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PROPOSED PLAN OF OPERATIONS
TO DRILL A GEOTHERMAL TEST WELL
ON UNITED STATES GEOTHERMAL RESOURCES LEASE
N-13186
NYE COUNTY, NEVADA

**UNIVERSITY OF UTAH
RESEARCH INSTITUTE
EARTH SCIENCE LAB.**

Al-Aquitaine Exploration, Ltd.

Calgary, Alberta
Canada

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I. Introduction

Al-Aquitaine Exploration, Ltd. proposes to drill a +6000 ft geothermal test well on Federal Geothermal Lease N-13186 in the Gabbs Valley area, Nye County, Nevada. In accordance with 30 CFR 270.34, 270.71 and GRO 2, 3 and 4, this Application, Plan of Operations and attached Exhibits are submitted for consideration and approval for the proposed work schedule.

The well will be located approximately 2436 ft south of the north boundary and 1627 ft west of the east boundary of Section 25, Township 12 north, Range 34 east, Nye County, Nevada.

Exhibit "I" is a legal survey plat showing the proposed wellsite location.

Exhibit "A" is a map of the surrounding area which shows the approximate well location.

II. Details of Work

The rotary drilling rig which will be utilized will meet all necessary requirements to drill, test and complete a +6000 ft exploratory well with complete safety for both personnel and equipment.

A specific drilling rig has not yet been contracted for. Detailed rig specifications will be supplied to USGS when the particular rig has been selected.

(a) General Rig Specifications

The following is a typical list of rig equipment which would be utilized to drill a +6000 ft geothermal test well.

1. A rotary-type rig with capability of drilling 7500-8000' with 4-1/2" DP.
2. Two draw-works engines - 400 HP or equivalent.
3. Two pumps - EMSCO D-500 type.
4. Mast - 112-126' portable type 500,000 lb capacity.
5. Substructure - Normally required to handle a full BOP stack commonly used in Dixie Valley area.
6. 7500' minimum 4-1/2" drill pipe.
7. Two 500 bbl. steel water storage tanks.
8. One 100 bbl. vacuum water truck.

9. Mud logging unit from conductor pipe to T.D.
10. Mud desander and desilter.
 - (b) Typical Inventory - Peter Bawden Rig #23
(see Exhibit "B")
 - (c) Typical Rig Layout (see Exhibit "C")
 - (d) Proposed Drilling Program
 - (1) Geological Prognosis

Surface - 5000': Sedimentary overburden consisting of alluvium, playa deposits, lo crustive beds, diatomite, conglomerate and a high proportion of clay.

5000' - 6000': Basement fault zone.

6000': Total depth.

(6) Logging

Open-hole wireline logs will be run at surface casing point, intermediate casing point and at total depth to evaluate possible geothermal reservoirs. Logs may also be run while drilling the main hole if bottom-hole temperature and/or formation properties are desired.

- (i) At surface casing point - Dual Induction Laterolog
- (ii) At intermediate casing point and at total depth -
 - Dual Induction Laterolog
 - Compensated Neutron Log
 - Formation Density Log
 - Borehole Compensated Sonic Log
 - Temperature Log (selected intervals)

(7) Testing

Drillstem and or tests through tubing will be performed if necessary to evaluate potential geothermal reservoirs.

(8) Mud Logging

A Mud Logging unit will be employed from below conductor casing to total depth. Parameters to be monitored and plotted will include:

1. Drilling Rate
2. Lithology
3. Total Gas
4. Mud Temperature In and Out
5. Mud Resistivity In and Out

(9) Alternate Drilling Operations

Hole conditions, or further evaluation operations may require alternate procedures not detailed above. A list of possible alternate procedures considered as an accepted drilling practice are detailed below:

1. Cutting conventional cores.
2. Plugging back and/or re-drilling.
3. Running intermediate casing and/or liners if required to seal off connate waters, abnormal pressure or poor hole conditions.
4. Side tracking.
5. Setting packers and/or cement plugs.
6. Plugging and abandonment.

(10) Blowout Prevention Equipment

For the blowout prevention equipment and choke manifold refer to the exhibit "D", "E", "F" in the Appendix.

(11) Topographic Features and Drainage Patterns

For topographic features and drainage patterns see Exhibit "A" and Exhibit "J", the Archeological/Botanical Report.

(e) Proposed Geothermal Test Well
Downhole Schematic - see Exhibit "G"

(f) Proposed Geothermal Test Well
General Surface Location Layout - see Exhibit "H".

III. EXISTING AND PLANNED ACCESS AND LATERAL ROADS - see Exhibit "A" and Exhibit "J"

IV. LOCATION AND SOURCE OF WATER SUPPLY AND ROAD BUILDING MATERIAL

Water will be supplied by drilling water wells on location if possible.

Where possible all roads will be upgraded using material from location construction.

V. CULTURAL RESOURCES PRESERVATION

As required under GRO-4, to protect and preserve the cultural and archeological inventory in the areas to be disturbed for access and drillsite location, an approved competent archeologist from the Nevada State Museum performed an Archeological and Botanical Reconnaissance. The results of this work is included as Exhibit "J".

VI. LOCATION OF CAMPSITES, AIRSTRIPS AND OTHER SUPPORTING FACILITIES

There is no need for any of these facilities to be constructed in the current Plan of Operations and none are being considered.

VII. LAND USE AND RESTORATION

(a) Additional Areas of Surface Disturbance

In addition to the access road and drill pad, there are other areas which may have potential surface disturbance. These are down-dip drainages from the rig site, which could receive overflows of fluids from liquid dominant reservoirs in the event of an uncontrolled blowout. These areas would require dikes of earthen fill temporarily, and in this unforeseen event, additional berms would be constructed to contain superfluous fluids. At the conclusion of any site usage, a restoration program, including obliterating and revegetating access roads, drill pads and other disturbed areas will be done in conjunction with the Nevada State Division of Wildlife Resources.

(b) Pollution of Surface and Groundwaters

All fluids utilized or produced at the rig site will be controlled and stored in gel-lined pits to avoid any contamination. After settling of any solids, the fluids will be drained off and used to keep down dust on the roads and rig site with permission from the Nye County road officials. Casing strings are designed to avoid any near surface or sub-surface contamination. Reserve pits will be lined with gel to prevent percolation of fluids into ground waters. Any produced fluids will not be allowed to enter natural drainages without express permission from the regulatory agencies.

(c) Damage to Fish, Wildlife and Vegetation

All surface disturbance will be kept to a minimum to limit destruction of wildlife habitat. There are no perennial streams or lakes nearby which would suffer contamination and no fish which might be endangered as a result. Well discharge lines will be directed away from nearby vegetation to prevent injury or contamination. An approved competent botanist will be engaged to examine the area involved in this plan of operations. Use of sensitive areas will be avoided. The botanist's report will be forwarded in triplicate to USGS as soon as it is completed.

(d) Noise and Air Pollution

Noise levels and air emission from operations will be controlled in accordance with Federal and State Quality Standards, and any local imposed standards. The area is relatively unpopulated and noise would not be a nuisance factor except to occasional visitors.

Mufflers will be used on rig engines and compressors as standard equipment. Any testing of steam or effluents from the well will be under muffling devices designed by the best technology available.

(e) Hazards to Public Health and Safety

1. Access to and around the drilling rig and assessor equipment will be strictly regulated to authorized personnel by Al-Aquitaine.
2. A normal compliment of safety and accident prevention equipment will be available at all times.
3. All rig personnel will be familiarized with geothermal operations and associated hazards.
4. Any usage or occurrence of toxic substances will be noted and immediate response for safety of personnel will be taken.

VIII. SOIL EROSION AND SUBSIDENCE

Any new roadway, grading, leveling or pad construction will be designed to prevent erosion or degradation of the surface. Care will be taken to avoid scarring or removal of excessive ground cover. Vehicular travel by rig personnel, company operatives and other authorized personnel will be confined to existing roads and trails. Any upgrading of roads shall be done in accordance with local and county and Federal road standards, which might include the installation of culverts, construction of drainage ditches and graveling or capping the road bed. Any soil disturbance will be returned as near to original state as closely as possible. Reserve pits will be allowed to settle out before the final backfill.

IX. SUMPS AND PITS

All materials excavated from the sump, reserve pits and rig-site leveling, will be utilized in the construction of the berms around these features to contain any geothermal fluids which may be a part of the testing procedure. These berms will be tamped to conform with good engineering practices, and leveled across the top to blend in with the surroundings as near as possible. Any material left over from construction of the berms or pad leveling will be stockpiled in an area adjacent to the drill pad and within the confines of the well-site boundaries. This material will be used later on to backfill or restore to original the grades of excavations as needed. Contamination of the ground water resources will be avoided by lining the sump and pits with one-quarter pound of bentonitic gel per foot of surface. This forms an impervious layer of clay which will allow only a minimum of seepage of produced fluids from the well along with any drilling fluid which might be objectional. Any unused or vacant pits will be fenced to protect wildlife or livestock. A program of backfilling and restoration will ultimately be proposed after a reasonable evaluation period.

X. WASTE DISPOSAL INCLUDING LIQUIDS, SOLIDS, TRASH AND HUMAN WASTE

A reserve pit will be located adjacent to the drilling pad and all fluids will be contained in this pit. The pit will be lined with an impervious gel to seal off any percolation of fluids. The solids will be allowed to settle out and along with other debris, such as drill cuttings, will be buried after the pit dries and is reclaimed. Garbage and other foreign materials will be deposited at an authorized dump. Excess uncontaminated fluids will be used as dust inhibitors on the roads.

During testing operations, any effluents produced as liquids during flow tests to determine reservoir capacity will be confined to the reserve pit. After drying, any residue will be buried before reclaiming the pit. Any steam which is flashed during testing (est. 15-20%) will be vented to the atmosphere. It is expected that only flow tests of short duration will be carried out and the duration of testing will be limited to the capacity of the sump and reserve pit.

XI. PROTECTION OF THE ENVIRONMENT

a) Fire Prevention

All brush and vegetation will be disposed of in a manner compatible with the Bureau of Land Management and U.S. Geological Survey requirements. Every reasonable effort will be made to avoid spillage of inflammable materials. Firefighting equipment will be located at the proposed well sites - exhaust stacks from all engines will be equipped with spark arrestors or built-in water cooled exhaust systems for spark control. All precautions will be taken to control and suppress any fires started in or near the Al-Aquitaine lease. The authorized officer shall be informed as soon as possible of any fire.

(b) Hydrogen Sulphide Contingency Plan

i) Introduction

Although dangerous amounts of hydrogen sulphide have not been associated with other wells in the area, H₂S gas could be encountered during the drilling operation. Al-Aquitaine Exploration, Ltd. will take steps to ensure the safety of all personnel on the location and in the immediate vicinity, in the event that dangerous amounts of hydrogen sulphide are released to the atmosphere. The drilling operation will be conducted safely using accepted drilling practices. A sufficient mud density will be maintained at all times to overbalance any formation which could contain gas.

To be effective, the plan requires the co-operation and effort of each person participating in the drilling of a possible H₂S well. Each person must know his responsibilities and duties in regard to normal drilling operations and emergency and safety procedures. He should thoroughly understand and be able to use in a moments notice, all safety equipment while performing his normal duties if the circumstances require. He should therefore familiarize himself with the location of all safety equipment and see that his equipment is properly stored, easily accessible at all times, and routinely maintained.

The intent of Al-Aquitaine Exploration, Ltd. is to provide a safe working place, not only for its employees but also for those other firms who are aiding in drilling this exploratory well. The Al-Aquitaine Exploration, Ltd.'s Drilling Foreman is required to enforce these safety procedures. They are set up for safety, and although they may seem to be stringent, we consider them as necessary for prudent operation.

ii) General Information and Effects of Hydrogen Sulphide

a) Instructions To Personnel Where Hydrogen Sulphide May Be Encountered

1. Every person involved in the operation will be informed of the characteristics of Hydrogen Sulfide, its dangers, safe procedures to be used when it is encountered, and recommended first aid procedures for regular rig personnel.

2. The H₂S SUPERVISOR will conduct a training session and will repeat as deemed necessary by him or as instructed by the DRILLING FOREMAN.

3. Instruction will include the following:

- a) Danger of Hydrogen Sulfide.
- b) Use and limitation of air equipment.
- c) Use of resuscitator; organize "buddy system" and first aid procedures.
- d) Use of H₂S detection devices; designate responsible people.
- e) Explain rig layout and policy on visitors; designate smoking and safety areas; emphasize the importance of wind direction.
- f) Explain functions of an H₂S Supervisor.
- g) Explain and organize H₂S drill.
- h) Explain the overall emergency plan with emphasis given to the evacuation phase of the plan.

4. The above instructions will be attended by every person involved in the operation.

5. Visitors will be instructed to report to Al-Aquitaine Exploration, Ltd's DRILLING FOREMAN.

6. Visitors will be refused entrance for lack of safety equipment, if special operations are in progress, or for other reasons involving personal safety.

b) Characteristics of Hydrogen Sulfide

1. Extremely toxic (POISONOUS).
2. Heavier than air, and colorless.
3. Has odor of rotten eggs, in small amounts.
4. Burns with a blue flame and produces Sulfur Dioxide (SO₂) gas, which is very irritating to eyes and lungs. The SO₂ is less toxic than H₂S, but can cause serious injury.
5. H₂S forms explosive mixture with air, between 4.3% and 46.0% by volume.
6. H₂S is soluble in water but becomes less soluble as the water temperature increases.
7. H₂S is almost as toxic as hydrogen cyanide - and is between 5 and 6 times as toxic as carbon monoxide.
8. Produces irritation to eyes, throat and respiratory tract.

c) Toxicity of Hydrogen Sulfide Gas

Common Name - Hydrogen Sulfide
Chemical Formula - H₂S
Specific Gravity - 1.18
Threshold Limit 1 - 10 ppm-4
20 ppm-5
Hazardous Limit 2 - 250 ppm/hr
Lethal Concentration 3 - 600 ppm

1. Threshold Limit - Concentration at which it is believed that all workers may be repeatedly exposed day after day without adverse effects.

2. Hazardous Limit - Concentration that may cause death.

3. Lethal Concentration - Concentration that will cause death with short-term exposure.

4. Threshold Limit = 10 ppm - American Conference of Governmental Industrial Hygienists.

5. Threshold Limit = 20 ppm - ANSI acceptable ceiling concentration for eight-hour exposure (based on 40 hour week) is 20 ppm. OSHA Rules and Regulations (CFR, Vol. 37, No. 202, Part II, Oct. 18, '72).

d) Effects of Hydrogen Sulfide on the Human Body

1. Concentrations

Percent(%)	PPM	100 Std.ft. ³	Physical Effects
0.001	10	0.65	Obvious and unpleasant odor.
0.002	20	1.30	Safe for 8 hours exposure.
0.01	100	6.48	Kills smell in 3 to 5 minutes; may sting eyes and throat.
0.02	200	12.96	Kills smell shortly; stings eyes and throat.
0.05	500	32.96	Dizziness; breathing ceases in a few minutes; needs prompt artificial respiration.
0.07	700	45.36	Unconscious quickly; death will result if not rescued promptly.
0.10	1000	64.80	Unconscious at once; followed by death within minutes.

f) Treatment for Hydrogen Sulfide Poisoning

Inhalation

As Hydrogen Sulfide in the blood oxidizes rapidly, symptoms of acute poisoning pass off when inhalation of the gas ceases. It is important, therefore, to get the victim of poisoning to fresh air as quickly as possible. He should be kept at rest and chilling should be prevented. If respiration is slow, labored or impaired, artificial respiration may be necessary. Most persons overcome by Hydrogen Sulfide may be revived if artificial respiration is applied before the heart action ceases. Victims of poisoning should be under the care of a physician as soon as possible. Irritation due to sub-acute poisoning may lead to serious complications such as pneumonia. Under those conditions, treatment by the physician necessarily would be symptomatic. The patient should be kept in fresh air and hygienic conditions should be watched carefully.

Contact With Eyes

Eye contact with liquid and/or gas containing Hydrogen Sulfide will cause painful irritation (conjunctivitis). Keep patient in a darkened room, apply ice compresses to eyes, put ice on forehead, and send for a physician. Eye irritation caused by exposure to Hydrogen Sulfide requires treatment by a physician, preferably an eye specialist. The progress to recovery in these cases is usually good.

Contact With Skin

Skin absorption is very low. Skin discoloration is possible after contact with liquids containing Hydrogen Sulfide. If such skin contact is suspected, the area should be thoroughly washed.

g) Safety Equipment

A. Blowout Prevention Equipment

1. Blowout preventers will be sour gas trimmed dressed for Hydrogen Sulfide service. Choke manifolds will be of similar materials.

2. Installation, operation, and testing of blowout preventers, choke manifolds, etc., dressed for Hydrogen Sulfide service, will be conducted in accordance with standard Company practice.

3. Manufacturer certification of the blowout preventer equipment for Hydrogen Sulfide service is desirable.

4. The closing unit should be located a safe distance from the wellbore and positioned for maximum utilization based on the prevailing wind direction.

B. Breathing Equipment

1. Filter-type or cartridge masks do not provide the necessary protection and will not be used in the drilling operation when a Hydrogen Sulfide environment may be encountered.
2. Self-contained breathing equipment will be used in the drilling operations involving a Hydrogen Sulfide environment. Pressure demand, or positive pressure breathing apparatus will have a Bureau of Mines and/or T.C. (NIOSH) approval.
3. The pressure demand breathing apparatus will have alarms that signal when air supply is getting low, 425 to 500 psi. This would allow a five to seven minutes escape time.
4. Masks should be stored on racks and protected from the weather. Rig crew equipment will be located at a readily accessible location on the rig floor.
5. For each 30 minutes self-contained unit, one spare airpack bottle will be kept on location or an airpack bottle rechargeable station will be supplied.

h) Responsibilities and Duties

Al-Aquitaine Exploration Ltd's Drilling Foreman

1. In an emergency situation, the DRILLING FOREMAN on duty will have complete responsibility and will take whatever action is deemed necessary in an emergency situation to ensure personnel safety, to protect the well and to prevent property damage.
2. Will advise the SUPERINTENDENT when procedures as specified herein have been met, will inform of emergencies and deviations from the plan, and see that procedures are observed at all times.
3. Will advise each contractor, service company and all others entering the site that Hydrogen Sulfide may be encountered and the potential hazards that may exist.
4. Will authorize the evacuation of local residents if Hydrogen Sulfide threatens their safety.
5. Will keep the number of persons on location to a minimum during hazardous operations.
6. Will assess the situation when alarm sounds, and issue work orders or, when conditions warrant, order all personnel to "Safe Briefing Areas".
7. Will direct corrective actions to control flow of gas.

8. Has full responsibility of the decision to ignite the well. The decision will be made only as a last resort.

Drilling Contractor

1. TOOLPUSHER will assume all responsibilities of the Al-Aquitaine Exploration Ltd's DRILLING FOREMAN in an emergency situation in the event the DRILLING FOREMAN becomes incapacitated.

2. TOOLPUSHER will order DRILLER to secure rig if the time permits.

3. DRILLER will secure rig in an emergency situation if time permits.

Temporary Service Personnel

All service personnel, such as cementing crews, logging crews, specialists, mechanics, and welders will furnish their own safety equipment as required to comply with OSHA and Al-Aquitaine Exploration, Ltd's regulations and procedures.

Visitors

1. VISITORS will be restricted, unless accompanied by the Al-Aquitaine Exploration, Ltd's DRILLING FOREMAN when Hydrogen Sulfide might be encountered.

2. VISITORS and non-essential personnel will be prohibited from remaining in or entering contaminated areas where the Hydrogen Sulfide concentration in the atmosphere exceeds 20 ppm.

NOTE: WHEN HYDROGEN SULFIDE MIGHT BE ENCOUNTERED NO PERSONNEL ON LOCATION WILL BE PERMITTED TO SLEEP IN VEHICLES.

i) Operations When Hydrogen Sulfide Gas Has Been Detected

1. At this time, the Al-Aquitaine Exploration, Ltd's DRILLING FOREMAN will assess the situation, outline a program of control and assign duties. His instructions will be followed carefully. Success depends on how quickly, thoroughly and effectively each man does his assigned duties.

2. When severity of the situation has been determined all personnel will be advised. If necessary, the DRILLING FOREMAN will place a guard at the entrance to the location to keep unauthorized personnel from entering the location.

3. Personnel will develop the practice of watching out for each other when emergency conditions exist. Where possible, work should be performed in pairs. When Hydrogen Sulfide emergency exists, personnel should use the "BUDDY SYSTEM" to prevent anyone from entering a contaminated area alone.

4. HYDROGEN SULFIDE GAS DISCIPLINE will be adhered to. When the "MASK ON" requirements exist, THERE ARE NO EXCEPTIONS.

5. Personnel will not remove breathing equipment until tests indicate that the atmosphere is safe to breathe and all clear is announced.

6. In the event of SUDDEN GAS RELEASE with no advance warning, personnel will be instructed to take the following general actions:

- Hold Breath (Do Not Breathe).
- Put On Protective Breathing Equipment.
- Help Any Person(s) In Distress.
- Proceed To The Designated Safe Briefing Area And Secure Instructions From Supervisor.
- DO NOT PANIC.
- If Conditions Warrant, Driller Will Secure Rig, Stop Motion Of Rig, And Close Blowout Preventers.
- Schooling And Instructions To All Personnel On Site Concerning Hydrogen Sulfide Safety Will Be Conducted

NOTE: PUT ON YOUR BREATHING EQUIPMENT BEFORE ATTEMPTING A RESCUE. YOU TOO, CAN BECOME A VICTIM.

j) Ignition of the Well

Responsibility

THE DECISION TO IGNITE THE WELL IS THE RESPONSIBILITY OF THE AL-AQUITAINE EXPLORATION, LTD'S DRILLING FOREMAN. In the event that he is incapacitated, it becomes the responsibility of the CONTRACT RIG SUPERINTENDENT.

1. The decision should be made only as a last resort and in a situation where it is clear that:

- Human life and property are endangered.
- There is no hope of controlling the blowout under the prevailing conditions at the well.

2. In all cases, an attempt should be made to notify the Aquitaine, Calgary office of the plans to ignite the well, if time permits. However, the FOREMAN must not delay his decision if human life is in danger.

Instructions For Igniting The Well

1. The primary method of igniting the well is a 25 mm flare gun with range of approximately 500 feet.
2. Always ignite the well from upwind and do not approach well any closer than is warranted.
3. Select a location that is clear and accessible for a hasty retreat and which provides maximum protection for the ignition team.
4. With the well ignited, remember that burned Hydrogen Sulfide is converted to Sulfur Dioxide, which is also toxic and poisonous. Do not assume the area is safe when the gas is being burned.
5. After the gas has been ignited, continue to observe the same emergency action and procedures as before. Continue to follow the instructions of the DRILLING FOREMAN.
6. All unassigned personnel will limit their actions to the directions of the AL-AQUITAINE EXPLORATION, LTD'S DRILLING FOREMAN.

Remember: AFTER WELL IS IGNITED, BURNING H₂S WILL CONVERT TO SO₂, WHICH IS ALSO HIGHLY TOXIC - DO NOT ASSUME THE AREA IS SAFE AFTER THE WELL IS IGNITED.

c) Uncontrolled Blowout and Contingency Plan

Uncontrolled blowout can occur as a result of the loss of control or means to shut-in a well if substantial flow of steam or fluid is encountered in the bore hole with sufficient pressure to temporarily render the blowout equipment ineffective or inoperative. When this occurs, the person in charge of the drilling operations will immediately notify the Al-Aquitaine Drilling Supervisor. If the flow cannot be contained, the Supervisor will take the following action:

1. Arrange for any injured persons to be dispatched to the nearest medical facility:

Churchill Public Hospital - 155 N Taylor, Fallon, Nevada
Phone (702) 423-3151

St. Mary's Hospital - 650 N Arlington, Reno, Nevada
Phone (702) 323-2041

Emergency Ambulance 911

If there is a threat to any local residents, the Sheriff should be notified as soon as possible:

Fallon Sheriff (702) 423-3116

2. Put into motion plans for containment or confinement of the flow.
3. See that all access roads are secured to prevent entry to the drillsite of unauthorized persons.
4. Report the situation to the Al-Aquitaine Drilling Superintendent, who will follow the same procedure as outlined in the Major Spill Contingency Plan.
5. Notify "Wild Well Control" specialists, if necessary, and apprise them of the problem.
8. Attempt to remove any damaged wellhead facility or blowout prevention equipment and install operable equipment.
9. If contractor's personnel is unable to contain flow, notify "Wild Well Control" specialists.
10. Maintain an inspection of the drillsite for any erosion that could undermine the rig structure.
11. After the flow has been contained, prepare to return the area as nearly as possible to its original contour, and reseed with approved vegetation.

Injuries

In the event of injuries that may occur, connected with this operation, Al-Aquitaine procedures will be followed, with specific and immediate attention given to proper air and/or transportation to a medical facility as required.

Refer to Emergency Phone Numbers, Emergency Personnel and Services.

Copies of accident reports from Al-Aquitaine and/or the contractor employing the injured individual will be submitted to the Nevada State Health Department, USGS and other organizations, as soon as possible.

d) Spill Program and Contingency Plans

Types of Potential Spills in Geothermal Drilling and Testing Operations

Drilling Fluids (Mud)

These are a mixture of water, chemicals, and solid particles used in drilling operations. Mud is pumped down the drill pipe, through the bit and carries drilled cuttings to the surface. The mud

is spilled into the sump, along with water used to wash down the rig floor, etc. The sump is designed to be large enough to contain all cuttings, mud and water that will accumulate during the drilling of the well. The sump is an earthen pit whose bottom is lined with Bentonite to prevent flooding from runoff water from a heavy rainstorm.

Although the danger is slight, a spill could occur by the sump overflowing, the wall breaking or through fluid seepage. Some mud is spilled onto the area immediately round the well bore during normal operations, but these volumes are small. A spill could occur if circulation were lost at a very shallow depth and mud channeled back to the surface.

Fuel Oil

Any spillage from fuel oil delivery trucks, fuel oil storage tanks or fuel lines would be extremely small.

Lubricating Oils and Other Petroleum Products

There is often some accumulation of lubricating oil associated with stationary engines and machinery at the drillsite. There may be some leakage from earth-moving equipment used to build the drillsites and access roads.

Possible Water Quality Affects

Condensate or Drilling Muds

1. Contaminate water possibly making it unsuitable for human or wildlife consumption.
2. Possible detrimental affect to flora of area.
3. Increase turbidity of water by particulates in fluid or by soil erosion.

Petroleum Products

1. Contaminate water.
2. Cover wildlife and plant life.

Plan for Clean-up and Abatement

In the event of discharges of condensate, drilling muds, petroleum products or construction debris, the overall contingency plan for the Gabbs Valley Area, Nye, Nevada, is as follows:

1. The person responsible for the operation will make an immediate investigation, then call the Al-Aquitaine Drilling Supervisor and advise him of the spill. The Al-Aquitaine Drilling Supervisor will, in turn, call out heavy equipment, regulate field operations, or do other work as applicable for control and clean-up of spill. If spill is small (i.e. less than 250 gallons) and easily containable without endangering watershed, the Al-Aquitaine Supervisor will direct and supervise complete clean-up and return to normal operations.

2. If spill is larger than 250 gallons, or is not easily contained, or endangers or has entered watershed, the Al-Aquitaine Drilling Supervisor will proceed to take necessary action to curtail, contain and clean-up spill, and notify personnel as follows:

- a) Call out heavy equipment, regulate field production, etc.
- b) Call for contract vacuum trucks or water pump trucks.
- c) Call Drilling Superintendent and advise of spill.

W.H. Sawotin: Office: (403) 267-9848
Residence: (403) 271-0980

The Drilling Superintendent Will:

1. Brief his immediate supervisor on the situation and course of action under way .

A.J. Brinker: Office: (403) 267-9860
Res: (403) 271-2793

2. Notify the following agencies or regulatory bodies as soon as practical, and work closely with them in all phases of operation:

United States Geological Survey
Reno, Nevada
(702) 784-5676

Bureau of Land Management
Carson City, Nevada
(702) 882-1631

Nevada State Fish and Game Department
Reno, Nevada
(702) 784-6214

- i) Reason for discharge or spillage
 - ii) Duration and volume of discharge
 - iii) Steps taken to correct problem
 - iv) Steps taken to prevent re-occurrence of problem
- e) Emergency Phone Numbers

AI-Aquitaine Personnel

Operations Manager: A.J. Brinker Office (403) 267-9860
Residence (403) 271-2793

Drilling Manager: W.H. Sawotin Office (403) 267-9848
Residence (403) 271-0980

Drilling Superintendent: R. Thomas Office (403) 267-9850
Residence (403) 281-5179

State and Federal Government Agencies

U.S.G.S. - Reno, Nevada (702) 784-5676
Menlo Park, California (415) 323-8111

B.L.M. - Carzen City, Nevada (702) 882-1631

Nevada Fish and Game Dept. - Reno, Nevada (702) 784-6214

Nevada State Forestry Division - Reno, Nevada (702) 329-4447

Emergency Fire Police, Ambulance

Emergency Fire - 911
Reno Fire Dept. - (702) 785-2345
Fallon Sherriff - (702) 423-3116
Highway Patrol - Zenith I - 2000
Police Dispatch and Emergency - (702) 423-2111
Churchill Public Hospital - (702) 323-2041
St. Mary's Hospital (Reno) - (702) 323-2041
Emergency Ambulance - 911

XII. RESERVOIR DATA, PRESSURE AND TEMPERATURE REPORTS

A record of the formations encountered, the thickness, lithologic characteristics and recorded temperatures, will be a part of the data gathering process along with the initial results of testing. All pressure data will be recorded, including the steam water ratio, surface pressures and temperatures. This data, along with the quantity and quality of the steam and effluent from the well bore, will be reported immediately to the Supervisor within thirty (30) days after a well is completed. The District Geothermal Supervisor will be notified of any cementing or testing operations in ample time to witness proposed operations, if he so desires.

Specific Procedures (if spill is larger than 250 gallons)

For Drilling Mud:

- a) Repair sump or contain with dikes.
- b) Haul pumpable liquid to another sump or to an approved disposal site and bury.

For Petroleum Products:

- a) Contain spill with available manpower.
- b) Use absorbents and dispose of same in county-approved area.

Have source of spill repaired at earliest practical time. Continue working crews, equipment and vacuum trucks on clean-up until all concerned agencies are satisfied.

3. Field personnel responsible for carrying out overall Contingency Plan:

- a) Drilling Contractor Tool Pusher
- b) Al-Aquitaine Company Drilling Supervisor
- c) Al-Aquitaine Exploration Field Supervisor
- d) Al-Aquitaine Drilling Superintendent
- e) Outside contractors for crews and equipment:

A & K Earthmovers Inc.
1200 Auction Rd.
Fallon, Nevada
(702) 423-6085

- f) Other available trucking and construction firms in the area, as required:

L.H. Brunuis Construction Co.
1815 Montello
Reno, Nevada
(702) 322-1069

Confirmation of Telephone Notification to Agencies and Regulatory Bodies

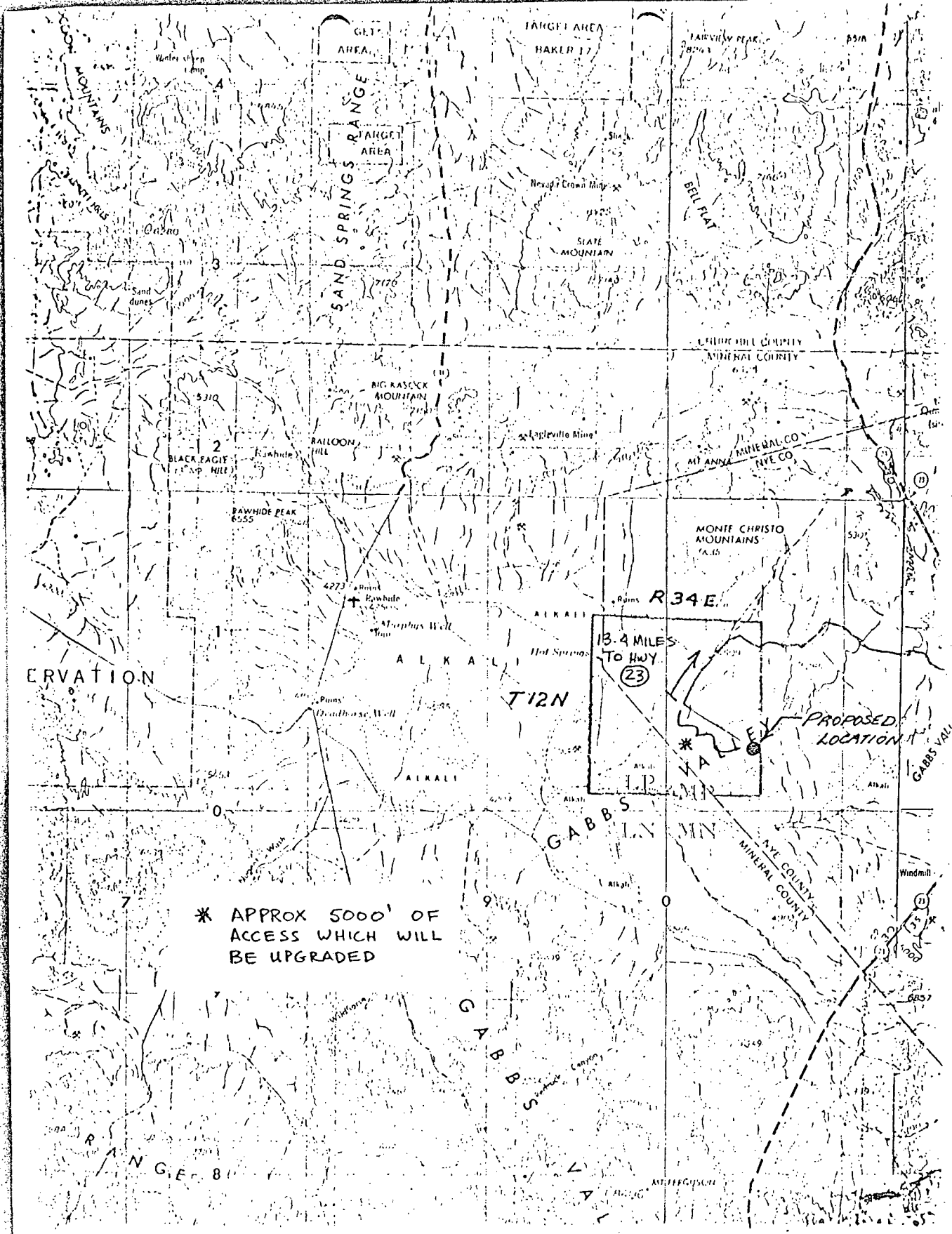
Telephone notification shall be confirmed by the Drilling Superintendent in writing within two(2) weeks of telephone notification, containing:

XIII. DATA GATHERING PROGRAM

In accordance with 30 CFR 270.34, a program of data gathering concerning the existing air and water quality, noise, seismic, and land subsidence activities, and ecological systems will be undertaken at least one year prior to the submission of any plan for production.

XIV. ABANDONMENT PROGRAM

After drilling and testing operations are concluded, and the well should prove uneconomically feasible to complete, a detailed Abandonment Program, in accordance with CFR 270.45, will be initiated. Any plan or program of abandonment will have demonstrated to the satisfaction of the Geothermal Area Supervisor that the well lacks productive capacity, and should be abandoned. Only then, with written consent from the Supervisor, will the Abandonment Program be completed.



ERVATION

* APPROX 5000' OF ACCESS WHICH WILL BE UPGRADED

13.4 MILES TO HWY. (23)

PROPOSED LOCATION

RANGE 8

GABBS

MINERAL COUNTY

Windmill

6857

6857

6857

6857

6857

6857

PETER BAWDEN DRILLING INC.INVENTORY RIG #2312,000' - 14,000' DIESEL ELECTRIC RIGDRAWWORKS

Emsco A800 WE double drum with automatic catheads, sand reel with 12,000' 9/16" sand line, Parkersburg 46" hydromatic brake, powered by a GE 752 integral mounted DC electric traction motor rated at 1000 H.P. intermittent.

MAST

133' Continental-Emsco type AB133 620,000 lbs. GNC. Base measurement 21'10" x 8'2". Crownblock model 44 Emsco, 7 sheaves 44" diameter grooved for 1 1/4" drilling line. Monkey board Continental-Emsco 8'9" H x 6'10" W x 16'5" L with steel windwalls.

SUBSTRUCTURE

Continental-Emsco 37'6" L x 28' W x 22' H. Each base width 7'6". Pony bases are 4' H x 39'7" L x 28' W; additional, if needed, 7' H x 39'7" L x 28'. Static rotary support (no set back) 450,000 lbs. set back capacity 250,000 lbs.

POWER PACKAGE

Three Caterpillar D 379 TA diesel electric sets with GE 752 DC generators, mounted in enclosed steel houses, with a complete AC and DC motor control center.

AUXILIARY POWER

Two GMC 12-V71 250 KW diesel electric generator sets.

MUD PUMP #1

Gardiner-Denver Model GXR 1000 HP duplex pump with Hydril pulsation dampener, powered by two Westinghouse 371 - 750 HP DC electric motors.

MUD PUMP #2

National Model K-700-A duplex with Hydril pulsation dampener powered by one Westinghouse 371 - 750 HP DC electric motor.

ROTARY TABLE

Oilwell 27 1/2" with pin drive bushing, oil bath, chain driven by drawworks.

RIG 23 INVENTORY
PAGE 2

TRAVELING EQUIPMENT

Blocks - Emsco Model RA 44/5 sheave grooved for 1 1/4" drilling line, rated at 350 tons, unitized to a Web Wilson Hydra Hook rated at 350 tons.

Swivel - Emsco L 300.

Links - 27 1/2" Varco Pin drive kelly bushing.

Kelly - 5" x 54' hex.

Weight Indicator - Martin Decker type D.

1 1/4" x 5000' 6 x 19 WRC drilling line.

9/16" x 12,000' sand line.

Steward & Stevenson Crown-o-matic.

BLOWOUT EQUIPMENT

12" 900 S - Shaffer double hydraulic gate

12" 900 S - GK Hydril

12" 900 S - Type D Drilling Spool

3" 900 S - Choke Manifold with two Shaffer adjustable chokes. Lower Kelly Cock, Upper Kelly Cock, floor safety valve, inside BOE. Hydril 80 gallons accumulator with Koomey 4 station remote controls.

MUD SYSTEM

Two 500 bbl circulating tanks with dual rumba shale shakers, Dahlory electric mud mixers, 12 cone Sweco desilter, three 6" x 8" Mission centrifugal pumps, complete low pressure mud system. A complete 1000 bbl active system.

WATER STORAGE

400 bbl rectangular tank with two mission shipping pumps.

CREW CHANGE HOUSE

Complete house with lockers, storage bins and electric heaters.

DRILLERS' HOUSE

25' x 7'6" x 7'8" steel construction, complete with knowledge box, work bench, lights, heaters, and storage shelves.

FUEL TANK

One 9500 gallon capacity, rectangular tank with fuel filter and transfer system.

DRILLING LINE

Edwards 1 1/4" x 5000'

RIG 23 INVENTORY
PAGE 3

PIPE RACKS

(3) three sets of 28' long A frame racks.

RIG SUPERINTENDENT TRAILER

One completely self-contained mobil unit.

AIR TUGGER

Ingersol Rand Model HV40 capacity 4000 lbs.

PIPE TONGS

Web Wilson AAX complete w/jaws.

DRILL PIPE

13,000' 5" Grade E Range 3 19^{50#} w/ 4 1/2" IF connections, 18 degree taper tooljoints.

DRILL COLLARS

18 - 7 1/2" / 7 3/4" x 2 13/16" x 30' steel w/ 6 5/8 reg. pin box connections.

SUBS

Miscellaneous subs for contractor drill string.

Rev. 01/16/79

PETER BAWDEN DRILLING INC.

— RIG 23 SPECIFICATIONS —

MAST:

133 Ft. Continental-Emsco, Type AB 133,
610,000 lbs. maximum rated static hook load.
Depth rating of 14,000 ft.

SUBSTRUCTURE:

Continental-Emsco, 33' - 6" x 28' x 10' high
with 4 ft. high pony subs. static rotary support
(no set back) 450,000 lbs. set back capacity -
250,000 lbs.

DRAWWORKS:

Continental-Emsco Model A-800, driven by one
G.E. 752 D.C. Motor with a Parkersburg 46"
hydromatic brake.

ROTARY:

Oilwell 27-1/2" chain driven by drawworks.

PRIME MOVERS:

3 - Caterpillar D379 engines with
G.E. 752 D.C. generators rated at 550 KW each.

AUXILIARY POWER:

2 - GMC 12V71 Engines with Bemac 250 KW
A.C. Generators.

PUMP NO. 1:

Gardner Denver GP-GXR-J, 1000 H.P., chain driven
by two Westinghouse 371 D.C. motors.

PUMP NO. 2:

National G700, 700 H.P., chain driven by one
Westinghouse 371 D.C. motor.

TRAVELING BLOCK:

Continental-Emsco 5 sheave 1-1/4" 44" dia., rated
at 350 tons.

HOOK:

Web Wilson Hydra Hook Model 2568939 rated at
350 tons.

SWIVEL:

Continental-Emsco L-300, rated at 300 tons.

L.P. MUD SYSTEM:

Mud Tank No. 1 - Capacity 500 Bbls. Equipped
with one dual rumba 4 x 5 shale shaker, one 15 H.P.
Dahlory mixer, one Seweco 12 cone desilter, and
one Mission 6 x 8R mixing pump.

Mud Tank No. 2 - Capacity 500 Bbls. Equipped
with one 10 H.P. and one 15 H.P. Dahlory mixers,
two 6 x 8R Mission mixing pumps and one mixing
hopper.

B.O.P. ACCUMULATOR UNIT:

Hydril Model 17K80, 40 Gal. charged capacity at
1500 P.S.I. W.P., with total reservoir capacity of 140
Gal. Koomey control manifold with four remote
control stations.

BLOWOUT PREVENTER:

1 - Hydril 12" - 900 Model GK.
1 - Shaffer double gate Type "B" 12" - 900 series
manual and hydraulic.

AIR SYSTEM:

2 - Ingersoll Rand Model 20-T2 electric air com-
pressors.
1 - Henderson Model HP-165A dessicant air dryer.

FUEL OIL TANK:

1 - Capacity 9500 Gal.

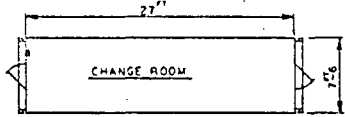
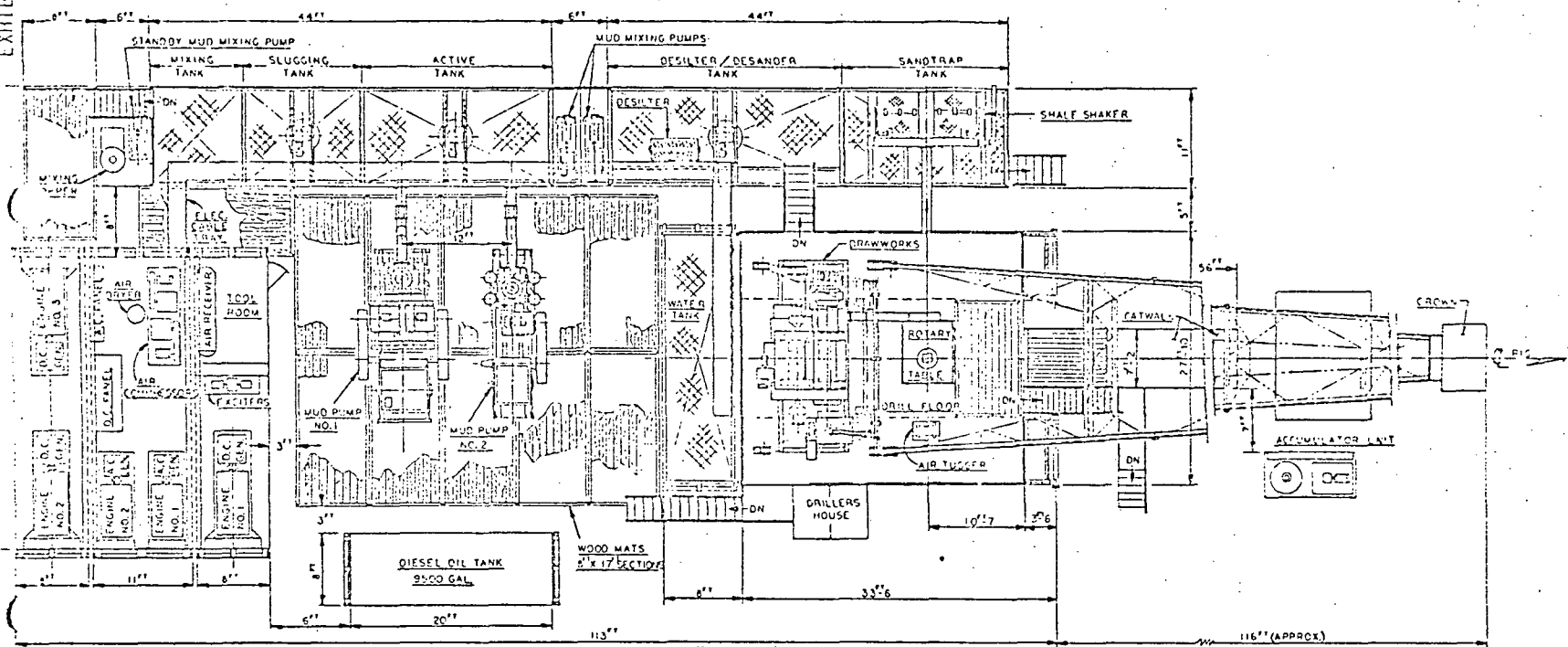
DRILL WATER TANK:


1 - Capacity of 250 Bbls.
2 - Mission 1-1/2 x 2P brake cooling pumps
mounted in pony subs.

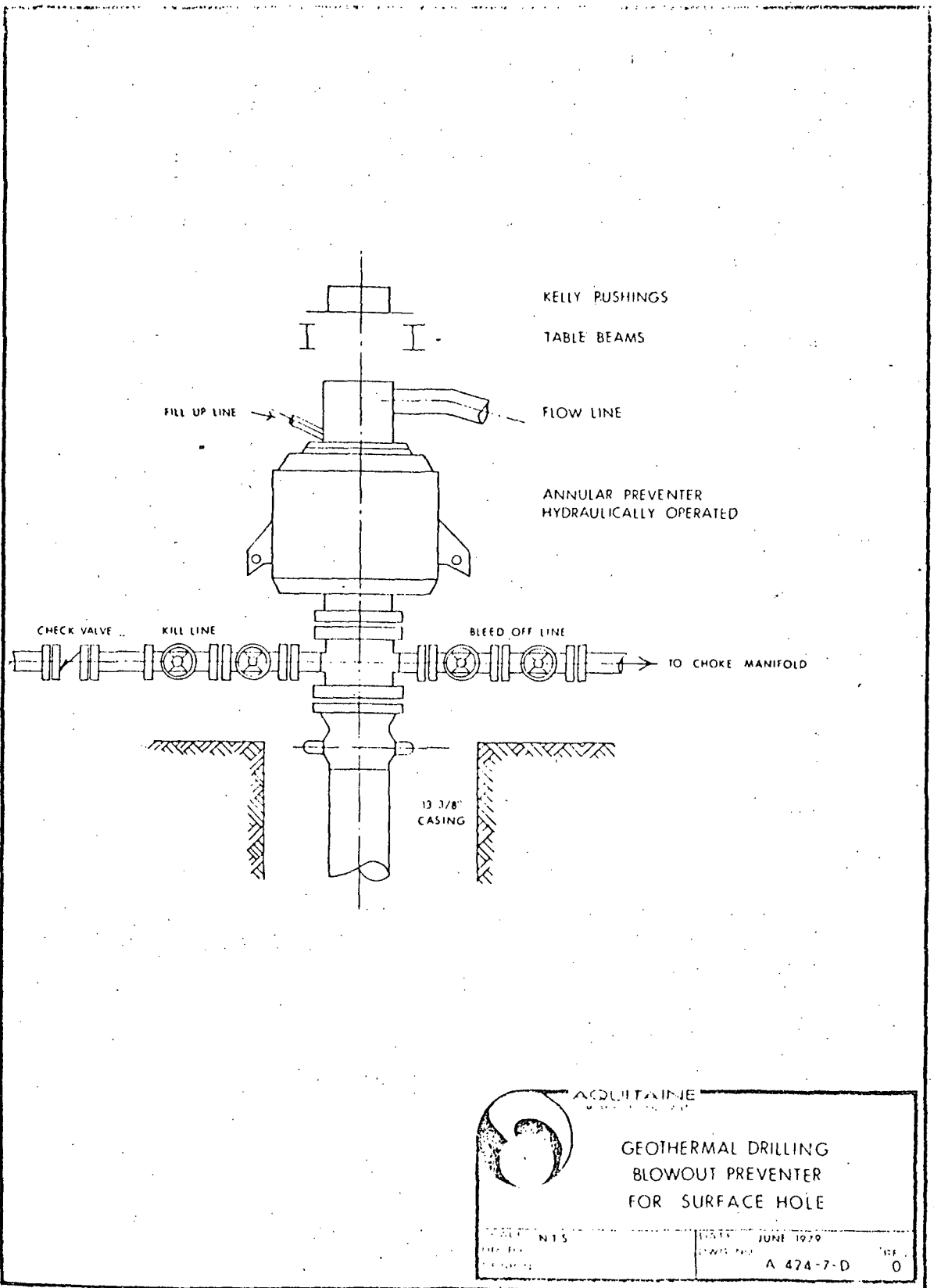
WASTE TANK:


1 - Capacity of 350 Bbls.

EXHIBIT C



PETER BAWDEN DRILLING INC.		RIG 23	
 ORANGE, CALIF. U.S.A.		GENERAL ARRANGEMENT	
		23-100	0

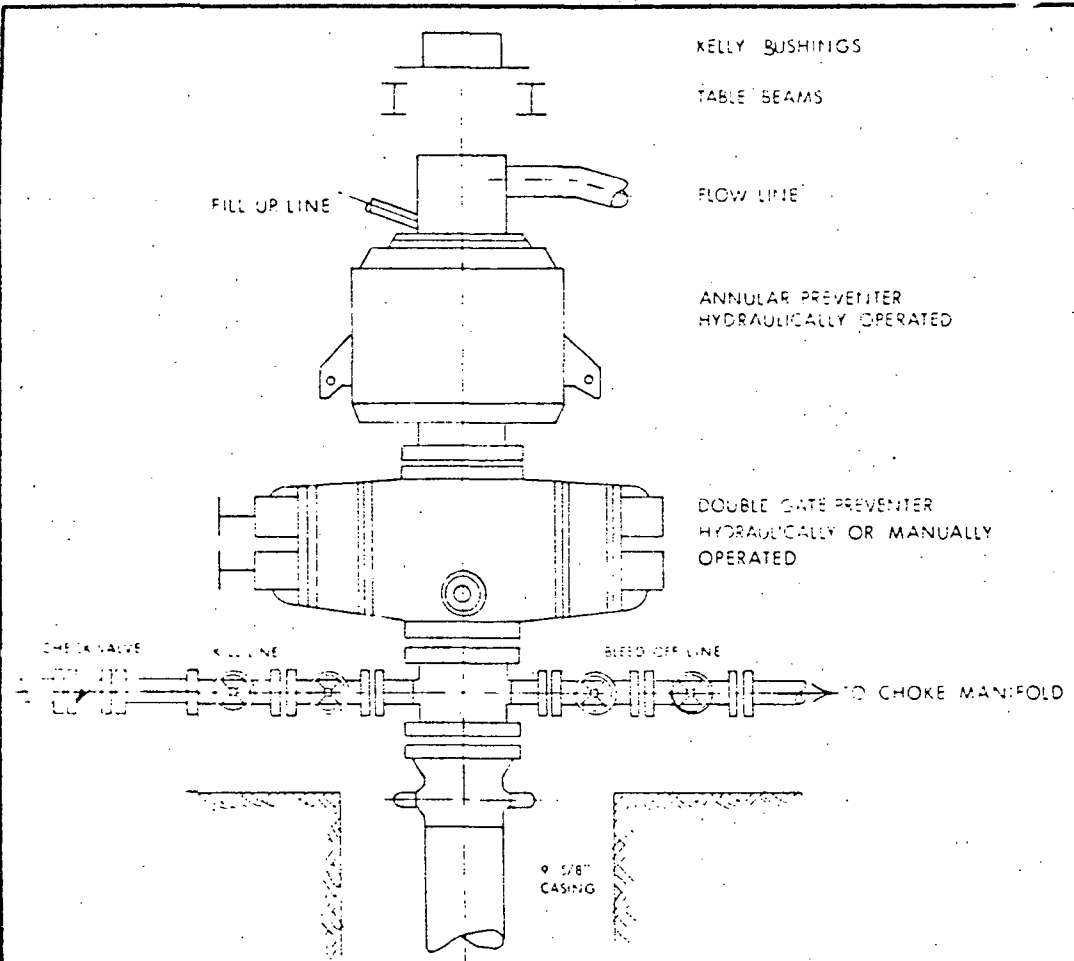


 **ACQUILINE**

**GEOHERMAL DRILLING
BLOWOUT PREVENTER
FOR SURFACE HOLE**

DATE: N 15	DATE: JUNE 1979	REF: 0
REV: 0	REV: 0	REV: 0
REV: 0	REV: 0	REV: 0

A 474-7-D



KELLY BUSHINGS

TABLE BEAMS

FILL UP LINE

FLOW LINE

ANNULAR PREVENTER
HYDRAULICALLY OPERATED

DOUBLE GATE PREVENTER
HYDRAULICALLY OR MANUALLY
OPERATED

CHECK VALVE

KILL LINE

BLEED OFF LINE

TO CHOKE MANIFOLD

9 5/8"
CASING



AQUITAINE

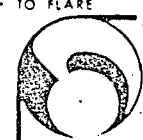
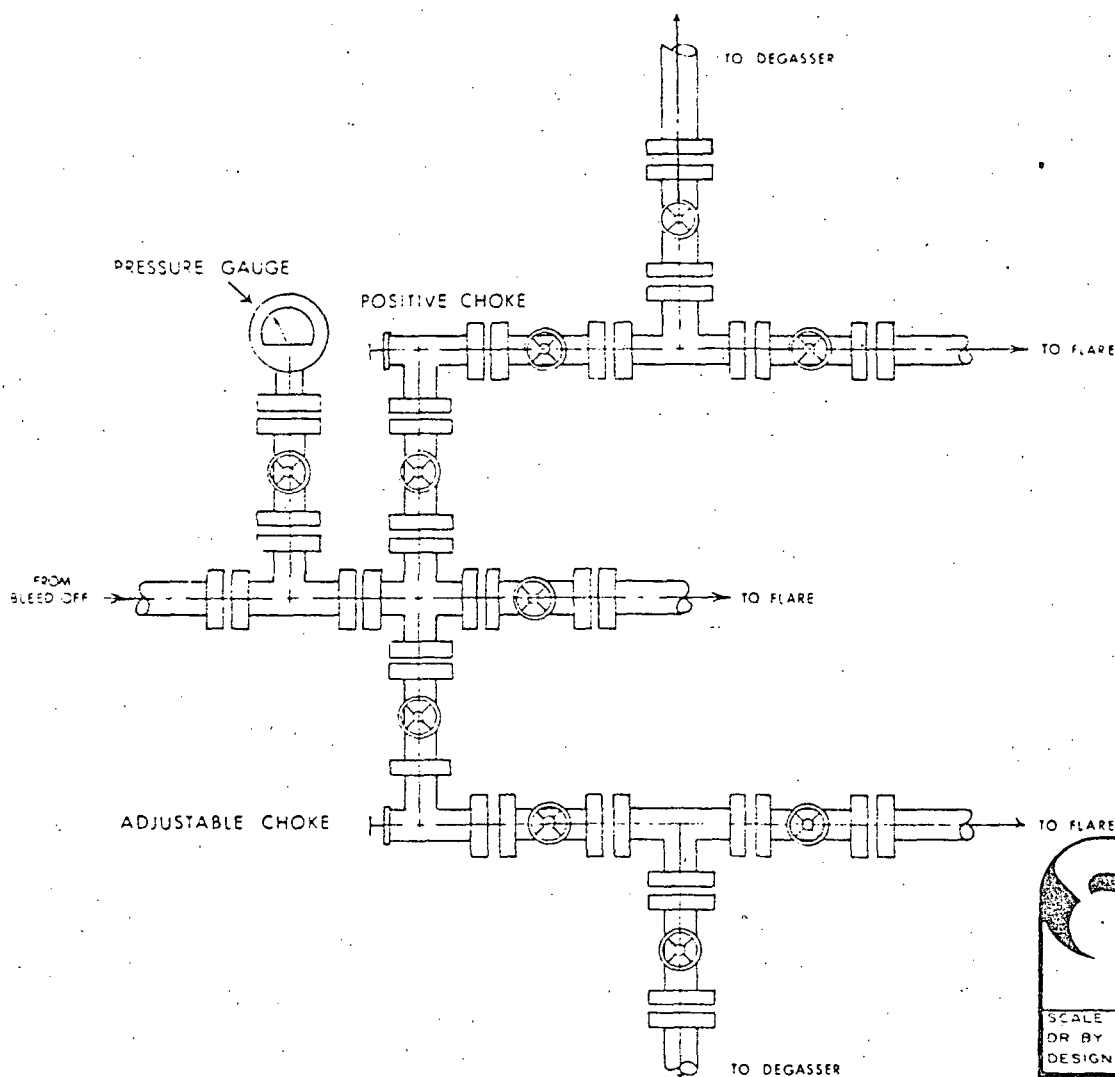
GEOTHERMAL DRILLING
BLOWOUT PREVENTER
FOR MAIN HOLE

SCALE N.T.S.
OR BY
DESIGN

DATE JUNE 1979
DWG NO. A-424-B-5

REV.
0

EQUIPMENT



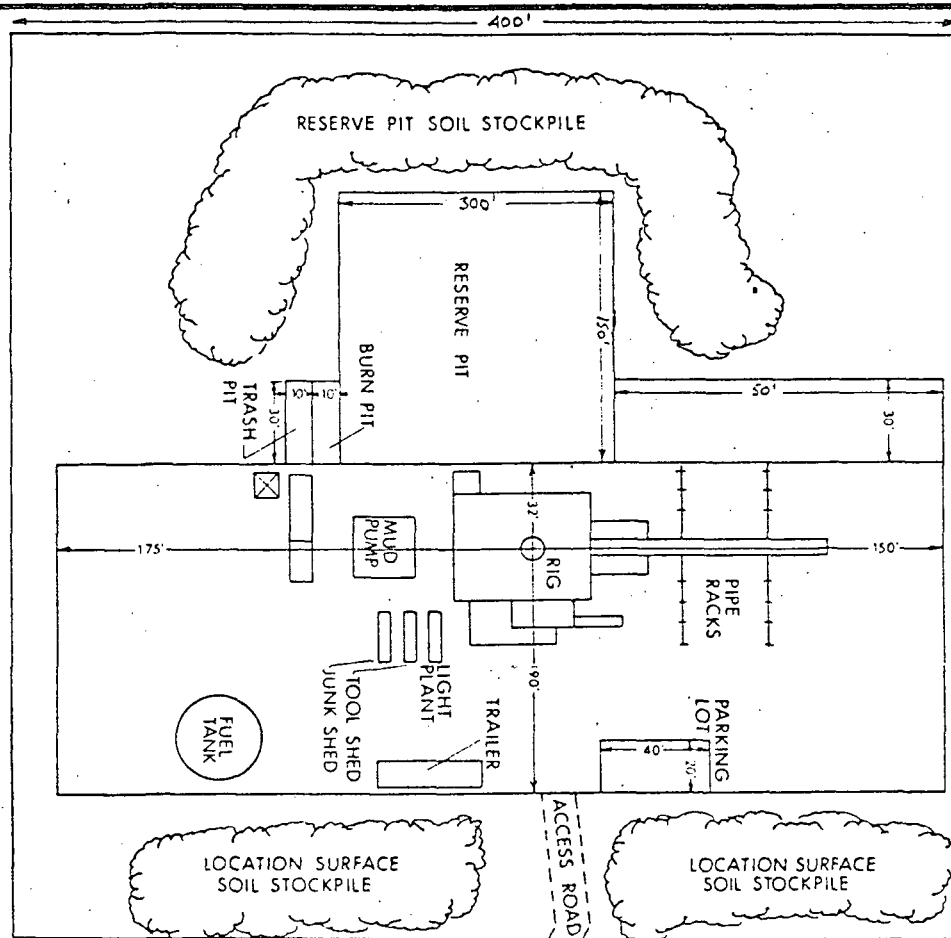
AQUITAINE
MARTELL & CO. LTD.

GEOTHERMAL DRILLING
CHOKE MANIFOLD
FOR SURFACE AND MAIN HOLES

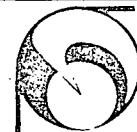
SCALE N.T.S.	DATE JUNE 1979	REV
DR BY	DWG NO. A-424-9-D	0
DESIGN		

EXHIBIT "F"

EXHIBIT "H"



400'
 STAKED LOCATION
 400' x 400'



AQUITAINE
 COMPANY OF CANADA LTD

PROPOSED GEOTHERMAL
 TEST WELL
 GENERAL SURFACE
 LOCATION LAYOUT

NOTE: ALL DIMENSIONS SHOWN ARE APPROXIMATE AND
 SUBJECT TO CHANGE DUE TO RIG REQUIREMENTS,
 LOCAL TOPOGRAPHY, AND SUPPLY REQUIREMENTS.

SCALE	N.T.S.	DATE	1979-07-17
DR. BY	J.W.	DWG. NO.	
DESIGN	P.H.	REV.	0

The Nevada State Museum

CARTER CAMPBELL
CARSON CITY, NEVADA 89701

Archaeological Services

Archaeological Resources Short ReportCounty: NyeADDENDUM to Nevada State Museum Short Report # 12-150, Contract #1113.
(Al Aquitaine Drill Location, Gabbs Valley, Dated: September
10, 1979)Project: Archaeological Reconnaissance of a Proposed Geothermal Drill
Location and Access Road in Gabbs Valley for Al. Aquitaine Explor-
ation Limited. (NSM Project # 12-150; Contract #1131)Project Director: Mary Rusco, Staff ArchaeologistReconnaissance Personnel: Bonita Brown, Archaeological TechnicianFederal Antiquities Permit: 77-Nv-097State Antiquities Permit: 177Date of Field Examination: February 1, 1980Date of Report: February 4, 1980Agency Notification: Brian Hatoff, Archaeologist for the Carson City
District Office, Bureau of Land Management. (January 28, 1980)Map Reference: BLM Planning Unit Map: Luning, (1:62,500); Nevada State
Highway Department Map: Quad 7-9 (1":4 miles) 1963-1971.Legal Description: T. 12 N., R. 34 E., Section 25. Access road traversing
NW 1/4; Drill Location. SW 1/4 of NE 1/4 section 25.Research Design: See previous NSM Report #12-150; 1113.Area and Environmental Setting: See previous NSM Report #12-150; 1113.Methods: Prior to the commencement of fieldwork, an extensive review of
site records, maps, area reports and archival literature was made.
The review aided predictions as to site locations and character.

Al Aquitaine Exploration in Gabbs Valley
NSM 12-150;1131
February 4, 1980
page 2

Field methods consisted of an intensive walking reconnaissance of the drill location (400'²; 14864 sq. meters) and access road (1.1 miles; 1.77km.)

The reconnaissance was conducted in a manner insuring total visual coverage, in transects of 10 meter intervals. Likely access routes approaching the drill location were surveyed to accomodate traversing the wash areas.

Previous Research: See previous NSM Report #12-150;1131.

National Register Properties: No properties currently listed on the National Register of Historic Places are situated on or near the subject area. (USDI 1979:7524)
No sites eligible for nomination to the National Register of Historic Places were found during the reconnaissance.

Results: No archaeological or historical values were found during the reconnaissance along the access road and at the drill location in Gabbs Valley.

Recommendations: It is expected that the Al Aquitaine Exploration, Limited drilling activities within the described areas will have no effect on surface historical or archaeological values.

note: If, during the construction of the road and drill pad, cultural materials are discovered, care should be exercised to leave them undisturbed and the following institutions should be promptly notified: the Nevada State Museum, Archaeological Services; the Nevada Division of Historic Preservation and Archaeology; and, the Bureau of Land Management, Carson District Office.

Acreage Surveyed: ca. 10 acres; 4.05 hectares

Submitted by: Bonita Brown
Bonita Brown, Archaeological Technician

Approved by: Mary Rusco Es
Mary Rusco, Project Director



The Nevada State Museum

CAPITOL COMPLEX
CARSON CITY, NEVADA 89710
Telephone (702) 881-4810

Archaeological Services

Archaeological Resources Short Report

County: Nye

Project: Archaeological reconnaissance at proposed drill location and access road in Gabbs Valley for Al Aquitaine Exploration Limited (NSM Project 12-150, Contract 1113).

Project Director: Mary Rusco, Staff Archaeologist

Field Personnel: Evelyn Seelinger, Archaeological Technician

Federal Antiquities Permit: 75-NV-078

State Antiquities Permit: 177

Date of Field Examination: August 24, 1979

Date of Report: September 10, 1979

Agency Notification: Brian Hatoff, Archaeologist for the Carson City District Office, Bureau of Land Management was notified of project completion August 29, 1979.

Map Reference: BLM Luning 30' Quad.

Legal Description: Access road across Sections 15,22,23,26 and 25 T12N, R34E.
Drill location in T12N, R34E, SE 1/4 of SW 1/4 of SW 1/4 of Section 25.

Research Design: Inventory and evaluation of archaeological and historic sites.

Methods: Prior to the commencement of fieldwork, a review of existing data was conducted to determine whether any archaeological or historical sites are known or might be expected for the area of the proposed drill location and access roads.

A map of the project area and detailed instructions for finding it were provided by the surveyor Lowell Emery. The portions of the access road across sections 15,22,23 and 26, where it is a two-track trail, were examined along both sides from a vehicle moving at a speed of less than 5 mph. The portion of the road across Section 25 to the drill location was inspected on foot. A roughly triangular area

Al Aquitaine Exp. Station in Gabbs Valley
NSM 12-150/1113
September 10, 1979
page 2

Methods (cont'd.): (indicated on attached map) between the drill location, the wash north and northwest of it and an existing trail was walked over in transects spaced at 20 to 30 meter intervals in order to insure coverage of all likely access routes nearest the drill location. Around the drill location an area measuring 100 meters on a side, with the site at its center, was inspected by walking transects spaced at intervals of 10 to 20 meters.

Approximately 3.9 acres were surveyed extensively (along roadside, from truck) and 10 acres were surveyed intensively.

Previous Research: Little is known of the archaeology in Gabbs Valley.

Bennett (1976:2) reported one site (26Mn152) during a survey of 28 drill locations. This is an open site ca. 1 mile SW of our subject area where possible quarry material was found washed down from a nearby ridge.

Dansie (1975:2) reported an extensive open site (26Ny537) and the remains of a possible burned shack 7 miles NW of the subject area during reconnaissance at 16 drill locations. Archaeological remains at site 26Ny537 include numerous concentrations of flaked and ground stone in sand dunes.

In the archaeological files at the Nevada State Museum (NSM n.d.), there is also the record of a stone circle associated with stone implements on a ridge tow (26Mn89) 6 miles west of the subject area.

Ethnographically, Gabbs Valley was considered part of the territory used primarily by a Northern Paiute band called Agaidokado, though it was probably also visited by bands of neighboring Paiutes and Shoshones (Stewart 1939: Map 1, 142).

Historic activities in central Gabbs Valley have centered around the mining districts of Eagleville and Rawhide during the early years of this century and the town of Gabbs since the early 1940's (Carlson 1974: 103, 117, 199).

Area and Environmental Setting: The subject area is in Gabbs Valley, roughly 10 miles west of the town of Gabbs. It is situated on gently west-southwest-aspected alluvial plain that is dissected by numerous dry washes and stream channels. Elevation is approximately 4600 feet A.S.L.

Soil: Silty sand intermixed with volcanic gravels.

Vegetation: Salt desert shrub community; flora observed include: Atriplex sp. (Shadscale); Dalea polyademia (desert indigo); Sarcobatus vermiculatus (greasewood); Tetradymia glabrata (littleleaf horsebrush).

Al Aquitaine Exploration in Gabbs Valley
NSM 12-150/1113
September 10, 1979
page 3

Area and Environmental Setting (cont'd.): Extensive patches of Oryzopsis hymenoides (Indian rice grass) cover the alluvial plain west and north of the drill hole.

Fauna: Fauna observed were Lepus californicus (jackrabbit) and unidentified birds.

Results of Reconnaissance: No archaeological or historic remains were found during reconnaissance along the access road and at the drill hole in Gabbs Valley.

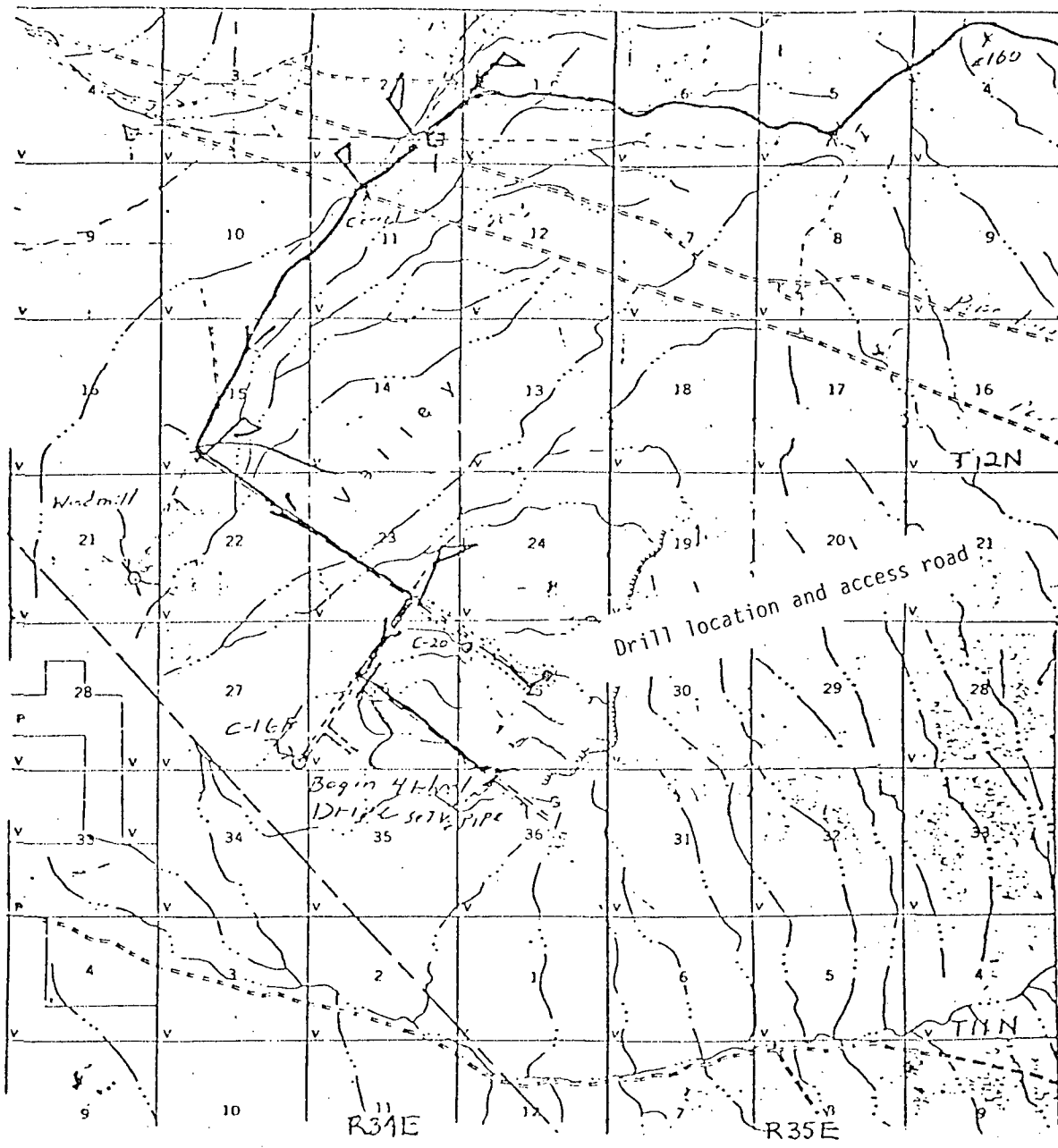
National Register Properties: No sites currently listed on the National Register of Historic Places are situated within the subject area (USDI 1979). During the course of this reconnaissance, no sites were found which might be considered eligible for inclusion on the National Register.

Summary and Recommendations: It is expected that the drilling project proposed by Al Aquitaine will have no effect on archaeological or historic values.

As a final note, it should be remembered that, even though this investigation was conducted in as thorough a manner as present techniques allow, sometimes important values may be overlooked or not recognized. If, during the course of drilling operations, notable antiquities are encountered, the Carson City District Bureau of Land Management and the Nevada Division of Historic Preservation and Archaeology should be notified immediately.

Submitted by: Evelyn Seelinger
Evelyn Seelinger, Archaeological Technician

Approved by: Mary Puzo
Mary Puzo, Staff Archaeologist



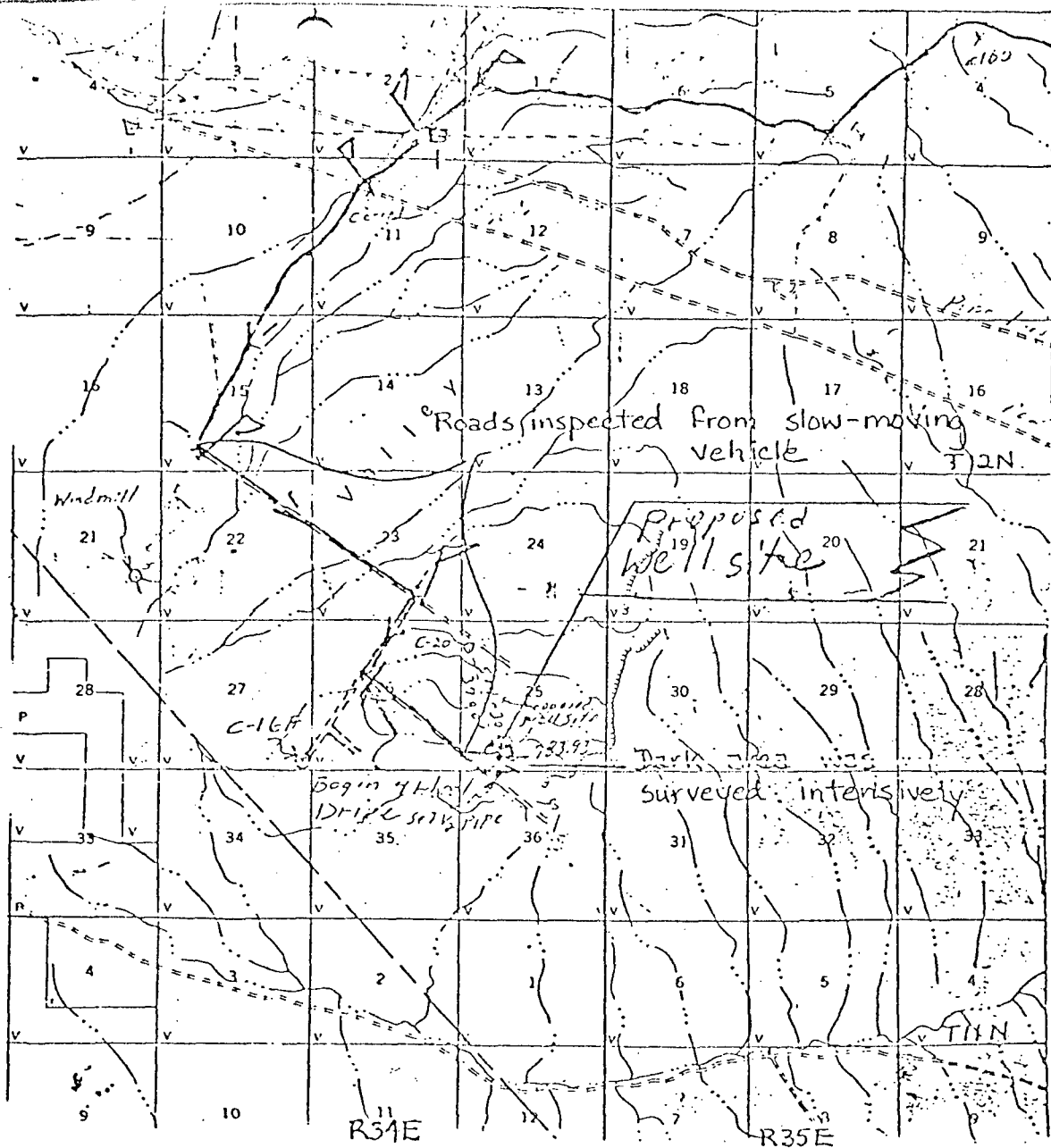
Location: Al Aquitaine Exploration Limited, geothermal drill site and access road--areas surveyed by the archaeological reconnaissance indicated by dotted(....) line.

Map: BLM Planning Unit, Lunning, 1:62,500

Al Aquitaine Exploration in Gabbs Valley
NSM 12-150/1113
September 10, 1979
page 4

BIBLIOGRAPHY

- Bennett, Reb
1976 Cultural resources report for geothermal resource exploration notices of intent AGS-40-N9012, NV-030-35. Nevada Bureau of Land Management Cultural Resources Report CR3-123(P). Photocopy of file at Nevada State Museum, Project 18-38.
- Carlson, Helen A.
1974 Nevada Place Names, A Geographical Dictionary. University of Nevada Press, Reno.
- Dansie, Amy
1975 Archaeological reconnaissance at 16 geothermal prospects in Gabbs Valley for Al Aquitaine. Ms. on file Nevada State Museum, Project 18-8.
- Nevada State Museum
n.d. Site Inventory Records. Central Archaeological Site Index for Nevada with Map Plot File.
- Stewart, Omer C.
1939 The Northern Paiute Bands. University of California Anthropological Records, Volume 2, Number 3. Berkeley.
- United States Department of the Interior (USDI)
1979 National Register of Historic Places. Federal Register, Vol. 44, No. 26. Heritage Conservation and Recreation Service. Washington, D.C.



AL-AQUITAINE DRILL LOCATION IN GABBS VALLEY (NSM Proj. 12-150)

Base map: BLM Luning 30' Quad

Scale: 1:62,500

Access roads and drill site are indicated above.