CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 86-88

WASTE DISCHARGE REQUIREMENTS
FOR
RATTLESNAKE MINES, LTD.
Northwest of Needles - San Bernardino County

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

1. Rattlesnake Mines, LTD., (hereinafter also referred to as the discharger), 4324 Alderbrook Ct., Las Vegas, NV 89103, submitted a Report of Waste Discharge, dated October 23, 1986, for a test heap-leach mining operation.

2. The discharger proposes an exploratory (pilot) gold and silver operation by heap leaching 10,000 tons of ore which will be placed on a synthetic impervious liner which is underlain by a sand leakage detection material that rests on an existing asphalt surface. The ore heap would be sprinkled with a solution of sodium cyanide (NaCN) that would leach through the ore dissolving the gold and silver before draining into a basin. The pregnant solution would then be piped to a recovery trailer where the precious metals would be removed. The remaining barren solution would drain into another basin where cyanide would be added to bring the concentration to the appropriate strength before it is recirculated onto the pile. This testing operation is expected to last 6 months. The processing site is to be located in the SE¼ of Section 19, T12N, R18E, SBB&M.

3. The discharger has stated preference to utilize synthetic liners throughout the operations.

4. The heap/leach ore pile would be underlain by a synthetic liner designed to be effective throughout the processing life of the pile. Sunlight resistant liners would be used where the liner is exposed to sunlight, and would extend under the edges of the pile. The ore pile would be detoxified, then flushed with fresh water after completion of the leaching operation to reduce the cyanide concentrations to an acceptable level which would result in a mining waste classification of Group C, under Subchapter 15, Chapter 3, Title 23, of the California Administrative Code.

5. The discharger reports that ground water at the site occurs at depths of more than 200 feet. The process water used for this heap-leaching operation is to be piped from a well located more than 700 ft. northwest of the plant site. There are no perennial surface waters near the site.

Cancelled
1/17/90

6. Mean annual precipitation in this area is 6 inches.

7. The Water Quality Control Plan for the Colorardo River Basin Region of California was adopted by the Regional Board on November 14, 1984.

8. The beneficial uses of the ground water within the Lanfair Hydrologic Subunit as set forth in the above Plan are municipal supply, agricultural supply, and industrial supply.

9. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the proposed discharge.

10. The Board in a public meeting heard and considered all comments pertaining to the proposed discharge.

11. The San Bernardino County Environmental Analysis Division has approved a Negative Declaration Number EAD 1153-481N (approved April 7, 1982) for a test mining operation at this location. The below waste discharge requirements are designed to assure against any significant adverse effects on the quality of local ground waters and on any temporary surface waters resulting from infrequent storm runoff.

IT IS HERBEY 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 a pollution or a nuisance as defined in Division 7 of the California Water Code.

2. The cyanide solution shall be contained within the processing system in leak-proof containers.

3. There shall be no wind transport of cyanide solution or ore containing cyanide away from the leaching or processing area.

4. The heap leach ore pile shall be underlain by a synthetic liner which has a maximum permeability of 1×10^{-7} cm/sec and a minimum thickness of 40 mils. The fluids contained therein shall not penetrate the plastic synthetic liner during the containment period. The plastic synthetic liner shall be underlain by a sand layer with a thickness of at least six (6) inches to protect the liner from puncture.

5. The pregnant and intermediate solution transport ditches shall be lined with a weather-resistant synthetic liner, which has a minimum thickness of at least 36 mils and a permeability which does not exceed 1×10^{-7} cm/sec.

6. 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 x 10^{-7} cm/sec. The bottom liner shall have a minimum thickness of 40 mils. The upper liner shall be weather-resistant synthetic material with a minimum thickness of 36 mils. The double liners for the leachate collection and removal system shall extend up the sidewalls to at least two (2) feet above the maximum working depth of cyanide solution and/or sludge contained therein. The remaining sidewalls shall have at least a single 36 mil weather-resistant synthetic liner. Other design details for protection of the quality of State waters shall be as approved by the Regional Board's Executive Officer.

7. The mill site where the precious metals recovery operation is conducted shall be underlain by a weather resistant synthetic liner of at least 36 mil thickness, with a maximum permeability of 1 x 10^{-7} cm/sec to contain any cyanide solution escaping the system through spillage or systems failure.

8. A dike with a minimum freeboard of at least 2 (two) feet with a weather-resistant synthetic liner of at least 36 mil thickness shall be maintained around the base of the heap leach pile to prevent runoff. The synthetic liner shall have a permeability which does not exceed 1 x 10^{-7} cm/sec.

9. The entire processing area shall be protected from any run-on, washout, or erosion which could occur as a result of floods having a predicted frequency of once in 100 years, as computed from the data for this area presented in the Department of Water Resources publication, "Rainfall Depth-Duration-Frequency for California", revised November 1982, and based on time of concentration at the processing area and applicable flood drainage channels.

10. The entire processing area shall be diked to impound all storm water drainage from the cyanide solution collection facilities and basins during a probable maximum one hour storm event as set forth in the Department of Water Resources Publication , "Rainfall Depth-Duration-Frequency for California", revised November 1982, (4.8 inches) in addition to 24 hours of cyanide solution draindown. Also, standby emergency facilities shall be available to assure containment of the stormwater drainage and of the leaching solution.

11. There shall be no discharge of process wastewater at any location without prior approval from the Regional Board.

12. Adequate measures shall be taken to ensure that liners will not be punctured for the duration of this activity.

13. Leached ore residue shall not be placed in perennial, intermittent, or ephemeral stream channels unless provision is made to divert runoff around the waste in a non-erosive manner. Waste shall not be placed where it can be eroded by streamflows or cause accelerated streambank erosion.

14. Prior to removal of leached ore residue from an impervious pad for disposal, or abandonment of the ore pile in place, the cyanide contained therein shall be neutralized to the level described in Discharge Specification No. 17, below. The neutralized ore shall also 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 Administrative Code.

15. All industrial waste materials, used cyanide containers or other hazardous products, shall be properly disposed of as approved by the Executive Officer.

16. Adequate measures shall be taken to assure that unauthorized persons and mammals are effectively excluded from the processing area.

17. The procedure for sampling and analyzing for free cyanide (CN-) in the ore residue to determine whether detoxification is complete, shall be as follows:

    a. A sampling grid of the ore pile on the leach pad shall be submitted for review and approval by the Executive Officer prior to the sampling operation.

    b. The sample to be analyzed from each sampling location shall consist of a 100 gram aliquot taken at depths of 25, 50, and 75 percent from the top of the ore pile, except that no sample shall be taken within 3 (three) feet above the plastic liner unless special provisions are made to avoid penetrating the liner or for sealing said penetrations.

    c. The sample analysis procedure shall be as set forth in Attachment A, which is a part of this order.

    d. The maximum allowable free cyanide (CN-)shall not exceed the following levels in the filtrate portion of a 5/1 extraction:

        1. Ten (ten) mg/l free cyanide (CN-) in 90 percent of the samples;

        2. Twenty (20) mg/l free cyanide (CN-) in any of the samples.

    e. For any sampling location that indicates a free cyanide level in excess of 20 mg/l in the filtrate, the extent of the inadequately detoxified area shall be determined and detoxified so that the cyanide levels will comply with the limitations contained in Specification No. 17 (d) 1 and 2 above.

18. All Chemical analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services or approved by the Executive Officer, and all sampling, preservation, storage and analyses shall be conducted in accordance with current EPA guideline

procedures or Standard Methods for the Examination of Water and Wastewater, 16th Edition.

19. Ground water monitoring wells shall be installed at appropriate locations and depths, as approved by the Executive Officer, to yield ground water samples that represent the back-ground water quality and to detect any possible migration of the cyanide solution into the ground water. Initial sampling from these wells shall be performed prior to any use of cyanide solution on the premises.

B. Provisions

1. At least 30 days[1] prior to commencement of construction of the facilities, 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 the pads, basins, leakage detection system and flood protection facilities.

2. 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 facilities are constructed in accordance with the technical report as approved by the Executive Officer to meet the requirements of this Order.

3. The discharger shall process no more than a total of 10,000 tons of ore, and shall process same within a period of time not to exceed 6 (six) months from the beginning of leaching operations.

4. At least 5 days prior to placing the synthetic liner over the sand pad, and 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 the construction procedures.

5. The discharger shall comply with "Monitoring and Reporting Program, No. "86-88," and future revisions thereto, as specified by the Executive Officer.

6. The discharger shall submit to the Board, at least 7 (seven) days prior to commencement of operation, written adequate assurance that $10,000 is committed to ensure detoxification of all cyanide, plus cleanup and closure of the processing and tailing disposal sites 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 after the effective date of this Order shall constitute abandonment for the purpose of this Order.

[1] unless a lesser period is approved by the Executive Officer.

8. The discharger shall immediately inform the Executive Officer of any detected leakage under the ore pile, or elsewhere in the facilities along with a proposal to correct same.

I, Arthur Swajian, 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 November 19, 1986.

Arthur Swajian
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ATTACHMENT A

SAMPLE PREPARATION PROCEDURE
FOR
IONIC CYANIDE ANALYSIS
also known as free or soluble cyanide

Description: Ionic cyanide and most weak complexes are soluble in distilled water. The strong complexes of iron, 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, flowthrough manner. The leachate is collected, alkalized for preservation, and made up to a definite volume. This leachate sample is then analyzed via "Standard Methods" 412C or E. Method 412D may not be used.

Apparatus:

1) Large glass funnel, the stem throat plugged with glass wool;

or

2) Large glass funnel with glass fiber filter paper: Whatman GF/C, 934-AH, or equivalent.

3) Balance capable of weighing to nearest 0.01g.

4) 500 ml volumetric flasks.

5) Items necessary to perform cyanide analysis as described in narrative above.

Reagents:

1) 2.5 N NaOH (100g NAOH/1)

2) Reagents necessary to perform cyanide analysis as described in narrative above.

Procedure:

Weight out, to the nearest 100± 1g of sample as received. Place in glass funnel, either glass wool plugged or with filter paper. Add 50.00 ml of 2.50 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 the 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 H_2O has been used. Make up volume in volumetric flask to mark with distilled water. This constitutes sample ready for analysis.

The titrimetric (412C) and the ion selective probe (412E) require no further preparation. The sample is then read directly by either titrimetric (412C) or the ion selective probe (412 E) and the results reported in mg/l (CN).

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 86-88
FOR
RATTLESNAKE MINES, LTD.
Northwest of Needles - San Bernardino County

Location: SE¼ of Section 19, T12N, R18E, SBB&M

MONITORING

Rattlesnake Mines, Ltd. shall report to the Regional Board the following:

1. The current status of mining operations as to whether the operation is active or inactive - monthly.

2. Immediate reporting of any accidental spillage, leakage, or release of cyanide solution including immediate measures being taken to correct same and limit detrimental effects.

3. Upon request from this Board's Executive Officer, the discharger shall furnish special technical and/or monitoring reports on the integrity of the cyanide solution containment system and on the leakage or spillage of cyanide solution outside the containment system.

4. Prior to commencement of operation, the discharger shall furnish the Regional Board with the results of testing the leak detection system of each double-lined containment basin and any other leak detection systems.

5. 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. 17, and shall request a Regional Board staff inspection for approval of the proposed discharge or cleanup procedure.

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

7. The leachate collection and removal system specified in Discharge Specification No. 6 shall be inspected or monitored daily for fluids.

8. Prior to any use of cyanide solution on the premises, the discharger shall sample and analyze the water from the ground water monitoring wells for cyanide concentration, and the results of the analyses shall be submitted to the Regional Board.

9. Ground water from the monitoring wells shall be sampled and analyzed monthly for free cyanide.

REPORTING

Monthly reports shall be submitted to the Regional Board by the 15th day of the following month. Reports for Item 2, (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. The results from the initial sampling required in Discharge Specification No. 19 shall be submitted to the Regional Board for review at least five (5) days prior to commencement of operations. 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.

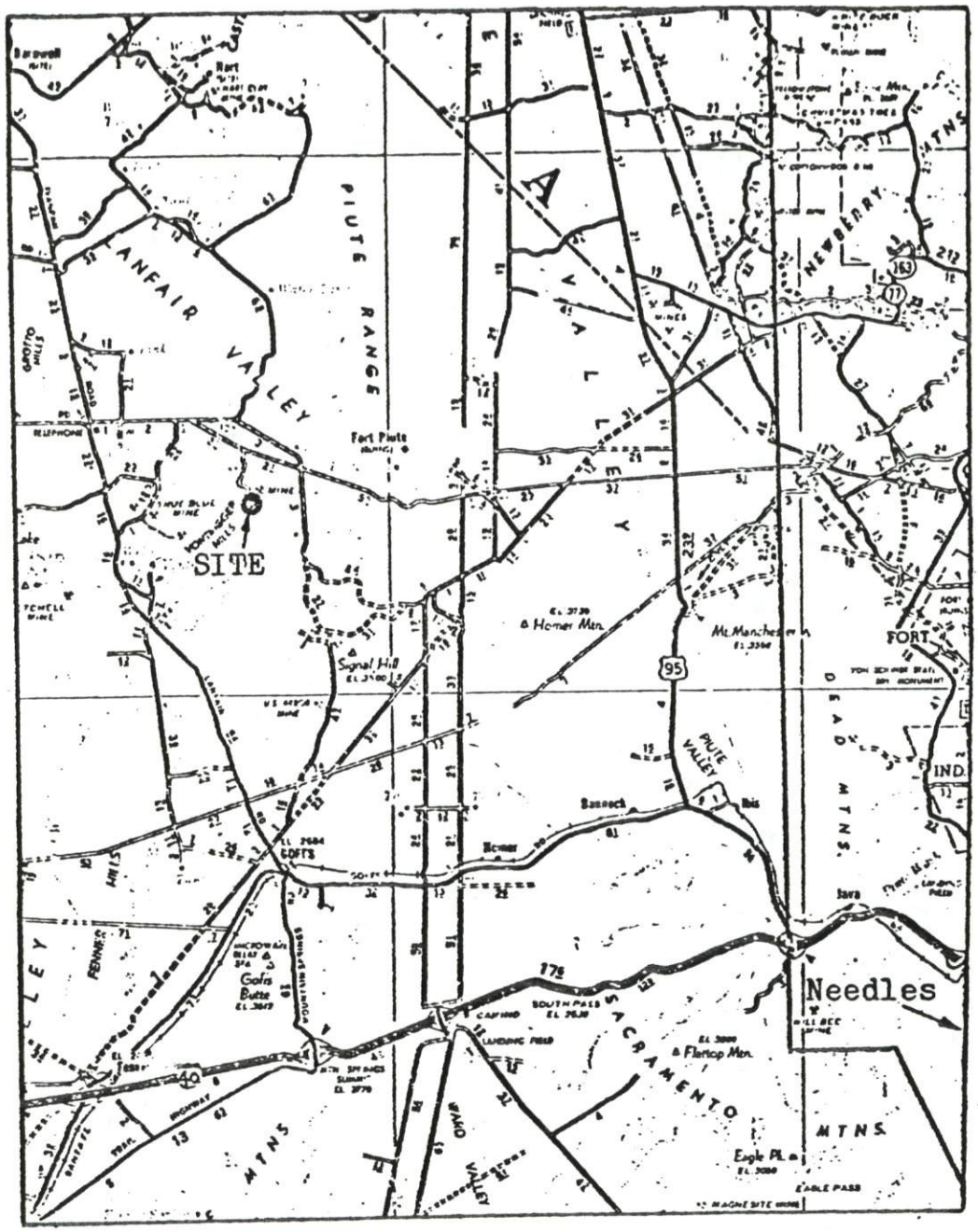
Mail reports to:

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

ORDERED BY: Arthur Sevajian
Executive Officer

November 19, 1986
Date

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - 7



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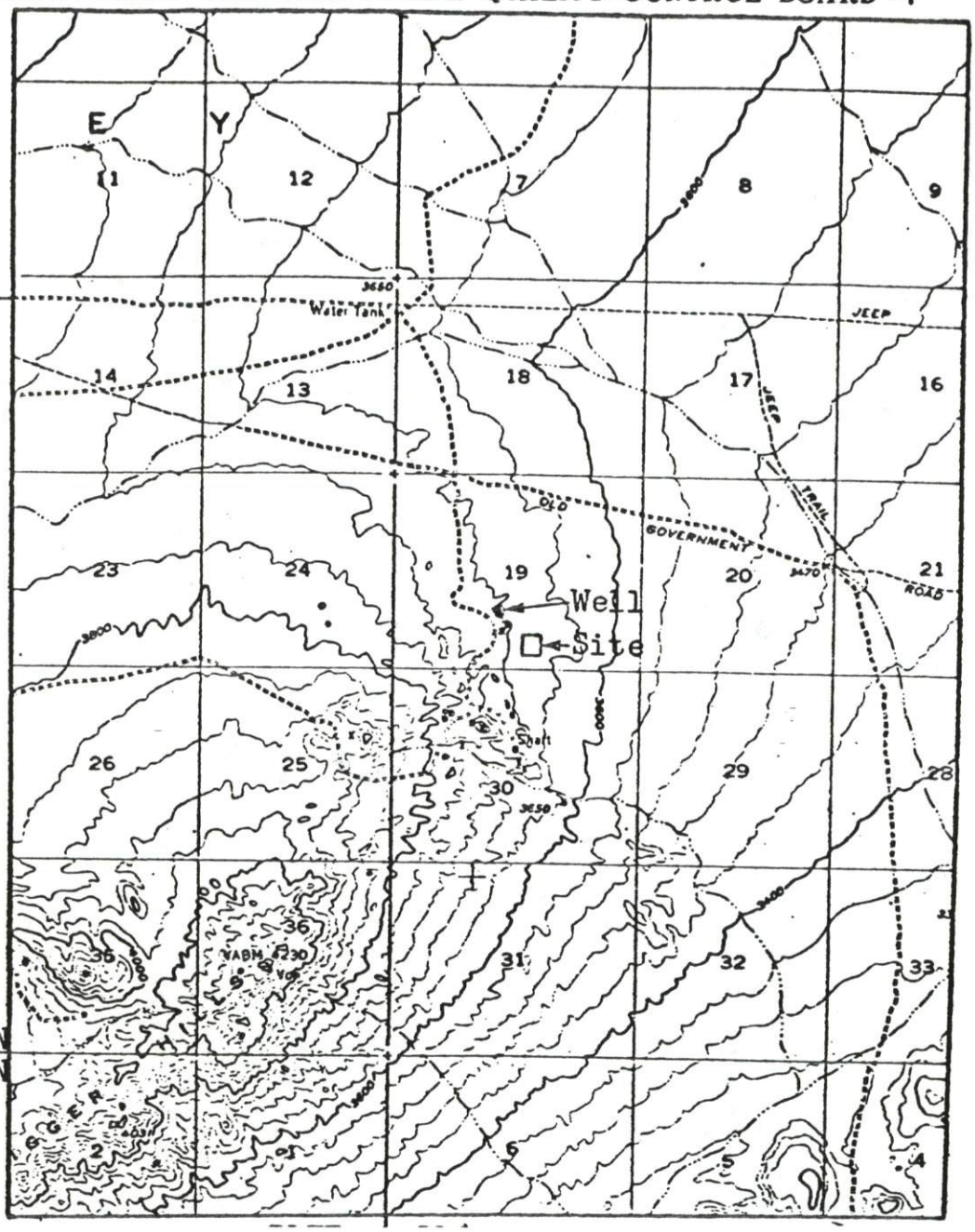
Scale:
1" = 4.5 mi.

SITE MAP NO. 1

RATTLESNAKE MINES, LTD.
Northwest of Needles - San Bernardino County

Order No. 86-88

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD -7



SITE MAP NO. 2

RATTLESNAKE MINES, LTD.
Portion of SE¼ of Section 19, T12N R18Em, SBB&M
USGS Lanfair Valley 15 min. Topographic Map
Northwest of Needles - San Bernardino County

Order No. 86-88