

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 89-036

WASTE DISCHARGE REQUIREMENTS
FOR
AMERICAN GIRL MINING CORPORATION
North of Winterhaven - Imperial County

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

1. American Girl Mining Corporation (hereinafter also referred to as the discharger), 2450 S. 4th Avenue, Suite 310, Yuma, Arizona, 85364, submitted a Report of Waste Discharge, dated November 23, 1988, and an adopted EIR dated January 25, 1989, for a new mining project to be located one mile from a presently permitted heap leach gold mining project which is presently being operated by the discharger.
2. The discharger proposes a mining and processing operation that will result in the removal of up to 8.5 million tons of gold-bearing ore over the next 10 to 11 years. The American Girl Canyon Project (hereinafter also referred to as the project) is located in the Cargo Muchacho Mountains on patented and unpatented lode and placer mining claims, primarily on land administered by the Bureau of Land Management (BLM) in an unsurveyed portion of T15S, R21E, Imperial County, California. Both the BLM and the County have jurisdiction with regard to the approval of land uses within this parcel of land.
3. The project will use both surface and underground ore mining techniques, as well as both milling and heap leach processing of the ore. The heap leach ore will be crushed to minus four inches in a portable crusher. Water (for wetting/agglomeration) and lime (for pH control) will be added at the crusher. The leach pad will cover an area of approximately 50 acres (over 2 million sq. ft.). The leach pad will be lined with a 60-mil high-density polyethylene (HDPE) membrane over a base which will be compacted to 95 percent standard proctor. A 12 oz., 110 mil geotextile membrane will be placed over the liner. Perforated pipe will be laid on top of the geotextile to provide drainage solution and to decrease the hydraulic head on the liner. Crushed ore will be placed on the pad to a maximum height of 80 feet. Placement of ore will be accomplished by truck end-dumping in order to decrease dynamic loads from heavy equipment on the liner. The processing of ore at the project will also include a milling circuit which crushes to 80 percent minus 200 mesh. In a series of steps the tailings are dried until the moisture content is reduced to 15 percent or less.
4. Upon completion of the heap leach process, each pile or segment would be flushed with fresh water or otherwise rinse-treated after

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Superseded by
order No. 95-015

completion of leaching operations to reduce cyanide concentrations to an acceptable level which would result in a mining waste classification of Group C, under Article 7, Subchapter 15, Chapter 3 of Title 23 of the California Code of Regulations. The pile would then be either abandoned in place or removed elsewhere.

5. Normal annual precipitation in this area is 2.5 inches, and normal annual surface evaporation is 150 inches.
6. The Water Quality Control Plan for the Colorado River Basin Region of California was adopted by the Regional Board on November 14, 1984.
7. The beneficial uses of ground water of the Amos-Ogilby Hydrologic Unit is municipal supply.
8. The discharger states that ground water is limited within the project area and is encountered in fractures within the bedrock material. Within the wash, the depth of ground water varies with average depths of between 80 to 100 feet. Recharge from direct precipitation is nominal with primary recharge resulting from ephemeral flow in surface drainages following large precipitation events.
9. The waste rock produced through mining will be disposed of in waste piles adjacent to the mining operations. The tailings product from the milling operation will consist of a silt-sand material. Tailings disposal will involve its transportation and placement in the waste rock disposal areas. At all times the tailings will be placed internal to the waste rock and will be covered with additional waste rock shortly after placement. The relative volumes of wastes are approximately 90 percent waste rock and 10 percent tailings. Upon project closure, a minimum five foot cover of waste rock will exist in any area in which tailings have been placed.
10. The discharger has done a comprehensive waste pile analysis by use of a computer program referred to as the Hydrologic Evaluation of Landfill Performance (HELP) Model which was developed for the United States Environmental Protection Agency. The HELP Model is a deterministic, quasi-two dimensional model that develops a long-term water balance based on historical or simulated daily rainfall records. After this has been analyzed, the discharger states that it can be interpolated that the soil water balance would not reach a condition in which sufficient moisture would accumulate to create a leachate. The normal and dry years of precipitation would dry the heaps and piles so that the influx of moisture from the wet years would only be adequate to raise the soil moisture to a level less than field moisture capacity, thus not allowing the creation of free moisture to percolate the natural ground.
11. Overburden soil and rock, and waste rock from the mining operations would be deposited in piles surrounding the mining pits and processing facilities. 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 that would cause degradation of water quality.

12. The discharger's analysis of the chemical constituents of the mill tailings show that their constituents are all near background levels. Also, the comprehensive waste pile analysis by use of an EPA approved computer program shows that, "The normal and dry years of precipitation would dry the tailing piles so that the influx of moisture from wet years would only raise the soil moisture to a level less than field moisture capacity, thus not allowing the creation of free moisture to percolate the natural ground." For these reasons, the tailings piles would have the classification of Group C per Article 7 of said Subchapter 15.
13. The Board has notified the discharger and interested agencies and persons of its intent to adopt waste discharge requirements for the discharge.
14. The Board in a public meeting heard and considered all comments pertaining to the proposed discharge.
15. Imperial County adopted on January 25, 1989, Environmental Impact Report - SCH # 88062922 which contains mitigation measures for American Girl Mine and Processing Facilities. This EIR indicates that this project would not have a significant effect on water quality.

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

A. Discharge Specifications

1. Neither the management and operation of the mining process nor the discharge of wastewater or other wastes shall create pollution or a 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 minimum thickness of 60 mils and a maximum permeability of 1×10^{-10} cm/sec, or an equivalent liner approved by the Executive Officer.
5. Equipment in all sections of the process area shall be installed above a concrete slab with floors sloped to contain spillage and shall be provided with collecting sumps fitted with vertical pumps to return any spillage to the process. The slab shall be designed to contain any drainage and/or rainwater, which would then be pumped back to the process.

6. The solution ditches (which are not trunk ditches) and adjacent solution collection and freeboard areas shall be lined with a synthetic liner which has a minimum thickness of 40 mils and a permeability which does not exceed 1×10^{-10} cm/sec. or equivalent liner approved by the Executive Officer.

7. Each cyanide solution containment basin, each cyanide-bearing sludge containment basin, and each trunk cyanide solution transport ditch, 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. The liners shall have a minimum thickness of 40 mils. Each basin shall contain a double-lined leak detection and withdrawal sump. Each trunk transport ditch shall contain double-lined leak detection and withdrawal sumps at approximately 1,000-foot intervals. The double liners with leachate collection and removal systems shall extend up the sidewalls to at least 2.0 feet (vertical) above the maximum working depth of the cyanide solution and/or sludge contained therein.

The remaining sidewalls of both basins and trunk transport ditches shall have at least a single 40 mils weather-resistant synthetic liner, or an equivalent liner approved by the Regional Board's Executive Officer.

8. All drainage and collection facilities used to contain or transport leaching solution shall be effectively sealed to prevent leakage of these liquids.

9. 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 one in 100 years, and based on time of concentrations at the processing area, as set forth in Department of Water Resources Bulletin No. 195 for Yuma, Arizona.

10. The heap leach processing area shall be diked, and 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 Yuma, Arizona. 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.

11. The impoundment area dikes and containment basins shall provide at least two feet of freeboard above the storage volumes required in

Discharge Specification No. 10, above. Transport ditches at the downgradient perimeter of the process area shall include at least two feet of freeboard for flows during a 100-year storm frequency.

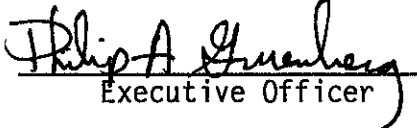
12. There shall be no discharge of process wastewater at any location without prior approval from the Executive Officer.
13. Adequate measures shall be taken to insure that liners will not be punctured for the duration of the leaching activity.
14. Leached ore residual shall not be placed in perennial, intermittent, or ephemeral stream channels. Waste shall not be placed where it can be washed away.
15. Prior to removal of leached ore residue from a lined pad, for disposal, the cyanide contained therein shall be neutralized as described in Discharge Specification No. 19, below.
16. Ore residue may be abandoned on a pad, provided the cyanide in the ore is neutralized as described in Discharge Specification No. 19, below, and all other necessary and applicable closure requirements are complied with.
17. All industrial waste materials not covered by said Article 7, Subchapter 15 shall be discharged at a Board-approved waste management unit. Any hazardous waste containers shall be rendered unusable prior to final disposal.
18. Adequate measures shall be taken to assure that unauthorized persons are effectively excluded from the processing area.
19. 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 of the ore pile or segment on the leach pad shall be submitted that is acceptable to 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 sample analysis procedure shall be as set forth in Attachment A.
 - d. The maximum allowable free cyanide (CN^-) shall not exceed the following levels in the filtrate portion of a 5/1 extraction.
 1. 90 percent of at least 10 samples shall contain less than 5 mg/l cyanide (CN^-) in the filtrate.
 2. None of the samples shall contain more than 10 mg/l cyanide (CN^-) in the filtrate.
 - e. For any sampling location that indicates a free cyanide level in excess of 10 mg/l in the filtrate, the areal extent of the area shall be determined and further neutralized so that the cyanide levels in that particular ore pile will comply with the limitations contained in Specification No. 19 (d) 1 and 2 above.
20. 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.
 21. The discharger shall maintain a ground water monitoring wells network and a vadose zone monitoring system in locations as approved by the Executive Officer.
 22. At least 60 days¹ prior to commencement of construction of each component of the facility, the discharger shall submit to the Board for approval by the Executive Officer a technical report which shall include a plan showing in detail the proposed construction of that component.
 23. At least 10 days prior to commencement of operations, the discharger shall submit to the Board 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 Order.

¹ 60 days unless a lesser period is approved by the Executive Officer in writing.

24. At least 10 days prior to loading ore onto the pads, the discharger shall notify the Board to allow sufficient time to schedule a staff evaluation of construction and inspection procedures utilized by the discharger for liner installation.
25. The discharger shall comply with "Monitoring and Reporting Program No. 89-036" and future revisions thereto, as specified by the Executive Officer.
26. Prior to any modifications in this facility which could result in material change in the quality or quantity of waste discharged, or any material change in location of discharge, the discharger shall report in writing to the Regional Board allowing sufficient time for Board consideration and action.
27. The discharger shall submit to the 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 insure neutralization of all cyanide, plus cleanup and closure of the processing and tailings disposal site upon abandonment of facilities, in a manner that will not adversely affect water quality.
28. Lack of construction or operational activity on the site for a period of one year shall constitute abandonment for the purpose of this Order.
29. The discharger shall maintain devices installed in the ore piles which permit measurement of solution depth (the hydraulic head) over the liner beneath that ore pile.
30. A closure plan shall be submitted to the Regional Board before the start of the leaching activities.

I, Phil 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 June 28, 1989.


Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ATTACHMENT A TO ORDER NO. 89-036

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 reported in mg/l (CN⁻).

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 89-036
FOR
AMERICAN GIRL MINING CORPORATION
North of Winterhaven - Imperial County

Location of Discharge: Unsurveyed Portion of T15S, R21E, SBB&M

MONITORING

American Girl Mining Corporation (discharger) shall report to the Regional Board concerning the following:

Monitoring and Reporting Program 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 collection sump and corresponding liner permeability in centimeters per second.
- D. Analysis for free cyanide and total cyanide in ground water from each ground water monitoring well, and of any water found in each seepage collection sump.
- E. Analysis for free cyanide and total cyanide for any liquid found in the vadose zone monitoring system.

Monitoring and Reporting Program No. 2

- A. Immediate reporting of any accidental spillage, leakage, or release of waste material, including immediate measures being taken to correct same.
- 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. 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 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. 19, and shall request a Regional Board staff inspection to approve the proposed discharge or cleanup procedure.

- D. Report of completion of cleanup of premises shall be submitted to the Regional Board in writing within one week following completion of work.

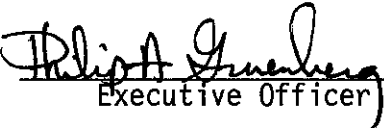
The above monitoring program shall be implemented and/or maintained immediately upon adoption of Order No. 89-036.

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 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:

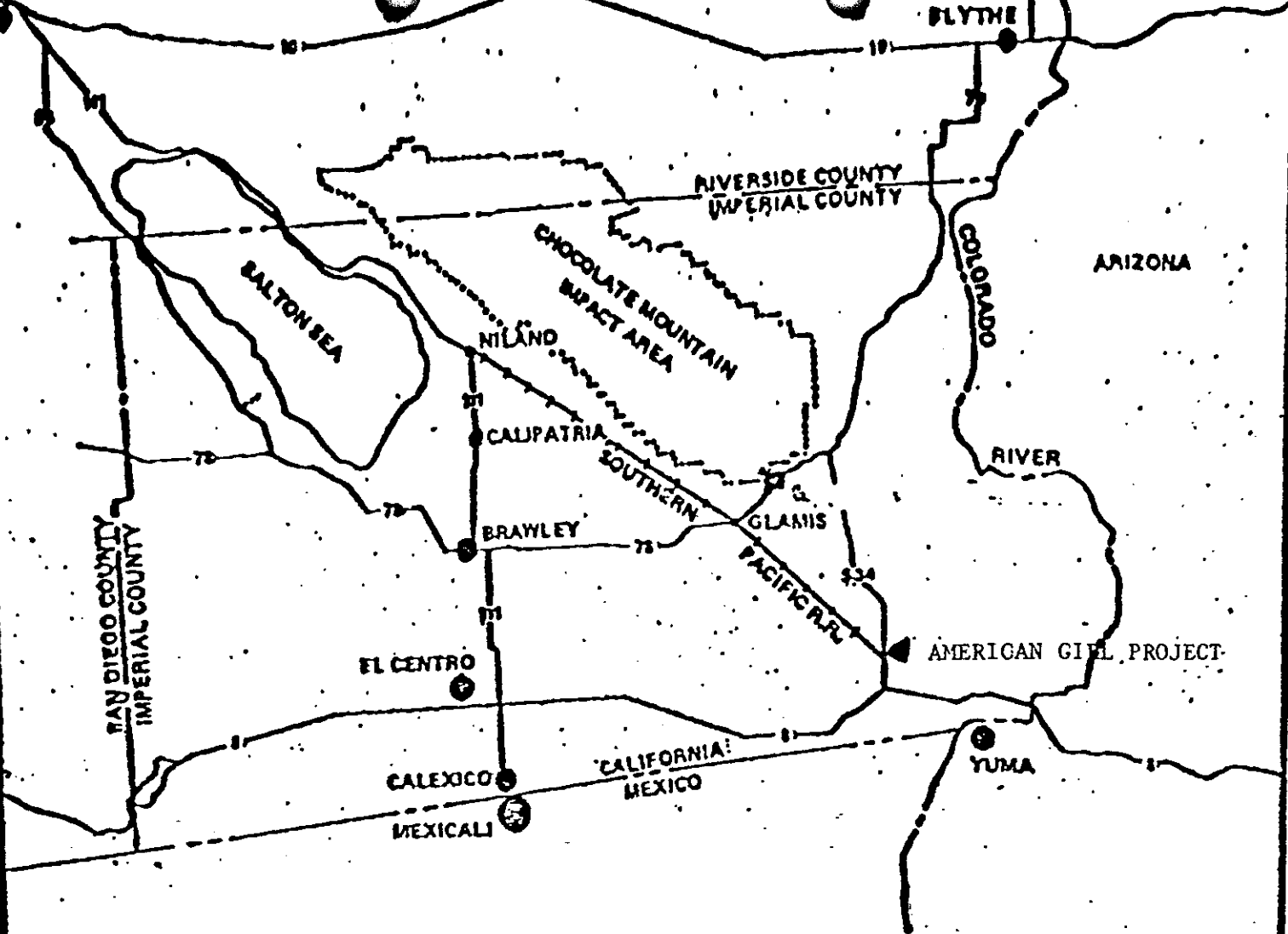

Executive Officer

June 28, 1989

Date

FLYTHE

INDIO



SAN DIEGO COUNTY
IMPERIAL COUNTY

RIVERSIDE COUNTY
IMPERIAL COUNTY

ARIZONA

BALTON SEA

CHOCOLATE MOUNTAIN
IMPACT AREA

COLORADO
RIVER

NI LIND

CALPATRIA

SOUTHERN
PACIFIC R.R.

GLANIS

BRAWLEY

AMERICAN GIRL PROJECT

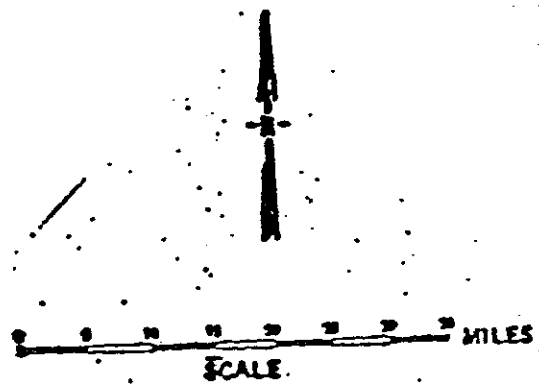
EL CENTRO

YUMA

CALEXICO

CALIFORNIA
MEXICO

MEXICALI

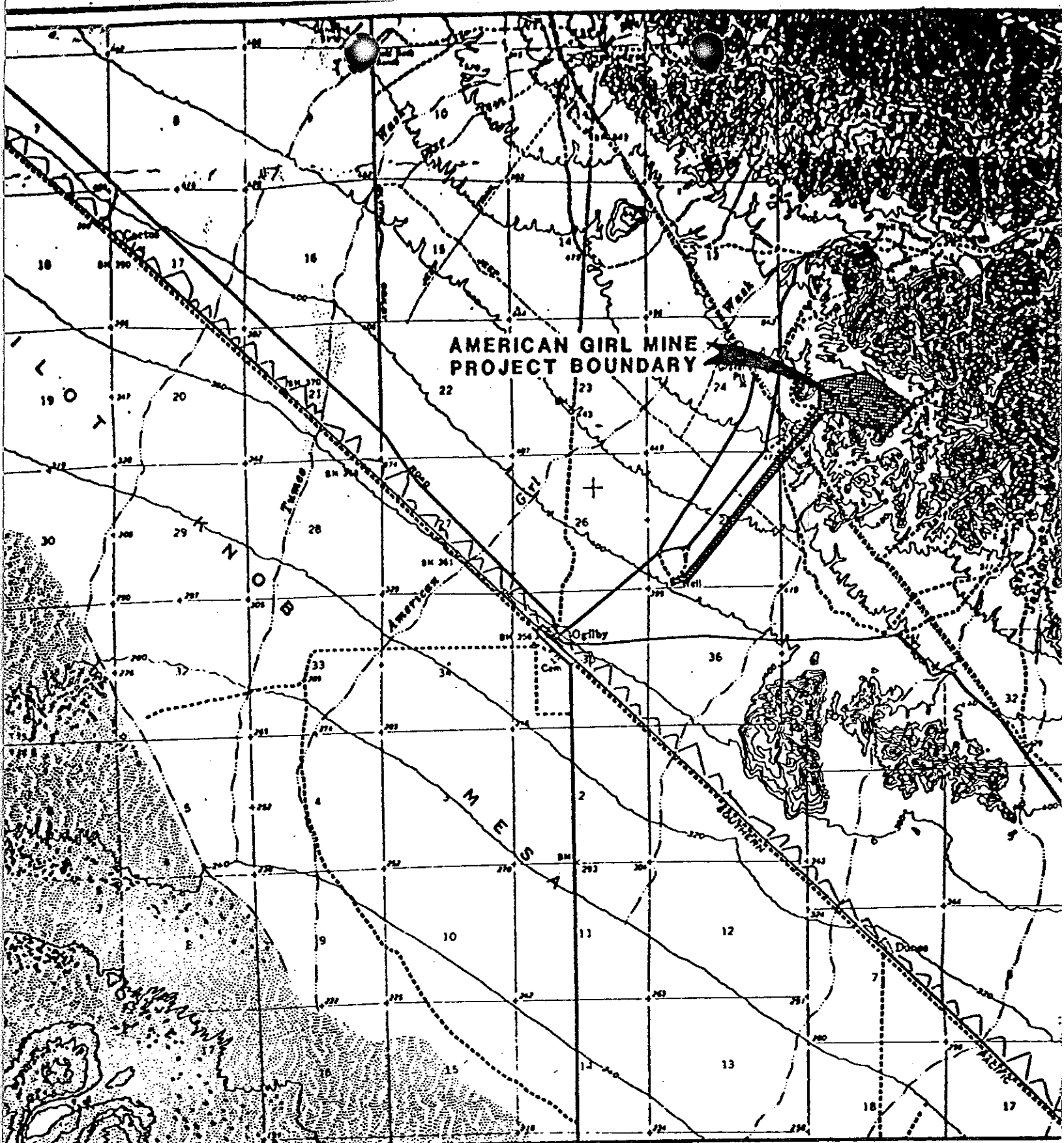


American Girl Project
Site Map No. 1

VICINITY MAP

Board Order No. 89-036

North of Ogilby, Imperial County



American Girl Project
 3 MILES Sections 25 & 26, T15S, R20E, SBB

LOCATION MAP
 Board Order 89-036
 North of Oligby, Imperial County

Site Map 2

PROJ	02
DA	77
REV	