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WORK PLANS

1998

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REMEDIATION PLAN

FOR THE

RIVER BANK CONTAMINATION

GIANT REFINING COMPANY
BLOOMFIELD
GW-001

PREPARED FOR:

NEW MEXICO OIL CONSERVATION DIVISION

PREPARED BY:

LYNN SHELTON
ENVIRONMENTAL MANAGER

FEBRUARY, 1998

REMEDIATION PLAN
FOR THE
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GIANT REFINING COMPANY - BLOOMFIELD

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GENERAL:

As described in the June, 1997 **RIVER BANK INVESTIGATION** report, an area of hydrocarbon contamination was discovered on the river bank of the San Juan River (the river) at this facility. A complete characterization program was performed to document the extent of the hydrocarbon contamination. Mitigation activities have continued at the site and have included: recovery of separate phase hydrocarbon (SPH), bi-weekly monitoring (for BTEX constituents) of the river in the area behind the containment boom, and recovery of separate phase hydrocarbon within the area of the refining facility in order to prevent additional contamination from migrating to the river bank.

Recovery of SPH at the river bank continued through March, 1997. In February, 1997, the flow rate of the river was returned to ~ 500+ cubic feet per second (cfs) from the low flow test in which the river was limited to 250 cfs for a period of four months. It is assumed that the low flow will not occur again as a test, although low flow can occur as a result of long term drought conditions. As a result of the return to normal flow of the river (~500cfs), SPH was no longer observed in the collection gallery installed near the river. Although recovery equipment has been left in place, no SPH has been seen or recovered since March, 1997.

As stated in the **RIVER BANK INVESTIGATION** report, the low flow conditions appeared to have lowered the hydraulic barrier of the river sufficiently to allow SPH, that was held as bank storage, to migrate west to the river and create the sheen.

Several remediation techniques have been explored in order to determine the most effective remediation program for protection of the river. To be successful, any remediation activity must be performed in concert with the recovery and management of the SPH plume located on top of the bluff and immediately below part of the Giant facility.

SITE SPECIFIC PROPOSAL:

Phase I

The first part (or phase) of a remedial program must be to create an impermeable barrier between the contaminated area and the river. Although the migration of the SPH seems to be inhibited by the normal flow of the river, it is always possible that the low flow condition (<300 cfs) may occur due to additional flow tests or as the result of long term drought conditions. Should low flow conditions exist for an extended period of time, it is

likely that, if SPH is still present and until the hydrocarbon contamination is mitigated, additional migration of SPH may occur.

Giant proposes to install an impermeable wall using sheet pilings. Specifically, an impermeable wall of high density polyethylene from Materials International (4501 Circle 75 Parkway, Atlanta, Georgia), brand name Shore Guard SG500, will be installed. A special sealant will be applied to interlocking seams to assure impermeability. The sheet pilings will be installed 5-10 feet from the edge of the river to minimize or eliminate impact to the river during installation.

The sheet piles will be ~22 feet long and will be driven into place with a crane mounted, hydraulically driven vibratory hammer. The plastic sheets will be supported during installation by a hardened steel mandrel. The sheets will be driven through the fluvials into the Nacimiento Formation. As the sheets are interlocking, an impermeable barrier will be created to prevent horizontal migration and the Nacimiento Formation is a natural barrier to vertical migration.

The sheet piling will be installed around the perimeter of the river bank to the outlet of the water make-up ponds, then south along the west edge of the make-up pond and then east to the east edge of the makeup pond. This will surround the contaminated soil and effectively prevent any migration of contaminants to the river. As the surface of the Nacimiento Formation dips to the north-northwest, this, again, provides adequate protection for the river from migration of contaminants.

A site drawing as well as a detail of the river bank are included as Attachment I and the extent of the sheet piling is marked for your reference.

The sheet piling, at ~22 feet, is of sufficient length to tie into the Nacimiento Formation and will be finished in heighth above the ground surface to allow a level surface across the entire river bank area.

Phase II

Because the installation of the sheet piling will provide an impermeable barrier that will prevent migration of contamination of the river and due to the fact that no SPH had been observed or recovered since March, 1997, Giant proposes to use in-situ remediation, with stimulated bio-remediation to enhance bio-degradation and subsequent cleanup of the hydrocarbon contaminated soil.

After installation of the impermeable barrier, Giant will backfill the low areas on the western part of the river bank with clean soil to establish a level grade across the river bank area. Giant will then plow or disc the hydrocarbon contaminated area and apply nitrogen/ phosphorus rich fertilizer to the affected area. Fertilizer applications will be transported down to the contamination by percolation. Giant will then plow or disc the affected area monthly to provide additional oxygen and to control vegetation growth. Giant plans to apply fertilizer twice annually during the warm months between April and October. Additions of

nitrogen/phosphorus rich fertilizer will serve as a stimulant for bacterial growth. Applications of the fertilizer will not affect the river because of the impermeable barrier.

Additionally, a monitor well will be installed as close to the current recovery culvert* as is safely possible, allowing room for sloughing or sliding of the talus slope to occur without damage to the well (see detail map for wellsite). This well will be monitored monthly with an interface probe to determine if SPH is present. Although Giant believes that most of the SPH has been recovered, if SPH is observed, collection of SPH will commence through the monitor well. If sufficient SPH is present, a collection gallery may need to be installed to recover the SPH. The need for this could be discussed between Giant and the OCD if a considerable volume of SPH is determined to be present. If no SPH is detected for one year, or after SPH recovery is abandoned, Giant will monitor the water in the monitor well for BTEX constituents quarterly until those constituents diminish to below WQCC standards. Quarterly progress reports will be submitted to OCD at that time to inform the OCD of the progress being made by the remediation efforts. When BTEX levels fall below WQCC standards, the river bank area will be considered clean and remediation and sampling activities will cease at that time.

In addition to the remediation activities on the river bank, Giant will continue to maximize product recovery from the plume beneath part of the refinery on top of the bluff. Upon approval of the Corrective Measures Study, an enhanced recovery system will be installed in order to expedite recovery of the SPH plume and cleanup of the Jackson Lake Terrace Formation. As this plume is considered to be the source of the contamination on the river bank, recovery activities will preclude the possibility of additional SPH from migrating to the river bank.

INSTALLATION:

Giant proposes to install the impermeable barrier, assuming approval of this remediation plan by OCD, in June or July 1998. Immediately after completion of the impermeable barrier, the river bank area will be backfilled as needed, leveled and then plowed or disced. The monitor well will be installed at that time.

This timetable provides the quickest assurance that no contamination can reach the river and provides the best assurance that the environment and human health are protected.

*The existing collection culverts will be removed because sloughing of the talus slope threatens to cover them up.

ATTACHMENT I

DETAIL DRAWING

NORTH

NOTES

REFERENCE DWGS.	NO.	REVISION	JOB No.	BY	DATE	BY	DATE	BY	DATE
				DRAWN		CHECKED		APPROVED	

SCALE 1/16 = 1'-0"	DATE	
DRAWN BY LDB	7/15/97	
INITIAL CHK.		
FINAL CHK.		
ENGR.		
APPR. BY		
AFE/WO No.		

GIANT • 1

GIANT REFINING CO.

BLOOMFIELD REFINERY — BLOOMFIELD NEW MEXICO

DWG. NO. **D-000-900-XXX** — REV. **0**

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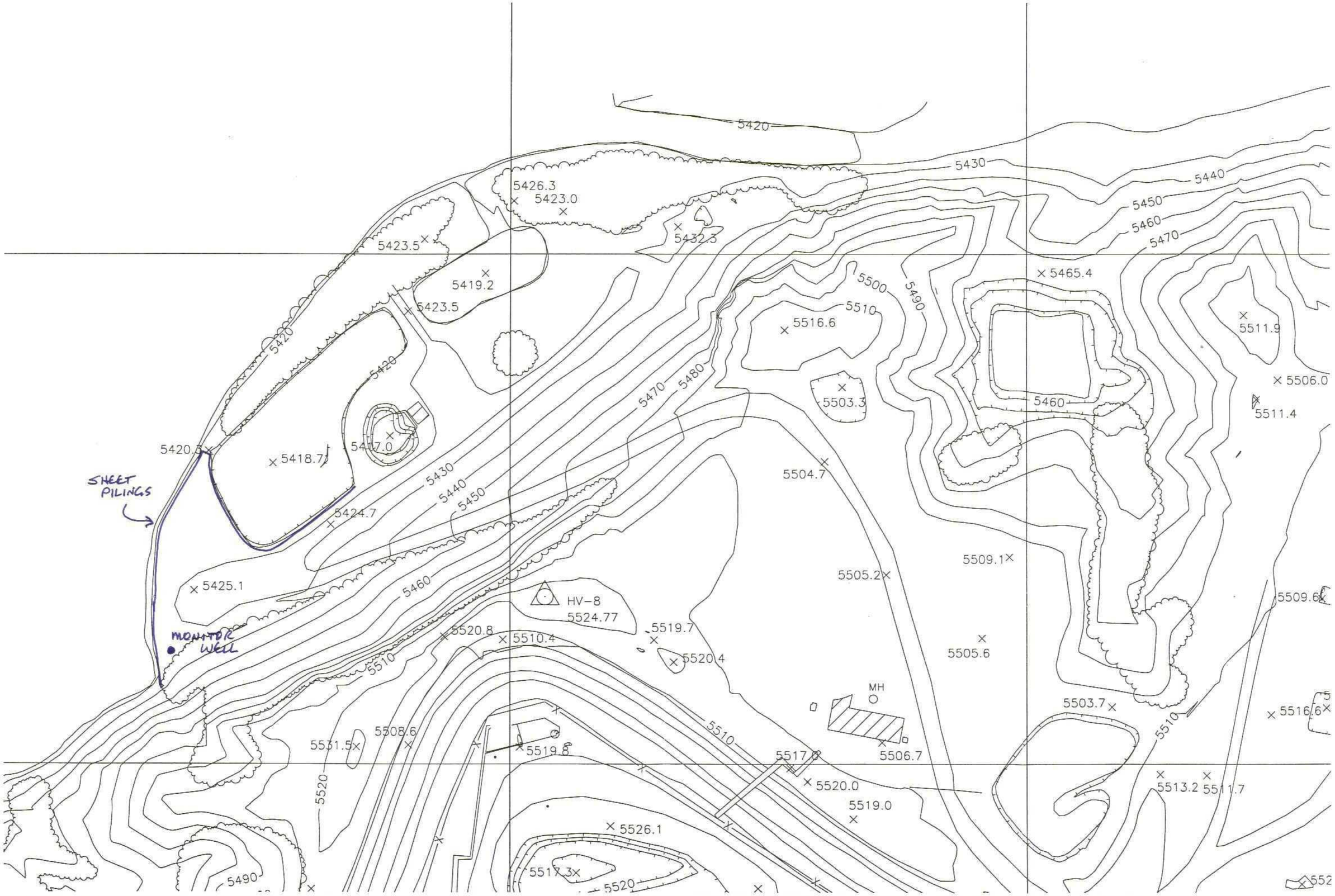

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