GW - 40

GENERAL CORRESPONDENCE

YEAR(S):
1993

DISCHARGE PLAN

GIANT INDUSTRIES ARIZONA, INC.

GIANT BLOOMFIELD REFINERY
REMEDIATION PROJECT

October 13, 1993

5764 U. S. Highway 64
Farmington, NM 87401

State of New Mexico
Energy, Minerals and Natural Resources Department
OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, NM 87501

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SANTA FE

DISCHARGE PLAN APPLICATION FOR NATURAL GAS PROCESSING PLANTS, OIL REFINERIES AND GAS COMPRESSOR STATIONS

(Refer to OCD Guidelines for assistance in completing the application.)

I. TYPE: Refinery

II. OPERATOR: Giant Industries, Inc.

ADDRESS: P. O. Box 256 5764 U. S. Highway 64 Farmington, NM

CONTACT PERSON: Tim Kinney PHONE: (505)632-3306

III. LOCATION: NW /4 SW /4 Section 22 & 27 Township 29N Range 12W
Submit large scale topographic map showing exact location.

IV. Attach the name and address of the landowner(s) of the disposal facility site.

V. Attach description of the facility with a diagram indicating location of fences, pits, dikes, and tanks on the facility.

VI. Attach a description of sources, quantities and quality of effluent and waste solids.

VII. Attach a description of current liquid and solid waste transfer and storage procedures.

VIII. Attach a description of current liquid and solid waste disposal procedures.

IX. Attach a routine inspection and maintenance plan to ensure permit compliance.

X. Attach a contingency plan for reporting and clean-up of spills or releases.

XI. Attach geological/hydrological evidence demonstrating that disposal of oil field wastes will not adversely impact fresh water. Depth to and quality of ground water must be included.

XII. Attach such other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.

XIII. CERTIFICATION

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Tim Kinney Title: Refinery Remediation Project Manager

Signature: Tim Kinney Date: 10/26/93

DISTRIBUTION: Original and one copy to Santa Fe with one copy to appropriate Division District Office.

DISCHARGE PLAN

I. TYPE OF OPERATION

Giant Industries Arizona, Inc. proposes an annual discharge of up to 12,000,000 gallons of treated water to infiltration trenches located within the inactive Giant Bloomfield Refinery. The water is derived from recovery wells which are part of a remedial action relating to the site.

II. OPERATOR/LEGALLY RESPONSIBLE PARTY AND LOCAL REPRESENTATIVE

Operator/Legally Responsible Party

Giant Industries Arizona, Inc.
23733 North Scottsdale Road
Post Office Box 12999
Scottsdale, Arizona 85267
Phone: (602) 585-8888

Local Representative

Timothy A. Kinney
Remediation Project Manager
Giant Refining Company
Post Office Box 256
Farmington, New Mexico 87499
Phone: (505) 632-8006

Correspondence regarding this discharge plan should be directed to the local representative.

III. LOCATION OF DISCHARGE/FACILITY

Legal Description:
The refinery is located in the NW 1/4 of Section 27, and the SW 1/4, Section 22, Township 29 N, Range 12 W, in San Juan County, New Mexico, approximately 5 miles west of Bloomfield, New Mexico.

Plate 1, enclosed, is an aerial view of the refinery with significant landmarks noted.

IV. LANDOWNER

Giant Industries Arizona, Inc.
23733 North Scottsdale Road
Post Office Box 12999
Scottsdale, Arizona 85267

V. FACILITY

The facility consists of the Giant Bloomfield Refinery and the associated remedial equipment both within, and south of the refinery boundary. The Giant Bloomfield Refinery operated from 1974 to 1982, and is presently inactive. Basically, the remedial system consists of a series of ground water recovery wells, water treatment facilities, and treated water infiltration trenches, processing up to 12,000,000 gallons of water per year. Plate 1 illustrates the refinery boundaries and significant site features within the refinery. Plate 2 illustrates the location and significant details of the southern remedial area.

VI. SOURCES, QUANTITIES AND QUALITY OF EFFLUENT

The facility effluent consists of treated water and separated hydrocarbons. Effluent is derived from contaminated water which is pumped from a series of recovery wells at the site. Up to 1,000,000 gallons of water may be treated and discharged per month. Figure 1 is the result of analytical work performed in the first quarter of 1993 and is representative of effluent quality, except that, with the addition of carbon filtration, PAH levels should drop dramatically in future analyses. General water chemistry, EPA 601, EPA 602, and PAH analyses are represented in the figures. In addition, to assist in scale control, twenty eight percent hydrochloric acid is injected at a rate of .01-.02% of the water volume treated. See Appendix A for sampling frequency, methods, procedures and locations. Major variations in effluent volumes and quality are not expected, as this has not been the operating experience over the last several years under the previous discharge plan.

VII. TRANSFER AND STORAGE OF PROCESS FLUIDS AND EFFLUENTS

Overview - Water Treatment System

At the Giant Bloomfield Refinery, contaminated water is pumped from the aquifer through a series of recovery wells located strategically within the contaminated plume, collected in storage tanks, and subsequently treated by air stripping and carbon adsorption, and, at times, augmented with bacterial enhancing nutrients, prior to discharge into the aquifer through an infiltration trench. Figure #2 is a simplified pictorial representation of a ground water recovery, treatment, and disposal system.

The recovery wells are utilized to recover free floating product and contaminated ground water from the aquifer and create a hydraulic barrier to prevent migration of the contamination plume beyond the well. The hydraulic barrier is formed as the pumping recovery well depresses the water table. This creates a cone of depression to which contamination from surrounding areas preferentially migrates. Figure #3 illustrates the concept. If sufficient recovery wells are placed so that the radii of influence from adjacent wells overlap, a barrier can be formed across the plume

preventing migration beyond the barrier. This is the principle employed at the refinery to contain and remediate the contamination plume.

Recovered water exhibiting dissolved phase and/or free phase hydrocarbons above New Mexico WQCC groundwater regulatory levels require treatment to within applicable guidelines prior to discharge. The method of treatment used at the Giant Bloomfield Refinery for the removal of dissolved phase hydrocarbons is air stripping followed by carbon adsorption. Air stripping is an operation in which undesirable dissolved hydrocarbon molecules are transferred from a liquid into a flowing air stream. Figure #4 illustrates a typical air stripper. Contaminated water is pumped to the top of the tower and distributed uniformly across the randomly packed column. It flows downward in a thin film layer along the packing surfaces. Air is injected at the base of the tower and flows upward, contacting the water. Volatile hydrocarbons are transferred from the water to the air and carried out the top of the column. The stripped effluent water exits the bottom of the column. Final polishing of the water is accomplished in the carbon adsorption unit where remaining volatile and non-volatile organic compounds are adsorbed into the carbon matrix.

At times, recovered water exhibits free phase hydrocarbons. Gravity separation of these components takes place in various tanks. The free floating hydrocarbon that is skimmed off the water is stored in a separate tank for eventual transportation off site.

Treated water is discharged to infiltration trenches strategically located within the refinery. Infiltration trenches consist of subsurface perforated piping systems placed within gravel packs where water can infiltrate the surrounding strata and eventually make its way to the aquifer. Figure #5 illustrates a typical infiltration gallery. The return of recovered water to the aquifer serves to recharge the aquifer and to flush contamination from overlying soil zones to the recovery well system. Infiltrated water also serves as a medium for the introduction of oxygen and nutrients for the stimulation of beneficial bacterial growth. The speed of remedial efforts is enhanced by the application of recovered water to specific source areas within the refinery. Infiltration trench locations are noted on Plate 1.

Equipment and Operation - Water Treatment System

Monitor Wells

Numerous monitor wells are located within the refinery and south of the refinery. Monitor wells within the refinery are identified by the acronym GBR (Giant Bloomfield Refinery) followed by a numerical designation. Monitor wells located south of the refinery are identified by the acronym SHS (South Highway Site) followed by a number. Monitor wells aid in characterization of the aquifer in their respective locations. Plate #1 illustrates the locations of the monitor wells within the refinery. Plate #2 illustrates the locations of the monitor wells south of the refinery.

Each well is unique in construction and geology. Informational sheets for each well are available. The sheets include well logs and completion details for every monitoring well.

Appendix A of this manual contains sampling frequency and analytical requirements for applicable wells. Analytical results from various wells help determine the effectiveness and progress of remedial efforts. In addition to sampling, the water level in each well is determined quarterly. This information is tabulated and utilized to prepare potentiometric surface maps. Figure #6 is a typical potentiometric map. The lines on the map represent the elevation of the surface of the ground water. The resulting contours are useful in determining the direction of ground water flow and the effectiveness of the hydraulic control achieved by the recovery well system.

Recovery Wells

Recovery wells are an integral part of the containment and remedial system. Recovery wells north of Highway 64 are identified by the acronym GRW (Giant Recovery Well) followed by a numerical designation. Recovery wells south of the highway are identified by their original SHS designation. See Plates 1&2. Analytical results from various wells help determine the effectiveness and progress of remedial efforts. Appendix A contains sampling frequency and analytical methods for applicable wells. The water level in each recovery well is determined quarterly. This information is used for the same purpose as the level information collected from the monitor wells. Water volumes from each recovery well are metered. Metered water volumes as well as well water levels indicate the effectiveness of the well pump and controls. Effort is made to maintain consistent maximum pumping rates to maximize the effectiveness of the hydraulic containment barrier.

Water Treatment

Air stripping and carbon adsorption processes are utilized for water treatment. The air stripper is designed to strip dissolved volatile organic compounds from the influent water to levels within regulatory effluent standards. Some volatile organic compounds present in the stripper influent that are not sufficiently volatile to be efficiently removed by the air stripper and must be removed by carbon adsorption. The combination of air stripping and carbon adsorption provides a greater degree of certainty as to the quality of effluent discharged.

Tank 102

Tank 102 acts as an intermediate storage tank for the water treatment system. It has a capacity of 500 barrels or 21,000 gallons. The tank stores water before it is pumped to the air stripper for treatment. Separation of any free phase hydrocarbon from the recovered water takes place in the tank. Free product is periodically skimmed from the tank and stored in a separate vessel. See Figure #7. Since the air stripper operates most efficiently within a specific range of water flow rates (20-50

GPM), and, since the recovery wells are not capable of continuous rates in this range, water is accumulated and periodically pumped from Tank 102 to the Air Stripper at a rate of 20-40 GPM. Piping and instrumentation associated with Tank 102 is illustrated by Figure #8. Water is pumped from Tank 102 to the Air Stripper by Pump #1, P1. Pump operation is based on the level of water in Tank 102. Level switches LS-1 and LS-2 are utilized by the Control Panel, located in the old Dispatch Office, to determine the water level and consequently the run status of Pumps. Level safety switches LSH-1 and LSL-1 indicate abnormally high or low water level conditions in Tank 102 and initiate control panel alarm and shutdown functions.

Tank 101

Tank 101 serves as the Air Stripper transfer pump run tank. It is a 400 gallon vertical fiberglass tank. The tank is entirely housed within a building known as the Tank 101 Building. Plate #1 indicates the location of the building. Tank 101 serves to accumulate and de-aerate water prior to pumping it to the carbon adsorber. See Figure #7. Also housed in the Tank 101 Building are several valves associated with the processing of water.

Acid Injection

To prevent scale deposition in piping, pumps, and valves downstream of the Air Stripper, a small quantity of 28% HCL is injected in the Tank 102 effluent stream. A 500 gallon HCL storage tank is located adjacent to Tank 102. An acid injection pump is located in the Tank 102 Building. The pump operates any time the Air Stripper is operating. Approximately 2 gallons of HCL are injected for every 10,000 gallons of water processed.

Tank 21

Tank 21 is located in the central part of the refinery. See Plate #1. The tank serves as the collection point for excess volumes of untreated recovery water. See Figure #10 for a schematic of the valves and controls located at Tank 21. There is a high level alarm switch, LSH-3, located at Tank 21. As a part of normal operation, Tank 21 may operate at very low water levels. Therefore, there is not a low level safety switch in the tank. A low level switch, LS-7 is located in Tank 21. In the event of low water level in the tank, Pump #3 will not start even though the Control Panel may be calling for it to run. There is an elevated level limiting trap and siphon break at Tank 21. This device prevents any accumulated scum or hydrocarbon from exiting the tank into the system as the water level is drawn down close to the outlet level.

Rainbow Springs

In the vicinity of an area known as the Refinery Burn Pit there is an underground water collection gallery. See Plate #1. It drains into a covered agricultural stock tank. The gallery and tank are referred to as Rainbow Springs. During the spring,

summer, and fall, contaminated water accumulates in the tank. Approximately once a week, water must be pumped from the tank into the water treatment system. Water from Rainbow Springs is metered into the system through the GRW-9 water meter. During the winter, operation of Rainbow Springs is terminated by capping the end of the gallery's effluent pipe which protrudes from the side of the hill above the tank.

Tank 22

Tank 22 is located in the central part of the refinery. See Plate #1. The tank serves as the collection point for excess treated or untreated water. See Figure #11 for a schematic of the valves and controls located at Tank 22. There is a high level alarm switch, LSH-2, and a low level alarm switch, LSL-2, located in Tank 22 which serve to annunciate undesirable events.

Air Compressor

The Air Compressor is an integral part of the remediation system. It is located in the Dispatch Office. The compressor pumps air for the operation of control valves and air sparging in various tanks. Without compressed air the system will not function. PSL-2 is located on the air compressor. It monitors the system air pressure. If the air pressure in the system drops below 50 psig an alarm is annunciated by the Control Panel.

Control Panel

The heart of the water treatment system is the microprocessor based Control Panel located in the Dispatch Office in the refinery. See Plate #1 for the location of the Dispatch Office. The Control Panel serves to monitor and control the operation of the treatment system, while providing alarm and shutdown functions to safeguard against spills and other undesirable events. Figure #12 illustrates the basic process flow scheme of the treatment system. Safety, alarm and shutdown functions are also initiated by the Control Panel. Tanks 101, 102, 21 & 22, and the air stripper are monitored for undesirable water levels. A low pressure switch monitors the Air Stripper blower status.

Excessively cold ambient conditions reduce the efficiency of the Air Stripper. A temperature switch located on the exterior of the Dispatch Office, monitors the ambient air temperature. The switch is set at 15-25 degrees Fahrenheit. When the ambient temperature drops below the preset limit, the panel interrupts the treatment processing sequence and initiates a low temperature delay. During the interruption, the recovery wells are diverted to Tank 21. The system returns to its original status when the ambient temperature returns to levels above the setpoint. Since water from the recovery wells continues to accumulate in Tank 21 during low temperature delays, as a spill prevention measure, a high water level alarm in Tank 21 will shut down the entire system including the power to the Recovery Wells if the delay lasts long enough to fill Tank 21.

In the event of a power failure, the system will shut down. It will return to normal operation after the power is restored.

The system operational logic is based on the program which is installed in the microprocessor within the Control Panel.

Recovery Well Filters

There are solids filters in each recovery well enclosure, and in the southern control building to control the deposition of solid contaminants in the system.

Heat Tracing

Water piping, which connects the On-Site and Off-Site systems, crosses through a culvert under US highway 64. The highway parallels the southern boundary of the refinery property. The exposed water piping is insulated and further protected from freezing by heat tracing.

Miscellaneous

All piping connecting wells and facilities is buried. All piping with the exception of infiltration trenches is pressurized at least occasionally. All piping installations are less than seven years old. All piping is PVC or other suitable plastic. Underground piping is schedule 40 minimum and aboveground piping is schedule 80 minimum. Valves and controls are constructed of suitable materials such as bronze, cast iron and stainless steel. All active tanks are surrounded by earthen berms with a minimum capacity of 1.5 times the maximum individual or combined applicable tank volume.

VIII EFFLUENT DISPOSAL

Effluent water is discharged to a variety of infiltration trenches within the refinery. See Figure #5 for details of typical infiltration trench construction. All water is treated prior to discharge. Effluent quality is monitored periodically to verify compliance with WQCC standards. See Appendix A for the sampling program schedule. In an effort to enhance both the degradation and recovery of hydrocarbons, water may have oxygen and nutrients added prior to discharge. The effect of this practice is closely monitored in accordance with approved plans. Infiltration trenches are located such that contaminated zones are reached with oxygen and nutrients by the treated water. Some flushing of free hydrocarbons also occurs. Free hydrocarbons are flushed toward active recovery wells to speed recovery of hydrocarbons and clean contaminated soil sources. Infiltration trench locations are noted on Plate #1. Treated effluent volumes are metered and reported.

IX INSPECTION, MAINTENANCE AND REPORTING

Inspection, maintenance, and reporting are an integral part of the remediation project. Inspection provides information critical to the safe and efficient operation of the system. Maintenance is key in the prevention of undesirable events and excessive downtime. Spills of untreated effluent are reported to the OCD office when the volume exceeds five barrels.

Regular inspections are performed to assure safe and efficient operation. On a regular basis during the workweek the system operation is monitored. Visual observations are made, looking for leaks, equipment malfunctions and the status of the control system. Observations are recorded in a bound field logbook with the date, time, and person recording the information noted.

An inspection in the control building at each tank, the southern area, and each recovery well is made regularly during the workweek. All equipment is inspected for leaks and malfunctions. The operator is familiar with the location of underground lines and notes any surface indication of underground leaks. Leaks of any size are noted and repaired. Readings from all water meters are observed and recorded in the log book regularly and comparisons of previous readings are made. Abnormal meter readings can indicate problems within the system. On a quarterly basis, the level of water and product is determined for each well. This includes both monitoring and recovery wells.

Knowledge of the ground water elevation is useful in determining the effectiveness of the recovery well network. Levels are determined on a quarterly basis. An electronic water/oil detection tape is to be used to determine levels. Collected data is recorded in the logbook, noting the depth to water and the depth to product as well as the time, date and person recording the observations.

Maintenance of the system includes replacement of filters in well houses, rotating equipment lubrication, air compressor oil changes, adding nutrients as necessary, listening for unusual pump and motor noise, inspecting the carbon pre-filter, and repairing all equipment as required.

X SPILL/LEAK PREVENTION AND REPORTING

Prevention

Leaks and spills are not likely, however, the potential does exist for these events. Tanks and piping are the most likely locations. Safeguards in place in the refinery include the choice of construction materials, safety and shutdown devices, secondary containment, inspection, and security.

1. Materials of Construction

   All piping is constructed of PVC or other hydrocarbon and corrosion resistant plastics. Material choices for valves and controls include plastic, stainless steel, bronze, and cast iron, all selected to be suitable for water and hydrocarbon service. Storage tanks are constructed of steel.

2. Safety and Shutdown Devices

   A microprocessor based central control and safety shutdown panel monitors, annunciates, and shuts down the water treatment system based on the occurrence of abnormal conditions as indicated by equipment sensors outlined following. All storage tanks are equipped with high and low level liquid sensors to detect breaches or overfills. The air stripper is equipped with a low ambient shutdown and drain system to prevent freezing.

3. Secondary Containment

   All tanks in service have viable earthen secondary containment berms in place. All of these bermed areas have a minimum liquid capacity of 1.5 times the total capacity of tank(s) contained within them.

4. Inspection

   Regular inspections during the workweek are performed. These inspections include looking for visual indications of leaks, checking tank levels, recording and comparing meter readings, and checking the condition of pump seals and motors. Unusual conditions are noted in the log book and reported to the Project Manager.

5. Security

   The facility is entirely fenced with chainlink or barbed wire. Gates are locked and access is limited to facility personnel and supervised visitors and contractors.

Emergency Response and Notification

In the event of an unplanned release of water or hydrocarbon at the facility, the project manager should be notified and act as the response coordinator. If he is not available, the next person noted in the following list of alternates should be notified.

	OFFICE	HOME
Project Manager Tim Kinney	632-8006	325-2907
Environmental Technician Jeany Overman	632-3306	325-0715
Pipeline Manager Chuck Calvery	632-8006	325-1043
Transportation Manager Ron Freel	632-8024	632-1364

If it is determined that the release is 5 barrels or greater, the OCD will be notified and a written report submitted.

Leaks occurring outside of tank containment berms should be contained or redirected so that they can be picked up by pumps or vacuum trucks and placed back in storage. In the event of piping leaks, the leaking section should be isolated by closing necessary valves and shutting down pumps. Leaks occurring inside of containment berms can be pumped back into storage tanks.

A red emergency shutdown button is located on the face of the control panel. Depressing the button shuts down all pumps and closes all air operated valves. It should be used in case of emergency.

Reporting

A report of activities at the facility is prepared quarterly. The report includes an update of operations, analytical results, water levels, a potentiometric surface amp, volume history, and specific conductance tracking.

XI SITE CHARACTERISTICS

The refinery is located on weathered outcrops of the Nacimiento Formation which is comprised of shales, sandstones and siltstones of Cretaceous-Tertiary age. Immediately to the west of the refinery and on Giant's property is a large unnamed arroyo which is underlain by 30 to 60 feet of Quaternary alluvial sediments. Older Quaternary terrace deposits of cobbles and boulders are observed on the interfluvial ridges adjacent to the arroyo. These terrace deposits may have been utilized as fill on the refinery site. The San Juan River Valley is located south of the site and contains up to several hundred feet of alluvial fill.

The uppermost zone of ground water in the refinery area is an unconfined to partially confined water-table unit which is hosted by the weathered, locally porous sandstones and shales of the Nacimiento Formation and arroyo alluvium. These units merge hydrologically with the San Juan River alluvium to the south. Figure 4-1 is a generalized east-west cross section across the refinery site showing the relationship of the arroyo alluvium to bedrock. Major hydrogeologic features of the site are:

- an interconnected water-table aquifer, hosted by both valley and arroyo fill and the upper parts of the Nacimiento sandstone;
- ground water at a depth of 25 to 45 feet beneath the land surface;
- an upper water-table surface generally conforming to topography, with ground water flow from north or northeast to south (towards the San Juan River) through the refinery area; and
- minor, local zones of perched ground water, lying 5 to 30 feet above the water table.

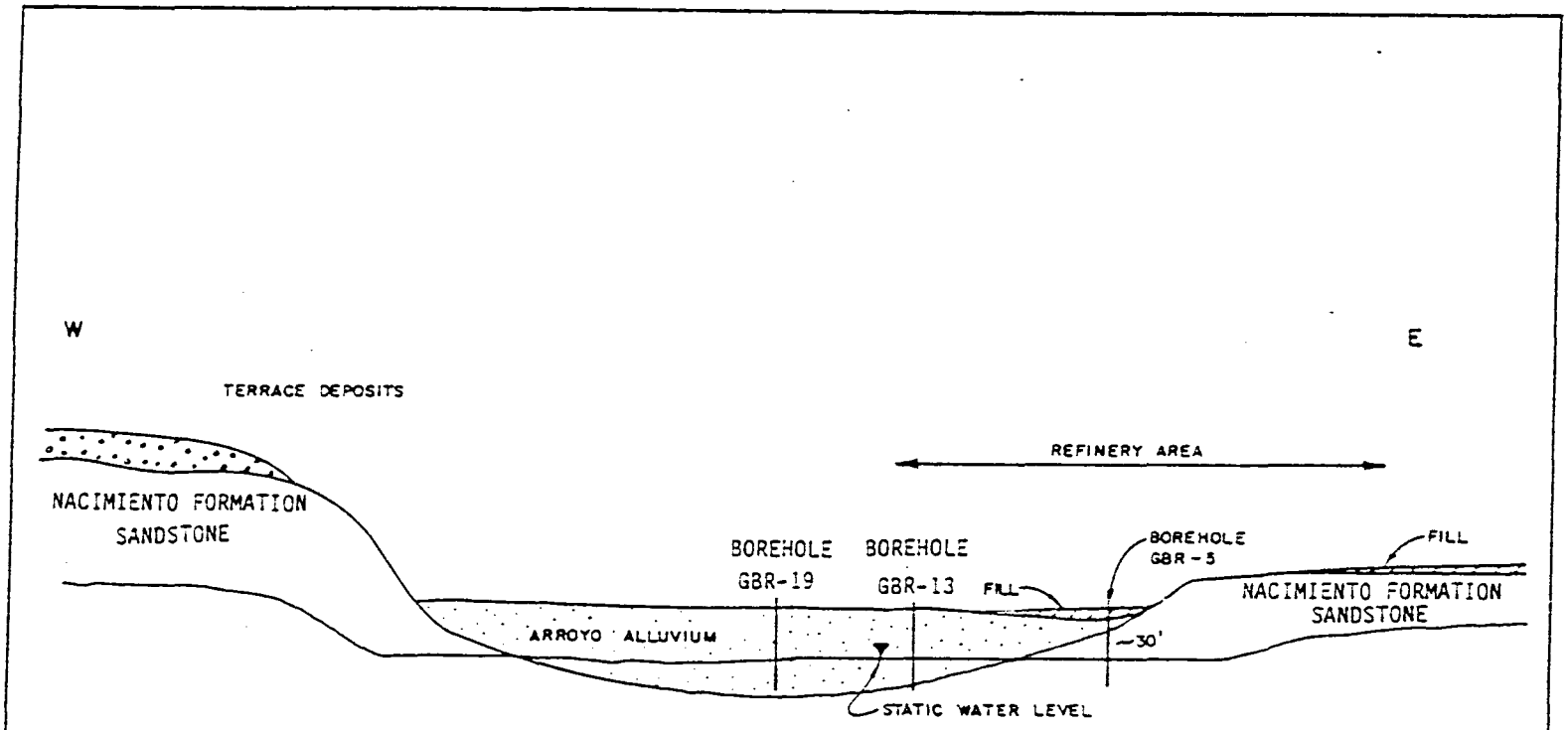


FIGURE 4-1

GENERALIZED EAST-WEST HYDROGEOLOGIC CROSS-SECTION ACROSS REFINERY SITE

Water levels and floating product thicknesses were measured in all wells on the refinery property from April through November 1986. A record of these measurements is shown in Table 4-1. A water table contour map was prepared (Figure 4-2) based on the static water levels of all the wells at the refinery measured in November 1986. This map is representative of static conditions of the aquifer because pumping was not being done at that time. Where floating product was encountered, the product thickness (Table 4-1) has been multiplied by 0.8 and added to the measured water elevation. This calculation corrects for the difference in density between floating product and water by taking into account a product density of approximately 0.8 g/cc. The result provides a value that should be the actual potentiometric surface.

The water table surface depicted in Figure 4-2 generally conforms to local topography. The ground water gradient slopes and flows from:

- north to south in the arroyo toward the San Juan River;
- northeast to southwest in the area east of the arroyo; and
- east to west at the arroyo boundary near the Diesel Spill Area.

Several pump tests were conducted in the Diesel Spill Area and in the Southern Refinery Area. Analysis of the pump tests in the Diesel Spill Area revealed small values of transmissivity and storativity near GBR-27 and moderate values near GBR-14. High values were found in the Southern Refinery Area near GBR-29. These findings imply that fine-grained sandstone, shale, and clay are more predominant in the northern part of the Diesel Spill Area and that coarse-grained sandstone dominates the geology in the southern part of the Diesel Spill Area and the Southern Refinery Area. Flow conditions appear to range from confined near GBR-27 where shale is present, to semi-confined near GBR-14 where clay is present.

TABLE 4-1

GIANT INDUSTRIES BLOOMFIELD REFINERY
CHRONOLOGY OF STATIC WATER LEVELS AND PETROLEUM PRODUCT THICKNESSES IN FEET
WELLS 5-16

DATE	WELL NO.-	GBR 5		GBR 6		GBR 7		GBR 8		GBR 9		GBR 10		GBR 11		GBR 13		GBR 14		GBR 15		GBR 16	
		W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.
4/3		-	-											5349.95	0	5354.75	0					-	-
4/15		5343.10	-											5349.91	0	5352.75	0					-	-
4/16		-	-											-	-	-	-					-	-
4/23		5341.20	0.00											5349.83	0	5352.68	0					5393.10	-
4/30		5342.54	0.00											5349.85	0	5352.79	0					5396.60	-
5/2		-	0.00											-	0	-	0					-	0
5/9		-	-											5349.83	-	5352.75	-						
5/28		-	0.00											-	0	-	0						
5/29		5358.21	1.38											-	0	5350.08	0						
5/30		-	0.08											-	0	-	0						
7/1		-	6.75											-	0	-	0						
7/15		-	14.00											5349.75	0.40	5351.77	0.56						
7/31		5351.93	11.04											-	-	5350.71	0.83						
8/12		5351.53	11.49											5348.66	0.17	5350.39	1.42						
10/7		5362.31	1.00	5359.50	-	-	-	-	-	-	-	-	-	-	-	5351.50	0.75	5365.83	0	5364.62	0		
10/8		5362.81	0.83	5359.54	0	5363.00	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
10/8 (After Pumping GBR-7)		5362.39	0.75	5358.58	0	5353.30	0							-	-	-	-			-	-		
10/9		-	-	-	-	-	-	5348.42	0	5348.50	0	5345.50	2.33	5348.87	0.75	-	-	-	-	-	-		
10/9 (After Pumping GBR-31)		-	-	-	-	-	-	5348.33	0	-	-	5345.62	2.38	-	-	-	-	5365.75	0	5364.50	0		
10/16		-	-	5360.90	-	5362.80	0	5348.38	0	5348.54	0	-	-	-	-	-	-	-	-	5357.58	0		
10/17 (after purging)								5348.42	0	5347.92	0	-	-	-	-	-	-	5365.50	0	5363.46	0		
11/4 (after purging)		5363.10	0.71	5360.17	0.04	5362.50	0	5348.46	0.04	5348.71	0	5348.17	2.04	5348.32	1.50	5351.79	0.38	-	-	-	-		
11/5 (after purge) (After Pumping GBR-29)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5366.46	0	5365.12	0		
11/19		5363.39	0.67	5360.33	0.08	5363.21	0	5348.79	0.04	5349.12	0	5347.42	3.17	5349.08	1.04	5352.33	0.38	5366.33	0	5365.25	0		
11/21 (After pump test)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5358.58	0	5360.37	0		

W.L. = WATER LEVEL IN FEET ABOVE SEA LEVEL
P.T. = PRODUCT THICKNESS IN FEET
- = NO MEASUREMENT
0 = ZERO MEASUREMENT

TABLE 4-1 CONTINUED

GIANT INDUSTRIES BLOOMFIELD REFINERY
CHRONOLOGY OF STATIC WATER LEVELS AND PETROLEUM PRODUCT THICKNESSES IN FEET CONT.
WELLS 17-25

DATE	WELL NO.-	GBR 17		GBR 18		GBR 19		GBR 20		GBR 21(S)		GBR 21(D)		GBR 22		GBR 23		GBR 24(S)		GBR 24(D)		GBR 25	
		W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.
4/3		-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/15		-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/16		-	-	-	-			-	-	5379.62	-	5372.92	-	5361.33	-	-	-	-	-	-	-	-	-
4/23		-	-	5407.15	-			5354.35	-	5377.70	-	5366.55	-	5361.00	-	5377.15	-	5370.70	-	5370.10	-	5367.65	-
4/30		-	-	5407.50	-			5354.00	-	5366.67	-	5370.34	-	5361.21	-	5378.50		5368.79		5368.62		5367.08	
5/2		-	-	-	0			-	0	5377.50	1.92	5370.54	0	5361.11	0	5378.71	0.01	5368.79	0.08	5368.17	0	5366.17	0
5/9		-	-	5407.75	-			5354.08	-	5289.67	-	5368.42	-	5361.17	-	5379.12	-	5368.83	-	5368.33	-	5367.21	-
5/28		-	-	-	0			-	0	-	-	-	0	-	0	-	-	-	-	-	0	-	0
5/29		5367.75	0	-	0			5352.17	0	5375.29	-	5369.67	0	5357.58	0	5375.71	-	5369.54	-	5365.12	0	5365.29	0
5/30		-	0	-	0			-	0	-	1.06	-	0	-	0	-	0.01	-	0.08	-	0	-	0
7/1		-	0	-	0			-	0	-	-	-	0	-	0	-	-	-	-	-	0	-	0
7/15		5367.78	0	5407.23	0			5353.18	0	5368.33	1.04	5371.58	0	5361.07	0	5377.45	0.02	5368.07	0.01	5368.70	0	5367.55	0
7/31		5368.31	0	5411.46	0			5354.20	0	5378.12	0.80	5371.54	0	5360.96	0	5379.23	0.04	5369.57	0	5369.32	0	5367.74	0.04
												5372.25	0	5361.11	0								
8/12		5367.89	0	5410.78	0			5354.20	0	5379.04	0.42					5379.22	0.03	5369.72	0.03	5369.08	0	5367.81	0
10/7		-	-	-	-	-	-	-	-	5379.37	0.50	5370.71	0	5361.84	0	5379.69	0	5369.87	0.04	5369.16	0	5365.30	0
10/8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/9																							
(After Pumping GBR-31		-	-	-	-	5355.00	0	-	-	-	-			5361.75	0	5379.69	0	5369.91	0.04	5369.08	0	5367.86	0
10/16		5369.06	0	5408.52	0	5355.00	0	5354.66	0	-	-	5363.58	0	5361.46	0	-	-	-	-	5366.52	0	5366.28	0
10/17		5369.06	0	5402.72	0	5355.00	0	5354.50	0	-	-	5360.79	0	5361.38	0	-	-	-	-	5368.20	0	5367.03	0
(after purging)																							
11/4		-	-	-	-	-	-	5354.87	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11/5																							
(After Pumping GBR-29)		5369.31	0	5408.56	0	5355.42	0	-	-	5379.71	0.50	5369.71	0	-	-	5379.98	0.02	5370.53	0.04	5369.58	0	5368.03	0
11/19		5369.64	0	5408.39	0	5355.62	0	5355.16	0	5379.79	0.46	5369.92	0	5359.34	2.96	5380.36	0.02	5370.91	0.02	5370.03	0	5368.03	0
11/21																							
(After pump test)		-	-	-	-	-	-	-	-	5379.75	0.33	5366.34	0	5360.04	2.79	5380.36	0	5369.45	0	5367.82	0	5366.95	0

W.L. = WATER LEVEL IN FEET ABOVE SEA LEVEL
P.T. = PRODUCT THICKNESS IN FEET
- = NO MEASUREMENT
0 = ZERO MEASUREMENT

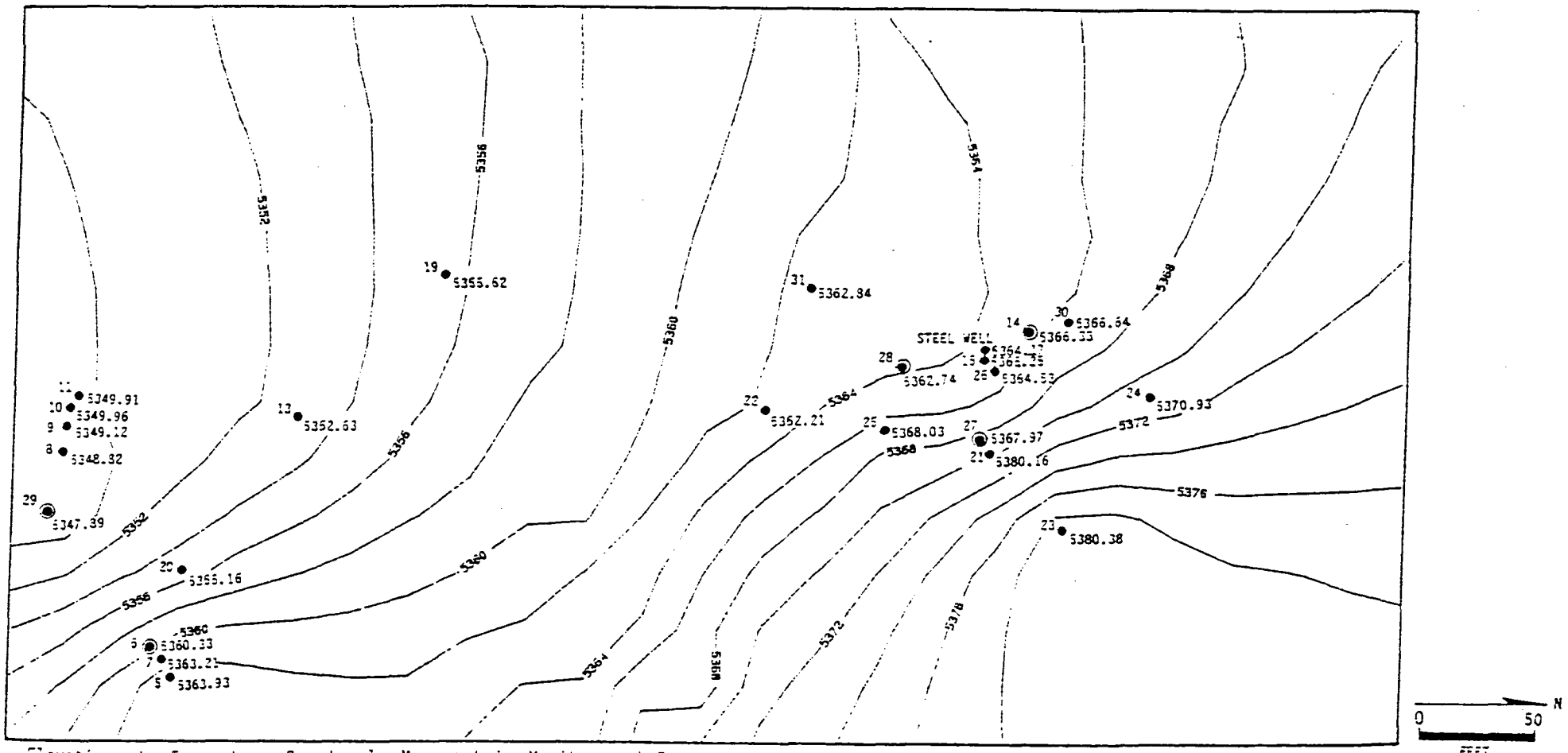
BLOOMFIELD

TABLE 4-1 CONTINUED

GIANT INDUSTRIES BLOOMFIELD REFINERY
CHRONOLOGY OF STATIC WATER LEVELS AND PETROLEUM PRODUCT THICKNESSES IN FEET CONT.
WELLS 26-31

DATE	WELL NO.-	GBR 26		GBR 27		GBR 28		GBR 29		GBR 30		GBR 31		STEEL WELL	
		W.L.	P.T.	W.L.	P.T.	W.L	P.T	W.L.	P.T.	W.L.	P.T.	W.L.	P.T.	W.L	P.T.
4/3		-	-	-	-	-	-	-	-					-	-
4/15		-	-	-	-	-	-	-	-					5363.17	-
4/16		-	-	-	-	-	-	-	-					5363.08	-
4/23		5362.65	-	-	-	-	-	-	-					5362.80	-
4/30		5362.92		5357.04	-	-	-	-	-					-	-
5/2		5362.85	0	5360.16	7.17	-	-	-	-					5363.12	0
5/9		5362.75	-	-	-	-	-	-	-					5362.92	-
5/28		-	0	-	8.08	-	-	-	-					-	0
5/29		5361.29	0	5357.67	8.67	5359.87	0.17	5345.00	0					5363.04	0
5/30		-	0	-	8.38	-	0.13	-	0					-	0
7/1		-	0	-	9.00	-	-	-	1.60					-	0
7/15		5362.62	0	-	-	5361.95	0.50	5342.85	4.50					5362.96	0
7/31		5362.93	0	5364.75	2.91	5360.59	0.58	5341.02	7.34					-	-
				(after being pumped)											
8/12		5362.31	0	-	-	5360.43	1.22	5341.61	6.50					-	-
10/7		5363.72	0	5367.25	0.42	5362.18	0	5342.27	6.25	5366.00	0	5362.30	0	5363.71	0
10/8		-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/9		-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/9															
(After Pumping GBR-31)		5363.56	0.04	5367.08	0.38	5361.47	0	-	-	5365.92	0	5362.21	0	5363.56	0
10/16		5363.35	0	-	-	5358.42	-	-	-	5365.79	0	5362.00	0	5362.79	0
10/17		5361.26	0	-	-	-	-	-	-	5365.83	0	5362.00	0	5363.04	0
(after purging)															
11/4		-	-	-	-	-	-	5343.02	5.58	-	-	-	-	-	-
11/5															
(After Pumping GBR-29)		5364.93	0.08	5368.08	0.29	5362.26	0.02	5345.94	2.04	5367.00	0.25	5362.42	0	5364.21	0
11/19		5364.39	0.17	5367.91	0.08	5362.54	0.12	5345.52	2.96	5366.50	0.17	5362.34	0	5364.17	0
11/21															
(After pump test)		5364.01	0.12	5357.16	0	5361.93	0	-	-	5366.42	0	-	-	5363.79	0

W.L. = WATER LEVEL IN FEET ABOVE SEA LEVEL
P.T. = PRODUCT THICKNESS IN FEET
- = NO MEASUREMENT
0 = ZERO MEASUREMENT



Elevations in Feet above Sea Level, Measured in Monitor and Recovery Wells and Corrected for Floating Product, if Present.

FIGURE 4-2

GROUND WATER LEVEL CONTOUR MAP - GIANT BLOOMFIELD REFINERY, NOV. 1986

APPENDIX A

MONITORING, SAMPLING AND REPORTING PROGRAM

Monitoring, sampling and analysis, and reporting are an integral part of the remediation project. Monitoring provides information critical to the safe and efficient operation of the system. Sampling and analytical work is the barometer by which the effectiveness of the project is determined. An emphasis is placed on correct monitoring, sampling, and analysis.

Monitoring

Monitoring the system helps maintain a safe and efficient operation. On a regular basis during the workweek the system operation should be monitored. Visual observations should be made, looking for leaks, equipment malfunctions and the status of the control system. Observations are to be recorded in a bound field logbook including the date, time, and person recording the information.

An inspection in all equipment enclosures should be made regularly. All equipment should be inspected for leaks and malfunctions. The operator should be familiar with the location of underground lines and note any surface indication of underground leaks. Leaks of any size should be noted and repaired. Leaks of a sufficient quantity may have to be reported to the appropriate governmental agency. Readings from all meters are to be observed and recorded in the log book regularly. Comparisons of previous readings should be made. Abnormal meter readings can indicate problems within the system. On a quarterly basis, the level of water and product should be determined for each well. This includes both monitoring and recovery wells. Knowledge of the ground water flow direction is useful in determining the effectiveness of the recovery well network. An electronic water/oil detection tape is to be used to determine levels. Record collected data in the logbook noting the depth to water and the depth to product as well as the time, date and person recording the observations. All measurements are to be recorded in feet and tenths of feet. A mark on the north side of the top of each well casing serves as the measurement reference point. It is necessary to decontaminate the detection tape between each well.

Sampling

Water samples are collected from a variety of wells on a regular basis. The samples are analyzed for various components. The results are included as a part of quarterly reports. Figure #13 is the sample matrix for the project. It illustrates the required analyses and the frequency for various wells and points in the system.

Purging

Wells must be properly purged prior to collection of samples. To obtain a representative aquifer sample it is necessary to withdraw at least 3-5 casing volumes of water from monitoring wells before sample collection. Water is withdrawn using a Teflon or stainless steel bailer. The bailer is repeatedly lowered into the well, withdrawn and emptied until sufficient water has been purged from the well.

The temperature, Ph, and conductivity of the purged water should be monitored at regular intervals as the well is purged. This will help to determine if enough water has been purged to insure a representative ground water sample. As the well is purged, these three parameters should stabilize. If they do not stabilize after 3 casing volumes have been purged, additional water will have to be purged until they do.

Some wells will purge dry. If a well purges dry and does not recover in a reasonable period of time, allow the well to recover and collect samples.

If the well to be sampled has an active recovery pump, collect the sample directly from the pump discharge after allowing a small volume of water to purge the sample valve and line.

Wells which exhibit free floating product are not sampled.

Decontamination

To prevent contamination of ground water samples or monitor wells, all sampling equipment must be thoroughly cleaned prior to each use. The following decontamination procedure is to be strictly adhered to.

1. Disassemble and thoroughly wash all sampling equipment with non-phosphate detergent and water.
2. Rinse several times with deionized water.
3. Rinse once with laboratory grade methanol.
4. Rinse again with deionized water.
5. Wrap the cleaned equipment with aluminum foil or plastic if it is not used immediately.

Plastic gloves should be worn during sampling. They must be disposed of or decontaminated per the above procedure between samples. Do not attempt to decontaminate the rope used with the bailer. Discard it and replace the rope with new rope for each well. Use new nylon, polypropylene or similar rope.

Sample Containers and Shipment

Laboratory supplied sample containers are to be used for all samples. All samples will be collected and placed in tightly sealed glass or polyethylene containers, as appropriate, and preserved in accordance with the requirements of EPA document SW-846 and the standard practices of the laboratory contracted to perform the analyses. The container and preservation technique will be specified by the laboratory. Immediately upon collection, label each container with an adhesive label clearly indicating, in waterproof ink, the project and site identification, sample number, method of sample preservation, date and time of sampling, and the name of the sample collector. The sample number is a unique ten digit code indicating the date and time of sampling. The first two digits represent the year, the third and fourth digits, the month, the fifth and sixth, the day, and the seventh, eighth, ninth, and tenth, the time based on a twenty four hour clock. For example, a sample collected on December 10, 1990 at 1:45 PM would be assigned a sample number of 9012101345. Each sample container is to be sealed with a chain of custody seal. The seal is an adhesive strip which contains the sample number, project and site designation, date and the signature and printed name of the sampler. The seal is affixed to the sample container in such a way that the container can only be opened by breaking the seal. Seals are to be removed only by the laboratory. Samples should be placed on ice as soon as possible and chilled to below 4 degrees Celsius.

Samples are to be shipped via Federal Express or similar overnight air freight to the laboratory. Samples are to be shipped packed in ice, in suitable coolers supplied by the laboratory. The samples must arrive at the laboratory no warmer than 4 degrees Celsius. Wrap the samples in Styrofoam, foam rubber, plastic bubble pack, or similar materials suitable for fragile shipment.

Chain of Custody Forms

All samples collected for analysis are to be accompanied by a chain of custody form. The document records the transfer of custody as the samples are processed. Figure #14 is an example of a properly filled out chain of custody form. The form is prepared in triplicate. One copy is to be retained by Giant prior to shipment. The original and the remaining copy are to be included with the samples. Chain of custody forms are kept on file with the corresponding laboratory report.

STRIPPER EFFLUENT

	1/93	2/93	3/93
GENERAL WATER CHEMISTRY			
Lab pH (s.u.)	8.00	7.60	7.30
Lab conductivity, umhos/cm	3540.00	3570.00	3470.00
Total dissolved solids (180)	2610.00	2610.00	2590.00
Total dissolved solids (calc)	2540.00	2520.00	2520.00
Total alkalinity as CaCO3	264.00	229.00	341.00
Total hardness as CaCO3	959.00	963.00	948.00
Bicarbonate as HCO3	322.00	280.00	416.00
Carbonate as CO3	ND	ND	ND
Hydroxide as OH	ND	ND	ND
Chloride	420.00	450.00	377.00
Sulfate	1110.00	1090.00	1110.00
Calcium	323.00	333.00	319.00
Magnesium	37.00	32.00	37.00
Potassium	2.40	24.00	2.60
Sodium	490.00	460.00	475.00
HALOCARBONS			
Bromodichloromethane	ND	ND	ND
Bromoform	ND	ND	ND
Bromomethane	ND	ND	ND
Carbon tetrachloride	ND	ND	ND
Chloroethane	ND	ND	ND
Chloroethane	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND
Chloroform	ND	ND	ND
Chloromethane	ND	ND	ND
Dibromochloromethane	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND
1,2-Dichloroethane	ND	ND	0.40
1,2-Dichloroethene	1.00	1.00	0.50
cis-1,2-Dic anthracene	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND
Methylene chloride	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND
Tetrachloroethene	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND
Trichloroethene	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND
Vinyl chloride	ND	ND	ND

Figure #1

STRIPPER EFFLUENT (Continued)

	1/93	2/93	3/93
AROMATICS			
Benzene	1.00	1.90	1.00
Chlorobenzene	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND
Ethylbenzene	1.00	2.50	1.20
Toluene	ND	ND	ND
Xylenes	5.00	7.10	2.10
Trichlorotrifluoroethane	ND	ND	ND
PAH			
Naphthalene	9.30		
Acenaphthylene	ND		
Acenapgthene	ND		
Fluorene	21.00		
Phenanthrene	33.00		
Anthracene	ND		
Fluoranthene	47.00		
Pyrene	ND		
Benzo(A)Anthracene	ND		
Chrysene	ND		
Benzo(B)Fluoranthene	ND		
Benzo(K)Fluoranthene	ND		
Benzo(A)Pyrene	ND		
Dibenzo(a,h)Anthracene	ND		
Benzo(g,h,i)Perylene	ND		
Indeno(1,2,3-CD)Pyrene	ND		
1-Methylnaphthalene	100.00		
2-Methylnaphthalene	33.00		

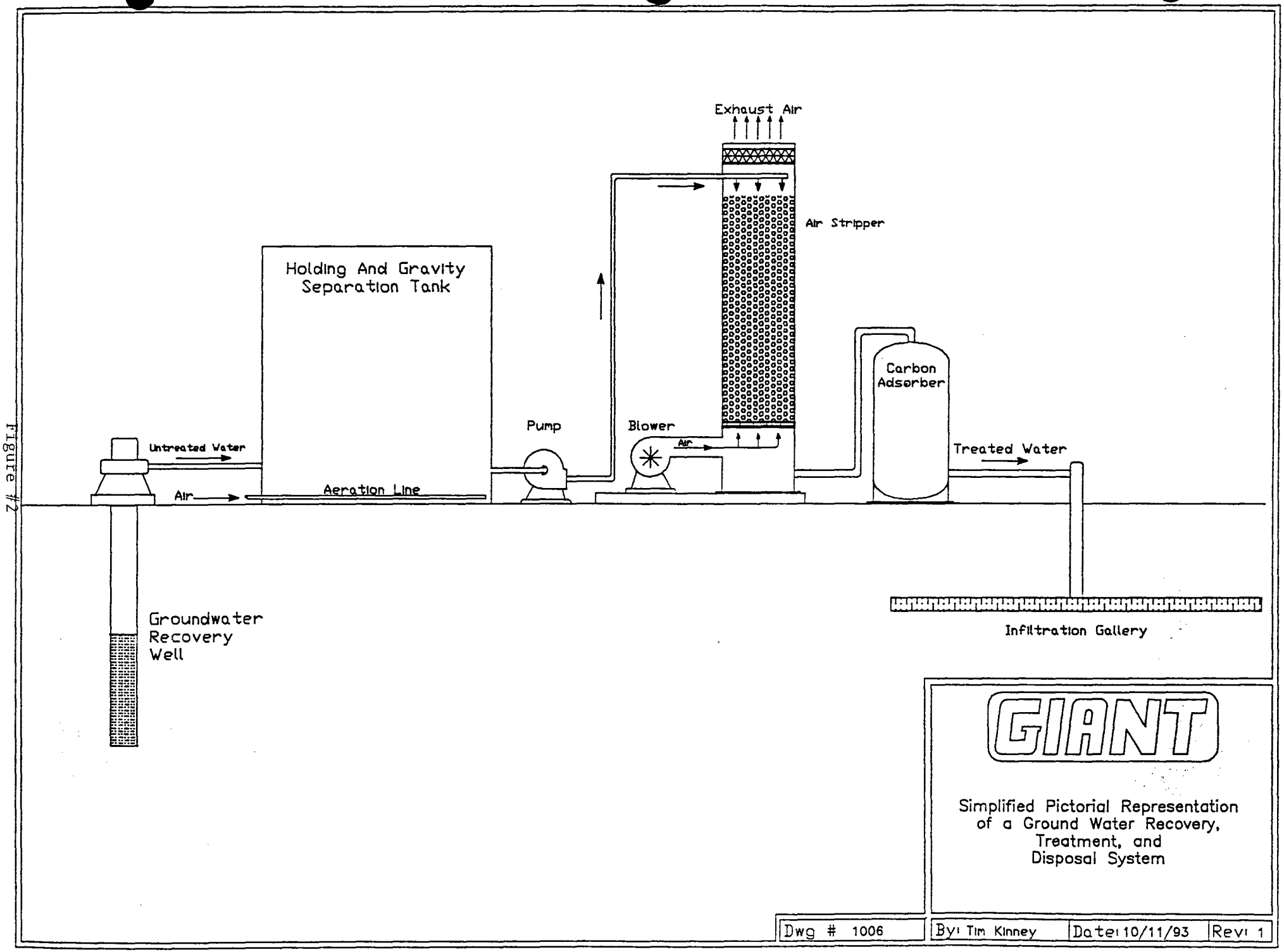


Figure #2

GIANT

Simplified Pictorial Representation of a Ground Water Recovery, Treatment, and Disposal System

Dwg # 1006	By: Tim Kinney	Date: 10/11/93	Rev: 1

The Effect Of Pumping On An Aquifer

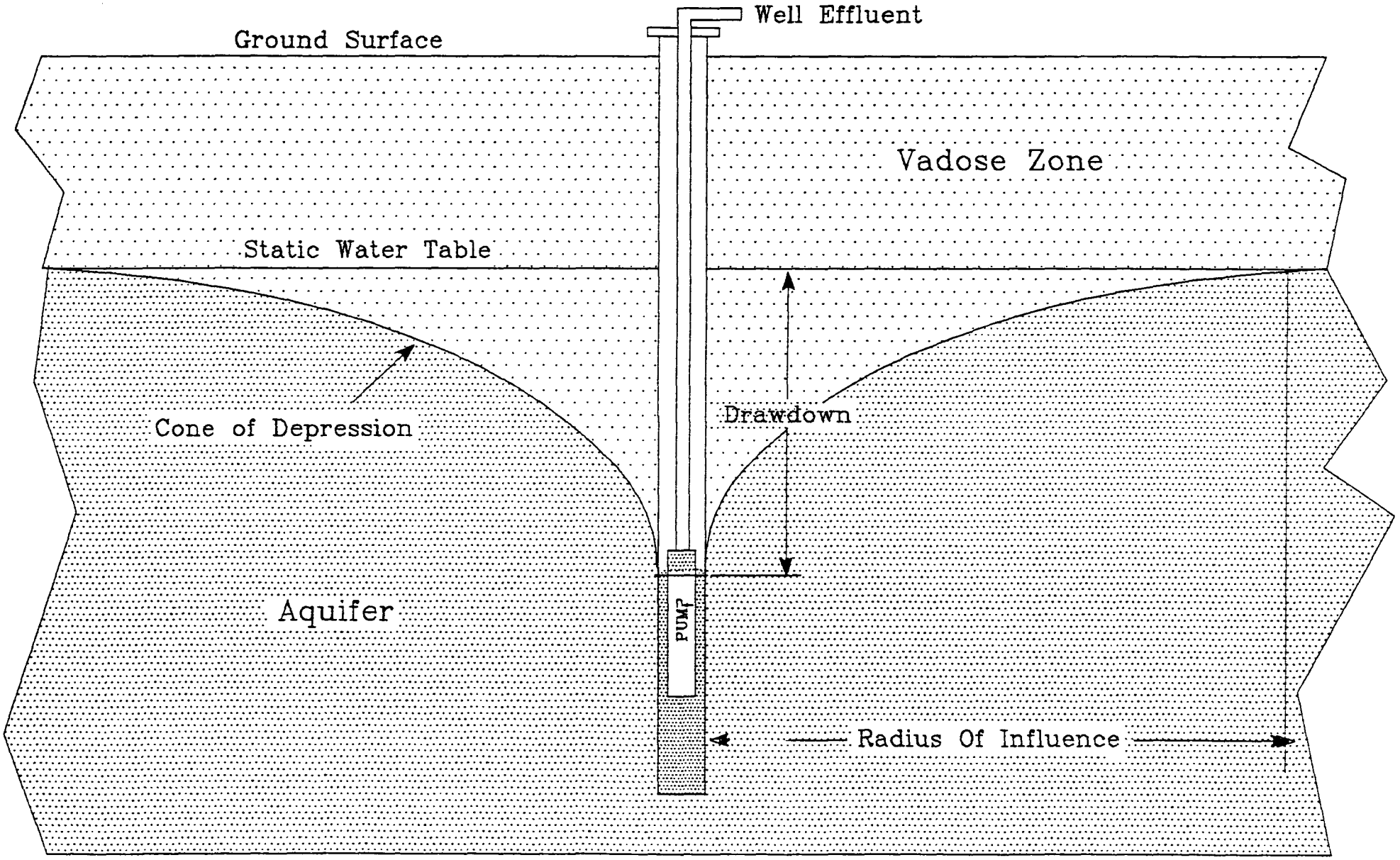
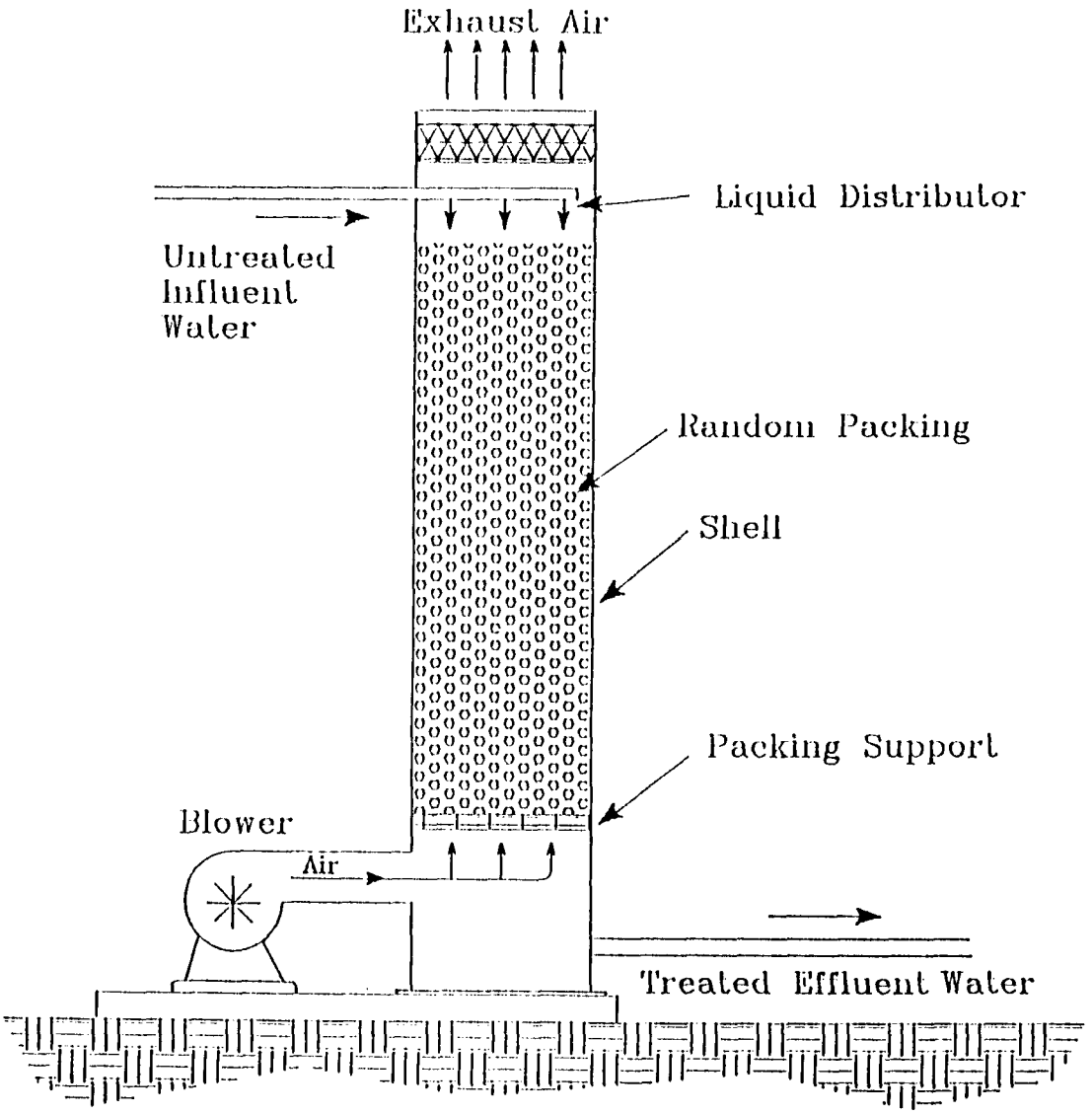


Figure #3

Typical Air Stripper



DWG# 1051

Figure #4

Trench Top View
Cut Away At The
Infiltration Line
Depth

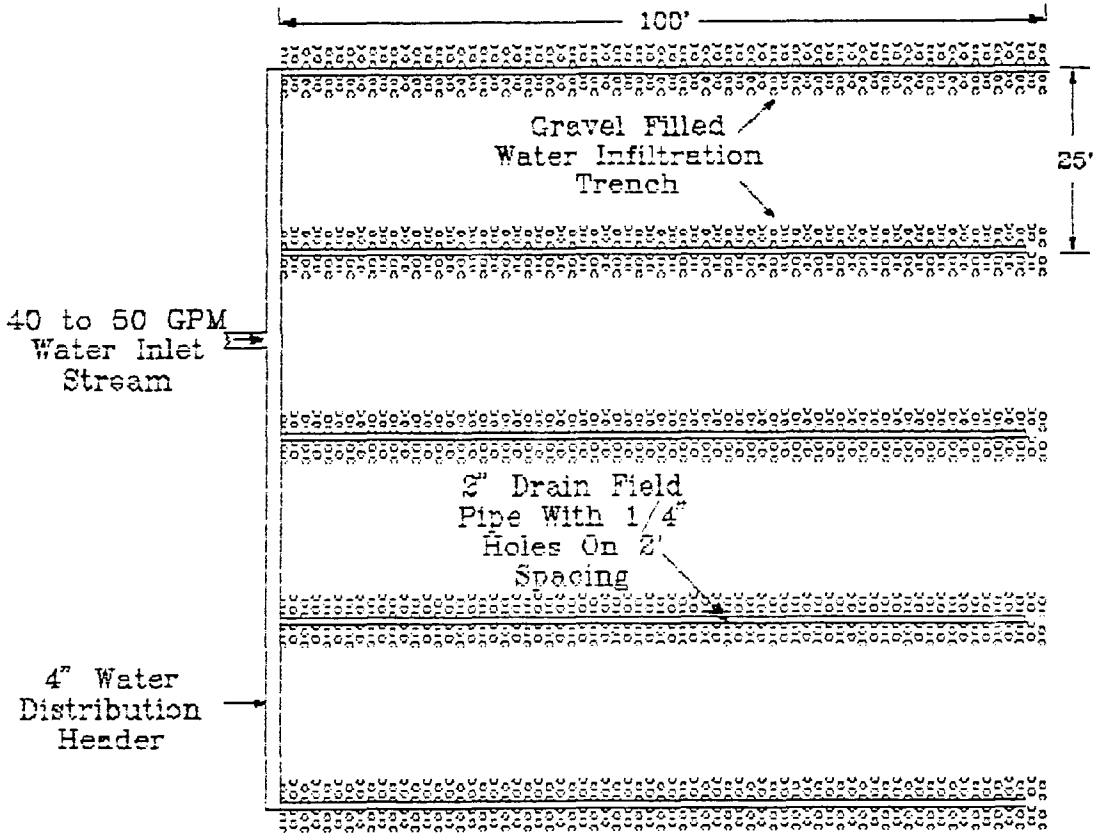
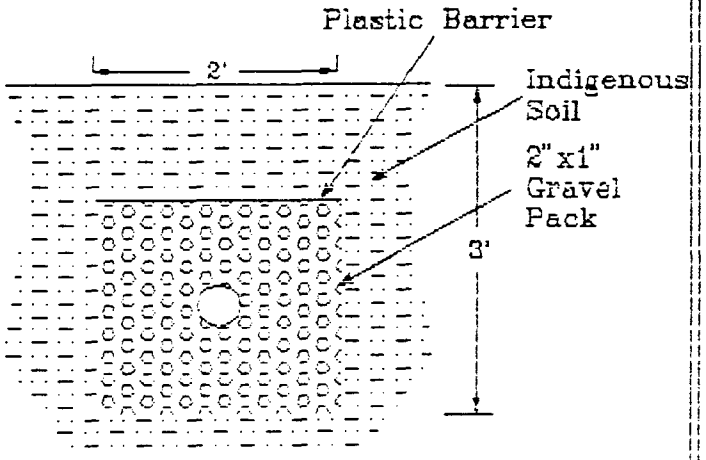


Figure #5

This design is of a typical infiltration gallery similar to the one in the North stormwater containment area

Two inch infiltration lines are designed to handle approximately ten gallons per minute each with a maximum length of 100 feet.



Cross Section Of A
Typical Infiltration
Trench

GIANT

Typical Water Infiltration Gallery

Dwg # 1057	By: Tim Kinney	Date 4/18/91	Rev 0

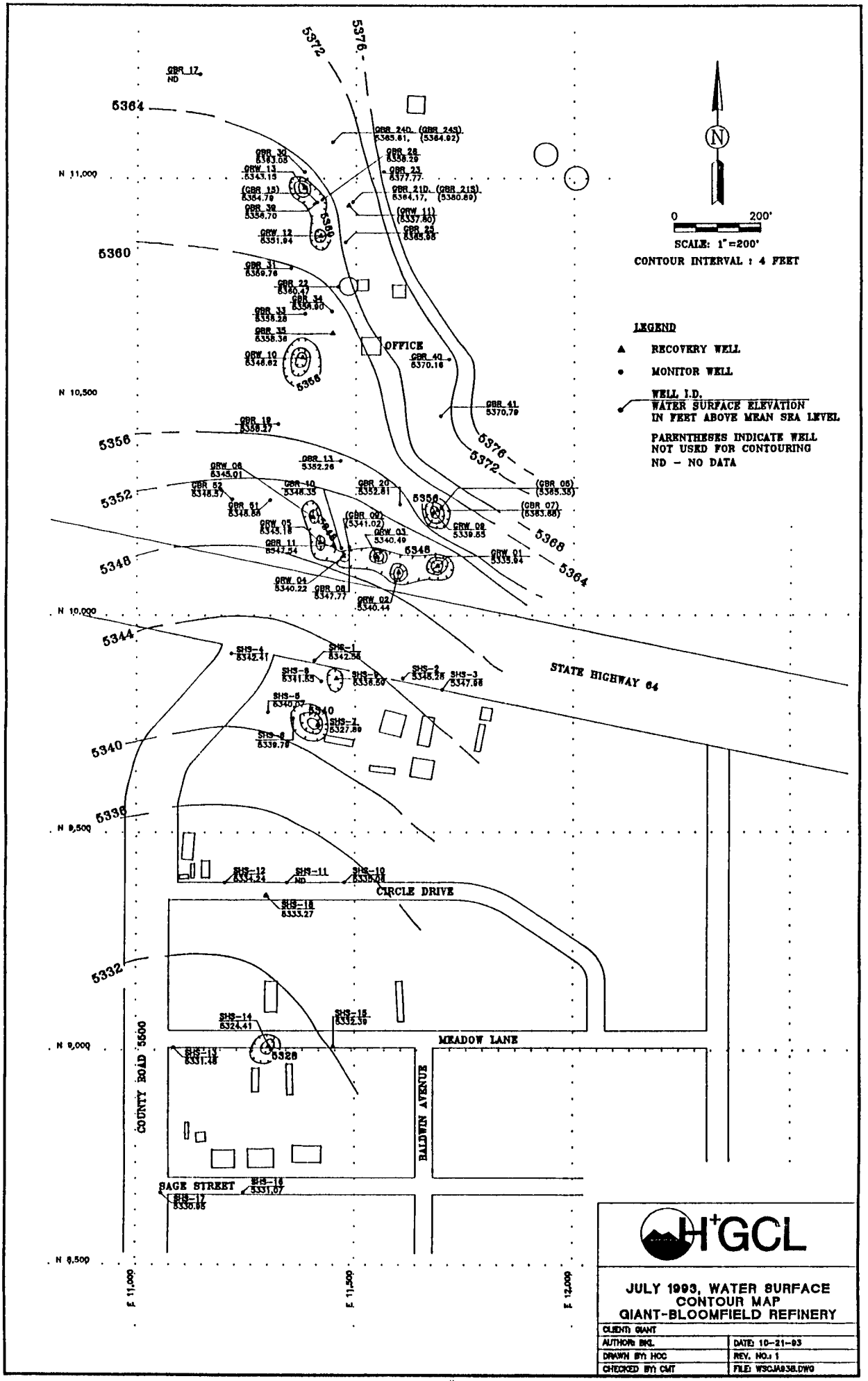
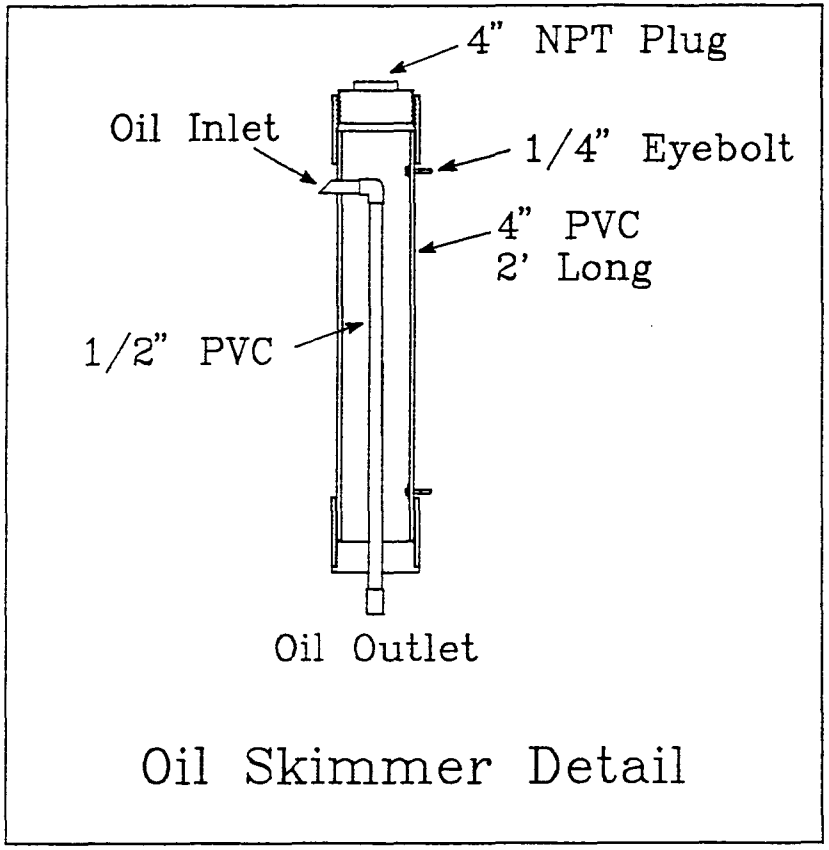
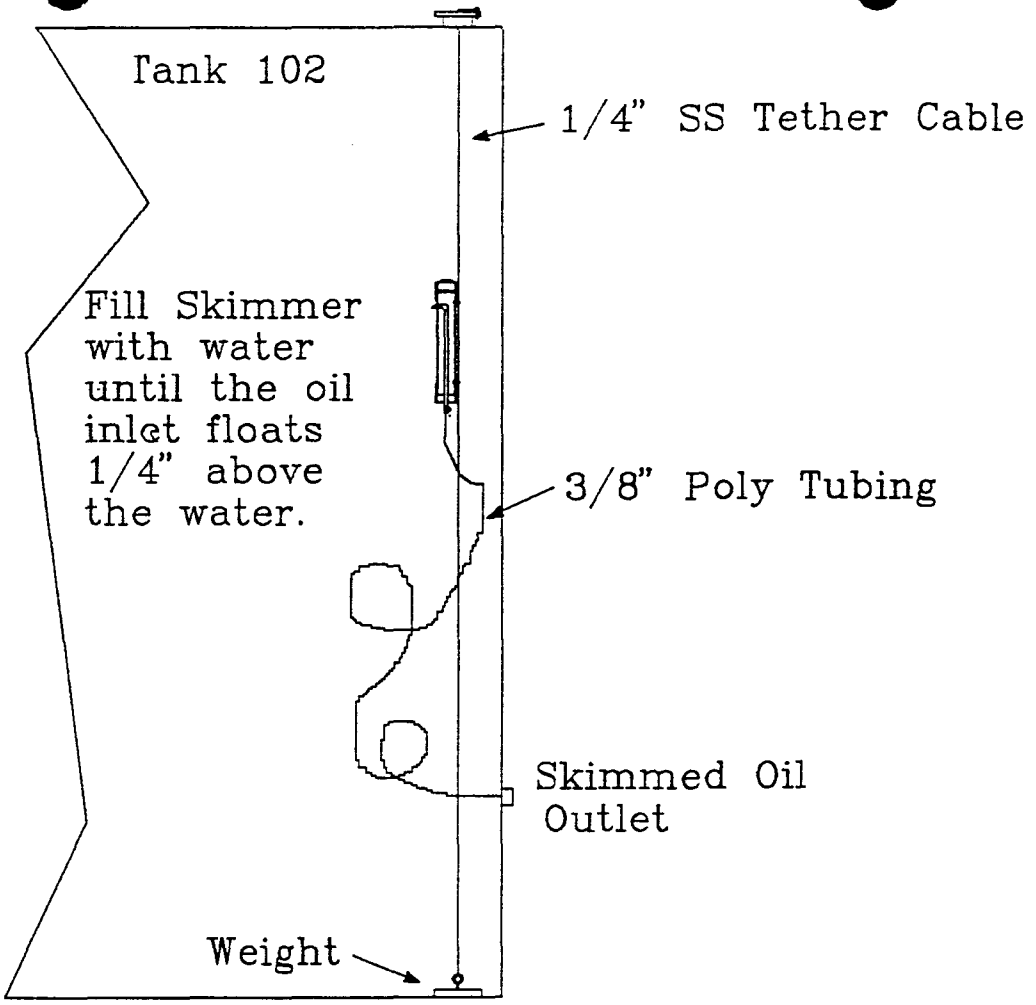

N
0
200'
SCALE: 1"=200'
CONTOUR INTERVAL : 4 FEET
LEGEND
RECOVERY WELL
MONITOR WELL
WELL I.D.
WATER SURFACE ELEVATION IN FEET ABOVE MEAN SEA LEVEL
PARENTHESES INDICATE WELL NOT USED FOR CONTOURING
ND - NO DATA
OFFICE
STATE HIGHWAY 64
CIRCLE DRIVE
MEADOW LANE
COUNTY ROAD 5600
BALDWIN AVENUE
SAGE STREET
N 11,000
N 10,500
N 10,000
N 9,500
N 9,000
N 8,500
E 11,000
E 11,500
E 12,000
JULY 1993, WATER SURFACE CONTOUR MAP
GIANT-BLOOMFIELD REFINERY
CLIENT: GIANT
AUTHOR: BKL
DATE: 10-21-93
DRAWN BY: HCC
REV. NO.: 1
CHECKED BY: CMT
FILE: WSCJA93B.DWG

FIGURE #6



Oil Skimmer Detail



GIANT

Floating Continous
Oil Skimmer
For Tank 102

Dwg #053	By: Jim Kinney	Date: 3/12/91	Rev: 0

Figure #7

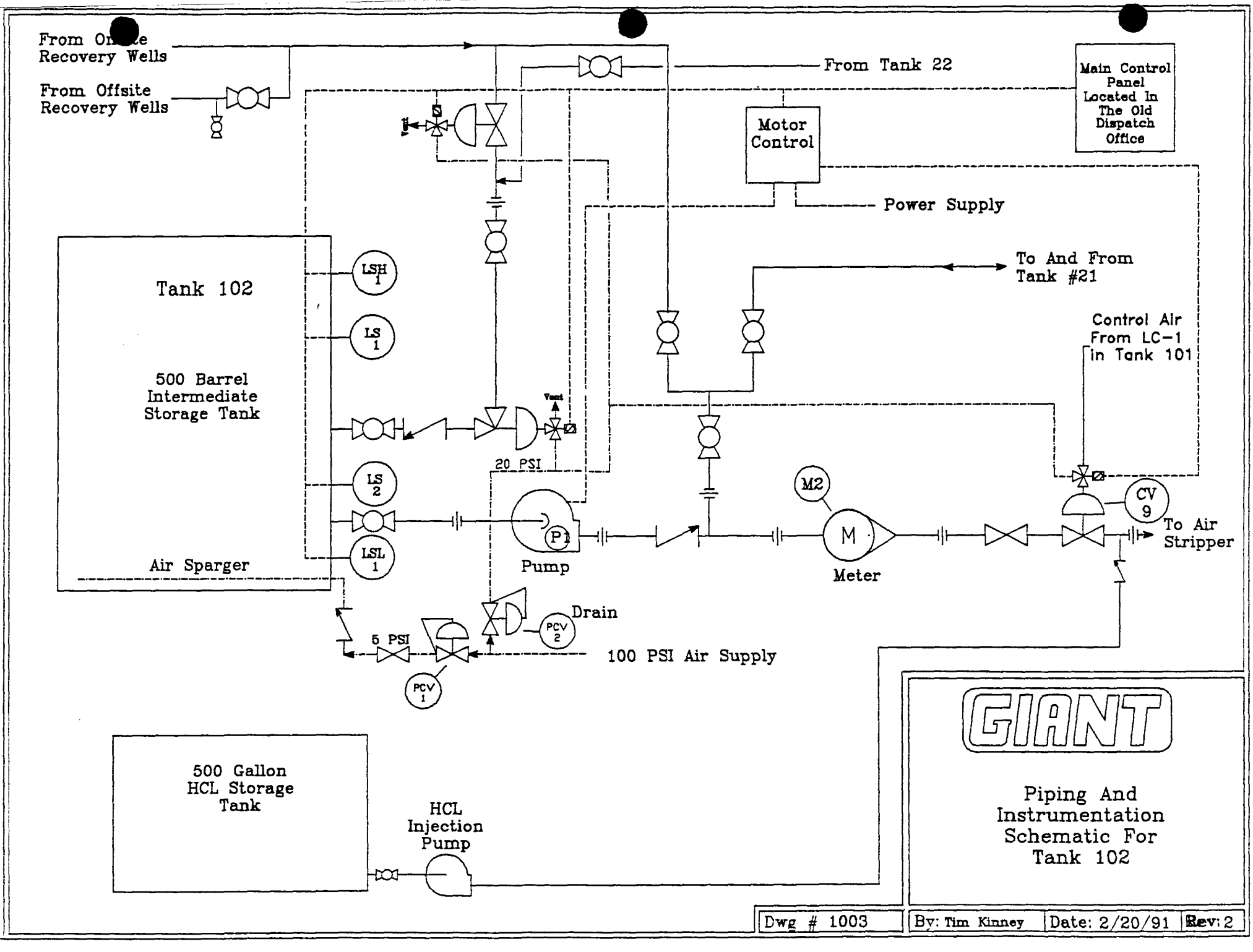

From Onsite Recovery Wells
From Offsite Recovery Wells
From Tank 22
Main Control Panel Located In The Old Dispatch Office
Motor Control
Power Supply
To And From Tank #21
Control Air From LC-1 in Tank 101
Tank 102
500 Barrel Intermediate Storage Tank
LSH 1
LS 1
LS 2
LSL 1
Air Sparger
Vent
20 PSI
P1
Pump
M2
M
Meter
CV 9
To Air Stripper
Drain
PCV 2
5 PSI
100 PSI Air Supply
PCV 1
500 Gallon HCL Storage Tank
HCL Injection Pump
GIANT
Piping And Instrumentation Schematic For Tank 102
Dwg # 1003
By: Tim Kinney
Date: 2/20/91
Rev: 2

Figure #8

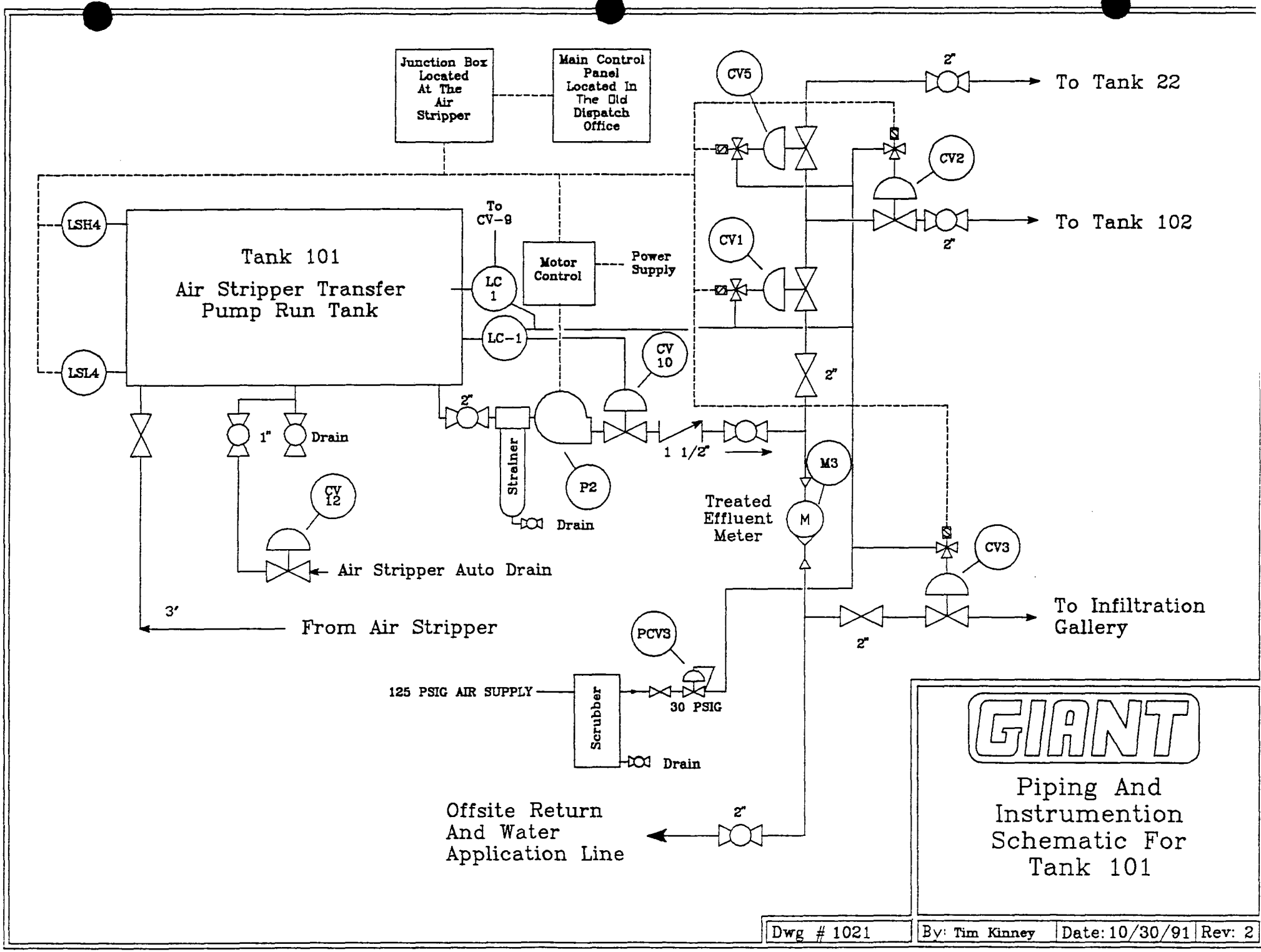

Junction Box Located At The Air Stripper
Main Control Panel Located In The Old Dispatch Office
CV5
2"
To Tank 22
CV2
To Tank 102
2"
CV1
LSH4
LSL4
Tank 101
Air Stripper Transfer Pump Run Tank
To CV-9
LC 1
Motor Control
Power Supply
LC-1
CV 10
2"
1"
Drain
2"
Strainer
P2
Drain
1 1/2"
M3
Treated Effluent Meter
M
CV 12
Air Stripper Auto Drain
CV3
3'
From Air Stripper
To Infiltration Gallery
2"
PCV3
125 PSIG AIR SUPPLY
Scrubber
30 PSIG
Drain
Offsite Return And Water Application Line
2"
GIANT
Piping And Instrumention Schematic For Tank 101
Dwg # 1021
By: Tim Kinney
Date: 10/30/91
Rev: 2

Figure #9

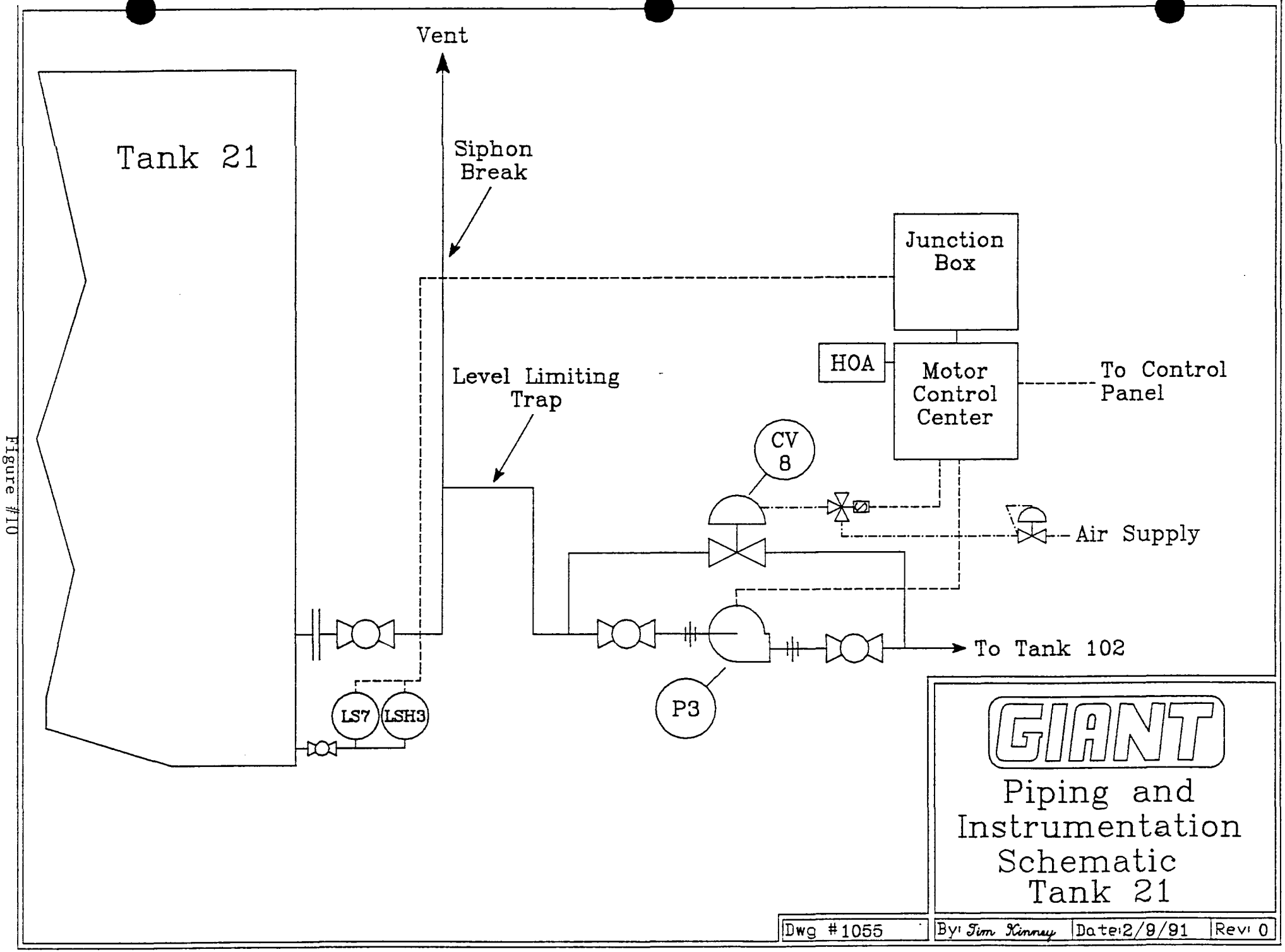

Vent
Tank 21
Siphon Break
Junction Box
HOA
Motor Control Center
To Control Panel
Level Limiting Trap
CV 8
Air Supply
To Tank 102
LS7
LSH3
P3
GIANT
Piping and Instrumentation Schematic Tank 21
Dwg #1055
By: Tim Kinney
Date: 2/9/91
Rev: 0

Figure #10

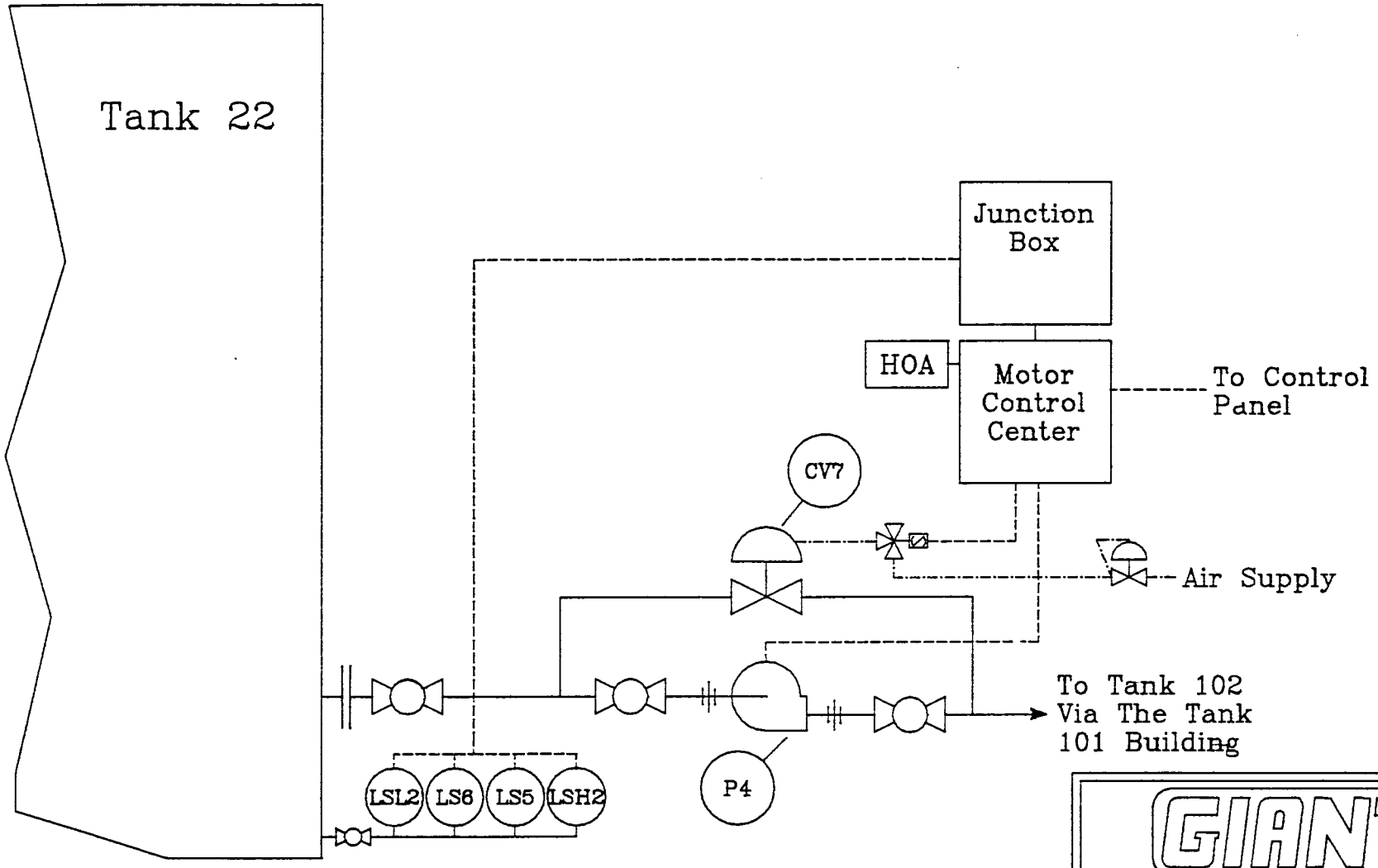


Figure #11

GIANT

Piping And Instrumentation Schematic For Tank 22

Dwg # 1056	By: Tim Kinney	Date: 4/17/91	Rev: 0

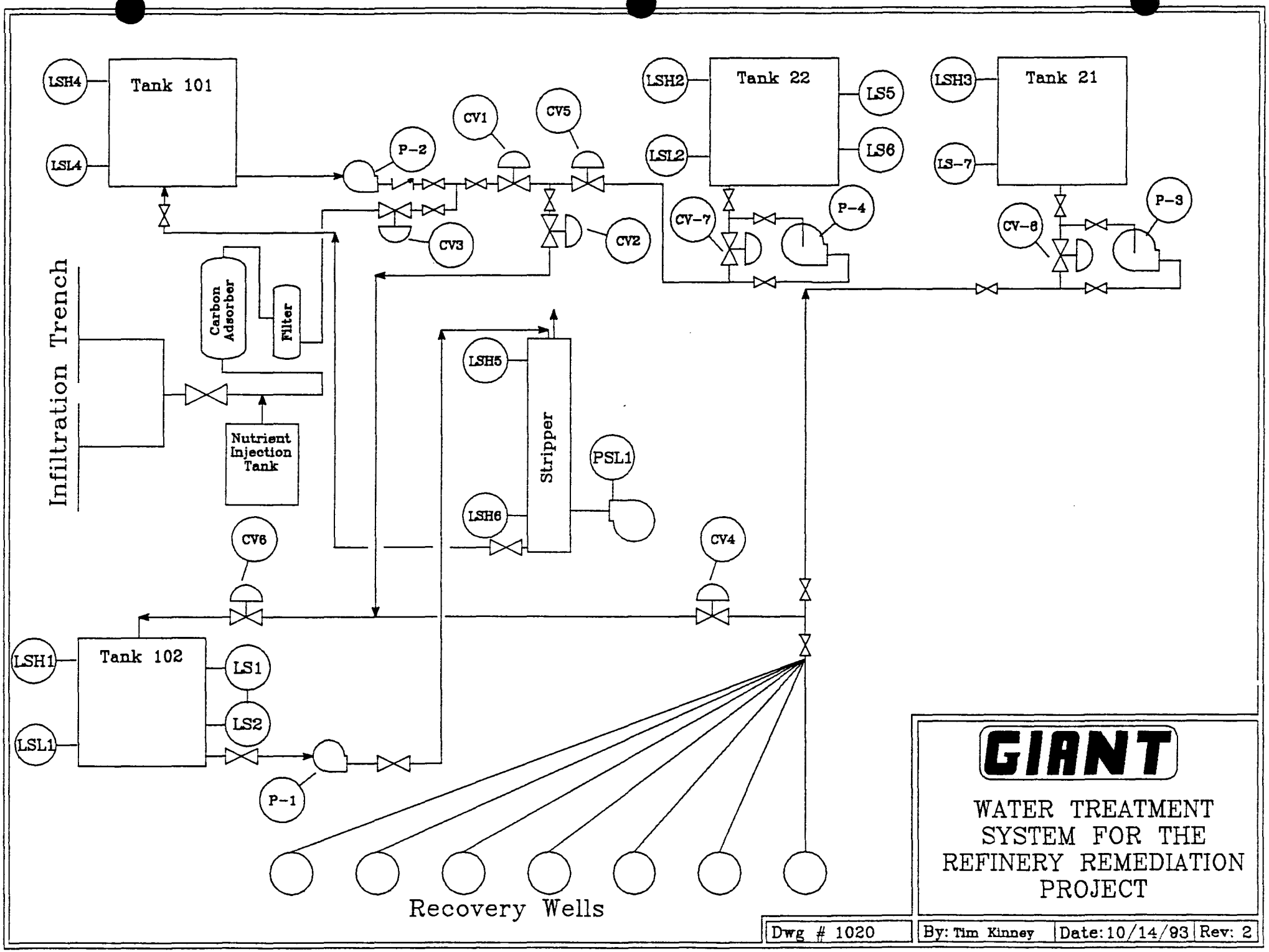
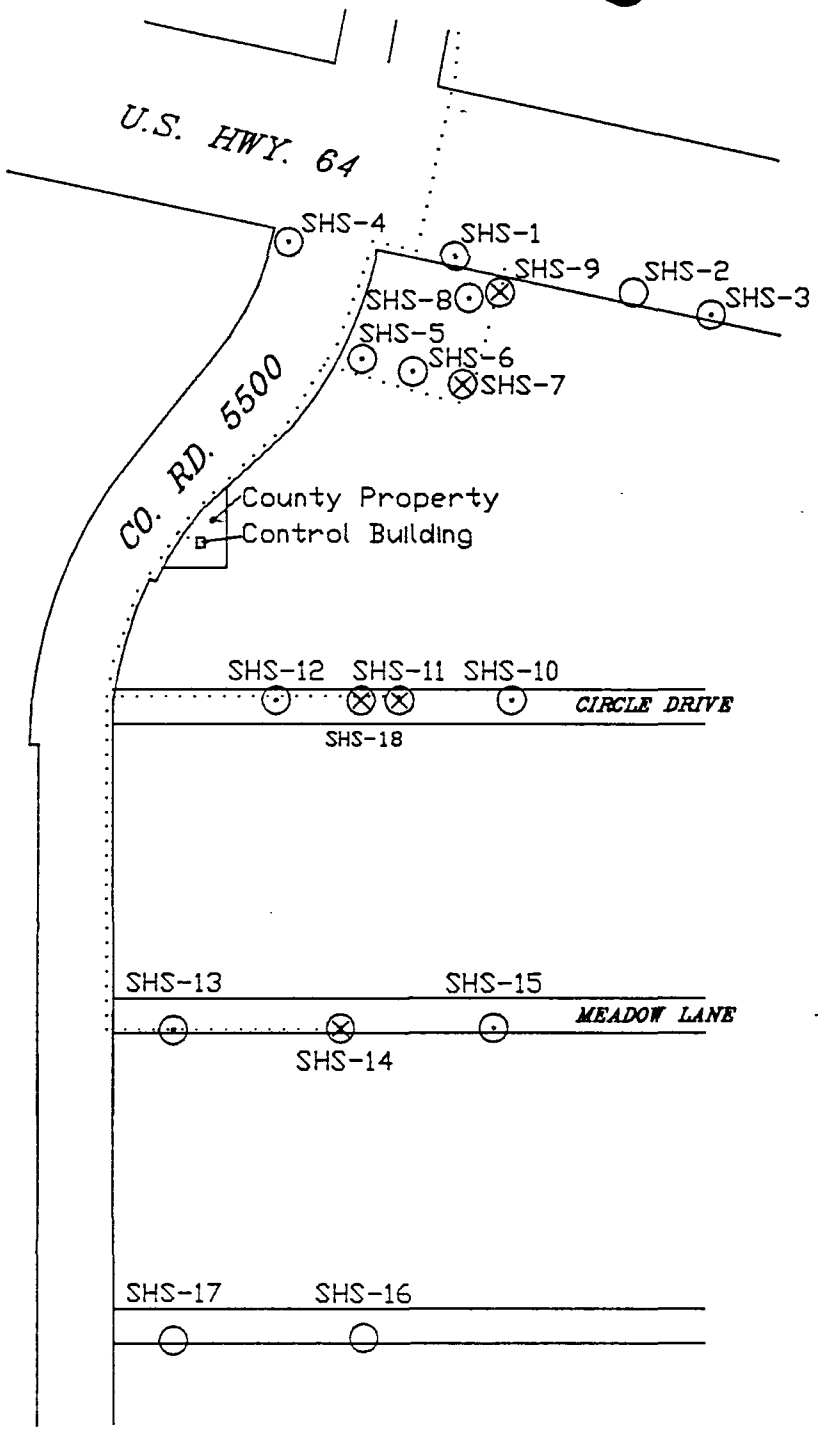

LSH4
Tank 101
LSL4
P-2
CV1
CV5
LSH2
Tank 22
LS5
LSL2
LS6
LSH3
Tank 21
LS-7
CV3
CV2
CV-7
P-4
CV-8
P-3
Infiltration Trench
Carbon Adsorber
Filter
Nutrient Injection Tank
LSH5
Stripper
PSL1
LSH6
CV6
CV4
LSH1
Tank 102
LS1
LS2
LSL1
P-1
Recovery Wells
GIANT
WATER TREATMENT SYSTEM FOR THE REFINERY REMEDIATION PROJECT
Dwg # 1020
By: Tim Kinney
Date: 10/14/93
Rev: 2

Figure #12



⊙ Monitor Wells

⊗ Recovery Wells

GIANT

Site Overview For The Offsite Area

Dwg # 1043	By: Jim Kinney	Date: 10/14/93	Rev: 1

Plate #2

GIANT
REFINING CO.

P.O. Box 256
Farmington, New Mexico
87499

505
632-3306

OIL CONSERVATION DIVISION
RECEIVED
'93 DEC 23 AM 9 41

December 21, 1993

Mr. Roger Anderson
Environmental Bureau Chief
New Mexico Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87504

Dear Mr. Anderson:

RE: Discharge Plan GW-40
Giant Bloomfield Refinery

Pursuant to our telephone conversation of December 20, 1993, Giant is submitting the following revision to Figure #13 of the Discharge Plan renewal application.

Sincerely,

Tim Kinney
Refinery Remediation
Project Manager

/dm

Enclosure

cc Carl Shook-Giant
Kim Bullerdick-Giant
Debbie Smith-Giant
Valda Terauds-H+GCL
Stephanie Odell-BLM
Dale Doremus-EID
Chris Shuey-SWRIC
Herbert Gorrod-EPA
Jim Durrett-SJC
Denny Foust-OCD

FIGURE #13

GIANT BLOOMFIELD REFINERY
SAMPLE MATRIX

Location	Monthly	Quarterly	Semi Annually	Annual
Stripper Influent		601 602 GWC	601 602 GWC	601 602 GWC
System Effluent		601 602 GWC PAH	601 602 GWC PAH	601 602 GWC Metals PAH
GRW-3				601 602 GWC PAH
GRW-6				601 602 GWC PAH
GRW-13				601 602 GWC PAH
GBR-15			601 602	601 602 GWC
GBR-17			601 602	601 602 GWC PAH
GBR-24D			601 602 PAH	601 602 GWC PAH

GIANT BLOOMFIELD REFINERY
SAMPLE MATRIX

Location	Monthly	Quarterly	Semi Annually	Annual
GBR-30			601 602	601 602 GWC PAH
GBR-31		601 602	601 602	601 602 GWC PAH
SHS-3			601 602	601 602 GWC
SHS-4			601 602	601 602 GWC
SHS-6				601 602 GWC
SHS-10		601 602	601 602	601 602 GWC
SHS-12		601 602	601 602	601 602 GWC
SHS-13		601 602	601 602	601 602 GWC
SHS-14				601 602 GWC

GIANT BLOOMFIELD REFINERY
SAMPLE MATRIX

Location	Monthly	Quarterly	Semi Annually	Annual
SHS-15			601 602	601 602 GWC
SHS-16		601 602	601 602	601 602 GWC
SHS-17		601 602	601 602	601 602 GWC
SHS-7				601 602 GWC
SHS-9				601 602 GWC
SHS-18				601 602 GWC
GBR-51				601 602 GWC
GBR-52				601 602 GWC
GBR-32			601 602 GWC Metals	601 602 GWC Metals

GIANT BLOOMFIELD REFINERY
SAMPLE MATRIX

Location	Monthly	Quarterly	Semi Annually	Annual
GBR-48			601 602 GWC Metals	601 602 GWC Metals
GBR-49			601 602 GWC Metals	601 602 GWC Metals
GBR-50			601 602 GWC Metals	601 602 GWC Metals

Notes

All wells will have water and free product elevations determined on a monthly basis.

Wells exhibiting free product will not be sampled.

FIGURE #13

GIANT BLOOMFIELD REFINERY
SAMPLE MATRIX

Location	Monthly	Quarterly	Semi Annually	Annual
Stripper Influent	601 602 GWC	601 602 GWC	601 602 GWC	601 602 GWC
System Effluent	601 602 GWC	601 602 GWC	601 602 GWC	601 602 GWC Metals PAH
GRW-3		601 602 GWC PAH	601 602 GWC PAH	601 602 GWC PAH
GRW-6		601 602 GWC PAH	601 602 GWC PAH	601 602 GWC PAH
GRW-13			601 602 GWC PAH	601 602 GWC PAH
GBR-15		601 602 GWC	601 602 GWC	601 602 GWC
GBR-17		601 602 GWC	601 602 GWC	601 602 GWC PAH
GBR-24D			601 602 GWC PAH	601 602 GWC

GIANT BLOOMFIELD REFINERY
SAMPLE MATRIX

Location	Monthly	Quarterly	Semi Annually	Annual
GBR-30		601 602 GWC	601 602 GWC	601 602 GWC PAH
GBR-31		601 602 GWC	601 602 GWC	601 602 GWC PAH
SHS-3			601 602 GWC	601 602 GWC
SHS-6				601 602 GWC
SHS-10			601 602 GWC	601 602 GWC
SHS-12		601 602	601 602 GWC	601 602 GWC
SHS-13			601 602 GWC	601 602 GWC
SHS-15			601 602 GWC	601 602 GWC
SHS-17		601 602	601 602 GWC	601 602 GWC

GIANT BLOOMFIELD REFINERY
SAMPLE MATRIX

Location	Monthly	Quarterly	Semi Annually	Annual
SHS-7			601 602 GWC	601 602 GWC
SHS-9			601 602 GWC	601 602 GWC
SHS-18			601 602 GWC	601 602 GWC
Tank 21				601 602 GWC Metals PAH
Offsite Stream				601 602 GWC Metals PAH

Notes

All wells will have water and free product elevations determined on a monthly basis.

Wells exhibiting free product will not be sampled.

GIANT

Bloomfield Refinery Remediation
5764 Highway 64
Post Office Box 256
Farmington, New Mexico 87499

CHAIN OF CUSTODY

Date: 4-15-91 Page 1 of 1

LABORATORY The Laboratory
ADDRESS 1212 E. Main Street
Lab City, CA
Telephone (222) 555 - 2222
SAMPLER'S SIGNATURE

SAMPLE NUMBER	MATRIX	LOCATION	POLYNUCLEAR AROMATICS 610/8310	HALOGENATED VOLATILES 601/8010	AROMATIC VOLATILES 602/8020	GENERAL WATER CHEMISTRY	BTEX\MTBE	CONDUCTIVITY	PRIORITY POLLUTANT METALS						NUMBER OF CONTAINERS
9104150955	Water	SHS-25		✓	✓	✓									5
9104151320	Water	GRW-64	✓			✓									3

REQUESTED ANALYSIS

PROJECT INFORMATION
PROJECT: Refinery Remediation
PROJECT MANAGER: Tim Kinney
SHIPPING I.D. NO. Fed. Express #
SHIPPED VIA Federal Express

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDITION/COLD
CONFORMS TO RECORD
LABORATORY NUMBER:

SPECIAL INSTRUCTIONS OR COMMENTS
Return original Chain of Custody to Giant

1004

RELINQUISHED BY: (Signature) 1.	RELINQUISHED BY: (Signature) 2.	RELINQUISHED BY: (Signature) 3
Sally Sampler		
(Printed Name) Sally Sampler	(Printed Name)	(Printed Name)
(Company) Giant Refining	(Company)	(Company)
DATE AND TIME: 4-15-91 4:30 p.m.	DATE AND TIME:	DATE AND TIME:
RECEIVED BY: (Signature) 1.	RECEIVED BY: (Signature) 2.	RECEIVED BY: (Signature) 3 LABORATORY
(Printed Name)	(Printed Name)	(Printed Name)
(Company)	(Company)	(Company)
DATE AND TIME:	DATE AND TIME:	DATE AND TIME:

Figure #14

san juan repr Form 209-29

GDR, 32, 46, 79, 5-7

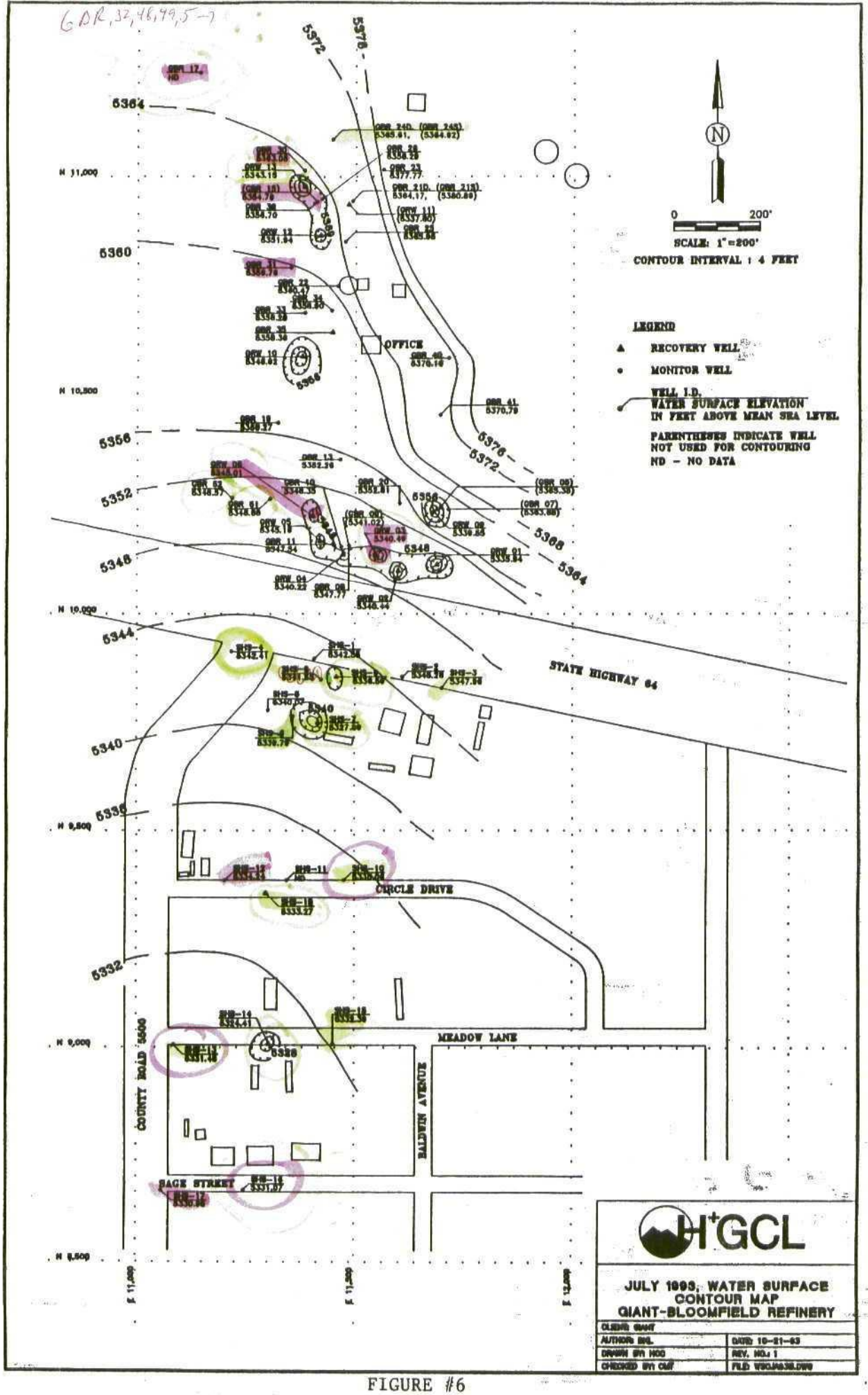


FIGURE #6