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ENTERED

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March 26, 2007

BY TELEFAX AND FIRST CLASS MAIL

RECEIVED
MAR 2007

Edmund H. Kendrick
Montgomery & Andrews
Post Office Box 2307
Santa Fe, New Mexico 87504-2307

Re: San Juan Refining Co. and Giant Industries Arizona, Inc.
Bloomfield Refinery
Draft Cleanup Order

Dear Ned:

Enclosed, as you requested, is a copy of the "Documentation of Environmental Indicator Determination" maintained by the Environmental Protection Agency. Although the first page is dated February 5, 1999, I understand it to be revised at least through 2006, and to be the most current version of the document. It states that "current human exposures are not under control" with respect to the Giant Refining Company, Bloomfield Refinery facility.

I look forward to meeting with you and other Giant representatives tomorrow to discuss the cleanup order for the Giant Bloomfield refinery. The meeting is scheduled to take place beginning at 9:00 a.m. at the Department's Hazardous Waste Bureau office, 2905 Rodeo Park Drive East, Building 1, Conference Room A, in Santa Fe.

Sincerely,

Charles de Saillan
Assistant General Counsel

Enclosure

cc: James Bearzi, Hazardous Waste Bureau
David Cobrain, Hazardous Waste Bureau
Hope Monzeglio, Hazardous Waste Bureau

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final
2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Giant Refining Company
Facility Address: 50 County Road 4990 Bloomfield NM 87413
Facility EPA ID #: NMD089416416

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   X If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available, skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives that are currently being used as Program measures for the Government Performance and Results Act of 1993, (GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			VOCs, SVOCs, TPH, Cr, Pb, Hg, and MTBE
Air (indoors)[2]			NA	
Surface Soil (e.g., <2 ft	X			BTEX, SVOCs and TPH
Surface Water	X			BTEX
Sediment	X			BTEX, SVOCs, TPH
Subsurf. Soil (e.g., >2 ft)	X			BTEX, SVOCs and TPH
Air (outdoors)	X			BTEX, hydrogen sulfide

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

_X_ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):
Groundwater contamination as phase-separated hydrocarbons (SPH), dissolved-phase BTEX (benzene, toluene, ethylbenzene, xylenes), other volatile organic compounds (VOCs), naphthalene and other semivolatile organic compounds (SVOCs), Methyl Tertiary-Butyl Ether (MTBE), gasoline- diesel- and oil-range organics (GRO, DRO and ORO), and chromium are present beneath the refinery facility. Based on information provided in Giant Refining Company's, Bloomfield Refinery (Giant) "Discharge Plan Application, Site Investigation and Abatement Plan" (Volumes I and II, July, 1999), the refinery is conducting ongoing total fluids recovery as an interim measure to prevent the migration of contaminants in the groundwater. The lateral extent of the phase-separated hydrocarbon plume has expanded since removal of the hydraulic barrier created by leaks from the Hammond Irrigation Ditch bordering the downgradient side of the refinery.

Historically, hydrocarbon contamination was observed in riverbank deposits along the San Juan River located adjacent to the north of the refinery. Giant Refining Company has constructed a barrier wall along the riverbank, consisting of sheet piles to depths of approximately 15 feet below surface grade and extended by a slurry wall to depths of approximately 30 feet below grade, at the locations where hydrocarbon contamination was observed in the riverbank sediments (the River Terrace Area). Evidence of hydrocarbon contamination has since been observed in seeps along the riverbank since installation of the barrier wall and in a well located on the river side of the barrier.

Petroleum–related contaminants present in the northwest portion of the facility present in various media pose potential exposures to construction workers, and refinery personnel. The information presented below identifies the events from 2001 to present which indicate current human exposures are not under control. Since the June 2001 CA725 determination, contaminants in the water table aquifer have migrated to the northwest portion of the facility and discharged at the contact between unconsolidated sand and gravel deposits and the Nacimiento Formation, into drainages that connect with the San Juan River. Contamination was also discovered at the River Terrace Area, located adjacent to the San Juan River, in groundwater and subsurface soils. Contaminants are present in groundwater, surface water, sediments, and surface soils, (e.g., < 2 feet), subsurface soil (e.g.;> 2 feet).

Groundwater contaminants detected beneath the facility include SPH and dissolved-phase BTEX and other VOCs, naphthalene and other SVOCs, MTBE, GRO, DRO and ORO, chromium, lead, and mercury.

Surface water contaminants include dissolved-phase BTEX and have been detected in the San Juan River and the Raw Water Ponds (process water supply). This information is documented in the monthly analytical laboratory results for monthly sampling (November 2005–March 2005) at the Raw Water Ponds and the "Release North of MW-45 Progress Report 9/22/04".

Contaminants detected in surface and subsurface soils, and sediment include BTEX and other VOCs, SVOCs, DRO, and GRO at the River Terrace Area, Seeps MW-45, MW-46, and MW-47 located along the bluff and in drainages intersecting the San Juan River, and also detected in soils during the installation of the Hammond Ditch Liner and North Boundary Barrier Wall. (see references)

Outdoor air is subject to VOC and hydrogen sulfide contamination released from process vents, valves, API separator, tanks, and the surface impoundments.

The Hammond Irrigation Ditch is located along the refinery's northern and western boundaries between the refinery and the San Juan River. The Hammond Conservancy District and Giant lined the Hammond Irrigation Ditch with concrete in 2001 and 2002. The water present in the ditch acted as a hydraulic barrier prior to installation of the liner, confining the bulk of the contaminants to within the refinery boundaries. Giant also installed a french drain to act as a recovery system and to preserve the integrity of the concrete liner. In January 2003, the New Mexico Environment Department (NMED) required the facility to install three monitoring wells (MW-45, MW-46, MW-47) on the north and west sides of the newly lined ditch to evaluate the effectiveness of the recovery system and to determine whether petroleum contamination was migrating beyond the irrigation ditch. In December 2003, the refinery notified NMED of the discovery of SPH in groundwater monitoring well MW-47, located on the river side of the ditch opposite the process area.

In October 2003, Giant informed NMED of the discovery of hydrocarbons in the #1 East Outfall located northeast of Tanks 13 and 14. Since the discovery of hydrocarbons, Giant has pumped the discharge from the #1 East Outfall to a collection tank (Tank #38) where the water is then routed to a separator tank (Tank #33), which separates emulsified hydrocarbons by gravitation. The underflow is then routed for discharge to the raw water ponds. During monthly sampling from November through March 2005, effluent from the #1 East Outfall recovery system entering the raw water ponds exceeded the New Mexico Water Quality Control Commission (WQCC) standard for benzene of 10 micrograms per liter (µg/L) at concentrations ranging from 25 µg/L to 99.7 µg/L.

In August 2004, NMED discovered active releases of petroleum hydrocarbons to drainages on the north side of the Facility. The drainages are small tributaries to the San Juan River. The releases are identified as the Seep North of MW-45. During the inspection of the drainages in 2004, hydrocarbons had contaminated sediments, surface soils, and subsurface soils and migrated to the San Juan River.

In November and December 2004 Giant discovered additional active releases in arroyos northwest of the Facility. The releases are identified as the Seep North of MW-46 and Seep North of MW-47. These seeps exhibited hydrocarbon stained sediments, surface and subsurface soils and dead vegetation. To assess contaminant migration from these releases, water samples were collected from the San Juan River at the following four locations: North of MW-45, North of MW-46, River Downstream of the Facility, and River Upstream of Facility. River water samples collected in August 2004 from sampling points identified as North of MW-45 and North of MW-46 (initially identified as the Draw North of MW-47) exceeded the maximum contaminant levels (MCL) for benzene (5 µg/L) at concentrations of 9.7 µg/L and 6.3 µg/L, respectively.

In October 2004 and April 2005, Giant conducted an investigation at the river terrace, landward of the sheet-pile barrier wall located along the river northeast of the refinery process area to evaluate for the presence and extent of hydrocarbons in groundwater. During the investigation, two monitoring wells

(MW-48 and MW-49) and 13 temporary well points (TP-1 through TP-13) were installed. Hydrocarbon contamination was detected in soil and groundwater samples collected from the borings. The highest concentrations of contaminants were detected near the sheet pilings and barrier wall (installed in 1999). Hydrocarbon contamination also extended to the east. In October of 2004, contaminant concentrations detected in groundwater samples collected from Temporary Wells TP-1, TP-2, TP-5, TP-6, and TP-8 exceeded both the NM WQCC standard for benzene (10 µg/L) and the EPA MCL (5 µg/L) with concentrations ranging from 98 µg/L to 3,100 µg/L. The sample results also exceeded the WQCC standard for toluene (750 µg/L) and EPA MCL (1,000 µg/L) in TP-2 with a concentration of 8,200 µg/L. Groundwater samples collected from TP-1, TP-2, TP-4, TP-5, TP-6, and TP-8 contained concentrations that exceeded the WQCC standard for ethylbenzene (750 µg/L) and EPA MCL (700 µg/L) with concentrations ranging from 810 µg/L to 5,200 µg/L. The WQCC standard for xylenes (620 µg/L) was exceeded in TP-1, TP-2, TP-4, TP-5, TP-6, and TP-8 with concentrations ranging from 1,600 µg/L to 39,000 µg/L.

Documented Groundwater Contamination
Chemical analyses of groundwater samples collected in March and August 2003, detected benzene and ethylbenzene in excess of the EPA MCLs and WQCC standards in the following monitoring wells and piezometers: MW-47, MW-45, P-4, and P-5 which are located on the north side (downgradient) of Hammond Ditch. Benzene concentrations ranged from 160 µg/L to 4,400 µg/L and ethylbenzene concentrations ranged from 3,000 µg/L to 5,500 µg/L. Groundwater samples collected from MW-45, P-4, and P-5 exceeded the WQCC standards and EPA MCLs for toluene and total xylenes at concentrations ranging from 630 µg/L to 3,000 µg/L and 10,000 to 30,000 µg/L, respectively.

Chemical analyses of groundwater samples collected in August 2003 revealed chloride concentrations exceeding the WQCC standard (250,000 µg/L) in monitoring wells MW-3, MW-13 (located in the southeastern portion of the facility), MW-27, MW-32, MW-33 (located southwestern portion of the Facility), and MW-47 (located on the north (downgradient) side of Hammond Ditch and east of the process area) at concentrations ranging from 360,000 µg/L to 1,400,000 µg/L. Sulfate exceeded the WQCC standard (600,000 µg/L) in groundwater samples collected from MW-3, MW-8, MW-12, MW-32, and MW-33 at concentrations ranging from 840,000 to1,900,000 µg/L.

During the March and August 2004 semi-annual and annual groundwater monitoring events, contaminant concentrations detected in groundwater samples collected from monitoring wells and piezometers MW-20, MW-45, MW-47, P-4, P-5, and P-6 exceeded the EPA MCL and WQCC standard for benzene at concentrations ranging from 560 µg/L to 21,000 µg/L. Toluene exceeded the WQCC standard (750 µg/L) in samples collected from monitoring wells MW-20 and MW-45 at concentrations of 1,200 µg/L and 860 µg/L, respectively. Ethylbenzene concentrations also exceeded the WQCC standard and EPA MCL in MW-45, MW-47, P-4, P-5, and P-6 at levels ranging from 900 µg/L to 9,100 µg/L. Groundwater samples collected from MW-45, MW-47, P-4, P-5, and P-6 exceeded the WQCC standard for total xylenes (620 µg/L) at levels ranging from 7,900 µg/L to 32,000 µg/L. These wells are located on the north side (downgradient) of Hammond Ditch toward the San Juan River with the exception of MW-20, which is located on the south side of Hammond Ditch.

During the August 2004 annual groundwater sampling event, contaminant concentrations detected in groundwater samples collected from the following monitoring and recovery wells exceeded the WQCC standard and EPA MCL for benzene: MW-11, MW-26, and MW-31 (located south of Sullivan Road offsite), MW-21, MW-30, RW-14, RW-15, and RW-16 (located in the tank farm area), MW-39 and RW-3 (located in the vicinity of the Process area) at concentrations ranging from 130 µg/L to 9,400 µg/L. Contaminants in groundwater samples exceeded the WQCC standard and EPA MCL for toluene in RW-14 and RW-15 at concentrations of 17,000 µg/L and 15,000 µg/L, respectively. The WQCC standard and EPA MCL for ethylbenzene was exceeded in groundwater samples collected from MW-30, RW-14, and RW-15 at concentrations ranging from 1,900 µg/L to 3,200 µg/L. The WQCC standard for total xylenes (620 µg/L) was exceeded in groundwater samples collected from monitoring and recovery wells MW-30,

MW-31, MW-39, RW-03, RW-14, RW-15, and RW-15 at concentrations ranging from 1,200 µg/L to 22,000 µg/L.

Analyses of the March and August 2004 groundwater sampling events, detected MTBE in the following monitoring wells and piezometer: MW-13, MW-20, MW-21, MW-29, MW-35, MW-36, MW-37, MW-38, MW-44, and P-6 at concentrations ranging from 2.6 µg/L to 26,000 µg/L. These wells are located in the tank farm area, north of the process area, and south of Sullivan Road. The EPA Region 6 Human Health Medium-Specific Screening Level (HHMSSL) for MTBE is 6.2 µg/L. MTBE also is classified as a NM WQCC toxic pollutant.

In August 2005, groundwater sampling revealed benzene concentrations above the WQCC standard and EPA MCL in TP-1, TP-2, TP-5, TP-6, and TP-8, ranging from 280 µg/L to 6,100 µg/L. A groundwater sample collected from TP-2 exceeded the WQCC standard and EPA MCL for toluene at a concentration of 8,700 µg/L. Contaminants detected in groundwater samples collected from TP-1, TP-2, TP-5, TP-6, and TP-8 exceeded the WQCC standard and EPA MCL for ethylbenzene at concentrations ranging from 2,800 µg/L to 4,200 µg/L. Total xylenes detected in samples collected from TP-1, TP-2, TP-5, TP-6, and TP-8, exceeded the WQCC standard (620 µg/L) at concentrations ranging from 7,500 µg/L to 25,00 µg/L.

Monitoring wells MW-48 (located on the refinery side of the River Terrace sheet pile) and MW-49 (located on the river side of sheet pile) were installed on October 28, 2004. During the installation, soil samples were collected. The soil sample collected during the installation of MW-48 at 5.0 to 6.5 feet contained DRO and GRO concentrations of 140,000 micrograms per kilogram (µg/kg) and 1,500,000 µg/kg, respectively. During the installation of MW-49, a soil sample was collected at a depth of 5.0 feet to 6.5 feet and contained GRO at 550,000 µg/kg.

TPH as DRO was detected in samples collected from TP-1, TP-2, TP-4, TP-5, TP-6, and TP-8 which exceed the Potable Groundwater (GW-1) guideline of 200 µg/L for unknown oil, found in the *New Mexico Environment Department TPH Screening Guidelines* (November 2005) at concentrations ranging from 1,100 µg/L to 7,800 µg/L.

As a result of the various releases described above, Giant has excavated contaminated soils at the seeps, has installed containment structures, and implemented various interim measures to help limit off-site migration of petroleum hydrocarbons along the north property boundary of the facility. The first interim measure was the installation of a soil-bentonite slurry containment barrier wall and a total fluids collection and observation well system between January and April 2005. The barrier wall extends approximately 8 to 28 feet below the ground surface in depth, and approximately 2,600 feet in length along the north refinery boundary on the north side of Hammond Ditch, from County Road 4990 to approximately 200 feet east of El Paso pipeline corridor. The fluid collection system consists of 15 recovery wells located between the refinery and the barrier wall and 14 monitoring wells located between the San Juan River and the barrier wall. The second interim measure was the installation of a bioventing remediation system to reduce hydrocarbon concentrations in the area of the river terrace. The bioventing system is comprised of 13 bioventing wells (BV-1 to BV-13) and three dewatering (DW) wells MW-48 serving as a dual purpose well, DW-1 and DW-2. The installation of the North Boundary Barrier wall appears to have slowed but not eliminated the migration of contamination toward the San Juan River. It is unclear if this will be the final remedy. The effectiveness of the bioventing system is remediating the river terrace area is still being evaluated.

REGULATED UNIT SUMMARY

NMED has determined that Giant Refining Company's Bloomfield Refinery has one regulated unit in interim status consisting of the North and South Oily Water Ponds, a surface impoundment system now designated as the North Aeration Lagoon (NAL) and the South Aeration Lagoon (SAL). The NAL and SAL are located in the northwest portion of the facility, north of the API Separator and south of Hammond Ditch. The NAL and SAL operate as a hazardous waste treatment unit that is regulated under the authority of the Hazardous Waste Act due to the treatment of benzene (hazardous waste Code D018). The NAL and

SAL are utilized to treat refinery wastewater effluent discharged from the API Separator by aeration which meets the definition of aggressive biological treatment as defined in 20.4.1.200 NMAC (incorporating 40 CFR 261.31 (b)). Potential worker and construction worker exposure exists due to air emissions and possible dermal contact.

Solid Waste Management Units (SWMU's) and Areas of Concern (AOC's) SUMMARY
NMED has identified the following SWMU's and AOC's, at the facility.

SWMU #2 The Former Drum Storage Area North Bone Yard was identified as a SWMU during a RCRA Facility Assessment (RFA) conducted in June 1987 by EPA and is located north of the former evaporation ponds (raw water ponds) on the northeast corner of the Facility. In July 1987, drums were removed from the North Bone Yard to the Warehouse Yard. The number and contents of the relocated drums is not clear. Monitoring well MW-1, located in the North Bone Yard, was sampled during both of the Phase III RFA events, and no targeted VOC's and SVOC's were detected. Currently, the North Bone Yard stores empty drums. It is not known if the North Bone Yard was used for waste storage in the past and it is not known whether any of these drums leaked. Due to the ambiguity of the SWMU, it is unclear if human exposures are controlled.

SWMU #3 The Underground Piping currently in use consists of several underground piping systems at the Facility. Due to the age of the refinery, operating activities, and age of piping at the Facility, it is likely the piping has contributed to releases of hazardous and other petroleum constituents into the environment in the past. Most of the current underground piping is associated with the transport and loading product areas, the Above Ground Storage Tank (AST) Farm, and the wastewater collection system. The wastewater collection system includes a network of curbing, paving, catch basins, and refinery sumps associated with the storm water collection system, loading terminal sumps, drains, and underground piping that collects rainwater and other effluent from various process areas within the refinery. The wastewater is conveyed to the API separator. Underground piping is a potential source of contamination due to the nature of activities conducted at the facility since operations began in the 1950's. The Groundwater Technology Incorporation (GTI) 1993 Report states, "[f]rom previous investigations, a separate-phase hydrocarbon (SPH) plume has been partially delineated at the BRC [Bloomfield Refining Company] site, extending from the western area of the site (near the offices) to the eastern portion of the AST Farm. The sources of this plume are believed to be product releases which have occurred from AST's and associated piping over many years of the facility's operation as a petroleum refinery." The underground piping system will need to be further investigated to determine the potential threat to groundwater. Potential refinery and construction worker exposures could occur via construction and other activities in this area.

SWMU #4 The Transportation Terminal Sump (TTS) is located in the southern portion of the refinery, south of Sullivan Road and south of the liquid propane gas (LPG) bullet tanks. The TTS was an earthen sump used as a truck cleaning area. There is potential for petroleum-related contamination in the vicinity of the TTS because there is no documentation of liners or containment structures in this area. Surface and subsurface contamination may be present as a result of incidental spills associated with truck loading and cleaning operations. In 1986, the sump was backfilled with soil. No investigation or cleanup was conducted at the time.

SWMU #5 The Heat Exchanger Bundle Cleaning Area (HEB) is located in the southern portion of the Facility. The HEB is used to clean scale deposits from heat exchangers. Historically, this area was used as an empty container storage area and the heat exchangers were cleaned in the process area of an abandoned truck terminal. The west portion of the old abandoned truck terminal has been converted to the Auxiliary Warehouse, and the east portion has been converted to the 90-day storage area. The heat exchanger hydro blast pad is attached to the 90-day storage area. The HEB cleaning takes place in an enclosed room with sheet metal walls, a concrete floor, and an attached outdoor concrete pad. Attached to the concrete pad is a sump approximately four feet wide, 50 feet long, four feet deep, and covered by perforated steel plates. The sump is intended to collect the sludge generated during the cleaning bundle process. An asphalt curb was installed around the perimeter of the concrete pad in 2001. The cleaning of the pad and sump contain sludge, K050 listed waste.

SWMU #6 The Abandoned Underground Piping consists of several networks of abandoned underground piping at the Facility, and may have leaked petroleum and other hazardous constituents into the environment. Underground piping is a potential source of contamination due to the nature of activities conducted at the Facility over the years.

SWMU #7 Raw Water Ponds (Fresh Water Ponds) historically, the Raw Water Ponds were known as the North and South Evaporation Ponds (N & S EP) and functioned as refinery wastewater treatment ponds. Currently the ponds are referred to as the Raw Water Ponds or the Fresh Water Ponds. The Ponds are located northeast of the process area and west of the Fire Training Area. The Raw Water Ponds are lined with four to six inches of bentonite clay and estimated to have a seepage rate of approximately 10 to 20 gallons per minute (gpm). Historically, treated wastewater from the North Oily Water Pond (North aeration lagoon) was transferred to the Raw Water Ponds. From the Raw Water Ponds, the water was evaporated or transferred to the spray irrigation area to enhance evaporation. The Raw Water Ponds were decommissioned in 1994 or 1995 after the construction of the Class I injection well, which currently receives treated refinery wastewater. Upon decommissioning, the Evaporation Ponds were converted to the Raw Water Ponds for storage of river water pumped from the San Juan River prior to treatment for use in refinery operations. In July 2003, hydrocarbons were found in the #1 East Outfall located northwest of the Raw Water Ponds on the north side of Hammond Ditch. In order to prevent hydrocarbon constituents from entering into the San Juan River, the Respondents installed a recovery system that employed a collection tank and a pump at the #1 East Outfall. The water/hydrocarbon mixture from #1 East outfall is routed to Tank #38. The effluent from Tank #38 is routed to a separator tank set up for gravitational separation of the mixed hydrocarbon effluent. The recovered oil is routed to a 25,000-gallon vessel (V-610) and the water underflow is routed to the refinery's Raw Water Ponds. The effluent entering the Raw Water Ponds has contained concentrations of benzene that exceeded the WQCC standards and MCL. Due to benzene exceedances and historical use of the ponds, petroleum contamination may be present in the pond water and pond sediments.

SWMU #8 The Inactive Landfill (formally called the Landfill) is a low-lying area located east of the Tank Farm and south of the Fire Training Area; its dimensions are unknown. The Inactive Landfill is currently not in use. It is unlined and does not have a waterproof cover, although it has been covered with soil. In October of 1984, visually contaminated soil from the aeration ponds (classified as K051 API separator sludge) was removed and disposed of in the Inactive Landfill. In November 1989, approximately 2,000 cubic yards of contaminated soil was stockpiled at the landfill area. In April 1991, the refinery operators petitioned EPA for a delisting determination for the soil, which was granted by EPA. The actual date of landfill closure is unclear.

SWMU #9 The Landfill Pond was an unlined, low-lying natural depression that resulted from blockage of an existing arroyo during the construction of the Hammond Ditch. The Landfill Pond was located east of the Fire Training Area and northeast of MW-8. The Landfill Pond collected water from Hammond Ditch, storm water drainage from the surrounding area, and possibly other fluids associated with the Inactive Landfill. In 1985, 13 surface soil samples were collected during closure activities. Benzene was detected at 1, 300 µg/kg. The low-lying area was filled in with no protective cover and the site has been graded to conform to the general contours of the surrounding arroyo. The Landfill Pond no longer exists. The precise closure date is unknown, but appears to have occurred in January or February of 1994. A closure plan was submitted in 1986, NMED approved the closure plan in a letter dated January 25, 1994 from NMED to Giant titled Bloomfield Refining Company Landfill Pond Closure Plan Approval; however, no closure report, closure certification or closure verification documentation is in NMED's administrative record.

SWMU #10 The Fire Training Area is located in the northeast portion of the Facility, north of the Inactive Landfill and east of the Raw Water Ponds. The Fire Training Area is utilized to train employees and the Bloomfield New Mexico Fire Department to fight fires that may occur at the Facility. This area stores holding tanks that contain diesel, gasoline, and other fuels used to set fires for training purposes. In the 1987 RCRA RFA, black oily stains were noted on the ground around several of the fuel holding tanks.

Investigations conducted at the site have detected diesel–range hydrocarbon contamination in surface and subsurface soils. Petroleum compounds used during training exercises have been, and could potentially continue to be, released to soils and groundwater in the vicinity of the site.

SWMU #11 The Spray Irrigation Area is a 10-acre parcel of land located in the southeast portion of the refinery. The 1984 Discharge Plan submitted to OCD identified the Spray Irrigation Area as an area bordered by an earthen berm to prevent surface drainage into nearby drainage channels. It was used to dispose of refinery wastewater by evaporation. A four-inch aluminum pipe was used to carry wastewater from the evaporation ponds (Raw Water Ponds) to sprinkler heads located across the 10-acre parcel. Spray irrigation took place primarily between the months of March and October. OCD required the Facility to conduct soil sampling at the unit and to install a groundwater monitoring well (MW-5) as part of a site investigation. Petroleum contamination was not detected during the investigation. MW-5 is located in the irrigation plot and is currently dry. Use of the Spray Irrigation Area was discontinued in 1994. An office building and an asphalt parking lot currently occupy the site.

SWMU #12 The API Separator is located in the process area of the refinery, south of the aeration lagoons. Fluids from the Facility's wastewater collection system, tank farm sumps, and sewer lines within the process areas are sent to the API separator. The API Separator generates listed hazardous waste (API Separator Sludge (K051). The API Separator is a large double chambered steel-reinforced concrete tank that uses gravity to separate the wastewater into three components: a sludge layer that sinks to the bottom of the separator, a scum layer containing oil that floats to the top and is returned back to the refinery process, and a clarified effluent in the middle that contains characteristic listed hazardous waste (D018). This last component is discharged from the API separator and sent to the aeration lagoons for treatment. In April 1994, a floating roof was installed on the API Separator consisting of a liquid mounted primary seal and secondary wiper seal.

SWMU # 13 The Process Area is located in the northwest portion of the refinery and houses most of the refinery's process units. The Process Area includes the crude unit, reforming unit, fluidized catalytic cracking unit, sulfur recovery unit, poly unit, merox treater unit, diesel hydrotreating unit, and the wastewater treatment system, including the API Separator and aeration lagoons (surface impoundments). The Process Area also incorporates pumps, valves, and piping systems used throughout the Facility to transfer various liquids among tanks and process units. The Process Area is documented as a suspected spill area. The crude unit is the site of a documented spill that occurred in 1986. Tanks 3, 4, and 5 are considered probable source areas of petroleum contamination. Bordering the process area to the north is Hammond Ditch and monitoring wells MW-45 and MW-47. SPH has collected in the french drain system constructed beneath the ditch and was discovered in substantial quantities in the monitoring wells. Both SPH and dissolved hydrocarbons are present in soil and groundwater beneath the process area.

SWMU # 14 Tank 3, 4, and 5 are located in the Process Area, south of recovery well (RW-9) and north of the merox treater unit. In March 2000, 500 barrels of reformate spilled from the tanks and was contained by berms in the vicinity of the tanks. Currently, Tanks 3 and 4 contain mid-grade gasoline; Tank 5 contains isomerate. The recovery wells located north of these tanks (the direction of groundwater flow) RW-22, RW-9, and RW-23 have all contained SPH since 2004.

SWMU # 15 Tank Farm Area is located east of the El Paso Pipeline and north of Sullivan Road in the central portion of the Facility. The Tank Farm Area consists of above ground storage tanks that store crude oil, intermediate feedstocks, finished-products, chemicals, and water. The tank sizes range from 1,000 barrels to 110,000 barrels. Over the years of operation, various releases have occurred due to spills and leaks from the tanks. Tanks 19, 22, and 26 have historically released diesel, gasoline, and kerosene of which an estimated 141 barrels were not recovered. The following tanks have documented leak repairs: 17, 18, 19, 20, 23, 24, 25, 26, 29, 30, and 31. The volume and type of product released to the environment from leaking tanks is not documented and the releases have not been characterized.

SWMU # 16 The Active Landfill is located east of the Fire Training Area. The Active Landfill is unlined and the dimensions and volume are unknown. The Active Landfill operation is regulated by OCD and is currently used to dispose of fluidized catalytic cracking fines and sulfur.

SWMU # 17 The River Terrace Area is located adjacent to the San Juan River north of the refinery process units. In 1999, the Facitly installed sheet pilings and a bentonite slurry wall adjacent to the San Juan River. The bentonite slurry and sheet pile barrier wall extends around the perimeter of the riverbank from the base of the bluff east of the refinery process area to the refinery river water supply inlet station. The bentonite slurry and sheet pile barrier wall was installed to prevent SPH and dissolved-phased hydrocarbons from migrating into the San Juan River. Between October 2004 and April 2005, the Facility completed another investigation in the riverbank area to evaluate the presence of petroleum contamination in groundwater on the refinery side of the bentonite slurry and sheet pile barrier wall. The investigation determined that petroleum contamination is present in the vicinity of the sheet pile/bentonite slurry wall barrier adjacent to the San Juan River and extending toward the refinery to the temporary wells east of the river inlet station. Hydrocarbons have been detected in monitoring well MW-49 located on the river side of the barrier. Human exposures are not controlled in this area based on the present contamination.

SWMU # 18 The Warehouse Yard is a fenced-in area situated west of the refinery offices and identified as a SWMU during the June 1987 RFA. The Warehouse Yard was upgraded in 1988 to include a metal frame storage shed with concrete flooring, curbing, and a collection trench. Currently the Warehouse Yard stores drums containing lube oils and other products used in refinery processes. Recovery Well #1 is located in the Warehouse Yard, where SPH has been detected historically; it is unclear if the SPH is a result of leaking drums.

AOC #19 The Seep North of MW-45 is located north of monitoring well MW-45 and was discovered in August 2004 during a site visit by NMED. SPH was discovered seeping from the bluff and migrating toward the San Juan River.

AOC # 20 The Seep North of MW-46 was discovered in November 2004. SPH and a water/hydrocarbon mixture were discovered seeping from the bluff and migrating toward the San Juan River. A containment structure was installed and recovered contaminated water is sent back through the wastewater treatment system.

AOC # 21 The Seep North of MW-47 was discovered in December 2004. SPH and a water/hydrocarbon mixture were discovered seeping from the bluff and migrating toward the San Juan River. A containment structure was installed and recovered contaminated water is sent back through the wastewater treatment system.

AOC # 22 The Product Loading Rack and Crude Receiving Loading Racks are located in the southeastern portion of the Facility south of Sullivan Road. The loading and receiving racks are the location of known and suspected releases. The crude loading area was the site of a spill in April 1986, in which 200 barrels of diesel fuel spilled near the crude unit; 150 barrels were not recovered. The product loading rack and underground piping are potential sources of contamination. Petroleum contamination is present in monitoring wells located directly downgradient of the Product Loading Rack and Crude Receiving Rack. In August 2004, MW-25 contained 0.97 feet of SPH and samples from MW- 26 and MW-31 contained benzene concentrations of 740 µg/L and 3,700 µg/L, respectively.

AOC # 23 The Southeast Holding Ponds are located in the far southeast portion of the Facility south of Sullivan Road. The Southeast Holding Ponds are double lined constructed with 60-milimeter high density polyethylene (60 mm HDPE). The ponds are used as a holding basin for excess treated wastewater reportedly utilized when the injection well is under repair or at capacity.

AOC # 24 Tank Area 41 and 43 are located in the southeastern portion of the Facility south of Sullivan Road and contain crude oil. This is an area of suspected releases. Contamination is present in monitoring wells located northwest of the tanks located generally downgradient from Tanks 41 and 43. In August

2004, MW-25 contained 0.97 feet of SPH and samples from MW- 26 and MW-31 contained benzene concentrations at 740 µg/L and 3,700 µg/L, respectively.

AOC # 25 The Auxiliary Warehouse and 90-DayStorage Area are located in the southern portion of the Facility abutting the Heat Exchange Bundle Cleaning Area to the west. The Auxiliary Warehouse and 90-Day Storage Area were constructed from a metal building that was a former abandoned truck terminal.

AOC # 26 The Tank Area 44 and 45 are located west of MW-5 in the southern portion of the facility, south of Sullivan Road. Tanks 44 and 45 store MTBE and naphtha. Tanks 44 and 45 may be a source of petroleum contamination detected nearby. MTBE is detected in a majority of the monitoring wells at the Facility indicating that a release may have occurred from Tank 44 or its ancillary equipment. A documented spill of naphtha occurred in November of 1984 from an unspecified storage tank in this area.

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3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

	Potential **Human Receptors** (Under Current Conditions)						
"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	Yes	No	Yes	Yes	No	No
~~Air (indoors)~~	___	___	___	___	___	___	___
Soil (surface, e.g., <2 ft)	No	Yes	No	Yes	Yes	No	No
Surface Water	No	Yes	No	Yes	Yes	Yes	No
Sediment	No	Yes	No	Yes	Yes	No	No
Soil (subsurface e.g., >2 ft)	No	Yes	No	Yes	No	No	No
Air (outdoors)	No	Yes	No	Yes	Yes	No	No

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__X__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s): There is potential for refinery worker and construction worker exposure at the following SWMUs and AOCs: the Process Areas, the Tank Farms, the Aeration Ponds, underground piping active and inactive, Transportation Terminal Sump, Raw Water Ponds, Fire Training Area, API Separator, Tank 3, 4, and 5, Tank Farm Area, Active Landfill, River Terrace Area, Seep North of MW-45, Seep North of MW-46, Seep North of MW-47, Product Loading Rack and Crude Receiving Loading Racks, Tank Area 41 and 43, Auxillary Warehouse and 90-Day Storage Area, and the Tank Area 44 and 45. Although interim measures have been implemented at the seeps, there is still a possibility for residual contaminants from the bluff and drainages to migrate to the San Juan River. The River Terrace Area is hydraulically connected to the San Juan River and is also contaminated with hydrocarbons. There is potential for exposure to recreational users of the San Juan River. In particular, if the recreational users were to exit the river on the river bank side of the refinery. See references under number 2 pages 9-10.

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

__X__ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):
There is potential for worker and construction worker exposure at the following SWMUs and AOCs: the Process Areas, the Tank Farms, the Aeration Ponds, underground piping active and inactive, Transportation Terminal Sump, Raw Water Ponds, Fire Training Area, API Separator, Tank 3, 4, and 5, Tank Farm Area, Active Landfill, River Terrace Area, Seep North of MW-45, Seep North of MW-46, Seep North of MW-47, Product Loading Rack and Crude Receiving Loading Racks, Tank Area 41 and 43, Auxillary Warehouse and 90-Day Storage Area, and the Tank Area 44 and 45. Although interim measures have been implemented at the Seeps and the River Terrace, there is still a possibility for residual contaminants from the bluff, drainages, and river bank area to migrate to the San Juan River. See reference in number 2, page 9-10.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

__X__ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Giant Refining Company, Bloomfield Refinery facility, EPA ID # NMD0489416416, located at P.O. Box 159, Bloomfield, New Mexico, 87413 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

__X__ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by _____ Date 11/29/2006
Hope Monzeglio
Environmental Scientist & Specialist

Supervisor _____ Date 11/29/2006
John E. Kieling
Program Manager, Permits Management Program
New Mexico Environment Department - Hazardous Waste Bureau

Locations where References may be found:

Giant Refining Company, Bloomfield Refinery
U#50 County Road 4990, Bloomfield, New Mexico 87413

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

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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.