mentioned disturbance will need to be reseeded in the fall of 1995 (see maintenance item #1). Sufficient topsoil for the establishment of vegetation has been borrowed and redistributed over the entire reclaimed area. A series of random and systematic sampling was conducted to identify the soil depth and the potential for any rooting or establishment problems. Random sampling of soil depth was done by digging soil pits approximately 18" deep to determine the depth of topsoil material acquired from a borrow site and distributed on the reclaimed site. Average topsoil depth was approximately 12 inches.

There are no perennial or intermittent streams near the site. All surface runoff drains to ephemeral drainages near the reclaimed site. Although the mine was situated in a geological strata that contained water, there should be no adverse effects to the hydrologic stability of the site. Concerns about surfacewater quality have been addressed by topsoiling, seeding and mulching the reclaimed shaft, stockpile and waste areas. With the exception of the retopsoiled area as discussed above, all of these areas are well covered with vegetation (Table 9), have achieved stability, and are configured to minimize erosion.

Table 9. Summary of Relative Cover Data at Homestake's Section 25 Mine.

Transect #1	Value (%)
Perennial Cover:	12
Litter Cover	29
Rock Cover	0
Bare Ground	59
Number of perennial species present in belt transect	9
Transect #2	Value (%)
Perennial Cover:	12
Litter Cover	41
Rock Cover	0
Bare Ground	47
Number of perennial species present in belt transect	7
Transect #3	Value (%)
Perennial Cover:	18
Litter Cover	18
Rock Cover	0
Bare Ground	65
Number of perennial species present in belt transect	7

Maintenance Item(s):

1. Reseed south portion of regraded and re-topsoiled wasterock pile (No. 1) no later than October 31, 1995. Please provide to the Director of the MMD, photographs and a description of work performed onsite, no later than November 15, 1995.

Photographs of Homestake's Section 25 Mine

No photographs were taken at this site.

Section 32, T 14N R10W

The Section 32 Mine prior reclamation site is located in the Ambrosia Lake valley, approximately 22 miles northwest of the City of Grants, New Mexico. The actual mine site consists of only 60 acres where the head frame existed -- the remaining mine workings were underground. Homestake, however, has asked for release of the entire mine site from further requirements of the Act (Craft, 1995). The owner of the surface estate and mineral rights is the State of New Mexico. Homestake operated and reclaimed the mine under a lease agreement with the State of New Mexico. The New Mexico Land Commission has officially terminated HMC's lease pending approval of reclamation by the Mining and Minerals Division (HMC, 1994).

Homestake-Sapin Partners began operation of the HMC Section 32 Mine November 1961. In 1968 this partnership became United Nuclear-Homestake partners. This partnership was, in turn, dissolved February 1981 and Homestake Mining Company-Grants (later renamed Homestake Mining Company of California) became the operator in February 1981. The mine was in operation from 1958 to 1979. The mine was wet and water was pumped from the mine into ponds (Craft, 1995). There are no surface water features in the section. Surface drainage is to an unnamed tributary of Arroyo del Puerto that, in turn, drains into San Mateo Creek. Structures which existed at the Section 32 Mine when it was in operation include an access road, vertical shaft, ventilation borehole, hoist house, office and change room building and a dewatering pond. Reclamation activities took place in August 1991 by independent contractors (HMC, 1994). Since then the site has been grazed as required by a lease agreement with the State of New Mexico (Craft, 1995).

This site was inspected for stability and the presence of permanent vegetation (Table 10). Although grazing has had a significant impact on the vegetation (Table 11) at this mine, the reclaimed areas are sufficiently stable with adequate vegetative cover.

Table 10. List of Species at Homestake's Section 32 Mine

COMMON NAME	<i>Genus and species¹</i>
Alkali sacaton	<i>Sporobolus airoides</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>
Western wheatgrass	<i>Agropyron smithii</i>
Blue grama	<i>Bouteloua gracilis</i>
Galleta	<i>Hilaria jamesii</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Ragweed	<i>Kochia scoparium</i>
Snakeweed	<i>Gutierrezia sarothrae</i>

¹ Nomenclature after: Martin, W. C. and C. R. Hutchins. 1986. *A Flora of New Mexico*. J. Cramer, Vaduz, Germany.
 Webb, S. I. et al. 1987. *A Utah Flora*. Great Basin Naturalist Memoir No. 9.

Table 11. Summary of Relative Cover Data at Homestake's Section 32 Mine

Transect #1	Value (%)
Perennial Cover:	12
Litter Cover	41
Rock Cover	0
Bare Ground	41
Number of perennial species present in belt transect	6
Transect #2	Value (%)
Perennial Cover:	0
Litter Cover	47
Rock Cover	0
Bare Ground	53
Number of perennial species present in belt transect	5

Maintenance Item(s):

None.

Photographs of Homestake's Section 32 Mine

The photographs on the following pages are panoramic views of the Section 32 Mine.

Summary and Conclusions

Based on the inspection of these sites, review of inspection information with Mining and Minerals Division staff and MMD's resources to conduct these inspections, staff recommends that the Section 15, Section 17, Section 25, and Section 32 mine sites operated by Homestake Mining Company (Homestake) be released from further requirements of the New Mexico Mining Act. These sites have perennial vegetation that is clearly becoming established. It is staff's conclusion that these sites meet the environmental conditions that allow for the reestablishment of a 'self-sustaining ecosystem' as defined in Rule 1 and put forth in Rule 5.7A of the New Mexico Mining Act.

Based on the outcome of these inspections, staff does not recommend the release of the Section 23 site. The vegetation at this site was too sparse to provide adequate information needed in making the determination that the site has been reclaimed to a condition that allows for a self-sustaining ecosystem. Staff recommends waiting to make this determination until the plant community onsite has become better established.

Literature Cited

- Bonham, C. D. 1989. *Measurement of Terrestrial Vegetation*. Wiley-Interscience. 338 pp.
- Craft, Fred. 1995. Resident Manager, Homestake Mining Company, Personal Communication
- DeAgüero, Joseph C. 1995. Reclamation Specialist, Mining and Minerals Division, Field Notes
- Homestake Mining Company (HMC) 1994. Reclamation Reports, Section 13 Mine, Section 15 Mine, Section 23 Mine, Section 25 Mine, Section 32 Mine.
- Kelly, V. C. 1963. *Geology and Technology of the Grants Uranium Region*, Memoir 15, New Mexico Bureau of Mines and Minerals Resources, Socorro, New Mexico.
- Martin, P. C., and C. R. Hutchins. 1980. *A Flora of New Mexico*. J. Cramer Press, Vaduz, Germany. 2591 pp.
- Welsh, S. L. et al. 1989. *A Utah Flora*. Great Basin Naturalist Memoir No. 9. Brigham Young University Press. 898 pp.

Appendix A

Stratigraphy of the Ambrosia Lake District (Kelly 1963).

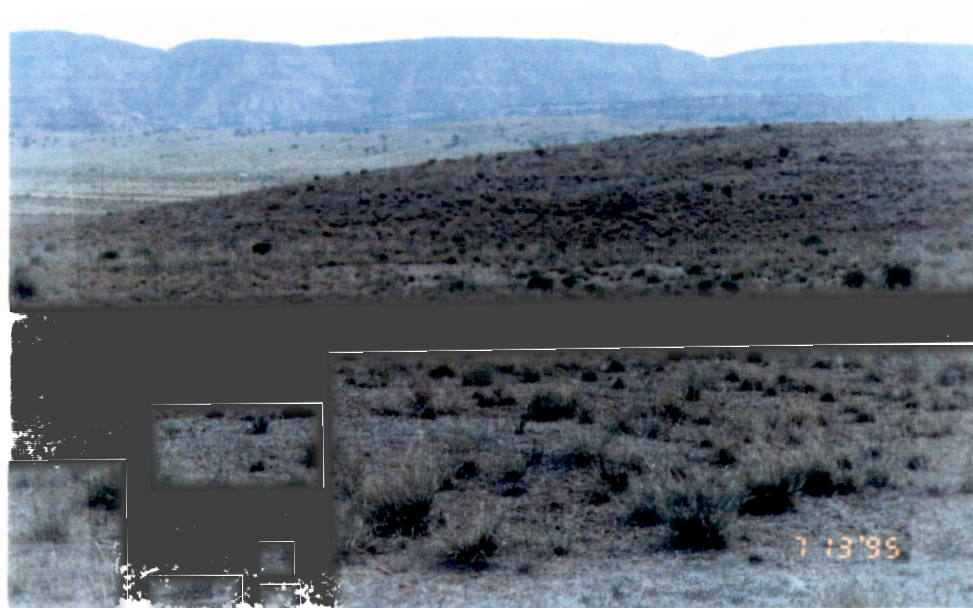
Appendix B

Reclamation Seed Mixture (HMC, 1994)

Common Name	Variety	Pounds Pure Live Seed per Acre
Western Wheatgrass	Arribu	3.2
Blue Grama	Lovington	0.5
Sand Dropseed		1.0
Galleta	Caryopsis	0.5
Galleta	Florets	1.2
Alkali Sacaton	Salado	1.5
	Total	7.9



*Section 13, T14N, R10W
From middle of site looking southwest*



Section 13, T14N, R10W
From south side of site looking west



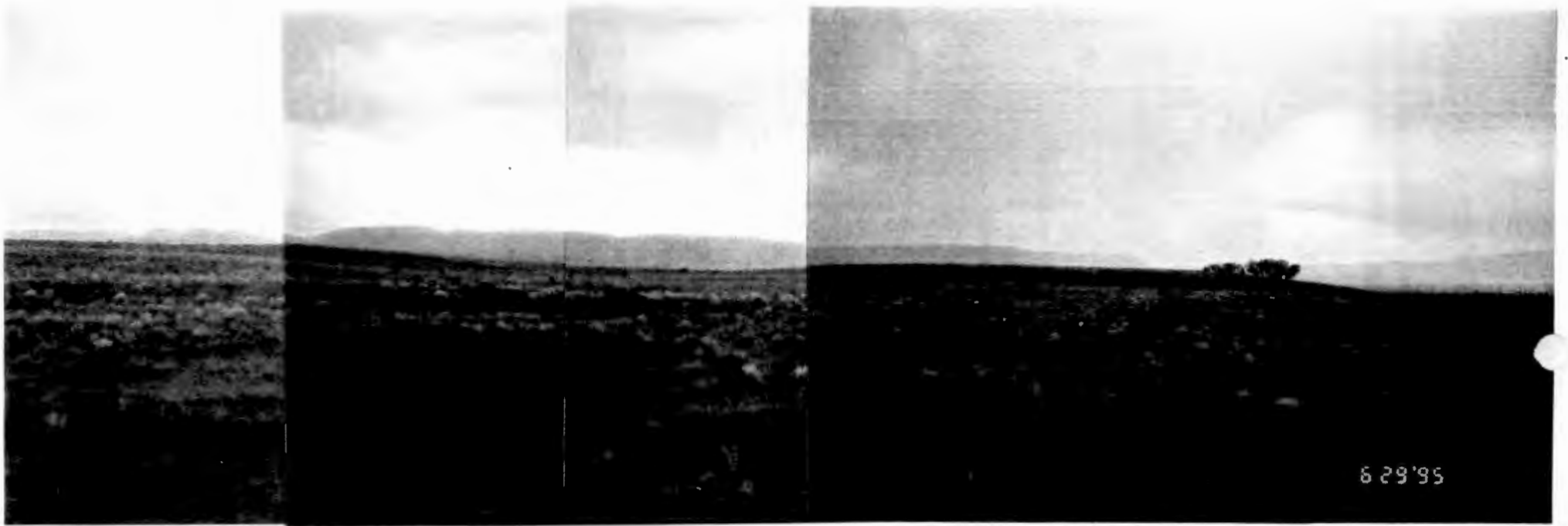
*Section 13, T14N, R10W
From middle of site looking northeast*



Homestake Section 15 T14N R10W



Homestake Section 15 T14N R10W



Homestake's Section 23 Mine (T 14N, R 10W).
Panoramic view. June 28, 1995.
Joe DeAguero Photographer



Homestake Section 23 Mine (T14N, R10W)
From east side of site looking west





*Section 32, T14N, R10W
From middle of site facing southeast*



*Section 32, T14N, R10W
From east side of site facing west*



Section 32, T14N, R10W

From north side of site facing northwest

(From left to right - Robert Young, Tacy Harling, Fred Craft)

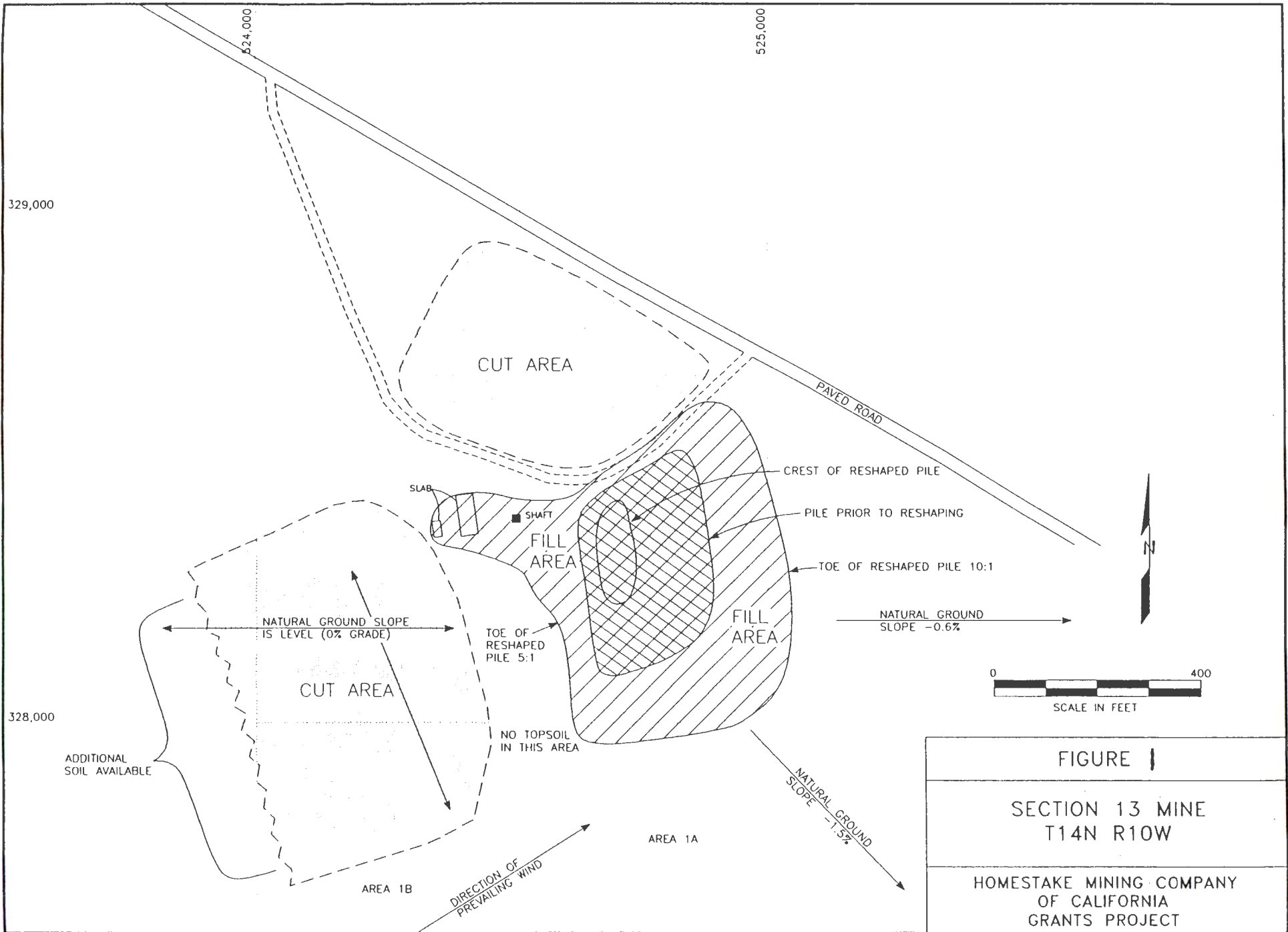


FIGURE 1
 SECTION 13 MINE
 T14N R10W
 HOMESTAKE MINING COMPANY
 OF CALIFORNIA
 GRANTS PROJECT

SYSTEM	STRATIGRAPHIC UNIT	
CRETACEOUS	MANCOS SHALE	
	DAKOTA SANDSTONE	
JURASSIC	MORRISON FORMATION	BRUSHY BASIN MEMBER
		"A" SANDSTONE
	WESTWATER CANYON MEMBER	"K" SHALE
		"B" SANDSTONE
		"K ₁ " SHALE
		"C" SANDSTONE
		"K ₂ " SHALE
		"D" SANDSTONE
		RECAPTURE MEMBER

Figure 2. Stratigraphic column of underlying formations (from Kelly, 1963)



From east side of site looking west



From middle of site looking northeast



From south side of site looking west



From middle of site looking southwest

Section 15 cont

				Specified List
1	Lit	Spai	Spai	GUSA
2	Lit	Agam	Bare	Spai
3	Bare	Hija	Lit	Hija
4	Bare	GUSA	Lit	Boqv
5	Bare	Haje	Lit	Boqv
6	Spai	Orly	Spai	GUSA
7	Spai		Spai	A LCA
8	Lit		Bare	H. jr
9	Bare		Bare	
10	Lit		Spai	
11	Spai		Rock	
12	Agam		Bare	
13	Bare		Lit	
14	Bare		Boqv	
15	Spai		Bare	
16	Lit		Bare	
17	Spai		Lit	

Topsoil depth
 Washrock - ① 10" ② 4.5"

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505



BRUCE KING
GOVERNOR

December 14, 1994

ANITA LOCKWOOD
CABINET SECRETARY

Mr. Fred Craft
HomeStake Mining Co
P. O. Box 98
Grants, New Mexico 87020

RE: Evaluation Guidelines for Prior Reclamation Sites.

Dear Mr. Craft:

The Mining and Minerals Division (MMD) will be conducting inspections for the purposes of prior reclamation for the site(s) you have requested release. Based on Section 69-36-5 E. of the New Mexico Mining Act, the MMD has developed inventory of items to determine whether the completed reclamation satisfies the requirements of the New Mexico Mining Act and the substantive requirements for reclamation pursuant to the applicable regulatory standards.

This checklist is included for your use to determine if your site meets all of the ten criteria. Based on site-specific information, the MMD will be using this checklist to establish criterion based decisions to release the site from further responsibilities under the Act or not.

MMD will begin inspection of prior reclamation sites in early 1995 and will make a determination by September 30, 1995. If you have any questions regarding the checklist or questions regarding the inspection of your reclamation sites, please contact me or Joe DeAgüero at 505\827-5970.

Sincerely,

A handwritten signature in black ink, appearing to read "H. Shepherd".

Holland Shepherd
Bureau Chief
Mine Act Reclamation Bureau
Mining and Minerals Division

VILLAGRA BUILDING - 408 Galisteo
Forestry and Resources Conservation Division
P.O. Box 1948 87504-1948
827-5830
Park and Recreation Division
P.O. Box 1147 87504-1147
827-7465

2040 South Pacheco
Office of the Secretary
827-5950
Administrative Services
827-5925
Energy Conservation & Management
827-5900
Mining and Minerals
827-5970

LAND OFFICE BUILDING - 310 Old Santa Fe Trail
Oil Conservation Division
P.O. Box 2088 87504-2088
827-5800

HOMESTAKE MINING COMPANY

P.O. BOX 98
GRANTS, NEW MEXICO 87020
(505) 287-4456

August 30, 1994



UPS TRACKING LABEL: 1078 5568 745

State of New Mexico
Energy, Minerals and Natural
Resources Department
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Attn.: Mr. Holland W. Shepherd, Bureau Chief

Re: Prior Reclamation of Mine Sites

Dear Mr. Shepherd:

Enclosed are the five prior reclamation reports for Homestake Mining Company of California mines. The mines are Section 13, 15, 23, 25, all in Township 14 North, Range 10 West, and Section 32 in Township 14 North, Range 9 West. These reports comply with the New Mexico Mining Act to satisfy prior reclamation activities. Also enclosed is a check for \$1250 for fees at \$250 per mine site.

If you have any questions please contact me at the Grants office.

Sincerely,

HOMESTAKE MINING COMPANY

A handwritten signature in black ink, appearing to read "F. R. Craft".

F. R. Craft
Resident Manager

FRC:jg

Enclosures

HOMESTAKE MINING COMPANY 650 CALIFORNIA STREET, 11th FLOOR
 SAN FRANCISCO, CALIFORNIA 94108

No. 0008959

DATE: 25-AUG-94 CUST. ACCT. NO.

VENDOR NAME State of New Mexico VENDOR NO: 3096

INVOICE NO.	INVOICE DATE	DESCRIPTION	DISCOUNT AMOUNT	NET AMOUNT
Inspection	19-AUG-94		.00	1,250.00

RECEIVED
 AUG 31 1994
 MINING & MINERALS
 DIVISION

PLEASE DETACH AND RETAIN THIS STATEMENT AS YOUR RECORD OF PAYMENT. *Thank You*

.00 1,250.00

HOMESTAKE MINING COMPANY

650 CALIFORNIA STREET, 11th FLOOR
 SAN FRANCISCO, CALIFORNIA 94108-2788

Drawn on
 Pittsburgh National Bank Jeannette, Pennsylvania
 in Cooperation With Wells Fargo Bank, N.A.
 #4759-008618 60-162/433

No. 0008959

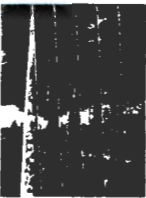
CHECK DATE	CHECK NUMBER	CHECK AMOUNT
25-AUG-94	8959	1,250.00

PAY One Thousand Two Hundred Fifty Dollars and No Cents

TO THE
 ORDER OF State of New Mexico
 Energy, Minerals & Natural Resource
 2040 South Pacheco Street
 Santa Fe NM 87505

RECEIVED
 AUG 31 1994
 MINING & MINERALS
 DIVISION

BY _____
 BY _____

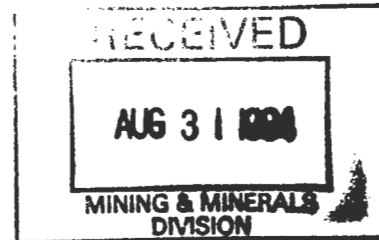


SANTA FE
PACIFIC
CORPORATION

BOX 27019 ALBUQUERQUE, NEW MEXICO 87125
6200 UPTOWN BLVD. NE. SUITE 400
ALBUQUERQUE, NM 87110
TEL 505-880-5300 FAX 505-880-5435

A Santa Fe Pacific Company

August 31, 1994
HAND DELIVERED



Mr. John Lingo, Director
Mining & Minerals Division
Energy, Minerals & Natural
Resources Department
2040 Pacheco Street
Santa Fe, New Mexico 87505

Re: Santa Fe Pacific Gold Corporation's Requests for Approval of
Prior Reclamation

Dear Mr. Lingo:

On behalf of Santa Fe Pacific Gold Corporation, this letter is being hand-delivered along with a series of one-page submittals and accompanying maps identifying certain properties which it believes were previously mined by other companies for recovery of uranium ores. These submissions are made in a spirit of cooperation even though Santa Fe Pacific Gold Corporation believes it is not required to make the submittals or undertake any other action under the New Mexico Mining Act, if that Act is deemed to apply at all to the uranium operations conducted at the site. Further, these submissions are made with the expectation that they may overlap with submissions by companies which conducted or owned the operations causing any disturbances.

For each site, Santa Fe Pacific Gold Corporation would like to request that the Director of the Mining and Minerals Division approve prior reclamation efforts pursuant to the New Mexico Mining Act if the Director believes that the Mining Act may be applicable to the operations previously conducted thereon. Pursuant to our attorney's recent discussions with you, these submissions are made with the express understanding that Santa Fe Pacific Gold Corporation fully preserves and does not waive any of its positions that it has no obligations whatsoever under the Mining Act with respect to these sites including, but not limited to, the following positions:

Mr. John Lingo, Director
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1. That any commodities or other materials produced from the properties or activities thereon constitute commodities, materials or activities regulated by the Nuclear Regulatory Commission such that the Mining Act does not apply;

2. That minerals were not produced from the properties in marketable quantities for a total of two years since January 1, 1970;

3. That as mere owner of mineral interests and lessor under instrument(s) pursuant to which operations owned and conducted by others occurred on the properties, Santa Fe Pacific Gold Corporation was not and is not an operator or owner of the operations with responsibilities, if there be any, under the Mining Act; and

4. That Santa Fe Pacific Gold Corporation has no obligation whatsoever to request approval of prior reclamation or carry out other responsibilities, if there be any, pertaining to the properties in relation to the Mining Act.

Santa Fe Pacific Gold Corporation makes these submissions with the further understanding that neither the submissions themselves, nor anything stated therein, nor the fact of making the submissions shall be advanced in any context, form or respect by the State of New Mexico or any agency or subdivision thereof as evidence or as an admission of any kind on any issue which may exist or hereafter arise in relation to Santa Fe Pacific Gold Corporation or its mineral properties in connection with the Mining Act. The same understanding applies in all respects to this letter.

With the exception of two mines, Santa Fe Pacific Gold Corporation believes these submissions cover all of its New Mexico properties that might conceivably be argued as properties on which "existing mining operations" are situated. The first such exception is the Northeast Church Rock Mine in Section 35, Township 17 North, Range 16 West. The Northeast Church Rock Mine was operated by United Nuclear Corporation under a lease with Santa Fe Pacific Minerals Corporation, now Santa Fe Pacific Gold Corporation. That lease recently terminated after the adoption of the New Mexico Mining Act.

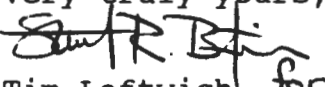
The second uranium mine for which submission is not made with this letter is the Old Church Rock Mine in Section 17, Township 16 North, Range 16 West. Santa Fe Pacific Gold Corporation believes that ongoing mining operations exist or are contemplated at that site by its most current lessee, Hydro Resources, Inc., and is informed that that company is already in contact with MMD

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concerning any Mining Act responsibilities that may be applicable to the operations.

Santa Fe Pacific Gold Corporation's purpose for voluntarily submitting the enclosed requests for approval of prior reclamation, and for identifying in this letter the two leased uranium mine sites for which no submissions are made, is to cooperate fully and in a spirit of good faith so as to assist the Mining and Minerals Division in its tasks of identifying and narrowing down the potential Mining Act-regulated operations that may require a greater level of regulatory involvement.

If you have any questions concerning this letter, the enclosed submissions or the nonwaiver/preservation of rights language included, please do not hesitate to call.

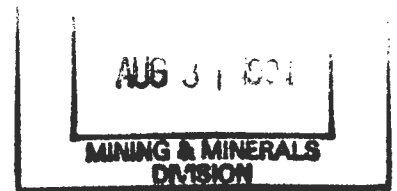
Very truly yours,

Tim Leftwich for

Request For Approval Of Prior Reclamation

Name Of Mine: Unknown

Topographic Location Of Mine: Section 13, T.14N., R.10W.

Operator Name: Homestake - Sapin



Description Of Site Condition: This section was mined by Homestake under a lease from Santa Fe Pacific Minerals Corporation. This section was reclaimed in 1992. Open mine features were backfilled and areas of surface disturbance revegetated with native plant species. Topography was returned to natural contour to the extent possible.

Date Of Request: August 31, 1994

Non-waiver/Preservation Of Rights: This request for approval of prior reclamation is made with the express understanding that Santa Fe Pacific Gold Corporation fully preserves and does not waive any of its positions that it has no obligations whatsoever under the Mining Act with respect to these sites including, but not limited to, the following positions:

1. That any commodities or other materials produced from the properties or activities thereon constitute commodities, materials or activities regulated by the Nuclear Regulatory Commission such that the Mining Act does not apply;
2. That minerals were not produced from the properties in marketable quantities for a total of two years since January 1, 1970;
3. That as mere owner of mineral interests and lessor under instrument(s) pursuant to which operations owned and conducted by others occurred on the properties, Santa Fe Pacific Gold Corporation was not and is not an operator or owner of the operations with responsibilities, if there be any, under the Mining Act; and
4. That Santa Fe Pacific Gold Corporation has no obligation whatsoever to request approval of prior reclamation or carry out other responsibilities, if there be any, pertaining to the properties in relation to the Mining Act.

Santa Fe Pacific Gold Corporation makes this submission with the further understanding that neither the submission itself, nor anything stated therein, nor the fact of making the submission shall be advanced in any context, form or respect by the State of New Mexico or any agency or subdivision thereof as evidence or as an admission of any kind on any issue which may exist or hereafter arise in relation to Santa Fe Pacific Gold Corporation or its mineral properties in connection with the Mining Act.

HOMESTAKE MINING COMPA...

P.O. BOX 98
GRANTS, NEW MEXICO 87020
(505) 287-4456

July 25, 1994



State of New Mexico
Energy, Minerals and Natural
Resources Department
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Attn.: Mr. Holland W. Shepherd, Bureau Chief

Re: Prior Reclamation of Mine Sites

Dear Mr. Shepherd:

Homestake Mining Company of California is preparing to submit, by August 31, 1994, prior reclamation status for the following mine sites: Section 13, Section 15, Section 23, Section 25 and Section 32. The prior reclamation status reports will consist of the following elements: Introduction, History of Operation, Climatology, Ecology, Geology, Topography, Hydrology, Mine Operation Description, Reclamation, Reclamation Procedures, Achievement of Reclamation Requirements, and Reclamation Seed Mixture. I believe the outline will complete the prior reclamation requirements.

I reviewed the list of mine sites listed under Homestake Mining Company of California and found the following listings need to be removed: UN-HP Section 23, UNC Section 15, UNC Section 25, UNC Section 32, UN-HP Section 13, and Section 25 T12N Wayne Jacke R10W.

It was good to see you again and I'm looking forward to working with you.

Sincerely,

HOMESTAKE MINING COMPANY

F. R. Craft (F.R.C.)
Resident Manager

FRC:jg