

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER
MONITORING AND REPORTING PROGRAM NO. R5-2006-0802

FOR
FORMER BAC, INC., FACILITY

TRACK FOUR, INC.,
A WHOLLY OWNED SUBSIDIARY OF AMSTED INDUSTRIES INC.,
AND
A FORMER OWNER, MERCK & CO., INC.,
MERCED COUNTY

This monitoring and reporting program (MRP) replaces MRP No. R5-2002-0833, which is hereby rescinded. The following Monitoring and Reporting Program contains the minimum monitoring and reporting requirements necessary to determine compliance with CAO Order No. 5-00-709. Reports may be combined with WDR Monitoring and Reporting Program No. 5-00-197.

This MRP is designed to delineate and monitor the extent of groundwater contaminant plumes and contamination, and determine whether remediation efforts are effective. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is approved in writing by Executive Officer of the Regional Board.

Prior to construction of any new groundwater monitoring or extraction wells, the Discharger shall submit plans and specifications to the Regional Board for review and approval. Once installed, all new wells shall be added to the monitoring program and shall be sampled and analyzed according to the schedule below.

All monitoring wells shall be purged using micropurging methodology with the use of dedicated bladder pumps in all monitoring wells, as necessary. This approach will increase consistency in sample collection, and produce analytical results that are more representative of actual groundwater conditions. Selected parameters including pH, conductivity, turbidity, and temperature of the pump discharge water shall be monitored during micropurging until they have stabilized. Solid and liquid wastes, principally water resulting from equipment decontamination, well development, formation water generated during drilling, and purge or sampling water, shall be collected and disposed of properly.

MONITORING AND EXTRACTION WELLS

The Discharger has constructed and operates 24 monitoring wells within its property boundary and 35 monitoring wells on adjoining properties as shown on Attachment A. Based on the current groundwater flow direction being westerly to northerly, wells MW-10, -11, -23, -24, and -25 monitor the upgradient side of the total chromium plume. The downgradient lateral extent of the plume, monitored by MW-54 (range 2-6 µg/l) shows constituent levels at or below the

average background concentration of 6 µg/l for total chromium. The range of total chromium results from downgradient well MW-48 (range 3-5 µg/l) currently reflect background conditions.

Monitoring wells MW-9M (range 6-2640 µg/l), -9L (range 3-727 µg/l) and MW-12M (range 3 - 75 µg/l), -12L (range 4-21 µg/l) monitor the medium and deep groundwater zones and indicate that total chromium has impacted these zones. Monitoring wells MW-57, MW-58 and MW-59 were installed in June 2001 to verify the lateral and vertical extent of the chromium plume to background concentrations. The total chromium results from MW-57 (range 5-10 µg/l) and MW-59 (range 5-8 µg/l) currently reflect near background conditions. The total chromium results from MW-58 (range 3-750 µg/l) indicate that the chromium plume is migrating downward in the vicinity of this well.

The Discharger has operated 14 on- and off-site extraction wells and may install and operate additional extraction wells as necessary to capture the 50 µg/l chromium plume. Additional extraction and monitoring wells shall be installed based on the results of the annual monitoring reports provided during long-term remediation.

GROUNDWATER MONITORING

The following wells shall be monitored semiannually: EW-1A, EW-2, EW-3, EW-4, EW-5, EW-8, EW-9, EW-10, EW-11, EW-12, EW-13, EW-14, MW-8, MW-9, MW-9L, MW-9M, MW-10, MW-12, MW-12L, MW-12M, MW-15, MW-21, MW-25, MW-26, MW-27, MW-28, MW-29, MW-30, MW-42, MW-43, MW-45, MW-46, MW-47, MW-49, MW-51, MW-52, MW-53, MW-54, MW-55, MW-56, MW-57, MW-58, MW-59, MW-60, MW-61, OW-1, Bill's Auto Wreckers domestic well, and Bernardo's Dairy domestic well.

The following wells shall be monitored annually: MW-11, MW-14, MW-22, MW-23, MW-24, MW-41, MW-44, MW-48, and MW-50.

Samples from the above wells shall be analyzed as follows:

| Constituent | EPA Analytical Methods ¹ | Units |
|---|-------------------------------------|-----------------|
| Specific Conductivity | Field Meter | µmhos/cm |
| PH | Field Meter | pH units |
| Temperature | Field Meter | °F |
| Water Level | Field Meter | 0.01 ft. MSL |
| Turbidity | Field Meter | Turbidity Units |
| Total Dissolved Solids (TDS) ² | 2540C | mg/l |
| Arsenic | 6010B | µg/l |
| Total Chromium | 6010B | µg/l |
| Hexavalent Chromium ² | 7199 | µg/l |
| Copper ³ | 6010B | µg/l |

| Constituent | EPA Analytical Methods ¹ | Units |
|--|-------------------------------------|-------|
| Benzene ⁴ | 8021B | µg/l |
| Ethylbenzene ⁴ | 8021B | µg/l |
| Xylenes ⁴ | 8021B | µg/l |
| Toluene ⁴ | 8021B | µg/l |
| Total Petroleum Hydrocarbons (Gasoline) ⁴ | 8015/5030 | µg/l |
| Methyl t-butyl ether (MTBE) ⁴ | 8260 | µg/l |
| 1,2-Dichloroethane (1,2-DCA) ⁴ | 8260 | mg/l |

¹ EPA Method or an equivalent method.

² Only for wells MW-10, -23, -24, -28, -44, -45, and -48.

³ Only for well EW-3

⁴ Only for wells EW-4 and EW-5. Analytical reports shall differentiate between “non-detect” and “trace” results.

All data shall be reported as either:

- numerical concentrations, for results at or above the quantitation limit;
- “trace” along with detection and quantitation limits, for results which fall between those limits; or
- “less than [detection limit]”, for results which are below the analytical detection limit.
- If any on constituent is not found in two consecutive sampling events, then that constituent may be dropped from the list at that specific sampling point upon approval by the Regional Board.

The commonly achieved detection levels, by U.S. Environmental Protection Agency (USEPA) analytical methods, are as follows (NA= Not Applicable):

| Constituent | Wastewater Analytical Method | Detection Level | Sediment/Soil Analytical Method | Detection Level |
|---|------------------------------|-----------------|---------------------------------|-----------------|
| Total Chromium | 6010B | 3.0 µg/l | 6010B | 1.0 mg/kg |
| Hexavalent Chromium | 7199 | 0.5 µg/l | 7199 | 0.5 mg/kg |
| Arsenic | 6010B | 2.0 µg/l | 6010B | 0.5 mg/kg |
| Copper | 6010B | 1.0 µg/l | 7211 | 1.0 µg/kg |
| Benzene | 8021B | 0.35 µg/l | NA | NA |
| Ethylbenzene | 8021B | 0.5 µg/l | NA | NA |
| Xylenes | 8021B | 0.5 µg/l | NA | NA |
| Toluene | 8021B | 0.5 µg/ | NA | NA |
| Total Petroleum Hydrocarbons (Gasoline) | 8015/5030 | 5.0 µg/ | NA | NA |
| Methyl t-butyl ether (MTBE) | 8260 | 0.5 µg/l | NA | NA |
| 1,2-Dichloroethane | 8260 | 0.5 µg/l | NA | NA |

QUALITY CONTROL SAMPLES

For quality control purposes, the Discharger shall collect and analyze one sampling blank and one duplicate for every twenty samples collected and analyzed. Each of these quality control samples shall be analyzed for the same parameters as the other samples collected.

REPORTING

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly the compliance with Cleanup and Abatement Order requirements.

Semiannual monitoring shall be conducted in the second and fourth quarters, with monitoring reports due to the Regional Board by **1 August** and **1 February**. Each Semiannual report is to include the following minimum information:

- (a) a description of the groundwater sampling event, including field logs. At a minimum, field logs shall contain water quality parameters measured before, during, and after purging, method of purging, depth of water, volume of water purged, etc. (field logs shall be made available upon request for the previous three years);
- (b) groundwater contour maps for all groundwater zones, if feasible;
- (c) isocontour contaminant concentration maps for all groundwater zones;
- (d) a table showing any newly installed well construction details such as well number, groundwater zone being monitored, coordinates (northings and eastings), ground surface elevation, reference elevation, elevation of screen, elevation of bentonite, elevation of filter pack, and elevation of well bottom;
- (e) a narrative description of changes to the historical lateral and vertical flow directions and gradients;
- (f) cumulative data tables containing the water quality analytical results and depth to groundwater;
- (g) a copy of the laboratory analytical data (top sheet) report and the chain-of-custody forms;
- (h) the status of any ongoing remediation, including cumulative information on the mass of contaminant removed from the subsurface, system operating time, the effectiveness of the remediation system, and a summary pertaining to the operation and maintenance of the system; and

- (i) if applicable, the reasons for and duration of all interruptions in the operation of any remediation system, and actions planned or taken to correct and prevent interruptions.

The 1 February submittal shall also be an **Annual** report, which shall contain an evaluation of the effectiveness and progress of the investigation and remediation. Specific information to be contained in the annual report shall include, at a minimum:

- (a) both tabular and graphical summaries of all data obtained during the previous year;
- (b) groundwater contour maps and contaminant concentration maps containing all data obtained during the previous year;
- (c) a discussion of the long-term trends in the concentrations of the pollutants in the groundwater monitoring wells;
- (d) an analysis of whether the contaminant plume is being captured by the extraction system or is continuing to spread (i.e., verification of hydraulic control of the plume);
- (e) definition of the horizontal and vertical extent of plume in all water bearing zones and contamination in the unsaturated zone to established background limits;
- (f) an analysis, with supporting data, which evaluates the impact(s) from irrigation practices and municipal and domestic well pumping on the horizontal and vertical extent of the plume(s).
- (g) a description of all remedial activities conducted during the year, an analysis of their effectiveness in removing the contaminants, and plans to improve remediation system effectiveness;
- (h) the anticipated date for completion of cleanup activities;
- (i) an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program;
- (j) if desired, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes;
- (k) a discussion of the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements;
- (l) an evaluation of the groundwater monitoring program for validity of analyses, frequency of sampling, and selection of performance monitoring wells for sampling;
- (m) recommendations, as appropriate, for a revised groundwater monitoring and/or extraction well plan which must be approved by the Regional Board prior to implementation of

selected changes to totally capture and monitor the effects of the groundwater treatment and control system; and

(n) an update of the groundwater control model.

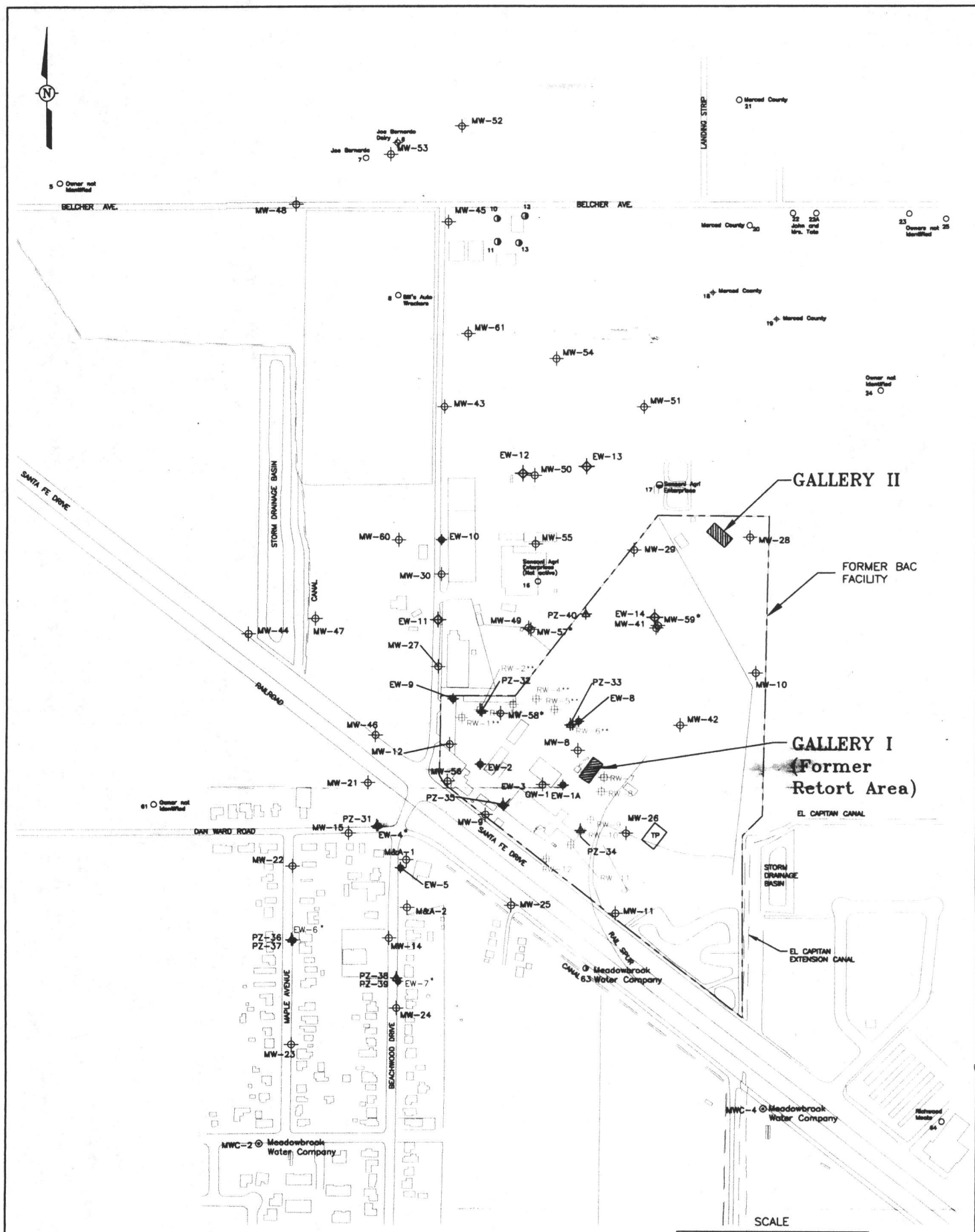
The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Regional Board.

The Discharger shall review this Monitoring and Reporting Program No. R5-2006-0802 to evaluate the adequacy of the remedial action. The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered By: _____
PAMELA C. CREEDON, Executive Officer

24 July 2006
(Date)

BLS



LEGEND

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|-------|--------------------------|---------------|----------------------------------|--|
| MW-11 | MONITORING WELL | TP | TREATMENT PLANT | OFFSITE WELLS (LOCATIONS APPROXIMATE) |
| EW-8 | EXTRACTION WELL | [Hatched Box] | INFILTRATION GALLERY | ◇ IRRIGATION WELL |
| EW-6 | OFF-LINE EXTRACTION WELL | * | WELL SCREEN IS IN DEEPER ZONE | ⊙ TEST WELL |
| RW-2 | REINJECTION WELL | ** | CURRENTLY NOT USED FOR INJECTION | ⊙ MEADOWBROOK MUNICIPAL WELL |
| PZ-34 | PIEZOMETER | | | ○ DOMESTIC WELL |
| | | | | ⊙ FIRE PROTECTION WELL |

**ATTACHMENT A
WELL LOCATION MAP
FORMER BAC FACILITY
MERCED, CALIFORNIA**