GW - 107

WORK PLANS

BURLINGTON
ENVIRONMENTAL

PROJECT WORK PLAN

JAL No. 4 FACILITY
LOCATED
NEAR JAL, NEW MEXICO

February 1995

EL PASO NATURAL GAS COMPANY
P.O. Box 1492
El Paso, Texas 79978

RECEIVED

FEB 24 1995

Environmental Bureau
Oil Conservation Division

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PROJECT WORK PLAN
Jal No. 4 Facility Located Near Jal, New Mexico

1.0 INTRODUCTION

El Paso Natural Gas Company (EPNG) hereby submits this work plan to the New Mexico Oil Conservation Division (OCD) for the groundwater extraction, investigation, and monitoring project at the Jal No. 4 Plant located approximately 10 miles north of Jal, New Mexico.

In 1989, EPNG detected a leak in the liner of a water-storage pond associated with the Jal No. 4 facility. The release consisted of high salinity water (brine) produced by the facility. At the request of the OCD, EPNG initiated a subsurface investigation of the leak in 1989. In response to this request, EPNG hired K.W. Brown & Associates, Inc. to perform a two-phased hydrogeologic study of the release. Based upon the results of these studies, a potential for off-site contamination was established; therefore, the OCD requested that EPNG further evaluate the potential vertical and horizontal extent of the contaminant plume. EPNG contracted Burlington Environmental Inc. (Burlington) to further evaluate and remediate the contaminant plume.

The five reports which have been prepared since the leak was discovered are:

- Expanded Hydrogeology Study for the El Paso Natural Gas Company Jal 4 Facility (K.W. Brown & Associates, Inc., 1990);
- Expanded Hydrogeology Study for the El Paso Natural Gas Company Jal 4 Facility: Phase II (K.W. Brown & Associates, Inc., 1991);
- Terrain Conductivity Survey Report (Burlington Environmental Inc., 1992);
- Phase III Groundwater Study EPNG Jal No. 4 Plant (Burlington Environmental Inc., 1992); and
- Phase IV Groundwater Study EPNG Jal No. 4 Plant (Burlington Environmental Inc., 1993).

According to K. W. Brown (1990), the principle water-bearing unit at the site is the Tertiary Ogallala Formation. The Ogallala unconformably overlies water-bearing red-bed sediments of the Dockum Group of the Triassic Chinle Formation. Groundwater at the site is unconfined. Locally, the saturated thickness of the Ogallala is approximately 60 feet and the potentiometric surface ranges from approximately 100 feet to 110 feet below surface. Based on January 1993 data, the groundwater gradient is approximately 0.0025 ft/ft with a southeasterly flow direction.

In a January 12, 1995, letter, the OCD requested that EPNG prepare a work plan to initiate recovery of contaminated groundwater as soon as possible, to install two additional monitoring wells, and to initiate quarterly groundwater quality monitoring at the site.

2.0 WORK PLAN

EPNG proposes the following work plan.

2.1 Project Set-up

Work schedules and coordination between Christie Gas, EPNG, and Burlington will be determined by EPNG. Burlington will be the contractor performing the field work and Scarborough Drilling has been subcontracted to install the monitoring wells and groundwater pumping equipment.

2.2 Site Work

Field work for this project will include installation of a groundwater extraction and injection system, monitoring well installation, and groundwater sampling. Other tasks include chemical analyses, design of the groundwater extraction and injection system, evaluation of the data gathered, and reporting of the results.

2.2.1 Initial Recovery of Contaminated Groundwater

Groundwater recovery will begin from Monitoring Well ACW-4 using a 3/4 horsepower submersible pump capable of pumping up to 10 gallons per minute. The water will be disposed of through a permitted injection well located approximately 600 feet north of Monitoring Well ENSR-1. The system will extract groundwater from ACW-4 and transport the water to the holding tank for the injection well, SWD Well No. 1. The system will include high-level shut-off controls at the holding tank to safeguard against overfilling the tank.

After the latest groundwater sampling data has been reviewed, an additional downgradient perimeter well will also be selected for groundwater recovery. This well will be selected based on chloride content and location on the leading edge of the plume.

2.2.2 Installation of Downgradient Monitoring Wells

Burlington will supervise the installation of two new monitoring wells using mud rotary methods southeast of existing monitoring wells ACW-10 and ACW-5. The placement of the wells is based on recent sample data obtained by EPNG, groundwater elevations, and groundwater gradient. Based on these factors, Burlington estimates that the proposed well locations will be outside of the contaminant plume.

To assess the vertical distribution of contamination, one well will be designed and installed to intercept the top of the saturated zone, with 15 to 20 feet of screen submerged. The second well will be designed and installed to collect groundwater samples at the red bed-Ogallala aquifer contact. This monitoring well will be installed at the red bed-Ogallala contact and screened 10 feet into the Ogallala.

Both wells will be constructed of 4-inch-diameter, Schedule 40 PVC with 0.010-inch slotted screen. The screened interval will be packed with 10/20 silica sand to 3 feet above the top of the screen. A 2-foot-thick bentonite seal will be placed above the

sand pack and the remaining annulus will be grouted to the surface with a cement-bentonite slurry. The wells will be completed with a 3 foot by 3 foot cement pad and lockable above-grade protection.

Following installation, the wells will be purged of a minimum of five casing volumes of groundwater and the water will be monitored during purging for temperature, pH, and conductivity until stable prior to sampling the groundwater. Samples will be obtained using a 2-inch submersible pump in the screened interval or disposable polyethylene bailers.

Target analytes for laboratory analysis include benzene, toluene, ethylbenzene, and xylenes by United States Environmental Protection Agency (USEPA) Method 8020, major cations and anions including total dissolved solids (TDS), and conductivity.

2.2.3 Groundwater Monitoring Program

Based on the January 12, 1995, letter from the OCD, groundwater samples will be collected on a quarterly basis from monitoring wells ACW-5, ACW-6, ACW-9, ACW-10, and the two new downgradient monitoring wells. The water samples will be analyzed for BTEX and major cations and anions using appropriate EPA-approved methods. In conjunction with quarterly groundwater sampling, groundwater elevations will be taken at all monitoring well locations.

2.3 Project Reporting

EPNG will submit quarterly reports to the OCD on April 1, July 1, October 1, and January 1 of each year. Each quarterly report will include the following:

- a table summarizing the present and past analytical results from the wells sampled during the quarter;
- a table showing past and present groundwater elevations for all the wells on the site; and
- a potentiometric surface map showing groundwater elevations and hydraulic gradient.

After two consecutive quarters of groundwater extraction, an evaluation of the remediation activities will be presented. The evaluation will include pump flow rates, estimates of total fluids pumped, groundwater monitoring data, and remediation progress.

It should be noted that first-quarter groundwater sampling was completed in January 1995 and will be incorporated in the first report due on April 1, 1995.

3.0 QUALITY ASSURANCE/QUALITY CONTROL

3.1 Collection of Samples

EPNG or its contractor will follow the sampling protocols and procedures as outlined in United States Environmental Protection Agency (USEPA) Test Methods for Evaluating Solid Waste (SW-846). Quality Assurance/Quality Control (QA/QC) procedures will be maintained so that the water samples collected and analyzed provide accurate and reliable information. QA/QC procedures for the project will include the use of the following items to prevent cross contamination between the samples:

- a decontaminated submersible pump for each sampling location purged;
- disposable latex gloves when collecting and handling the groundwater samples; and
- disposable polyethylene bailers or a decontaminated submersible pump when collecting the groundwater samples.

Field QA/QC procedures will consist of collecting a duplicate sample and an equipment rinsate blank at a frequency of 5 percent of the samples collected in the field or one of each per sampling event. In addition, a trip blank will be analyzed for BTEX.

3.2 Sample Identification and Control

All samples will be identified by a unique numbering system. The sample number will be referenced to the unique monitoring well name.

Sample Labeling

A sample identification code will be used to identify each sample on the chain-of-custody form. The sampler is responsible for verifying that each sample is put in the appropriate sample container. At the time of sampling, this person must fill in the time sampled, the date sampled, sign and complete the sample labels, and affix to the container jar. The label will then be covered by clear tape to protect the label.

Sample Control

Strict chain-of-custody procedures will be followed. Sample containers and coolers for shipping, supplied by the laboratory, will be used to store all samples. The samples will be under the direct observation of EPNG or its contractor's personnel at all times or secured with custody seals to detect tampering. All samples will be preserved on ice or blue ice packs immediately after collection. The water samples will be shipped directly from the field to the laboratory accompanied by the chain-of-custody forms.

3.3 Analytical Methods

The samples will be analyzed for the following constituents:

- benzene, toluene, ethylbenzene, and total xylenes (USEPA Method 8020);
- inorganic chloride;
- total dissolved solids (TDS);
- electrical conductivity;
- sulfate;
- pH;
- potassium;
- sodium;
- calcium;
- hardness ;
- alkalinity; and
- magnesium.

3.4 Cross-Contamination Controls

All drilling and sampling tools will be decontaminated before and after each use to prevent cross-contamination. The decontamination procedure for sampling equipment will consist of cleaning with a brush and Alconox™ solution followed by a potable water rinse and a distilled-water rinse. Drilling equipment will be steam cleaned. All equipment will be decontaminated prior to use and before removal from each location. Decontamination water and drill cuttings will be disposed of on-site.

3.5 Documentation of Sampling Activities

All information pertinent to field work will be recorded in a field logbook during performance of that activity. The field logbook will be a bound book that has consecutively numbered pages. Information pertinent to the work performed will be recorded in the field logbook and on field forms for sampling events and daily activities. Entries in the field logbook will contain three basic categories of information including, but not limited to:

- site activities;
- photo/survey data; and
- sampling data.

Site activity entries will be completed daily to record all relevant site investigation information. The photograph/survey and sampling logs will be completed on an "as performed" basis.

The field logbook will be kept throughout the field sampling operations to document relevant information concerning sample generation, preparation and field data. All sampling activities and data will be recorded on specified forms.

A record of each sample collected will be kept on a chain-of-custody form. The chain-of-custody form will provide an accurate written record which can be used to trace the custody of samples from the time of collection through data analysis and reporting. The sampler will complete a chain-of-custody form for samples collected each day. The following will be specified for each sample:

- sample number;
- sample date;
- sample time;
- sampler's name;
- preservatives (if applicable);
- analysis requested; and
- comments.

Field documentation will include well installation reports, groundwater sampling forms, well purging and development forms, photographs, lithologic logs, field logbook, chain-of-custody forms, and the quarterly groundwater sampling reports. The Project Manager will submit a report to EPNG following completion of each field work phase.

4.0 HEALTH AND SAFETY PLAN

The existing site-specific Health and Safety Plan will be used for this project. This plan was prepared in compliance with 29 CFR 1910 and provides for the protection of personnel in the field. Prior to initiating field work each morning, there will be a "tailgate" safety meeting to discuss safety issues. All personnel involved with the field operations will attend.

elpaso

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JUN 16 2003

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Via Federal Express

June 13, 2003

Mr. William C. Olson
New Mexico Oil Conservation Division
1220 St. Francis Dr.
Santa Fe, NM 87504

RE: Work Plan for Installation of Recovery Well RW-3, Jal No. 4 Gas Plant, Lea County, New Mexico

Dear Mr. Olson:

El Paso Natural Gas Company (EPNG) hereby submits the enclosed "Work Plan for Installation of Recovery Well RW-3, Jal No. 4 Gas Plant, Lea County, New Mexico". The enclosed work plan details, location, installation and construction of the proposed recovery well RW-3. As you are aware we are currently negotiating disposal access to the on site disposal well. Once New Mexico Oil Conservation Division approval of the enclosed work plan is granted and disposal of the pumped liquids is secured we will begin the permitting process through the New Mexico State Engineers Office.

If you have any questions concerning the enclosed work plan, please call me (505) 599-2124 or Buddy Richardson at (918) 492-1600.

Sincerely,

Scott T. Pope P.G.
Senior Environmental Scientist

xc: Mr. Chris Williams, NMOCD, Hobbs - w / enclosures; **Via Federal Express**
Mr. Darrell Campbell, EPNG - w / enclosures
Mr. Buddy Richardson, ABI - w / enclosures
Mr. Ed Nichols, EPNG – ROW - w / o enclosures
Jal 4 file - w / enclosures

Atkins Environmental
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Tulsa, OK 74103

Telephone 918.492.1600
Fax 918.496.0132

info@atkinsamericas.com
www.atkinsamericas.com

June 13, 2003

Mr. Scott T. Pope, P.G.
Senior Environmental Scientist
El Paso Natural Gas Company
614 Reilly Avenue
Farmington, New Mexico 87401

Re: Work Plan for Installation of Recovery Well RW-3
Jal No. 4 Gas Plant
Lea County, New Mexico

Dear Mr. Pope:

As per request, Atkins Americas, Inc. (Atkins) is pleased to submit to El Paso Natural Gas Company (EPNG) the following Work Plan to install recovery well RW-3 on the Jal No. 4 Gas Plant property located in Lea County, New Mexico (Plant). The purpose for installing this well is to increase the number of groundwater recovery wells from 3 to 4. Presently groundwater is actively pumped from recovery wells RW-1 and RW-2, as well as converted monitoring well ENSR-2. The groundwater removed from these wells is disposed into the Shell State No. 13 saltwater disposal well located immediately north of the Plant. The Plant and this disposal well are currently owned and operated by Texas LPG Storage Company. The objective of EPNG's groundwater recovery system is to remove groundwater that has been impacted by brine and petroleum hydrocarbon. Computer modeling, previously performed by Atkins, has indicated that the installation of recovery well RW-3 will improve the hydraulic capture of the impacted groundwater and will accelerate the removal of contaminant load. The following sections describe in detail the activities to be performed during the installation of this recovery well.

Well Location

Recovery well RW-3 will be installed at the location shown on attached Figure 1. On this figure, the location of RW-3 is shown in conjunction with the calibrated steady-state simulation of the groundwater potentiometric surface of the affected aquifer. Also shown is the general groundwater flow direction across the area of impact. On Figure 12 the location of the proposed recovery well is again shown in conjunction with the chloride concentrations in groundwater. As is shown, this well will be located adjacent to existing groundwater monitoring well ACW-8 in an area where the concentrations of chloride in groundwater are the highest.

Drilling and Construction

A construction diagram for the proposed recovery well is provided on Figure 3. Water rotary drilling methods will be used to drill the borehole to a total depth of approximately 180 feet below ground level (BGL). This depth is the approximate base of the affected aquifer. Circulated drill cuttings will be collected on 5-foot depth intervals and will be described by an on-site hydrogeologist. Lithologic descriptions and observations made throughout the drilling and well installation activities will be documented on a boring record and well construction diagram.

Groundwater saturation is expected in the RW-3 borehole at a depth of approximately 102 feet BGL. The borehole will be 12-¼ inches in diameter from surface to total depth. The recovery well will be constructed with 8-inch diameter Schedule 80 PVC casing and screen. The screened interval will extend from approximately 140 to 180 feet BGL (40-foot screened interval). The well will be constructed with 35-slot screens. The casing will extend from 2 feet above ground level to 140 feet BGL.

The screen/casing-borehole annulus will be completed as follows: 8/16 mesh inert filter pack material (sand/gravel) will be gravity placed from total depth to 5 feet above the top slot (135 feet BGL), a 5-foot thick bentonite seal will be gravity placed from 130 to 135 feet BGL, and a cement-bentonite grout will be tremie circulated from 130 feet BGL to the ground surface. A lockable 10-inch diameter steel protector will be cemented into place from 2 feet above ground level to 4 feet BGL. A concrete pad 4 feet by 4 feet by 6-inches thick will be formed around the well casing and protector. Protective steel posts (4) and rails will be placed immediately around the concrete pad and will be painted with a color that has high visibility.

Development

Following the well installation, the well will be developed by first bailing and then by pumping. Development will continue until the production of formation fines has been eliminated and the pH and specific conductance have stabilized. At a minimum, 4 borehole volumes plus twice the volume of water lost to the formation during drilling will be removed during development.

Pump Installation

A 4½-inch diameter stainless steel electric submersible pump will be installed inside the casing at a depth of approximately 175 feet BGL. A 1¼-inch diameter PVC discharge pipe will extend from the pump to 2½ feet above ground level. A 1-inch diameter PVC pipe will be installed from 2 feet above ground level to approximately 175 feet BGL and will be used for measuring groundwater levels. A ⅜-inch diameter polyethylene tube will be banded to the discharge pipe along with the electrical cable. The discharge pipe will be connected to the subgrade disposal pipeline for disposal into the Shell State No. 13 disposal well.

Disposal of Derived Wastes

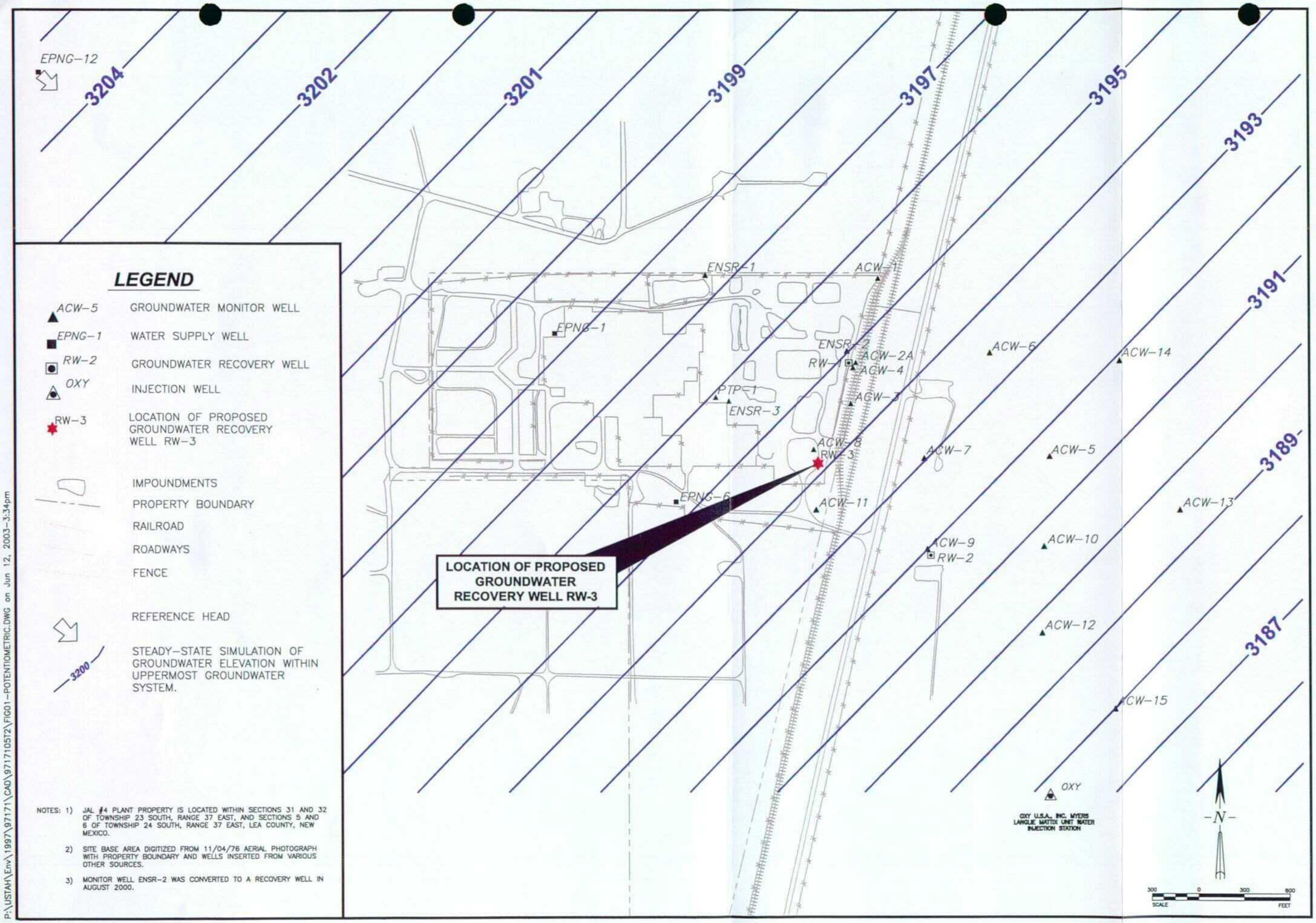
Drill cuttings and fluids (water) will be contained in a steel mud pit during active drilling operations. Following the well completion, the drill cuttings will be placed onto and covered with sheet plastic next to the wellhead pending the results of a chemical analysis of the cuttings (BTEX, TPH and electrical conductance). Based upon the results of these chemical analyses, the cuttings will either be spread on-site or disposed off-site at a properly permitted disposal facility. Fluids will be transferred to the Plant's surface impoundments and will not require chemical analysis.

If you have any questions regarding the above work scope, please do not hesitate to contact me at (918) 492-1600. As always we appreciate this opportunity to be of continued service to EPNG.

Sincerely,
Atkins Americas, Inc.

George H. Richardson, P.G.
Senior Project Manager

GHR/me



LEGEND

- ACW-5 — GROUNDWATER MONITOR WELL
- EPNG-1 — WATER SUPPLY WELL
- RW-2 — GROUNDWATER RECOVERY WELL
- OXY — INJECTION WELL
- RW-3 — LOCATION OF PROPOSED GROUNDWATER RECOVERY WELL RW-3
- IMPOUNDMENTS
- PROPERTY BOUNDARY
- RAILROAD
- ROADWAYS
- FENCE
- REFERENCE HEAD
- 3200 — STEADY-STATE SIMULATION OF GROUNDWATER ELEVATION WITHIN UPPERMOST GROUNDWATER SYSTEM.

NOTES:
1) JAL #4 PLANT PROPERTY IS LOCATED WITHIN SECTIONS 31 AND 32 OF TOWNSHIP 23 SOUTH, RANGE 37 EAST, AND SECTIONS 5 AND 6 OF TOWNSHIP 24 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO.
2) SITE BASE AREA DIGITIZED FROM 11/04/76 AERIAL PHOTOGRAPH WITH PROPERTY BOUNDARY AND WELLS INSERTED FROM VARIOUS OTHER SOURCES.
3) MONITOR WELL ENSR-2 WAS CONVERTED TO A RECOVERY WELL IN AUGUST 2000.

ATKINS

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FIGURE TITLE	LOCATION OF PROPOSED GROUNDWATER RECOVERY WELL RW-3 SHOWN WITH CALIBRATED STEADY-STATE SIMULATION OF POTENTIOMETRIC SURFACE
DOCUMENT TITLE	WORK PLAN FOR INSTALLATION OF RECOVERY WELL RW-3
CLIENT	EL PASO NATURAL GAS COMPANY
LOCATION	JAL #4 PLANT LEA COUNTY, NEW MEXICO

DATE	6/13/03
SCALE	1"=600'
DESIGNED BY	GHR
APPROVED BY	GHR
DRAWN BY	SKG

PROJECT NUMBER
9717105 P2
FIGURE NUMBER
1

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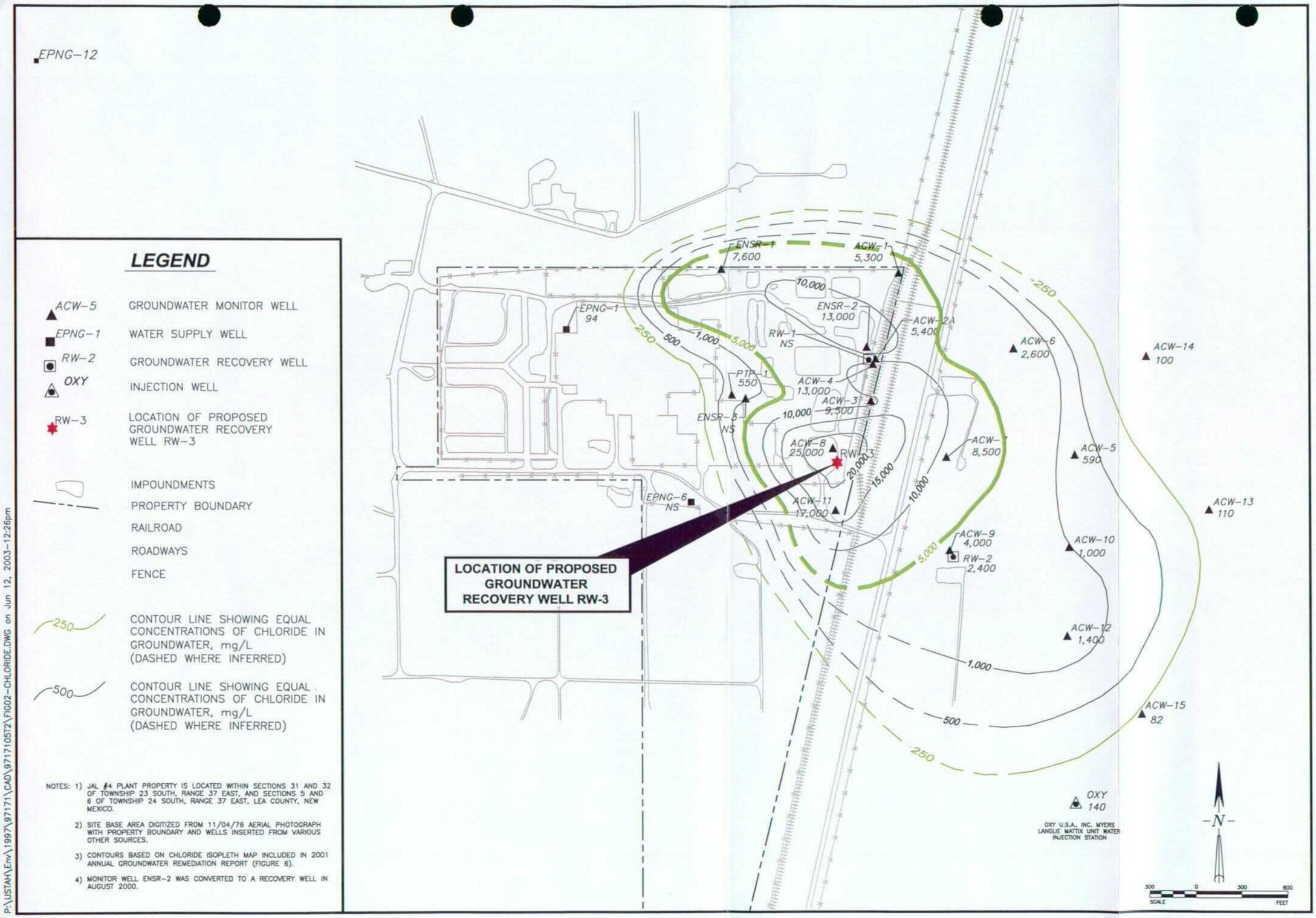

P:\USTAH\Env\1997\97171\CAD\9717105T2\FIG02-CHLORIDE.DWG on Jun 12, 2003-12:26pm

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FIGURE TITLE	LOCATION OF PROPOSED GROUNDWATER RECOVERY WELL RW-3 SHOWN WITH APPROXIMATE AREA OF CHLORIDE IMPACTED GROUNDWATER
DOCUMENT TITLE	WORK PLAN FOR INSTALLATION OF RECOVERY WELL RW-3
CLIENT	EL PASO NATURAL GAS COMPANY
LOCATION	JAL #4 PLANT LEA COUNTY, NEW MEXICO

DATE	6/13/03
SCALE	1"=660'
DESIGNED BY	BEM
APPROVED BY	GHR
DRAWN BY	SKG

PROJECT NUMBER
9717105 P2
FIGURE NUMBER
2

CONSTRUCTION DETAIL FOR PROPOSED RECOVERY WELL RW-3

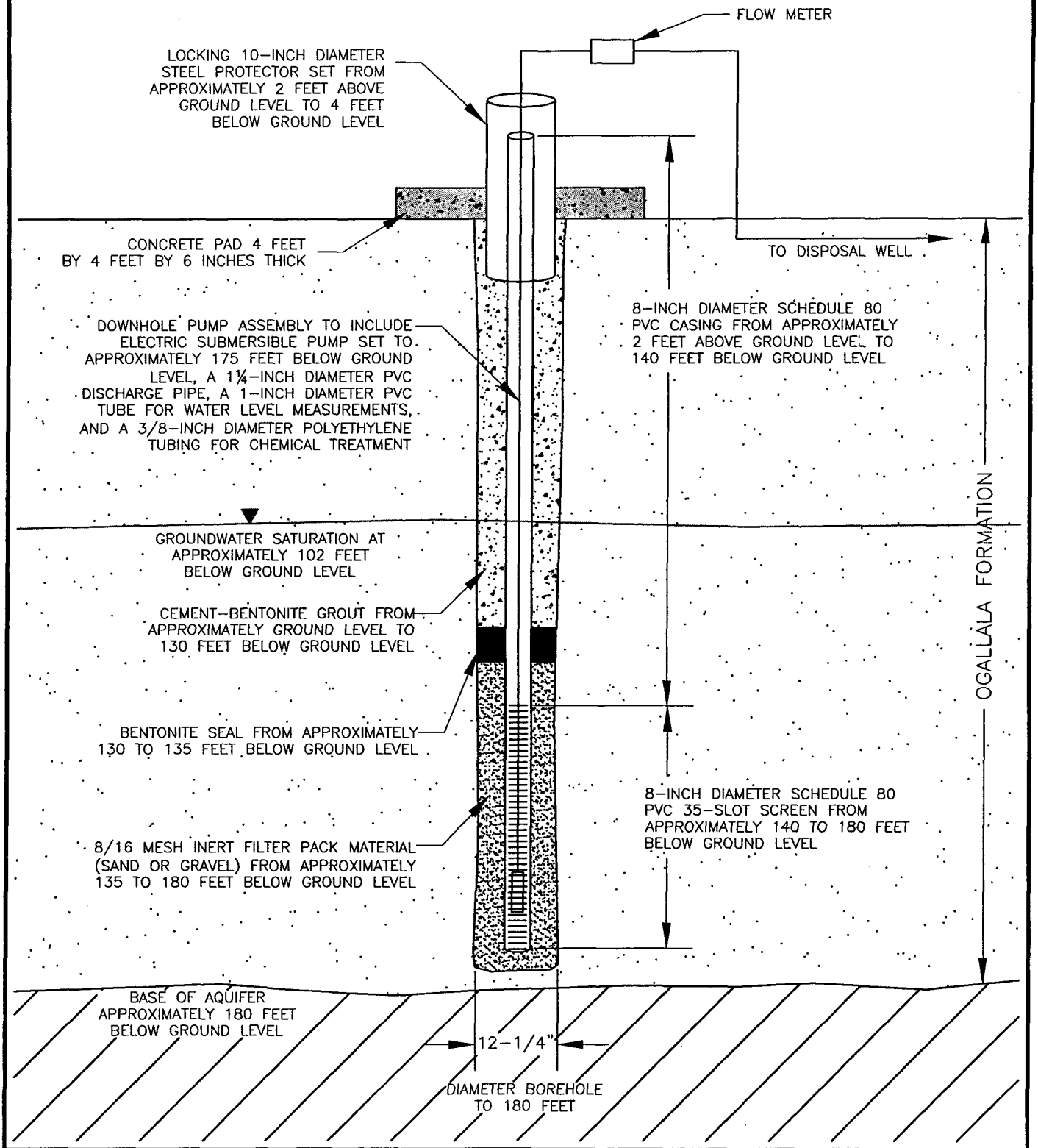

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FIGURE TITLE	***CONSTRUCTION DETAIL FOR PROPOSED RECOVERY WELL RW-3***
DOCUMENT TITLE	WORK PLAN FOR INSTALLATION OF RECOVERY WELL RW-3
CLIENT	EL PASO NATURAL GAS COMPANY
LOCATION	JAL #4 PLANT LEA COUNTY, NEW MEXICO

DATE	6/13/03
SCALE	N/A
DESIGNED BY	GHR
APPROVED BY	GHR
DRAWN BY	SKG
PROJECT NUMBER	9717105 P2
FIGURE NUMBER	3

P:\USTAH\Env\1997\97171\CAD\9717105T2\FIG03-WELL DETAIL.dwg on Jun 12, 2003-12:47pm