GW - 1

WORK PLANS

1993

GROUNDWATER TECHNOLOGY

Groundwater Technology, Inc.
2501 Yale Blvd. SE, Suite 204, Albuquerque, NM 87106
Tel: (505) 242-3113 Fax: (505) 242-1103

April 20, 1993

Mr. Greg J. Lyssy
U.S. Environmental Protection Agency, Region 6
RCRA Technical Enforcement
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

RE: **Interim Measures Work Plan**
Bloomfield Refining Company
#50 County Road 4990
Bloomfield, New Mexico

Administrative Order On Consent
U.S. EPA Docket No. VI-303-H

Dear Mr. Lyssy:

Enclosed please find three (3) copies of the pages of the Interim Measures Work Plan revised pursuant to the comments from the United States Environmental Protection Agency (USEPA) dated March 26, 1993. Bloomfield Refining Company (BRC) made a preliminary response to the USEPA comments in the monthly progress report dated April 1, 1993. During our telephone conversation on April 14, 1993, I indicated that BRC intended to complete radius of influence calculations using aquifer test data to be obtained during the RCRA Facility Investigation. You requested that we incorporate these responses to USEPA comments in the work plan and submit revised pages to you for review/approval.

BRC will schedule interim measure field activities upon receipt of written approval of the revised Interim Measures Work Plan. Should you have any questions or comments, please do not hesitate to contact me at (505) 242-3113 or Chris Hawley of BRC at (505) 632-8013.

Sincerely,
Groundwater Technology, Inc.

Cymantha Diaz
Project Manager

ENCLOSURE
cc: Chris Hawley - BRC
Joe Warr - BRC
Dave Roderick - BRC
Roger Anderson - NM-OCD
Ed Horst - NMED

INTERIM MEASURES WORK PLAN

BLOOMFIELD REFINING COMPANY
50 COUNTY ROAD 4990
BLOOMFIELD, NEW MEXICO

RECEIVED
APR 21 1993
OIL CONSERVATION DIV.
SANTA FE

APRIL 20, 1993

Prepared For:

BLOOMFIELD REFINING COMPANY
P.O. BOX 159
BLOOMFIELD, NEW MEXICO 87413

Prepared by:

GROUNDWATER TECHNOLOGY, INC.
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ALBUQUERQUE, NEW MEXICO 87103

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INTERIM MEASURES WORK PLAN
BLOOMFIELD REFINING COMPANY
#50 COUNTY ROAD 4990
BLOOMFIELD, NEW MEXICO

April 20, 1993

Prepared for:

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Bloomfield, New Mexico 87413

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2501 Yale Boulevard, S.E., Suite 204
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Cymantha Diaz
Project Manager

Sara Brothers (TB)
Sara Brothers
Operations Manager, New Mexico

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1.4 Groundwater Monitoring

BRC conducts groundwater monitoring and sampling of certain wells as part of the compliance requirements for the facility's discharge plan (GW-1) and for the RCRA groundwater monitoring. Monitoring wells MW-1 and MW-5 are sampled semi-annually for the following parameters as part of the discharge plan requirements, because they are located adjacent to the clay-lined evaporation ponds in the northeast portion of the facility and the spray irrigation area in the southeast portion of the facility, respectively:

- Water level
- pH
- Total dissolved solids (TDS)
- Benzene, toluene, ethylbenzene and total xylenes (BTEX)
- Chlorinated purgeable volatile hydrocarbons
- Phenol
- Cyanide
- Iron, manganese, sulfate, nitrate/nitrite as N, ammonia, total Kjeldahl N
- Arsenic, barium, boron, cadmium, chromium, lead

The monitoring requirements will change for the underground injection of water as described in Section 2.1 below (Underground Injection Well).

Wells MW-9, MW-20, MW-21, RW-15 and RW-18 were sampled quarterly during 1991 and 1992 as part of the RCRA groundwater monitoring requirements for the SOWP and NOWP. Wells MW-21 and RW-15 were established as upgradient monitoring wells, while wells MW-9, MW-20 and RW-18 were established as downgradient monitoring wells. These wells were sampled for BTEX (USEPA Method 8020); chlorinated herbicides (USEPA Method 8150); organochlorine pesticides and PCBs (USEPA Method 8080); total organic halides (TOX; USEPA Method 9020); priority pollutant metals (USEPA Method 200.7/200 series); and the drinking water parameters total organic carbon, phenols, fecal coliforms, gross alpha/beta radiation, radium 226, radium 228, flouride, nitrate/nitrite, chloride, sulfate and sodium.

Since SPH is present in both upgradient and downgradient wells around the SOWP and NOWP, it seems likely that a portion of the SPH plume has migrated under SOWP and NOWP. The SPH plume has been identified as consisting of refinery products (current product storage is shown in Table 3). Refinery products contain much higher concentrations of BTEX than the SOWP and NOWP and would contribute much more BTEX to the dissolved phase, masking any release from

the SOWP or NOWP. Table 4 provides summarized groundwater analytical results of samples collected from the RCRA compliance wells.

It should be noted that the SPH present in the subsurface at the site is lighter-than-water non-aqueous phase liquid (LNAPL). BRC is a light crude refinery with crude supplies in excess of 42° API gravity. No bottom upgrading is performed. BRC has no reason to believe that refinery operations could have caused a dense non-aqueous phase liquid (DNAPL) component in the groundwater, nor have investigations suggested DNAPLs to be a concern.

waste does not contain hazardous constituents at levels of concern. USEPA provided comments on the delisting petition in correspondence dated June 17, 1992 and December 29, 1992. BRC responded to these comments in correspondence dated July 20, 1992 and December 30, 1992. BRC has until about June 1993 to correct some deficiencies in the petition, primarily with a requirement to obtain additional sample results, to keep the petition in-process.

Landfill Runoff Pond

The landfill runoff pond is a natural depression created during the construction of the Hammond Ditch, when an arroyo was blocked. Soil samples were collected from this area in 1985, and results were consistent with clean closure. The results were submitted in a final report (Engineering Science, 1986).

2.4 Hydrocarbon Recovery System Installation and Operation

As described in Section 1.3, BRC installed two recovery wells (RW-1 and RW-2) and four piezometers and converted MW-10 to a third recovery well (RW-3) in June 1988. Air-operated skimmer pumps were installed in the three recovery wells and the system was started up on January 4, 1989. A report entitled "Site Investigation and Remedial Action Conceptual Design" dated March 1988 provided to USEPA included information about the radius of influence of pumping wells RW-1, RW-2 and RW-3.

Additional hydrocarbon recovery wells (RW-14 through RW-19) were installed in August 1990. Each of these wells contained SPH, was equipped with a recovery pump, and piped to the recovery system. A total of nine recovery wells comprise the hydrocarbon recovery system, seven of which are currently active.

Figure 5 presents SPH thicknesses in wells gauged in October 1991 under non-pumping conditions. SPH was detected in decreasing order in RW-17, RW-16, RW-18, RW-19, MW-4, RW-15, RW-14, P-2, RW-2 and MW-9. The recovery system layout is presented in Figure 6 (detail shown in Figure 6A). Recovery is done by submersible pumping devices set at the water table/SPH interface. They are piped to Tank 33 (10,000 gallon capacity) or to a sewer leading to the API separator. Lines leading to Tank 33 are constructed of schedule 80 PVC, while lines from Tank 33 to the API separator are constructed of coated-and-wrapped, carbon steel.

The pumping devices are identically constructed (by the facility) in all but RW-18 (Ejector System Inc. U-3000 recovery system) and operate on a timed, cycled pumping rate (estimated at a maximum of 1/2 gallon per minute). These pumps are approximately 3 feet long, 2 3/8-inch diameter PVC or stainless steel with a top fill set at the SPH/water table interface. The pump is allowed time to fill, then a timer activates the pumping cycle and compressed air is applied to the pump, forcing the liquid to the surface. The Ejector System pump in RW-18 operates under the same principles but with air controls only, for safety reasons. RW-1 and RW-3, the inactive wells, were shut off because they do not contain SPH. Tank 33 is routinely gauged and emptied to a sewer leading to the API separator.

In accordance with item C.2.c of the CAP, BRC has an existing wastewater treatment system capable of treating groundwater from recovery wells. The system operates in accordance with federal, state and local laws under the facility's approved discharge plan issued by the NM-OCD. The system is designed to treat process water as shown in the schematic in Figure 8.

BRC has an intake in the San Juan River to provide raw water for facility processes. Water (approximately 369,000 gallons per day) is pumped from the river to the east and west raw water ponds. Water from the raw water ponds is filtered and then either channeled through softeners and to the boilers for steam generation or to the two cooling towers. The steam is used in the process units. The process wastewater is discharged to the API separator. Cooling tower blowdown is directly discharged to the API separator.

The wastewater treatment system consists of a network of tank farm sumps, which are emptied by vacuum truck, and sewer lines within the process areas which lead directly to the API separator unit. The API separator discharges to HDPE lined South and North Oily Water Ponds (SOWP and NOWP) which are equipped with aerators. The facility plans to double-line these hazardous waste impoundments in 1994.

After aeration, water is discharged to the evaporation ponds (either the clay-lined north and south evaporation ponds or the HDPE double-lined north and south evaporation ponds). The total daily discharge averages 100,800 gallons. BRC is in the process of permitting an injection well as an alternative to total evaporation of the refinery discharge. When the injection well is permitted and installed (expected by late 1993), the clay-lined evaporation ponds will be taken out of service and the double-lined evaporation ponds will serve as backup and retention ponds prior to underground injection of treated wastewater. The proposed monitoring requirements for the injection fluids are described in the following section.

3.0 PROPOSED ADDITIONAL INTERIM MEASURES

The objectives of the additionally proposed interim measures are to prevent the off-site migration of hydrocarbons by adding new recovery points to the recovery system and to effectively recover hydrocarbons to reduce the source of dissolved contamination. The Hammond Ditch surrounds the property, except to the south, and is diked during the non-irrigation season to maintain a hydrogeological barrier to contaminant movement. Investigative activities to be performed as part of the RFI will provide additional information delineating hydrocarbon plumes so that a site-wide corrective measure can be properly designed. However, since hydrocarbons have been noted in a seep along the bluff north of the facility, additional interim measures are proposed.

The additional interim measures consist of installing two recovery wells and piping to a sewer discharge location, deploying pumping systems in each well, surveying well locations and elevations, monitoring static water elevation levels, startup testing to obtain baseline water quality data from these wells and set pump flow rates, and maintenance/monitoring of recovery operations and water elevation readings on a regular basis. These proposed interim measures can readily be incorporated into the long-term corrective measure for the BRC site.

Install Additional Recovery Wells

Two 6-inch recovery wells will be installed in the area of tanks 3, 4 and 5 as shown in Figure 6. These locations were selected based on the estimated extent of the SPH plume (Figure 5), location of the seeps along the bluff, and monitoring of RW-18, MW-9 and MW-20. The SPH thickness is shown to be 0.25 feet or less at the location of the two newly proposed recovery wells. The seep observed along the San Juan River bluff containing hydrocarbons consists of water, dissolved soil minerals, dissolved hydrocarbons (BTEX), and floating hydrocarbons (recently only a sheen at most). Pumping from the two new wells is anticipated to control the migration of SPH and hydrocarbons constituents toward the seep.

The water thickness in the gravel zone above the Nacimiento thins as the velocity increases at the seep point. BRC is confident that the gravel zone is continuous over the area where the new recovery wells will be installed, as it has been encountered during the installation of each of the 26 previously installed wells at the site. The gravel zone was approximately 10 feet thick at both MW-9 and RW-18 locations which are nearby.

The radius of influence of the additional wells has not been determined as part of developing this IM Plan. The RFI work scope includes aquifer testing to facilitate the design of the Corrective Measures for the site. The aquifer testing data will be used to calculate capture zones for existing and any additionally proposed recovery wells. Monitoring before and after startup will be used to verify capture zone calculations.

The impact of the Hammond Ditch on the proposed recovery wells has not been modeled. BRC has demonstrated the effectiveness of the ongoing source elimination program. Keeping water in Hammond Ditch during the non-irrigation season keeps the ditch banks loaded with fresh water longer which inhibits migration of SPH to the ditch from the refinery and stops further migration of SPH across the ditch. The amount of SPH in the seep at the river bluff has decreased substantially over recent years. In addition, the recovery well RW-18 may be very responsible for the fact that no SPH was noted in Hammond Ditch during the previous non-irrigation period.

The locations of the proposed new recovery wells are considered the best possible for the purposes of interim measures. Process areas limit access to more southern locations. The locations were selected to intercept the plume known to be migrating northward in this area. It is entirely possible that these wells will not be useful for long as recovery wells as fresh water is pulled from Hammond Ditch, but they will always be useful for monitoring purposes to evaluate the effectiveness of upgradient remediation efforts. If pumping the new wells causes the groundwater quality to improve in the wells, then the interim measure is working.

SPH present in the area between the Hammond Ditch and the bluff is isolated from the existing and proposed recovery wells by the ditch. BRC plans to investigate this area with a backhoe, digging a test pit. After this investigation, a recovery well or other appropriate equipment may be installed into the pit.

The two additional recovery wells will be installed by driving casing with a 10-inch bit to the top of the Nacimiento (estimated at 30 feet BGS). Drilling activities will be supervised by a qualified geologist who will log sediments encountered and monitor for volatile hydrocarbons using a photoionization detector (PID). Well logs will be prepared to show lithologic descriptions, PID readings and well construction details.

The well construction schematic is shown in Figure 7. As with the other wells installed at the BRC site, the length of the well screen will be field-determined based on the depth to the Nacimiento

Formation. Well screen will be set so that it extends from the top of the Nacimiento to five feet above the seasonally high water table (probably the elevation of the Hammond Ditch when full). Since the screen is set five feet above the seasonally high water table, lighter-than-water or floating hydrocarbons will be detectable during well gauging.

For purposes of design, approximately 25 feet of 0.020-inch slotted, 6-inch diameter fiberglass-reinforced epoxy (FRE) well screen with a section of FRE casing as the silt leg will be installed in the 10-inch borehole so that the screen extends 5 feet above the static water table. Sand filter pack will be installed in the annular space from the bottom of the well to approximately 5 feet above the top of the well screen. A two-foot thick layer of bentonite will be installed above the filter pack, and the well will be grouted to the surface with a cement/bentonite mixture.

The well head will consist of a flush-mounted 3' x 3' steel roadbox or equivalent installed in a concrete pad. The road box will be installed once the piping for the pumping equipment is completed. The wells will be piped to discharge recovered groundwater and product via 2-inch diameter schedule 80 PVC line to the sewer system leading to the API separator. Each of the two wells will be equipped with pneumatic pumping systems (either total fluids or dual phase). Both water and product will be discharged to the sewer leading to the API separator for treatment.

The wells will be developed following installation by purging water from the well column until it appears sediment-free and swabbing the well using a surge-block. Purge water will be discharged to the sewer leading to the API separator. Drill cuttings will be disposed appropriately.

Deploy Pumping Systems

BRC will obtain cost quotes from pump suppliers for pneumatically operated systems. A pumping scenario to maximize SPH recovery, will be designed. Appendix A includes pump specifications for a likely system. Selected pump specifications will be provided to USEPA with a monthly progress report during implementation of the Interim Measures Work Plan.

Survey Well Locations and Elevations

A professional surveyor will be contracted by BRC to check the existing well elevations and locations, and new well elevations (ground surface, top of inner casing, top of outer casing) will be also surveyed to an accuracy of 0.01 foot and well locations to an accuracy of 0.1 foot. A scaled site plan showing surveyed well locations and the elevations will be prepared.

Gauge Liquid Levels in Wells

The existing recovery pumps will be deactivated for a period of approximately 24 hours. A comprehensive round of liquid levels will be collected from all wells at the site using an ORS Interface Probe™. This instrument is capable of detecting product layers as thin as 0.01 foot. Gauging information will be tabulated and reduced using well elevation data and a water table elevation contour map will be constructed. The water table elevation contour map will indicate static groundwater conditions prior to startup of the recovery system. Appendix B contains a sample liquid level gauging form to be completed during these monitoring events.

Startup Testing

Baseline groundwater samples will be collected from the two new wells. Sampling will be conducted in accordance with the Data Quality Assurance Collection Plan submitted as part of the RFI Work Plan (March 1993). Groundwater samples will be analyzed for volatile organic compounds (VOCs; USEPA Method 8240), semivolatile organic compounds (BNAs; USEPA Method 8270), total petroleum hydrocarbons (TPH; USEPA Method 418.1) and metals (USEPA Method 6010/7000 series).

Following the collection of static liquid levels from all site wells and baseline groundwater sampling, BRC will conduct startup testing in the two new recovery wells in order to determine the optimum flow rates. Based on previous field studies at the site, well yields have ranged from 1.5 to 13.5 GPM. Therefore, startup step tests will be performed, pumping at different flow rate increments, to determine the rate that induces a moderate, sustained drawdown (estimated at 2 feet). The initial flow rate will be set at 0.5 GPM and will be increased at 0.5 GPM increments. The water level in the well will be monitored continuously during pumping, and the water levels at specific time intervals will be recorded. Once the optimum flow rate is determined, the pumps will be set and left to operate. The seven other recovery wells will be re-activated.

Maintenance/Monitoring

The facility maintenance personnel routinely checks the recovery equipment to be certain it is operational. Tank 33 is also checked regularly to determine when it should be discharged to the API separator. The two new recovery wells will be equipped with flow meters to monitor the volume of water and the volume of SPH pumped from each well. If pumping equipment fails, the facility maintenance personnel will make the necessary repairs and re-activate the pumps as quickly as possible. Liquid levels from all wells will be gauged once a month after startup. This information will indicate groundwater flow patterns and hydrocarbon thicknesses over time.

4.0 HEALTH AND SAFETY

BRC and its contractors will conduct all site activities in accordance with health and safety regulations set forth by 29 CFR 1910.120. The BRC facility has established rigorous in-house preventative procedures and response training. A copy of the Spill Prevention Control and Countermeasure (SPCC) plan certified by a professional engineer and a detailed site-specific Health and Safety Plan (HASP) including Material Safety Data Sheets (MSDS) are maintained onsite at all times. The site-specific HASP will be followed by all site workers during implementation of the proposed interim measure activities.

Site workers will have received OSHA health and safety training and be participating in a medical monitoring program. Each worker will read and sign the HASP before beginning field activities. The site supervisor will review the scope of activities each morning and will indicate appropriate health and safety considerations and procedures. Workers will wear Level D personal protective equipment (PPE) at a minimum, which includes a hard hat, safety glasses, steel-toed boots, gloves and a worksuit. Air monitoring using a PID will be conducted during field work to determine the need to upgrade to Level C PPE.

5.0 REPORTING

In accordance with item C.3 of the CAP, BRC will submit monthly progress reports for the first year of interim measures and quarterly thereafter. The progress reports will include the following items:

- the percentage of the IM completed
- summaries of all findings during the reporting period
- summaries of all changes made in the IM during the reporting period
- summaries of all contacts with representatives of the local community, public interest groups, or state government during the reporting period
- summaries of all problems or potential problems encountered during the reporting period
- actions being taken to rectify problems
- changes in personnel during the reporting period
- projected work for the next reporting period
- copies of daily reports, inspection reports, etc.
- copies of validated laboratory reports (quarterly)

In addition, within 60 days after the completion of the startup testing, an Interim Measures Report will be submitted to USEPA. The report will include the following items:

- synopsis of interim measures and certification of their design/construction
- explanation of any modifications to the plans and why these were necessary for the project
- listing of the criteria for judging the functioning of the interim measures and explanations of any modifications to these criteria
- results of facility monitoring, evaluating to what extent the interim measures will meet or exceed the performance criteria
- explanation of the operation and maintenance to be undertaken at the facility
- copies of inspection reports, analytical data, photographs, as-built drawings and other supporting documentation

6.0 SCHEDULE

Figure 9 presents the schedule for interim measure activities. The equipment and contractor procurement, and scheduling are allotted three weeks from USEPA's approval of the IM work plan. Well installation and development are allotted one week, and two weeks are allocated for completing the piping connections. Well gauging, sampling and surveying together will take one week, as will startup testing. System operation, maintenance, and monitoring will be an ongoing activity. Monthly progress reports will be prepared for the first year. An IM Report will be prepared and submitted to USEPA within sixty days following the completion of the startup testing. Allowing a two-week contingency, the additional recovery wells will be operational within 11 weeks and the IM Report will be submitted within 5 months of USEPA's approval.

7.0 REFERENCES

Engineering Science, "Final Closure Plan for the API Wastewater Ponds, Landfill, and Landfill Pond at the Bloomfield Refinery", August 1986.

Engineering Science, "A Final Report on Section 3013 Administrative Order Work Elements", February 1987.

Geoscience Consultants, Ltd., "Final Report on Soil Vapor Survey, Well Installation and Hydrocarbon Recovery System", August 1989.

Tierra Environmental Co., Inc., "A Feasibility Study Class I Injection Well and Facilities", July 1992.

TABLE 4 (Page 1 of 2)

SUMMARY OF ORGANIC GROUNDWATER ANALYTICAL DATA
RCRA COMPLIANCE WELLS
BLOOMFIELD REFINING COMPANY
BLOOMFIELD, NEW MEXICO

WELL ID	SAMPLE DATE	TOC	TOX	B	T	E	X	TOTAL PHEN	EDC	2,4 DCP	2,4 DMP	4,6-DNC	2,4 DNP	2-NP	4-NP	BENZ ANTH	PHEN	CHRY-SENE	FLUO-RENE	NAPH	PYR	2 CHLR PHEN	PCMC	BENZ FLR	A-NAPH	ANTH	FLUORANTH
MW-9	26-Mar-86	143	NT	7.4	6.3	3.2	ND	0.304	ND	0.160	ND	ND	ND	ND	ND	ND	0.149	ND	0.012	ND	ND	ND	ND	ND	ND	ND	ND
	23-Jun-86	180	NT	4	1.7	0.71	NT	0.372	ND	0.150	ND	ND	ND	ND	ND	ND	0.170	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	18-Sep-86	240	NT	17.7	10.6	0.015	NT	0.17	ND	ND	ND	ND	ND	ND	1.10	0.007	0.013	ND	ND	ND	0.010	ND	ND	ND	0.028	ND	ND
	16-Dec-86	275	NT	1.49	0.754	0.504	ND	0.160	ND	ND	ND	ND	ND	ND	ND	ND	0.133	ND	ND	0.029	ND	ND	ND	ND	ND	ND	ND
	8-Nov-91	63.3	0.041	16.200	0.309	8.700	10.820	0.115	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	7-Feb-92	109	0.054	2.740	1.570	0.610	2.940	0.11	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10-Jun-92	97.7	0.049	15.600	1.100	4.800	6.800	0.330	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	16-Oct-92	48.9	0.036	17.500	0.700	2.200	7.300	0.180	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW-20	8-Nov-91	19.7	0.037	0.002	ND	ND	0.004	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	7-Feb-92	21.4	0.041	0.201	0.035	0.011	0.051	0.020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10-Jun-92	19.2	0.038	0.017	0.008	0.003	0.012	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	16-Oct-92	15.2	0.030	0.022	0.005	ND	0.002	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW-21	8-Nov-91	12.2	0.065	0.001	0.011	ND	0.001	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	7-Feb-92	12.9	0.051	0.010	0.020	0.005	0.026	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10-Jun-92	14.6	0.042	1.940	0.450	ND	0.630	0.010	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	16-Oct-92	14.9	0.048	3.010	0.420	ND	0.090	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
RW-15	8-Nov-91	27.2	0.204	16.100	1.780	23.700	18.760	0.059	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	7-Feb-92	40.8	0.045	4.430	3.850	1.540	4.410	0.140	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10-Jun-92	29.9	0.115	21.700	3.800	27.300	20.900	0.140	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	16-Oct-92	26.3	0.180	17.600	2.500	25.200	15.200	0.260	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
RW-18	8-Nov-91	48.9	0.040	3.830	ND	ND	ND	0.044	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	7-Feb-92	63.6	0.045	1.990	0.150	0.361	1.401	0.070	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10-Jun-92	88.0	0.075	4.500	1.800	ND	3.200	0.140	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	16-Oct-92	46.9	0.068	4.410	0.440	ND	0.370	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

TABLE 5 (Page 2 of 2)

SUMMARY OF ORGANIC GROUNDWATER ANALYTICAL DATA
RCRA COMPLIANCE WELLS
BLOOMFIELD REFINING COMPANY
BLOOMFIELD, NEW MEXICO

NT=Not Tested
ND= Not Detected
Units=mg/l (approximately equivalent to parts per million (ppm)).

KEY

B=Benzene
T=Toluene
E=Ethylbenzene
X=total Xylenes
Total Phen=Total Phenols
EDC=1, 2-Dichloroethane
2, 4-DCP=2, 4-Dichlorophenol
2, 4-DMP=2, 4-Dimethylphenol
4, 6-DNC=4, 6-Dinitro-o-cresol
2, 4-DNP=2, 4-Dinitro-phenol
2-NP=2-Nitrophenol
4-NP=4-Nitrophenol
BENZANTH=Benzo(a)anthracene
PHENE=Phenol
CHRY=Chrysene
P-C-M-C=P-chloro-m-cresol
BENZFLUOR=Benzo(K)fluoranthene
FLUOR=Fluorene
A-NAPH=Acenaphthene
PYR=Pyrene
NAPH=Yaphthalene
2-CHLRPHEN=2-Chloro-phenol
FLUORANTH=Fluoranthene
TOC=Total Organic Carbon
TOX=Total Organic Halogens

GROUNDWATER TECHNOLOGY