GW - 32

PERMITS, RENEWALS, & MODS Application

2004

GIANT
REFINING COMPANY

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September 26, 2005

Hope Monzeglio
NMED Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505-6303

Re: Response Letter, HWB-GRCC-04-001

Dear Hope Monzeglio:

The Giant Ciniza refinery received the approval with modifications for the 2003 OCD Annual Report GW-32, August 2004. This response includes all requested information, revised documentation and electronic submittals. This response letter details where the information was revised cross-referencing NMED's numbered comments.

1. Giant will follow this directive.

2. Giant will follow this directive. OCD requirements will be included but in a separate section of the report. After your review of the 2004 OCD report, please let us know if this new approach meets NMED's needs.

3. Enclosed is a CD (Attachment 1) of the renewal application that includes the November 2004 Amendments and any changes required by this Approval with Modifications, and a revised hard copy. Also enclosed is a redline version of the pages that were modified. Just added to the application sampling schedule are the two monitoring wells GWM-2 and GWM-3 that were drilled next to the aeration lagoons this week. Log of test borings and installation diagrams for these wells will be forwarded to you once they are received from Precision Engineering.

4. The Ciniza Well & Borings Locations map was revised and is attached to this document as Attachment 2.

5. Future reports will identify the Permit Condition being addressed.

6. Giant will follow NMED's position paper when preparing the annual groundwater report.

7. A mistake was made in the last sentence of Section 9.0, #7, pg. 9-4. Well #2, a potable well, is scheduled for sampling in 2006 to meet SDWS, and every three years thereafter. Well #2 should be #3. This section has been revised. The well names in the Table of this section have been revised to match those on the map. The designations of industrial and potable have been removed from this section, as these are terms used by the NMED

Drinking Water Section to show where the water is used. Well construction details of wells PW2 and PW4 are included as Attachment 3. Giant cannot locate the details for PW3 but has asked Bill Kingsley to obtain these records on his next visit to the state office. The PW3 records will be forwarded once they are obtained.

8. a) The new boundary well development information is included as Attachment 3A.

   b) Well BW1C was not nested, the "65 feet set well in boring" was a mistake by Precision Engineering and they have corrected this log included as Attachment 4.

   c) Well construction diagrams for all boundary wells are included as Attachment 5.

9. a) The old API Separator was removed from service on October 6, 2004 and the start up of the new API Separator was on this same date.

   b) The API Separator sludge was sent offsite for recycling at the Norco refinery (463,160 lbs) in October 2004. This material was shipped offsite for oil recovery subject to the sludge exemption found in 40CFR 261.4 (12). Also 4500 lbs of K051 combination of sludge and sand was sent offsite for disposal in December of 2004. The volume of process sewer sludge (F037) generated was 5600 lbs.

   c) The spent sand and contaminated soil was picked up and sent offsite for hazardous waste disposal by RINCHEM. The waste was sent to their Albuquerque storage facility.

   d) Vacuum trucks, air monitor, air compressor, backhoe, jackhammer, sand blaster, welders, and hand tools, shovels and 55 gallon DOT open top drums were utilized for this project.

   e) The old 8-inch outlet line was replaced with a 24-inch pipe, which routes effluent to Aeration lagoon #1.
   The pipe skimmer seal between the bays was replaced.
   The inlet piping was replaced and hooked up to the storm water drainage system.
   The concrete was patched in numerous places in both bays.
   The weir wall downstream of the pipe skimmer was rebuilt on both bays.

   f) The following photos taken in November 2004 are included as Attachment 6:
   Photo 1 – Cleaning of the old separator north bay.
   Photo 2 – Old separator south bay after cleaning.
   Photo 3 – Old separator both bays being cleaned.
   Photo 4 – Picture of the new separator.

   g) No sampling activities occurred during closure. The clean-up materials were excluded oil bearing hazardous secondary materials inserted back into a petroleum refinery and listed hazardous wastes K051 and F037. A copy of the waste determinations from the Ciniza Waste Determination Notebook for API Separator sludge and API Separator sand and RINCHEM profile sheets are included as Attachment 7.

h) Envirotech removed all residual material with Vacuum trucks. All sections of the separator were steam cleaned and sand blasted by REFCHEM in preparation for inspection and repair. Sandblasted material was removed with shovel and drums by REFCHEM.

i) The old separator was placed into stormwater usage in mid December. It is to be used for the storm water drainage system at the refinery.

j) All closure activities are documented above.

10. Giant will follow this directive in all future reports.

11. Future reports will identify wells requiring additional analysis separately. This page was revised (Attachment 8) indicating OW-11 was also analyzed for other parameters.

12. This page was revised, see (Attachment 8). The term low was deleted and the reference to OCD wells (mistake) was changed to OW. The request to sample OW 14 on a semiannual basis was added to Section 9 of the renewal application.

13. Enclosed as Attachment 9 are the grab sample results of the inlet water to Pond #2, which was sampled in the fourth quarter of 2004. It appears no pond sample was taken in 2004. Giant is adding this requirement to the sampling table of the discharge plan making it more visible and not hidden in the text. Giant will assure that this sample will not be missed in 2005. Section 9.0 of the renewal application was revised to indicate semi-annual sampling on the effluent from aeration lagoon 2 to the inlet to evaporation pond 1.

14. Giant will follow this directive.

15. The units in the Tables labeled Fall 2002 and Fall 2003 represent connections in ug/l and the Tables (see Attachment 10) have been revised to reflect this.

16. Giant will follow this directive.

17. The discharge plan renewal was approved in the fourth quarter of 2004 and only one sample point/visual inspection was taken. In 2003 visual inspections and annual testing (general chem., and RCRA constituents) were not required for O1, OW-10, SMW-2 and SMW-4 and therefore no action was taken.

18. Giant will follow this directive.

19. Giant will follow this directive.

20. In 2003 product recovered from RW-1 was 17.3 gallons, RW-5 was 3,250 mls of product, and RW-6 had 9,050 ml of product recovered. Giant personnel measured the volume of product recovered by bailing the well and using a calibrated bucket to measure the volume of product recovered. Product thickness measurements were not taken until 2004. In the future, Giant will include product thickness maps and volume recovered in our annual report.

21. a) RW-5 and RW-6 were only sampled in the first quarter of 2003. Permit condition 16.A.vi. was not effective until June 23, 2004.
    b) RW-2 did not contain any product when it was inspected in the first quarter of 2003.

    c) Data was not reported for the recovery wells in the third and fourth quarters of 2003 because they were not inspected (see explanation under 21.a.)

    d) Samples of the Northeast OCD Land Treatment Area did not occur in the year 2003 since this was not a requirement under the old permit conditions. The date of the Discharge Permit Approval Conditions that included this condition was June 23, 2004.

22. An inspection/meeting by OCD/NMED was held at Ciniza on September 8, 2005. In that meeting Wayne Price of OCD agreed to accept NMED recommended closure activities for the railroad rack lagoon solid waste management unit cleanup.

23. In June 2004, Fuhs Trucking was hired to remove surface soil (stained with salts) from the temporary storage evaporation ponds (TSP) at the northwest corner of the Ciniza refinery property. Approximately 5000 cubic yards of soil was removed from the TSP and used as dike material between ponds 5 and 6 along with 3500 cubic yards of fresh soil. Approximately 5,622 cubic yards of soil was removed from the Central OCD Landfarm and used as fill to cover the TSP. Analytical results from the landfarm are included as Attachment 11.

24. Grab samples of the Pilot wastewater did not occur in the year 2003 since this was not a requirement under the old permit conditions, the date of the Discharge Permit Approval Conditions that included 20.3 was June 23, 2004.

25. Copies of the "The proposal for the refinery boundary wells installation" and "A Progress Report on The Discharge Plan Renewal" were inadvertently left out of the 2003 Annual Report. Enclosed as Attachment 12 are copies of these reports.

26. Giant will follow this directive.

Thank you for your review of the 2003 Annual Report and please contact me at 505-722-0217 if you have any questions regarding this response letter.

Sincerely,

Ed Riege
Environmental Superintendent

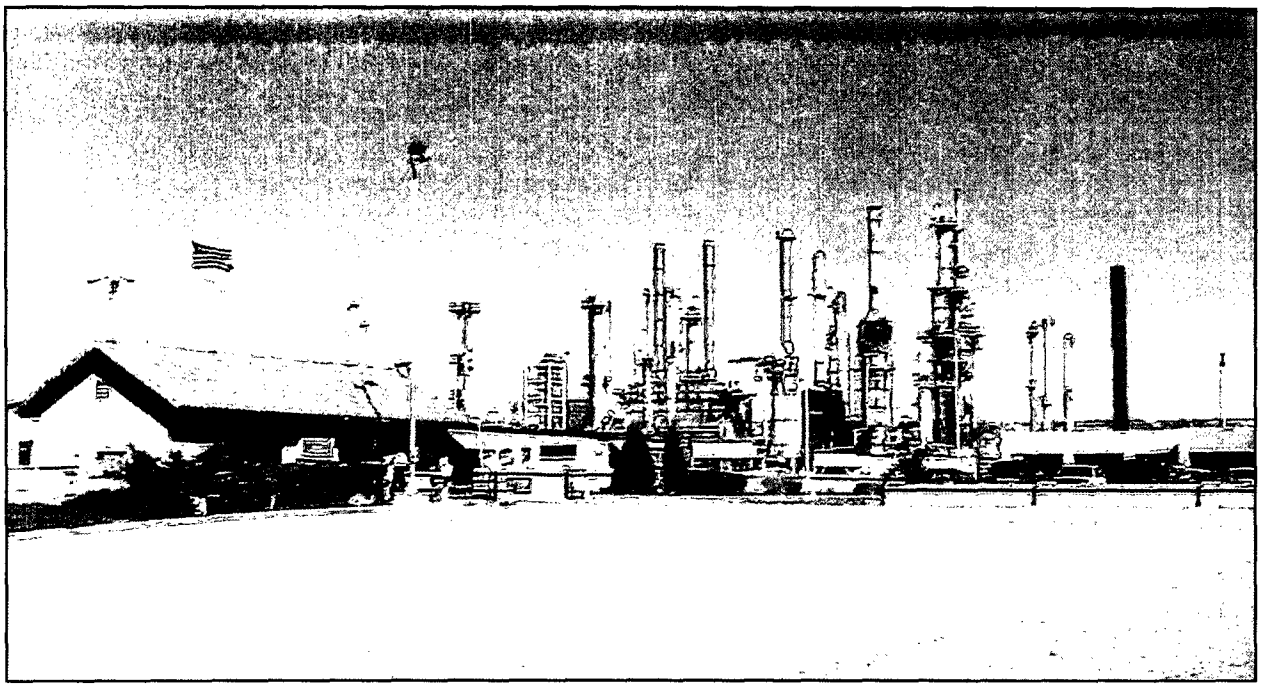
cc: Wayne Price OCD Santa Fe
Denny Faust OCD Aztec
Ed Rios General Manager
James Romero Environmental Engineer

Attachments: 13

OCD Discharge Plan Renewal Application

Giant Refining Company – Ciniza Refinery

McKinley County, New Mexico



Submitted to:

State of New Mexico
Oil Conservation Division
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Submitted by:

Giant Refining Company
Route 3, Box 7
Gallup, New Mexico 87301

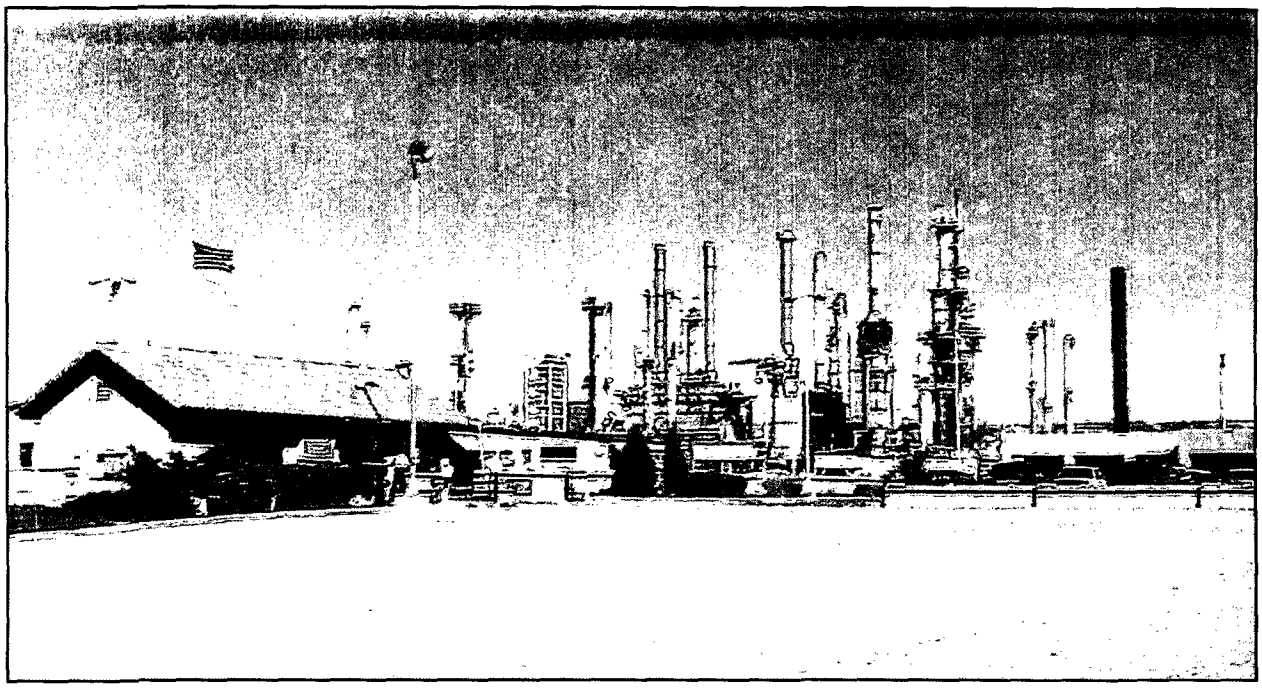
Submitted on:

April 28, 2004
Volume I
~~Revised~~ Revision 1 November 2004
Revision 2 September 2005

OCD Discharge Plan Renewal Application

Giant Refining Company – Ciniza Refinery

McKinley County, New Mexico



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Disclaimer

This application has been prepared using the requirements, format, and guidance that is contained in the document titled "Guidance For The Preparation Of Discharge Plans At Natural Gas Plants, Refineries, Compressor and Crude Oil Pump Stations" (Revised 12-95), as issued by the Oil Conservation Division. Furthermore, this application was prepared for the sole and expressed purpose of renewing the existing discharge plan permit, of which renewal is required every five years. The information contained in this application is proprietary and may not be used for any purpose other than the processing of this application without the expressed written consent of the Giant Refining Company.

Table of Contents

Section 1.0 Type of Operation

The Ciniza Refinery is a crude oil refining facility.

The Standard Industrial Classification (SIC) code is 2911 and the NAIC is 32411.

The refinery receives and processes up to 32,000 barrels per day of crude oil and other feedstocks, and then produces various finished products; including propane, butane, naphtha, unleaded gasoline, jet fuel, diesel, kerosene, and residual fuel.

[Special Note: During 2003, Giant Industries Arizona, Inc. sold the Giant Travel Center refueling plaza on Interstate 40 at Exit 39 to another company. As such, this facility has now been removed from the scope of this application and the new owner of the travel center shall be responsible for all on-site activities that are necessary to comply with EPA, NMED, OCD, and other regulatory requirements. The Ciniza Refinery will continue to receive sanitary wastewater from the travel center, which shall be conveyed solely and directly to the aeration basins for further treatment and disposition in the evaporation ponds. The new travel center owner and operator shall be responsible for all on-site treatment of the sanitary effluent in order to comply with discharge criteria. In the event that the travel center operator cannot comply with discharge criteria, then the refinery reserves the right to terminate the connection and suspend receiving the wastewater inflow from this source.]

Section 2.0 Name of Operator or Legally Responsible Party or Local Representative

Owner:	Giant Industries Arizona, Inc. 23733 North Scottsdale Road Scottsdale, Arizona 85255	(parent corporation)
Operator:	Giant Refining Company Route 3, Box 7 Gallup, New Mexico 87301	(postal address)
	Giant Refining Company I-40, Exit 39 Jamestown, New Mexico 87347	(physical address)
Key Contact:	Ed Rios, General Manager	
Telephone:	(505) 722-3833	

Section 3.0 Location of the Discharge Plan Facility

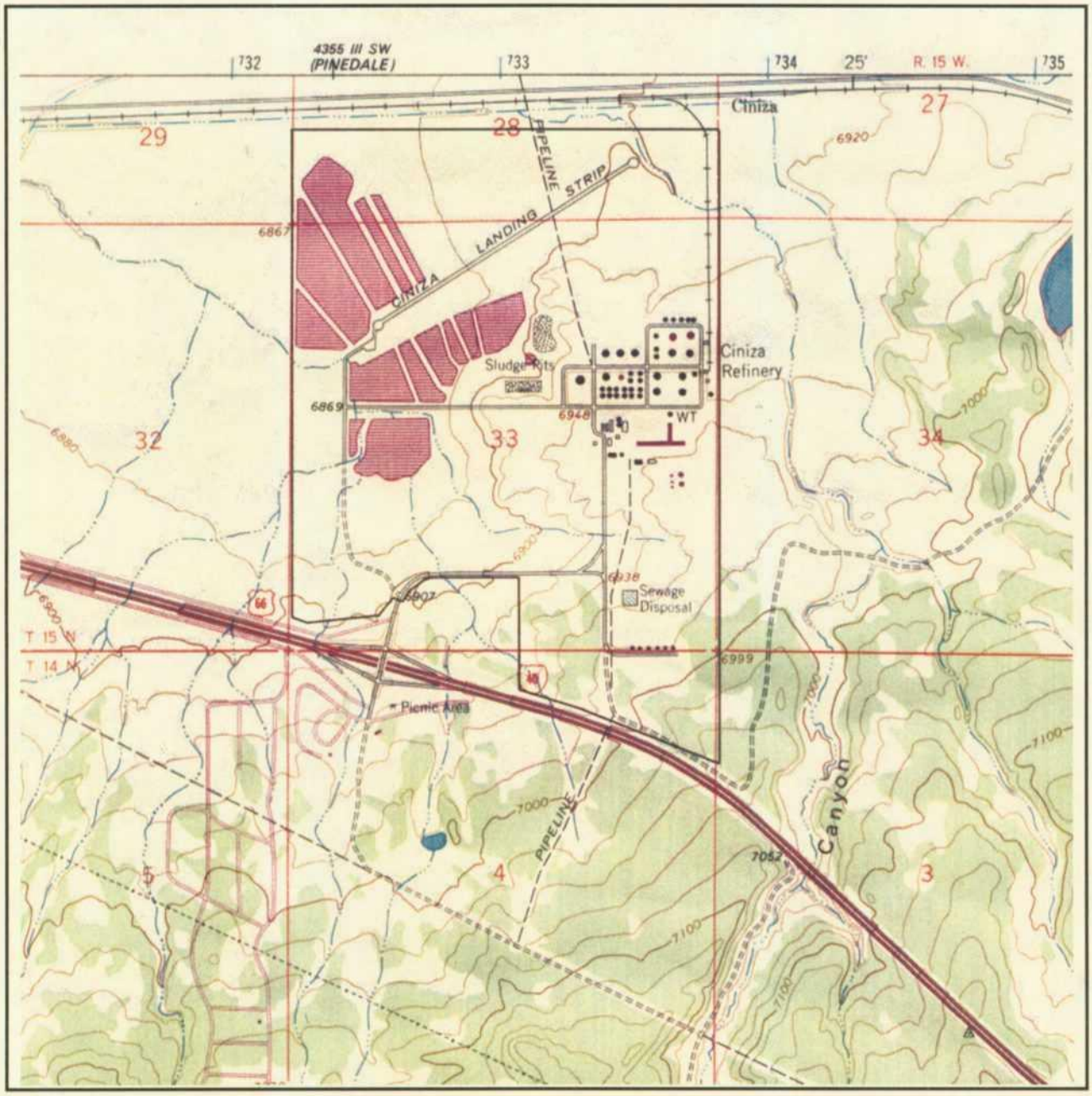
The Ciniza Refinery is generally located within the west-central region of the State of New Mexico, approximately 17 miles east-southeast of the City of Gallup in McKinley County. It is more specifically located immediately north of Interstate 40 at Exit 39, and approximately one mile northeast of the Pilot (formerly Giant) Travel Plaza.

Regional Map

The plant site is nominally located at latitude 35° 29' 30" and longitude 108° 24' 40".

The refinery is situated on an 810 acre irregular shaped tract of land that is substantially located within the lower one quarter of Section 28 and throughout Section 33 of Township 15 North, Range 15 West of the New Mexico Prime Meridian. A small component of the property lies within the northeastern one quarter of Section 4 of Township 14 North, Range 15 West.

Locality Map
USGS Topographical Map - Ciniza Quadrangle (Revised 1980)



A detailed map of the plant site is also included with this application as Appendix A. This map is large format and measures 34 inches wide by 22 inches high.

Section 4.0 Landowners

Prior to 1957, the land area encompassing the Ciniza Refinery was federal land managed by the Bureau of Land Management (BLM).

In 1957, the El Paso Natural Gas Company obtained the land from the BLM and constructed the refinery on the current 810 acre tract.

In 1964, the Shell Oil Company purchased the refinery and associated property from the El Paso Natural Gas Company.

In 1982, Giant Industries Arizona, Inc. purchased the refinery and associated property from the Shell Oil Company.

Giant Industries Arizona, Inc. is the current landowner of record.

Address: Giant Industries Arizona, Inc.
23733 North Scottsdale Road
Scottsdale, Arizona 85255

Telephone: (480) 585-8888

Section 5.0 Facility Description

The Ciniza Refinery is located within a rural and sparsely populated section of McKinley County. The setting is a high desert plain on the western slope of the continental divide. The nearest population centers are the Pilot (formerly Giant) Travel Center refueling plaza, the Interstate 40 highway corridor, and a small cluster of residential homes located on the south side of Interstate 40 approximately 2 miles southwest of the refinery. The surrounding land is comprised primarily of public lands and is used for cattle and sheep grazing at a density of less than six cattle or 30 sheep per section. McKinley County is predominantly rural, as are the adjoining portions of neighboring counties.

The refinery primarily receives crude oil via two 6 inch diameter pipelines; Bisti Pipeline comes down from the Four Corners Area and enters the refinery property from the north and Hospah Pipeline comes in from the northeast and is an interconnection with a main interstate pipeline. In addition, the refinery also receives natural gasoline feedstocks via a 4 inch diameter pipeline that comes in from the west along the Interstate 40 corridor. These feedstocks are then stored in tanks until refined into products. The refinery has an overall capacity to process up to 32,000 barrels per day of crude oil and natural gasoline feedstocks.

The refinery incorporates various processing units that convert crude oil and natural gasoline into finished products. These units are briefly described as follows.

- The distillation unit separates crude oil into various fractions; including gas, naphtha, light oil, heavy oil, and residuum.
- The fluidized catalytic cracking unit breaks up long-chain hydrocarbon molecules into smaller molecules, and essentially converts heavier oils into naphtha and lighter oils.
- The alkylation unit combines specific types of hydrocarbon molecules into a high octane gasoline blending component.
- The reforming unit combines low octane naphtha molecules to form high octane naphtha.
- The hydrotreating unit removes undesirable sulfur and nitrogen compounds from intermediate feedstocks, and also saturates these feedstocks with hydrogen.
- The isomerization unit converts low octane hydrocarbon molecules into high octane molecules.
- The treater units remove impurities from various intermediate and blending feedstocks in order to produce finished products that comply with sales specifications.
- The sulfur recovery unit converts and recovers various sulfur compounds from other processing units and then produces a solid elemental sulfur byproduct.

As a result of these processing steps, the refinery produces a wide range of petroleum products including propane, butane, unleaded gasoline, jet fuel, diesel, kerosene, and residual fuel.

In addition to the aforementioned processing units, various other equipment and systems support the operation of the refinery and are briefly described as follows.

Storage tanks are used throughout the refinery to hold and store crude oil, natural gasoline, intermediate feedstocks, finished products, chemicals, and water. These tanks are all located aboveground and range in size from 80,000 barrels to less than a 1,000 barrels. A grouping of tanks is commonly referred to as a "tank farm."

Pumps, valves, and piping systems are used throughout the refinery to transfer various liquids among tankage and processing units.

A railroad spur track and a railcar loading rack are used to transfer feedstocks and products from refinery tankage both into and out of railcars.

Several tank truck loading racks are used at the refinery to load out finished products and also may receive crude oil, other feedstocks, additives, and chemicals.

A pipeline connects the refinery to the Pilot (formerly Giant) Travel Center and is used to supply gasoline and diesel fuel to the refueling plaza.

A firefighting training facility is used to conduct employee firefighting training.

The process wastewater system is a network of curbing, paving, catch basins, and underground piping that collects rainwater and other effluent from various processing areas within the refinery and then conveys this wastewater to the API separator.

The API separator is a large concrete containment structure that utilizes gravity and residence time to separate wastewater into three components; a sludge layer that sinks to the bottom, a scum layer that floats to the top, and a clarified effluent remaining in the middle. The clarified effluent then flows onward to the stripper columns.

At the stripper columns, ambient air is blown upwards through a falling cascade of clarified wastewater and, as a result, dissolved gases and light hydrocarbons are disengaged and vented. Effluent from the stripper columns flows onward to the aeration basins.

At the aeration basins, the clarified and stripped wastewater is further mixed with ambient air in order to oxidize any remaining constituents and increase the dissolved oxygen concentration in the water in order to enhance microbial activity. Effluent from the aeration basins flows onward to the evaporation ponds.

At the evaporation ponds, wastewater is converted into vapor via solar and mechanical wind-effect evaporation. Liquid wastewater is not discharged from the refinery.

The storm water system is a network of valves, gates, berms, embankments, culverts, trenches, ditches, natural arroyos, and retention ponds that collect, convey, control, treat, and release storm water that falls within or passes through refinery property.

Items Specifically Requested in the OCD Guidance Document

1. Location of fences

   The refinery incorporates an outer perimeter fence that substantially consists of barbed wire and posts, and roughly corresponds to the property boundaries. In addition, interior zones of 8 foot high chain link fencing are installed around the process areas, warehouse yards, storage pads, loading racks, and other sensitive areas. The locations of these fence lines are shown on the plant site drawing in Appendix A.

2. Location of pits

   The refinery no longer uses earthen pits for waste accumulation. The locations of former pits are shown on the plant site drawing in Appendix A. All of these former pits have been excavated, remediated, and backfilled with clean soil.

3. Location of berms

   The refinery uses earthen berms to form secondary containment basins for tankage and also for storm water flow control and outlying retention basins. The locations of these berms are shown on the plant site drawing in Appendix A.

4. Location of tanks

   The refinery uses aboveground tanks for storage at various locations within the refinery. The locations of these tanks are shown on the plant site drawing in Appendix A. Large groupings of tanks are identified as named tank farms. This includes the following:

   - Main Tank Farm
   - Hot Oil Tank Farm
   - Tank Truck Loading Rack Tankage Area
   - High Pressure Storage Bullets Area
   - Hydrogen Storage Bullets Area

5. Location of discharges

   Treated process wastewater is evaporated at the evaporation ponds. Some of this water is occasionally sold to construction companies for non-domestic beneficial uses such as road surface wetting and dust suppression.

   Storm water that is not contained on-site is released off-site at two outfall locations on the western boundary of refinery property. During extreme rainfall events, some storm water may exit refinery property via sheet run-off at the northern and western boundaries.

   Sanitary sewage is treated and released at three septic fields located within the refinery.

   The locations of the evaporation ponds, storm water outfalls, and septic fields are shown on the plant site drawing in Appendix A.

6. Location of storage facilities

   The refinery uses warehouses, outdoor yards, and curbed pads for storage of various materials and equipment within the refinery. The locations of these storage facilities are shown on the plant site drawing in Appendix A.

7. Location of disposal facilities

   The refinery uses an OCD-permitted landfarm to treat non-hazardous oily residue that is intermittently generated within the refinery. The OCD-permitted landfarm is not currently receiving additional waste material, and will remain as such until existing hydrocarbon constituents are more fully biodegraded. In the interim, a temporary landfarm is being used to treat non-hazardous oily waste material that is being generated at the refinery. This application includes a modification request covering the new temporary landfarm.

   The refinery formerly operated other land treatment units in order to treat and dispose of various waste materials generated within the refinery. These sites are no longer in use. Some are closed and others are in the process of closure. Additional discussion of these sites is included in Section 13.

   The locations of the current OCD-permitted landfarm, former land treatment units, and former disposal sites are all shown on the plant site drawing in Appendix A.

8. Location of processing facilities

   The refinery uses various processing units and support systems as described above. The locations of these facilities are shown on the plant site drawing in Appendix A.

9. Location of other relevant facilities including drum storage

   The locations of drum storage and other relevant facilities are labeled and shown on the plant site drawing in Appendix A.

Section 6.0 Materials Stored or Used at the Facility

The refinery receives, stores, and processes crude oil and other petroleum-based feedstocks, and then produces various intermediate feedstocks and finished products, including propane, butane, unleaded gasoline, jet fuel, diesel, kerosene, and residual oil. These materials are stored in aboveground atmospheric and pressurized tanks, and are listed on Table 6.1 and Table 6.2 in Appendix B, respectively. These tables include the following information.

- tank name
- contents
- material of construction
- year tank was built or most recently modified
- volume
- location

The refinery also receives, stores, and uses a variety of additives, chemicals, and other sensitive materials in order to support the operation of the refinery. These materials are listed on Table 6.3 in Appendix B. This table includes the following information.

- material name
- maximum quantity stored on-site at any given time
- location

Items Specifically Requested in the OCD Guidance Document

The OCD guidance document specifically requires that the following categories be included in the material list.

- process specific chemicals
- acids / caustics
- detergents / soaps
- solvents / inhibitors / degreasers
- paraffin treatment / emulsion breakers
- biocides
- other

The tables in Appendix B include the materials that correspond to the above categories.

Section 7.0 Sources and Quantities of Effluent & Waste Solids Generated at the Facility

The following processing units, systems, equipment, and categories are potential sources of wastewater effluent or waste solids generated at the refinery.

Sources of wastewater effluent include the following. Most of these discharges are collected in the refinery process sewer system and flow to the API separator. An exception is the boiler feedwater treatment system, which has a dedicated drainage line to Evaporation Pond No. 2.

Boiler Feedwater Treatment System

Raw water is treated in this equipment in order to remove impurities before being supplied as feedwater to the refinery boilers. Wastewater containing dissolved solids is routinely discharged to Evaporation Pond No. 2 via in a dedicated drainage line from the water softening units and reverse osmosis (RO) units.

This discharge typically ranges from 70,000 to 100,000 gallons per day.

Boilers

Five boilers are in service at the refinery: two cogeneration boilers, two utility boilers, and one CO boiler. Wastewater containing dissolved solids is routinely discharged to the process sewer from these boilers.

This discharge typically ranges from 20,000 to 30,000 gallons per day.

Cooling Towers

Two cooling towers are in service at the refinery. Wastewater containing dissolved solids and biocide residue is routinely discharged to the process sewer from this equipment.

This discharge typically ranges from 20,000 to 50,000 gallons per day.

Crude Unit

Two desalters at the crude distillation unit are used to remove impurities and water from crude oil. Wastewater containing dissolved solids and trace hydrocarbons are routinely discharged to the process sewer from this equipment.

This discharge typically ranges from 30,000 to 40,000 gallons per day.

Naphtha Hydrotreater Unit (NHT)

One overhead accumulator drum at this processing unit is used to remove condensed water. Wastewater containing trace hydrocarbons is routinely discharged to the process sewer from this accumulator drum.

This discharge typically ranges from 600 to 800 gallons per day.

Alkylation Unit Scrubber

A scrubber tower at the alkylation unit is used to remove impurities and entrained water from a gas stream. Wastewater containing dissolved solids and trace hydrocarbons are intermittently discharged to the process sewer from this equipment.

This discharge typically ranges from 1,500 to 2,000 gallons per week.

Butane Treater Column

A caustic wash column at this treater unit is used to remove impurities from butane products. Occasionally, this caustic solution must be replaced and, at that time, the spent solution is discarded. Wastewater containing dissolved solids and trace hydrocarbons are intermittently discharged to the process sewer from this equipment.

This discharge typically ranges from 300 to 350 gallons per week.

Straight-Run Gasoline Treater Columns

A caustic wash column and a water wash column at this treater unit are used to remove impurities from an intermediate gasoline feedstock. Occasionally, the caustic solution must be replaced and, at that time, the spent solution is discarded. Wastewater containing dissolved solids and trace hydrocarbons are intermittently discharged to the process sewer from the caustic wash column and routinely discharged from the water wash column.

This discharge typically ranges from 900 to 1,000 gallons per event when changing out the caustic wash solution, which occurs approximately 2 to 3 times per year.

Light-Cat Gasoline Treater Column

A caustic wash column at this treater unit is used to remove impurities from a gasoline product. Occasionally, the caustic solution must be replaced and, at that time, the spent solution is discarded. Wastewater containing dissolved solids and trace hydrocarbons are intermittently discharged to the process sewer from this equipment.

This discharge typically ranges from 900 to 1,000 gallons per event when changing out the caustic wash solution, which occurs approximately 2 to 3 times per year.

Alkylate Treater Column

A caustic wash column at this treater unit is used to remove impurities from an intermediate gasoline feedstock. Occasionally, the caustic solution must be replaced and, at that time, the spent solution is discarded. Wastewater containing dissolved solids and trace hydrocarbons are intermittently discharged to the process sewer from this equipment.

This discharge typically ranges from 900 to 1,000 gallons per event when changing out the caustic wash solution, which occurs approximately 2 to 3 times per year.

KOH Treater Columns

Six scrubber towers at these treater units are used to remove impurities from propane and butane product streams. Wastewater containing dissolved solids and trace hydrocarbons are routinely discharged to the process sewer from this equipment.

This discharge typically ranges from 100 to 150 gallons per day.

Jet Fuel Treater Columns

A scrubber column and water wash column are used to remove impurities from jet fuel product streams. Occasionally, the caustic solution must be replaced and, at that time, the spent solution is discarded. Wastewater containing dissolved solids and trace hydrocarbons are intermittently discharged to the process sewer from this equipment.

This discharge typically ranges from 40,000 to 60,000 gallons per event when changing out the caustic wash solution, which occurs approximately 2 to 3 times per year.

Diesel/Kerosene Treater Columns

Four salt wash columns are used to remove impurities from diesel and kerosene product streams. Occasionally, the caustic solution must be replaced and, at that time, the spent solution is discarded. Wastewater containing dissolved solids and trace hydrocarbons are routinely discharged to the process sewer from this equipment.

This discharge typically ranges from 250 to 800 gallons per event when changing out the caustic wash solution, which occurs approximately 2 to 3 times per year.

Sulfur Recovery Unit (SRU)

At the SRU, sulfur compounds are recovered from refinery feedstocks and then converted into a wet solid. Wastewater from a rinsing operation and a belt press dewatering operation is routinely discharged to the process sewer. This wastewater contains dissolved solids and trace sulfur compounds.

This discharge typically ranges from 25,000 to 35,000 gallons per day.

Storage Tanks

Numerous aboveground storage tanks are used within the refinery to store various products and intermediate feedstocks. Wastewater containing dissolved solids and trace hydrocarbons are occasionally drained from these tanks as bottom water or decanted water, and then discharged to the process sewer.

This discharge typically ranges from 1,800 to 2,500 gallons per day. Most of this discharge comes from the crude oil storage tanks.

Sources of solid waste include the following. Most of these waste materials are generated intermittently and then removed, collected, containerized, and stored until shipped off-site for recycling or disposal.

Fluid Catalytic Cracking Unit (FCCU) Catalyst

A metallic (alumina) catalyst is used within the FCCU to convert hydrocarbon molecules. This catalyst is periodically replaced and the spent catalyst is stored in drums or supersacks until disposed at an off-site landfill. This material is a dry metallic solid and is non hazardous.

Approximately 350 to 450 tons of spent FCCU catalyst is generated each year.

Defluorinator Unit Catalyst

A metallic (alumina) catalyst is used within the Defluorinator Unit to remove trace fluorine from propane and butane products. This catalyst is periodically replaced and the spent catalyst is stored in supersacks until disposed at an off-site landfill. This material is a dry metallic solid and is non hazardous.

Approximately 600 to 900 tons of spent Defluorinator catalyst is generated each year.

Reforming Unit Catalyst

A metallic (platinum) catalyst is used in the reforming unit to convert hydrocarbon molecules. This catalyst is periodically replaced and the spent catalyst is recycled by an off-site metal recovery service. This material is a dry metallic solid and is shipped as a D018 hazardous waste due to the presence of trace benzene.

Approximately 10 to 15 tons of reformer catalyst is generated every one to two years.

Naphtha/Diesel Hydrotreating Units (NHT/DHT) Catalyst

Metallic catalysts are used in these treating units to convert hydrocarbon molecules. These catalysts are periodically replaced and the spent catalysts are recycled by an off-site metal recovery service. This material is a dry metallic solid and is shipped as a K171 hazardous waste.

Approximately 7 tons of naphtha hydrotreater catalyst and 10 tons of diesel hydrotreater catalyst are generated each year.

Spent Zinc Oxide Catalyst

A metallic (zinc) catalyst is used in the isomerization unit to convert hydrocarbon molecules. This catalyst is periodically replaced and the spent catalyst is recycled by an off-site metal recovery service. This material is a dry metallic solid and is non hazardous.

Approximately 2 to 3 tons of zinc oxide catalyst is generated every two years.

Sulfur Byproduct

An elemental sulfur byproduct is routinely generated at the SRU. This solid residue is stored in supersacks until shipped off-site for disposal at a landfill.

Approximately 400 to 800 tons of sulfur byproduct is generated each year.

Vapor Recovery Unit (VRU) Used Seal Fluid

An air pollution control system is used to capture vapor emissions during tank truck loading. This system uses ethylene glycol as a seal fluid in a vacuum pump. Periodically, this fluid must be replaced.

Approximately 330 gallons of used ethylene glycol is generated per change-out. Because this is a new system, the frequency of change-out is not known.

Heat Exchanger Bundle Cleaning Pad Oily Sludge

Heat exchanger bundles are occasionally cleaned in order to restore heat transfer performance. This cleaning activity is conducted within a concrete enclosure that incorporates a wastewater accumulation sump. Oily sediment and sludge may accumulate in the bottom of this sump. Wastewater overflows from this sump and is discharged into the process sewer.

The heat exchanger bundle cleaning sludge is a listed hazardous waste (K051) and is collected and contained in 55 gallon drums until disposed at an off-site hazardous waste disposal facility.

The quantity of this waste typically ranges from 0 to 3 tons per year.

Process Sewer System Sludge

Sediment, sludge, and other debris can occasionally accumulate within the piping, junction boxes, and interceptor manholes that comprise the process sewer system. These materials are periodically removed via a vacuum truck and upon removal are classified as a hazardous waste (F037). This material remains in the vacuum truck until transported off-site for disposal.

The quantity of this waste typically ranges from zero to five tons per year.

Maintenance Shops

Most process equipment and mobile equipment is repaired and maintained at the refinery maintenance shops. Waste oils and antifreeze are collected in 55 gallon drums and recycled.

Approximately 2 drums of antifreeze and 4 drums of used motor oil are generated each year.

Quality Control Laboratory

Residual petroleum products are recycled in the refinery. Residual or expired reagents and other discarded chemicals are stored in lab packs until disposed off-site.

OCD Landfarm

Oily non hazardous solid waste is treated at the OCD-permitted landfarm located on-site.

The quantity of oily solid waste typically ranges from zero to 10 tons per year.

RCRA 90 Day Storage Pad

All hazardous wastes are stored at the RCRA 90 Day Storage Pad until shipped off-site for recycling, treatment, or disposal. All hazardous wastes are placed in containers and stored on this dedicated concrete pad.

Aerosol Spray Cans

Most aerosol spray cans at the refinery contain paint. All aerosol spray cans that have been used up or that have been discarded for other reasons are collected and carried to the satellite waste accumulation area. All cans are then checked for contents. Non-empty cans are punctured and drained into a dedicated 55 gallon drum.

Typically 50 to 100 aerosol spray cans are discarded each year.

Asbestos Containing Material (ACM)

Historically, asbestos containing materials have been used within the refinery for pipe and tank insulation. Occasionally, these materials must be removed and disposed as part of normal maintenance activities. All friable asbestos containing materials are abated in compliance with EPA and NMED regulations. These materials are double-bagged and stored in a segregated and secure area of the RCRA 90 Day Storage Pad.

The quantity of ACM disposed each year is highly variable, and ranges from zero to as much as 50 cubic yards.

Lead/Acid Batteries

Discarded lead acid batteries are placed in a segregated area of the RCRA 90 Day Storage Pad until shipped off-site for recycling.

The number of batteries discarded each year is highly variable and ranges from zero to as much as 50 units.

Spent Sand Blasting Media

Sand blasting is occasionally conducted at the refinery as part of normal maintenance activities. After repeated reuse, the sand grit becomes degraded and loses its abrasive action. When this occurs, the spent sand blasting media must be replaced. This material is then stored in drums or supersacks until disposed at an off-site landfill. This material is non hazardous.

The quantity of spent sand blasting media typically ranges from zero to 2 tons per year.

Section 8.0 Description of Current Liquid & Solid Waste Collection / Storage / Disposal Procedures

The following procedures are used to manage the wastewater effluents and solid wastes that are generated within the refinery as described in Section 7.0.

Process Wastewater

Process wastewater is generated at various refinery processing units, storage tanks, utility systems, and maintenance activities as described in Section 7.0. This water is collected in a segregated sewer system located throughout the refinery processing and tankage areas. This collection system is substantially composed of concrete paving and curbing, concrete catch basins and trenches, and buried concrete and carbon steel pipe. Process wastewater flows by gravity to the API separator where solids, sludge, and floating scum are removed. From the API separator, the clarified effluent flows down to the benzene strippers and then on to the aerations basins and evaporation ponds. This wastewater is ultimately converted into vapor via solar and mechanical wind-effect evaporation. A small amount of evaporation pond water is occasionally sold to construction companies for non domestic beneficial use.

Process Sewer System Sludge

Oily sediment and sludge accumulates within the piping, junction boxes, and manholes of the process sewer system. This sludge is periodically removed using vacuum trucks and typically remains within the truck until it is shipped off-site for disposal.

Sewer system sludge is typically incinerated or disposed at either the following facilities:

TERIS LLC
American Oil Road
El Dorado, AR 71730
EPA ID: ARD069748192

Rinchem Co. Inc.
6133 Edith Blvd. NE
Albuquerque, NM 87107
EPA ID: NMD002208627

API Separator Sludge

Oily sediment and sludge accumulates at the bottom of the API separator. The API separator is taken out of service annually and the bottom sludge is removed via vacuum trucks. This sludge typically remains in the truck until it is shipped off-site for recycling.

API separator sludge is recycled as a feedstock to a petroleum coker at the Norco Refinery:

Motiva Enterprises, LLC – Norco Refinery
15536 River Road
Norco, LA 70079
EPA ID: LAD008186579

Storage Tank Bottom Sludge

Oily sludge accumulates at the bottom of storage tanks (e.g. crude oil, FCCU feed tanks). These tanks are periodically taken out of service and the sludge is removed, containerized, and shipped off-site for oil recovery, treatment, and disposal.

Tank bottom sludge is typically incinerated or disposed at either the following facilities:

TERIS LLC
American Oil Road
El Dorado, AR 71730
EPA ID: ARD069748192

Rinchem Co. Inc.
6133 Edith Blvd. NE
Albuquerque, NM 87107
EPA ID: NMD002208627

Heat Exchanger Bundle Cleaning Pad Sludge

Oily sludge accumulates at the bottom of the cleaning pad sump. At the conclusion of the exchanger cleaning operation, this sludge is removed, placed in 55 gallon drums, then shipped off-site for oil recovery, treatment, and disposal.

Heat exchanger sludge is typically incinerated or disposed at either the following facilities:

TERIS LLC
American Oil Road
El Dorado, AR 71730
EPA ID: ARD069748192

Rinchem Co. Inc.
6133 Edith Blvd. NE
Albuquerque, NM 87107
EPA ID: NMD002208627

Oily Non Hazardous Soil & Debris

Oily soil and debris is occasionally generated within the refinery due to maintenance activities, leaks, or spills. This material is collected, containerized, and then may either be treated at the OCD landfarm or shipped off-site for oil recovery, treatment, and disposal.

When sent off-site, oily soil and debris is typically disposed at either the following facilities:

Waste Management of Arizona
Painted Desert Landfill
9001 North Porter Avenue
Joseph City, Arizona 86032
EPA ID: AZR05B244

Northwest New Mexico Regional Solid Waste Authority
101 Red Mesa Bluffs Drive
Thoreau, New Mexico 87323
Permit No. SWM-172203

Spent FCCU Catalyst

This material is a non hazardous dry solid that is stored in drums or supersacks after removal from the FCCU.

Spent FCCU catalyst is typically disposed at either the following facilities:

Waste Management of Arizona
Painted Desert Landfill
9001 North Porter Avenue
Joseph City, Arizona 86032
EPA ID: AZR05B244

Northwest New Mexico Regional Solid Waste Authority
101 Red Mesa Bluffs Drive
Thoreau, New Mexico 87323
Permit No. SWM-172203

Spent Reformer Catalyst

This material is a dry solid that is stored in drums or supersacks after removal from the reformer. Occasionally it is reprocessed on-site and then placed back into the reformer. On other occasions, it is shipped out via truck as a D018 hazardous waste and then reprocessed at an off-site facility.

When sent off-site, spent reformer catalyst is reprocessed at either of the following facilities:

Tricat, Inc.
Spent Catalyst Regeneration Facility
100 Taylor Blvd.
McAlester, OK 74501
EPA ID: OKD987097151

Multimetco, Inc.
1610 Frank Akers Road
Anniston, AL 36207
EPA ID: ALD980837959

Spent NHT/DHT Catalyst

This material is a dry solid that is stored in drums or supersacks after removal from the treater units. After removal, it is shipped out via truck as a K171 hazardous waste and recycled at an off-site facility.

When sent off-site, spent treater catalyst is recycled at either of the following facilities:

Tricat, Inc.
Spent Catalyst Regeneration Facility
100 Taylor Blvd.
McAlester, OK 74501
EPA ID: OKD987097151

Eurecat
13100 Bay Park Road
Pasadena, TX 77505
EPA ID: TXD06829963

Spent Defluorinator Catalyst

This material is a non hazardous dry solid that is stored in drums or supersacks after removal from the defluorinator.

Spent defluorinator catalyst is typically disposed at either the following facilities:

Waste Management of Arizona
Painted Desert Landfill
9001 North Porter Avenue
Joseph City, Arizona 86032
EPA ID: AZR05B244

Northwest New Mexico Regional Solid Waste Authority
101 Red Mesa Bluffs Drive
Thoreau, New Mexico 87323
Permit No. SWM-172203

Zinc Oxide Catalyst

Spent zinc oxide catalyst is collected in supersacks and then shipped by truck to UNICAT Catalyst Technologies, Inc., the original product manufacturer, who then contracts with the following company for recycling and disposal of this material. This material is non hazardous.

Cameron Chemical Corporation
830 Old Dill Road
Suffolk, VA 23434

SRU Sulfur Byproduct

This material is a non hazardous wet solid that is drained and stored in supersacks after being generated at the SRU.

Sulfur byproduct is typically disposed at either the following facilities:

Waste Management of Arizona
Painted Desert Landfill
9001 North Porter Avenue
Joseph City, Arizona 86032
EPA ID: AZR05B244

Northwest New Mexico Regional Solid Waste Authority
101 Red Mesa Bluffs Drive
Thoreau, New Mexico 87323
Permit No. SWM-172203

Mercury Contaminated Waste Materials

Fluorescent light bulbs, instrument contents, and laboratory waste that contains mercury is handled as a D009 hazardous waste and is typically transported via truck and recycled at:

Recyclights
405 W. 86th Street
Minneapolis, MN 55420
EPA ID: MND000903463

Excess or off-spec chemicals

These materials are typically generated at the quality control laboratory and then placed in lab pack disposal containers. These lab packs are typically disposed by using Rinchem.

Rinchem Co. Inc.
6133 Edith Blvd. NE
Albuquerque, NM 87107
EPA ID: NMD002208627

Asbestos Containing Material

The materials are regulated as a special waste and are stored in doubled plastic bags and then disposed at Keers Environmental.

Keers Environmental, Inc.
Disposal Site
Mountainair, NM 87036
EPA ID: NMD147273528

Cooling Tower Sludge and Salt

This material is generated in the cleaning of cooling towers and contains primarily sodium and chloride. This material is non hazardous and non-detect for TCLP metals. Giant has made application to dispose of this material.

Northwest New Mexico Regional Solid Waste Authority
101 Red Mesa Bluffs Drive
Thoreau, New Mexico 87323
Permit No. SWM-172203

Section 9.0 Modifications

Groundwater Monitoring Plan

On July 23, 2003, a meeting was held at the Ciniza Refinery that included representatives of the refinery, OCD, and NMED. At this meeting, a detailed discussion of the groundwater monitoring plan took place and a consensus agreement was reached in regard to proposed modification of the existing plan. As such, the following changes were made in this application.

1. In the third quarter of 2004, the following existing wells that were technically inadequate or potentially hazardous to groundwater quality were plugged and abandoned: OW-2, 3, 7, 9, and 24, and also SMW-1, 3, and 5. The general procedure for closure was to use a 6% bentonite (montmorillonite clay), and cement slurry as the closing agent. Slurry was injected at the bottom of the wells to displace the water. A minimum of three (3) well volumes of slurry was pressure injected into the well. Slurry weight was approximately thirteen (13) pound per gallon. Once injection was completed the surface finish was demolished and removed from the well location. This concrete will be used for pond rip-rap. The steel protective casing was cut and removed from the concrete and taken to the scrap metal recycling storage area. The well site was re-graded to natural conditions. A closure report indicating slurry volumes and any work performed at the well locations will be placed in the well file. Precision Engineering, Inc. will change databases and electronic files to reflect the well closures and the dates of the closure. Copies of the updated maps have been provided to OCD and NMED.

   OW-16, 17, 25, and 26 were previously plugged and closed and have now been replaced by RW-5 and 6. In addition, OW-20 has been closed and will not be replaced.

2. New groundwater monitoring well installation.

   New groundwater monitoring wells were installed in October and November 2003, and June and July 2004. There are three new sites for these wells located near the northwest corner boundary of the refinery. One site is located generally west of Evaporation Pond Number 8. One is located generally northwest of Evaporation Pond Number 11. One site is located generally north of Evaporation Pond Number 12.

   At each of the three sites, a dedicated well was drilled, installed, sealed, and screened solely within the Sonsela Sandstone Bed artesian reservoir (BW-1-C, BW-2-C, and BW-3-C). These wells shall be used for the purpose of detecting a potential impact to the Sonsela Aquifer.

   At each of the three sites, a dedicated well was drilled, installed, sealed, and screened solely within the alluvial layer that exists immediately above and upon the surface of the Chinle Formation (BW-1-B, BW-2-B, and BW-3-B, **Well B-1-B was dry**). This potential groundwater source is known to be intermittent and variable; these wells shall be used to detect potential contamination within the shallow groundwater layer that exists intermittently above the Chinle Formation aquiclude.

   At each of the three sites, an additional dedicated well was drilled and installed because drilling activity indicated the potential presence of an intermediate water-bearing strata

(e.g. sand lens) located above the Chinle Formation (BW-1-A, BW-2-A, and BW-3-A; **BW-1-A and BW-3-A were dry**.). These wells were installed because it appears likely that a distinct water-bearing layer had been identified and that it could be reliably sampled.

3. A new well (GWM-1) was installed downgradient of the aeration basins in order to monitor for the presence of shallow groundwater and was used to detect potential leakage from the aeration basins. The location of this well was determined in the field after mutual consultation by representatives of the refinery, OCD, and the drilling contractor. The well was drilled into a sand zone and contains water. In September 2005, two new dry wells were installed (GWM-2/GWM-3). GWM-2 is located at the NW corner of aeration lagoon #2 and GWM-3 is located NW corner of evaporation pond 1. Both wells were drilled below the bottom of the lagoons and will be monitored monthly through December 2005. If any water is found OCD/NMED will be notified immediately. Starting in 2006, monitoring will be decreased to quarterly if no water is present.

4. The new groundwater monitoring wells described in Item 2 above, plus OW-11, 12, 13, 14, 29, and 30, and MW-1, 4, and 5, and SMW-2 and 4 shall be routinely measured, sampled, and analyzed so as to provide the information necessary to detect an adverse groundwater impact and allow for a timely and effective response.

   The observation, measurement, sampling frequency, and type of analysis shall be as follows.

Well ID	Frequency	Measurement[4] / Analysis
OW-1	Quarterly	Visual check for artesian flow conditions
OW-10	Quarterly	Level measurement of the Sonsela Aquifer water table
GWM-1	Quarterly	Water level measurement
	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
GWM-2	Quarterly	Check for water, ***Monthly through 2005***
GWM-3	Quarterly	Check for water, ***Monthly through 2005***
OW-11	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
OW-12	Annual	BTEX / MTBE
OW-13[2]	Annual	BTEX / MTBE
OW-14	Annual	BTEX / MTBE
OW-29	Annual	BTEX / MTBE
OW-30	Annual	BTEX / MTBE
BW-1-A[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-1-B[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-1-C[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-2-A[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals

(e.g. sand lens) located above the Chinle Formation (BW-1-A, BW-2-A, and BW-3-A; **BW-1-A and BW-3-A were dry**.). These wells were installed because it appears likely that a distinct water-bearing layer had been identified and that it could be reliably sampled.

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4. The new groundwater monitoring wells described in Item 2 above, plus OW-11, 12, 13, 14, 29, and 30, and MW-1, 4, and 5, and SMW-2 and 4 shall be routinely measured, sampled, and analyzed so as to provide the information necessary to detect an adverse groundwater impact and allow for a timely and effective response.

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OW-10	Quarterly	Level measurement of the Sonsela Aquifer water table
GWM-1	Quarterly	Water Level measurement
	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
GWM-2	Quarterly	Check for water, ***Monthly through 2005***
GWM-3	Quarterly	Check for water, ***Monthly though 2005***
OW-11	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
OW-12	Annual	BTEX / MTBE
OW-13[2]	Annual	BTEX / MTBE
OW-14	Annual	BTEX / MTBE
OW-29	Annual	BTEX / MTBE
OW-30	Annual	BTEX / MTBE
BW-1-A[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-1-B[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-1-C[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-2-A[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals

BW-2-B[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-2-C[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-3-A[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-3-B[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-3-C[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
MW-1	Annual	General chemistry / RCRA list constituents[5]
MW-4	Annual in 05, 07, 0	General chemistry / RCRA list constituents[5] Modified skinner list metals & organics
MW-5	Annual in 05, 07, 09	General chemistry / RCRA list constituents[5] Modified skinner list metals and organics
SMW-2	Annual in 05, 07, 09	General chemistry / RCRA list constituents[5] Modified skinner list metals and organics
SMW-4	Annual in 05, 07, 09	General chemistry / RCRA list constituents[5] Modified skinner list metals and organics
RW-1	Annual	Measurement of product layer thickness, if present
RW-2	Annual	Measurement of product layer thickness, if present
RW-5	Annual	Measurement of product layer thickness, if present
RW-6	Annual	Measurement of product layer thickness, if present
PW-2	2004 then every 3 yr starting with 2008	SOCs, VOCs, Heavy Metals, Cyanide, Nitrates
PW-3	Every 3 years starting with 2006	SOCs, VOCs, Heavy Metals, Cyanide, Nitrates
PW-4	Every 3 years starting with 2004	SOCs, VOCs, Heavy Metals, Cyanide, Nitrates
Pond 1 inlet (EP1-IN)	Semi-Annual	BTEX, SVOCs, RCRA metals

BW-2-B[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-2-C[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-3-A[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-3-B[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
BW-3-C[3]	Annual	General chemistry / VOC / SVOC / BTEX / MTBE / metals
MW-1	Annual	General chemistry / RCRA list constituents[5]
MW-4	Annual in 05,07,09,	General chemistry / RCRA list constituents[5] Modified skinner list metals & organics
MW-5	Annual in 05,07,09,	General chemistry / RCRA list constituents[5] Modified skinner list metals & organics
SMW-2	Annual in 05,07,09,	General chemistry / RCRA list constituents[5] Modified skinner list metals & organics
SMW-4	Annual in 05,07,09,	General chemistry / RCRA list constituents[5] Modified skinner list metals & organics
RW-1	Annual	Measurement of product layer thickness, if present
RW-2	Annual	Measurement of product layer thickness, if present
RW-5	Annual	Measurement of product layer thickness, if present
RW-6	Annual	Measurement of product layer thickness, if present
PW 2	2004 then every 3 yr starting with 2008	SOCs, VOCs, Heavy Metals, Cyanide, Nitrates
PW 3	Every 3 years starting with 2006	SOCs, VOCs, Heavy Metals, Cyanide, Nitrates
PW 4	Every 3 years starting with 2004	SOCs, VOCs, Heavy Metals, Cyanide, Nitrates
Pond 1 inlet (EP-1 IN)	Semi-Annual	BTEX, SVOCs, RCRA metals

Pond 2 Inlet	Annual	BOD, COD, TDS, BTEX, MTBE
Evaporation pond (alternate yr to yr)	Annual	General Chemistry
Pilot Wastewater	Quarterly	TCLP (method 1311 and BOD
NE OCD landfarm	Quarterly	TPH, BTEX
	Annual	TPH, BTEX,General Chemistry, total metals

[1] This is the new well installed downgradient of the aeration basins.

[2] When OW-14 is cleaned up, then monitoring of OW-13 shall be discontinued.

[3] These are the new wells installed at the northwest corner boundary of the refinery. BW-1-A BW-1-B,and BW-3-A were dry at the time of drilling.

[4] To the extent practicable, water table depth shall be measured at each well annually.

[5] Frequency of sampling shall be per RCRA post closure schedule.

5. In addition to groundwater monitoring, surface water monitoring shall also be conducted as follows.

   On a semi-annual basis, a grab sample of the effluent from aeration lagoon 2 to the inlet to evaporation pond 1 (EP-1 IN) shall be collected and analyzed for BTEX using EPA method 8021B, semi volatile organics (SVOCs) using EPA method 8270 and RCRA metals

   On a annual basis, a grab sample of the inlet water to Pond #2 shall be collected and analyzed for BOD, COD, TDS, BTEX, and MTBE.

   On a annual basis, a grab sample of evaporation pond water shall be collected and analyzed for general chemistry parameters. The evaporation pond selected for sampling shall be the pond, considered by refinery personnel, to most likely contain the highest salinity or TDS. In addition, the selected pond shall be alternated from year-to-year in order to provide a broader indication of analysis.

6. Waste water from Pilot Travel Center and Truck Stop Facility.

   Grab samples shall be collected quarterly from the sampling and metering station (triangular notch weir) on the Pilot incoming line. The samples will be analyzed for hazardous characteristics (TCLP) by EPA Method 1311 and B.O.D.

Pond 2 inlet	Annual	BOD, COD, TDS, BTEX, MTBE
Evaporation Pond (alternate yr to yr)	Annual	General Chemistry
Pilot wastewater	Quarterly	TCLP (Method 1311) and BOD
NE OCD landfarm soil	Quarterly	TPH, BTEX
	Annual	TPH, BTEX, general chemistry, total metals

[1] This is the new well installed downgradient of the aeration basins.

[2] When OW-14 is cleaned up, then monitoring of OW-13 shall be discontinued.

[3] These are the new wells installed at the northwest corner boundary of the refinery. BW-1-A BW-1-B,and BW-3-A were dry at the time of drilling.

[4] To the extent practicable, water table depth shall be measured at each well annually.

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   On a annual basis, a grab sample of evaporation pond water shall be collected and analyzed for general chemistry parameters. The evaporation pond selected for sampling shall be the pond, considered by refinery personnel, to most likely contain the highest salinity or TDS. In addition, the selected pond shall be alternated from year-to-year in order to provide a broader indication of analysis.

6. Waste water from Pilot Travel Center and Truck Stop Facility.

   Grab samples shall be collected quarterly from the sampling and metering station (triangular notch weir) on the Pilot incoming line. The samples will be analyzed for hazardous characteristics (TCLP) by EPA Method 1311 and B.O.D.

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   Grab samples shall be collected quarterly from the sampling and metering station (triangular notch weir) on the Pilot incoming line. The samples will be analyzed for hazardous characteristics (TCLP) by EPA Method 1311 and B.O.D.

7. ~~Well #4 used for industrial purposes~~PW 4 was sampled August 12, 2004 and will be sampled every three years (next in 2007) according to the table in item 4. ~~Industrial Well #2 will be~~ PW 2 was sampled in 2004 and will be sampled every three years beginning in 2008. ~~Well #2, a potable well~~PW 3, is scheduled for sampling in 2006 to meet SDWS, and every three years thereafter.

8. Giant ~~proposes to~~is conducting a perimeter search of the refinery property on a bimonthly basis starting in December 2004. The inspection will focus on hydrocarbon staining or any release that could result in contamination leaving the property boundary. Giant has prepared an inspection checklist to be completed and signed by the environmental employee conducting the inspection. Completed inspection sheets will be maintained onsite.

Surplus Water Sales

Various construction companies have contacted the Giant Refinery and asked to purchase water for use in road construction, soil wetting and compaction, and dust suppression. Ed Horst, former Giant Environmental Manager, requested permission from OCD to allow the sale and use of surplus wastewater from the evaporation ponds for this purpose. Permission was granted in a letter dated July 11, 1996 and various conditions were imposed. Giant is now requesting modification of the OCD Discharge Plan to include the ongoing practice of selling surplus evaporation pond water to construction companies for non domestic beneficial use. The following conditions shall apply to all water sales conducted under this new provision.

1. Only wastewater that is RCRA non hazardous may be offered for sale.

2. Only wastewater that complies with the following conditions may be offered for sale.

   Wastewater shall not exceed RCRA hazardous characteristic criteria including ignitability, corrosivity, reactivity, and toxicity as specified in 40 CFR 261. Wastewater TDS shall not exceed 30,000 ppm. Wastewater TPH shall not exceed 100 ppm using EPA Method 418.1. Wastewater fecal coliform count shall not exceed 500 organisms per 100 ml.

3. The company seeking to purchase the water must first obtain approval from the local OCD District Office and also provide a copy of the correspondence to the OCD Environmental Bureau. In the approval request letter, the company must specify in detail where, how, and when the water will be used. The company must also agree in writing to abide by these conditions.

4. The water shall only be applied or used in a manner that avoids excess water run-off into ditches, arroyos, or any watercourse.

6. Waste water from Pilot Travel Center and Truck Stop Facility.

   Grab samples shall be collected quarterly from the sampling and metering station (triangular notch weir) on the Pilot incoming line. The samples will be analyzed for hazardous characteristics (TCLP) by EPA Method 1311 and B.O.D.

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Surplus Water Sales

Various construction companies have contacted the Giant Refinery and asked to purchase water for use in road construction, soil wetting and compaction, and dust suppression. Ed Horst, former Giant Environmental Manager, requested permission from OCD to allow the sale and use of surplus wastewater from the evaporation ponds for this purpose. Permission was granted in a letter dated July 11, 1996 and various conditions were imposed. Giant is now requesting modification of the OCD Discharge Plan to include the ongoing practice of selling surplus evaporation pond water to construction companies for non domestic beneficial use. The following conditions shall apply to all water sales conducted under this new provision.

1. Only wastewater that is RCRA non hazardous may be offered for sale.

2. Only wastewater that complies with the following conditions may be offered for sale.

   Wastewater shall not exceed RCRA hazardous characteristic criteria including ignitability, corrosivity, reactivity, and toxicity as specified in 40 CFR 261. Wastewater TDS shall not exceed 30,000 ppm. Wastewater TPH shall not exceed 100 ppm using EPA Method 418.1. Wastewater fecal coliform count shall not exceed 500 organisms per 100 ml.

3. The company seeking to purchase the water must first obtain approval from the local OCD District Office and also provide a copy of the correspondence to the OCD Environmental Bureau. In the approval request letter, the company must specify in detail where, how, and when the water will be used. The company must also agree in writing to abide by these conditions.

4. The water shall only be applied or used in a manner that avoids excess water run-off into ditches, arroyos, or any watercourse.

5. At the end of each day's activity, unused water will be stored in trucks or tanks such that the water does not drip or drain onto the ground overnight.

Giant is currently selling evaporation pond water to WW Construction Company of Albuquerque, New Mexico for use in road construction activities. Approximately 160,000 gallons per week have been sold since the summer of 2002 and Giant anticipates continuing this activity for the near term.

Temporary Landfarm

As mentioned earlier in this application, the existing OCD-permitted landfarm is currently not receiving additional waste material, and will remain out of service, until the existing hydrocarbon constituents are biodegraded. As such, a temporary landfarm unit has been created and is now being used on an interim basis to treat the ongoing generation of non hazardous oily waste at the refinery. With this application, Giant is requesting a modification to the OCD Discharge Plan to include this temporary landfarm as a permitted treatment unit. The location of the temporary landfarm is as shown on the plant site drawing in Appendix A. This landfarm is now designated as the "Northeast OCD Land Treatment Area" and its dimensions are approximately 300 feet by 75 feet. The operation of this new landfarm will follow the same requirements as are in current use for the existing OCD landfarm, which shall now be designated as the "Central OCD Land Treatment Area." These operational requirements are described in the Giant-OCD correspondence contained in Appendix F, and include the following items:

1. The landfarm shall have a perimeter fence, access gate, and identification sign.
2. The landfarm shall have a perimeter berm to control precipitation run-on and run-off.
3. Material delivered to the landfarm for treatment shall be spread within 72 hours of receipt.
4. Material shall be spread in lifts of six inches or less.
5. Material shall be tilled at least once per month in order to enhance biodegradation.
6. New material shall not be added to the landfarm until the preceding lift/soil matrix has been analyzed and it has been determined that TPH is less than 100 ppm, total BTEX is less than 50 ppm, and benzene is less than 10 ppm.
7. Material that is RCRA hazardous (either listed or characteristic) shall not be received or treated at the landfarm.
8. Moisture shall be added to the landfarm as necessary to enhance biodegradation. Excess moisture or ponding shall be removed or absorbed by the soil within 72 hours.
9. Chemical agents, microbes, or other foreign substances used to enhance biodegradation shall be approved in advance by OCD.
10. No material containing free liquids shall be accepted or treated at the landfarm.

11. Periodic soil sampling and analysis shall be performed in order to ascertain potential impact to native subsurface soil beneath the landfarm. On a quarterly basis, a soil grab sample shall be collected from a random location within the central zone of the landfarm at a depth of 2 to 3 feet below ground surface. The sample shall be analyzed for TPH and BTEX. In addition, on an annual basis, this sample shall also be analyzed for general chemistry parameters and total metals.

12. Analytical results shall be submitted to OCD annually.

Aeration Basin Biotreatment

In prior years, a dense sludge was found to accumulate at the bottom of the aeration basins and this necessitated periodic cleanout. During 2002, Giant conducted a pilot test of a new bio-treatment additive that the manufacturer indicated would inhibit the formation of this sludge. This test proved to be successful and Giant is now requesting a modification to the OCD Discharge Plan to include the use of this additive on an ongoing basis. Additional information regarding this additive is included in Appendix D.

Section 10.0 Inspection, Maintenance, & Reporting

Refinery personnel and contractors routinely conduct inspection, maintenance, and repair of all processing units, systems, tanks, equipment, instrumentation, valves, piping, and other items necessary for the continued operation of the refinery. Some of these activities are conducted under the auspices of applicable regulations (e.g. 29 CFR 1910.119 – OSHA Process Safety Management Standard) and involve detailed recordkeeping and reporting. Specific procedures that relate to sources of liquid effluent and solid waste are described as follows.

Process Wastewater Collection System

Paving, curbing, catch basins, and trenches are routinely inspected for integrity. Previously, a video inspection technique was used to examine sewer system piping and components. As required by OCD, Giant will now begin utilizing the pressure test technique to verify the integrity of sewer system components. Giant proposes to conduct this pressure testing in increments of 20% per year over the next 5 years, until the entire system has been checked. The 20% increment will be based on nominal sewer pipe length and Giant will endeavor to test the most important sections first. This test program will use the OCD methodology and criteria.

The API separator is emptied and inspected annually. If a crack or seam failure is discovered, it is repaired before placing the API separator back in service. It should be noted that the refinery is planning to construct a new API separator during the next year. This new separator will use modern techniques for assuring the integrity of the containment basin.

The benzene strippers are inspected annually. During major maintenance, the packing is removed and cleaned. At this time, the stripper vessels are emptied and internally inspected. If needed, repairs are made before placing the strippers back in service.

Refinery operations personnel routinely conduct visual surveillance of process areas and monitor the integrity of concrete paving, curbing, catch basins, and trenches. Problems with containment systems are reported to the maintenance department for repair.

Storm Water Collection System

Storm water system "Best Management Practices" are described in detail in the Storm Water Pollution Prevention Plan (SWPPP) included in Appendix F.

Storage Tanks, Petroleum, and Chemical Storage Areas

Refinery Operations, Warehouse, Safety, Environmental, Technical Services, and Laboratory Field personnel routinely conduct visual surveillance of storage areas and monitor the integrity of containment and check for leakage or other problems. All incidents and near-misses are reported to refinery management for follow-up action and response. Additional information is included in the refinery ICP and SPCC.

Section 11.0 Spill/Leak Prevention & Reporting Procedures (Contingency Plans)

The Ciniza Refinery has developed, implemented, and is currently utilizing an Integrated Contingency Plan (ICP) as described in the Federal Register Notice "The National Response Team's Integrated Contingency Plan Guidance (One Plan)" dated June 5, 1996 (Volume 61, Number 109, pages 28641 – 28664). This document describes the recommended method for developing and adopting a comprehensive and integrated contingency plan for complying with the numerous and overlapping safety and environmental requirements of OSHA, DOT, EPA, USCG, RSPA and other federal and state regulations. This includes the following regulations.

- EPA Spill Prevention, Control, & Countermeasures Plan (40 CFR Part 112.7)
- EPA Facility Response Plan (40 CFR Parts 112.20 & 112.21)
- EPA Risk Management Program (40 CFR Part 68)
- EPA Contingency Planning Requirements (40 CFR Parts 264, 265, & 279.52)
- USCG Facility Response Plan (33 CFR Part 154, Subpart F)
- DOT/RSPA Pipeline Response Plan (49 CFR Part 194)
- DOT Emergency Response Plans (49 CFR Parts 130 & 172)
- OSHA Process Safety Management Standard (29 CFR 1910.119)
- OSHA Emergency Action Plan (29 CFR 1910.38)
- OSHA Training & Response Requirements (29 CFR 1910.120)
- NMED/OCD Emergency Response Requirements

Included within the ICP is a plan for addressing Spill Prevention, Control, and Countermeasures (SPCC) as required by the Oil Pollution Act (40 CFR Part 112.7). The requirements of the ICP and SPCC encompass and comply with the requirements of NMOCD Rule 116 and WQCC Section 1203.

In addition, a Storm Water Pollution Prevention Plan (SWPPP), as required by Clean Water Act NPDES Multi-sector General Permit requirements, has been developed and implemented.

A copy of the Ciniza Refinery ICP and SWPPP is included as Appendix F.

Section 12.0 Site Characteristics

The Ciniza Refinery is located within a rural and sparsely populated section of McKinley County. The setting is a high desert plain on the western flank of the continental divide. The surrounding land is comprised primarily of public lands and is used for cattle and sheep grazing at a density of less than six cattle or 30 sheep per section. Surface vegetation predominantly consists of native grasses, shrubs, cacti, and small trees. Average rainfall is less than 7 inches per year.

Local topography consists of a gradually inclined downslope from high ground in the southeast to a lowland fluvial plain in the northwest. The highest point on refinery property is located at the southeast corner boundary (elevation approximately 7,040 feet) and the lowest point is located at the northwest corner boundary (elevation approximately 6,860 feet). The refinery processing facility is located on a flat man-made terrace at an elevation of approximately 6,950 feet.

Surface water in this region predominantly consists of the man-made evaporation ponds and aeration basins located within the refinery, a cattle watering pond (Jon Myer's Pond) located east of the refinery, two small unnamed spring fed ponds located south of the refinery, and the South Fork of the Puerco River and its tributary arroyos. The various ponds and basins typically contain water consistently throughout the year. The South Fork of the Puerco River and its tributaries are intermittent and generally contain water only during and immediately after the occurrence of precipitation.

The 810 acre refinery property site is located on a layered geologic formation. Surface soils generally consist of fluvial and alluvial deposits; primarily clay and silt with minor inter-bedded sand layers. Below this surface layer is the Chinle Formation, which consists of very low permeability claystones and siltstones that comprise the shales of this formation. As such, the Chinle Formation effectively serves as an aquiclude. Inter-bedded within the Chinle Formation is the Sonsela Sandstone bed, which represents the uppermost potential aquifer in the region.

The Sonsela Sandstone bed lies within and parallels the dip of the Chinle Formation. As such, its high point is located southeast of the refinery and it slopes downward to the northwest as it passes under the refinery. Due to the confinement of the Chinle Formation aquiclude, the Sonsela Sandstone bed acts as a water-bearing reservoir and is artesian at its lower extremis. Artesian conditions exist throughout the central and western portions of the refinery property.

Groundwater flow within the Chinle Formation is extremely slow and typically averages less than 10^{-10} centimeters per second (less than 0.01 feet per year). Groundwater flow within the surface soil layer above the Chinle Formation is highly variable due to the presence of complex and irregular stratigraphy; including sand stringers, cobble beds, and dense clay layers. As such, hydraulic conductivity may range from less than 10^{-2} centimeters per second in the gravelly sands immediately overlying the Chinle Formation up to 10^{-8} centimeters per second in the clay soil layers located near the surface.

Shallow groundwater located under refinery property generally flows along the upper contact of the Chinle Formation. The prevailing flow direction is from the southeast and toward the northwest; however, a subsurface ridge has been identified and is thought to deflect some flow in a northeasterly direction in the vicinity of the refinery tank farm.

Items Specifically Requested in the OCD Guidance Document

Section A – Hydrologic/Geologic Information

1. Provide the name, description, and location of any bodies of water, streams, or other watercourses; and groundwater discharge sites within one mile of the outside perimeter of the facility. For water wells, locate wells within one-quarter mile of the outside perimeter of the facility and specify use of water.

   The following water bodies are located within one mile of the outside perimeter of the refinery.

   Aeration Basins

   The aeration basins are shown on the plant site drawing in Appendix A.

   Evaporation Ponds

   The evaporation ponds are shown on the plant site drawing in Appendix A.

   Storm Water Retention Areas

   The storm water retention areas are shown on the plant site drawing in Appendix A.

   The South Fork of the Puerco River & its Tributaries

   The South Fork of the Puerco River and its tributary arroyos are shown on the topographical map in Section 3.0.

   Jon Myer's Pond (NE 1/4, Section 34, T15N, R15W)

   Jon Myer's Pond is located approximately one mile east of the plant site and is partially shown on the topographical map in Section 3.0. This pond is a source of water for cattle.

   Unnamed Ponds (NW 1/4, Section 4, T14N, R15W)

   These unnamed ponds are located approximately 1/4 mile south of Interstate 40 and are shown on the topographical map in Section 3.0.

   Unnamed Artesian Surface Seep (south of Pond 9)

   A small marshy area is located south of Evaporation Pond No. 9. This marsh results from a surface seep of artesian water from the Sonsela Sandstone Bed.

2. Provide the depth to and total dissolved solids concentration of the groundwater most likely to be affected by any discharge. Include the source of information and how it was determined. Provide a recent water quality analysis of the groundwater, if available, including name of analyzing laboratory and sample date.

In this permit application, shallow groundwater is defined to be groundwater that lies above the Chinle Formation aquiclude. Shallow groundwater is the groundwater most likely to be affected by any discharge at the refinery.

Shallow groundwater located under the refinery is irregular, intermittent, and frequently discontinuous. As such, it represents an unreliable and unpredictable potential water source, and consequently is not extracted for beneficial use in this region.

Due to irregular surface topography and the inclined nature of the Chinle Formation, depth to groundwater is highly variable in the vicinity of refinery property. Groundwater may be encountered in as little as 1 foot below ground surface in the marsh area south of Pond 9 and as much as 180 feet below ground surface at the northwest corner of the refinery.

Sampling and analysis of shallow groundwater has been ongoing at the refinery since the mid 1980's and this data has been supplied to OCD in the annual groundwater reports.

3. Provide the following information and attach or reference source information.

   a. Soil type(s)

      Soil types vary from fine sands at the southeast boundary of the refinery to highly plastic clays located at the northwestern boundary of the refinery.

      This information was obtained from the Soil Conservation Service McKinley County Soil Map.

   b. Name of aquifer(s)

      The uppermost useable aquifer is the SONSELA SANDSTONE BED located within the PETRIFIED FOREST MEMBER of the CHINLE FORMATION. Mr. Bill Kingsley, P.E, supplied this information.

   c. Composition of aquifer material

      The Sonsela Sandstone Bed is composed of sandstone. This information is from numerous drilling logs. Copies of these logs are included in Appendix C.

   d. Depth to rock at base of alluvium

      Bedrock depth ranges from exposed to over 85 feet below ground surface at the northwest corner boundary.

4. Provide information on:

   a. The flooding potential at the discharge site with respect to major precipitation and/or run-off events

      The alluvial flatlands located at the north, northwestern, and western sections of the refinery are located within a flood plain as shown on the FEMA maps.

b. Flood protection measures

The evaporation ponds are protected against flood impacts by the minimum 8 foot high earthen berms which form the containment of the ponds.

Section B – Additional Information

1. Provide stratigraphic information including formation and member names, thickness, lithologies, lateral extent, etc.

   A stratigraphic profile diagram of the refinery site is provided in Appendix E.

2. Provide generalized maps and cross-sections.

   A plant site drawing is provided in Appendix A and a stratigraphic profile diagram of the refinery site is provided in Appendix E.

3. Provide potentiometric maps for aquifers potentially affected.

   With the implementation of this renewed and modified Discharge Plan, Giant will begin collecting data of groundwater depth. When this information becomes available, Giant will prepare a potentiometric map of the Sonsela Aquifer and submit this map to OCD.

4. Provide porosity, hydraulic conductivity, storativity and other hydrologic parameters of the aquifer.

Porosity	10 - 20 percent
Conductivity	0.01 - 0.05 cm/s

5. Provide specific information on the water quality of the aquifer.

   Sampling and analysis of shallow groundwater has been ongoing at the refinery since the mid 1980's and this data has been supplied to OCD in the annual groundwater reports.

6. Provide information on expected alteration of contaminants due to sorption, precipitation or chemical reaction in the unsaturated zone, and expected reactions and/or dilution in the aquifer.

   The predominant type of contaminant at the refinery is petroleum hydrocarbons.

   Petroleum hydrocarbons are easily adsorbed onto soil particles and tend to remain in the interstitial voids until washed out by precipitation or consumed by microorganisms.

   Petroleum hydrocarbons do not tend to react with soil particles.

Section 13.0 Other Compliance Information

The Ciniza Refinery was constructed in 1957 and has been in near continuous operation since that time. Over the years, various releases of petroleum-based products and other materials have occurred, largely as a result of minor spills, equipment leaks, waste treatment activities, and from former impoundments and disposal sites. As a result, surface soil, subsurface soil, and groundwater has been impacted at various locations and over various time periods spanning the past 46 years.

Some of these sources of prior contamination are now fully remediated, closed, and no longer represent a source of release to the environment. Examples of this include the following Solid Waste Management Units (SWMUs).

Empty Container Storage Area
Old Burn Pit
Landfills Area
Inactive Land Treatment Area and associated Drainage Ditch
Sludge Pits
Secondary Oil Skimmer and associated Drainage Ditch
Old Neutralization Tank and associated Drainage Ditch

Other sources of prior contamination are still in the process of final closure, but never-the-less no longer represent a source of release to the environment. An example of this is the RCRA Land Treatment Unit. Giant is working with NMED to complete the closure of this site and will conduct monitoring for several years under a post-closure care plan.

Some sources of prior contamination are still in the process of investigation or remediation, and consequently may represent a continuing source of release. An example of this is the Tank Farm (SWMU #6). Although the original source of the release (a hole in a storage tank bottom) has been repaired, residual hydrocarbons may still be present in the soil and groundwater located under the Main Tank Farm. A hydrocarbon recovery system has been installed and is continuing to operate. Another example is the Railroad Rack Lagoon (SWMU #8). This former retention pond was taken out of service in the 1980's and no longer receives wastewater from the Railcar Loading Rack. Corrective action is being implemented to remove and treat oily sludge from the lagoon and the site will be closed upon completion of the clean-up plan.

Other SWMUs were previously investigated to determine if they might be a potential source of release to the environment. This includes the Contact Wastewater Collection System (Process Sewer System), the Aeration Basins, and the Evaporation Ponds. Each of these units is an active and vital component of the refinery's wastewater treatment system.

Appendix A

Appendix B

Appendix C

Appendix D

Appendix E

Appendix F

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

June 14, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-696

Mr. John J. Stokes
Giant Refining - Ciniza Refinery
Route 3, Box 7
Gallup, NM 87301

RE: Approval of Landfarm
Discharge Plan GW-032 Modification
Giant Ciniza Refinery
McKinley County, New Mexico

Dear Mr. Stokes:

The **discharge plan modification GW-032 for the Giant Ciniza Refinery Landfarm** located in Section 28 and Section 33, Township 15 North, Range 15 West, NMPM, McKinley County, New Mexico, **is hereby approved** under the conditions contained in the enclosed attachment. The discharge plan modification consists of the landfarm application and its contents dated April 12, 1995.

The discharge plan modification application was submitted pursuant to Section 3-106 of the New Mexico Water Quality Control Commission Regulations. Please note Sections 3-109.E and 3-109.F which provide for possible future amendments or modifications of the plan. Please be advised that the approval of this plan does not relieve Giant Refining Co. of liability should the operations associated with this facility result in pollution of surface water, ground water, or the environment. In additon, OCD approval does not relieve Giant of responsibility for compliance with any other Federal, State, or Local laws and/or regulations.

Please be advised that all exposed pits, including lined pits and open top tanks (tanks exceeding 16 feet in diameter), shall be screened, netted, or otherwise rendered nonhazardous to wildlife including migratory birds.

Please note that Section 3-104 of the regulations requires that "When a plan has been approved, discharges must be consistent with the terms and conditions of the plan." Pursuant to Section 3-107.C you are required to notify the Director of any facility expansion, production increase, or process modification that would result in any change in the discharge of water quality or volume.

This modification approval to the existing discharge plan will expire August 14, 1996, and you should submit an application for renewal in ample time before this date.

The discharge plan modification for the Giant Refining Co. Ciniza GW-032 is subject to the WQCC Regulation 3-114 discharge plan modification fee. Every billable facility submitting a discharge plan for modification shall be assessed a fee equal to the filing fee of fifty dollars ($50) plus the flat fee of three-thousand, nine-hundred and ten dollars ($3910) for Refineries filing for modification of existing discharge plans.

The filing fee and flat fee for the approved discharge plan modification has not been received by the OCD. The checks should be submitted to the **NMED - Water Quality Management** through the NMOCD office in Santa Fe, New Mexico.

On behalf of the staff of the Oil Conservation Division, I wish to thank you and your staff for your cooperation during this discharge plan review.

Sincerely,

William J. LeMay
Director

WJL/pws
Attachment

XC : Denny Foust

ATTACHMENT TO OCD PERMIT APPROVAL
Giant Refining Co. Ciniza Refinery
(June 14, 1995)

LANDFARM OPERATION

1. All operating procedures where not specified below will be adhered to as outlined in the application as submitted by Mr. John Stokes with Giant Refining dated April 12, 1995.

2. The facility will be fenced and have a sign at the entrance. The sign will be legible from at least 50 feet and will contain the following information: a) name of the facility, b) the permit number GW-032, c) location by section, township and range, and d) emergency phone number.

3. An adequate berm will be constructed and maintained to prevent runoff and runon for that portion of the facility containing contaminated soils.

4. All contaminated soils received at the facility will be spread and disked within 72 hours of receipt.

5. Soils will be spread in six inch lifts or less.

6. Soils will be disked a minimum of once every two weeks to enhance biodegradation of the contaminants.

7. Successive lifts of contaminated soils will not be spread until a laboratory measurement of Total Petroleum Hydrocarbons (TPH) in the previous lift is less than 100 parts per million (ppm), and the sum of all aromatic hydrocarbons (BTEX) is less than 50 ppm, and the benzene concentration is less than 10 ppm. Comprehensive records of laboratory analysis and the sampling locations will be maintained at the facility. Authorization from the OCD will be obtained prior to the spreading of successive lifts and/or removal of the remediated soils.

8. Only oilfield wastes regulated by the OCD which are exempt from RCRA Subtitle C regulations or non-hazardous by characteristic testing will be accepted at the facility. Solids from operations not currently exempt under RCRA Subtitle C or mixed exempt/non-exempt solids will be tested for the appropriate hazardous Characteristics and submitted to OCD for approval prior to acceptance. Comprehensive records of all laboratory analyses and sample locations will be maintained by the Giant Refining Co.

9. Moisture will be added as necessary to enhance biodegradation and to control blowing dust. There will be no ponding, pooling or runoff allowed. Any ponding of precipitation will be removed within seventy-two (72) hours of discovery.

10. Enhanced bio-remediation through the application of microbes (bugs) and/or fertilizers will only be permitted after prior approval from the OCD. Request for the application of microbes must include the location of the area designated for the bioremediation program, composition of additives, and the method, amount and frequency of application.

11. No free liquids or soils with free liquids will be accepted at the facility.

12. Comprehensive records of all materials received at the facility will be maintained at the facility. The records for each load will include: a) the origin, b) date received, c) quantity, d) exempt or non-exempt status and analyses for hazardous constituents if required, and e) exact cell location and any addition of microbes, moisture, fertilizers, etc.

TREATMENT ZONE MONITORING

1. One (1) background sample will be taken from the center portion of the landfarm two (2) feet below the native ground surface. The sample will be analyzed for total petroleum hydrocarbons (TPH), general chemistry, and heavy metals using EPA approved methods.

2. A treatment zone not to exceed three (3) feet beneath the landfarm will be monitored. A minimum of one random soil sample will be taken from each cell, with no cell being larger than five acres, six (6) months after the first contaminated soils are received in the cell and then quarterly thereafter. The sample will be taken at two (2) to three (3) feet below the native ground surface.

3. The soil samples will be analyzed using approved EPA methods for TPH and BTEX quarterly, and general chemistry and heavy metals annually.

4. After obtaining the soil samples the bore holes will be filled with an impermeable material such as bentonite cement.

REPORTING

1. Analytical results from the treatment zone monitoring will be submitted to the OCD Santa Fe Office within thirty (30) days of receipt from the laboratory.

2. The OCD will notified of any break, spill, or any other circumstance that could constitute a hazard or has potential to result in contamination in accordance with OCD Rule 116 and WQCC section 1-203.

CLOSURE

The Giant will notify the OCD upon cessation of operations. Upon cessation of landfarming operations for six (6) consecutive months, the Giant will complete cleanup of constructed facilities and restoration of the facility site within the following six (6) months, unless an extension is granted by the Director of the OCD. When the facility is to be closed no new material will be accepted. Existing soils will be remediated until they meet the OCD standards in effect at the time of closure. The area will then be reseeded with indigenous grasses and allowed to return to its natural state. Closure will be pursuant to all OCD requirements in affect at the time of closure.

GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

November 17, 1995

Mr. William J. LeMay
Oil Conservation Division
New Mexico Energy, Minerals, and Natural Resources Department
2040 South Pacheco
Santa Fe, New Mexico 87505

Re: Discharge Plant GW-032 Modification Fee - Landfarm Approval

Enclosed with this letter is a check in the amount of $3,960.00 to cover the permit modification and filing fees for a modification to Giant Refining Company's OCD discharge permit GW-032 for Giant's Ciniza refinery. This fee was requested in your modification approval letter dated June 14, 1995. Due to an oversight on Giant's part, payment of this fee was inadvertently overlooked. I apologize for the delay.

Thank you for your staff's assistance in the permit modification process.

Sincerely,

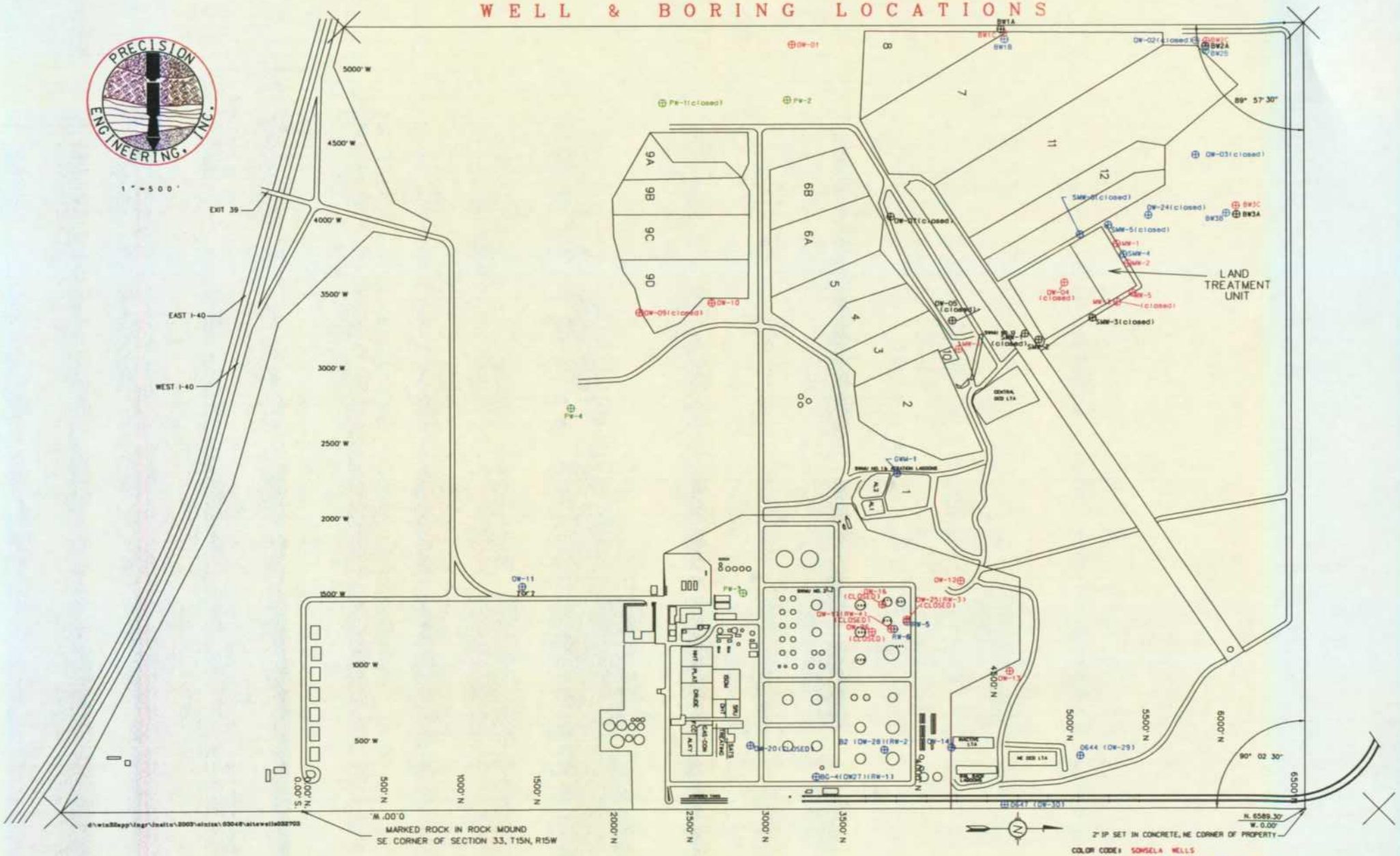
David C. Pavlich

David C. Pavlich
Health, Safety, and Environmental Manager
Giant Refining Company

[SRP\WPDOCS\WJL1117.95]

CINIZA REFINERY

WELL & BORING LOCATIONS



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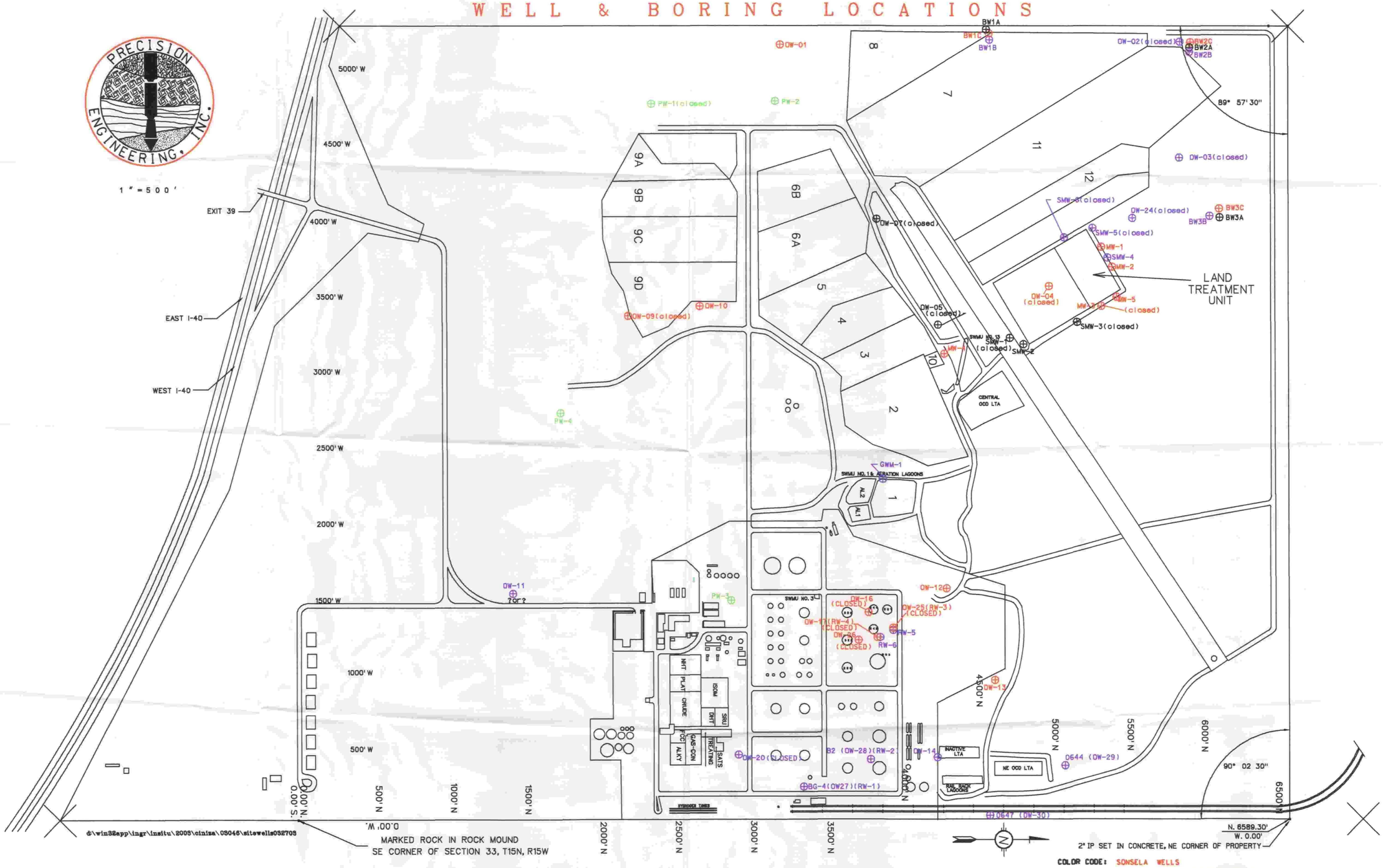
CINIZA REFINERY

WELL & BORING LOCATIONS

PRECISION ENGINEERING, INC.

1" = 500'



COLOR CODE: SONSELA WELLS
CHINLE/ALLUVIUM INTERFACE WELLS
UPPER SAND WELLS
RAW WATER PRODUCTION WELL

NOTE: CLOSED = ABANDONED

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History of Drilling Water Well No. 2

North Well

Well No. 2 was spudded in on September 24, 1956, by a Franks 5,000 Rotary Rig owned by The Barron Drilling Company of Farmington, New Mexico. A 12-3/4" bit was used to a depth of 227 feet, the depth at which the alluvial fill was depleted and no further surface water was encountered. The hole was then reamed with a 20" reamer back to the 227 foot level and 16" O.D. casing was set and cemented by The Halliburton Company. It should be noted that the sand stratum in this well carried much deeper than in Well No. 1. A total of 200 sacks of cement was used to cement the 227 feet of surface casing.

The hole was reduced to a 15" hole, using a 12-3/4" bit after the cement had set for 24 hours. The drilling was moderately easy until a hard formation was hit at 312 feet and continued through the stratum at 390 feet. The conglomerate at 390 feet did not contain water although it had all the necessary characteristics. From 400 feet to 580 feet, the stratum was very hard and slow drilling - Mudstone, which contained considerable gypsum and gravel mineral particles. In this formation, there was some mud dilution as it was necessary to bring the mud weight up to 11.0 pounds. The second water pay was hit in the aquifer of sandstone from 580 feet to 620 feet. This was not, however, the Glorietta formation, but does produce some water pay. Drilling became very slow and one more aquifer was hit in the lower red member at 630 feet which produced a small quantity of water. The first indication of the Glorietta was struck at 725 feet but this aquifer is only 15 feet in thickness. However, it seemed to yield considerable water as mud dilution became a problem. It was now necessary to go to 12 pound mud to hold the drive from this level. The main Glorietta formation was struck at 792 feet and carried through to 885 feet.

At 950 feet, a crevice was struck and circulation was lost completely. It was necessary to add over 600 sacks of lost-circulation material before the crevice could be plugged. After circulation was restored, the crevice was cemented by The Halliburton Company from 945 feet to 965 feet and allowed to set for 24 hours. Drilling was then resumed and the hole drilled through the cement with no further trouble. The Yeso formation played out at 1,070 feet and the drilling stopped.

The 12" casing was run and, due to caving, was stuck at 965 feet, the point at which the crevice cementing was terminated. It was then necessary to clear the hole with a 9-3/4" bit and run a second string of pipe. The 8-7/8" O.D. casing was set at 950 feet to 1,075 feet and a cement plug at the bottom.

The well was shot perforated by Schlumberger, six (6) shots to the foot, alternating six shots of jets and six shots of bullets as indicated on the well graph. After perforating, the well flowed 270 gpm artesian and developed 140 pounds shut-in pressure.

Smith Machinery Company ran the pumping test with a 10" turbine set at 600 feet. The results of which indicated that the well will produce 370 gpm steady at 600 feet which is 100 to 150 feet above the main producing aquifer in this well. With submersible pump set at 900 feet, this well should produce at least 500 gpm with no detrimental effects on the well.

J. E. Druley
January 14, 1957

(1)

LITHOLOGIC LOG

CINIZA REFINERY

Water Well No. 2

Material	Thickness (feet)	Depth (feet)
QUATERNARY:		
ALLUVIUM:		
Clay and Sand	74	74
Sand, pale-red (10R 4/2), very fine to medium grains; subangular to rounded; clear and frosted quartz, minor dark minerals and gypsum; weak calcareous cement	116	190
TRIASSIC:		
CHINLE FORMATION:		
Petrified Forest member:		
Mudstone, grayish-red (5R 4/2) mottled with white; minor dark minerals	10	200
Sandstone, grayish-red-purple (5RP 4/2) and white, very-fine to medium-grained; poorly sorted; subangular to rounded grains; frosted to clear quartz, minor to abundant dark minerals; calcareous; some mudstone, possibly caved from higher zone.	30	230
Siltstone, grayish-red-purple (5RP 4/2) and white; some clay and medium to coarse sand; minor dark minerals	30	260
Mudstone, grayish-purple (5RP 4/2) and white; some shaly partings; minor gypsum; noncalcareous Mudstone, white to light-gray (N7); some gypsum; non-calcareous Mudstone, grayish-red-purple (5RP 4/2) and light-gray (N7); minor gypsum; sandy in lower part, quartz and dark minerals; noncalcareous	50	310

	Thickness (feet)	Depth (feet)
Sandstone, grayish-red (5R 4/2), very-fine to very-coarse grained; gravel up to 6mm across; angular to subangular; pebbles are sandy siltstone; some clay; noncalcareous - small gravel scattered.	30	340
Siltstone, grayish-red (5R 4/2); fine to coarse sand and pebbles of sandstone and siltstone common; limonite and dark minerals rare; calcareous. Siltstone, grayish-red (5R 4/2) and white; very fine to fine frosted grains of quartz sand; dark minerals common, mica rare, secondary calcite abundant. Siltstone, grayish-red (5R 4/2); limonite and dark minerals rare; gypsum abundant; calcareous	50	390
Conglomerate, grayish-red (5R 4/2) and white, very-fine to fine pebbles of siltstone and sandstone, angular to subrounded; some calcareous material	10	400
Mudstone, grayish-red (5R 4/2); slightly shaly parting; minor limonite; noncalcareous; some gravel Mudstone, grayish-red (10R 4/2) to grayish-red-purple mottled with white; minor limonite; calcareous Mudstone, grayish-red (10R 4/2) to grayish-red-purple; minor limonite; calcareous; very-fine to fine gravel composed of grayish-red siltstone and sandstone common, more dark minerals in gravel than in 390-400 foot interval Mudstone, grayish-red (10R 4/2); gypsum common; calcareous Mudstone, grayish-red (10R 4/2) to dark-reddish-brown (10R 3/4); partly sandy; quartz and dark minerals rare, gypsum abundant; calcareous	178	578
Lower Red member:		
Sandstone, light-gray (N7) to grayish-red-purple (5RP 4/2), very-fine grained to silty; poorly sorted; abundant quartz and dark minerals, minor limonite; calcareous		
Sandstone, light-gray (N7) to grayish-purple (5RP 4/2), very-fine grained to coarse grained; poorly sorted; some very-fine gravel; grains are stained and frosted quartz, minor dark minerals, and siltstone; calcareous; gravel increases in lower part	43	621
Mudstone, grayish-red-purple (5RP 4/2) and white; minor gypsum; some clear to frosted quartz sands and minor dark minerals; calcareous Mudstone, pale-reddish-brown (10R 5/4) and white; gypsum common; some sand and gravel; calcareous	24	645
Sandstone, light-brownish-gray (5YR 6/1) to pale-reddish-brown (10R 5/4), very-fine to medium-grained; poorly sorted; stained and frosted quartz abundant, dark minerals common, limonite rare; noncalcareous	26	671

	Thickness (feet)	Depth (feet)
Siltstone, pale-red (10R 6/2), well sorted; minor sand; calcareous	43	714
Shinarump member:		
Mudstone, grayish-red (10R 4/2) and mottled white; angular to subangular sand and gravel common; grains are chiefly light-gray sandstone, greenish-gray siltstone, and grayish-red-purple mudstone, minor limestone	5	719
Siltstone, pale-red (10R 6/2), poorly sorted; stained quartz sand common, minor dark minerals and limonite; calcareous	5	724
Moenkopi formation:		
Sandstone, pale-red (10R 6/2) to yellowish-gray (5Y 8/1), medium to very-fine grained and silty; poorly sorted; chiefly clear quartz, minor stained quartz and dark minerals, mica rare; calcareous; some limestone and mudstone pebbles. Sandstone, silty, grayish-orange-pink (5YR 7/2), fine grained; well sorted; clear quartz, minor dark minerals and limonite; weak calcareous cement	15	739
Siltstone, grayish-red-purple (5RP 6/2); well sorted; minor dark minerals; strongly calcareous	11	750
Mudstone, grayish-red-purple (5RP 6/2), grayish-red (10R 4/2), and light-gray (N7); minor dark minerals and limonite; noncalcareous Mudstone, light-gray (N7) to grayish-red-purple (5RP 4/2), light color caused by leaching; some sand and very-fine to fine gravel; curved partings prominent; dark minerals common; noncalcareous	32	782
Conglomerate, various colors, fine to medium grained; angular to subrounded; pebbles are chiefly medium-dark-gray (N4) cherty limestone	10	792
PERMIAN:		
GLORIETTA FORMATION:		
Sandstone, grayish-orange-pink (5YR 7/2), very-fine to fine grained; medium sorting; subrounded to rounded; clear quartz, minor dark minerals and limonite; strong calcareous cement Sandstone, grayish-orange-pink (10R 8/2) and yellowish-gray (5Y 8/1), very-fine to fine grained; some silt; minor dark minerals, limonite common, highly calcareous	93	885

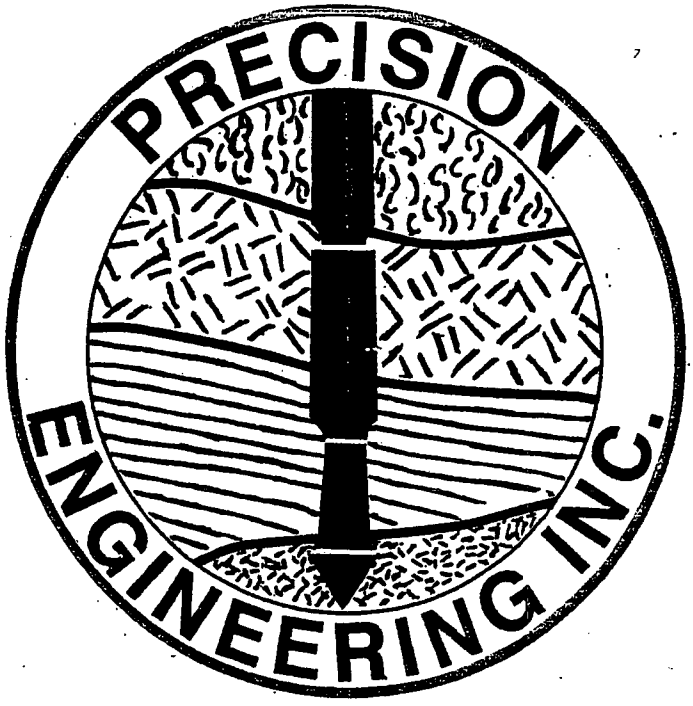
	Thickness (feet)	Depth (feet)
YESO FORMATION:		
Upper member:		
Mudstone, grayish-red (10R 4/2); grayish-red-purple (5RP 4/2), and light-gray (N7); dark minerals rare, minor limonite; partly calcareous	10	895
Sandstone, grayish-orange-pink (5YR 7/2) to pale-red (10R 6/2), very-fine to fine grained; subrounded to rounded; minor dark minerals and limonite; calcareous Sandstone, very-pale-orange (10YR 8/2), very-fine grained and silty; sorting poor to medium; clear quartz; silica cement; dark minerals and limonite rare; noncalcareous	55	950
Crevice	10	960
Sandstone, moderate-orange-pink (5YR 8/4), very-fine to fine grained and silty; poorly sorted; clear to frosted quartz, silica cement; dark minerals and limonite rare; calcareous Sandstone, pale-red (10R 6/2) to pale-brown (5YR 5/2), very-fine to fine grained and silty; clear and stained quartz, dark minerals and limonite common; calcareous Sandstone, white to pinkish-gray (5YR 8/1), very-fine grained; subrounded; sorting good; clear quartz, silica cement, dark minerals and limonite rare; noncalcareous	80	1,040
Siltstone, light-brown (5YR 6/4) to moderate-brown (5YR 4/4); has appearance of soil; some quartz sand and bands of white calcareous material; highly calcareous Siltstone, grayish-red (5R 4/2) and white; grains of frosted quartz and dark minerals rare; medium calcareous; some light-olive-gray (5Y 6/1), finely crystalline limestone and some dark minerals and mica in lower part; noncalcareous	10	1,050
Sandstone, light-olive-gray (5Y 6/1) and yellowish-gray very-fine grained and silty; some medium quartz grains; poorly sorted; noncalcareous; some greenish-gray (5GY 6/1) calcareous mudstone	20	1,070
Mudstone, grayish-red (5R 4/2); fine grained quartz and dark minerals common; calcareous	5	1,075

J.E.D.
1/14/57

Well #4

Post-it® Fax Note 7671	Date 10/8/03	# of pages ▶ 21
To Diane Baines	From D Madrini	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # 505-326-3747	Fax #	

January 27, 2000



Ciniza Refinery Water Well #4

Gallup, New Mexico

File No.: 99-058

Submitted To:

Mr. Eddie Stalcup
Giant Refining Company
Route 3, Box 7
Gallup, New Mexico
87301

History of Drilling Water Well #4
Ciniza Refining Company

The well was spudded in on November 12, 1999 with a Gardner-Denver 2000, Rig #10, owned and operated by United Drilling Inc. of Roswell, NM. The pilot hole was drilled using a 7 7/8" J33 (carbide button) bit to depth of 175' to a sandstone bed competent to anchor the surface casing below the alluvium and shallow water producing zones. The Sonsela member of the Chinle Formation was encountered at a depth of 15' to 85' which produced some water (not measured) that thinned the drilling mud.

The hole was reamed to 32" with three passes. The first was a 17 1/2" mill tooth bit and the hole extended an additional five feet to allow for the length of the reamer and pilot bit. The mill tooth seemed to drilled faster than the button bit, especially in the mudstone. The 17 1/2" bit was used as the pilot for the 24" reamer and also on the 32" reamer. Both reamers had open ports, not jets, at the cones, which did not keep the mudstone from balling up on the cones and slowed drilling.

Twenty four inch surface casing was run to a depth of 175'. The casing was a welded, flush joint. Concern was expressed by the drilling contractor that the casing might collapse if cemented in one stage so it was decided to cement in two stages. Cement was tremmied from bottom to top by the drilling contractor. Two yards of concrete were required to bring the cement to surface after shrink back.

A 9 7/8" mill tooth bit was used to extend the pilot hole from below the surface casing. The mill tooth penetrated the mudstones better than the previously used button bit.

Sloughing of the mudstones in the Chinle Formation mixed with cuttings throughout the hole masking the strata being drilled. After electric/nuclear logs were run, the strata could better be determined.

Formation water began thinning the drilling mud at 570', interbedded sandstone and mudstone were encountered at this depth. An increase in pit volume was apparent at 620'. Drilling had stopped at 650' for the night and was flowing 13.5 gallons per minute the next morning. The drilling contractor had been working daylight tour only but began 24 hour operations when the well started flowing. The viscosity was increased from 45 to 55 and the weight increased from 9.9 to 11.5 lbs./gal. This viscosity and weight stabilized the water flow but not the sloughing of the Chinle formation. Drilling rates averaged 5 minutes per foot.

Hard sandstone was encountered at 655'. The bit seemed to be locked up at 735' but when pulled for inspection it was undergauge and replaced. A 9 7/8" button bit was installed and reamed 150' back to bottom. After 240' of dense sandstone drilling was stopped and the hole was logged. Using the E-logs and neutron-density logs the formations were identified and it was decided to continue drilling.

A 7 7/8" inch button bit (original pilot bit) was used and more collars were added to increase weight. Until this point the hole had remained almost vertical but started deviating dramatically with the extra weight.

Limestone was encountered at 1060' which is in the Yeso Formation and drilling was stopped at 1076'.

Reaming for the production casing began from the bottom of the surface casing to 775' with a 17 1/2" bit. A cone from the 17 1/2" bit was lost and was washed to the bottom with the 7 7/8" bit. The reaming was accomplished using 9 lbs./gal. mud to make up volume and allowed to thin as the well began to flow.

A 13 3/8" threaded casing was to be run from surface to 750' but because of deviation the casing could only be run to 733'. The casing was cemented from the bottom to top by BJ Well Services from Farmington, NM.

The hole was reamed with a 12 1/2" bit from 775 to 1075' and the well was completed open hole below 733'.

Initial flow rate after drilling was 120 gallons per minute with dissolved solids at 1300 ppm.

To increase production the Lower Chinle Formation was perforated. The casing was perforated by Schlumberger from 560'-715' at eight shots per foot using tubing guns with jet shot.

The initial flow rate after perforation was approximately 150 gallons per minute and dissolved solids at 600 ppm.

CINIZA WATER WELL #4
(Replacement of water well #1)

UNITED DRILLING CO. Roswell, NM
Rig #10, Gardner-Denver 2000
Measurements from kelly bushing 6' above ground
Bit 7 7/8" J33 button bit.

11-12-99
Alluvium

0-5 Sand, fine to medium, red-brown, sub angular, chert, quartz-frosted; some petrified wood pieces, some clay.

5-10 Gravel, sandy, coarse, sub-angular, sandstone, quartz, chert.

10-15 Clay, red-brown, slightly sandy.

Chinle Formation
Petrified Forest Member

Sonsela Sandstone Bed (12')

15-20 Sandstone, fine to medium, quartz, chert.

20-25 Sandstone, fine, mainly quartz, some frosting, sub-rounded to rounded, chert.

25-30 Sandstone, fine, well sorted, calcite cemented, sub-rounded, typically frosted ~1% dark lithics, cuttings are coarse sand size. Hard drilling.

30-35 Same as above.
33-34' mudstone stringer.

11-13-99

35-40 Sandstone, very fine, well sorted, round to sub-rounded, some frosting, dominately quartz, <10% other, <1% dark lithics. Easier drilling

40-45 Same as above, ~1% dark lithics, some shaly stringers.

45-50 Same as above, dense again at 50'.

50-55 Same as above with shaly stringers throughout, sandstone is dense, chert/quartz fine grains, quartz rounded, frosted 50%; shale is dark red to purple; chert appears to be associated with the shale, shaly @ 54'.

55-60 Shale/mudstone purple with light blue to white chert.

60-65 Shale/mudstone purple to dark red, some grey pieces, dense, shale/mudstone interbedded ~1'.
Drilling Rate: 2 min/ft.

65-70 Mudstone/shale interbedded, some chert/silicious chips, some blue-green shale, white appears to be gypsum, very soft/friable when wet, suspect high montmorillonite content.

70-75 Sandstone, fine, well sorted, 1% dark lithics, few limestone pieces, silica cemented, hard drilling.

75-80 Sandstone, quartz, well sorted, very fine, silica cemented hard (mature); some thin shale interbeds (dark purple), hard, fissile, softens in water (montmorillonite?); some black shards of silica rock with copper colored veins (phlogopite).

80-85 Sandstone, white well sorted, very fine, rounded to well rounded, weaker than above.

85 Bottom of Sonsela Sandstone Bed

85-90 Mudstone-shaly (fissile) soft, purple to white or light grey, fissile, feels sticky (montmorillonite), some quartz grains, relatively easy drilling.

90-95 Same as above with 10% white pieces, purple primary, very sticky and soft when wet.

95-100 Same as above.

100-105 Same as above some blue-green interbedded with purple layers.

105-110 Same as above.

110-115 Same as above.

115-120 Same as above, slightly more light green to white mudstone.

Deviation survey @ 100' = 1/2 degree.

120-125 Same as above.

125-130 Same as above.

130-135 Same as above.

135-140 Same as above.

140-145 Same as above, slightly denser drilling, slightly brighter red-purple.

145-150 Same as above, softer drilling.

150-155 Same as above, firmer drilling ~1ft/min.

155-160 Same as above.

160-165 Same as above.

165-170 Same as above.

170-175 Same as above. @172 hard drilling. Very fine sandstone, some chert interbedded with sandstone. Drilling rates as follows: 172-173: 6 min; 173-174: 3 min; 174-175: 12 min. Circulate to run casing.

Terminated pilot hole to ream for surface casing.

Went from 7 7/8" bit to 17 1/2" bit.

11-14-99
Began reaming 17 1/2" hole, slow drilling in sandstone, 80' drilled.

11-15-99
Deviation survey @ 90' = 1/4 degree. (5.25"/100')

Sonsela making some water and diluting mud, mixed mud.

175-180 Same as above, easier drilling with the mill tooth bit. Sandstone, very fine, super mature, white, well sorted silica cement, interbedded with mudstone.

Increased depth of hole to allow for the larger reamers to reach the 175' depth.

Deviation survey @ 160' = 1/8 degree. (2"/100')

11-16-99
Start drilling 24" hole.

11-17-99
Drill 24" hole to 135' progress slow. Pull bit to inspect, cones are clogged with clay.

11-18-99
Mix mud, clean off pilot bit and reaming bit, finish reaming 24" hole.

11-19-99

Begin Reaming 32". Using 32" reamer with 17 1/2" pilot. Cannot get 17 1/2" plus 24" and 32" reamer in the hole since substructure is only 6 feet high.
Thirty two inch bit may "waller" unless lightly loaded.

11-20-99
Ream 32" hole.

11-21-99
Ream 32" hole.

11-22-99
Finish reaming 32" hole, condition and circulate hole. Lay down pipe and collars and reamer, run tremmie pipe, remove rotary table. 1:30-4:00pm wait on orders. Giant agreed to allow structural welders to place surface casing-will not allow on production casing. 4:00-7:30 pm run 175' of 24" casing and cutoff.

11-23-99
Replace rotary table, adjust tremmie, place first 8 yards of cement on outside of casing.

11-24-99
Place second 8 yards of cement.

11-25-99 thru 11-28-99
Shutdown for Thanksgiving.

11-29-99
Place 2 yards concrete at top of casing (15'). Mixed mud began drilling 9 7/8" SDC mill tooth bit (Smith) 1:30 pm.

180-185 Siltstone, hard, white/light tan, slightly cemented, some carbonate pieces (appears to be cement); some mudstone.

185-190 Mudstone, (claystone) dense, grey-blue to light brown, some very thin siltstone lenses.

190-195 Same as above.

195-200 Same as above.

200-205 Mudstone, dense, blue-grey, more siltstone than above, some chert/quartz grains, amber to yellow-brown in the (claystone, siltstone) matrix.

205-210 Same as above.
Drilling Rate: 2.5 min/ft.

210-215 Same as above, better cutting returns.

215-220 Sandstone, 50%, red-purple, very fine, well sorted, stained yellow, effervesces with HCl; mudstone, 50%, red-purple and white (soft), chert.

220-225 Mudstone, red-purple, white (soft), no sandstone, clear quartz with impurities (black specs).

225-230 Same as above.
Drilling Rate: 225-235 1ft/min.

230-235 Same as above, amber quartz grains.

235-240 Same as above, 2% sandstone, clear and stained (yellow to red) effervesces.

240-245 Same as above, 1% stained sandstone, chert.

245-250 Same as above, no sandstone, plus chert.

250-255 Same as above, 1% clear sandstone, chert.

255-260 Same as above.

260-265 Mudstone, red-purple, 2% blue-grey, no sandstone or chert.

265-270 Same as above, 10% blue-grey.

270-275 Same as above, 30% blue-grey.

275-280 Same as above.

Deviation survey @ 248' = 1/4 degree.

Stuck in hole at 275' cuttings fell back in and stuck bit while running deviation survey. Circulated and freed pipe.

11-30-99
Mud flowing from casing approximately 1 gpm.
Viscosity 36 seconds.

280-285 Mudstone, Same as above.

285-290 Sandstone/siltstone interbedded. Sandstone is partially silica cemented, some carbonate cemented (50%/50%), multicolored silica particles in sandstone; siltstone is red-purple, weak (easily broken). Sandstone 60% of section.

290-295 Sandstone/siltstone, with interbedded dark lithic particles (50%), 40% sandstone, siltstone is more competent (dense). Drilling Rate: 2 ft/min.

295-300 Same as above, slightly more siltstone, 70%, red-purple.

300-305 Sandstone, (70%) white, little staining, carbonate cement; some mudstone, 80% red-purple, 20% blue-green. Drilling Rate: 2 min/ft

305-310 Mudstone, red-purple, some minor sandstone pieces (likely washed up), some limonite staining. Drilling Rate: 2 min/ft.

310-315 Same as above.

315-320 Same as above.

320-325 Same as above, 10% sandstone

Viscosity 46 seconds.

325-330 Mudstone, red-purple 90%, grey 5%, sandstone 5%.

330-335 Same as above.

335-340 Same as above, no sandstone.

340-345 Same as above.

345-350 Same as above. Drilling Rate: 1 min/ft.

350-355 Same as above.

Viscosity 45 seconds

355-360 Same as above. Drilling Rate: 3 min/ft.

360-365 Same as above.

365-370 Same as above.

370-375 Same as above, purple mudstone, firmer. Drilling Rate: 4 ft/min.

Deviation survey @ 248' = 1/4 degree.

375-380 Same as above. Viscosity 46 seconds;

380-385 Same as above.

385-390 Same as above. Drilling Rate: 2 min/ft.

390-395 Same as above.

395-400 Same as above but brighter red, some very thin gypsum plates.

400-405 Same as above, firmer, especially the blue-grey material
Drilling Rate: 4 min/ft.

405-410 Mudstone, brown-red, firmer.

Viscosity: 46 seconds; Weight: 8.9 lbs/gal.

410-415 Same as above.

415-420 Same as above.

420-425 Same as above.

425-430 Same as above. Drilling Rate: 3-4 min/ft.

430-435 Same as above.

435-440 Same as above.

440-445 Same as above. Drilling Rate: 1-2 min/ft.

Viscosity: 44 seconds; Weight: 9.9 lbs/gal.

445-450 Same as above.

450-455 Same as above.

455-460 Same as above. Dense.

12-1-99

Well flowing 1 gpm.
Viscosity: 46 seconds; Weight: 9.1 lbs/gal.

460-465 Same as above.

465-470 Same as above.

Deviation survey @ 435' = 3/8 degree.

470-475 Same as above.

475-480 Same as above (mainly claystone).

Viscosity: 43 seconds; Weight: 9.3 lbs/gal.

480-485 Same as above, slightly more red, some blue-grey mottling ~15%. Pits gaining volume.

485-490 Mudstone, red-brown, red-purple, 5-10% grey mottling; siltstone, yellow-red, brown, slightly calcareous.

490-495 Same as above.

495-500 Same as above.

500-505 Same as above.

505-510 Same as above with ~2% sandstone white and dark lithics (50%-50%).

510-515 Same as above.

515-520 Same as above.

520-525 Same as above.

Viscosity: 58 seconds; Weight: 9.9 lbs/gal. Mixed 10 sacks gel.

525-530 Same as above with some siltstone; ~10% sandstone, white, hard, calcareous cement, quartz (50%) dark lithics (50%), very fine grained.

530-535 Same as above with ~1% sandstone.

535-540 Same as above.

Viscosity: 48 seconds; Weight: 9.9 lbs/gal.
Drilling Rate: 2 min/ft.

540-545 Same as above.

Blue Water Creek and Shinarump Undifferentiated

545-550 Same as above, 50% grey, 50% red, soft to firm .

Drilling Rate: 4 min/ft.

550-555 Same as above with some gypsum.

555-560 Same as above.

Drilling Rate: 5 min/ft from 558-573. (At 573' increased rotation speed to try to increase drill rate)

560-565 Same as above some firmer grey.

565-570 Same as above, 60% red, 40% grey

570-575 Same as above, 70% red, 30% grey.

575-580 Same as above, 50% grey, 50% red, a few sandstones grains.

580-585 Same as above.

585-590 Same as above, ~2% sandstone, quartz with silica cement.

590-595 Same as above some limonite.

Drilling Rate: 5 min/ft.

595-600 Same as above, a little siltier, 5% sandstone, very fine to fine, some limonite staining.

Viscosity: 43 seconds; Weight: 9.9 lbs/gal.

600-605 Same as above, silty mudstone, white and yellow stained, sandstone 10%.

605-610 Same as above with red sandstone, 15%.

610-615 Same as above, 5% sandstone.

615-620 Same as above, 5% sandstone. Less limonite.

Viscosity: 39 seconds; Weight: 9.9 lbs/gal.

620-625 Same as above, 3% sandstone.

Pit volume appears to have increased since morning.

625-630 Same as above.

630-635 Same as above.

Mixed mud. Viscosity: 57 seconds; Weight: 10.0 lbs/gal.
Larger and more cuttings. 30% sandstone (origin?)
Lowered pit approximately 1 foot at 2:30 pm. Full again at 4:30 pm.

635-640 Silty mudstone, red, firm to soft; sandstone, red, soft, very fine, slightly calcareous cement.

640-645 Sandstone, red-purple, some white, some mudstone, primarily siltstone, sandstone is typically dark colored minerals, very fine but some larger particles, rounded, some limonite.
Drilling Rate: 5 min/ft.

Viscosity: 56 seconds; Weight: 10.4 lbs/gal.

645-650 Sandstone, clean, well rounded, quartz and dark lithics, silica cement, some limonite stained.

Viscosity: 55 seconds; Weight: 10.6 lbs/gal.

12/3/99

Well flowing-estimate 10 gpm (end of pipe not reachable)

12/4/99
Flowing clear - measured 13 1/2 gpm

Deviation survey @623' = 7/16 degrees.

Drilling Rate: 2 min/ft.

650-655 Sandstone, red; mudstone, grey, most likely cave in.

Viscosity: 55 seconds; Weight: 11.5 lbs/gal.

655-660 Same as above, 5% light grey sandstone, well rounded, quartz, silica cement.

660-665 Sandstone, red, very fine, 5% light grey sandstone, red and white chert, grey mudstone, some gypsum.

665-670 Sandstone, red, 50%, some light grey sandstone, some limonite; grey, mudstone.

670-675 Same as above. Red sandstone consists of quartz, sub-rounded, red stained, very fine; grey mudstone.
Drilling Rate: 4 min/ft.

675-680 Mudstone, grey; sandstone, light red, soft; siltstone, firm. Small piece of well rounded gravel (silica), 20% purple silty mudstone.

680-685 Sandstone, light red, soft, 50%; light grey sandstone, firm, 20%; 10% of sandstone is strongly calcareous; purple silty mudstone.
Drilling Rate: 4-5 min/ft.

Viscosity: 50 seconds; Weight: 11.5 lbs/gal.

685-690 Sandstone 60% light red; 20% purple siltstone; 20% grey mudstone, some dark grains and is firmer.

690-695 Sandstone, 80%; light red, soft, very fine, well sorted, stained quartz, and light grey, finer, lithics in well sorted quartz, calcareous; 20% silty, grey mudstone; some limestone.

695-700 Light red, well sorted, soft, calcareous sandstone; medium grey mudstone, silty, some limonite.
Drilling Rate: 10 min/ft.

700-705 Sandstone, red-brown, firm, calcareous when crushed, very fine, quartz with red stain, pale red, silty to very fine sandstone, hard, quartz and dark minerals, 80%; mudstone, grey and purple mudstone (20%).

705-710 Sandstone, 60% light red; 20% red mudstone; 10% light grey sandstone with limonite; 10% sandstone with angular red mudstone clasts to very fine sand, calcareous when crushed, hard.
Drilling Rate: 10 min/ft

710-715 Same as above.

Pump not pumping well. Viscosity 78. Half of volume as before.

715-720 Same as above with more grey and red mottled mudstone, and gypsum.

Moenkopi Formation (820')

720-725 Sandstone, pale red, 60%, effervesces when broken; mudstone, grey, 20%, 5% mottled; 5% limestone.
Drilling Rate: 10 min/ft, Viscosity 90, Weight 11.5

725-730 Same as above.

Trip bit; locked up

12/5/99
Bit O.K. - 2 jets plugged - clean bit and return trip (did not change bit). Bit in excellent condition otherwise.

Viscosity: 74 seconds; Weight: 11.5 lbs/gal.

Circulate, pebbly chert and other silica rocks, sandstone - pale red, fine not calcareous, quartz grains in pale red matrix, some (approximately 10%) dark lithic rock grains also - also medium grey mudstone (15%) rounded, easily broken by hand. Very slow drilling. Still poor pumping. 730-731 Calcite infilling (1/4") 6:50am - Shut down - no progress (3/4') since 4:40am. Trip bit still locking up. Bit worn, replaced with carbide button, (Security).

12/6/99
Work on pumps. Trip back in hole. Ream 150 feet with new button fit - old button bit was undergauge.
6:15pm - Drilling Rate: 12 min/ft

730-735 Sandstone, pale red to light red, 70%, well sorted quartz, slight staining, red sandstone; 30% grey mudstone, dark purple mudstone.

735-740 Same as above. 10% white sandstone, same characteristics as the pale red - some dark chert, some white mudstone.
Drilling Rate: 20 min/ft.

Viscosity: 50 seconds; Weight: 11.5 lbs/gal.

740-745 Same as above. 10% white mudstone mottled with purple; grainy (gypsum?).
Drilling Rate: 15 min/ft,

Viscosity: 40 seconds; Weight: 11.4 lbs/gal.

745-750 Same as above. Some cherty limestone (?) fizzles some.

Deviation survey @ = 7/16 degrees.

Viscosity: 46 seconds; Weight: 11.5 lbs/gal.

12/6/99
11:50pm - Swivel leaking
Viscosity: 46 seconds; Weight: 11.4 lbs/gal.

750-755 Sandstone, 50% light red, 40% pale red, to 10% white, very fine, well sorted, clear quartz, very fine dark lithics, non-calcareous, angular to sub-angular; 1-2% overall limestone, grey-green to grey. 1% dark red mudstone.
Drilling Rate: 8 - 10 min/ft

755-760 Same as above, effervesces when particles are crushed, mudstone approximately 15%, hard drilling.
Drilling Rate: 8-10 min/ft.

760-765 Same as above, pale red sandstone, frosted, 60%, sandstone is non-calcareous; approximately 10% mudstone, some grey claystone approximately 2%.
Drilling Rate: 12-13 min/ft

Viscosity: 66 seconds; Weight: 11.6 lbs/gal.

765-770 Same as above.

770-775 Same as above, approximately 40% mudstone - dark red/purple with minor grey to light blue white, sandstone still very light red to tan, angular to sub-angular, quartz frosted, well sorted, some red staining gives overall light red color, non-calcareous, red staining very slightly calcareous.

775-780 Same as above. Minor limestone pieces are angular - sub-angular, well sorted quartz, non-calcareous/mudstone is calcareous.

Drilling Rate: 9-10 min/ft. Bit bounced significantly in this interval.

780-785 Same as above. Some clear, some frosted, mainly angular, very fine; approximately 30% purple, 15% grey - blue mudstone.
Drilling Rate: 7-10 min/ft.

Viscosity: 50 seconds; Weight: 11.6 lbs/gal.

785-790 Sandstone, 50% white, quartz, well sorted, very fine, angular to sub-angular dark lithic rock, rare mica, very weakly calcareous; approximately 5% mudstone, primarily blue grey, some brown-red/purple,
Drilling Rate:7-10 min/ft.

790-795 Same as above.
Drilling Rate:6-7 min/ft.

Viscosity: 52 seconds; Weight: 11.8 lbs/gal.

795-800 Same as above.

800-805 Same as above, Drilling Rate:8-10 min/ft.

805-810 Same as above, Drilling Rate:8 min/ft.

810-815 Same as above, Drilling Rate:6-7 min/ft.

Viscosity: 51 seconds; Weight: 11.8 lbs/gal.

815-820 Same as above, Drilling Rate:8-10 min/ft.

820-825 Same as above, Drilling Rate:12 min/ft.

825-830 Same as above.

830-835 Same as above.

835-840 Same as above, some less red,
Drilling Rate:11 min/ft.

Viscosity: 52 seconds; Weight: 11.9 lbs/gal.

840-845 Same as above, more tan, less pale red, 80% tan 20% pale red.
Drilling Rate: 20 min/ft.

Glorietta Formation (846')

845-850 Same as above.
Drilling Rate:5-8 min/ft.

Viscosity: 51 seconds; Weight: 11.9 lbs/gal.

850-855 Same as above, slightly yellow tan-yellow a little easier to break.

855-860 Same as above, only 2% lithics in sandstone.
Drilling Rate:8 min/ft.

Viscosity: 52 seconds; Weight: 11.9 lbs/gal.

860-865 Same as above, less yellow.
Drilling Rate: 10 min/ft.

865-870 Same as above, tan.

Viscosity: 51 seconds; Weight: 11.9 lbs/gal.

870-875 Same as above, some yellow mostly tan, one fracture face with red staining.

Table has been popping some, approximately 30 feet.

875-880 Same as above.
Drilling Rate:10 min/ft.

Viscosity: 55 seconds; Weight: 11.9 lbs/gal.

<u>12/7/99</u>

880-885 Same as above.

885-890 Same sandstone, shows more mudstone (red-purple) than above approximately 30%, many sandstone pieces show fracture dendritic psilomelane, hematite coating on faces, non-calcareous.
Drilling Rate: 20 min/ft.

890-895 Same as above, non-calcareous, angular, clear but some frosted, very fine approximately 15-20% mudstone.

Viscosity: 54 seconds; Weight: 11.9 lbs/gal.

895-900 Mudstone plus sandstone interbeds, sandstone as above, mudstone (887-993), mudstone dark red-purple, non-calcareous, mudstone/sandstone approximately 60/40%, suspect rate in mudstone approximately 40 min/ft, sandstone 6-10 min/ft.

Viscosity: 56 seconds; Weight: 12 lbs/gal.

900-905 Sandstone, same sandstone as above, approximately 20% mudstone, slow drilling appears to be in mudstone.
Drilling Rate: 9-12 min/ft.

Viscosity: 57 seconds; Weight: 12 lbs/gal.

905-910 Same as above.

12/8/99 Drilling 1:05 pm
7 7/8 bit. 15,000 lbs on bit
Drilling Rate:5 min/ft.
Viscosity: 46 seconds; Weight: 11.8 lbs/gal.

910-915 Same sandstone plus slough from trip, mostly red purple mudstone, wall cake balls.

915-920 Sandstone, white as above plus red purple mudstone 50/50%, as above, one piece of light red very, very fine sandstone, non-calcareous, one piece of greenish-grey mudstone, 10% grey mudstone.
Drilling Rate:8-10 min/ft.

920-925 Sandstone-red purple mudstone-grey mudstone (softer than red-purple) 40/30/30%.

925-930 Same as above, sandstone plus red-purple mudstone plus grey mudstone.
Drilling Rate: 12 min/ft.

Viscosity: 48 seconds; Weight: 11.8 lbs/gal.

935-940 Sandstone, white, very few lithics, sub-angular, well sorted, 40%, slightly calcareous when crushed; red brown mudstone 40%; grey plus purple mudstone, 20% mottled together.
Drilling Rate:10 min/ft.

Viscosity: 49 seconds; Weight: 11.9 lbs/gal.

940-945 Sandstone, white to tan (as above); purple plus grey mudstone, soft red brown mudstone, blocky, firmer.

945-950 Same as above.

Yeso Formation (948')
950-955 Red brown mudstone 60% (grey mottled modules); 35% sandstone, very slightly calcareous; 5% greenish grey mudstone.

955-960 Mudstone, red brown, blocky in appearance, 30%; mudstone, red purple, 30%; sandstone, tan white, slightly calcareous, 30%; greenish grey mudstone with quartz sand, lithics were green modules 8%; red sandstone with quartz lithics, banded as to silt and sand, a few grey mud balls.
Viscosity: 48 seconds; Weight: 12 lbs/gal.

Deviation survey @ 928' = 1 1/4 degrees

960-965 Sandstone, light grey (same as above); 40%-mudstone red brown 30%; red purple 5%; light grey mudstone, medium soft 20%; grey mud balls 5%.
Drilling Rate: 10-12 min/ft.

965-970 Sandstone, light grey to tan 60%; red brown mudstone 35%; red purple 5%.

12/9/99 1:20 am

970-975 Sandstone, strongly calcareous when broken, light grey, very fine, angular to sub-angular, quartz, flakes crumble easily, some red brown mudstone washes up with sandstone-suspect washout from above.
Drilling Rate:12 min/ft.

Viscosity: 46 seconds; Weight: 12 lbs/gal.

975-980 Same as above.

980-985 Sandstone as above; red brown mudstone, some medium grey mudstone 60/40%, sandstone/mudstone approximately 50/50%, mudstone/sandstone is likely interbedded although some washing may be occuring-caliper log will tell
Drilling Rate: 9-10 min/ft.

Viscosity: 51 seconds; Weight: 12 lbs/gal.

985-990 Mudstone, red brown 90%, grey/purple 10%, minor light blue grey, some mottled red brown/blue grey, crumbly, few pieces of sandstone but rare.
Drilling Rate:7-10 min/ft.

990-995 Sandstone/mudstone 50/50%, sandstone is very fine, weakly calcareous, light blue grey-very light red, quartz, rounded to sub-rounded, slightly frosted to clear; mudstone 50/50%, red brown-light blue grey-medium grey, some mudstone washing from above.
Drilling Rate:5-6 min/ft.

Viscosity: 52 seconds; Weight: 12.1 lbs/gal.

995-1000 Same as above, some chert.
Drilling Rate: 5-6 min/ft.

Viscosity: 55 seconds; Weight: 12.2 lbs/gal.

1000-1005 Same as above, slightly more mudstone-approximately 60%, grey mudstone is slightly calcareous.

1005-1010 Same as above, some chert, sandstone is calcareous when broken.
Drilling Rate:7-10 min/ft.

Viscosity: 7-10 seconds; Weight: 12.2 lbs/gal.

1010-1015 Same as above, mudstone/sandstone approximately 70/30%; mudstone red brown/blue grey approximately 80/20%.

1015-1020 Sandstone, very slightly calcareous, sub-rounded, generally clear, very fine light grey-white, crumbles easily; approximately 25% shale that appears to have sloughed from walls above (large pieces), red brown and mottled, medium to light brown grey.

1020-1025 Same as above.

1025-1030 Same as above, some blue green mudstone pieces, some (minor) dark red sandstone, very fine non-calcareous, some clay balls with sample, added water and cleaned pit.
Drilling Rate:7-9 min/ft.

Viscosity: 43 seconds; Weight: 11.8 lbs/gal.

1030-1035 Same as above.

1035-1040 Same as above.

1040-1045 Same as above, 40% sandstone.

1045-1050 Same as above, 70% sandstone, sandstone appears a little coarser.

1050-1055 Same as above, 70% sandstone, some sandstones have slightly larger quartz grains, sub-rounded, clear.
Drilling Rate: 10 min/ft.
Viscosity: 56 seconds; Weight: 11.6 lbs/gal.

1055-1060 Same as above, 60% sandstone, dark grey, hard limestone 20%.

Rotary table very noisy at 1057'.

1060-1065 Limestone, hard, dark grey to grey 60/30%, red purple mudstone 10%, sandstone grey, limestones may be partially dolomitized.
Drilling Rate:10 min/ft.

Viscosity: 48 seconds; Weight: 11.6 lbs/gal.

1065-1070 Limestone 70%, red brown 15%, red purple, 18%, white soft to clay balls 8%, grey mudballs 8%.

Total depth 1076 feet

Deviation survey @ 1040' = 1 1/2 degrees

12/10/99 - 12/15/99

Ream 17 1/2"to 775'.
Set 13 3/8" casing to 731' and cement.
Cone lost off reaming bit. Washed hole to 1075'.
Cone at 1076'.

12/16/99

Begin reaming 12" hole. Well completed as open hole from 731' to 1020. The 7 7/8" rathole is from 1020' to 1076'.

Well shut in pressure, before perforating, on 1/10/00 was 112 psi with unrestricted flow at approximately 110 gpm.

Perforated 13 3/8" casing with 8 shots per foot from 560'-715' to increase production.

1/27/00

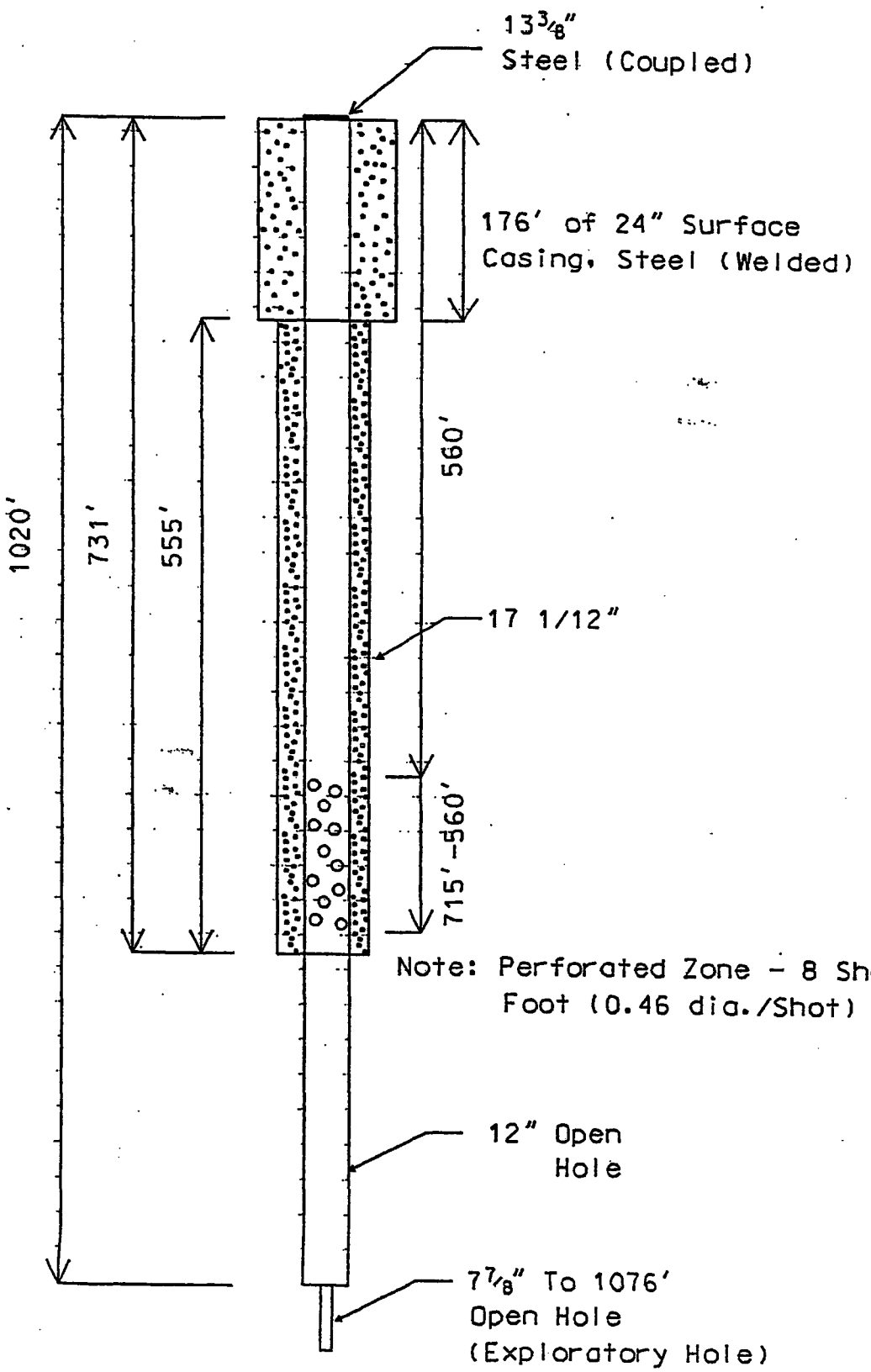
Unrestricted flow not measured at the time of this report.

CINIZA REFINERY

COMPLETION DIAGRAM

CINIZA WELL #4

Note: All Elevations from Kelly Bushing



Note: Perforated Zone - 8 Shots per Foot (0.46 dia./Shot)

ATTACHMENT 3A

The boundary wells BW-1C, BW-2A, BW-2B, BW-2C, BW-3B, and BW-3C.
were purged with a portable submersible pump. Each well was purged three well volumes prior to field sampling for: pH, electric conductivity, and temperature. See the following table for results and data.
The boundary wells BW-1A, BW-1B, BW-3A contained no water at the time of purging and no sampling was conducted.

WELL PUMPING & SAMPLING LOG

WELL #	BW-1-C	BW-2-A	BW-2B	BW-2-C	BW-3-B	BW-3-C					
SAMPLE DAY	8/4/04	8/4/04	8/4/04	8/4/04	8/4/04	8/4/04					
SAMPLE TIME	1330	1130	1230	1030	0930	0900					
OVA READING											
LIQUID DEPTH	18.8	32.1	29.7	27.5	32.9	63.2					
1) TEMP. F	62	63	62	62	61	62					
pH	9.35	8.33	8.40	8.78	8.61	8.78					
SP. COND.	1280	1441	2280	1401	1534	1380					
2) TEMP. F	62	63	62	62	61	62					
pH	9.36	8.40	8.35	8.84	8.50	8.87					
SP. COND.	1304	1424	2310	1411	1532	1391					
3) TEMP. F	62	63	62	62	61	62					
pH	9.42	8.70	8.45	8.83	8.58	8.88					
SP. COND.	1307	1475	2330	1428	1527	1394					
4) TEMP. F	62	63	62	62	61	62					
pH	9.44	8.46	8.42	8.82	8.57	8.89					
SP. COND.	1310	1435	2330	1449	1538	1389					

Sheet: 1 OF 5
Bore Point: Offset BW1 5'

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 03-118
Site: Ciniza Boundary Wells

Water Elevation: 9' bgs
Boring No.: BW 1 C

Log of Test Borings

Elevation: 6876.75 TOC
Date: 11/10/2003

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
	0-4.0	Continuous	//////////		**Clay**, firm, red-brown, moist				
			//////////						
			//////////						
			//////////						
			//////////	2.5					
			//////////						
			//////////						
	4.0-5.0		//////////		**Clay**, silty, firm-stiff, red-brown, wet				
			//////////						
			//////////	5.0					
	5.0-10.0		//////////		**Clay**, firm-stiff, red-brown, wet ("Fat Clay")				
			//////////						
			//////////						
			//////////						
			//////////	7.5					
			//////////						
			//////////						
			//////////						
			//////////						
			//////////	10.0					
	10.0-20.0		//////////		**Clay**, stiff, red-brown, wet ("Fat Clay")				
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////	15.0					
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////	20.0					
	20.0-24.5		//////////		**Clay**, hard, damp-moist, some slickensides,				
			//////////		(shrink swell), brittle, slightly silty @ 21.0-21.3				
			//////////						

SIZE & TYPE OF BORING: 4-1/4" ID Hollow Stemmed Auger **LOGGED BY:** WHK

M:\wells\[BW1C.xls]Sheet1

Sheet: 2 OF 5
Bore Point: Offset BW1 5'

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 03-118
Site: Ciniza
Boundary Wells

Water Elevation: 9' bgs
Boring No.: BW 1 C

Log of Test Borings

Elevation: 6876.75 TOC
Date: 11/10/2003

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
			//////////	22.0					
	24.5-24.7		********		**Sand**, very fine, silty, dry, loose, light red-brown				
	24.7-26.5		/*/*/*/*/*/	25.0	**Clay**, very sandy, silty hard, damp, red-brown crumbly				
	26.5-28.5		**_**_**_		**Sand**, very fine, silty, dry, slightly clayey, occasional < 1cm clay beds, loose-moderate dense, very light brown				
	28.5-30.5		//*//*//*//	30.0	**Clay**, slightly sandy, silty, firm-stiff, very light red-brown, damp, occasional laminar salt bed, dry, very crumbly in hand				
	30.5-31.3		//*//*//*//		**Clay**, sandy, gradational with above dry, stiff-hard, very light brown				
	31.3-32.3		//*//*//*//						
	32.3-32.9		********		**Sand**, very fine, loose, silty, slightly clayey, moderate dense, very light brown, dry				
	32.9-33.2		//*//*//*//						
	33.2-35.0		//*//*//*//		**Clay**, slightly sandy, firm, dry, very light brown crumbles easily				
			********						
			********		**Sand**, very silty, dry, very light brown, moderate, dense				
			//*//*//*//						
			//*//*//*//		**Clay**, slightly sandy, silty, hard, dry, crumbly, very light red-brown, graditional contacts				
			//*//*//*//	35.0					
	35.0-40.0		//////////		**Clay**, red-brown, "Fat", damp, crumbly in hand carves smooth vitrius surface with knife, hard, 2 lamini of very fine sand in 5' run				
			//////////	40.0					
	40.0-45.0		//////////		**Same as above**, 1 sand laminae				

SIZE & TYPE OF BORING: 4-1/4" ID Hollow Stemmed Auger **LOGGED BY:** WHK

M:\wells\[BW1C.xls]Sheet2

Sheet: 3 OF 5
Bore Point: Offset BW1 5'

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 03-118
Site: Ciniza
Boundary Wells

Water Elevation: 9' bgs
Boring No.: BW 1 C

Log of Test Borings

Elevation: 6876.75 TOC
Date: 11/10/2003

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
			//////////	44.0					
			//////////						
			//////////	45.0					
	45.0-50.0		//////////		**Same as above**				
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////						
			//////////	50.0					
	50.0-52.0		**/**/**/		**Sand**, clayey, moderate dense, dark red-purple,				
			//**/		damp				
			//**/						
	52.0-55.0		//////////		**Clay**, dark red-purple, hard, moist-wet, crumbles				
			//////////		in hand sample				
			//////////						
			//////////						
			//////////						
			//////////						
			//////////	55.0					
	55.0-58.2		/*/*/*/*/*/		**Clay**, very sandy, red-purple, hard, brittle, moist-				
			/*/*/*/*/*/		wet, gradition of sand is greater with depth				
			/*/*/*/*/*/						
			/*/*/*/*/*/						
			/*/*/*/*/*/						
			/*/*/*/*/*/						
	58.2-59.8		**/**/**/		**Sand**, slightly clayey, mottled red-grey, dry, dense				
			//**/		dense-very dense, pebbles of limestone, chert				
	59.8-60.0				and sandstone				
				60.0	**Petrified Forest Formation of the Painted**				
	60.0-65.0				**Desert Member**. **Clay**,(claystone), red, carbonate				
					nodules, (white), hard, crumbly, damp-moist				
					Same as above, some grey mottling, fissile				
					at 60.0'				
				65.0					

SIZE & TYPE OF BORING: 4-1/4" ID Hollow Stemmed Auger **LOGGED BY:** WHK

M:\wells\[BW1C.xls]Sheet3

Sheet: 4 OF 5
Bore Point: Offset BW1 5'

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 03-118
Site: Ciniza
Boundary Wells

Water Elevation: Not Encountered
Boring No.: BW 1 C

Log of Test Borings

Elevation: 6876.75 TOC
Date: 11/10/2003

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
	0-65.0	Continuous		65.0	See Stratigraphic Log From BW 1				
	65.0-119.0				**Mudstone/Siltstone** interbedded, blocky, damp-dry, dense **Chinle Group, Petrified Forest Formation, Painted Desert Member**				
				75.0					
				85.0					
				95.0					
				105.0					
				115.0					
	119.0-131.0				**Petrified Forest Formation,** **Sandstone**, white, hard, some pebbles of quartzite, and mafic rock, interbedded claystone and siltstone				
				125.0					
	131.0-134.5				**Sandstone**, very hard, clean, quartz, water bearing				
	134.5-145.0			135.0	**Mudstone**, grey, moist, firm				
				145.0					
	145.0-152.0				**Siltstone/Mudstone**, grey, sandy				

SIZE & TYPE OF BORING: 4-1/4" ID Hollow Stemmed Auger **LOGGED BY:** WHK

M:\wells\[BW1C.xls]Sheet4

Sheet: 5 OF 5
Bore Point: Offset BW1 5'

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 03-118
Site: Ciniza
Boundary Wells

Water Elevation: Not Encountered
Boring No.: BW 1 C

Log of Test Borings

Elevation: 6876.75 TOC
Date: 11/10/2003

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
				151.0					
	152.0-154.0				**Sandstone**, white-light grey, hard, silty				
				155.0					
	T.D.			157.0	Set well in boring, see well diagram				

SIZE & TYPE OF BORING: 4-1/4" ID Hollow Stemmed Auger **LOGGED BY:** WHK

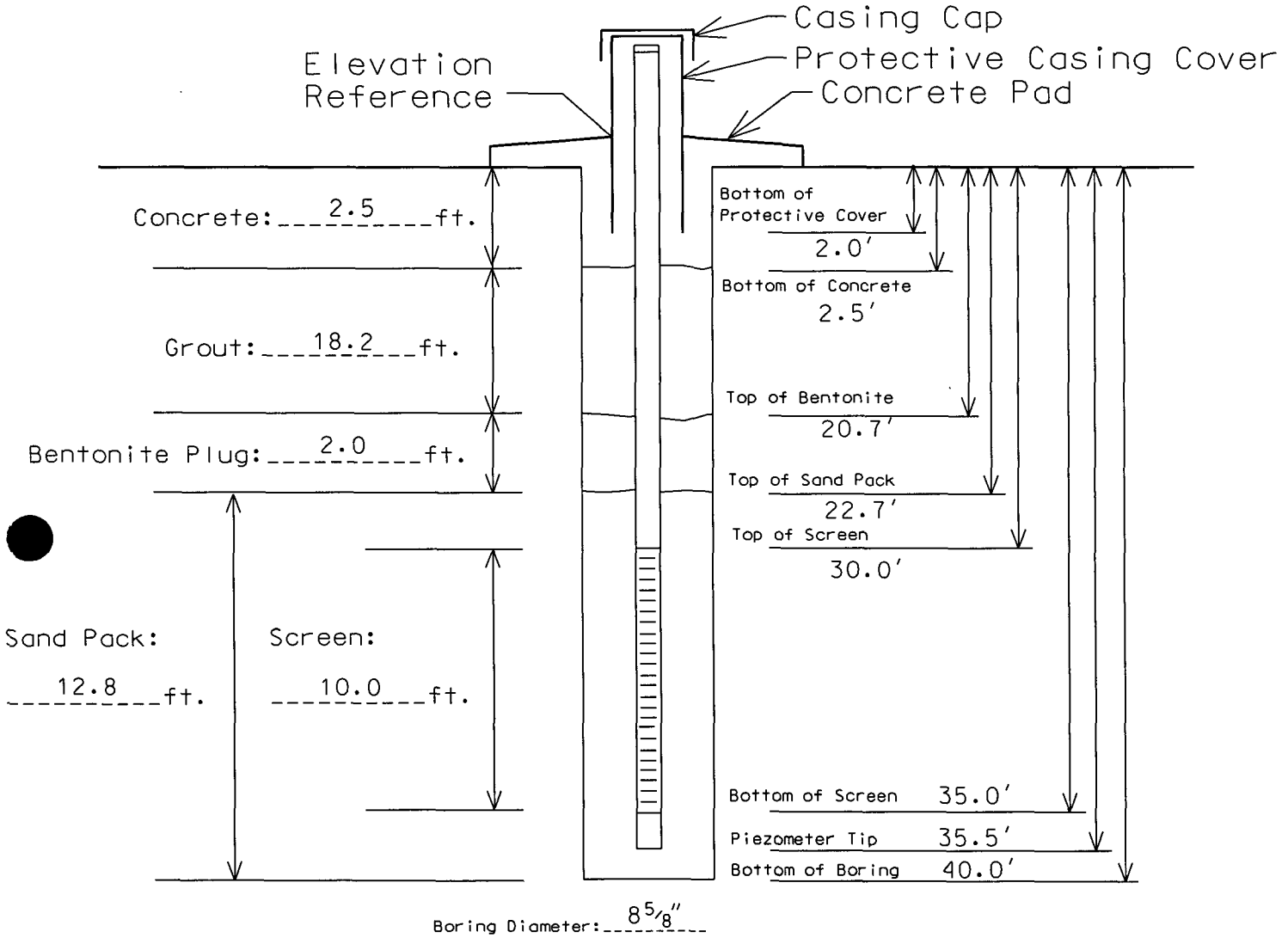
M:\wells\[BW1C.xls]Sheet5

PRECISION ENGINEERING, INC.

505-523-7674

Installation Diagram

Monitoring Well No. BW-1A



Boring Diameter: 8 5/8"

Sand Type: 20-40 Silica

Bollards, Type/Size: 3" Dia. Steel, Conc. Filled

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: 6% Bentonite

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 5205.03

Other: Backfilled w/ Bentonite 35'-37' Clay 37'-40'

Bottom Cap Used? Yes

Site Easting: 4605.10

Project #: 03-118

Project Name: Ciniza Refinery - Boundry Wells

Elevation: 6876.73 TOC

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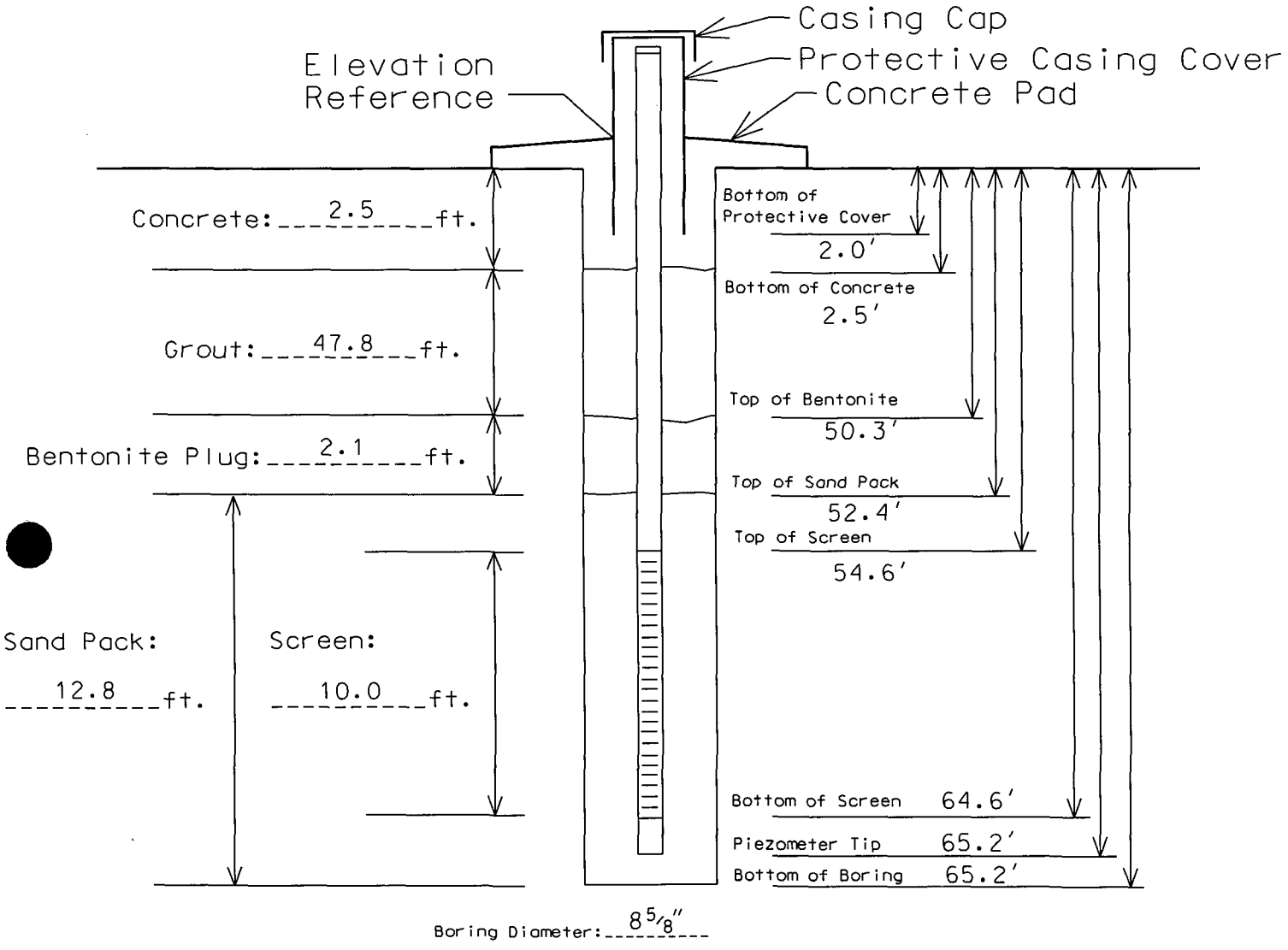
PRECISION ENGINEERING, INC.

505-523-7674

Installation Diagram

Monitoring Well No. BW-1B



Boring Diameter: 8 5/8"

Sand Type: 20-40 Silica

Bollards, Type/Size: 3" Dia. Steel, Conc. Filled

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: 6% Bentonite

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 5194.46

Other: N/A

Bottom Cap Used? Yes

Site Easting: 4601.15

Project #: 03-118

Project Name: Ciniza Refinery - Boundry Wells

Elevation: 6876.91 TOC

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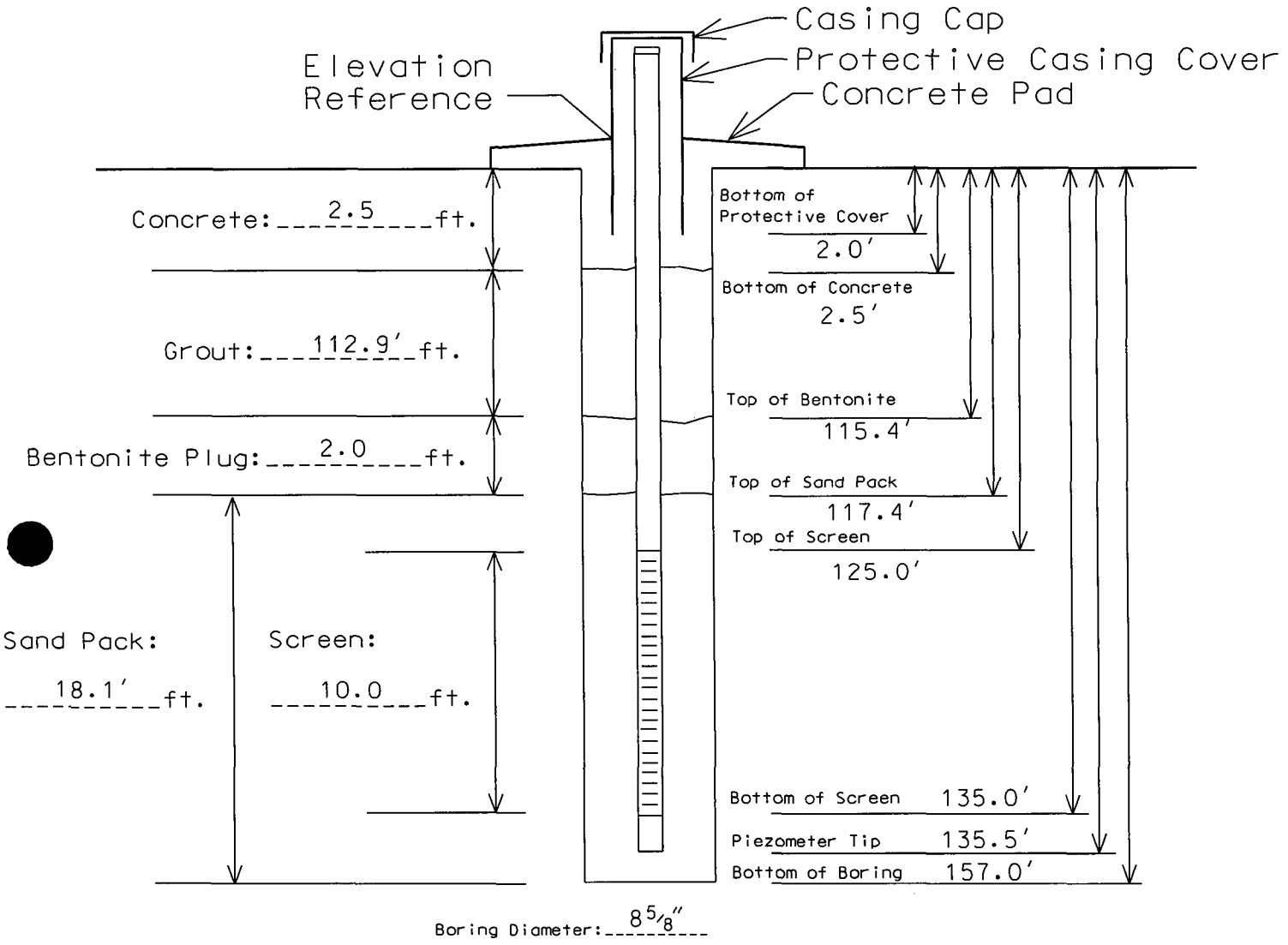
505-523-7674

Installation Diagram

Monitoring Well No. BW-1C



Boring Diameter: 8 5/8"

Sand Type: 20-40 Silica

Bollards, Type/Size: 3" Dia. Steel, Conc. Filled

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: 6% Bentonite

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 5200.55

Other: N/A

Bottom Cap Used? Yes

Site Easting: 4603.52

Project #: 03-118

Project Name: Ciniza Refinery - Boundry Wells

Elevation: 6876.75 TOC

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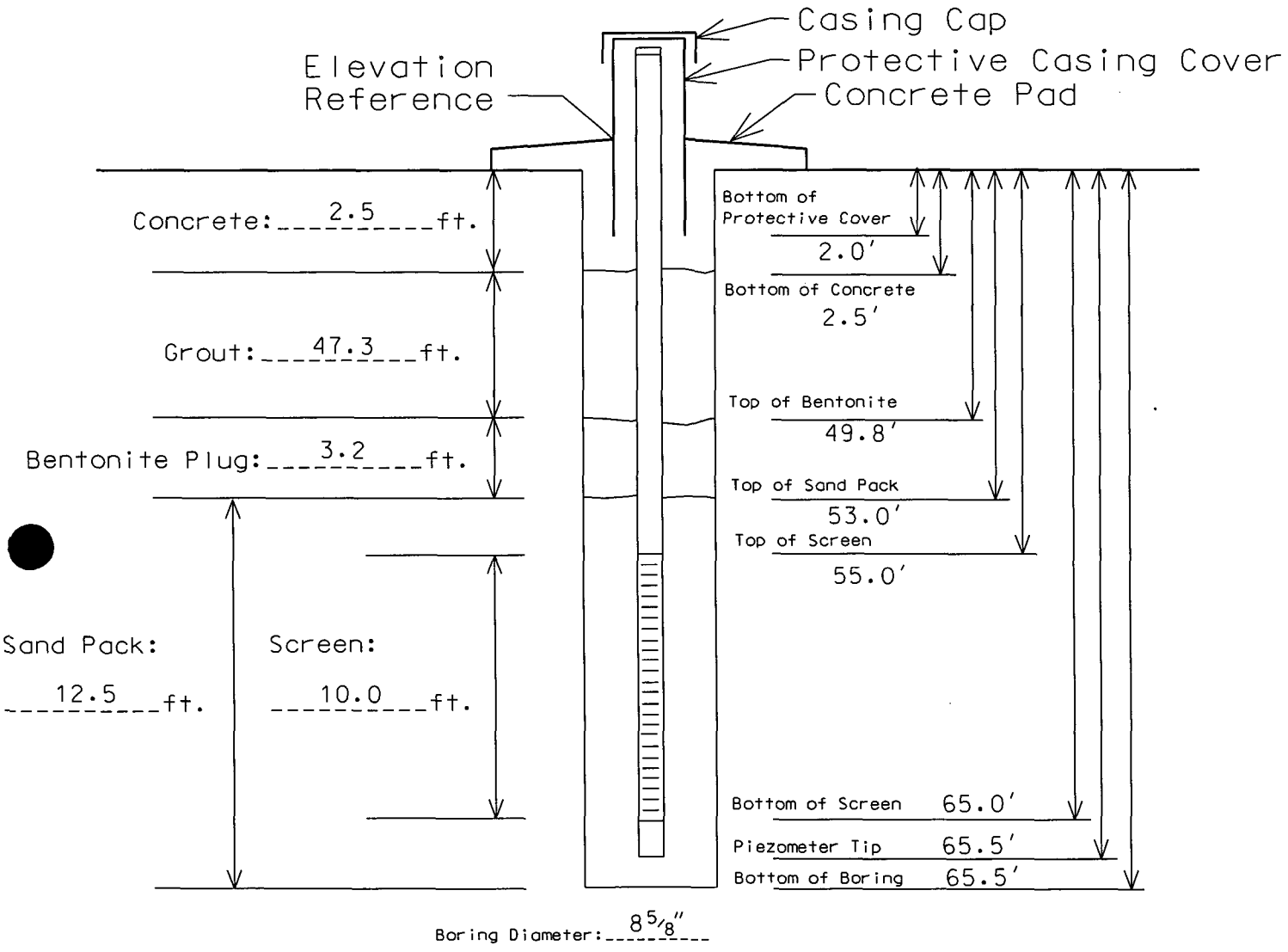
PRECISION ENGINEERING, INC.

505-523-7674

Installation Diagram

Monitoring Well No. BW-2A



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Bollards, Type/Size: 3" Dia. Steel, Conc. Filled

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: 6% Bentonite

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 5109.11

Bottom Cap Used? Yes

Site Easting: 5934.61

Other: N/A

Project #: 03-118

Project Name: Ciniza Refinery - Boundry Wells

Elevation: 6874.72 TOC

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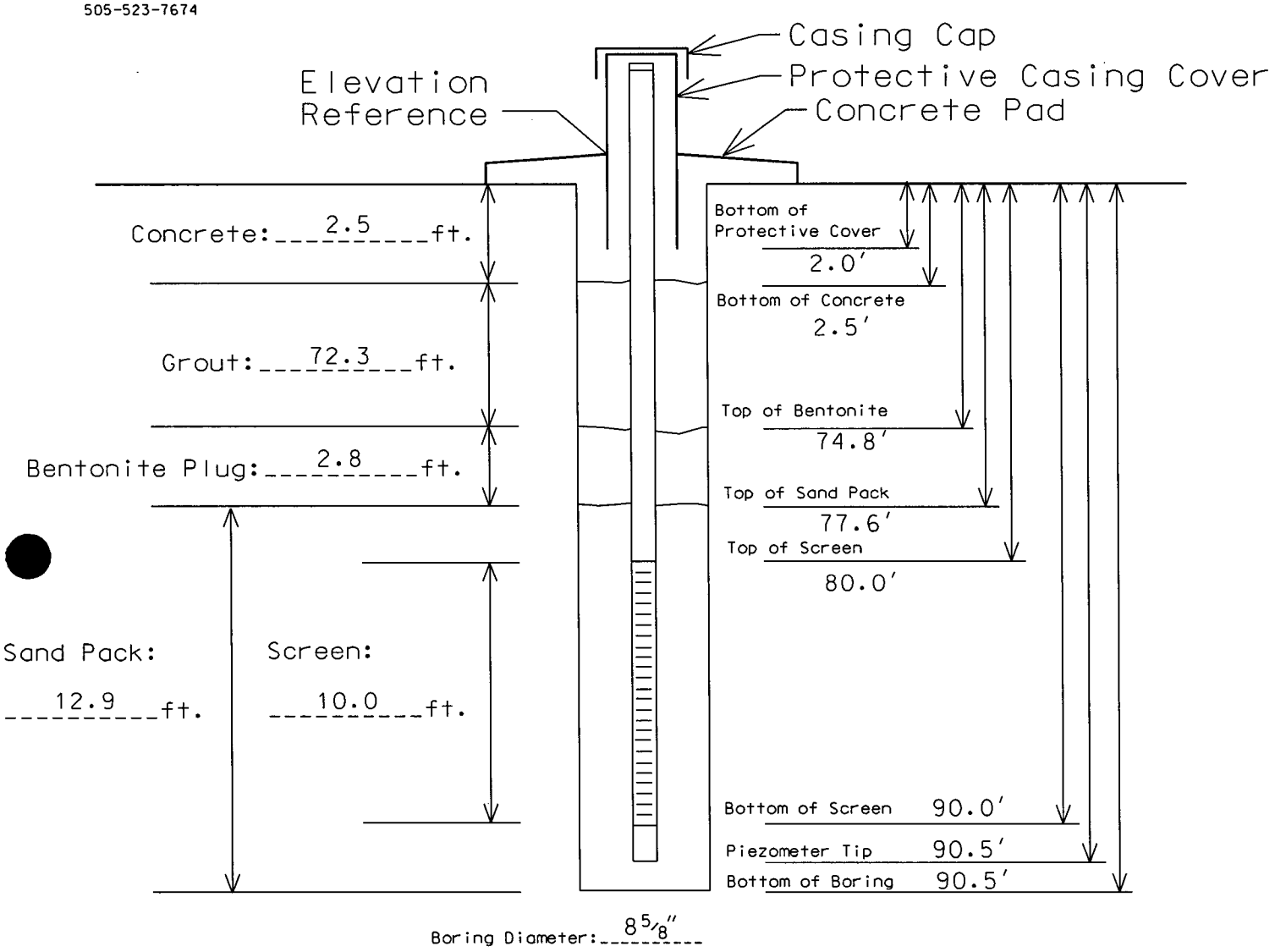
PRECISION ENGINEERING, INC.
505-523-7674

Installation Diagram

Monitoring Well No. BW-2B



Boring Diameter: 8 5/8"

Sand Type: 20-40 Silica

Bentonite: 3/8" Stabilized Pellets (TR-30)

Cement/Grout: 6% Bentonite

Water: Potable

Other: N/A

Bollards, Type/Size: 3" Dia. Steel, Conc. Filled

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Riser Type/Size: 2" PVC Sch. 40

Locking Expandable Casing Plug? Yes

Bottom Cap Used? Yes

Site Northing: 5098.43

Site Easting: 5933.04

Project #: 03-118 Project Name: Ciniza Refinery - Boundry Wells Elevation: 6874.58 TOC

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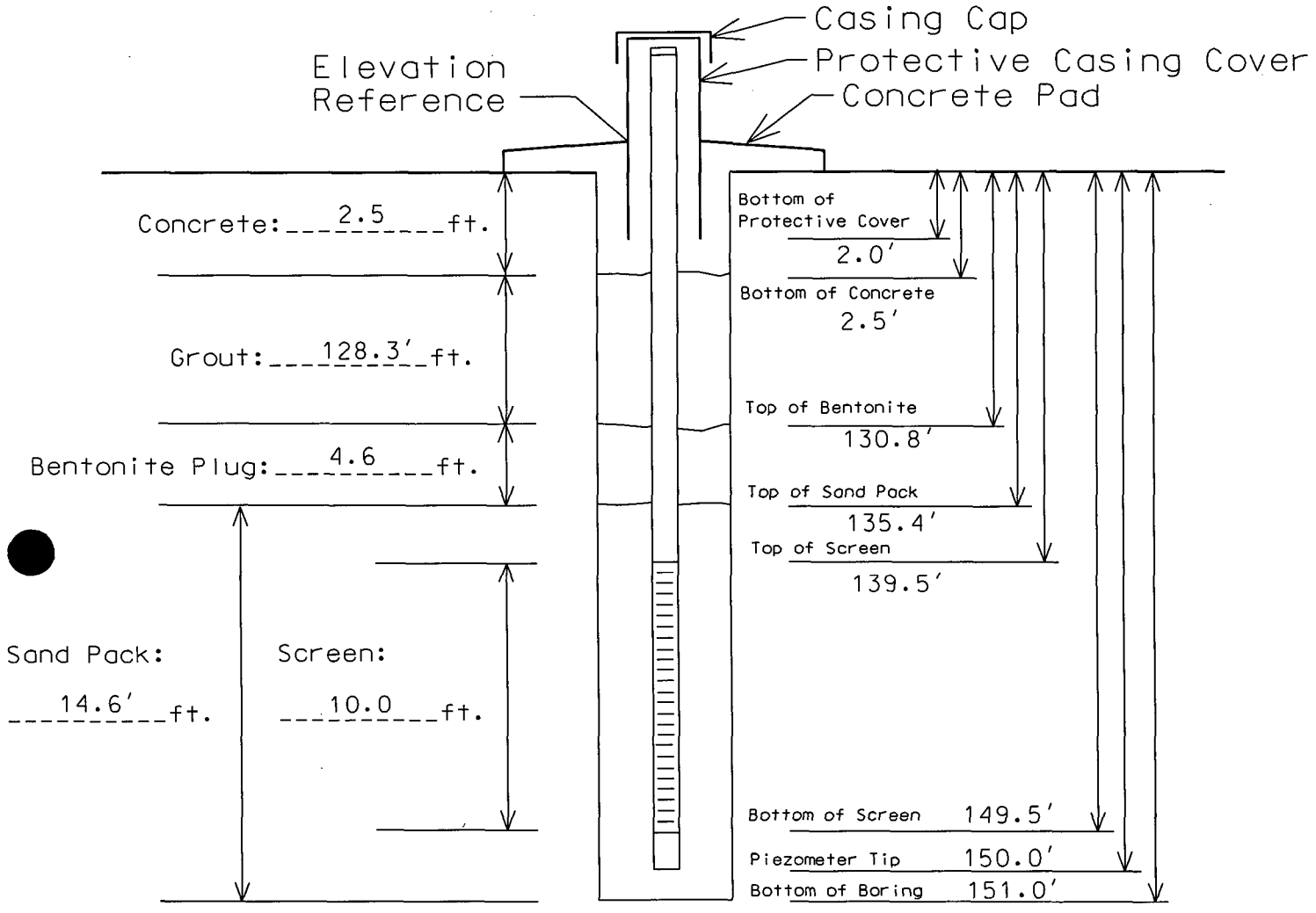
PRECISION ENGINEERING, INC.

505-523-7674

Installation Diagram

Monitoring Well No. BW-2C



Boring Diameter: 8 5/8"

Sand Type: 20-40 Silica

Bollards, Type/Size: 3" Dia. Steel, Conc. Filled

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: 6% Bentonite

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 5122.83

Other: N/A

Bottom Cap Used? Yes

Site Easting: 5937.75

Project #: 03-118 Project Name: Ciniza Refinery - Boundry Wells Elevation: 6875.40 TOC

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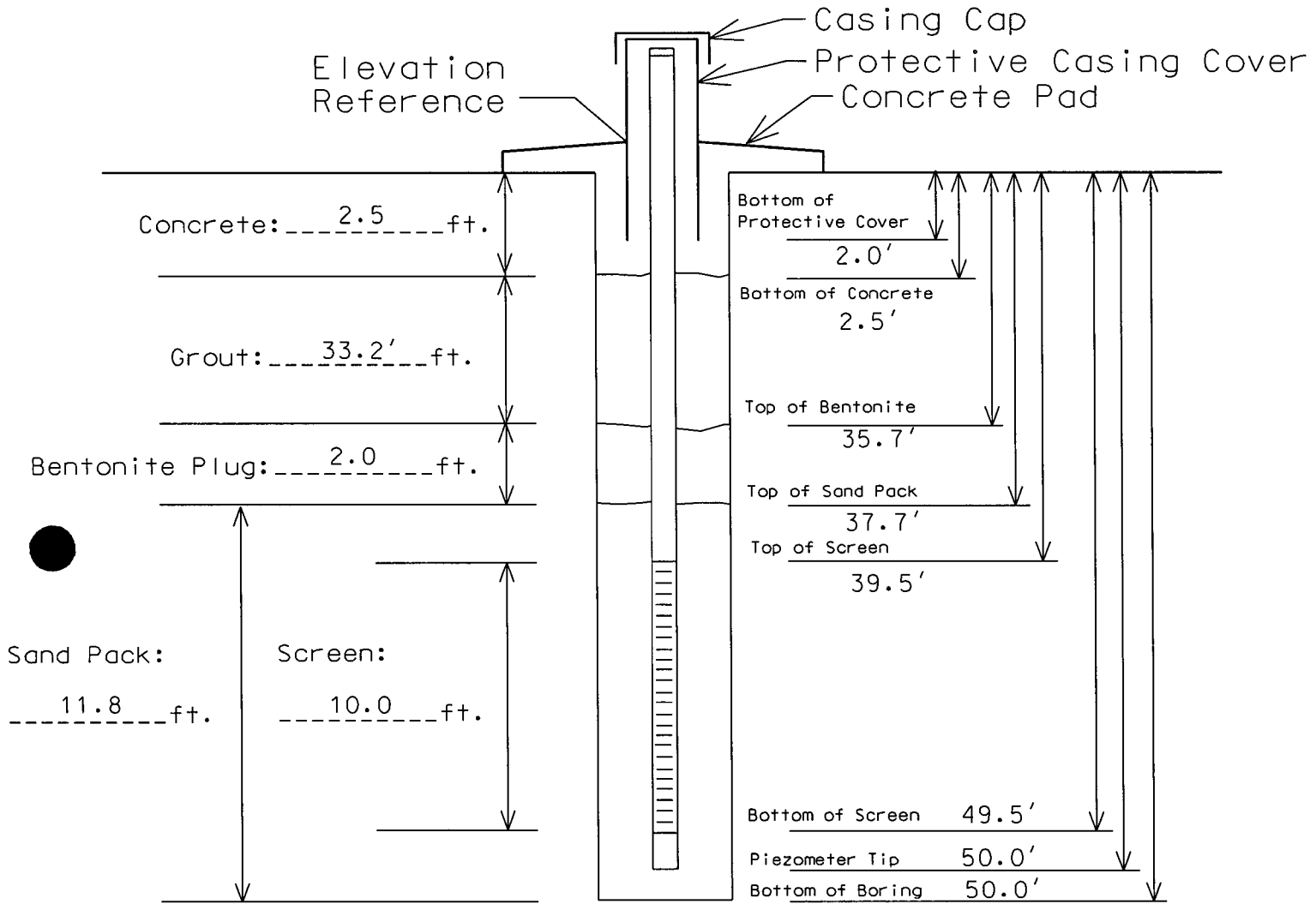
PRECISION ENGINEERING, INC.

505-523-7674

Installation Diagram

Monitoring Well No. BW-3A



Boring Diameter: 8 5/8"

Sand Type: 20-40 Silica

Bollards, Type/Size: 3" Dia. Steel, Conc. Filled

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: 6% Bentonite

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 3982.32

Bottom Cap Used? Yes

Site Easting: 6134.03

Project #: 03-118

Project Name: Ciniza Refinery - Boundry Wells

Elevation: 6878.22 TOC

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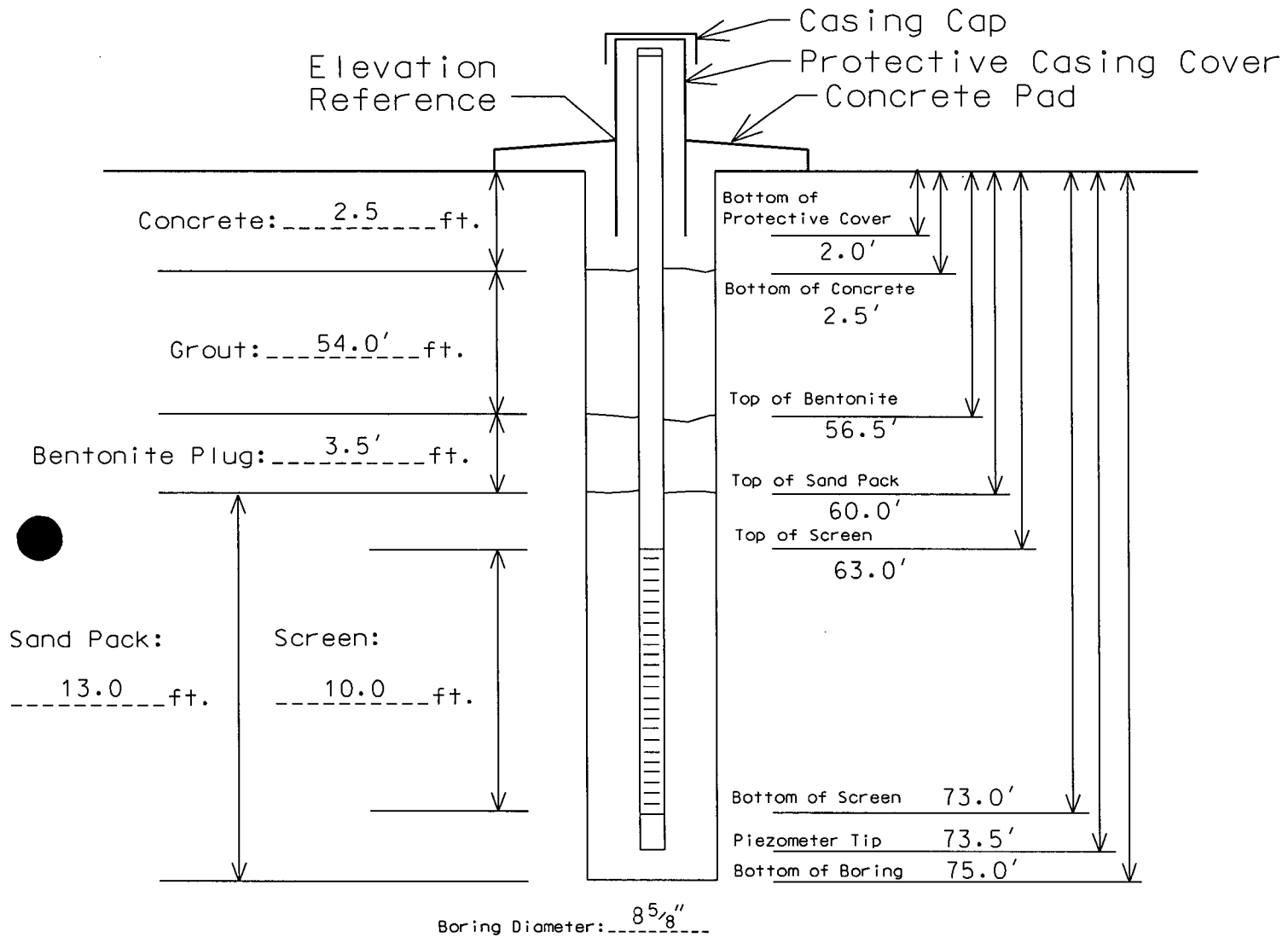
PRECISION ENGINEERING, INC.

505-523-7674

Installation Diagram

Monitoring Well No. BW-3B



Boring Diameter: 8 5/8"

Sand Type: 20-40 Silica

Bollards, Type/Size: 3" Dia. Steel, Conc. Filled

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: 6% Bentonite

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 3988.42

Backfill with 3/8" Bentonite Chips to 73.0'

Other:

Bottom Cap Used? Yes

Site Easting: 6119.89

Project #: 03-118

Project Name: Ciniza Refinery - Boundry Wells

Elevation: 6878.79 TOC

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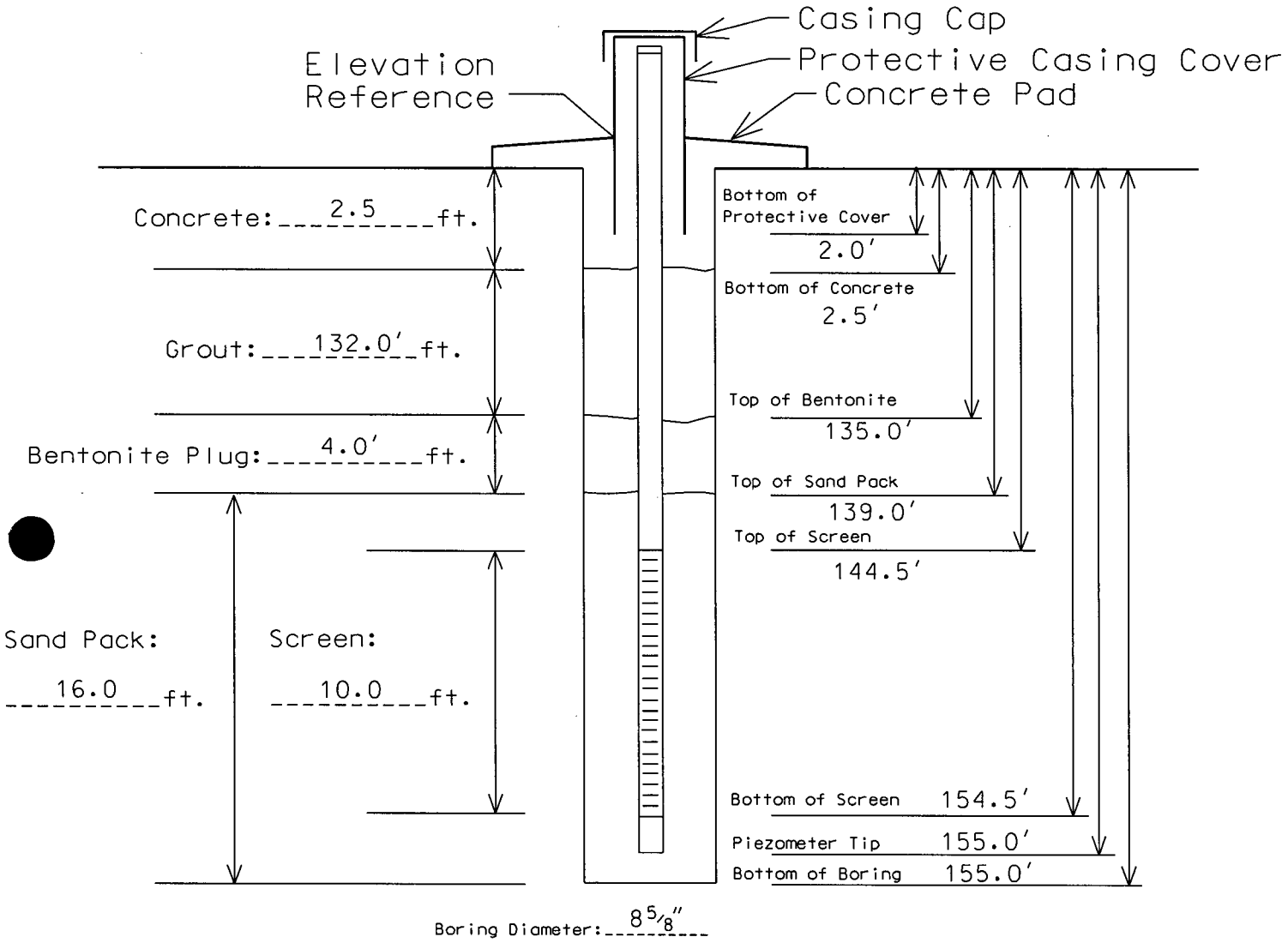
PRECISION ENGINEERING, INC.

505-523-7674

Installation Diagram

Monitoring Well No. BW-3C



Boring Diameter: 8 5/8"

Sand Type: 20-40 Silica

Bollards, Type/Size: N/A

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: 6% Bentonite

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 4000.62

Other: N/A

Bottom Cap Used? Yes

Site Easting: 6129.32

Project #: 03-118

Project Name: Ciniza Refinery - Boundry Wells

Elevation: 6878.08 TOC

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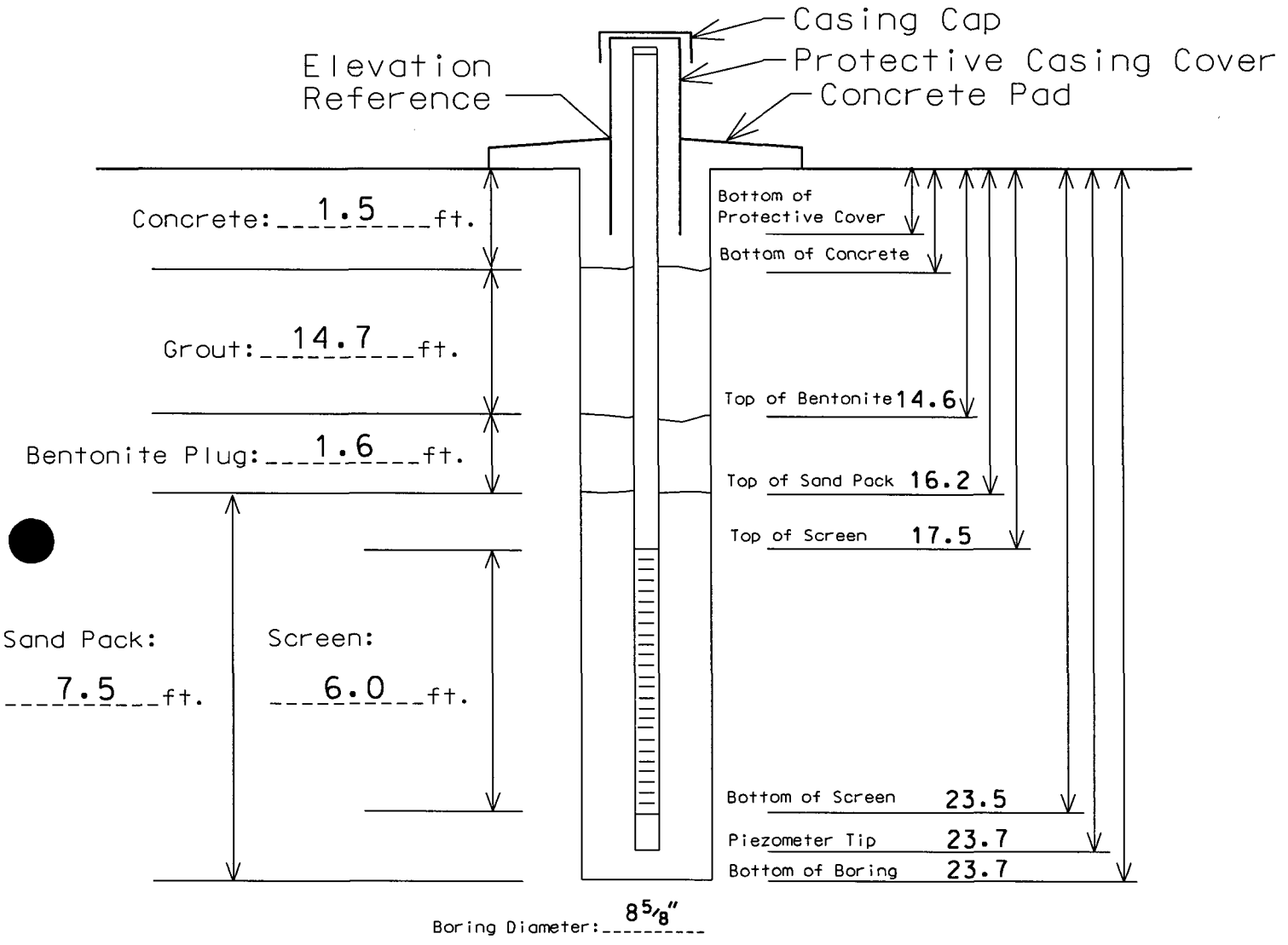
PRECISION ENGINEERING, INC.

505-523-7674

Installation Diagram

Monitoring Well No. GWM-1



Boring Diameter: 8 5/8"

Sand Type: 20-40 SILICA

Bollards, Type/Size: NONE INSTALLED

Bentonite: 3/8" CHIPS

Screen Type/Size: 2", #10 SLOT, SCH 40 PVC

Cement/Grout: 6% BENTONITE/CEMENT

Riser Type/Size: 2", SCH 40 PVC

Water: NONE

Locking Expandable Casing Plug? YES

Site Northing: 2254.94

Other: ---

Bottom Cap Used? YES

Site Easting: 3892.73

Project #: 03-118

Project Name: POND 1 GROUNDWATER OBSERVATION

Elevation: 6912.65 TOC

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Photo 1

Giant Ciniza Refinery
O/D API Oil Water Separator
Cleaning of the North Bay
November 2004

Photo 2

Giant Ciniza Refinery
O/D API Oil Water Separator
South Bay After Cleaning
November 2004

Photo 3

Giant Ciniza Refinery
O/D API Oil Water Separator
Both Bays Being Cleaned
November 2004

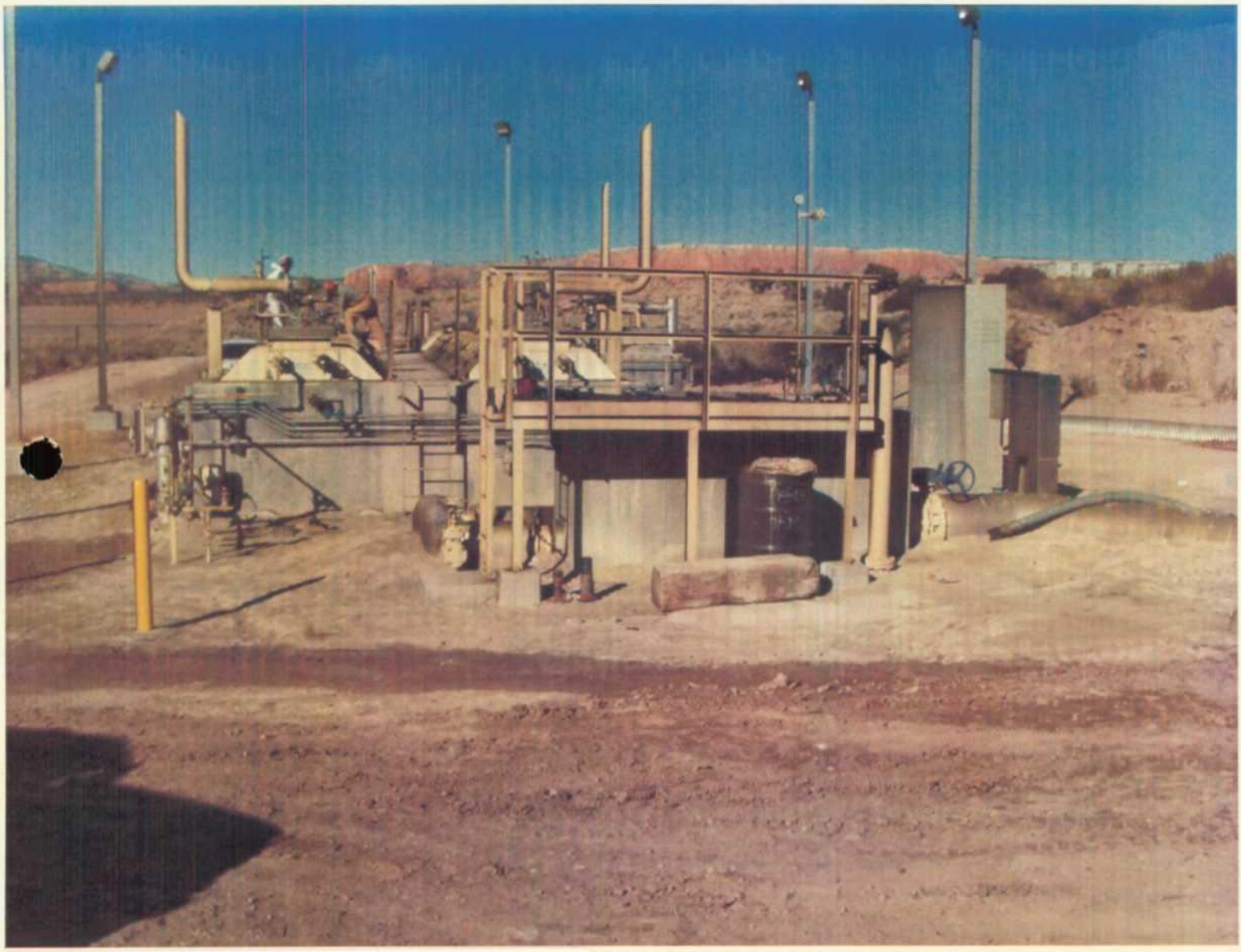

Photo 4

Giant Ciniza Refinery
New API Oil Water Separator
November 2004

Waste:	API Separator Sludge
Description/Determination:	Solids accumulate in the oil / water separator which receives waste water from the refinery drainage system consisting of a network of tank farm sumps and sewer lines within the process areas. Oil is separated and recovered for processing. The solids are removed annually by vacuum trucks and shipped offsite for oil recovery subject to the sludge exemption. This exemption can be found in 40CFR261.4 (12) which excludes oil bearing hazardous secondary materials that are generated at a petroleum refinery (SIC code 2911) and are inserted into a petroleum refinery process. The sludge cannot be placed onto the land or speculatively accumulated before being recycled. The sludge contains benzene (D018) and is a listed hazardous waste (K051) but is exempt from hazardous waste regulation if it is sent for recycling. The water passes through air strippers before flowing to the aeration lagoons and evaporation ponds.
Attachments:	40 CFR 261.4 (12)

Waste:	API Separator Sand
Description/Determination:	Approximately once a year the API separator is cleaned out and sand is used to isolate the API bays for cleaning. The sand comes into contact with API sludge. After cleaning is completed the sand is removed from the API and placed into drums for offsite disposal as a listed hazardous waste (K051).

Generator's Waste Profile Sheet

RINCHEM Company, Inc.
6133 Edith Blvd NE
Albuquerque, NM 87107
Phone: (505) 345-3655
FAX: (505) 344-7986

A. GENERAL INFORMATION

Generator Name:	Giant Refining Company	Number:	RC7001
Facility Address:	17 Miles East of Gallup, NM	Generator US EPA ID:	NMD000333211
	Gallup, NM 87301	Generator State ID:	
Technical Contact:	Steve Morris	Title: Environmental Mgr	Phone: 5057220258
Name of Waste:	K051 OIL REFINERY SLUDGE		
Process Generating Waste:	API SEPERATOR SLUDGE		

B. PHYSICAL CHARACTERISTICS OF WASTE

Color (Describe): BLACK/BROWN

Clarity: ☐ Clear ☐ Cloudy
Describe: SOLID

Phase Separation
Number of Layers: 1

pH: ☐ <2.0 ☐ 2.0-4.0 ☐ 4.1-5.9 ☑ 6.0-8.0 ☐ 8.1-10.0 ☐ 10.1-12.5 ☐ >12.5 ☐ Exact

Specific Gravity: ☐ <.8 ☐ .8-1.0 ☐ 1.0-1.2 ☐ Exact ☐ 1.2-1.4 ☑ 1.4-1.6 ☐ >1.6

Flash Point: ☐ <70F ☐ 70F-140F ☐ 140F-200 ☑ >200F ☐ Exact

C. CHEMICAL COMPOSITION

	Range Lower	Range Upper	
SOIL	0	25	%
HYDROCARBONS	0	10	%
SALTS	0	40	%
OIL	0	20	%
CAUSTIC RESIDUAL	0	5	%
			%
			%
			%
			%
			%

D. METALS

	Total (PPM)	EPA Extraction Process (MG/ML)
Arsenic		
Barium		
Cadmium		
Chromium		
Mercury		
Lead		
Chromium Hex		
Selenium		
Silver		
Copper		
Nickel		
Zinc		
Thallium		

E. OTHER COMPONENTS

☐ Cyanides ☐ PCB's
☐ Sulfides ☐ Phenolics

F. SHIPPING INFORMATION

DOT Hazardous Material: ☐ Yes ☑ No

Proper Shipping Name: HAZARDOUS WASTE SOLID, N.O.S. (OIL, SLUDGE)

Hazard Class: 9

ID No: NA3077 R.Q.:

Anticipated Volume (Units): 9 DRUMS

Per: ☐ One Time ☐ Week ☐ Month ☐ Quarter ☐ Year ☐ #Error

G. HAZARDOUS CHARACTERISTICS

Reactive: ☑ None ☐ Pyrophoric ☐ Shock Sensitive ☐ Explosive ☐ Water Reactive ☐ Other

Other Hazardous Characteristics:
☑ None ☐ Radioactive ☐ Etiological ☐ Pesticide Manufacturing Waste ☐ Other

US EPA Hazardous Waste: ☐

US EPA Hazardous Waste Codes: K051

H. SPECIAL HANDLING INFORMATION:

171

I hereby certify that all information in this and all attached documents is complete and accurate, and that all known or suspected hazards have been disclosed. I further certify that any samples submitted with this profile number are representative of the waste to be shipped and are taken in accordance with SW 846 or other approved procedures. I agree to notify Rinchem in writing when the process generating this waste stream changes or when I have reason to believe the data contained herein is not complete and accurate.

Signature: _____ Title: _____ Date: _____

Permit Condition 16. A. Annual Groundwater Report

i. A description of the monitoring and remediation activities, which occurred during the year including conclusions and recommendations.

Summaries of the analytical can be found in 16.A.ii. and copies of the lab analysis for these wells can be found in 21.B.

Summary of wells:

Monitor wells 1,2,4, & 5 were non detect for all parameters analyzed for except for barium. Minute amounts were found in the range of .083 to .15 ppm, which is below groundwater standards. OW wells 12,13,14,29 & 30 were analyzed for BTEX and MTBE. All parameters were non detect except for 2.7 ppb for MTBE at OW30 and the following were detected in OW14:

- Benzene- 190 ppb Benzene level exceeds (WQCC) and EPA (MCL)
- Toluene- 2 ppb
- Ethylbenzene- 2.3 ppb
- Xylene- 2.5 ppb
- MTBE- 46 ppb

OW-11 was analyzed for BTEX, MTBE, general chemistry, VOC's, SVOC's, and metals. Analysis indicate numbers below the New Mexico Water Quality Standards (NMWQS) for benzene, toluene, ethylbenzene, xylene, MTBE, VOC's, SVOC's and RCRA metals. General chemistry results showed exceedance for sulfate and TDS.

Conclusion & recommendation: OW14 continues to show levels of contamination. OW14 is located north and down gradient of the tank farm and is drilled to the top of the Chinle shale formation. The recommendation is to continue to sample OW 12,13,14, 29 and 30 on an annual basis and OW11 on a semi-annual basis for BTEX/MTBE as indicated in the groundwater discharge permit renewal.

Summary of surface water sampling:

Surface water sampling was conducted at the aeration lagoon inlet (AL1-IN), evaporation pond 1 inlet (EPI-IN) and the outlet from evaporation pond 2 (EP2-OUT). Summaries of the analytical can be found in 16.A.ii. BTEX and MTBE were detected in AL1-IN. EPI-IN and EP2-OUT were all non detect for BTEX and MTBE except for the following:

- EP1-IN xylene- 13 ppb
  MTBE- 17 ppb
- EP2-OUT toluene- 1.2 ppb
  Xylene- 1 ppb

Conclusion & recommendation: Proceed with the startup of the new API separator along with the addition of a third benzene stripper. This should help to reduce the contaminants leaving the API oil water separator. The recommendation is to follow the surface water-monitoring requirement as indicated in the groundwater discharge renewal. On an annual basis, a grab sample of the inlet water to Pond #2 shall be collected and analyzed for BOD, COD, TDS, BTEX, MTBE, and total RCRA metals. On an annual basis, a grab sample of evaporation pond water shall be collected and analyzed for

general chemistry parameters. This sampling will be conducted in the fourth quarter of this year.

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

December 08, 2004

Steve Morris
Giant Refining Co
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-3833
FAX (505) 722-0210

RE: Evap. Pond #2 Inlet 111904 Order No.: 0411219

Dear Steve Morris:

Hall Environmental Analysis Laboratory received 1 sample on 11/19/2004 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

ACCREDITED IN ACCORDANCE WITH nelac

4901 Hawkins NE ■ Suite D ■ Albuquerque, NM 87109
505.345.3975 ■ Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory

Date: *08-Dec-04*

CLIENT: Giant Refining Co
Client Sample ID: Pond #2 Inlet
Lab Order: 0411219
Collection Date: 11/19/2004 11:00:00 AM
Project: Evap. Pond #2 Inlet 111904
Lab ID: 0411219-01
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Methyl tert-butyl ether (MTBE)	110	100		µg/L	40	11/24/2004 3:19:09 PM
Benzene	24	20		µg/L	40	11/24/2004 3:19:09 PM
Toluene	72	20		µg/L	40	11/24/2004 3:19:09 PM
Ethylbenzene	20	20		µg/L	40	11/24/2004 3:19:09 PM
Xylenes, Total	110	20		µg/L	40	11/24/2004 3:19:09 PM
Surr: 4-Bromofluorobenzene	103	74-118		%REC	40	11/24/2004 3:19:09 PM
EPA METHOD 7470: MERCURY						Analyst: **CMC**
Mercury	0.0012	0.00020		mg/L	1	12/2/2004
EPA 6010C: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	12/2/2004 9:20:49 AM
Barium	0.14	0.020		mg/L	1	12/2/2004 9:20:49 AM
Cadmium	ND	0.0020		mg/L	1	12/2/2004 9:20:49 AM
Chromium	0.012	0.0060		mg/L	1	12/2/2004 9:20:49 AM
Lead	0.0075	0.0050		mg/L	1	12/2/2004 9:20:49 AM
Selenium	ND	0.050		mg/L	1	12/7/2004 8:56:19 AM
Silver	ND	0.0050		mg/L	1	12/2/2004 9:20:49 AM
EPA METHOD 160.1: TDS						Analyst: **MAP**
Total Dissolved Solids	3800	200		mg/L	4	11/24/2004

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

ASSAIGAI ANALYTICAL LABORATORIES, INC.

4301 Masthead NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259
3332 Wedgewood, Ste. N • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820
127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558

Explanation of codes	
B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

HALL ENVIRONMENTAL
attn: ANDY FREEMAN
4901 HAWKINS NE, SUITE D
ALBUQUERQUE NM 87109-4372

STANDARD

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: HALL ENVIRONMENTAL
Project: EVAP POND2
Order: 0411487 HAL03 Receipt: 11-19-04

for: *William P. Biava: President of Assaigai Analytical Laboratories, Inc.*

Sample: *POND #2 INLET* Collected: *11-19-04 11:00:00* By:
Matrix: *AQUEOUS*

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Prep Date	Run Date
0411487-01A		**EPA 405.1 Biochemical Oxygen Demand**						By: CMS		
BOD04148	WC.2004.3313.16		Biochemical Oxygen Demand	1246	mg/L	1	2		11-19-04	11-24-04
0411487-01B		**EPA 410.1 Chemical Oxygen Demand**						By: NJL		
WCOD04040	WC.2004.3367.14		Chemical Oxygen Demand	2270	mg / L	10	10		12-03-04	12-06-04

Unless otherwise noted, all samples were received in acceptable condition and all sampling was performed by client or client representative. Sample result of ND indicates Not Detected, ie result is less than the sample specific Detection Limit. Sample specific Detection Limit is determined by multiplying the sample Dilution Factor by the listed Reporting Detection Limit. All results relate only to the items tested. Any miscellaneous workorder information or footnotes will appear below.

Analytical results are not corrected for method blank or field blank contamination.

Hall Environmental Analysis Laboratory

Date: *08-Dec-04*

CLIENT: Giant Refining Co
Work Order: 0411219
Project: Evap. Pond #2 Inlet 111904

QC SUMMARY REPORT
Method Blank

Sample ID **Reagent Blank 5m** Batch ID: **R13881** Test Code: **SW8021** Units: **µg/L** Analysis Date **11/24/2004 8:25:04 AM** Prep Date
Client ID: Run ID: **PIDFID_041124A** SeqNo: **322965**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	2.5									
Benzene	ND	0.5									
Toluene	ND	0.5									
Ethylbenzene	ND	0.5									
Xylenes, Total	ND	0.5									
Surr: 4-Bromofluorobenzene	20.19	0	20	0	101	74	118	0			

Sample ID **MB-6991** Batch ID: **6991** Test Code: **SW7470** Units: **mg/L** Analysis Date **12/2/2004** Prep Date **12/2/2004**
Client ID: Run ID: **MI-LA254_041202A** SeqNo: **324028**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.0002									

Sample ID **MB-6980** Batch ID: **6980** Test Code: **SW6010A** Units: **mg/L** Analysis Date **12/2/2004 9:05:17 AM** Prep Date **12/1/2004**
Client ID: Run ID: **ICP_041202A** SeqNo: **323941**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.02									
Barium	ND	0.02									
Cadmium	ND	0.002									
Chromium	ND	0.006									
Lead	ND	0.005									
Selenium	0.01884	0.05									J
Silver	0.001192	0.005									J

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

I

CLIENT: Giant Refining Co
Work Order: 0411219
Project: Evap. Pond #2 Inlet 111904

QC SUMMARY REPORT
Method Blank

Sample ID **MB-6980** Batch ID: **6980** Test Code: **SW6010A** Units: **mg/L** Analysis Date **12/7/2004 7:59:54 AM** Prep Date **12/1/2004**
Client ID: Run ID: **ICP_041207A** SeqNo: **324781**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Selenium	0.0209	0.05									J

Sample ID **MB-6956** Batch ID: **6956** Test Code: **E160.1** Units: **mg/L** Analysis Date **11/24/2004** Prep Date **11/23/2004**
Client ID: Run ID: **WC_041124C** SeqNo: **323022**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	50									

4 / 8

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

Date: *08-Dec-04*

CLIENT: Giant Refining Co
Work Order: 0411219
Project: Evap. Pond #2 Inlet 111904

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID **BTEX std 100ng** Batch ID: **R13881** Test Code: **SW8021** Units: **µg/L** Analysis Date **11/24/2004 2:19:21 PM** Prep Date

Client ID: Run ID: **PIDFID_041124A** SeqNo: **323077**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	35.23	2.5	40	0	88.1	54.9	142	0			
Benzene	19.81	0.5	20	0	99.0	81.3	121	0			
Toluene	20.17	0.5	20	0	101	84.9	118	0			
Ethylbenzene	19.93	0.5	20	0	99.6	53.8	149	0			
Xylenes, Total	59.98	0.5	60	0	100	83.1	122	0			

Sample ID **LCS-6991** Batch ID: **6991** Test Code: **SW7470** Units: **mg/L** Analysis Date **12/2/2004** Prep Date **12/2/2004**

Client ID: Run ID: **MI-LA254_041202A** SeqNo: **324033**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.00542	0.0002	0.005	0	108	75.2	134	0			

Sample ID **LCSD-6991** Batch ID: **6991** Test Code: **SW7470** Units: **mg/L** Analysis Date **12/2/2004** Prep Date **12/2/2004**

Client ID: Run ID: **MI-LA254_041202A** SeqNo: **324034**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.004943	0.0002	0.005	0	98.9	75.2	134	0.00542	9.21	0	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Giant Refining Co
Work Order: 0411219
Project: Evap. Pond #2 Inlet 111904

QC SUMMARY REPORT
Laboratory Control Spike - generic

Sample ID **LCS-6980** Batch ID: **6980** Test Code: **SW6010A** Units: **mg/L** Analysis Date **12/2/2004 9:08:09 AM** Prep Date **12/1/2004**
Client ID: Run ID: **ICP_041202A** SeqNo: **323942**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.436	0.02	0.5	0	87.2	80	120	0			
Barium	0.46	0.02	0.5	0	92.0	80	120	0			
Cadmium	0.4281	0.002	0.5	0	85.6	80	120	0			
Chromium	0.4782	0.006	0.5	0	95.6	80	120	0			
Lead	0.4388	0.005	0.5	0	87.8	80	120	0			
Silver	0.4356	0.005	0.5	0.001192	86.9	80	120	0			

Sample ID **LCSD-6980** Batch ID: **6980** Test Code: **SW6010A** Units: **mg/L** Analysis Date **12/2/2004 9:11:17 AM** Prep Date **12/1/2004**
Client ID: Run ID: **ICP_041202A** SeqNo: **323943**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.4641	0.02	0.5	0	92.8	80	120	0.436	6.24	20	
Barium	0.4811	0.02	0.5	0	96.2	80	120	0.46	4.50	20	
Cadmium	0.4473	0.002	0.5	0	89.5	80	120	0.4281	4.39	20	
Chromium	0.5006	0.006	0.5	0	100	80	120	0.4782	4.58	20	
Lead	0.4614	0.005	0.5	0	92.3	80	120	0.4388	5.03	20	
Silver	0.4582	0.005	0.5	0.001192	91.4	80	120	0.4356	5.05	20	

Sample ID **LCS-6980** Batch ID: **6980** Test Code: **SW6010A** Units: **mg/L** Analysis Date **12/7/2004 8:02:19 AM** Prep Date **12/1/2004**
Client ID: Run ID: **ICP_041207A** SeqNo: **324782**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Selenium	0.5304	0.05	0.5	0.0209	102	80	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Giant Refining Co
Work Order: 0411219
Project: Evap. Pond #2 Inlet 111904

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID **LCSD-6980** Batch ID: **6980** Test Code: **SW6010A** Units: **mg/L** Analysis Date **12/7/2004 8:04:44 AM** Prep Date **12/1/2004**
Client ID: Run ID: **ICP_041207A** SeqNo: **324783**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Selenium	0.5466	0.05	0.5	0.0209	105	80	120	0.5304	3.01	20	

Sample ID **LCS-6956** Batch ID: **6956** Test Code: **E160.1** Units: **mg/L** Analysis Date **11/24/2004** Prep Date **11/23/2004**
Client ID: Run ID: **WC_041124C** SeqNo: **323023**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	982	50	1000	0	98.2	80	120	0			

7 / 8

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

Sample Receipt Checklist

Client Name GIANTREFIN | Date and Time Received:

Work Order Number 0411219 | Received by AT

Checklist completed by A Gonzales 11/19/04
Signature | Date

Matrix | Carrier name Client drop-off

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☐	Not Shipped ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑	
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
samples received within holding time?	Yes ☑	No ☐		
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	

Container/Temp Blank temperature? **6°** *4° C ± 2 Acceptable* If given sufficient time to cool.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345-3975 Fax 505.345.4107
www.hallenvironmental.com

Client: Giant Refining Company - Ciniza
Address: Route 3 Box 7 Gallup, NM 87301
Phone #: 505 722 3833
Fax #: 505 722 0210

Project Name: Evap. Pond #2 Inlet 111904
~~Project #~~:
Project Manager: Steve Moore
Sampler: Steve Moore
Samples Cold?: 6° ☐ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HCl	Preservative	HEAL No.
11/19/04	1100	Water	Pond #2 Inlet	7				041219 1

ANALYSIS REQUEST

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B MOD (Gas/Diesel)	TPH (Method 418.1)	Volatiles Full List (8021)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals Total	Cations (Na, K, Ca, Mg)	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260 (VOA)	8270 (Semi-VOA)	COD, TDS	8021 BTEX + MTBE	Air Bubbles or Headspace (Y or N)
								X						X	X	

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	Date:	Time:
11/19/04	1340	Steve Moore		11/19/04	1340
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)		

Remarks:

Fall 2003		BTEX		MTBE		
ug/l	Date	OW	OW	OW	OW	OW
	Sampled	12	13	14	29	30
Benzene	Fall 03	ND	ND	190	ND	ND
Toluene	Fall 03	ND	ND	2	ND	ND
EthyBen	Fall 03	ND	ND	2.3	ND	ND
Xylene	Fall 03	ND	ND	2.5	ND	ND
MTBE	Fall 03	ND	ND	46	ND	2.7

Fall 2002		BTEX		MTBE		
ug/l	Date	OW	OW	OW	OW	OW
	Sampled	12	13	14	29	30
Benzene	Fall 02	ND	ND	40	ND	ND
Toluene	Fall 02	ND	ND	ND	ND	ND
EthylBen	Fall 02	ND	ND	ND	ND	ND
Xylene	Fall 02	ND	ND	ND	ND	ND
MTBE	Fall 02	ND	ND	14	1.6	3.1

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

May 18, 2004

Dorinda Mancini
Giant Refining Co
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0227
FAX (505) 722-0210

RE: Ciniza Central OCD Landfarm Order No.: 0405115

Dear Dorinda Mancini:

Hall Environmental Analysis Laboratory received 2 samples on 5/14/2004 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

Hall Environmental Analysis Laboratory

Date: *18-May-04*

CLIENT: Giant Refining Co
Client Sample ID: Central OCD LF-No
Lab Order: 0405115
Collection Date: 5/13/2004 1:30:00 PM
Project: Ciniza Central OCD Landfarm
Lab ID: 0405115-01
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **JMP**
Diesel Range Organics (DRO)	610	10		mg/Kg	1	5/17/2004 11:44:03 AM
Motor Oil Range Organics (MRO)	570	50		mg/Kg	1	5/17/2004 11:44:03 AM
Surr: DNOP	107	60-124		%REC	1	5/17/2004 11:44:03 AM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	5/16/2004 6:16:50 PM
Surr: BFB	97.0	74-118		%REC	1	5/16/2004 6:16:50 PM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *18-May-04*

CLIENT: Giant Refining Co
Client Sample ID: Central OCD LF-So
Lab Order: 0405115
Collection Date: 5/13/2004 1:45:00 PM
Project: Ciniza Central OCD Landfarm
Lab ID: 0405115-02
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **JMP**
Diesel Range Organics (DRO)	850	10		mg/Kg	1	5/17/2004 12:14:14 PM
Motor Oil Range Organics (MRO)	990	50		mg/Kg	1	5/17/2004 12:14:14 PM
Surr: DNOP	108	60-124		%REC	1	5/17/2004 12:14:14 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	5/16/2004 6:48:03 PM
Surr: BFB	102	74-118		%REC	1	5/16/2004 6:48:03 PM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: *18-May-04*

CLIENT: Giant Refining Co
Work Order: 0405115
Project: Ciniza Central OCD Landfarm

QC SUMMARY REPORT

Method Blank

Sample ID **MB-5785** Batch ID: **5785** Test Code: **SW8015** Units: **mg/Kg** Analysis Date **5/17/2004 3:12:08 AM** Prep Date **5/16/2004**
Client ID: Run ID: **FID(17A) 2_040517A** SeqNo: **273951**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10									
Motor Oil Range Organics (MRO)	ND	50									
Surr: DNOP	9.993	0	10	0	99.9	60	124	0			

Sample ID **MB-5784** Batch ID: **5784** Test Code: **SW8015** Units: **mg/Kg** Analysis Date **5/16/2004 1:35:56 PM** Prep Date **5/14/2004**
Client ID: Run ID: **PIDFID_040516A** SeqNo: **273436**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0									
Surr: BFB	910.9	0	1000	0	91.1	74	118	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

Date: *18-May-04*

CLIENT: Giant Refining Co
Work Order: 0405115
Project: Ciniza Central OCD Landfarm

QC SUMMARY REPORT
Laboratory Control Spike - generic

Sample ID **LCS-5785** Batch ID: **5785** Test Code: **SW8015** Units: **mg/Kg** Analysis Date **5/17/2004 3:42:17 AM** Prep Date **5/16/2004**
Client ID: Run ID: **FID(17A) 2_040517A** SeqNo: **273952**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50.35	10	50	0	101	67.4	117	0			

Sample ID **LCSD-5785** Batch ID: **5785** Test Code: **SW8015** Units: **mg/Kg** Analysis Date **5/17/2004 4:12:28 AM** Prep Date **5/16/2004**
Client ID: Run ID: **FID(17A) 2_040517A** SeqNo: **273953**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51.59	10	50	0	103	67.4	117	50.35	2.42	17.4	

Sample ID **LCS-5784** Batch ID: **5784** Test Code: **SW8015** Units: **mg/Kg** Analysis Date **5/16/2004 3:09:50 PM** Prep Date **5/14/2004**
Client ID: Run ID: **PIDFID_040516A** SeqNo: **273437**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24.84	5.0	25	0	99.4	73.8	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

I

Hall Environmental Analysis Laboratory

Sample Receipt Checklist

Client Name GIANTREFIN

Date and Time Received:

Work Order Number 0405115

Received by AMG

Checklist completed by Signature Date 05/14/04

Matrix

Carrier name Client drop-off

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☐	Not Shipped ☑
Custody seals intact on sample bottles?	Yes ☑	No ☐	N/A ☐	
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
samples received within holding time?	Yes ☑	No ☐		
Water - VOA vials have zero headspace?	No VOA vials submitted ☑	Yes ☐	No ☐	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	

Container/Temp Blank temperature? 7° *4° C ± 2 Acceptable* If given sufficient time to cool.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

orrective Action _____

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite A
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

Client: Ciniza Refinery / Giant Refining Co

Address: ~~P.O. Box 7~~ 3 ~~Box 7~~ / Gallup, NM 87301

Phone #: 505-722-3833

Fax #: 505-722-0210

Project Name: Ciniza Central OCD Land farm

Project #:

Project Manager: D. Mancini

Sampler: ~~Steve~~ Morris

Samples Cold?: ☒ Yes ☐ No 7.0

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HCl	Preservative	HEAL No.
								0405115
5/13/04	1330	Soil	Central OCD LF-No	1/403				1
5/13/04	1345	Soil	Central OCD LF-So					2

ANALYSIS REQUEST

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B MOD (Gas/Diesel)	TPH (Method 418.1)	Volatiles Full List (8021)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Cations (Na, K, Ca, Mg)	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260 (VOA)	8270 (Semi-VOA)			Air Bubbles or Headspace (Y or N)
		X														
		X														

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
5/14/04	0820	Brenda Mancini	
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
5/14/04	10:30		D. Gonzales 5/14/04 1030

Remarks: Rush + please fax results

DM

GIANT
REFINING COMPANY

April 16, 2003

Wayne Price
Environmental Bureau
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

Dave Cobrain
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505

RE: Well Placement Approval

Dear Mr. Price and Mr. Cobrain:

Over the past several years, your offices and Giant discussed replacement and addition of wells along the property boundaries in the Northwest corner of the Ciniza Refinery. We submitted a map and description of the proposed wells in our monthly progress reports of 2003. We also included a request for closure of Wells OW-2 and OW-3. The new wells will provide better information about groundwater quality in the area currently monitored by OW-2 and OW–3.

As we understand it, the purpose of these new wells is to ensure that no contamination of groundwater has occurred and to provide a means to monitor the groundwater on a regular schedule (annually) to ensure that any potential future contamination is discovered.

Included with this request for approval and concurrence of the placement of the wells, is the estimated costs (supplied by Precision Engineering, Inc.) for drilling of up to nine wells in three locations and the closure of OW-2 and OW-3 (~$66,000). We estimate analytical costs at about $3000/well for the initial sampling, for a total project cost of ~$100,000.

Because this is a very significant project with substantial costs, Giant requests your concurrence for the location and purpose of the new wells and the closure of OW-2 and OW-3. Once we receive your approval, Ciniza will prepare an internal Request for Expenditure for these funds.

We plan to start drilling in early June, 2003. Your prompt attention and written response is needed to secure the funds in time to meet our proposed start date.

PHONE
505-722-3833
FAX
505-722-0210

ROUTE 3
BOX 7
GALLUP
NEW MEXICO
87301

Please contact me at 505.722.0227 or @ ***dmancini@giant.com*** with any questions or concerns regarding this request. Thank you for your assistance.

Sincerely,

Dorinda Mancini
Environmental Manager, Ciniza Refinery

Enc

CC: Roger Anderson, OCD
Dave Cobrain, HWB
Ed Riege, Env. Superintendent
Matthew Davis, General Manager (w/o enc.)
File

PRECISION ENGINEERING, INC.
P.O. BOX 422 • LAS CRUCES, NM 88004
PH: (505) 523-7674
FAX 505-523-7248 • e-mail: werpei@aol.com

April 8, 2003

Ms. Dorinda Mancini
Giant Refining Company, Inc.
Ciniza Refinery
Route 3, Box 7
Gallup, New Mexico 87301

Re: Proposal for Refinery Boundary Wells
Ciniza Refinery Facility Site

Dorinda,

This letter is our proposal for installation of monitoring wells at the perimeter of the refinery property. Briefly summarized we understand the scope of services will be to install up to three (3) wells at each of three (3) locations (up to nine (9) wells total). Additionally, two existing wells, OW-2 and OW-3, will be closed and permanently sealed. Below is a list and brief description of the tasks that will be performed to accomplish the required work to the satisfaction of the OCD, who we understand is requiring the work. Should you require, we will discuss our proposed scope with the OCD so that there is an understanding with all parties as to our perception of the project needs.

Task 1

Mobilize all materials and equipment to the site (Ciniza Refinery). Precision Engineering, Inc. will furnish all equipment, personnel, and materials to construct the wells and close out the existing wells. In the past, as a cost saving measure the Refinery has elected to furnish some materials (bagged cement, and concrete mix as examples). Should the Refinery wish to do this for the proposed project the final fee will be adjusted accordingly. Precision Engineering, Inc. will provide lodging and per diem for all its personnel assigned to the project.

Task 2

Meet with project related personnel and stake the well locations. The wells at the site are anticipated to be artesian. New Mexico State guidelines indicate that all wells that are artesian in nature are subject to the requirements of the Office of the State Engineer and as such will require permitting. Precision Engineering, Inc. will assist Giant Refining Company in obtaining the required permits to install the wells. Precision Engineering, Inc. will also notify all individuals as required by law as to the time of installation and will invite all OSE officials to be present during the installation. It is unlikely these regulatory officials will wish to be present, however, it is our responsibility to make the offer.

Task 3

One boring will be advanced at each of the three locations for the purpose of obtaining a detailed stratigraphic log of the site formation. The boring will be sampled continuously using a static split barreled intrusion sampler mounted ahead of the advancing auger. The samples will be logged in detail with special attention paid to the notation of free water locations. This log will be used to locate water bearing zones above the soil/Chinle Formation interface. Precision Engineering, Inc. will meet with project related personnel and decisions concerning the location of screens will be made. Historically, a gravelly or sandy horizon has been observed to directly overly the unweathered Chinle Formation. At many locations at the site this permeable zone is water bearing as a result of water accumulation on top of the impervious siltstones and claystones that form the bulk of the Chinle Shales. Assuming this zone is water bearing a monitoring well will be placed with screen crossing the entire thickness of this layer. If the zone is not water bearing a decision will be made with the concurrence of the Refinery Environmental Department representative and, if necessary, representatives of appropriate regulatory agencies. These wells will be described as "interface wells" and the gravel layer itself will be referred to as the "interface zone" when referred to in this document.

Where the log of the boring indicates there are sand zones above the interface layer that are water bearing an additional well will be placed that discretely monitors the water from that upper zone. Screen length may vary somewhat in these wells since thickness of the zone(s) being monitored are anticipated to vary. Again, prior to placing the screens concurrence from project related parties will be obtained. The wells located above the interface zone will be labeled as the "sand wells" and the monitored zones will be known as the "sand zones" where referred to later in this document.

In addition to the wells monitoring the recent alluvial and fluvial sediments above the Chinle Formation, an additional well will be advanced to the Sonsela Sandstone; a named sandstone bed within the Chinle Formation. It is anticipated that installation of these wells will require a change of drilling methods to rotary. Currently it is planned to use "foam" to drill the borings. The use of foam as a drilling agent will require little water and has no significant environmental impact of the surface or subsurface. The well will be placed to monitor the water that is migrating through the Sonsela Sandstone bed. The well designation in this document will be "Sonsela well".

All wells placed for this activity will be constructed using two (2) inch nominal diameter, schedule 40, PVC riser pipe. Screens will be constructed of machine slotted schedule 40, PVC. Slotted pipe will have openings of 0.010 inch (#10). All wells will have bottom end caps. The screen and casing will be equipped with centralizers that will keep the casing centered in the bore hole and vertical. Centralizers will be placed at a maximum of twenty foot intervals to keep the relatively small diameter casing from buckling. In the deep wells the casing will be suspended as well to prevent buckling.

The screen will be sand packed from a point one (1) foot below the bottom of the screen to a point two (2) feet above the top of the screen. The sand will be sized to limit the amount of fines that migrate laterally into the well. A standard 10-20 grading will be used. It should be noted that because of the limited amount of water available in some of the water bearing sands and their proximity to adjacent clays, development of the wells to clear water is considered unlikely.

A layer of montmorillonite clay (bentonite) pellets a minimum of two (2) feet in thickness will be placed immediately above the sand. It is anticipated that the wells will be somewhat artesian. As a result bentonite coated with "confectioner's lacquer" will be used to retard the reaction (hydration) with water until the pellets are at the desired location. The confectioner's lacquer is a food grade product and will not impact the water quality of the wells. Once the montmorillonite clay has hydrated, the wells will be grouted to the surface with slurry comprised of 6% montmorillonite clay (bentonite) and 94% Portland Type I-II cement.

Once the slurry has been allowed to set, an above ground vault will be constructed. The vault will be constructed of a six (6) inch steel casing mounted in a four (4) foot square pad. At locations where the vault is in danger of being hit by traffic, three (3) inch diameter steel bollards filled with concrete will be placed in the surface pad as well. The pad will be sloped away from the vault pipe to facilitate drainage away from the well annulus.

The primary steel vault that shields the PVC riser pipe will extend into the surface pad approximately twenty-four (24) inches. The steel protective vault will be capped with a lockable aluminum protective casting that indicates the vault contains a monitoring well. The exterior surface of the cap will be imprinted with the well designation. The interior of the cap will have the date the well was placed, total depth of the well, amount of screen and the contact where logs can be obtained. The PVC riser pipe will be equipped with a lockable expansion cap. Locks will not be provided, however, keyed alike locks can be provided if requested.

Drilling will be accomplished using the following unit or combination of drilling units:
CME 75D and CP-650

Task 4

The wells will be purged and developed. The primary purpose of the purge and development is to clean the sediment from the sanding effort. Developing the wells to produce clear water will not be part of the development process.

Task 5

After all work is complete at each of the three locations the site will be cleaned up and restored as close as practical to the predrilling condition. Cuttings will be leveled, or if they are contaminated they will be transported to a holding area as designated by Giant Refining Company Environmental Department representatives.

Task 6

After it is determined the wells that are installed in the above tasks are producing at a rate acceptable to Giant Refining Company, wells designated as OW-2 and OW-3 will be closed. Both wells report they have been finished with grouted in place PVC casing making pulling the casing impossible or impractical at best. It is proposed that the closure process be as follows:

1) Tremmie a fluidized portland cement grout from the bottom of the well to the top. Grout will be treated with fluidizing agents so that it will intrude into the formation and all gravel pack areas.

2) A heavy portland cement grout will then be pumped into the well and pressurized to fill all annular spaces. Since the casing has been grouted in place, casing splitting then grouting will not be required.

3) Grout volume will be monitored. A grout volume that is a minimum of one and three-fourths (1-¾) of the computed theoretical volume of the well will be injected.

4) The surface vaults will be removed and disposed of at a location on the facility property designated by Giant Refining Company.

5) Any exposed casing will be cut off below grade and the site will be cleaned up and leveled.

Task 7

Well collar (ground) elevations and top of casing elevations will be determined.

Task 8

Logs and notes taken during the installation of the wells and during the closure of OW-2 and OW-3 will be provided to Giant Refining Company. All well stratigraphy will be entered into the Giant Refining-Ciniza data base kept by Precision Engineering, Inc. Although subsurface models will not be updated as a part of this project the information will be available for incorporation into any future subsurface model updates required by the client.

End of Tasks

Because of the decisions that must be made on the site as well as the need for accurate and detailed logging, a registered professional geological engineer as well as a geologist will be present at the site at all times throughout the project. The engineer and geologist assigned to this project are:

William H. Kingsley, PE and Nathan A. Sanders

Additional technicians will be used on this project as required. If you require resumes of the above personnel please contact our office.

Because the presence or absence of water above the interface zone is not known at the facility boundary, a lump sum price is not practical. It is also not 100% certain that there will be water at the interface zone, although it is assumed that this will be a monitoring point. It is known that the Sonsela Sandstone is located at all points below the facility property. The following has been developed considering the variable nature of the upper sediments.

Mobilization:	**$4,750.00**
Drill and Log Continuous Boring (Three Locations lump sum):	**$6,930.00**
Install Interface Wells (per Each):	**$2,140.00**
Drill and Install Sand Wells (per Each):	**$2,870.00**
Drill and Install Sonsela Wells (Three Wells lump sum):	***$36,500.00**
Close Wells OW-2, OW-3 (lump sum):	**$1,700.00**

* - If 4" materials are used for these wells - **$37,310.00**

If the total possible scope of this project is performed there will be a total of three (3) sand wells, three (3) interface wells, and three (3) Sonsela wells. The nine (9) wells will be located on a total of three (3) sites on the Giant Refining-Ciniza Refinery Site. For the purpose of this proposal it

has been assumed that the sand wells will not exceed seventy (70) feet in depth, the interface wells will not exceed ninety (90) feet in depth, and the Sonsela wells will not exceed a total depth of one hundred sixty (160) feet. If all portions of the project are performed, and the 4" material option is selected for the Sonsela wells only, the fee will not exceed **$65,720.00**.

New Mexico Gross Receipts Tax at a rate of 6.5% ($4,271.80 max.) will be added to the final fee for this project.

We will schedule the project to fit your timelines upon receipt of notice to proceed. If you have questions concerning the intent of the proposal or require clarification concerning the proposed tasks, contact our office. We look forward to working with you on this project.

Sincerely,
Precision Engineering, Inc.

William H. Kingsley, PE

GIANT
REFINING COMPANY

April 7, 2003

Wayne Price
Environmental Bureau
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: February/March 2003 Progress Report
Giant Refining Co., Ciniza Refinery GW-032 Discharge Plan

Dear Mr. Price:

As your office has requested, Ciniza is submitting a progress report on the Discharge Plan renewal issues identified in our 12/10/02 meeting. The Draft Permit will be submitted to your office by June 15, 2003.

1. Three additional nested wells around ponds - We anticipate that the drilling will start the first week in June, 2003. We would like to confirm your approval of the proposed sites ASAP so that we can request the funds for this work. It is unlikely that Ciniza will receive the funds unless the state concurs in writing that our plan meets their approval. We will send a letters under separate cover asking for OCD and NMED concurrence.

2. Investigate tank farm area near recovery wells and install possible French drain – Enclosed are logs from the following borings: 656, 657, 658, 659, 665, and 668. These logs represent borings outside the tank farm dikes, to the north, east and northeast, of Tanks 337, 344, and 345. Please see item # 6 below for the area inside the dike.

3. Investigate around old OW-20 high pH area – Enclosed are the original boring log for OW-20 from January, 1981. On January 14 and 15, 2003, Precision Engineering attempted to drill two different replacement wells in the same area as the original OW-20. We were unsuccessful in replacing OW-20 and closed the well on January 15th. You will find the logs for the attempted replacement wells and the well closure report enclosed. For general information, I am enclosing the well closure procedure used by Precision Engineering.

4. Investigate past OW-29. Find possible channels – Enclosed you will find logs for the following borings near and around the area between the NE corner of the tank farm and the North boundary of the plant: b-1(B1), b-3(B3), 643, 648, 649, MP-4, and MP-9.

5. Inspect the truck center – **At your convenience.**

PHONE
505-722-3833
FAX
505-722-0210

ROUTE 3
BOX 7
GALLUP
NEW MEXICO
87301

6. Find out where OW-17 was located. Now closed, but was originally located w/in tank farm. Sonsela wells were closed in this area. – Please see "close up" map of the area near OW-17 and other wells/borings in the area inside the berms of Tanks 337, 344, and 345. Logs enclosed include: 666, 667, RW-5 (recovery well), RW-6 (recovery well). Also enclosed are the original logs and well closure reports for wells: OW-16, OW-17, OW-25 and OW-26.

7. Prevent runoff from the old temporary pond area – **Complete**.

8. Show drainage ditches on drawings – **Will be included w/Discharge Plan Application due to your office by June 15, 2003.**

9. Submit storm water plan – see #8 above

10. Giant wants to monitor only OW-11, 12, 14, 29, 30 and MW 4 – **Groundwater results for all wells sampled in 2002 will be submitted to NMED, RCRA Programs and OCD on June 1, 2003 along with the Discharge Plan Application.**

11. Giant wants to close OW-2 and OW-3 and replace with new ones – see #1 above.

12. Giant does not want to monitor OW-1, OW-9, and OW-10. RCA wants these wells to be checked to make sure they are still under artesian conditions – No additional information.

13. NMED (RCRA) wants MW-1, 4, 5 and SMW-4 monitored (LTU) – **See # 10 above.**

14. RCA wants Pond #2 sampled – **We would like to confirm this before we submit the discharge plan. As we understand this item, the outlet at Pond #2 will be the compliance point for sampling for the wastewater treatment system / evaporation pond system interface. Parameters will be established by OCD as part of the new Discharge Plan. Ciniza would like to confirm this interpretation as soon as possible.**

15. Old API must be rebuilt or demonstrate that it is not leaking – The API Separator is scheduled for cleaning and inspection the week of April 28, 2003.

16. Giant must complete pressure testing all plant drain lines, sumps, including the tank farms, etc. by 6/1/03. – **No further sewer testing was completed in February or March 2003. We would like to propose completing 80% of the sewer testing by 12/31/03 and the last 20% by 12/31/2004.**

17. Giant must complete Discharge Plan submittal by 10/1/03 with monthly progress reports – **In progress. To be submitted by 6/15/03.**

18. RCA wants monthly progress reports. – This report for February and March 2003 will be the last submitted.

19. Issues of geological channels need to be resolved – To be resolved.

20. LWP to spell out in DP all samples to be taken from which wells and analysis, including frequency – **To be determined**.

Please feel free to contact me at 505.722.0227 or @ ***dmancini@giant.com*** with any questions or concerns you have regarding this report. Thank you for your assistance with our Discharge Plan submittal.

Sincerely,

Dorinda Mancini
Environmental Manager, Ciniza Refinery

Enc

CC: Roger Anderson, OCD
Dave Cobrain, HWB
Ed Riege, Env. Superintendent
Matthew Davis, General Manager (w/o enc.)
File

12/10/02 Meeting held with Giant-Ciniza: GW-032 Dorinda Mancini, Ed Riege, LWP, RCA, Dave Cobrain.

Minutes of meeting: OCD to require the following:

1. Three additional nested wells around ponds.

2. Investigate tank farm area near recovery wells and install possible French drain

3. Investigate around old OW-20 high PH area

4. Investigate past OW-29 Find possible channels

5. Inspect the truck center

6. Find out where old OW17 was located. Now closed was inside of tank farm. Sonsela wells were closed in this area.

7. Prevent run-off from old pond area.

8. Show drainage ditches on drawings

9. Submit storm water plan

10. Giant wants to monitor only OW-11,12,14,29, 30 + MW-4

11. Giants wants to close OW-2&3 replace with new ones

12. Giant does not want to monitor OW-1,9,10 RCA wants these wells to be checked to make sure they are still under Artesia conditions.

13. NMED (RCRA) wants MW-1,4,5 SWM-4 old LTU

14. RCA wants pond #2 to be sampled.

15. Old API must be rebuilt or demonstrate it is not leaking.

16. Giant must complete pressure testing all plant drain lines, sumps, including tank farms, etc. by June 1, 2003

17. Giant must complete DP submittal by Oct 1, 2003 with monthly progress reports.

18. RCA wants monthly progress report.

19. Issues of geological channels needs to be resolved.

20. LWP to spell out in DP all samples to be taken from which wells and analysis, including frequency.