GW - 45

REPORTS

YEAR(S):

2002

Jack Ford

CIMARRON GAS PROCESSING EQUIPMENT COMPANY, INC.

P.O. BOX 1406
GUYMON, OK 73942
Ph. 580-338-5496
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1830 1st AVENUE
GREELEY, CO 80631
(970) 352-3123
Fax (970) 352-3125

October 16, 2002

Denny G. Foust
Environmental Geologist
1000 Rio Brazos Road
Aztec, NM 87410

Dear Denny G. Foust:

Enclosed please find glycol spill report #00044-003. To our knowledge we are in full compliance with all requirements for clean-up. Please contact myself, John Moore, if you need any further information.

Thank you in advance,

John W. Moore
Cimarron Gas Processing

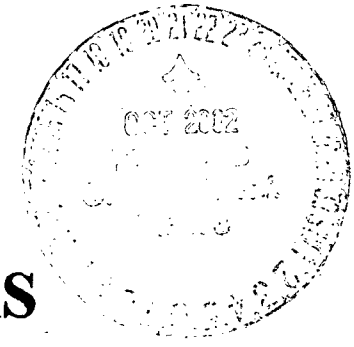
Jack Ford

ENVIROTECH INC.

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

GW-045

GLYCOL SPILL CLEANUP
MOBILE REBOILER LOCATION
WILLIAMS FIELD SERVICE'S
KUTZ PLANT



FOR

CIMARRON OIL & GAS
P.O. BOX 1406
GUYMAN, OKLAHOMA 73942

PROJECT #00044-003

OCTOBER 2002

5796 U.S. HIGHWAY 64 • FARMINGTON, NM 87401 • (505) 632-0615

ENVIROTECH INC.

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

October 8, 2002

Cimarron Oil & Gas
Attn: John Moore
Box 1406
Guyman, Oklahoma 73942

Project # 00044-003

800-822-8755

Re: Glycol spill cleanup at mobile reboiler location at WFS' Kutz Plant

Dear Mr. Moore:

Envirotech Inc. has completed cleanup of soil contaminated with used glycol at the referenced site. It is our understanding that Cimarron was reconditioning glycol for WFS at the site. Used glycol was staged near the mobile reboiler in a 75 barrel tank and fed to the reboiler through a pipe fitted with a sensor to supply feed stock on demand. The supply line developed a leak and discharged an unknown volume of glycol to the concrete slab and surrounding area.

Envirotech was contacted by Mr. John Moore at approximately 8:30 on October 7, 2002. A crew, tools , and equipment were mobilized to the site and arrived on-site at approximately 10:30 am. A tail gate safety meeting was conducted before work began. Williams Field Service personnel were on location to spot underground utilities before excavation activities began. The scope of work included removal of glycol contaminated soil to the visual extent of contamination, backfilling the excavation with clean granular material, and placing aggregate base coarse material back on the surface to complete the work.

Glycol had impacted soil on three sides of the 25' x 55' concrete slab being used as a work area. Spills around the margins of the concrete slab varied in depth from 2' to 4'4" and had surface footprints ranging upwards from 6' wide to 29' wide and varied in length from 20' to 50' (see Site Sketch). No attempt was made to excavate contaminated soil from under the cement slab.

The mobile reboiler was moved out of the work area so that excavation would be expedited. The area was excavated using a Cat 416 Backhoe. Contaminated soil was loaded directly to dump trucks for transport to Envirotech's NMOCD permitted Soil Remediation Facility, Landfarm #2. Approximately 118 cubic yards of contaminated soil was removed from the site. Transport and acceptance of the contaminated soil for remediation is documented on Bill Lading Numbers 20040 and 20123. Note that approximately 12 barrels of glycol sludge were transported to Envirotech's Blending Facility as documented on BOL # 20040. Clean backfill and aggregate base coarse are *documented on* Bill of Lading number 20135, 20123, and 20101.

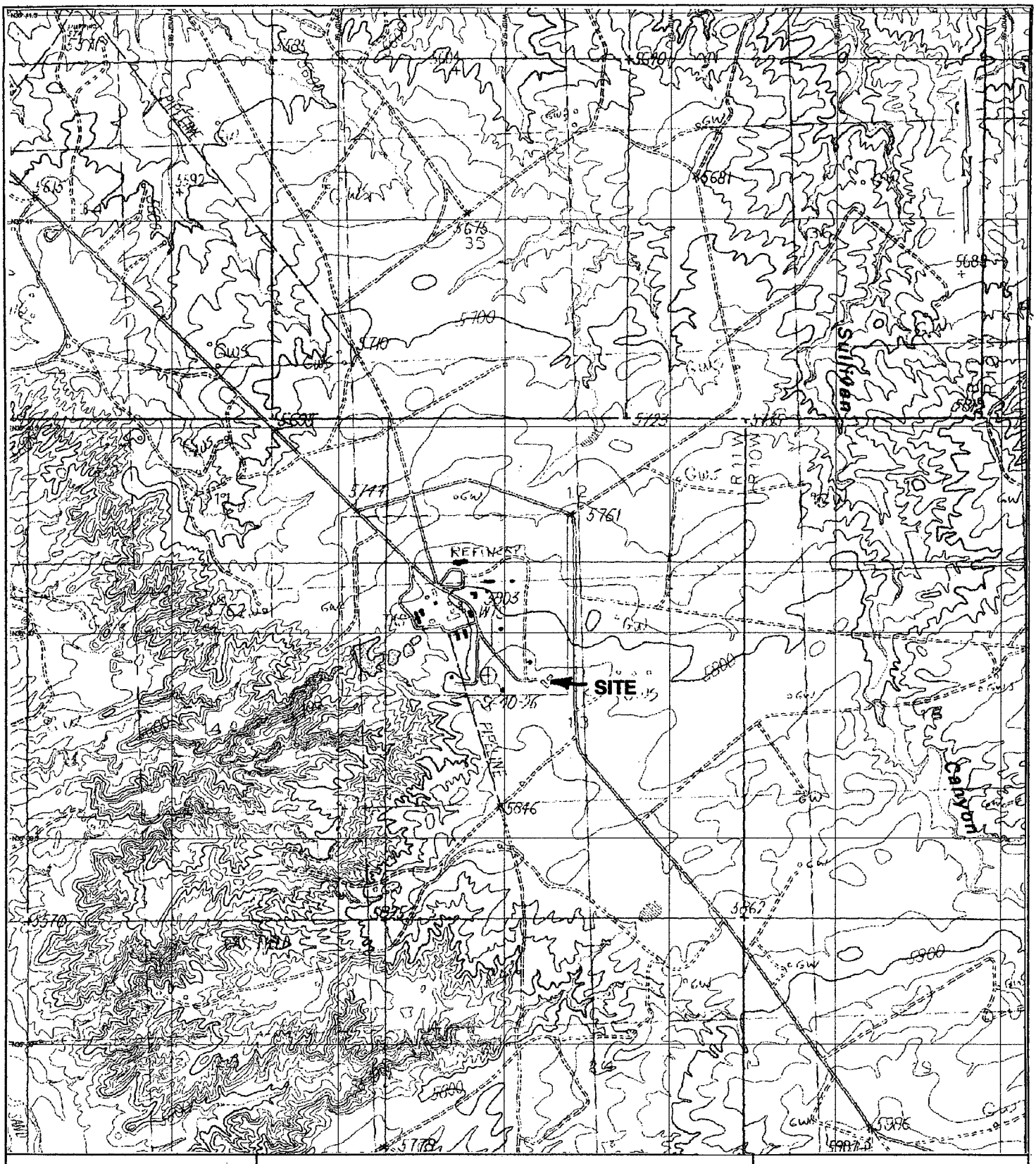
No soil samples were collected for analysis. Contaminated soils were removed to the extent of visual contamination. Used glycol contamination extends to the depths noted on the site drawing at the margins of the concrete slab. The distance that glycol extends under the concrete is unknown. Additional soil remediation may be necessary when the concrete slab is removed.

If you have further questions or comments regarding the cleanup of glycol contaminated soil at the referenced location please feel free to contact us at 505-632-0615.

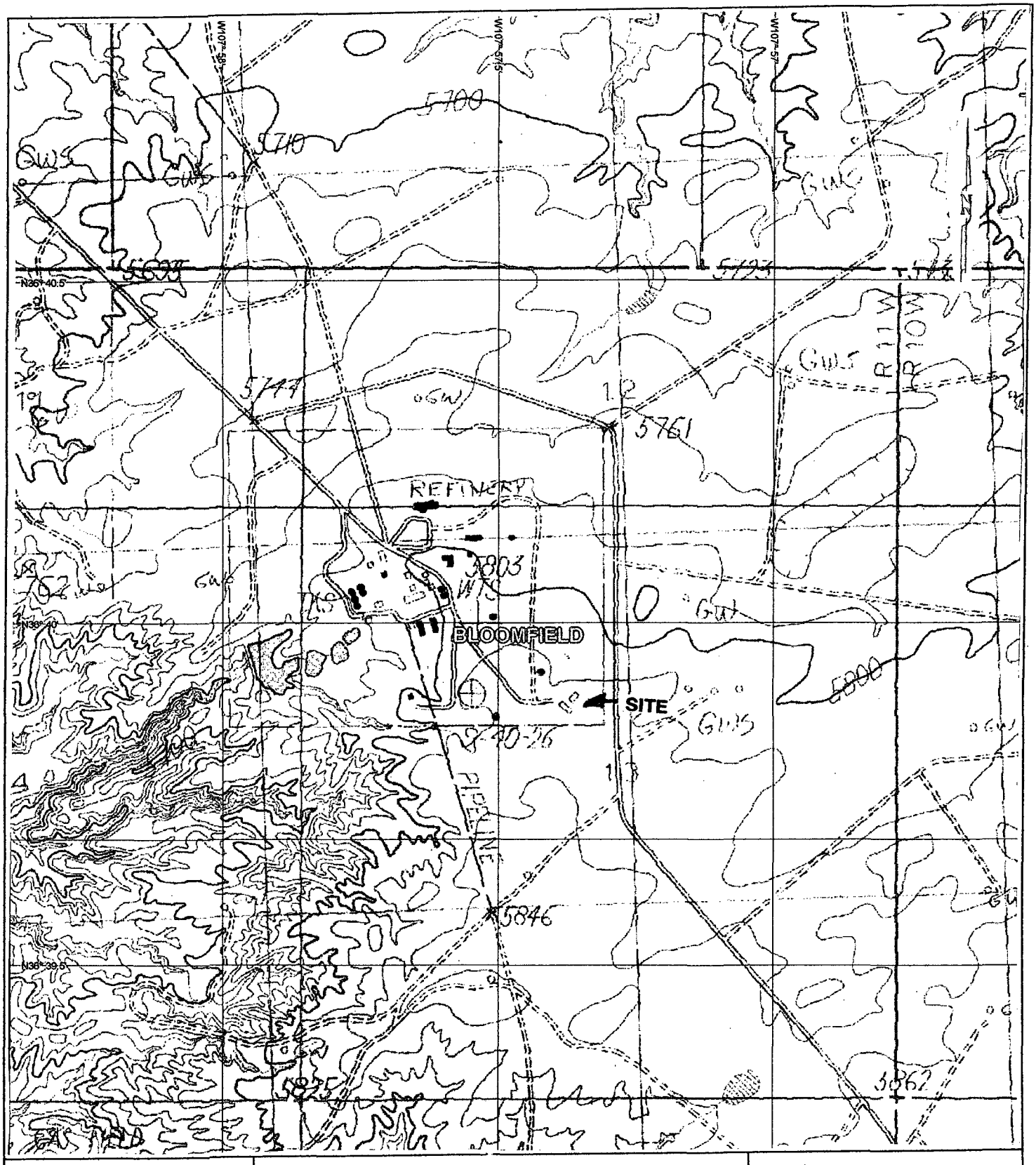
Sincerely,

Envirotech Inc.

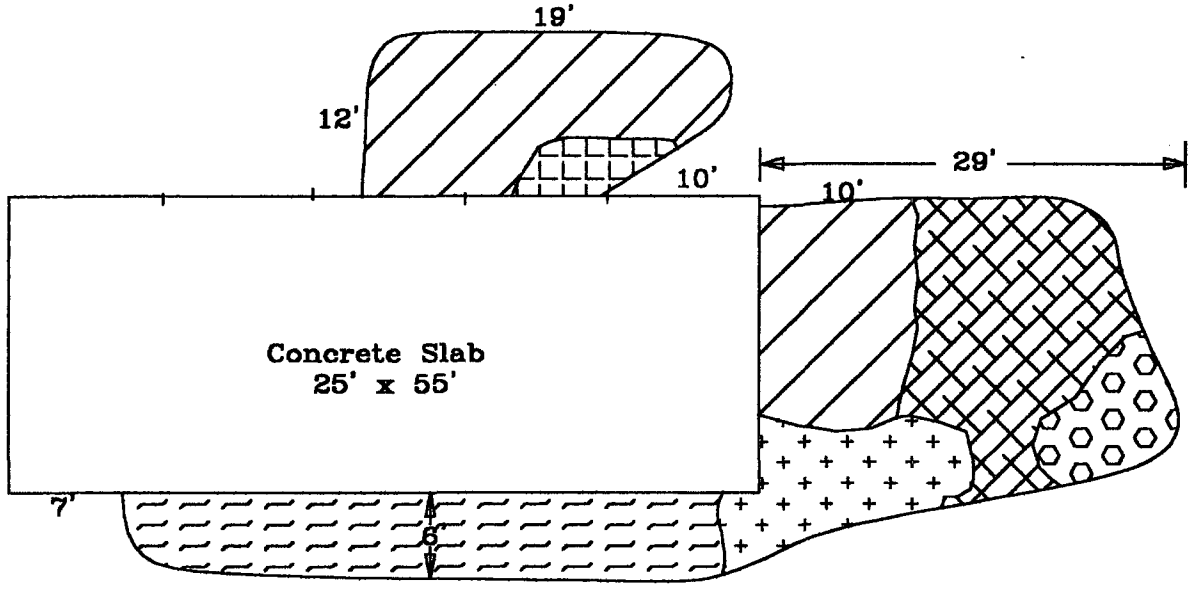
Harlan M . Brown
Geologist / Hydrogeologist
New Mexico Certified Scientist #083



Cimmaron Oil & Gas Spill Cleanup SE Corner WFS Bone Yard Glycol Reboiler Upset NW 4 Sec 13, T28N, R11W San Juan County, NM	**Envirotech Inc.** Environmental Scientists & Engineers 5796 US Highway 64 Farmington, New Mexico	**Vicinity Map** Figure 1 | Date: 10/02 DRW: HMB | PRJ MGR: MES
Project No.: 00044-003		



Cimmaron Oil & Gas Spill Cleanup SE Corner WFS Bone Yard Glycol Reboiler Upset NW 4 Sec 13, T28N, R11W San Juan County, NM Project No.: 00044-003	Envirotech Inc. Environmental Scientists & Engineers 5796 US Highway 64 Farmington, New Mexico	Vicinity Map Figure 1a | Date: 10/02 DRW: HMB | PRJ MGR: MES



2' Deep

3' Deep

3' 4" Deep

3' 8" Deep

4' Deep

4' 4" Deep

All angles, directions, and distances determined by sighting and pacing from existing site features. Accuracy of measurements implied only to the degree of accuracy of method.

NO SCALE

Cimmaron Oil & Gas Spill Cleanup SE Corner WFS Bone Yard Glycol Reboiler Upset NW 4 Sec 13, T28N, R11W San Juan County, NM	Envirotech Inc. Environmental Scientists & Engineers 5796 US Highway 64 Farmington, New Mexico	Site Map Figure 2 | Date: 10/02 DRW: HMB | PRJ MGR: MES
Project No.: 00044-003		

Photo #1 - North side of concrete slab, before excavation - view west

Photo #2 - North side of concrete slab, excavation complete

Photo #3 - North side of concrete slab, after excavation, gravel replaced - view west

Photo #4 - East side of concrete slab, before excavation, view northeast

Photo #5 - East side of concrete slab, excavation complete - view west

Photo #6 - East side of concrete slab, excavation, complete, gravel replaced, view west

Photo #7 - South side of concrete slab, before excavation - view west

Photo #8 - South side of concrete slab, before excavation

Photo #9 - South side of concrete slab, after excavation - view west

Photo #10 - South side of concrete slab, after excavation, view west

Photo #11 - South side of concrete slab, backfill of excavation in progress, view west

Photo #12 - South side of concrete slab, excavation complete, gravel replaced

OCD - File Copy

SUNTERRA GAS PROCESSING COMPANY
Kutz Canyon Gas Plant

Waste Water Discharge Plan GW-45
December 1987

Sunterra GAS PROCESSING COMPANY
P.O. BOX 1869 • BLOOMFIELD, NM 87413 • (505) 632-8033

December 21, 1987

Mr. William J. LeMay, Director
Oil Conservation Division (OCD)
Energy, Minerals and Natural
Resources Department
P.O. Box 2088
Santa Fe, New Mexico 87501

Re: Kutz Canyon Gas Plant
Waste Discharge Plan GW-45

Dear Mr. LeMay:

Enclosed are four (4) copies of the Waste Discharge Plan application for Sunterra's Kutz Canyon Gas Plant.

I hereby certify that I am familiar with the information contained in and submitted with this application and that such information is true, accurate and complete to the best of my knowledge and belief.

I look forward to working with OCD as you review our discharge application.

Sincerely,

John Renner
General Manager

JR:bb
Enclosures
c: Mr. David Boyer

INTRODUCTION

Sunterra Gas Processing Company's ("Sunterra") Kutz Canyon Gas Plant ("Plant") is located approximately two miles south of Bloomfield, New Mexico. The Plant site covers approximately 22 acres. The location is shown on Exhibit 1. The Plant site is leased from the Bureau of Land Management (BLM) under lease number SF 075309.

The Plant was originally constructed in 1949. The Plant consists of two different extraction systems to remove ethane and higher hydrocarbons from field natural gas. The hydrocarbons that are removed are marketed in several places. The residual natural gas is also marketed by another company. An upgrade and a new extraction system was added in 1976.

The Plant was purchased by Sunterra on December 31, 1986. Prior to that time, the Plant was owned by Southern Union Company. Upon assumption of ownership, Sunterra realized that the existing waste water system was not adequate and revisions were needed to protect the environment. This plan will outline Sunterra's proposal to reduce the amount of wastewater requiring treatment and removal of hydrocarbons from the wastewater for recycle and reuse.

The following is a more detailed description of the two extraction units at the Plant:

Kutz #1 Processing Unit

The Kutz #1 unit was built in 1949 and is currently active. The designed unit capacity is for 120 million cubic feet of gas per day with a refrigerated oil absorption process.

The unit process begins with raw field gas injected with glycol which passes through an exchanger to cool the gas, and then to a chiller to provide further cooling. Water in the gas is absorbed by the glycol. In a glycol separator, heavy hydrocarbons and glycol are separated from the gas. The glycol moves to a reboiler (distillation unit) where the water is cooked off and directed to pond #1. The glycol is recycled for reuse in the injection process. The gas proceeds to an adsorption unit where it is bubbled through cold lean oil (absorption oil) which absorbs the higher hydrocarbons making a rich oil. The gas then is directed to the residual gas pipeline stream.

The rich oil mixed with hydrocarbons is drawn off the bottom of the adsorber. This oil goes to a demethanizer tower. Methane gas is flashed out of the rich oil and is directed to the residual gas pipeline. The remaining rich oil is heated and moves to a still column, where ethane, propane, butane and natural gasolines are flashed out. The flashed out material or product is cooled and directed to storage vessels or to a fractionator where propane is separated for local sale. Either the propane or the mixed product stream moves through an iron sponge, which picks up any hydrogen sulfide. This iron sponge process has been utilized in the unit since 1978. Soda ash is mixed with water and injected into the iron sponge to keep it activated. The refined product from the iron sponge moves to storage for sale.

A cooling tower serves to cool the product, lean oil, engine oil, propane, glycol and other needs. Currently, an algaecide and IWE scale inhibitor are used in the cooling towers. Blow down from the cooling tower is directed to pond #1.

Methanol is occasionally used in Kutz #1 for injection into the process stream in order to retard ice formation in the system. The methanol is essentially consumed in the system as it moves to storage with the product. Ambitrol, a dilution of glycol, is used in the unit as an antifreeze and coolant. Ethyl mercaptan, a product odorant, is injected into the propane product at the truck loadout.

Process water and associated liquid constituents are conveyed by a system of drains to pond #1, shared with the Kutz #2 unit. The flare burns off hydrocarbon vapors released from the unit. A schematic of the process wastewater flow is presented in Exhibits 2 and 3.

Kutz #2 Processing Unit

Built in 1976, the Kutz #2 unit was designed for a cryogenic process and is currently active. The unit has a capacity of approximately 80 million cubic feet of gas per day.

The process begins with field gas directed upward from the bottom of a process tower. Diethanolamine solution (DEA) is directed downward through the tower to contact the rising gas. Acid gases are extracted from the gas by the DEA. The rich DEA is then directed to a still column for acid gas removal. The

acid gases are emitted to the atmosphere. The DEA is cooled for recycling. Water losses from the DEA system are made up with deionized river water. The gas is directed from the DEA process to one of the two dehydrator towers in which water is adsorbed by molecular sieves. The second tower is cooled and regenerated while adsorption continues in the first tower. The water removed during regeneration flows to pond #1. The gas is chilled in heat exchangers and chillers and goes to separators for separation of hydrocarbon liquids. Gas pressure is reduced in turbo expanders which liquifies ethane, propane, butane and natural gasolines. The liquids then move to a demethanizer. Methane and some ethane are flashed off and directed to the residual gas pipeline. The liquid product moves through heat exchangers and to storage and mixed with Kutz #1 unit product. The liquid product is pumped from storage to a pipeline for market.

Methanol is occasionally used at Kutz #2 to mitigate or prevent icing problems in the system. Ambitrol is used as a coolant and antifreeze for Plant engines.

Similar to the Kutz #1 unit, a system of drains directs wastewater and waste liquids from the unit to pond #1 jointly utilized by both units. Hydrocarbon vapor releases from the unit are directed to the flare. A schematic of the process wastewater flow is presented in Exhibits 4 and 5.

Wastewater Characterization

Exhibit 3 is the present water flow diagram for the Plant. All process and sanitary facilities water is obtained from the San Juan River. River water is

pumped to three large storage tanks on the Plant property. From these storage tanks, water is routed to the process or sanitary facilities.

The majority of water used at the Plant is for cooling tower makeup. At present, the cooling tower operation accounts for 85% of the water usage at the Plant. In the cooling tower, 88% of the water is lost in evaporation with 12% as blow down routed to pond #1. This blow down contains dissolved solids (TDS) in the 1,500 ppm range.

Another small stream from the deionizer regeneration cycle contains dissolved solids. The salts that are removed from the river water are purged to pond #1. This stream averages approximately 46 gallons per day.

There are several open drains which drain wash down water in the compressor buildings. These wash downs average 530 gallons per day and can be contaminated with lubrication oils and grease. Presently, these are going to pond #1 untreated.

Ethylene glycol is used in the Kutz #1 Plant to remove water from the inlet gas stream. This produced water, approximately 360 gallons per day, is presently being discharged to pond #1. This produced water is of a better quality than river water and as outlined under Process Changes will be utilized in the cooling tower as makeup.

We also use approximately 2,000 gallons, per fire fighting training session, 4-6 times a year.

In the iron sponge process to remove sulfur from the Kutz #1 liquid product stream, water and soda ash are injected into the sponge to keep the iron sponge moist. Approximately 20 gallons per day of water enters pond #1 and 5 gallons per day enters the product stream from the iron sponge vessel. Approximately once a year the iron sponge is steamed in the vessel to remove sulfur. The sulfur and steam are vented and the iron sponge can be reused. Eventually, physical degradation of the iron sponge can cause an unacceptable pressure drop in the vessel. The iron sponge is then removed from the vessel, allowed to dry and is landfilled.

Except for the sink in the Kutz #2 control room, no sanitary facilities wastewater is commingled with process wastewater. The sanitary wastewater is discharged into septic systems. The Kutz #2 sink discharges up to 100 gallons/day into pond #1.

Exhibit 3 is a map showing present discharge points within the Plant and their routing into pond #1. Also shown on the map is the septic systems for the sanitary wastewater.

Planned Process Changes

Upon review of the wastewater streams that presently are being produced, it became apparent that some changes could be done to minimize the quantity of wastewater generated and reduce the amount of river water used. Since the cooling tower is the largest single user of water and contributes the most wastewater to pond #1, Sunterra is in the process of evaluating methods to

increase the cycles of concentration. With the increase in cycles, pH controlled at 7 to 7.5 with sulfuric acid, then silica will be the controlling parameter for blow down. Sunterra will also need to change corrosion inhibitors from the present IWE 7044 to IWE 7200. The IWE 7200 is an orthophosphate corrosion inhibitor and will be maintained at 5 to 15 ppm in the tower, therefore the blow down will also have 5 to 15 ppm of the orthophosphate in it. Sunterra will also be using two biocides to control microbiological growth which will also be in the blow down, these are IWE 100 and IWE 6135.

All the wastewater from the floor drains, which could be contaminated with oil, will be sent to a collector box and then routed through an oil and water separator to remove any oil. The water out of the separator will be directed to the new evaporation pond and the oil will be placed in storage for recycle.

The Kutz #1 glycol regeneration water and the Kutz #2 regenerator gas scrubber water are lower in total dissolved solids than river water, therefore these regeneration waters will be used as cooling tower makeup. This will reduce the amount of river water required for make-up in the cooling tower.

The Kutz #2 sink drain will also go into the collector.

We will analyze the streams that flow to the new evaporation pond for those parameters listed in Guidelines of the Preparation of Groundwater Discharge Plans at Natural Gas Processing Plants upon approval to implement the above changes. In Appendix 1 are analyses of the water in the three ponds at the Plant along with analyses of cooling tower blow down.

With the double-lined new evaporation pond installed, Sunterra does not believe that groundwater monitoring wells need to be installed. A leak detection system as shown on Exhibits 6-9 will alert Sunterra to any potential damage to the top liner, which will be repaired immediately, and the under-liner will protect any groundwater from contamination. For the same reasoning, Sunterra has not supplied data on groundwater TDS concentrations or actual depth to groundwater.

Transfer and Storage of Process Fluids and Effluents

Exhibit 3 is an orthophoto of the Plant showing wastewater flow routing. All of the flows are underground. All tanks and separators are above ground. The collection boxes shown on Exhibit 3 are underground and are of cinder block-concrete design. At present, all floor drains are directed to pond #1 with no treatment. As mentioned previously, Sunterra plans to treat these drains to remove machinery lubricating fluids that were going to pond #1.

Exhibits 4 and 5 show the proposed changes Sunterra plans to implement. The new collector box will be underground and of concrete construction. All other process changes will be above ground. Sunterra plans to do integrity testing of the underground wastewater pipelines once the waste discharge plan has been approved, and our process changes implemented. The results of these tests will be submitted to the OCD.

Spill/Leak Prevention and Housekeeping Procedures

Within the processing units, small spills or leaks will be controlled with the use of curbs or berms around pieces of equipment that are the most susceptible, such as pumps, tanks and separators. Major spills would drain across the Plant and be contained in pond #3 (see Exhibit 5).

Small leaks or spills will be picked up with a portable pump and tank. Also storm water that falls within the curbed or bermed area will be picked up with this portable pump and tank. Rainfall will be put in the collector box to remove any residual oils and the water directed to the new evaporation pond.

Major spills that enter pond #3 will be picked up with a vacuum truck. Depending on the material, Sunterra would probably contract to dispose of the material. OCD would be notified immediately (within 24 hours) of a major spill. Within 10 days after the spill, OCD would receive a report detailing the cause of the spill, remedial actions taken and plans to prevent reoccurrence.

Based upon our initial findings of the integrity of below ground wastewater piping, we will submit a plan, which will include methods of leak detection and frequency of performing the plan.

The 100YR-24HR precipitation event at the Plant site is approximately 2.8 inches. This amounts to approximately 1.7 million gallons of runoff from the 22 acre Plant site assuming no infiltration. Pond #3 will hold approximately

15 million gallons and therefore the flooding potential at the site is very remote.

Effluent Disposal

At present all wastewaters, except from sanitary facilities, enter pond #1; the overflow from pond #1 enters pond #2 via an overflow pipe. A spillway has been constructed so that overflow from pond #2 would enter pond #3, however, there has never been an overflow from pond #2 into pond #3. Pond locations are depicted on Exhibit 3.

Sunterra plans to close both ponds #1 and #2. Sunterra plans to construct a double-lined evaporation pond as shown on Exhibits 6-9. Once the new evaporation pond has been excavated, the excavated material will be used to berm around ponds #1 and #2 to divert storm water runoff around the ponds into pond #3. Once the new evaporation pond is put into service, the old ponds #1 and #2 will be allowed to dry out, then the excavated materials from the building of the new evaporation pond will be used to backfill both ponds #1 and #2. Once both ponds are backfilled, they will be graded so that storm water will readily drain off of the old pond locations.

The design specifications for the new evaporation pond are shown in Exhibits 6-9. The sides of the pond will be 18 inches above natural grade so that storm water runoff will not enter the evaporation pond from the watershed that it is in.

Flow into the new evaporation pond will be measured by a single flow meter on the incoming discharge line to the pond. A leak detection system, as shown on Exhibits 6-9, will be monitored daily to warn of any damage to the top liner and the liner will be repaired if a leak is detected.

Site Characteristics

Within the area defined by a boundary one mile outside the perimeter of the Plant, there are no permanent bodies of water (apart from the artificial ponds that are part of the Plant itself), and no perennial streams. The USGS 7 1/2-minute Bloomfield Quadrangle shows two ephemeral ponds on the mesa top, one of about 0.7 acre and the other of about 1.1 acre surface area. Neither is known to bear a name. The center of the first is about 300 feet from the north line and about 2,300 feet from the east line of section 12, T28N, R11W, and the center of the second is about 100 feet from the south line and 1,400 feet from the east line of Section 13. The first pond lies on the opposite side of a low drainage divide from the gas processing parts of the Plant, and the second lies across a low divide and about 60 feet above them.

The first pond is formed by a low dike in a small arroyo; it does not appear on aerial photographs as recent as 1955. The second occupies a natural depression, and existed prior to 1935.

The Plant is located near the edge of a gently sloping mesa top. On the southwest, there is a dissected slope of fairly high relief bordering Kutz Canyon; between the edge of the mesa and the floor of the canyon, a distance of about 6,000 feet at the position of the Plant, the topographic relief is

about 300 feet. The slope is cut by convoluted, sometimes steep-walled drainage courses and their tributaries. To the north, northeast and east of the Plant the mesa slopes down to the valley of the San Juan River and to major tributary arroyos, and is dissected by drainages. To the southeast, the mesa top rises to a drainage divide about four miles from the Plant. All of the drainages are normally dry. The Plant and its surroundings are shown on Exhibit 1.

No water wells are found within one mile of the perimeter in either an examination of State Engineer Office records or a field check, but one or perhaps two water wells have existed within the area in the past. Stone and others (1983) give a record of a well in SE¼, SE¼, NW¼, SE¼ section 34, T29N, R11W. The record indicates the well to be 800 feet deep, and to produce from the Ojo Alamo Sandstone. A dry-hole marker for an abandoned oil and gas test was found at the location. At about 300 FNL, 1,400 FEL, section 11, T28N, R11W, the 16 inch surface casing and 8 5/8 inch casing of what appears to be an abandoned water well were found; both were plugged with cement, and there is no evidence of recent use. There is no record of any water well drilled at the Plant.

Groundwater discharges naturally through small seeps in many places in the drainages which dissect the slopes around the mesa. The seeps are marked by mineral efflorescences and by the growth of vegetation, often salt cedar, in the bottoms of the drainages, and water can be found near the surface. The seeps probably drain into perched bodies of ground water in the Nacimiento Formation which are recharged by precipitation on the mesa top. The geologic and hydrogeologic conditions are described in greater detail in a following

section. None of the seeps is known to form a spring with usable flow. Aerial photographs of 1935 and 1955 were examined to determine whether the site of the present ponds at the Plant had been the location of a spring of any importance before the Plant was built, and no indication of a significant spring was found.

The groundwater in closest proximity to the ponds into which water from the Plant is placed is the shallow, perched water in the Nacimiento Formation beneath the site. It is expected that there is perched water in the sandstone lenses and beds from very close to the surface, down to the water table. The depth to the water table itself is not known directly, but it may be inferred that the water table is controlled by the level of Kutz Canyon, and has a relatively gentle slope, which leads to the conclusion that its depth beneath the Plant is on the order of 200 feet or more.

The lithologic makeup of the Nacimiento Formation was studied by examining a number of electric logs of oil and gas tests in the vicinity. Sixteen wells, by no means all of the wells within a one mile perimeter, were considered; the locations are shown on Exhibit 1. Exhibit 10 is a diagrammatic cross-section which shows the relationship of the Nacimiento Formation to the underlying Ojo Alamo Sandstone and Kirtland Shale. The Nacimiento includes several sandstone beds that may be correlated beneath the Plant. The logs available do not provide information in the upper 130 to 275 feet, but it is probable that the same general lithologic makeup prevails; sandstone beds are visible on the outcrop in the slopes to the west of the Plant.

The proportion of sandstone in the Nacimiento where it was studied through electric logs ranges from about 17 percent to about 40 percent, and averages about 25 percent. The recharge of water in these beds is probably from infiltration of rain and snow on the surface of the mesa, and flow is probably through unsaturated materials until the first sandstone is reached. Discharge, as described above, is through seeps in the drainages on the mesa slopes. It is probable that the uppermost of these sandstone beds or lenses is only a few feet below the surface in the vicinity of the Plant, as estimated from observations of the outcropping rocks in the slopes.

Water from underflow in several of the drainages in the mesa slope, which is likely to represent the natural discharge from the seeps, was sampled by Kutz Plant personnel; the locations of the sampling points are shown on Exhibit 1. The results of analyses, by the laboratory at the Plant, are as follows:

Sample	Date	pH	Conductance, µmhos
26	5-19-87	7.6	21,300
30	5-17-87	7.7	11,400
31	5-17-87	7.7	15,200
32	5-17-87	7.0	24,700

Brown and Stone (1979) characterize the waters of the Nacimiento in the Aztec Quadrangle, a few miles to the north of the Plant, as "generally poor," and present four analyses, as follows:

Well location	HCO_3 epm	Cl epm	SO_4 epm	Na+K epm	Mg epm	Ca epm	TDS ppm	Conductance µmhos
32.10.16.400	0.41	115.66	0.44	95.87	0.72	19.46	6754	12700
30.10.02.100	1.75	0.34	11.26	2.07	1.86	9.46	1004	1523
30.10.23.400	0.20	0.60	75.00	65.00	1.10	8.80	5204	--
30.10.23.400	2.00	1.00	54.00	46.00	1.00	10.00	1921	--

A generalization as to water quality in the Nacimiento is given by Stone and others (1983, p. 30): "Water in some of the more extensive sandstones has a specific conductance of less than 1500 µmhos; however, specific conductance exceeds 2000 µmhos in the finer grained Nacimiento strata. The specific conductance of water in the Nacimiento along the San Juan River commonly exceeds 4000 µmhos."

The nearest analysis found for water from a well in the Nacimiento in a similar geologic and topographic situation is that of the Tenneco well in 28.10.26.32 (Stone and others, 1983, Table 1, p. 102; Table 6, p. 35). That analysis is summarized as follows:

HCO_3 mg/l	Cl mg/l	SO_4 mg/l	Na+K mg/l	Mg mg/l	Ca mg/l	TDS mg/l	Conductance µmhos
136	15	2600	696	16	500	3910	4580

The analysis was done by the U.S. Geological Survey laboratory; the sample was collected October 16, 1974. The location of the Tenneco well is about five miles from the facility.

The topographic situation at the Plant suggests that water in the sandstones of the Nacimiento, moves, in a general way, toward the drainages on each side of the mesa that drain toward the San Juan River, and to the river itself. At the Plant itself, located as it is near the rim of the mesa, it is reasonable to expect perched water in the sandstone beds to move toward the Kutz Canyon drainage, that is, to the west.

Water in the underlying Ojo Alamo Sandstone, the first thick sandstone body in the stratigraphic section below the facility, moves to the north and west toward natural discharge in the San Juan (see Stone and others, 1983, Figure 28).

Soil type: The soils beneath the facility itself, and on the surrounding mesa top, are light colored, calcareous silty clay loam. The depth of soil is not known from soil borings, but several feet of relief can be observed, and a number of feet of soil can be seen in cross-section at the mesa rim.

Names of aquifers: In descending order, the aquifers beneath the Plant are the Nacimiento Formation, which underlies the facility, the Ojo Alamo Sandstone, the sandstone beds of the Kirtland Shale and Fruitland Formation, the Pictured Cliffs Sandstone, the Cliff House Sandstone, and deeper units of Cretaceous age and older. The Cretaceous/Tertiary boundary is thought to lie within or at the base of the Ojo Alamo Sandstone.

Composition of aquifer materials: The Nacimiento at this locality is made up of gray, greenish-gray, and purple mudstones, with lenses and beds of light gray and yellowish gray sandstone. The sandstone beds are generally soft, but there are hard lenses within them. The sandstones range in thickness from less than a foot to over 60 feet, although there is much interbedding of mudstone and claystone in the thicker units. Only the lower part of the formation is present at the Plant; the full thickness would have been 1,000 feet or more, based on projection from areas where the entire formation is present, but much of the total has been removed by erosion. The thickness beneath the Plant is about 710 feet.

Beneath the Nacimiento is the Ojo Alamo Sandstone, a widespread unit of medium- to coarse-grained, sometimes pebbly, sandstone. It contains beds of conglomerate in some areas. The Ojo Alamo is a widely used source of domestic and livestock-watering supplies in the central San Juan Basin. At the site of the Plant, the top of the Ojo Alamo is at about 710 feet, and the thickness of the unit, which consists of a massive sandstone bed with thin lenses of shale, ranges from about 140 feet to more than 180 feet.

The aquifer characteristics and water quality of the Ojo Alamo at the Plant are not known from direct evidence, but may be inferred from the work of Stone and others (1983, Figures 29 and 30). It is probable that the specific capacity of the aquifer is less than 1.0 gpm/feet, and that the specific conductance of the water is on the order of 2,000 μmhos/cm.

Under the Ojo Alamo is a sequence of shales, sandstone beds, and coals, all of Cretaceous age, assigned to the Kirtland Shale, the Fruitland Formation, and the Pictured Cliffs Sandstone. The thicker sandstone beds in this sequence from aquifers of very minor importance elsewhere in the San Juan Basin, but beneath the Plant they are gas producing. The water associated with them is likely to be of poor quality; the sandstone in the Fruitland that yields gas in the Kutz Fruitland gas field is at about 1600 feet beneath the Plant, and contains water with about 17,500 mg/l total dissolved solids (Fassett, 1978, p. 359). The Pictured Cliffs Sandstone is at about 1,800 feet and also produces gas.

The depth to bedrock at the Plant is not accurately known, but is probably only a few feet. There is no alluvium, but only an unsaturated, sandy soil as described above.

CONCLUSION

Sunterra believes that this discharge plan, along with the proposed Plant changes, will result in reduced wastewater being generated, minimization of the potential to impact groundwater and with the removal of potential hydrocarbons in the wastewater be an environmentally sound plan.

REFERENCES CITED

Brown, D. R., and Stone, W. J., 1979, Hydrogeology of Aztec quadrangel, San Juan County, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Hydrogeologic Sheet 1.

Fassett, J. E. , 1978, (Ed.) Oil and Gas Fields of the Four Corners Area, Vol. 1: Four Corners Geological Society, 368 p.

Stone, W. J., Lyford, E. P., Frenzel, P. F., Mizell, N. H., and Padgett, E. T., 1983, Hydrogeology and Water Resources of San Juan Basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Hydrologic Report 6, 70 p.

EXHIBIT 1

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

BLOOMFIELD QUADRANGLE
NEW MEXICO–SAN JUAN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

LEGEND

- Sample site, natural ground water discharge.
- Gas well; log data used in geologic description.
- Possible abandoned water well.
- Ephemeral pond
- A A' Line of cross section shown on Exhibit 10.

Bloomfield

KUTZ PLANT SITE

Sample Point 30

Sample Point 31

Sample Point 26

Sample Point 32

T. 29 N.
T. 28 N.
R. 11 W.
R. 10 W.

SUNTERRA GAS PROCESSING COMPANY

KUTZ PLANT

PLANT SITE AND SAMPLE LOCATIONS

Exhibit 1

PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY
CONTROL BY ..... USGS, NOS/NOAA
COMPILED FROM AERIAL PHOTOGRAPHS TAKEN 1977
FIELD CHECKED ..... 1981 MAP EDITED 1985
PROJECTION ..... TRANSVERSE MERCATOR
GRID: 1000-METER UNIVERSAL TRANSVERSE MERCATOR ..... ZONE 13
10,000-FOOT STATE GRID TICKS ..... NEW MEXICO, WEST ZONE
UTM GRID DECLINATION ..... 1°45' WEST
1985 MAGNETIC NORTH DECLINATION ..... 13° EAST
VERTICAL DATUM ..... NATIONAL GEODETIC VERTICAL DATUM OF 1929
HORIZONTAL DATUM ..... 1927 NORTH AMERICAN DATUM
To place on the predicted North American Datum of 1983, move the projection lines as shown by dashed corner ticks (2 meters north and 56 meters east)
There may be private inholdings within the boundaries of any Federal and State Reservations shown on this map

PROVISIONAL MAP
Produced from original manuscript drawings. Information shown as of date of field check.

SCALE 1:24 000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225
OR RESTON, VIRGINIA 22092

NEW MEXICO
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Flora Vista
2 Aztec
3 Turley
4 Horn Canyon
5 Blanco
6 Gallegos Trading Post
7 East Fork Kutz Canyon
8 Huerfanito Peak

ADJOINING 7.5 QUADRANGLE NAMES

ROAD CLASSIFICATION

Improved Road .....
Unimproved Road .....
Trail .....
Interstate Route U.S. Route State Route

BLOOMFIELD, NEW MEXICO
PROVISIONAL EDITION 1985

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1985

EXHIBIT 2

EXHIBIT 2

KUTZ PLANT WATER FLOW DIAGRAM BEFORE PROCESS CHANGES

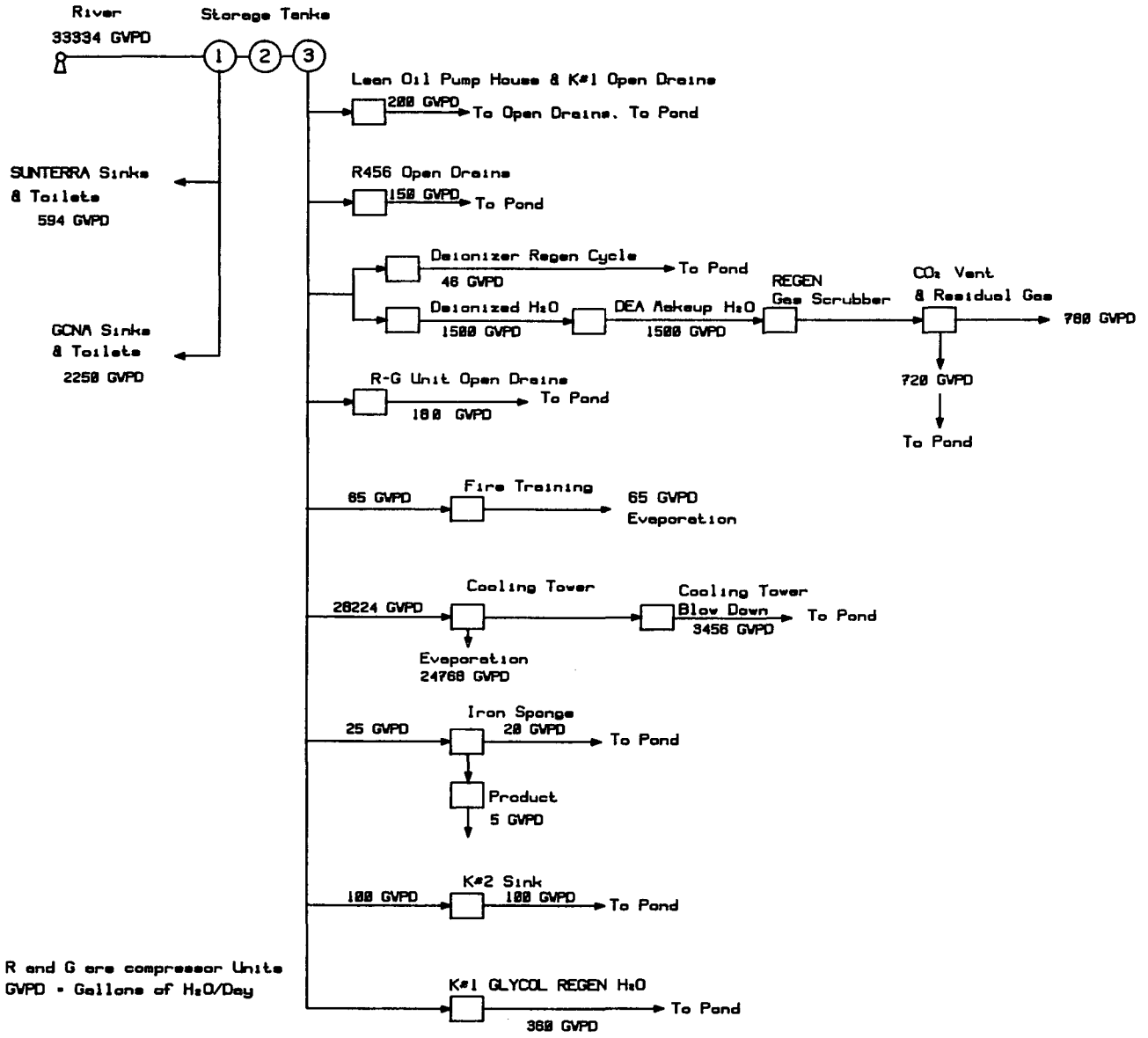


EXHIBIT 3

Y-STATION
FLARE POND DRAIN EQUIPMENT LIST

Y-STATION 2" TO FLARE POND

EQUIPMENT	VALVE POSITION
INLET GAS SCRUBBER	AUTO
INLET GAS FILTER (NORTH)	AUTO
INLET GAS FILTER (SOUTH)	AUTO
FUEL GAS SCRUBBER (NORTH)	AUTO
FUEL GAS SCRUBBER (SOUTH)	AUTO
COMPRESSOR 2ND/3RD STAGE SCRUBBERS Y-1	AUTO
COMPRESSOR 2ND/3RD STAGE SCRUBBERS Y-2	AUTO
COMPRESSOR 2ND/3RD STAGE SCUBBERS Y-3	AUTO
COMPRESSOR 2ND/3RD STAGE SCRUBBERS Y-4	AUTO

Y-STATION 8" TO Y-PIT

EQUIPMENT	VALVE POSITION
Y-1 VENT BLOWDOWN	AUTO
Y-2 VENT BLOWDOWN	AUTO
Y-3 VENT BLOWDOWN	AUTO
Y-4 VENT BLOWDOWN	AUTO

K-BLDG TO 6" Y-PIT

EQUIPMENT	VALVE POSITION
K-4 VENT BLOWDOWN	AUTO
K-5 VENT BLOWDOWN	AUTO
K-6 STARTER EXHAUST	AUTO
K-7 STARTER EXHAUST	AUTO

KUTZ PLANTS
FLARE POND DRAIN EQUIPMENT LIST

KUTZ 2 OPEN 4"

EQUIPMENT	VALVE POSITION
LP SEPARATOR	CLOSED
HP SEPARATOR	CLOSED
DEMETHANIZER	CLOSED
COLD GAS EXCHANGER	CLOSED
COOL GAS EXCHANGER	CLOSED
INLET GAS CHILLER	CLOSED
DEHYD OUTLET FILTER	CLOSED
LP FUEL GAS SCRUBBER	CLOSED
HP FUEL GAS SCRUBBER	CLOSED
DEA CHARCOAL FILTER	CLOSED
TREATED GAS FILTER	CLOSED
STRIPPER OVHD ACCUM	CLOSED
DEA STRIPPER BOTTOMS PUMPS	CLOSED
DEA BOOSTER PUMPS	CLOSED
DEA CONTACTOR	CLOSED
FLASH TANK	CLOSED
DEA STORAGE TANK	CLOSED
DEA MAKE UP TANK	CLOSED
HOT OIL TO DEA MAKE UP TANK	CLOSED
EXPANDER OIL TANK	CLOSED
REGEN GAS SCRUBBER	CLOSED

KUTZ 2 CLOSED DRAIN 3"

EQUIPMENT	VALVE POSITION
HP FUEL SCRUBBER	AUTO
LP FUEL SCRUBBER	AUTO
INLET GAS SEPARATOR	AUTO
DEA REBOILER	CLOSED
DEA CONTACTOR	CLOSED
REGEN GAS SCRUBBER	AUTO
DEA FLASH TANK GAS	AUTO
TREATED GAS FILTER	CLOSED
DEHYD OUTLET FILTER	CLOSED
HOT OIL PUMPS	CLOSED
EXP/COMP SUCTION SCRUBBER	AUTO
EXP/COMP PIPING BLOWDOWN	CLOSED

KUTZ 2 FLARE LINE 8"

EQUIPMENT	VALVE POSITION
REFRIG SURGE TANK	CLOSED
REFRIG SUCTION SCRUBBER	CLOSED
LP ECONOMIZER	CLOSED
HP ECONOMIZER	CLOSED
INLET GAS CHILLER	CLOSED
DEMETHANIZER	CLOSED

KUTZ 1 OPEN DRAIN (SOUTH)

EQUIPMENT	VALVE POSITION
GLYCOL VACUUM STILL	CLOSED
WATER TREATMENT BLDG	OPEN
GASOLINE SCRUBBER	AUTO
R-1,2,3 G-2,3,4	OPEN
KUTZ 2 CONTROL ROOM	OPEN

KUTZ 1 OPEN DRAIN (NORTH)

EQUIPMENT	VALVE POSITION
KUTZ ABSORBER	CLOSED
DAKOTA ABSORBER	CLOSED
DEMETHANIZER	CLOSED
LEAN OIL RECLAIMER	CLOSED
LEAN OIL SURGE TANK	CLOSED
PRODUCT RECOMPRESSION SUCTION SCRUBBER	CLOSED
R-4,5,6	CLOSED
EAST RECIP. PRODUCT PUMPS	CLOSED
INLET GAS COOLING TOWER WATER	AUTO
INLET GASOLINE SCRUBBER	CLOSED

KUTZ 1 CLOSED DRAIN 2" UNDERGROUND

EQUIPMENT	VALVE POSITION
REFRIG SURGE TANK	CLOSED
INLET CHILLER	CLOSED
KUTZ ABSORBER	CLOSED
DAKOTA ABSORBER	CLOSED
SOUTH REFRIG SUCTION SCRUBBER	CLOSED
LEAN OIL RECLAIMER	CLOSED
LEAN OIL SURGE TANK	CLOSED
FUEL GAS FILTER	CLOSED
ABSORBER REC. PUMPS	CLOSED
STILL REFLUX PUMPS	CLOSED
INLET GASOLINE SCRUBBER	CLOSED
SOUTH REFRIG DISCHARGE SCRUBBER	CLOSED
RESIDUE CHILLER	CLOSED

KUTZ 1 CLOSED DRAIN 2" PIPE RACK

EQUIPMENT	VALVE POSITION
RECIP PRODUCT PUMPS	CLOSED
INTERNAL FUEL GAS	CLOSED
PRODUCT RECOMPRESSOR SUCTION SCRUBBER	CLOSED
STILL OVERHEAD	AUTO
WEATHERING VALVE	AUTO
DEMETH RECYCLE	AUTO
LEAN OIL SLOP TANK	AUTO

KUTZ 1 CLOSED DRAIN 4" PIPE RACK

EQUIPMENT	VALVE POSITION	EQUIPMENT	VALVE POSITION
REFRIG ECOMOMIZER	CLOSED	NORTH DISCHARGE SCRUBBER	CLOSED
PROPANE CHILLER	CLOSED	NORTH SUCTION SCRUBBER	CLOSED
R-4,5,6 BLOWDOWN	CLOSED	RECOMPRESSION SUCTION SCRUBBER	CLOSED

SUNTERRA GAS PROCESSING COMPANY

KUTZ PLANT
WASTE FLOW DIAGRAM BEFORE PROPOSED PROCESS CHANGES

APPROX. SCALE: 1"=50'	REV. DATE 12/4/87		DWG. NO. EXHIBIT 3
DATE: August 25, 1987	11/12/87	12/9/87	
PREPARED BY:	LOCATION: A portion of the NW1/4 of Sec. 13 & a portion of the NE1/4 of Sec. 14, T. 28 N., R. 11 W.		
MODIFIED BY: Rose Alcazar	DATE OF PHOTOGRAPHY: 6/10/1982		

LEGEND

- FLARES
- CONTACT WATER DRAINS
- NON CONTACT WATER DRAINS
- GENERATOR, Y-STATION BLOWDOWNS
- KUTZ 2 OPEN DRAIN
- SANITARY WASTE
- < DIRECTION OF FLOW

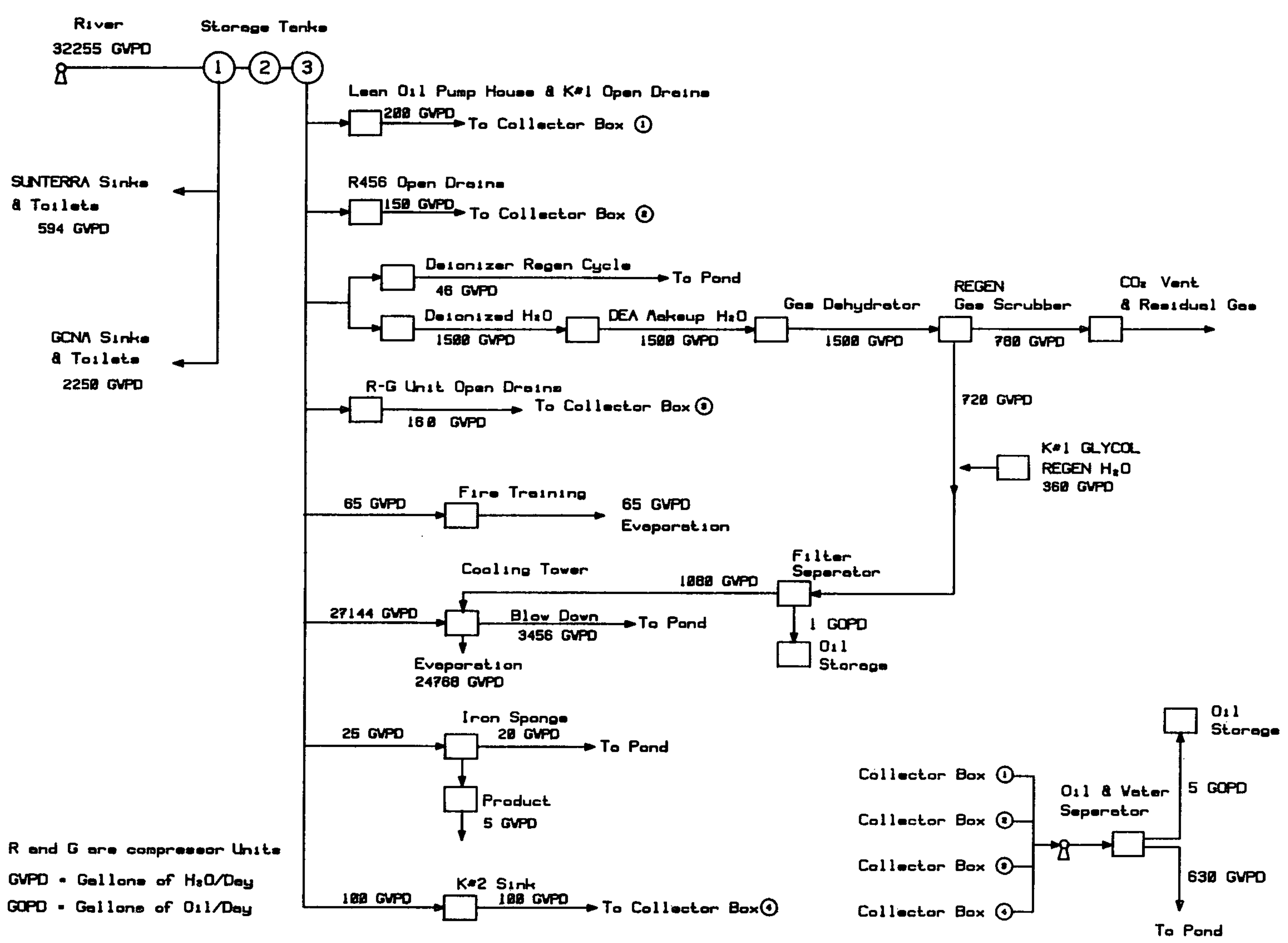
NOTE: G, K, R & Y refer to compresssor stations

KOOGLE & POULS ENGINEERING, INC.

EXHIBIT 4

EXHIBIT 4

KUTZ PLANT WATER FLOW DIAGRAM AFTER PROCESS CHANGES



R and G are compressor Units

GWPD = Gallons of H_2O/Day

GOPD = Gallons of Oil/Day

Y-STATION
FLARE POND DRAIN EQUIPMENT LIST

Y-STATION 2" TO FLARE POND

EQUIPMENT	VALVE POSITION
INLET GAS SCRUBBER	AUTO
INLET GAS FILTER (NORTH)	AUTO
INLET GAS FILTER (SOUTH)	AUTO
FUEL GAS SCRUBBER (NORTH)	AUTO
FUEL GAS SCRUBBER (SOUTH)	AUTO
COMPRESSOR 2ND/3RD STAGE SCRUBBERS Y-1	AUTO
COMPRESSOR 2ND/3RD STAGE SCRUBBERS Y-2	AUTO
COMPRESSOR 2ND/3RD STAGE SCUBBERS Y-3	AUTO
COMPRESSOR 2ND/3RD STAGE SCRUBBERS Y-4	AUTO

Y-STATION 8" TO Y-PIT

EQUIPMENT	VALVE POSITION
Y-1 VENT BLOWDOWN	AUTO
Y-2 VENT BLOWDOWN	AUTO
Y-3 VENT BLOWDOWN	AUTO
Y-4 VENT BLOWDOWN	AUTO

K-BLDG TO 6" Y-PIT

EQUIPMENT	VALVE POSITION
K-4 VENT BLOWDOWN	AUTO
K-5 VENT BLOWDOWN	AUTO
K-6 STARTER EXHAUST	AUTO
K-7 STARTER EXHAUST	AUTO

KUTZ PLANTS
FLARE POND DRAIN EQUIPMENT LIST

KUTZ 2 OPEN 4"

EQUIPMENT	VALVE POSITION
LP SEPARATOR	CLOSED
HP SEPARATOR	CLOSED
DEMETHANIZER	CLOSED
COLD GAS EXCHANGER	CLOSED
COOL GAS EXCHANGER	CLOSED
INLET GAS CHILLER	CLOSED
DEHYD OUTLET FILTER	CLOSED
LP FUEL GAS SCRUBBER	CLOSED
HP FUEL GAS SCRUBBER	CLOSED
DEA CHARCOAL FILTER	CLOSED
TREATED GAS FILTER	CLOSED
STRIPPER OVHD ACCUM	CLOSED
DEA STRIPPER BOTTOMS PUMPS	CLOSED
DEA BOOSTER PUMPS	CLOSED
DEA CONTACTOR	CLOSED
FLASH TANK	CLOSED
DEA STORAGE TANK	CLOSED
DEA MAKE UP TANK	CLOSED
HOT OIL TO DEA MAKE UP TANK	CLOSED
EXPANDER OIL TANK	CLOSED
REGEN GAS SCRUBBER	CLOSED

KUTZ 2 CLOSED DRAIN 3"

EQUIPMENT	VALVE POSITION
HP FUEL SCRUBBER	AUTO
LP FUEL SCRUBBER	AUTO
INLET GAS SEPARATOR	AUTO
DEA REBOILER	CLOSED
DEA CONTACTOR	CLOSED
REGEN GAS SCRUBBER	AUTO
DEA FLASH TANK GAS	AUTO
TREATED GAS FILTER	CLOSED
DEHYD OUTLET FILTER	CLOSED
HOT OIL PUMPS	CLOSED
EXP/COMP SUCTION SCRUBBER	AUTO
EXP/COMP PIPING BLOWDOWN	CLOSED

KUTZ 2 FLARE LINE 8"

EQUIPMENT	VALVE POSITION
REFRIG SURGE TANK	CLOSED
REFRIG SUCTION SCRUBBER	CLOSED
LP ECONOMIZER	CLOSED
HP ECONOMIZER	CLOSED
INLET GAS CHILLER	CLOSED
DEMETHANIZER	CLOSED

KUTZ 1 OPEN DRAIN (SOUTH)

EQUIPMENT	VALVE POSITION
GLYCOL VACUUM STILL	CLOSED
WATER TREATMENT BLDG.	OPEN
GASOLINE SCRUBBER	AUTO
R-1,2,3 G-2,3,4	OPEN
KUTZ 2 CONTROL ROOM	OPEN

KUTZ 1 OPEN DRAIN (NORTH)

EQUIPMENT	VALVE POSITION
KUTZ ABSORBER	CLOSED
DAKOTA ABSORBER	CLOSED
DEMETHANIZER	CLOSED
LEAN OIL RECLAIMER	CLOSED
LEAN OIL SURGE TANK	CLOSED
PRODUCT RECOMPRESSION SUCTION SCRUBBER	CLOSED
R-4,5,6	CLOSED
EAST RECIP. PRODUCT PUMPS	CLOSED
INLET GAS COOLING TOWER WATER	AUTO
INLET GASOLINE SCRUBBER	CLOSED

KUTZ 1 CLOSED DRAIN 2" UNDERGROUND

EQUIPMENT	VALVE POSITION
REFRIG SURGE TANK	CLOSED
INLET CHILLER	CLOSED
KUTZ ABSORBER	CLOSED
DAKOTA ABSORBER	CLOSED
SOUTH REFRIG SUCTION SCRUBBER	CLOSED
LEAN OIL RECLAIMER	CLOSED
LEAN OIL SURGE TANK	CLOSED
FUEL GAS FILTER	CLOSED
ABSORBER RES. PUMPS	CLOSED
STILL REFLUX PUMPS	CLOSED
INLET GASOLINE SCRUBBER	CLOSED
SOUTH REFRIG DISCHARGE SCRUBBER	CLOSED
RESIDUE CHILLER	CLOSED

KUTZ 1 CLOSED DRAIN 2" PIPE RACK

EQUIPMENT	VALVE POSITION
RECIP PRODUCT PUMPS	CLOSED
INTERNAL FUEL GAS	CLOSED
PRODUCT RECOMPRESSOR SUCTION SCRUBBER	CLOSED
STILL OVERHEAD	AUTO
WEATHERING VALVE	AUTO
DEMETH RECYCLE	AUTO
LEAN OIL SLOP TANK	AUTO

KUTZ 1 CLOSED DRAIN 4" PIPE RACK

EQUIPMENT	VALVE POSITION
REFRIG ECOMOMIZER	CLOSED
PROPANE CHILLER	CLOSED
R-4,5,6 BLOWDOWN	CLOSED

EQUIPMENT	VALVE POSITION
NORTH DISCHARGE SCRUBBER	CLOSED
NORTH SUCTION SCRUBBER	CLOSED
RECOMPRESSION SUCTION SCRUBBER	CLOSED

SUNTERRA GAS PROCESSING COMPANY

KUTZ PLANT
WASTE FLOW DIAGRAM AFTER PROPOSED PROCESS CHANGES

APPROX. SCALE: 1"=50'	REV. DATE	12/4/87	12/17/87	DWG. NO.
DATE: August 25, 1987	11/12/87	12/9/87		EXHIBIT 5
PREPARED BY:	LOCATION: A portion of the NW1/4 of Sec. 13 & a portion of the NE1/4 of Sec. 14, T. 28 N., R. 11 W.			
MODIFIED BY: Rose Alcazar	DATE OF PHOTOGRAPHY: 6/10/1982			

LEGEND

- FLARES
- CONTACT WATER DRAINS
- NON CONTACT WATER DRAINS
- GENERATOR, Y-STATION BLOWDOWNS
- OIL LINE
- SANITARY WASTE
- < DIRECTION OF FLOW

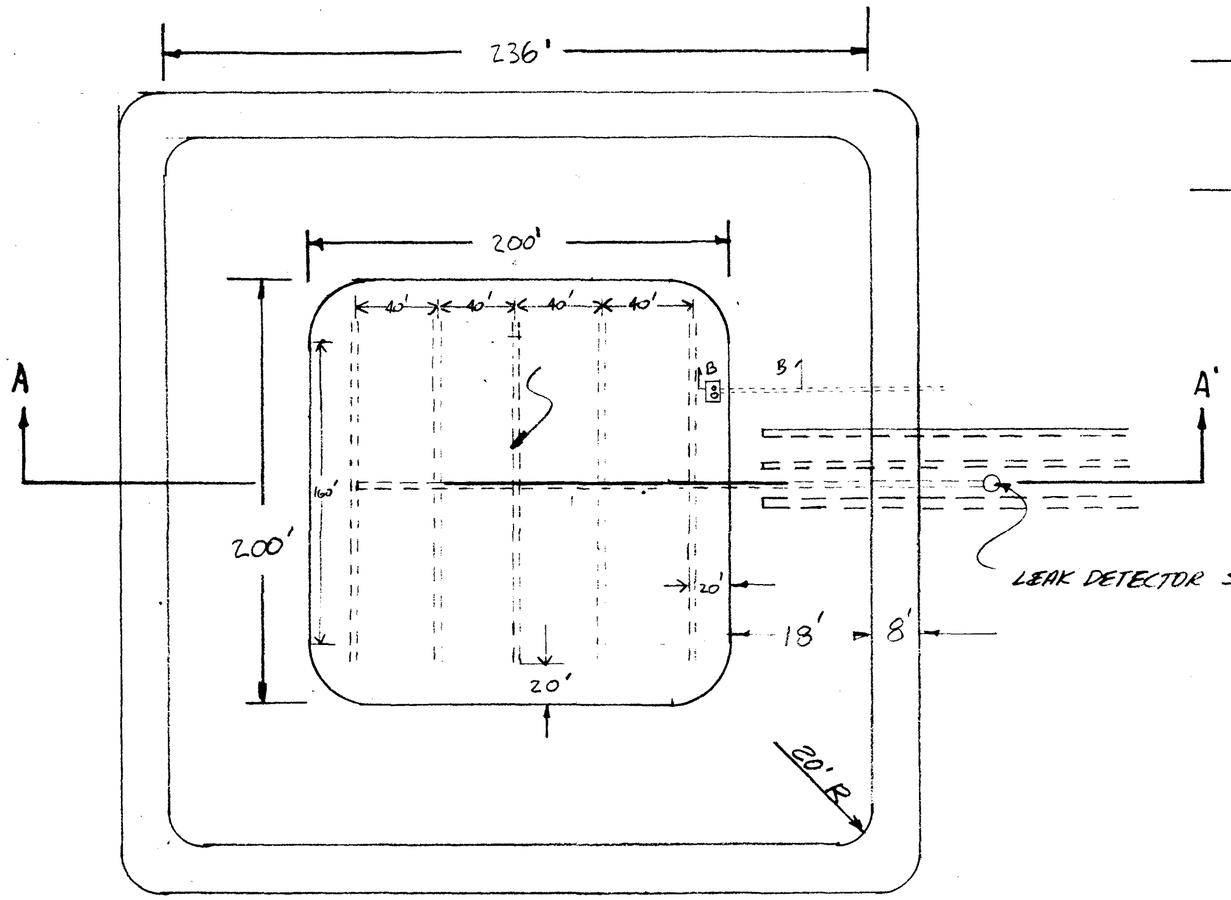
NOTE: G, K, R & Y refer to compressor stations

KOOGLE & POULS ENGINEERING, INC.

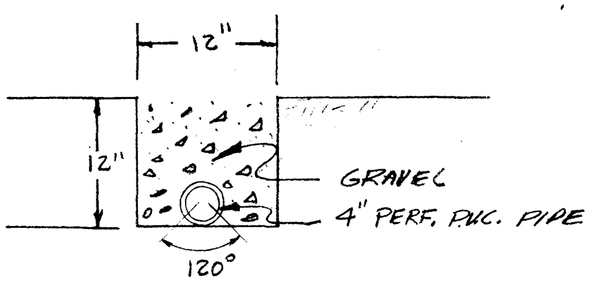
EXHIBIT 5

EXHIBIT 6

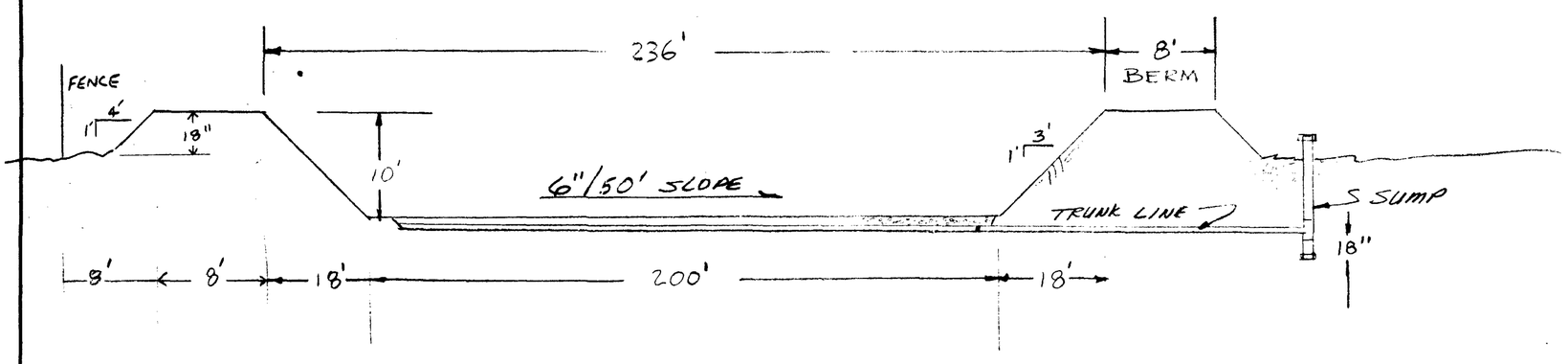
DATE	SYM	REVISION RECORD	AUTH.	DR.	CK.



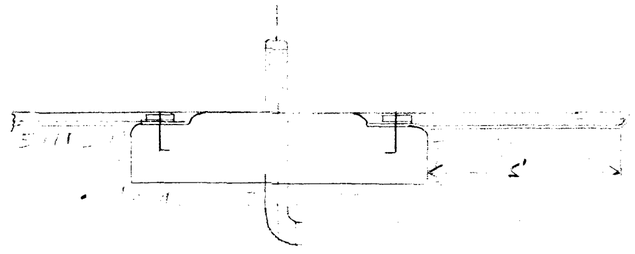
PLAN SECTION
NOT TO SCALE



ANCHOR TRENCH DETAIL
NOT TO SCALE



SECTION DETAIL A-A'
NOT TO SCALE

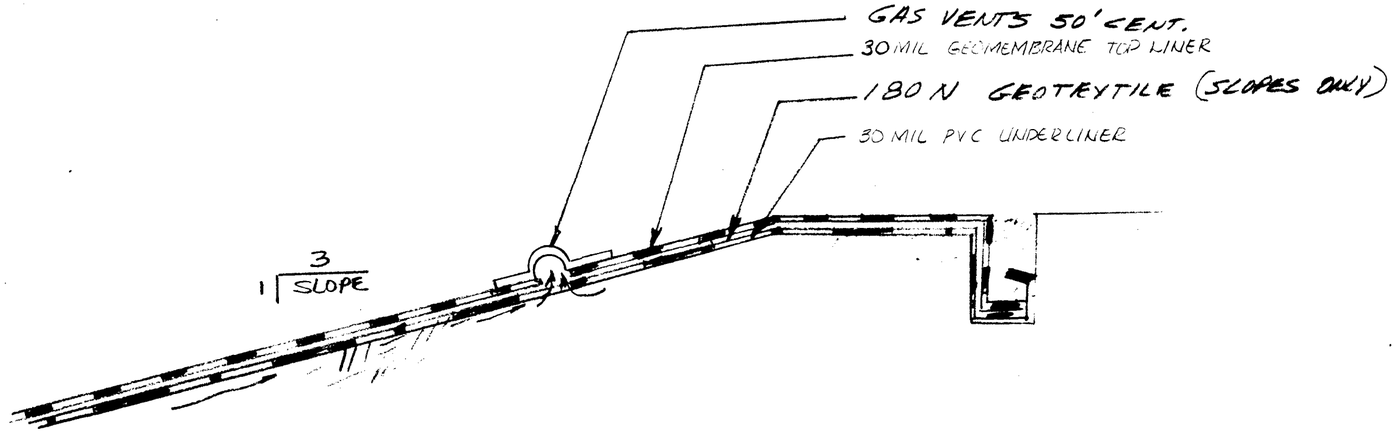


SECTION B-B'
NOT TO SCALE

TOLERANCES (EXCEPT AS NOTED)	SUNTERRA GAS PROCESSING COMPANY		
DECIMAL ±		SCALE NONE	DRAWN BY / APPROVED BY
FRACTIONAL ±	TITLE: LINED PIT WITH LEAK DETECTOR		
ANGULAR ±	DATE: DEC. 1987	DRAWING NUMBER: EXHIBIT 6	

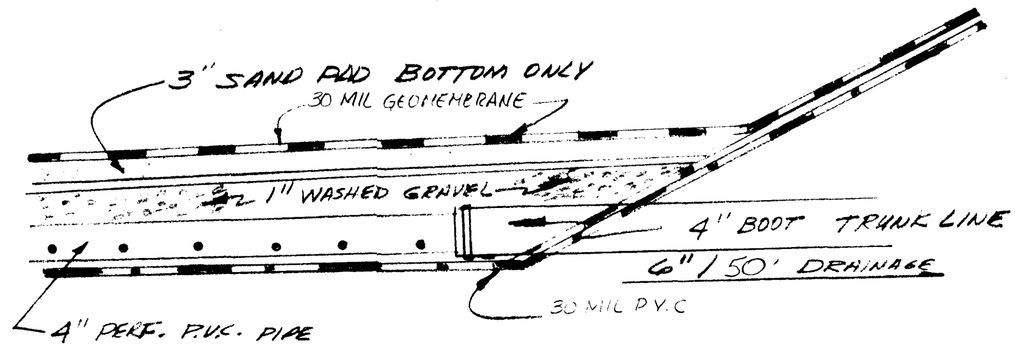
EXHIBIT 7

DATE	SYM	REVISION RECORD	AUTH.	DR.	CK.



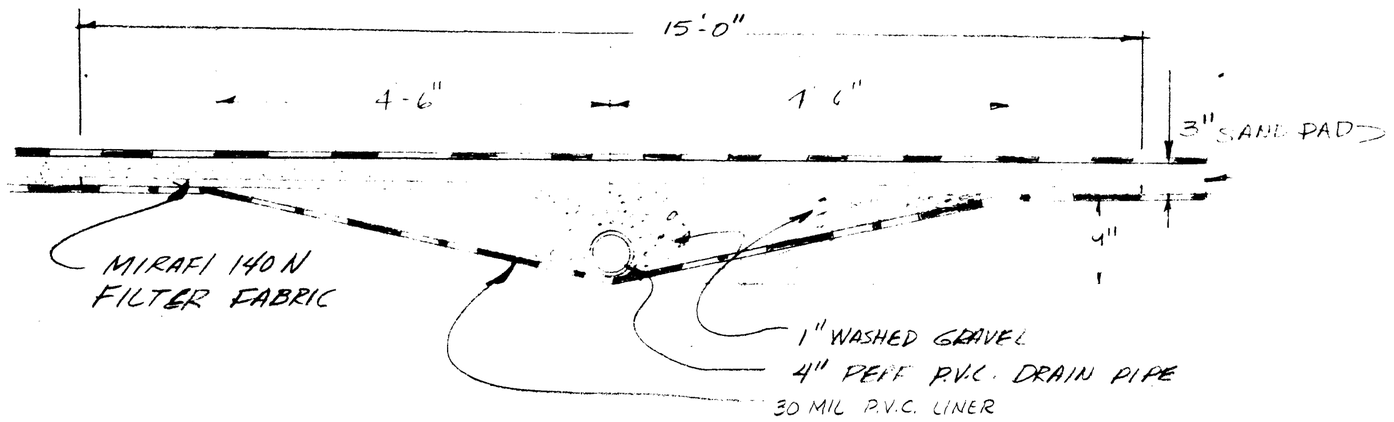
DOUBLE LINER ANCHOR

NOT TO SCALE



TYPICAL SECTION BOOT PENETRATION

NOT TO SCALE



V-DITCH LEAK DETECTOR DOUBLE LINER SYSTEM

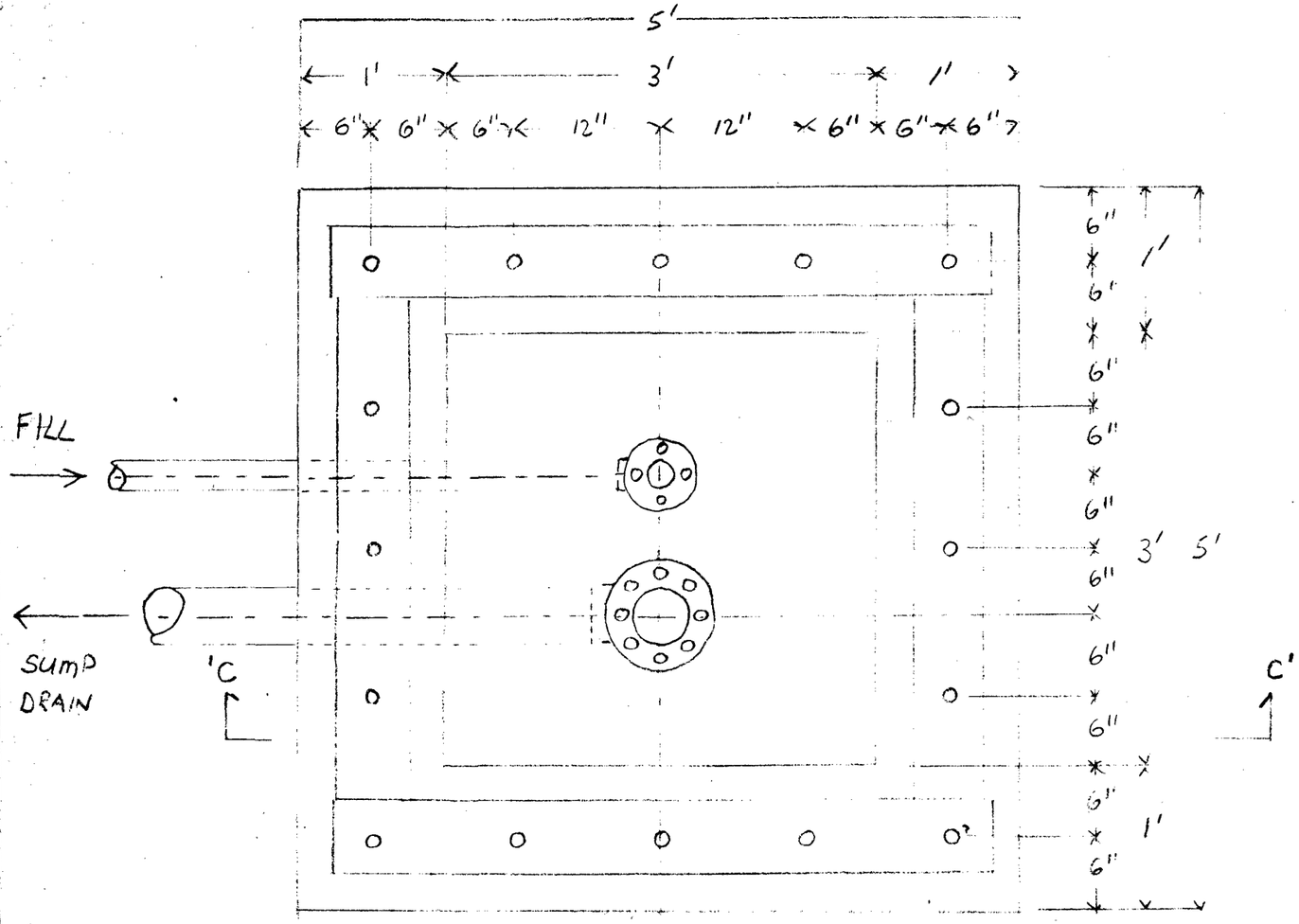
NOT TO SCALE

TOLERANCES (EXCEPT AS NOTED)	SUNTERRA GAS PROCESSING COMPANY		
DECIMAL ±		SCALE NONE	DRAWN BY / APPROVED BY
FRACTIONAL ±	TITLE: TYPICAL SECTION DOUBLE LINER		
ANGULAR ±	DATE: DEC. 1987	DRAWING NUMBER: EXHIBIT 7	

EXHIBIT 8

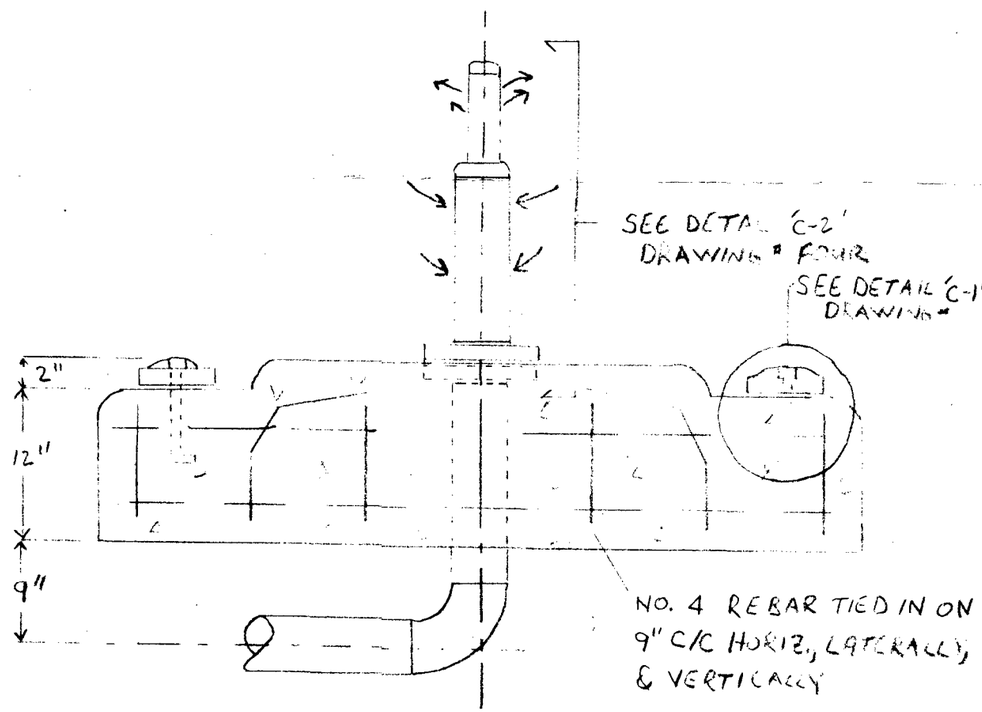
REFERENCE DRAWINGS

GENERAL NOTES



CONCRETE PAD PLAN

NOT TO SCALE



PIPE PENETRATION DETAIL

SECTION C-C'

NOT TO SCALE

SUNTERRA GAS PROCESSING COMPANY			
PIPE PENETRATION DETAIL			
SCALE NONE	DATE DEC. 1987	DR'N	APP'D
JOB NO.	DRAWING NO.		REV. NO.
	EXHIBIT 8		

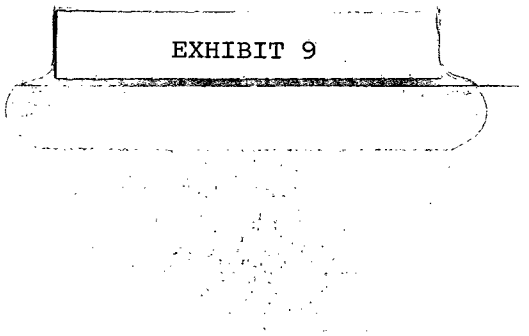


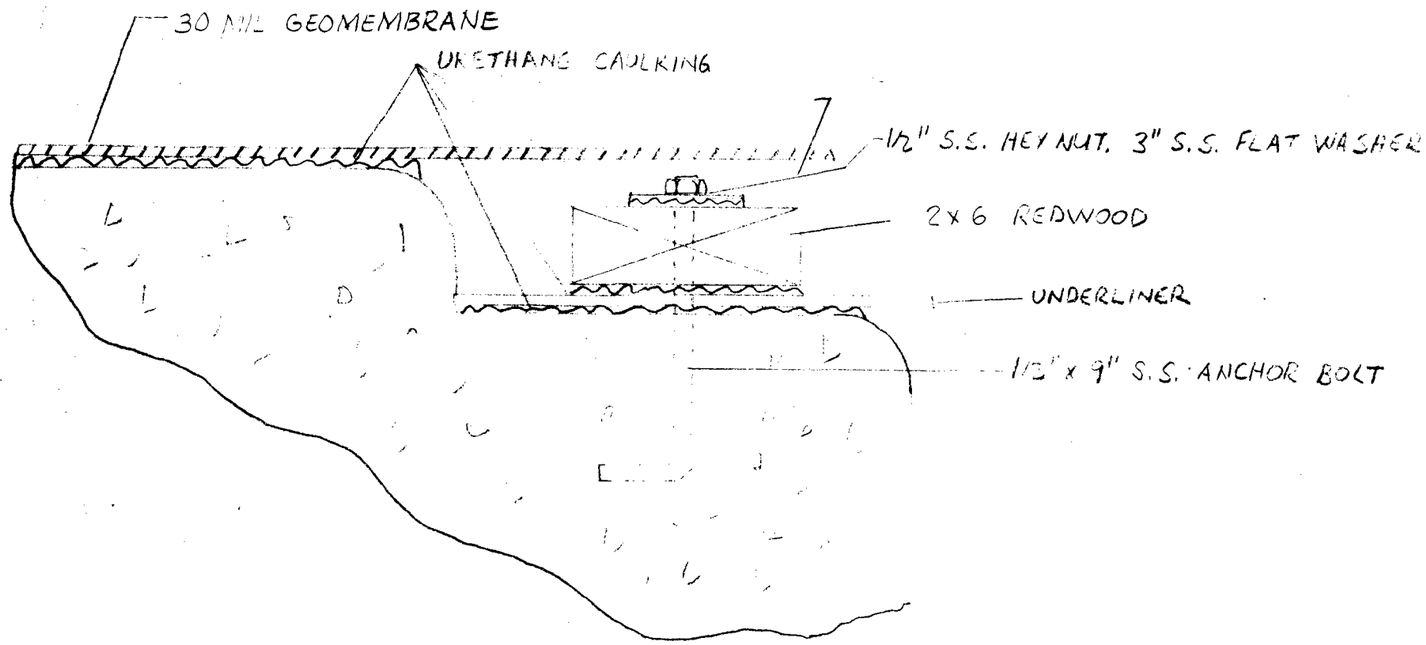
EXHIBIT 9

REFERENCE DRAWINGS

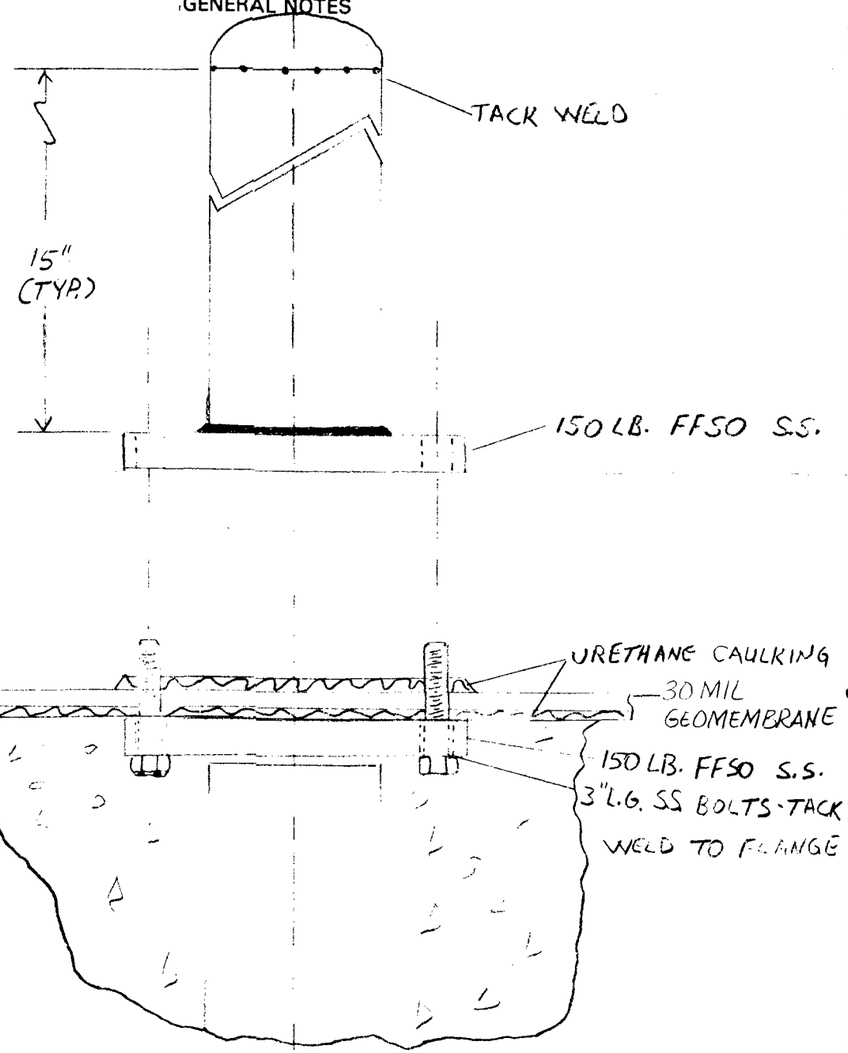
GENERAL NOTES

NOTE

1. CUT ANCHOR BOLT OFF FLUSH WITH TOP OF NUT AFTER TIGHTENING
2. COVER NUT AND WASHER WITH URETHANE CAULKING APPROX. 3/8" THICK x 4" DIA.
3. SPRAY COMPLETED ASSEMBLY WITH CEILCOTE 'U-600' SEALER OR EQ.
4. INSTALL TOP LINER, CAULKING & INLET-OUTLET ASS'YS. AFTER SAND IS IN PLACE



DETAIL 'C-1'
NOT TO SCALE



DETAIL 'C-2'
NOT TO SCALE

SUNTERRA GAS PROCESSING COMPANY			
CONCRETE PAD-ANCHOR BOLTS			
SCALE NONE	DATE DEC. 1987	DR'N	APP'D
JOB NO.	DRAWING NO.		REV. NO.
	EXHIBIT 9		

EXHIBIT 10

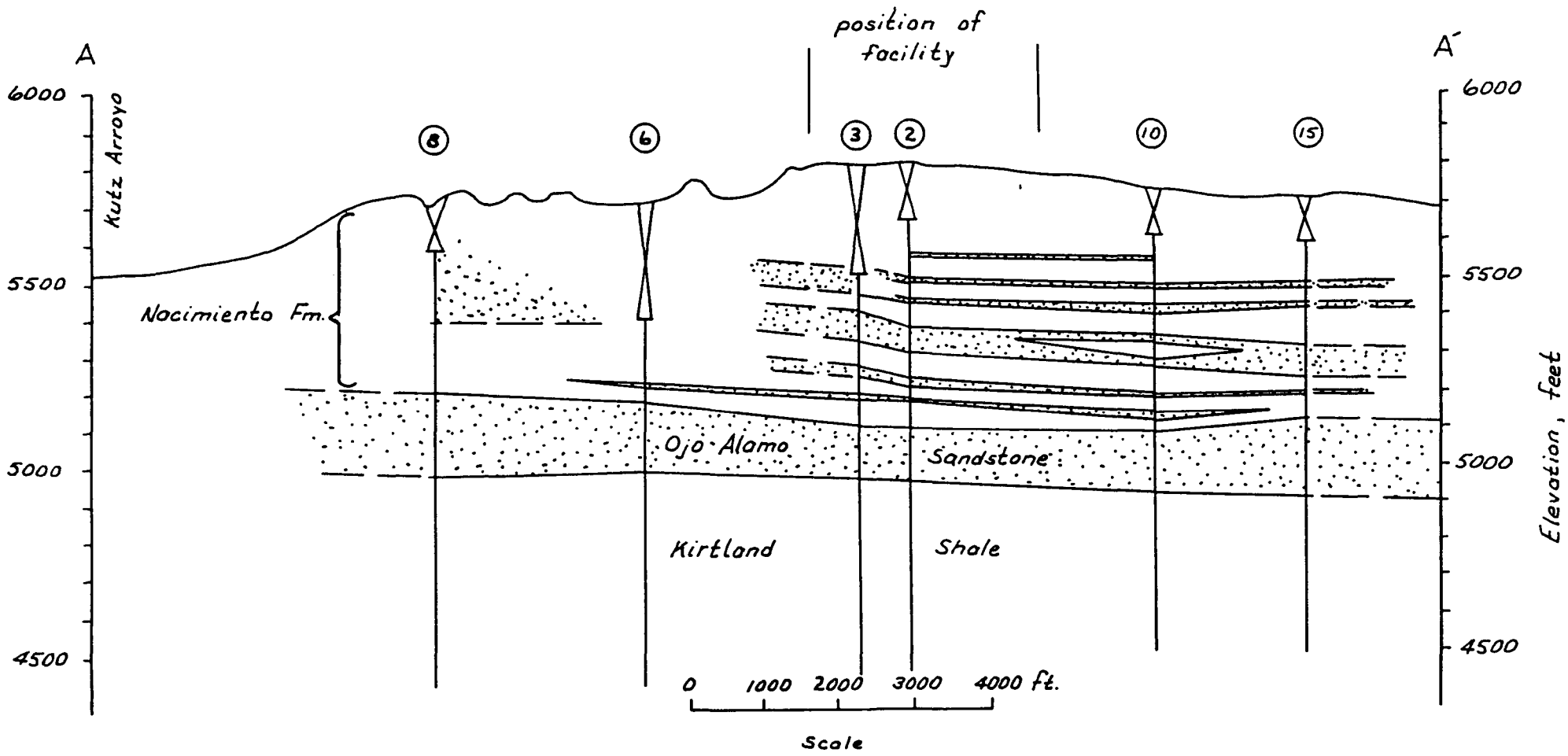


EXHIBIT 10. Cross section A–A'. See EXHIBIT 1 for line of section. Wells are identified in text.

APPENDIX 1

KUTZ PLANT SAMPLING LOCATIONS
Duplicate Sampling with OCD 4/22/87

Sample I.D.

1. Water Sample of Kutz #1 Cooling Tower Sump
2. Water Sample of Flare Pond #1 Southwest Corner
3. Water Sample of Pond #2 Middle of North Side
4. Water Sample of Pond #3 Southwest Corner

ASSAIGAI
ANALYTICAL
LABORATORIES

TO: Sunterra Gas Processing
ATTN: Gary Jordan
PO Box 2106
Albuquerque, NM 87103

DATE: 29 May 1987
0661

SAMPLE ID : #1

ANALYTE	ANALYTICAL RESULTS	NOMINAL DETECTION LIMITS
As	<0.05 mg/l	0.05 mg/l
Ba	<1.0 mg/l	1.0 mg/l
Cd	<0.01 mg/l	0.01 mg/l
Cr	<0.05 mg/l	0.05 mg/l
CN	<0.01 mg/l	0.01 mg/l
F	0.59 mg/l	0.01 mg/l
Pb	0.05 mg/l	0.01 mg/l
Total Hg	0.0023 mg/l	0.002 mg/l
NO 3 as N	<0.01 mg/l	0.01 mg/l
Se	0.019 mg/l	0.002 mg/l
Ag	<0.05 mg/l	0.05 mg/l
Benzene	<0.001 mg/l	0.001 mg/l
Toluene	<0.001 mg/l	0.001 mg/l
CCL 4	<0.01 mg/l	0.01 mg/l
1,2 Dichloroethane	<0.001 mg/l	0.001 mg/l
1,1 Dichloroethylene	<0.001 mg/l	0.001 mg/l
1,1,2,2 Tetrachloroethylene	<0.001 mg/l	0.001 mg/l
1,1,2 Trichloroethylene	<0.001 mg/l	0.001 mg/l
Ethyl Benzene	<0.001 mg/l	0.001 mg/l
Xylenes	<0.001 mg/l	0.001 mg/l
Methylene Chloride	<0.001 mg/l	0.001 mg/l
CCL 3	<0.001 mg/l	0.001 mg/l
1,1 Dichloroethane	<0.001 mg/l	0.001 mg/l
EDB	<0.001 mg/l	0.001 mg/l
1,1,1 Trichloroethane	<0.001 mg/l	0.001 mg/l
1,1,2 Trichloroethane	<0.001 mg/l	0.001 mg/l
1,1,2,2 Tetrachloroethane	<0.001 mg/l	0.001 mg/l
Vinyl Chloride	<0.001 mg/l	0.001 mg/l
Cu	0.03 mg/l	0.01 mg/l
Cl	44 mg/l	1.0 mg/l
Fe	<0.3 mg/l	0.3 mg/l
Mn	0.03 mg/l	0.01 mg/l
SO 4	913 mg/l	1.0 mg/l
Zn	0.072 mg/l	0.008 mg/l
Al	<0.1 mg/l	0.1 mg/l
B	0.357 mg/l	0.04 mg/l
Co	<0.03 mg/l	0.03 mg/l
Mo	<0.05 mg/l	0.05 mg/l
Ni	0.150 mg/l	0.01 mg/l

REFERENCE: "Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods", USEPA, SW 846, EMSL-Cincinnati, 1982.

An invoice for services is enclosed. Thank you for contacting Assaigai Laboratories.

Sincerely,

Jennifer V. Smith, Ph.D.
Laboratory Director

87-0692-C

SCIENTIFIC LABORATORY DIVISION

700 Camino de Salud NE
Albuquerque, NM 87106 841-2570

STATE OF NEW MEXICO
ENVIRONMENT

REPORT TO: David Boyer
N.M. Oil Conservation Division
P. O. Box 2088
Santa Fe, N.M. 87504-2088
PHONE(S): 327-5812

S.L.D. No. OR- 692
DATE REC. 4-27-87
PRIORITY
USER CODE: 8 2 2 3 5
SUBMITTER: David Boyer
CODE: 2 6 0

SAMPLE COLLECTION CODE: (YYMMDDHHMMIII) 8 7 0 4 2 2 / 2 4 0 WB

SAMPLE TYPE: WATER ☒, SOIL ☐, FOOD ☐, OTHER: _____ CODE: _____

COUNTY: San Juan ; CITY: Bloomfield CODE: _____

LOCATION CODE: (Township-Range-Section-Tracts) 2 8 N + / / W + 2 3 + / / / (10N06E24342)

ANALYSES REQUESTED: Please check the appropriate box(es) below to indicate the type of analytical screens required. Whenever possible list specific compounds suspected or required.

PURGEABLE SCREENS

- ☐ (753) Aliphatic Purgeables (1-3 Carbons)
- ☒ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes

Other Specific Compounds or Classes

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (760) Organochlorine Pesticides
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
- ☐ (760) Organochlorine Pesticides
- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

Remarks: Sun Terra - Kutz Cooling Tower

FIELD DATA:

pH= 7.5 strip; Conductivity= 1300 umho/cm at 9 °C; Chlorine Residual= _____ mg/l

Dissolved Oxygen= _____ mg/l; Alkalinity= _____ mg/l; Flow Rate _____ ____/____

Depth to water _____ ft.; Depth of well _____ ft.; Perforation Interval _____-_____ ft.; Casing: _____

Sampling Location, Methods and Remarks (i.e. odors, etc.)

Dipped from sump. Cooling tower shut down previous week

I certify that the results in this block accurately reflect the results of my field analyses, observations and activities.(signature collector): [signature] Method of Shipment to the Lab: hand carried

This form accompanies 2 Septum Vials, ____ Glass Jugs, and/or ____ _____

Samples were preserved as follows:

- ☐ NP: No Preservation; Sample stored at room temperature.
- ☒ P-Ice: Sample stored in an ice bath (Not Frozen).
- ☒ P-$Na_2S_2O_3$: Sample Preserved with Sodium Thiosulfate to remove chlorine residual.

CHAIN OF CUSTODY

I certify that this sample was transferred from _____ to _____

at (location) _____ on ____/____/____ - ____:____ and that the statements in this block are correct. Evidentiary Seals: Not Sealed ☐ Seals Intact: Yes ☐ No ☐

Signatures _____ _____

For OCD Use: Date Owner Notified _____ Phone or Letter? _____ Initials _____

ANALYSES PERFORMED

LAB. No:: OR- 692

THIS PAGE FOR LABORATORY RESULTS ONLY

This sample was tested using the analytical screening method(s) checked below:

PURGEABLE SCREENS

- ☐ (753) Aliphatic Purgeables (1-3 Carbons)
- ☒ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes

Other Specific Compounds or Classes

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (760) Organochlorine Pesticides
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
- ☐ (760) Organochlorine Pesticides
- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

ANALYTICAL RESULTS

COMPOUND(S) DETECTED	CONC. [PPB]	COMPOUND(S) DETECTED	CONC. [PPB]
aromatic purgeables	N.D.		
halogenated purgeables	N.D.		
* DETECTION LIMIT *	100 ug/L	+ DETECTION LIMIT +	

ABBREVIATIONS USED:

N D = NONE DETECTED AT OR ABOVE THE STATED DETECTION LIMIT

T R = DETECTED AT A LEVEL BELOW THE STATED DETECTION LIMIT (NOT CONFIRMED)

[RESULTS IN BRACKETS] ARE UNCONFIRMED AND/OR WITH APPROXIMATE QUANTITATION

LABORATORY REMARKS: _____

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes ☐ No ☒ Seal(s) broken by: not sealed date: _____

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements on this page accurately reflect the analytical results for this sample.

Date(s) of analysis: 5/4/87 Analyst's signature: Mary C. Eden

I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block.

Reviewers signature: K Meyerhei

New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED	LAB NO.	USER CODE ☐ 59300 ☐ 59600 ☒ OTHER: 82235	
Collection DATE 04/22/87	SITE INFORMATION ►	Sample location SUNTERRA – KUTZ PLANT	
Collection TIME 1240		Collection site description COOLING TOWER	
Collected by — Personal/Agency BOYER/ANDERSON /OCD			

SEND FINAL REPORT TO ►
ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5812

Station/well code

Owner

SAMPLING CONDITIONS

☐ Bailed ☒ Dipped ☐ Pump ☐ Tap	Water level	Discharge —	Sample type GRAB
pH (00400) 7.5 (STRIP)	Conductivity (Uncorrected) 1360 µmho	Water Temp. (00010) 9 °C	Conductivity at 25°C (00094) µmho
Field comments (See VOC Form for Comments)			

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted 1

☐ NF: Whole sample (Non-filtered) ☒ F: Filtered in field with 0.45 µmembrane filter ☐ A: 2 ml H_2SO_4/L added

☒ NA: No acid added ☐ Other-*specify:* ☐ A: 5ml conc. HNO_3 added ☐ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA		Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	1943	µmho	5/1
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☒ Other: pH	8.30		5/5
☐ Other:			
☐ Other:			

A-H_2SO_4			
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From F, NA Sample:

			Date Analyzed
☒ Calcium	225	mg/l	5/14
☒ Potassium	4.64	mg/l	/
☒ Magnesium	47	mg/l	5/14
☒ Sodium	223	mg/l	
☒ Bicarbonate	336	mg/l	5/5
☒ Chloride	44	mg/l	5/5
☒ Sulfate	886	mg/l	5/12
☒ Total Solids	1562	mg/l	5/14
☒ CO_3	0		5/5
☐			
☒ Cation/Anion Balance			

Analyst	Date Reported	Reviewed by
	5 / 26 / 87	

Laboratory remarks

FOR OCD USE -- Date Owner Notified _____ Phone or Letter? _____ Initals _____

CATIONS				ANIONS		
ANALYTE	MEQ.	PPM	DET.LIMIT	ANALYTE	MEQ.	PPM
Ca	11.23	225.00	< 3.0	HCO3	5.51	336.00
Mg	3.86	47.00	< 10.0	SO4	18.46	886.00
Na	9.70	223.00	< 10.0	Cl	1.24	44.00
K	0.12	4.68	< 0.5			
Mn	0.00	0.00		NO3	0.00	0.00
Fe	0.00	0.00		CO3	0.00	0.00
				NH3	0.00	0.00
				PO4	0.00	0.00
SUMS	24.91	499.68			25.21	1266.00

TDS(measured) = 1562.00 ppm

Ion Balance = 98.82%

Sample No. =8701468
Date out/By CG 5/24/87

HEAVY METALS

New Mexico Health and Env[illegible]ent Department
SCIENTIFIC LABORATORY [illegible]ION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED	[illegible]	LAB NO.	[illegible]
USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 82235		
Collection DATE	04/22/87	SITE INFORMATION ►	Sample location: SUN TERRA - KUTZ PLANT
Collection TIME	1240		Collection site description: COOLING TOWER
Collected by — Person/Agency	BOYER ANDERSON / OCD		

SEND FINAL REPORT TO ►

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5812

Station/ well code:

Owner:

SAMPLING CONDITIONS

☐ Bailed ☐ Pump ☒ Dipped ☐ Tap	Water level	Discharge	Sample type: GRAB
pH (00400): 7.5 (Strip)	Conductivity (Uncorrected): 1382 µmho	Water Temp. (00010): 9 °C	Conductivity at 25°C (00094): µmho

Field comments:

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted: 1

☐ NF: Whole sample (Non-filtered) ☒ F: Filtered in field with 0.45 µmembrane filter ☐ A: 2 ml H_2SO_4/L added

☐ NA: No acid added ☐ Other-*specify:* ☐ A: 5ml conc. HNO_3 added ☒ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA	Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)	µmho	
☐ Total non-filterable residue (suspended) (00530)	mg/l	
☒ Other:		
☒ Other: Cr. by A.A. 0.006		5/22
☐ Other:		

A-H_2SO_4		
☐ Nitrate-N + Nitrate-N total (00630)	mg/l	
☐ Ammonia-N total (00610)	mg/l	
☐ Total Kjeldahl-N ( )	mg/l	
☐ Chemical oxygen demand (00340)	mg/l	
☐ Total organic carbon ( )	mg/l	
☐ Other:		
☐ Other:		

From ____, NA Sample:

		Date Analyzed
☐ Calcium	mg/l	
☐ Potassium	mg/l	
☐ Magnesium	mg/l	
☐ Sodium	mg/l	
☐ Bicarbonate	mg/l	
☐ Chloride	mg/l	
☐ Sulfate	mg/l	
☐ Total Solids	mg/l	
☐		
☐		
☐ Cation/Anion Balance		

Analyst:

Date Reported: 6 | 1 | 87

Reviewed by: [signature]

Laboratory remarks:

FOR OCD USE -- Date Owner Notified _____ Phone or Letter? _____ Initals _____

ASSAIGAI
ANALYTICAL
LABORATORIES

TO: Sunterra Gas Processing
ATTN: Gary Jordan
PO Box 2106
Albuquerque, NM 87103

DATE: 29 May 1987
0661

SAMPLE ID : #2

ANALYTE	ANALYTICAL RESULTS	NOMINAL DETECTION LIMITS
As	0.28 mg/l	0.05 mg/l
Ba	<1.0 mg/l	1.0 mg/l
Cd	<0.01 mg/l	0.01 mg/l
Cr	<0.05 mg/l	0.05 mg/l
CN	0.03 mg/l	0.01 mg/l
F	0.70 mg/l	0.01 mg/l
Pb	0.09 mg/l	0.01 mg/l
Total Hg	<0.002 mg/l	0.002 mg/l
NO 3 as N	<0.01 mg/l	0.01 mg/l
Se	0.020 mg/l	0.002 mg/l
Ag	<0.05 mg/l	0.05 mg/l
Benzene	0.14 mg/l	0.001 mg/l
Toluene	0.24 mg/l	0.001 mg/l
CCL 4	<0.01 mg/l	0.01 mg/l
1,2 Dichloroethane	<0.001 mg/l	0.001 mg/l
1,1 Dichloroethylene	<0.001 mg/l	0.001 mg/l
1,1,2,2 Tetrachloroethylene	<0.001 mg/l	0.001 mg/l
1,1,2 Trichloroethylene	<0.001 mg/l	0.001 mg/l
Ethyl Benzene	0.011 mg/l	0.001 mg/l
Xylenes	0.12 mg/l	0.001 mg/l
Methylene Chloride	0.31 mg/l	0.001 mg/l
CCL 3	<0.001 mg/l	0.001 mg/l
1,1 Dichloroethane	<0.001 mg/l	0.001 mg/l
EDB	<0.001 mg/l	0.001 mg/l
1,1,1 Trichloroethane	<0.001 mg/l	0.001 mg/l
1,1,2 Trichloroethane	<0.001 mg/l	0.001 mg/l
1,1,2,2 Tetrachloroethane	<0.001 mg/l	0.001 mg/l
Vinyl Chloride	<0.001 mg/l	0.001 mg/l
Cu	0.03 mg/l	0.01 mg/l
Cl	89 mg/l	1.0 mg/l
Fe	2.68 mg/l	0.3 mg/l
Mn	0.39 mg/l	0.01 mg/l
SO 4	771 mg/l	1.0 mg/l
Zn	0.034 mg/l	0.008 mg/l
Al	<0.1 mg/l	0.1 mg/l
B	0.376 mg/l	0.04 mg/l
Co	<0.03 mg/l	0.03 mg/l
Mo	<0.05 mg/l	0.05 mg/l
Ni	0.182 mg/l	0.01 mg/l

REFERENCE: "Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods", USEPA, SW 846, EMSL-Cincinnati, 1982.

An invoice for services is enclosed. Thank you for contacting Assaigai Laboratories.

Sincerely,

Jennifer V. Smith, Ph.D.
Laboratory Director

87-0689-C

SCIENTIFIC LABORATORY DIVISION

700 Camino de Salud NE
Albuquerque, NM 87106 841-2570

HEALTH ENVIRONMENT — STATE OF NEW MEXICO

REPORT TO: David Boyer
N.M. Oil Conservation Division
P. O. Box 2088
Santa Fe, N.M. 87504-2088
PHONE(S): 827-5812
SUBMITTER: David Boyer

S.L.D. No. OR- 87-0689
DATE REC. 4-27-87
PRIORITY
USER CODE: 82235
CODE: 2160

SAMPLE COLLECTION CODE: (YYMMDDHHMMIII) 870421125 5 WB

SAMPLE TYPE: WATER ☒, SOIL ☐, FOOD ☐, OTHER:_____ CODE:

COUNTY: San Juan ; CITY: Bloomfield CODE:

LOCATION CODE: (Township-Range-Section-Tracts) 28N + 11W + 13 + 11 (10N06E24342)

ANALYSES REQUESTED: Please check the appropriate box(es) below to indicate the type of analytical screens required. Whenever possible list specific compounds suspected or required.

PURGEABLE SCREENS

- ☐ (753) Aliphatic Purgeables (1-3 Carbons)
- ☒ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes

Other Specific Compounds or Classes

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (760) Organochlorine Pesticides
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
- ☐ (760) Organochlorine Pesticides
- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

Remarks: SunTerra Kutz Pond #1 (upper)

FIELD DATA:

pH= 6.5 Grab; Conductivity= 2610 umho/cm at 24.5 °C; Chlorine Residual=_____mg/l

Dissolved Oxygen=_____mg/l; Alkalinity=_____mg/l; Flow Rate_____ ____/____

Depth to water _____ft.; Depth of well_____ft.; Perforation Interval ____-____ft.; Casing:_____

Sampling Location, Methods and Remarks (i.e. odors, etc.) Oily wastes, H.C. odor also anaerobic dis
SunTerra Pond #1 (upper) Receives all plant
waters (except septic), Sample west side of inlet pipe

I certify that the results in this block accurately reflect the results of my field analyses, observations and activities.(signature collector): [signature] Method of Shipment to the Lab: hand carried

This form accompanies 2 Septum Vials, ____ Glass Jugs, and/or ____ _____

Samples were preserved as follows:

- ☐ NP: No Preservation; Sample stored at room temperature.
- ☒ P-Ice Sample stored in an ice bath (Not Frozen).
- ☒ P-$Na_2S_2O_3$ Sample Preserved with Sodium Thiosulfate to remove chlorine residual.

CHAIN OF CUSTODY

I certify that this sample was transferred from _____ to _____

at (location) _____ on ____/____/____ - ____:____ and that

the statements in this block are correct. Evidentiary Seals: Not Sealed ☐ Seals Intact: Yes ☐ No ☐

Signatures _____ _____

For OCD Use: Date Owner Notified _____ Phone or Letter?_____ Initials _____

ANALYSES PERFORMED

LAB. No.: OR- 689

THIS PAGE FOR LABORATORY RESULTS ONLY

This sample was tested using the analytical screening method(s) checked below:

PURGEABLE SCREENS

- ☐ (753) Aliphatic Purgeables (1-3 Carbons)
- ☒ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes

Other Specific Compounds or Classes

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (760) Organochlorine Pesticides
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
- ☐ (760) Organochlorine Pesticides
- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

ANALYTICAL RESULTS

COMPOUND(S) DETECTED	CONC. [PPB]	COMPOUND(S) DETECTED	CONC. [PPB]
halogenated purgeables	N.D		
Aromatic purgeables			
benzene II	[10]		
Toluene	8E		
ethylbenzene	T.R.		
p-xylene	T.R.		
m-Xylene	25		
o-Xylene	T.R.		
* DETECTION LIMIT *	25-47/L	+ DETECTION LIMIT +	

ABBREVIATIONS USED:

N D = NONE DETECTED AT OR ABOVE THE STATED DETECTION LIMIT
T R = DETECTED AT A LEVEL BELOW THE STATED DETECTION LIMIT (NOT CONFIRMED)
[RESULTS IN BRACKETS] ARE UNCONFIRMED AND/OR WITH APPROXIMATE QUANTITATION

LABORATORY REMARKS: Three peaks eluting light unsaturated compounds detected with the photoionization detector but not identified.

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes ☐ No ☒ Seal(s) broken by: not sealed date: _____

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements on this page accurately reflect the analytical results for this sample.

Date(s) of analysis: 6/2/96 . Analyst's signature: Mary C. Ellen

I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block.

Reviewers signature: K Meyerhein

New Mexico Health and Env[illegible]nt Department
SCIENTIFIC LABORATORY D[illegible]ION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED	[illegible]	LAB NO.	[illegible]
USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 82235		
Collection DATE	04/22/87	SITE INFORMATION ►	Sample location: SUNTERRA - KUTZ PLANT
Collection TIME	1255		Collection site description: POND 1
Collected by — Person/Agency	BOYER / ANDERSON / OCD		

SEND FINAL REPORT TO ►

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5812

Station/ well code:

Owner:

SAMPLING CONDITIONS

☐ Bailed ☒ Dipped ☐ Pump ☐ Tap	Water level	Discharge	Sample type: GRAB
pH (00400): 6.5 (STATED)	Conductivity (Uncorrected): 2610 µmho	Water Temp. (00010): 24.5 °C	Conductivity at 25°C (00094): µmho
Field comments: (See WOC sheet for comments)			

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted

☐ NF: Whole sample (Non-filtered) ☒ F: Filtered in field with 0.45 µmembrane filter ☐ A: 2 ml H_2SO_4/L added

☒ NA: No acid added ☐ Other-*specify:* ☐ A: 5ml conc. HNO_3 added ☒ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA		Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)	2566	µmho	5/1
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☐ Other:			
☐ Other:			
☐ Other:			

A-H_2SO_4			
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldanl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From ____, ~~Filtered~~ NA SAMPLE

			Date Analyzed
☒ Calcium	292	mg/l	5/14
☒ Potassium	7.41	mg/l	5/13
☒ Magnesium	36	mg/l	5/14
☒ Sodium	304	mg/l	5/13
☒ Bicarbonate	702	mg/l	5/5
☒ Chloride	88	mg/l	5/15
☒ Sulfate	629	mg/l	5/12
☒ Total Solids	2288	mg/l	5/19
☒ CO_3	0		5/5
☐			

☒ Cation/Anion Balance

Analyst	Date Reported	Reviewed by
	5/26/87	[illegible]

Laboratory remarks: pH = 6.72

FOR OCD USE -- Date Owner Notified _____ Phone or Letter? _____ Initals _____

CATIONS				ANIONS		
ANALYTE	MEQ.	PPM	DET.LIMIT	ANALYTE	MEQ.	PPM
Ca	14.57	292.00	< 3.0	HCO3	11.50	702.00
Mg	2.96	36.00	< 10.0	SO4	13.10	629.00
Na	13.40	308.00	< 10.0	Cl	2.48	88.00
K	0.19	7.41	< 0.5			
Mn	0.00	0.00		NO3	0.00	0.00
Fe	0.00	0.00		CO3	0.00	0.00
				NH3	0.00	0.00
				PO4	0.00	0.00
SUMS	31.11	643.41			27.09	1419.00

TDS(measured) = 2288.00 ppm

Ion Balance = 114.85%

Sample No. =8701469

Date out/By [illegible]

New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

Hvy METALS
GENERAL WATER CHEMISTRY
and NITROGEN ANALYSIS

DATE RECEIVED	[illegible]	LAB NO.	[illegible]
USER CODE	☐ 59300 ☐ 59600 ☒ OTHER: 82235		
Collection DATE	04/22/87	SITE INFORMATION	
Collection TIME	1255		
Collected by — Person/Agency	BOYER/ANDERSON /OCD		
Sample location	SUNTERRA - KUTZ PLANT		
Collection site description	POND 1		

SEND FINAL REPORT TO ►

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5812

Station/ well code

Owner

SAMPLING CONDITIONS

☐ Bailed ☒ Dipped ☐ Pump ☐ Tap	Water level	Discharge	Sample type: GRAB
pH (00400): 6.5 (Stn. 10)	Conductivity (Uncorrected): 2610 µmho	Water Temp. (00010): 24.5 °C	Conductivity at 25°C (00094): µmho

Field comments: (See VOC Sheet FR comments)

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted

☐ NF: Whole sample (Non-filtered) ☒ F: Filtered in field with 0.45 µmembrane filter ☐ A: 2 ml H_2SO_4/L added

☐ NA: No acid added ☐ Other-*specify:* ☐ A: 5ml conc. HNO_3 added ☒ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

~~HNO₃~~ Units Date analyzed

☐ Conductivity (Corrected) 25°C (00095)		µmho	
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☒ Other:	ICAP Scan		
☒ Other:			
☐ Other:			

~~A-H₂SO₄~~

☐ Nitrate-N + Nitrite-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From ___, NA Sample:

			Date Analyzed
☐ Calcium		mg/l	
☐ Potassium		mg/l	
☐ Magnesium		mg/l	
☐ Sodium		mg/l	
☐ Bicarbonate		mg/l	
☐ Chloride		mg/l	
☐ Sulfate		mg/l	
☐ Total Solids		mg/l	
☐			
☐			
☐ Cation/Anion Balance			

Analyst | Date Reported: 5 / 18 / 87 | Reviewed by: Jim Ashley

Laboratory remarks: 1.0ml HNO_3 added at SLD. Digested

FOR OCD USE -- Date Owner Notified _____ Phone or Letter? _____ Initals _____

ICAP SCAN

SLD Lab No. ICP 226 Reviewed by: Jim Ashby

Analyst JB 5/6/87 Date Reported: 5/18/87

ELEMENT	ICAP VALUE(mg/l)	AA VALUE(mg/l)
Aluminum	<0.1	
Barium	0.4	
Beryllium	<0.1	
Boron	0.3	
Cadmium	<0.1	
Calcium	360.	
Chromium	<0.1	
Cobalt	<0.05	
Copper	<0.1	
Iron	1.4	
Lead	<0.1	
Magnesium	43.	
Manganese	0.52	
Molybdenum	<0.1	
Nickel	<0.1	
Silicon	18.	
Silver	<0.1	
Strontium	45	
Tin	<0.1	
Vanadium	<0.1	
Zinc	<0.1	
Arsenic		
Selenium		
Mercury		

New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED: 5/9/87	LAB NO. [illegible]	USER CODE ☐ 59300 ☐ 59600 ☒ OTHER: 82235	
Collection DATE: 04/22/87	SITE INFORMATION ►	Sample location: SAUTERRA - KEUTZ PLANT	
Collection TIME: 1255		Collection site description: POND 1	
Collected by — Person/Agency: BOYER/ANDERSON /OCD			

SEND FINAL REPORT TO ►
ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088

Attn: David Boyer

Phone: 827-5812

RECEIVED
MAY 29 1987
OIL CONSERVATION DIVISION

Station/ well code:
Owner:

SAMPLING CONDITIONS

☐ Bailed ☐ Pump ☒ Dipped ☐ Tap	Water level:	Discharge:	Sample type: GRAB
pH (00400): 7 (Strip)	Conductivity (Uncorrected): 2500 µmho	Water Temp. (00010): 21 °C	Conductivity at 25°C (00094): µmho

Field comments:

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted: 1

☐ NF: Whole sample (Non-filtered) ☒ F: Filtered in field with 0.45 µmembrane filter ☐ A: 2 ml H_2SO_4/L added

☐ NA: No acid added ☐ Other-*specify:* ☐ A: 5ml conc. HNO_3 added ☒ A: ~~4ml fuming HNO_3 added~~ 2ml H_2SO_4

ANALYTICAL RESULTS from SAMPLES

NF. NA		Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)		µmho	
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☐ Other:			
☐ Other:			
☐ Other:			

F. NA		Units	Date analyzed
☐ Calcium (00915)		mg/l	
☐ Magnesium (00925)		mg/l	
☐ Sodium (00930)		mg/l	
☐ Potassium (00935)		mg/l	
☐ Bicarbonate (00440)		mg/l	
☐ Chloride (00940)		mg/l	
☐ Sulfate (00945)		mg/l	
☐ Total filterable residue (dissolved) (70300)		mg/l	
☐ Other:			

NF. A-H_2SO_4			
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

F. A-H_2SO_4			
☒ Nitrate-N +, Nitrate-N dissolved (00631)	0.04	mg/l	5/12
☒ Ammonia-N dissolved (00608)	11.1	mg/l	5/7
☒ Total Kjeldahl-N ( )	36.9	mg/l	5/15
☐ Other:			

Analyst	Date Reported	Reviewed by
	5/20/87	CG

Laboratory remarks:

FOR OCD USE -- Date Owner Notified _____ Phone or Letter? _____ Initals _____

ASSAIGAI
ANALYTICAL
LABORATORIES

TO: Sunterra Gas Processing
ATTN: Gary Jordan
PO Box 2106
Albuquerque, NM 87103

DATE: 29 May 1987
0661

SAMPLE ID : #3

ANALYTE	ANALYTICAL RESULTS	NOMINAL DETECTION LIMITS
As	<0.05 mg/l	0.05 mg/l
Ba	<1.0 mg/l	1.0 mg/l
Cd	<0.01 mg/l	0.01 mg/l
Cr	<0.05 mg/l	0.05 mg/l
CN	<0.01 mg/l	0.01 mg/l
F	0.65 mg/l	0.01 mg/l
Pb	0.08 mg/l	0.01 mg/l
Total Hg	<0.002 mg/l	0.002 mg/l
NO 3 as N	<0.01 mg/l	0.01 mg/l
Se	0.016 mg/l	0.002 mg/l
Ag	<0.05 mg/l	0.05 mg/l
Benzene	0.004 mg/l	0.001 mg/l
Toluene	0.012 mg/l	0.001 mg/l
CCL 4	<0.01 mg/l	0.01 mg/l
1,2 Dichloroethane	<0.001 mg/l	0.001 mg/l
1,1 Dichloroethylene	<0.001 mg/l	0.001 mg/l
1,1,2,2 Tetrachloroethylene	<0.001 mg/l	0.001 mg/l
1,1,2 Trichloroethylene	<0.001 mg/l	0.001 mg/l
Ethyl Benzene	<0.001 mg/l	0.001 mg/l
Xylenes	<0.001 mg/l	0.001 mg/l
Methylene Chloride	<0.001 mg/l	0.001 mg/l
CCL 3	<0.001 mg/l	0.001 mg/l
1,1 Dichloroethane	<0.001 mg/l	0.001 mg/l
EDB	<0.001 mg/l	0.001 mg/l
1,1,1 Trichloroethane	<0.001 mg/l	0.001 mg/l
1,1,2 Trichloroethane	<0.001 mg/l	0.001 mg/l
1,1,2,2 Tetrachloroethane	<0.001 mg/l	0.001 mg/l
Vinyl Chloride	<0.001 mg/l	0.001 mg/l
Cu	<0.01 mg/l	0.01 mg/l
Cl	107 mg/l	1.0 mg/l
Fe	0.84 mg/l	0.3 mg/l
Mn	0.44 mg/l	0.01 mg/l
SO 4	197 mg/l	1.0 mg/l
Zn	0.066 mg/l	0.008 mg/l
Al	<0.1 mg/l	0.1 mg/l
B	0.139 mg/l	0.04 mg/l
Co	<0.03 mg/l	0.03 mg/l
Mo	<0.05 mg/l	0.05 mg/l
Ni	0.186 mg/l	0.01 mg/l

REFERENCE: "Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods", USEPA, SW 846, EMSL-Cincinnati, 1982.

An invoice for services is enclosed. Thank you for contacting Assaigai Laboratories.

Sincerely,

Jennifer V. Smith, Ph.D.
Laboratory Director

87-0690-C

SCIENTIFIC LABORATORY DIVISION

700 Camino de Salud NE
Albuquerque, NM 87106 841-2570

HEALTH ENVIRONMENT — STATE OF NEW MEXICO

REPORT TO: David Boyer
N.M. Oil Conservation Division
P. O. Box 2088
Santa Fe, N.M. 87504-2088
PHONE(S): 827-5812
SUBMITTER: David Boyer

S.L.D. No. OR- 690
DATE REC. 4-27-87
PRIORITY
USER CODE: 8 2 2 3 5
CODE: 2 6 0

SAMPLE COLLECTION CODE: (YYMMDDHHMMIII) 8 7 0 4 2 7 1 3 1 5 DB

SAMPLE TYPE: WATER [X], SOIL [ ], FOOD [ ], OTHER: _____ CODE: _____

COUNTY: San Juan ; CITY: Bloomfield CODE: _____

LOCATION CODE: (Township-Range-Section-Tracts) 2 8 N + 1 1 W + 1 3 + 1 1 1 (10N06E24342)

ANALYSES REQUESTED: Please check the appropriate box(es) below to indicate the type of analytical screens required. Whenever possible list specific compounds suspected or required.

PURGEABLE SCREENS

- [ ] (753) Aliphatic Purgeables (1-3 Carbons)
- [X] (754) Aromatic & Halogenated Purgeables
- [ ] (765) Mass Spectrometer Purgeables
- [ ] (766) Trihalomethanes

Other Specific Compounds or Classes

- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____

EXTRACTABLE SCREENS

- [ ] (751) Aliphatic Hydrocarbons
- [ ] (760) Organochlorine Pesticides
- [ ] (755) Base/Neutral Extractables
- [ ] (758) Herbicides, Chlorophenoxy acid
- [ ] (759) Herbicides, Triazines
- [ ] (760) Organochlorine Pesticides
- [ ] (761) Organophosphate Pesticides
- [ ] (767) Polychlorinated Biphenyls (PCB's)
- [ ] (764) Polynuclear Aromatic Hydrocarbons
- [ ] (762) SDWA Pesticides & Herbicides

Remarks: San Juan Pond 2 (Middle)
Kelly

FIELD DATA:

pH= 7 Strip; Conductivity= 2500 umho/cm at 21 °C; Chlorine Residual= _____ mg/l

Dissolved Oxygen= _____ mg/l; Alkalinity= _____ mg/l; Flow Rate _____ ____/____

Depth to water _____ ft.; Depth of well _____ ft.; Perforation Interval _____-_____ ft.; Casing: _____

Sampling Location, Methods and Remarks (i.e. odors, etc.)

Over-Flow from pond 1, Sample from North side
Black Water, Suspect Iron, no oil, particulates

I certify that the results in this block accurately reflect the results of my field analyses, observations and activities.(signature collector): David Boyer Method of Shipment to the Lab: Hand carried

This form accompanies 2 Septum Vials, ____ Glass Jugs, and/or ____ _____

Samples were preserved as follows:

- [ ] NP: No Preservation; Sample stored at room temperature.
- [X] P-Ice Sample stored in an ice bath (Not Frozen).
- [X] P-$Na_2S_2O_3$ Sample Preserved with Sodium Thiosulfate to remove chlorine residual.

CHAIN OF CUSTODY

I certify that this sample was transferred from _____ to _____

at (location) _____ on ____/____/____ - ____:____ and that the statements in this block are correct. Evidentiary Seals: Not Sealed [ ] Seals Intact: Yes [ ] No [ ]

Signatures _____ _____

For OCD Use: Date Owner Notified _____ Phone or Letter? _____ Initials _____

ANALYSES PERFORMED

LAB. No.: OR- 697

THIS PAGE FOR LABORATORY RESULTS ONLY

This sample was tested using the analytical screening method(s) checked below:

PURGEABLE SCREENS

- ☐ (753) Aliphatic Purgeables (1-3 Carbons)
- ☒ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes

Other Specific Compounds or Classes

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (760) Organochlorine Pesticides
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
- ☐ (760) Organochlorine Pesticides
- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

ANALYTICAL RESULTS

COMPOUND(S) DETECTED	CONC. [PPB]	COMPOUND(S) DETECTED	CONC. [PPB]
aromatic hydrocarbons	N.D.		
halogenated hydrocarbons	N.D.		
* DETECTION LIMIT * ✱	50 ppb	+ DETECTION LIMIT + +	

ABBREVIATIONS USED:

N D = NONE DETECTED AT OR ABOVE THE STATED DETECTION LIMIT

T R = DETECTED AT A LEVEL BELOW THE STATED DETECTION LIMIT (NOT CONFIRMED)

[RESULTS IN BRACKETS] ARE UNCONFIRMED AND/OR WITH APPROXIMATE QUANTITATION

LABORATORY REMARKS: _____

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes ☐ No ☑ Seal(s) broken by: not sealed date: _____

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements on this page accurately reflect the analytical results for this sample.

Date(s) of analysis: 5/4/87 Analyst's signature: Gary C. Eden

I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block.

Reviewers signature: L Meyerhen

New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED | LAB NO. | USER CODE ☐ 59300 ☐ 59600 ☒ OTHER: 82235

Collection DATE: 04/22/87
Collection TIME: 1315
Collected by — Person/Agency: BOYER/ANDERSON /OCD

SITE INFORMATION ►
Sample location: SUNTERRA - KUTZ PLANT
Collection site description: POND 2

SEND FINAL REPORT TO ►
ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088
Attn: David Boyer
Phone: 827-5812

Station/well code:
Owner:

SAMPLING CONDITIONS

☐ Bailed ☒ Dipped ☐ Pump ☐ Tap	Water level	Discharge	Sample type: GRAB
pH (00400): 7 (STRIP)	Conductivity (Uncorrected): 2500 µmho	Water Temp. (00010): 21 °C	Conductivity at 25°C (00094): µmho

Field comments: (See VOC Form for comments)

SAMPLE FIELD TREATMENT — Check proper boxes → Pre Filtered only

No. of samples submitted | ☐ NF: Whole sample (Non-filtered) | ☒ F: Filtered in field ~~with 0.45 µmembrane filter~~ | ☐ A: 2 ml H_2SO_4/L added

☒ NA: No acid added ☐ Other-specify: ☐ A: 5ml conc. HNO_3 added ☐ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA		Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	2500	µmho	5/14
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☒ Other: pH	7.48		5/5
☐ Other:			
☐ Other:			

A-H_2SO_4			
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From Pre F, NA Sample:

			Date Analyzed
☒ Calcium	216	mg/l	5/14
☒ Potassium	21.5	mg/l	5/14
☒ Magnesium	44	mg/l	5/14
☒ Sodium	368	mg/l	5/14
☒ Bicarbonate	1228	mg/l	5/5
☒ Chloride	119	mg/l	5/5
☒ Sulfate	147	mg/l	5/12
☒ Total Solids	2302	mg/l	5/19
☒ CO_3	0		5/5
☐			
☒ Cation/Anion Balance			

Analyst | Date Reported: 5/28/87 | Reviewed by: CG

Laboratory remarks:

FOR OCD USE — Date Owner Notified _____ Phone or Letter? _____ Initals _____

CATIONS				ANIONS		
ANALYTE	MEQ.	PPM	DET.LIMIT	ANALYTE	MEQ.	PPM
Ca	10.78	216.00	< 3.0	HCO3	20.12	1228.00
Mg	3.61	44.00	< 10.0	S04	3.06	147.00
Na	16.01	368.00	< 10.0	Cl	3.36	119.00
K	0.55	21.50	< 0.5			
Mn	0.00	0.00		NO3	0.00	0.00
Fe	0.00	0.00		CO3	0.00	0.00
				NH3	0.00	0.00
				PO4	0.00	0.00
SUMS	30.95	649.50			26.54	1494.00

TDS(measured) = 2302.00 ppm

Ion Balance = 116.60%

Sample No. =8701472
Date out/By 5/28/87

ASSAIGAI ANALYTICAL LABORATORIES

TO: Sunterra Gas Processing
ATTN: Gary Jordan
PO Box 2106
Albuquerque, NM 87103

DATE: 29 May 1987
0661

SAMPLE ID : #4

ANALYTE	ANALYTICAL RESULTS	NOMINAL DETECTION LIMITS
As	<0.05 mg/l	0.05 mg/l
Ba	<1.0 mg/l	1.0 mg/l
Cd	<0.01 mg/l	0.01 mg/l
Cr	<0.05 mg/l	0.05 mg/l
CN	0.03 mg/l	0.01 mg/l
F	0.60 mg/l	0.01 mg/l
Pb	0.11 mg/l	0.01 mg/l
Total Hg	<0.002 mg/l	0.002 mg/l
NO 3 as N	20.7 mg/l	0.01 mg/l
Se	0.096 mg/l	0.002 mg/l
Ag	<0.05 mg/l	0.05 mg/l
Benzene	<0.001 mg/l	0.001 mg/l
Toluene	<0.001 mg/l	0.001 mg/l
CCL 4	<0.01 mg/l	0.01 mg/l
1,2 Dichloroethane	<0.001 mg/l	0.001 mg/l
1,1 Dichloroethylene	<0.001 mg/l	0.001 mg/l
1,1,2,2 Tetrachloroethylene	<0.001 mg/l	0.001 mg/l
1,1,2 Trichloroethylene	<0.001 mg/l	0.001 mg/l
Ethyl Benzene	<0.001 mg/l	0.001 mg/l
Xylenes	<0.001 mg/l	0.001 mg/l
Methylene Chloride	<0.001 mg/l	0.001 mg/l
CCL 3	<0.001 mg/l	0.001 mg/l
1,1 Dichloroethane	<0.001 mg/l	0.001 mg/l
EDB	<0.001 mg/l	0.001 mg/l
1,1,1 Trichloroethane	<0.001 mg/l	0.001 mg/l
1,1,2 Trichloroethane	<0.001 mg/l	0.001 mg/l
1,1,2,2 Tetrachloroethane	<0.001 mg/l	0.001 mg/l
Vinyl Chloride	<0.001 mg/l	0.001 mg/l
Cu	<0.01 mg/l	0.01 mg/l
Cl	437 mg/l	1.0 mg/l
Fe	<0.3 mg/l	0.3 mg/l
Mn	<0.01 mg/l	0.01 mg/l
SO 4	1750 mg/l	1.0 mg/l
Zn	<0.008 mg/l	0.008 mg/l
Al	<0.1 mg/l	0.1 mg/l
B	0.515 mg/l	0.04 mg/l
Co	<0.03 mg/l	0.03 mg/l
Mo	<0.05 mg/l	0.05 mg/l
Ni	0.268 mg/l	0.01 mg/l

REFERENCE: "Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods", USEPA, SW 846, EMSL-Cincinnati, 1982.

An invoice for services is enclosed. Thank you for contacting Assaigai Laboratories.

Sincerely,

Jennifer V. Smith, Ph.D.
Laboratory Director

87-0688-C

SCIENTIFIC LABORATORY DIVISION

700 Camino de Salud NE
Albuquerque, NM 87106 841-2570

STATE OF NEW MEXICO
HEALTH ENVIRONMENT

REPORT TO: David Boyer
N.M. Oil Conservation Division
P. O. Box 2088
Santa Fe, N.M. 87504-2088

S.L.D. No. OR- 87 688
DATE REC. 4-29-87
PRIORITY

PHONE(S): 827-5812
USER CODE: 8 2 2 3 5
SUBMITTER: David Boyer
CODE: 2 6 0

SAMPLE COLLECTION CODE: (YYMMDDHHMMMM) 870404 2121 1313 10 QB

SAMPLE TYPE: WATER ☒, SOIL ☐, FOOD ☐, OTHER: _____ CODE: _____

COUNTY: San Juan ; CITY: Bloomfield CODE: _____

LOCATION CODE: (Township-Range-Section-Tracts) 28N + 11W + 13 + 1 1 (10N06E24342)

ANALYSES REQUESTED: Please check the appropriate box(es) below to indicate the type of analytical screens required. Whenever possible list specific compounds suspected or required.

PURGEABLE SCREENS

- ☐ (753) Aliphatic Purgeables (1-3 Carbons)
- ☒ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes

Other Specific Compounds or Classes

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (760) Organochlorine Pesticides
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
- ☐ (760) Organochlorine Pesticides
- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

Remarks: San Juan Kutz Pond 3 (Lower)

FIELD DATA: WO 3980 2L2C

pH= 8.5 Strip ; Conductivity= ~~26,000~~ umho/cm at ~~25~~ °C; Chlorine Residual= _____ mg/l

Dissolved Oxygen= _____ mg/l; Alkalinity= _____ mg/l; Flow Rate _____ _____/_____

Depth to water _____ ft.; Depth of well _____ ft.; Perforation Interval _____ - _____ ft.; Casing: _____

Sampling Location, Methods and Remarks (i.e. odors, etc.)

From W. end. Lots of salt deposits on banks, water clear, no oil

I certify that the results in this block accurately reflect the results of my field analyses, observations and activities.(signature collector): Howard Bayer Method of Shipment to the Lab: Hand carried

This form accompanies 2 Septum Vials, _____ Glass Jugs, and/or _____ _____

Samples were preserved as follows:

- ☐ NP: No Preservation; Sample stored at room temperature.
- ☒ P-Ice Sample stored in an ice bath (Not Frozen).
- ☒ P-$Na_2S_2O_3$ Sample Preserved with Sodium Thiosulfate to remove chlorine residual.

CHAIN OF CUSTODY

I certify that this sample was transferred from _____ to _____

at (location) _____ on ____/____/____ - ____:____ and that

the statements in this block are correct. Evidentiary Seals: Not Sealed ☐ Seals Intact: Yes ☐ No ☐

Signatures _____ _____

For OCD Use: Date Owner Notified _____ Phone or Letter? _____ Initials _____

ANALYSES PERFORMED

LAB. No.: OR- 688

THIS PAGE FOR LABORATORY RESULTS ONLY

This sample was tested using the analytical screening method(s) checked below:

PURGEABLE SCREENS

- ☐ (753) Aliphatic Purgeables (1-3 Carbons)
- ☒ (754) Aromatic & Halogenated Purgeables
- ☐ (765) Mass Spectrometer Purgeables
- ☐ (766) Trihalomethanes

Other Specific Compounds or Classes

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

EXTRACTABLE SCREENS

- ☐ (751) Aliphatic Hydrocarbons
- ☐ (760) Organochlorine Pesticides
- ☐ (755) Base/Neutral Extractables
- ☐ (758) Herbicides, Chlorophenoxy acid
- ☐ (759) Herbicides, Triazines
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- ☐ (761) Organophosphate Pesticides
- ☐ (767) Polychlorinated Biphenyls (PCB's)
- ☐ (764) Polynuclear Aromatic Hydrocarbons
- ☐ (762) SDWA Pesticides & Herbicides

ANALYTICAL RESULTS

COMPOUND(S) DETECTED	CONC. [PPB]	COMPOUND(S) DETECTED	CONC. [PPB]
aromatic purgeables	N.D		
halogenated purgeables	N.D.		
* DETECTION LIMIT *	25 ppb	+ DETECTION LIMIT +	

ABBREVIATIONS USED:

N D = NONE DETECTED AT OR ABOVE THE STATED DETECTION LIMIT

T R = DETECTED AT A LEVEL BELOW THE STATED DETECTION LIMIT (NOT CONFIRMED)

[RESULTS IN BRACKETS] ARE UNCONFIRMED AND/OR WITH APPROXIMATE QUANTITATION

LABORATORY REMARKS: _____

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes ☐ No ☑ Seal(s) broken by: not sealed date: _____

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements on this page accurately reflect the analytical results for this sample.

Date(s) of analysis: 5/4/87 Analyst's signature: Mary C. Eden

I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block.

Reviewers signature: K Meyerhar

New Mexico Health and En[illegible]nt Department
SCIENTIFIC LABORATORY [illegible]VISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED: 4 27 87	LAB NO. [illegible]	USER CODE ☐ 59300 ☐ 59600 ☒ OTHER: 82235	
Collection DATE: 04 22 87	SITE INFORM-ATION ►	Sample location: SUNTERRA - KUTZ PLANT	
Collection TIME: 1330		Collection site description: POND 3	
Collected by — Person/Agency: /OCD			

SEND FINAL REPORT TO ►
ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87504-2088
Attn: David Boyer
Phone: 827-5812

Station/well code:
Owner:

SAMPLING CONDITIONS

☐ Bailed ☒ Dipped ☐ Pump ☐ Tap	Water level: —	Discharge: —	Sample type: GRAB
pH (00400): 8.5	Conductivity (Uncorrected): 3920 µmho	Water Temp. (00010): 21 °C	Conductivity at 25°C (00094): µmho

Field comments: (See VOC Form for Comments)

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted:
☐ NF: Whole sample (Non-filtered) ☒ F: Filtered in field with 0.45 µmembrane filter ☐ A: 2 ml H_2SO_4/L added
☒ NA: No acid added ☐ Other-*specify:* ☐ A: 5ml conc. HNO_3 added ☐ A: 4ml fuming HNO_3 added

ANALYTICAL RESULTS from SAMPLES

NA		Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)	4367	µmho	5/14
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☐ Other:			
☐ Other:			
☐ Other:			

A-H_2SO_4			
☐ Nitrate-N + Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

From F, NA Sample:

			Date Analyzed
☒	Calcium	84 mg/l	5/14
☒	Potassium	0.39 mg/l	5/13
☒	Magnesium	53 mg/l	5/14
☒	Sodium	835 mg/l	5/13
☒	Bicarbonate	39 mg/l	5/5
☒	Chloride	456 mg/l	5/5
☒	Sulfate	1707 mg/l	5/17
☒	Total Solids	3172 mg/l	5/19
☒	CO_3	23 mg/l	5/5
☐			

☐ Cation/Anion Balance

Analyst	Date Reported	Reviewed by
	5 26 87	

Laboratory remarks: pH = 9.61

FOR OCD USE -- Date Owner Notified _____ Phone or Letter? _____ Initals _____

a2

CATIONS				ANIONS		
ANALYTE	MEQ.	PPM	DET.LIMIT	ANALYTE	MEQ.	PPM
Ca	4.19	84.00	< 3.0	HCO3	0.64	39.00
Mg	4.35	53.00	< 10.0	S04	35.56	1707.00
Na	36.32	835.00	< 10.0	Cl	12.86	456.00
K	0.01	0.39	< 0.5			
Mn	0.00	0.00		NO3	0.00	0.00
Fe	0.00	0.00		CO3	0.00	0.00
				NH3	0.00	0.00
				PO4	0.00	0.00
SUMS	44.87	972.39			49.06	2202.00

TDS(measured) = 3172.00 ppm

Ion Balance = 91.46%

Sample No. =8701471

Date out/By [illegible]