

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 90-056

WASTE DISCHARGE REQUIREMENTS
FOR
AMERICAN GIRL MINING CORPORATION, JOINT VENTURE
North of Ogilby - Imperial County

The California Regional Water Quality Control Board, Colorado River Basin Region, finds that:

1. American Girl Mining Corporation, Joint Venture (hereinafter also referred to as the discharger), P.O. Box 6426, Yuma, Arizona, 85364, submitted an original Report of Waste Discharge, dated May 22, 1987, for a heap-leach mining operation. This Board Order is a three-year update of Board Order No. 87-80.
2. The discharger proposes a gold and silver extraction operation by heap cyanide leaching 4 million tons of ore for approximately 10 years. The ore heap would be continually sprinkled with a solution that contains 0.4 grams per liter of sodium cyanide (NaCN), and lime (CaO) for pH control. The solution would leach through the ore dissolving the gold and silver before draining into a pregnant solution containment basin. The solution would then be piped through carbon column units, where the precious metals would be removed. The remaining barren solution would drain into a tank where cyanide would be added to bring the concentration of the solution to the appropriate strength before it is recirculated onto the pile. The processing site is to be located in an unsurveyed portion of T15S, R21E, and in Section 25 and 26, T15S, R20E, SBB&M, which is about 3 miles north of Ogilby in Imperial County.
3. Up to four million tons of ore will be leached on one large leach pad. The ore to be leached will be underlain by a continuous synthetic (or equivalent) liner. The liner design would be based on: (1) the size of the ore particles in the initial life, against the liner, (2) maximum pile height, (3) ore placement methods, (4) subgrade preparation and/or overliner procedures, and (5) provisions for controlling the hydraulic head of the solution on the liner.
4. Upon completion of the ore-leaching process, each pile or segment would be flushed with fresh water, or otherwise rinse-treated, to reduce cyanide concentrations to a mining waste classification of Group C, Article 7, Subchapter 15, Chapter 3, of Title 23, California Code of Regulations. The pile would then be either abandoned in place or moved elsewhere.
5. Normal annual precipitation in this area is 3.5 inches, and normal annual surface evaporation is 9 feet.

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Revised
495-088

6. The depth to bedrock in the project area is between 100 and 150 feet. More than 20 drill holes have been drilled at the project site to delineate the ore body. These cores were drilled between 350 and 550 feet. The Regional Board has copies of the drill logs in its files. The drill logs show that no ground water was encountered in any of these drill logs. For this reason, ground water monitoring wells would not be practical for this project. The industrial water supply for this project is derived from a well which is located approximately 2 miles to the southwest of the property.
7. Overburden soil and rock and waste rock from the mining operations would be deposited in piles surrounding the mining pits. These materials have the classification of Group C per Article 7 of said Subchapter 15, based on laboratory tests on crushed rock which show that the material is not acid generating or hazardous and would not cause a discharge having a significant effect on water quality.
8. This discharge has been subject to waste discharge requirements adopted in Board Order No. 87-80.
9. The Water Quality Control Plan for the Colorado River Basin Region of California designates the beneficial uses of ground and surface waters in this Region.
10. The beneficial use of ground waters in the Amos-Ogilby Hydrologic Unit is:
 - a. Municipal supply (MUN)
11. The Board has notified the discharger, and all known interested agencies and persons of its intent to update waste discharge requirements for said discharge.
12. The Board in a public meeting heard and considered all comments pertaining to this discharge.
13. The U.S. Department of the Interior, Bureau of Land Management, has prepared an environmental assessment dated August 17, 1987 in accordance with the provisions of the National Environmental Policy Act (42, U.S.C. Section 4321 et. seq.) and in compliance with the State Guidelines under the California Environmental Quality Act (Chapter 3, Title 14, California Code of Regulations). This environmental assessment is in compliance with all C.E.Q.A. requirements and indicates that this project would not have a significant effect on water quality. The State Clearinghouse number for this document is 87081903.

IT IS HEREBY ORDERED, the discharger shall comply with the following:

A. Discharge Specifications

1. Neither the mining process nor the discharge of wastewater or other wastes shall create pollution or nuisance as defined in Division 7 of the California Water Code.
2. The cyanide solutions shall be contained only in the processing system or in other leak-proof containers.

3. There shall be no wind transport of cyanide solution or ore containing cyanide away from the leaching area.
4. The heap leach ore pile shall be underlain by a synthetic liner which has a maximum permeability of 1×10^{-10} cm/sec and a minimum thickness of 40 mils. An equivalent liner may be approved by the Regional Board's Executive Officer if the discharger demonstrates that the equivalent liner will function equal to or better than the above-specified minimum system.
5. Each cyanide solution containment basin shall be underlain by a double liner with a leachate collection and removal system installed between the two synthetic liners. Each synthetic liner shall have a permeability which does not exceed 1×10^{-10} cm/sec. Each liner shall have a minimum thickness of 40 mils. Each basin shall contain a leak detection system and withdrawal sump. The double liners with leachate collection and removal system shall extend up the sidewalls to at least the following heights (vertical) above the maximum working depth of the cyanide solution and/or sludge contained therein:
 - a. 2.0 feet as regards basins.
 - b. 1.3 feet as regards transport ditches (except as required in Specification No. 8, below).

The remaining sidewalls of both basins and truck transport ditches shall have a single 36 mils reinforced weather-resistant synthetic liner, or an equivalent liner approved by the Regional Board's Executive Officer. Other design details for protection of the quality of State waters shall also be approved by the Executive Officer.

6. The processing area shall be protected from any run-on, washout, or erosion which could occur as a result of a storm having a predicted frequency of once in 100 years, and based on time of concentration at the processing area, as set forth in Department of Water Resources Bulletin No. 195 for El Centro, Blythe and Hayfield, California and Yuma, Arizona. The average value shall be taken from these four reporting stations.
7. The heap leach processing area shall be bermed, and capacity in the above described containment basins shall be provided to impound all storm water drainage from the piles and from the cyanide solution collection and transport facilities during a maximum probable one-hour storm, as set forth in Department of Water Resources Bulletin No. 195 for El Centro, Blythe and Hayfield, California and Yuma, Arizona. The average value (5.0 inches) taken from these four reporting stations is to be used. In addition, containment capacity shall be provided for 24 hours of cyanide solution draindown from the piles. Also, standby emergency facilities shall be available to assure continual circulation of the leaching solution if at any time it is determined that a planned processing configuration or rate could in an emergency result in flow in excess of existing basin storage capacity. The additional storm storage capacity shall be provided before the new processing configuration is started.
8. The impoundment area berms and containment basins shall provide at least two feet of freeboard above the storage volumes required in Discharge Specification No. 7, above.

9. There shall be no discharge of process wastewater at any location without prior approval from the Regional Board.
10. Adequate measures shall be taken to ensure that liners will not be punctured for the duration of the leaching activity.
11. Leached ore residual shall not be placed in perennial, intermittent, or ephemeral stream channels unless provisions are made to divert runoff around the waste in a non-erosive manner. Waste shall not be placed where it can be eroded by stream flows or cause accelerated stream bank erosion.
12. Prior to removal of leach ore residue from an impervious pad, for disposal, the cyanide contained therein shall be neutralized as described in Discharge Specification No. 16, below.
13. Ore residue may be abandoned on a pad, provided the cyanide in the ore is neutralized as described in Discharge Specification No. 16, below. The ore tailings shall be detoxified to reduce the concentration of extractable metals to below hazardous levels, as specified under Article 11, Division 4, Title 22 of the California Code of Regulations. The detoxified ore tailings shall meet the requirements for classification as a Group C mining waste as prescribed in Section 2571 of Subchapter 15, Chapter 3, Title 23 of the California Code of Regulations.
14. All industrial waste materials not covered by said Article 7, Subchapter 15 shall be discharged at a regional waste management unit approved by the Regional Board. Any hazardous waste containers shall be rendered unusable prior to final disposal.
15. Adequate measures shall be taken to assure that unauthorized persons and mammals are effectively excluded from the processing area.
16. When abandoning leached ore residue, the procedure for determination of whether free cyanide (CN⁻) in the ore residue has been neutralized to a satisfactory level shall be as follows:
 - a. A sampling grid for the ore pile or segment on the leach pad shall be submitted for approval by the Executive Officer. The sampling grid shall contain a total of at least ten sampling locations on the ore pile or segment being abandoned.
 - b. The sample to be analyzed from each sampling location shall contain 100 grams as an aliquot of samples taken as set forth below, except that no sample shall be taken within three feet above the plastic liner unless special provisions are made to avoid penetrating the liner or for sealing said penetrations:
 1. An ore pile thirty feet or less in depth shall have samples taken at 25, 50, and 75 percent of the depth.
 2. An ore pile greater than thirty feet in depth shall have samples taken every ten feet of depth.

- c. The procedure for preparing samples for the analysis of free cyanide and extractable metals in the detoxified tailings shall be consistent with Monitoring and Reporting Program No. 90-056, and Attachments A and B to said Monitoring and Reporting Program. The monitoring reports shall be certified to be true and correct, and signed, under penalty of perjury, by an authorized officer of the company.
 - d. The maximum allowable free cyanide (CN⁻) shall not exceed the following levels in the filtrate portion of a 5:1 extraction.
 1. None of the samples shall contain more than 1 mg/l free cyanide (CN⁻) in the filtrate.
 - e. For any sampling location that indicates a free cyanide level in excess of 1 mg/l in the filtrate, the areal extent of the inadequately detoxified area shall be determined and detoxified so that the cyanide levels in that particular ore pile will comply with the limitations contained in Specification No. 16 D.1., above.
17. Adjacent and contiguous ore piles or segments shall also be sampled simultaneously when any pile or segment is to be abandoned. If any additional processing is done in the sampled areas, the piles and segments tested will require additional neutralization and testing prior to abandonment or removal.
 18. The discharger shall maintain a vadose zone monitoring system in locations as approved by the Executive Officer.
 19. A device which measures the hydraulic head on the leach pad liner shall be installed at the point at which the hydraulic head is anticipated to be maximum.

B. Provisions


1. At least 60 days¹ prior to commencement of construction of each of the above mentioned components of the facility, the discharger shall submit to the Regional Board for approval by the Executive Officer, a technical report which shall include a plan showing in detail the proposed construction of the component.
2. At least 10 days prior to commencement of operations, the discharger shall submit to the Regional Board's Executive Officer a certificate, signed by a California Registered Civil Engineer, stating that the pads, containment basins, leakage detection system, flood protection and attendant facilities, and disposal areas are constructed in accordance with the technical report as approved by the Executive Officer to meet the requirements of this Board Order.

¹60 days unless a lesser period is approved by the Executive Officer

3. At least 10 days prior to loading ore onto the pads, the discharger shall notify the Regional Board to allow sufficient time to schedule a staff evaluation of construction and inspection procedures utilized by the discharger for liner installation.
4. The discharger shall comply with "Monitoring and Reporting Program No. 90-056", and future revisions thereto, as specified by the Executive Officer.
5. Prior to any significant modifications in this facility which could result in material change in the quality or quantity of wastes discharged, or any material change in location of discharge, the discharger shall report in writing to the Regional Board allowing sufficient time for Regional Board consideration and action.
6. The discharger shall submit to the Regional Board, at least 30 days prior to commencement of the herein stated expanded operations, written adequate assurance that money is committed in an amount sufficient to ensure detoxification of all cyanide, plus cleanup and closure of the processing site upon abandonment of facilities, in a manner that will not adversely affect water quality.
7. Lack of construction or operational activity on the site for a period of one year shall constitute abandonment for the purpose of this Board Order.
8. The discharger shall install a device for testing the leak detection system of each double-lined containment structure. Said testing shall be subject to approval by the Executive Officer.

IT IS FURTHER ORDERED that Board Order No. 87-80 be superseded by this Board Order.

I, Philip A. Gruenberg, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on September 19, 1990.


Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 90-056
FOR
AMERICAN GIRL MINING CORPORATION - JOINT VENTURE
North of Ogilby - Imperial County

Location: Section 25 and 26, T15S, R20E, SBB&M

MONITORING

Monitoring and Reporting No. 1

The discharger shall submit to the Regional Board monthly reports containing the following:

- A. The current status of mining operations as to whether the operation is active or inactive.
- B. An estimate of the total amount of ore (tons) presently being processed.
- C. The amount of liquid collected in each seepage detection sump and the period of time since the last evacuation.
- D. Analysis for the free cyanide and total cyanide of any water found in each seepage detection sump.
- E. Analysis for free cyanide and total cyanide for any liquid found in the vadose zone monitoring system.
- F. The amount of hydraulic head (inches) on leach pad liner. Readings to be taken weekly, and the weekly average to be reported monthly.

Monitoring and Reporting No. 2

- A. Immediate reporting of any accidental spillage, leakage, or release of waste material, including immediate measures being taken to correct same and limit detrimental effects.
- B. Upon request from this Board's Executive Officer, the discharger shall furnish special technical and/or monitoring reports on the treatment and discharge of wastes, and on the integrity of the cyanide solution containment system.
- C. The discharger shall submit quarterly reports showing present and planned drainage parameters. These drainage parameters shall show compliance with Discharge Specifications A.7. and A.8. of this Board Order.

- D. At least 30 days prior to any proposed abandonment of leached ore residues or discharge of wastewater, or termination of the operation described in this Board Order, the discharger shall submit a copy of the results of analyses of the cyanide concentration in the leached ore residue and in the wastewater in accordance with Discharge Specification No. 16.
- E. Report of completion of cleanup of premises shall be submitted to the Regional Board in writing within one week following completion of work.

The above Monitoring Program shall be implemented and/or maintained immediately upon adoption of Board Order No. 90-056.

REPORTING

Quarterly reports shall be submitted to the Regional Board by January 15, April 15, July 15 and October 15. Monthly reports shall be submitted to the Regional Board by the 15th day of the following month. Reports for Item 2A, (above) shall be forwarded immediately and if at all possible shall be preceded by phone communication to the Regional Board's office, phone no. (619) 346-7491. Copies of the reports submitted to the Board pursuant to this Monitoring and Reporting Program shall be maintained at the operations site, and shall be made available to staff of the Regional Board upon request.

Mail reports to:

California Regional Water Quality Control Board
Colorado River Basin Region
73-271 Highway 111, Suite 21
Palm Desert, CA 92260

ORDERED BY: Philip A. Gumbert
Executive Officer

September 19, 1990

Date

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ATTACHMENT A

ANALYTICAL PROCEDURE
FOR

IONIC CYANIDE

Also known as free soluble cyanide

Description: Ionic cyanide and most weak complexes are soluble in distilled water. The strong complexes of ions, although normally soluble, are bound too tightly to the particle surface and are not solubilized. The sample is leached with distilled water in a single pass, flow-through manner. The leachate is collected, alkalized for preservation, and made up to a definite volume. This leachate sample is then analyzed via "Standard Methods" 412 C or E. Method 412 D may not be used.

Apparatus:

- 1) Large glass funnel, the stem throat plugged with glass wool;
- 2) Large glass funnel with glass fiber filter paper: Whatman GF/C, 934-AH, or equivalent.
- 3) Balance capable of weighing to nearest 0.01 g.
- 4) 500 ml volumetric flasks.
- 5) Items necessary to perform cyanide analysis as described in narrative above.

Reagents:

- 1) 2.5 N NaOH (100 g NaOH/l)
- 2) Reagents necessary to perform cyanide analysis as described in narrative above.

Procedure:

Weigh out, to nearest 0.01 g, 100±1 g of samples as received. Place in glass funnel, either glass wool plugged or with filter paper. Add 50.00 ml of 2.5 N NaOH to 500 ml volumetric flask and place it so as to catch the filtrate from the funnel. Pour 50 ml of distilled (or deionized) water onto the solid sample and allow to percolate through. When liquid level is even with the top of the solids, add an additional 50 ml of water. Repeat the addition of water until a total of 400 ml H₂O has been used. Make up volume in volumetric flask to mark with distilled water. This constitutes the sample ready for analysis.

The titrametric (412C) and the ion selective probe (412E) require no further preparation. The sample is then read directly by either titrametric (412C) or the ion selective probe (412E) and the results indicating the amount of ionic cyanide reported in mg/l.

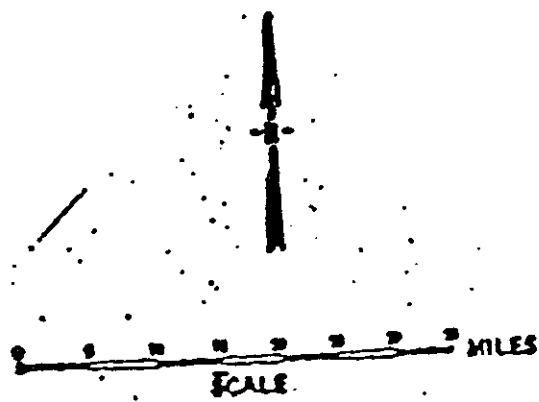
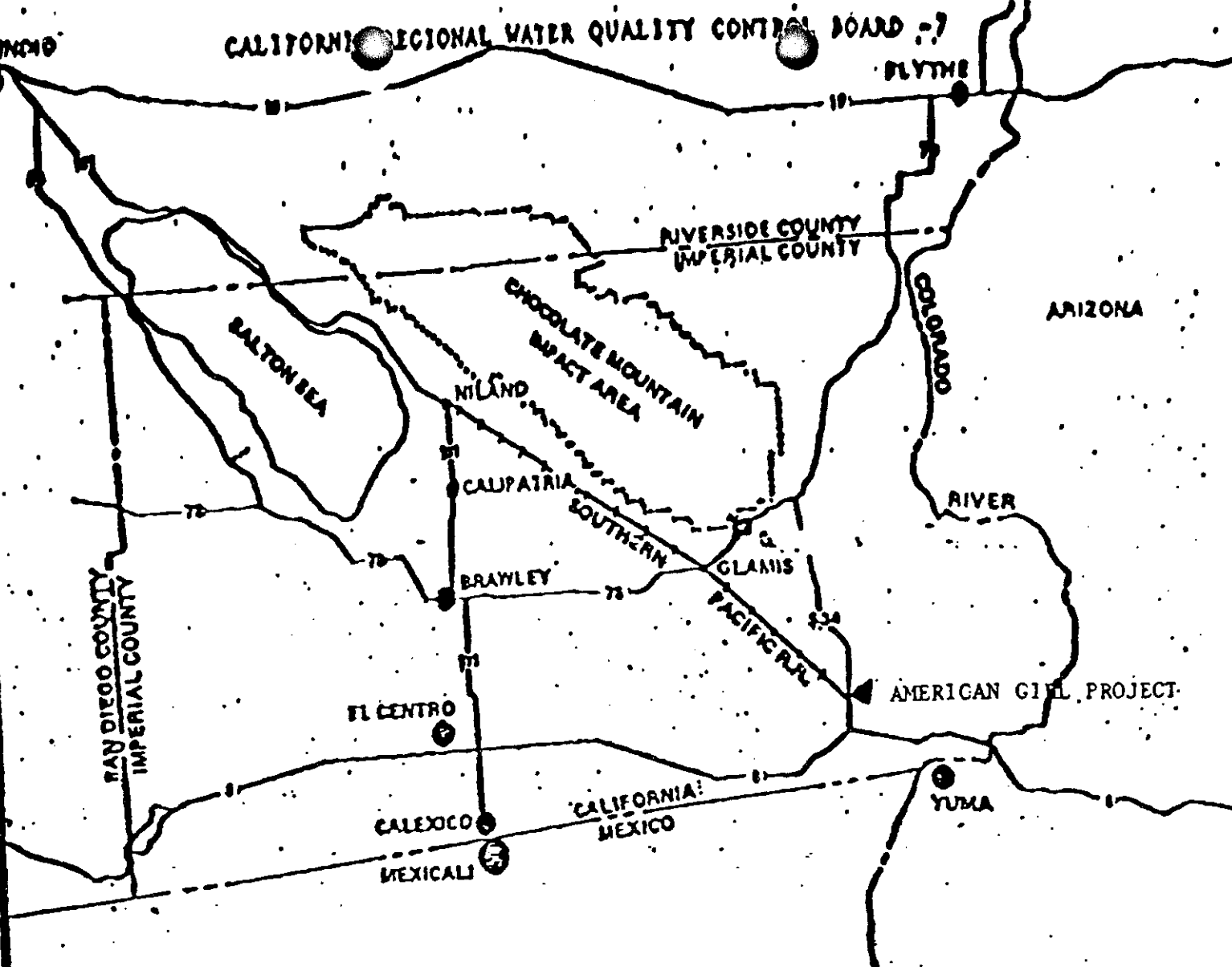
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ATTACHMENT B

PROCEDURE FOR THE DETERMINATION
OF EXTRACTABLE METALS

- A. Samples from each location, as approved by the Regional Board's Executive Officer, shall be composited and tested for the net acid/base potential utilizing the procedure in "Field and Laboratory Methods Applicable to Overburden and Minesoil", (PB-280-495), March 1978; pp. 47-50 & 69-72.
1. If the net acid/base potential indicates a presence of net acid forming potential, the composites shall be subjected to the waste extraction test described in Section 66700, Article 11, Chapter 30, Division 4, Title 22 of the California Code of Regulations.
 2. If the net acid/base potential indicates an absence of net acid forming potential, the composites shall be subjected to a waste extraction test similar to that in A.1., above, but utilizing distilled water buffered to the pH of rainwater, as the extractant.
- B. The resultant test extracts shall be analyzed as follows:
1. All of the extracts shall be analyzed for copper and iron.
 2. Ten percent of the extracts shall be analyzed for the metals listed under Section 66699, Article 11, Chapter 30, Division 4, Title 22 of the California Code of Regulations.

INDIO

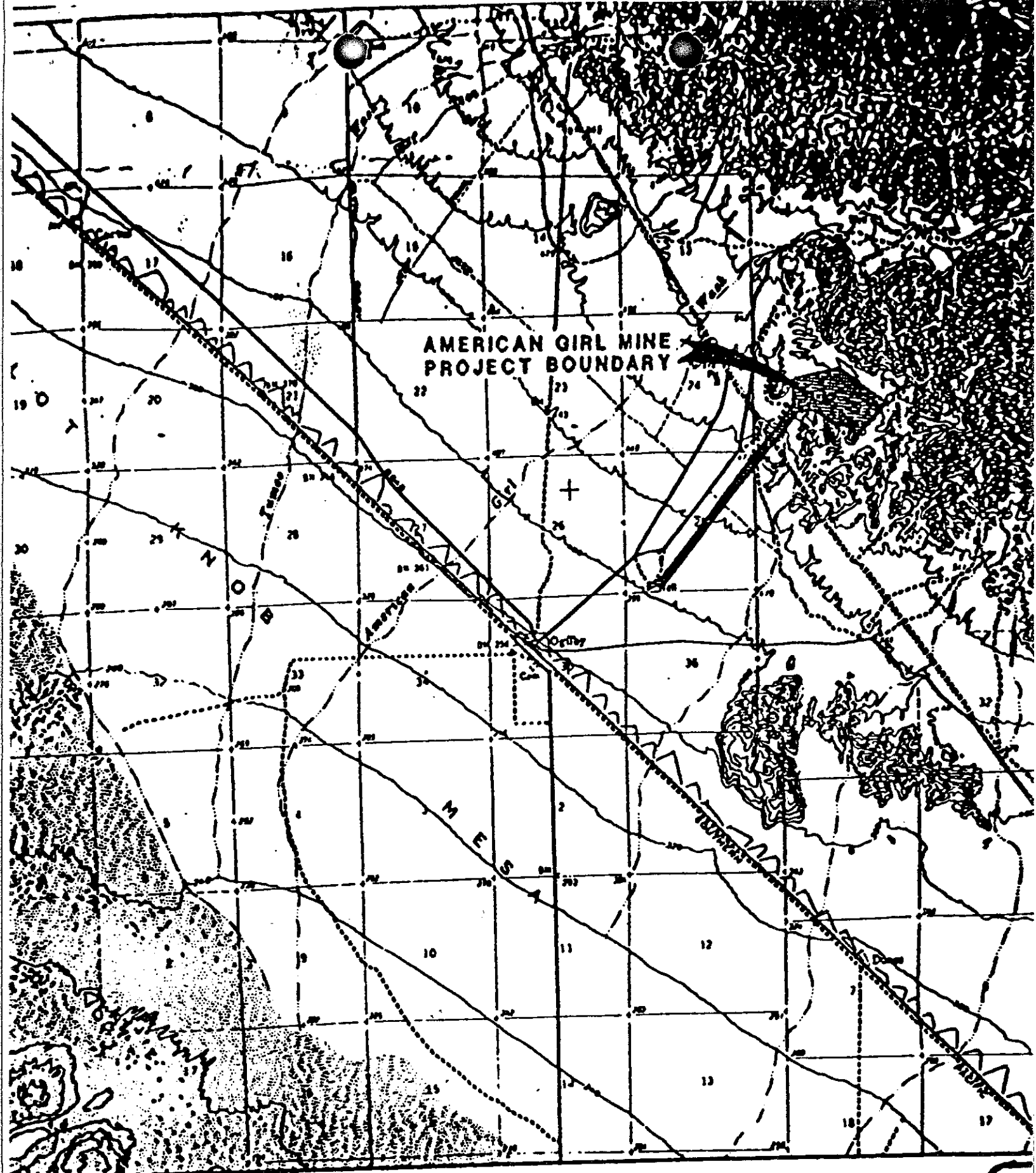


American Girl Project
Site Map No. 1

VICINITY MAP

Board Order No. 90-056

Imperial County



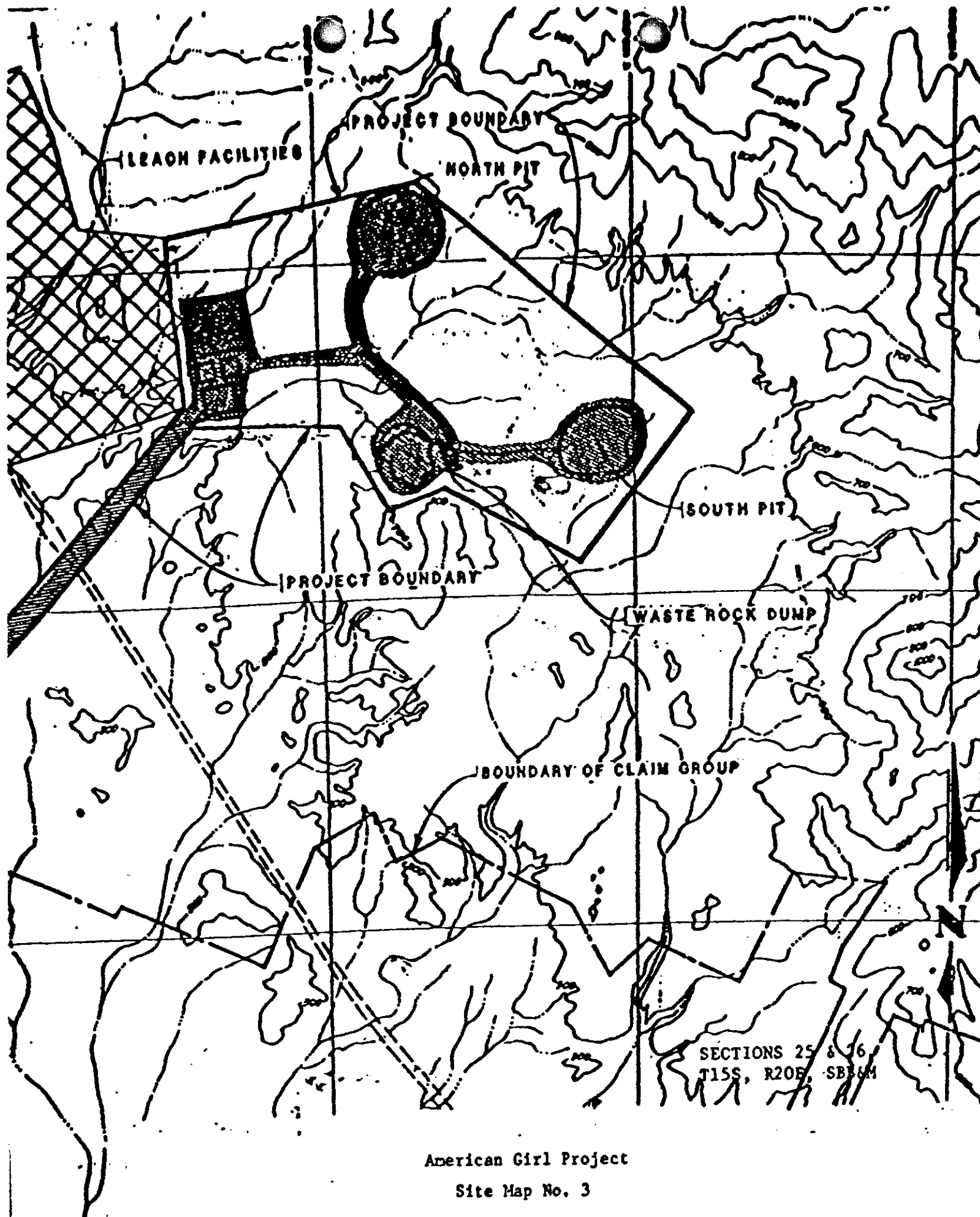
AMERICAN GIRL MINE
PROJECT BOUNDARY

American Girl Project
3 MILES Sections 25 & 26, T15S, R20E, SBB
Site Map No. 2



Board Order No. 90-056
North of Oligby, Imperial County

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1000 FEET



American Girl Project
Site Map No. 3

GENERAL FACILITIES

ARRANGEMENT