KTN & ASSOCIATES
43289 Osgood Road, Fremont, Calif. 94539
(415) 623-0480
Cal. State Cont. Lic. # 572427

CUSTOM ALLOY SCRAP SALES, INC.

2739 Peralta Street
Oakland, California

2730 **Work Plan** Jan 24, 1991

2730 Peralta

REGISTERED GEOLOGIST
CHRISTOPHER M. FRENCH
Exp 6/30/92
No. 4485
STATE OF CALIFORNIA

K.T.W. & ASSOCIATES

43289 Osgood Road, Fremont, Calif. 94539
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January 24, 1991

Mr. Pat O'Brien
Custom Alloy Scrap Sales, Inc.
2730 Peralta Street
Oakland, California 94607

Subject: Submittal of Work Plan

Dear Mr. O'Brien:

K.T.W. & Associates (KTW) is pleased to submit this workplan for remediation of floating diesel product at 2730 Peralta Street, Oakland, California. The location of the site is shown in Plate 1[1]. This plan has been drafted in response to the letter by Mr. Gil Wistar of the Alameda Health Care Services Agency (ACHCSA) dated December 28, 1990. In the letter from the ACHCSA, it was required that further work include:

a) Definition of the areal extent of the free product and dissolved hydrocarbon plumes.
b) Evaluation of the potential for leaching of heavy metals in the ITP yard and groundwater monitoring for metals.
c) Preparation of a comprehensive site remediation plan for soil and groundwater.

Pursuant to your request, we are directing our immediate attention to removal of the floating product plume beneath the property. We agree that this action commands the highest priority and most immediate attention. The remaining items are addressed in a preliminary fashion in the subsequent portions of this workplan. A schedule for implementation of the outstanding workplan items will be drafted following start-up and assessment of floating product remediation. A phased implementation of remaining tasks will be proposed.

TASK 1 - GROUNDWATER REMOVAL AND TREATMENT

Subtask 1.1 - Removal of Floating Product

Wells MW-1 and MW-2, shown in Plate 2[2] , may be fitted with extraction systems specifically designed for the effective removal of floating product. Present plans

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[1]MacKinnon Environmental Consulting, (1990)

[2]MacKinnon Environmental Consulting, (1990)

provide for installation and operation of the Westinghouse Groundwater Recovery flexible axial peristaltic pump (FAP pump) fitted with a product skimming attachment. This latter extractions system may have site specific advantages over the QED system in terms of both design, utility and hydrodynamic impact.

Pumped product may be conveyed to a double contained, skid mounted, 550 gallon aboveground storage tank manufactured by Ace Tank & Equipment. Hydrocarbon product may be stored on-site for a period of less than ninety (90) days and may be transported from the site by Evergreen Environmental, a licensed hazardous waste transporter, for recycling. Copies of all applicable hazardous waste manifests will be maintained on-site, and copies will be submitted to the Alameda County Health Care Services Agency. Please make absolutely certain that all waste manifests are retained and safely stored.

During startup, the product removal system may be operated at a series of variable pumping rates in order to establish the most efficient operating range. It may be necessary to cycle the extraction system if the product yield from the formation is lower than the operational range of the extraction system. In addition, the systems may be cleaned and inspected once weekly to ensure against system fouling due to the presence of fine grained particulate matter and microbial decomposition products.

Subtask 1.2 - Conversion to Total Fluids Extraction

The product extraction system may be converted to total fluids following successful completion of the product recovery phase. During the product recovery phase, permitting for fulfillment of National Pollution Discharge Elimination System (NPDES) requirements, if applicable, and Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements (WDR) may be implemented. In conjunction with completion of permitting requirements, a suitable plan for design, installation and implementation of a pump and treat system may be developed. Suitable treatment technologies may include UV oxidation, carbon filtration or, if permitted, direct disposal to the sanitary sewer system. It is not possible to rationally design such a system until floating product has been removed from the water bearing zone and the concentration of hydrocarbon in groundwater of the influent stream to the proposed treatment system can be established.

TASK 2 - SOIL REMEDIATION AND DISPOSAL

Hydrocarbon contaminated soil may either be treated on-site or, if present in only limited quantities at modest concentrations, may be hauled off-site for either treatment or disposal. If hydrocarbon contaminated soil is present in concentrations below 100 parts per million (ppm), the material will be transported directly to a Class III landfill following representative sampling, analysis and documentation procedures, including completion of landfill documentation requirements.

Bills of Lading or weight tags received from the landfill must be retained in your files and treated as if they constitute a legal document, as is the case with hazardous waste manifests. If hydrocarbon contamination is present in concentrations ranging from 100 to 1,000 ppm, the material may either be treated on-site by biological methods submitted to a permitted treatment unit located in Richmond for use as base in an asphalt batch plant, or transported off-site to a Class II landfill by a licensed transporter under proper manifest. The on-site treatment option is discussed in greater detail below.

2.1 - On Site Treatment

The hydrocarbon potentially present in site soil will be readily amenable to on-site bioremediation, if site conditions (spatial and logistical constraints) allow for such. This treatment method is cost effective and expeditious, although not as expeditious as off-site transport. The principal of treatment for other hydrocarbon fuels is the same as for gasoline. Remediation level and time are proportional to the ease of transport of oxygen and nutrients. However, the amount of treatment due to simple volatilization is significantly less than for gasoline. The time and level of treatment is a function of the starting concentration and the soil type (permeability). Highly contaminated impervious soils take a longer time to biodegrade. Generally, soils containing diesel fuels take a minimum of sixty (60) to ninety (90) days to degrade. Mechanical aeration of the system, either by weekly turning or by installation of an explosion-proof blower system, significantly accelerates the biodegradation rate. Repeated application of the fertilizer (nutrient) will also enhance the rate of decomposition.

A biotreatment system may be constructed with a polyethylene base, sidewalls and cover to inhibit percolation of leachate, if any, and offgassing of fugitive nuisance odors. Nutrients and exogenous bacteria provided by the SolMar Corporation are sprayed onto the affected soil during the construction phase. Alternately, a special soil formulation containing a high concentration of bacteria and nutrients may be mixed in with the indigenous soil. The aeration system, consisting of two-inch slotted pipe manifolded to a 3/4-hp regenerative blower, is installed during construction (if necessary). Off-gas controls, in the form of vapor phase carbon, may be applied to the blower effluent if hydrocarbon concentrations exceed Bay Area Air Quality Management District permitting threshold limits. Alternately, the soil may be turned.

Soil sampling points may be utilized to monitor treatment progress. Soil samples will be collected during the first day of treatment to be used as baseline data to verify subsequent hydrocarbon measurements. Soils may be sampled on a three (3) to four (4) week basis until treatment levels indicate that the soil may be transported off-site. For final stockpile characterization, at least one (1) soil sample should be collected for every twenty cubic yards (20 cu. yds.) of soil.

TASK 3 - PLUME DEFINITION AND GROUNDWATER MONITORING

Federal and state regulations and guidelines require that the extent of groundwater contamination be evaluated, and that groundwater monitoring be performed, where the release of hydrocarbons from an underground storage system has impacted groundwater.

It is noted that previous hydrogeologic investigations, presented in the Phase II investigation report dated December 3 1990, have provided for preliminary definition of the extent of non detectable concentrations in the saturated zone. As shown in the cross section provided in Plate 3[3] non detectable concentrations of hydrocarbons have been analyzed in the saturated interval at drilling locations MW-5 (situated on Peralta Street) and B8, B9 and B12 (located on 26th Street). The previous subsurface activities have also defined the areal extent of a permeable sand lens, which appears to be serving as the locus of contaminant migration. The extent of the lens appears to be largely confined to the area of the site, and is of limited areal extent.

Task 3.1 - Plume Definition

It could be surmised that a limited portion of the groundwater and floating product plumes may have migrated off-site. The extent of floating product and groundwater contamination may be evaluated by utilizing the QED Hydro Pump Drilling System for rapid acquisition of groundwater samples. It is proposed that a series of three (3) boreholes be drilled along 26th Street between the location of previous boreholes B9 and B12. Based upon the field and analytical results, at least one (1) additional well may be installed on or off-site.

Task 3.2 - Groundwater Monitoring

Existing groundwater monitoring wells will be sampled and analyzed at quarterly intervals in accordance with the following monitoring scheme:

MW-3: TPH-D, TPH-G and BTXE
MW-4: TPH-D, TPH-G and BTXE, and TOG
MW-5: TPH-D, TPH-G and BTXE and metals (Cu, Pb, Cr and Zn)
MW-6: TPH-D, TPH-G and BTXE and metals (Cu, Pb, Cr and Zn)[4]

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[3]MacKinnon Environmetal Consulting, (1990)

[4]TPH-D: Total Petroleum Hydrocarbons as Diesel
TPH-G: Total Petroleum Hydrocarbons as Gasoline
BTXE: Benzene, Toluene, Xylene, and Ethylbenzene
TOG: Total Oil and Grease
Cu: Copper
Pb: Lead
Cr: Chromium
Zn:: Zinc

In addition, all wells will be evaluated for information pertaining to depth to groundwater and the presence or absence of floating product. Groundwater monitoring reports will be submitted on a quarterly basis and will include a summary of monitoring activities, a tabulation of current and past analytical results, and a tabulation of groundwater elevation data.

TASK 4 - EVALUATION OF METAL LEACHATE

A connection seems to have been drawn by the Alameda County Health Care Services Agency between the presence of metals detected in soil which had been collected at a depth of approximately four (4) feet, and the presence of metals detected in soil collected at a depth of ten (10) feet. From this, the conclusion has apparently been made that some form of leaching may be occurring.

From a physicochemical standpoint, it is widely understood and recognized that the oxides and hydroxides of heavy metals are generally insoluble in water under standard Eh-pH conditions. For example, evaluation of the equilibrium formula:

$$CrOH \rightleftarrows [Cr^{+++}] \times [OH^{---}] \quad KSP = 7 \times 10^{-31} \qquad (1)$$

yields an extremely low solubility product, from which it is known that the substance is only very slightly soluble in water under normal Eh-pH conditions.

Upon closer examination of the results of previous investigations, presented in Table 1, Attachment B, it may be concluded that one (1) sample contained elevated concentrations of lead and zinc. The two values for lead and zinc have been compared to CCR Title 22, Section 66699 for evaluation of the presence of persistent or bioaccumulative toxic substance and it has been determined that the values fall below the respective values of the Total Threshold Limit Concentrations (TTLC). The remaining samples appear to fall into a very normal distribution of values which fall well within the expected range reported for the average crustal abundance of the elements.[5]

At this time we do not find any evidentiary support for the assumption that metal is leaching into groundwater at the site. Because all previous groundwater analysis have shown the presence of nondetectable concentrations of metals, including Well MW-5, located downgradient from the ITP area, the technical evidence supports the conclusion that heavy metals are not leaching into the groundwater. To provide further evidence that this is not occurring, it is recommended that Well MW-2 be sampled and analyzed for the four (4) metals of concern following successful conclusion of floating product remediation.

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[5] Values for crustal abundance, Pricinciples of Geochemistry, Brian Mason, 1966, John Wiely & Sons, Inc., New York, New York

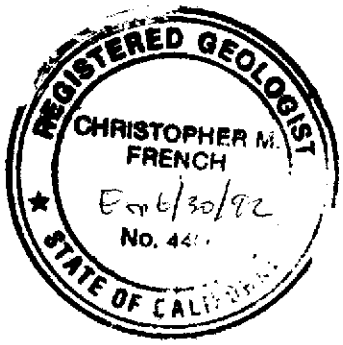
SCHEDULE

We are prepared to commence free product recovery in middle to late February. For the purpose of scheduling, we anticipate that free product recovery operations may be completed in six months. A schedule for the remaining project tasks will be completed following implementation and assessment of the floating product remediation project, with the exception of quarterly monitoring. Quarterly monitoring will proceed according to the existing schedule drafted by MacKinnon Environmental.

Should you have any questions, please call.

Very truly yours,

Kevin Krause
Vice President
K.T.W. & Associates



Christopher M. French
Registered Geologist

Attachments

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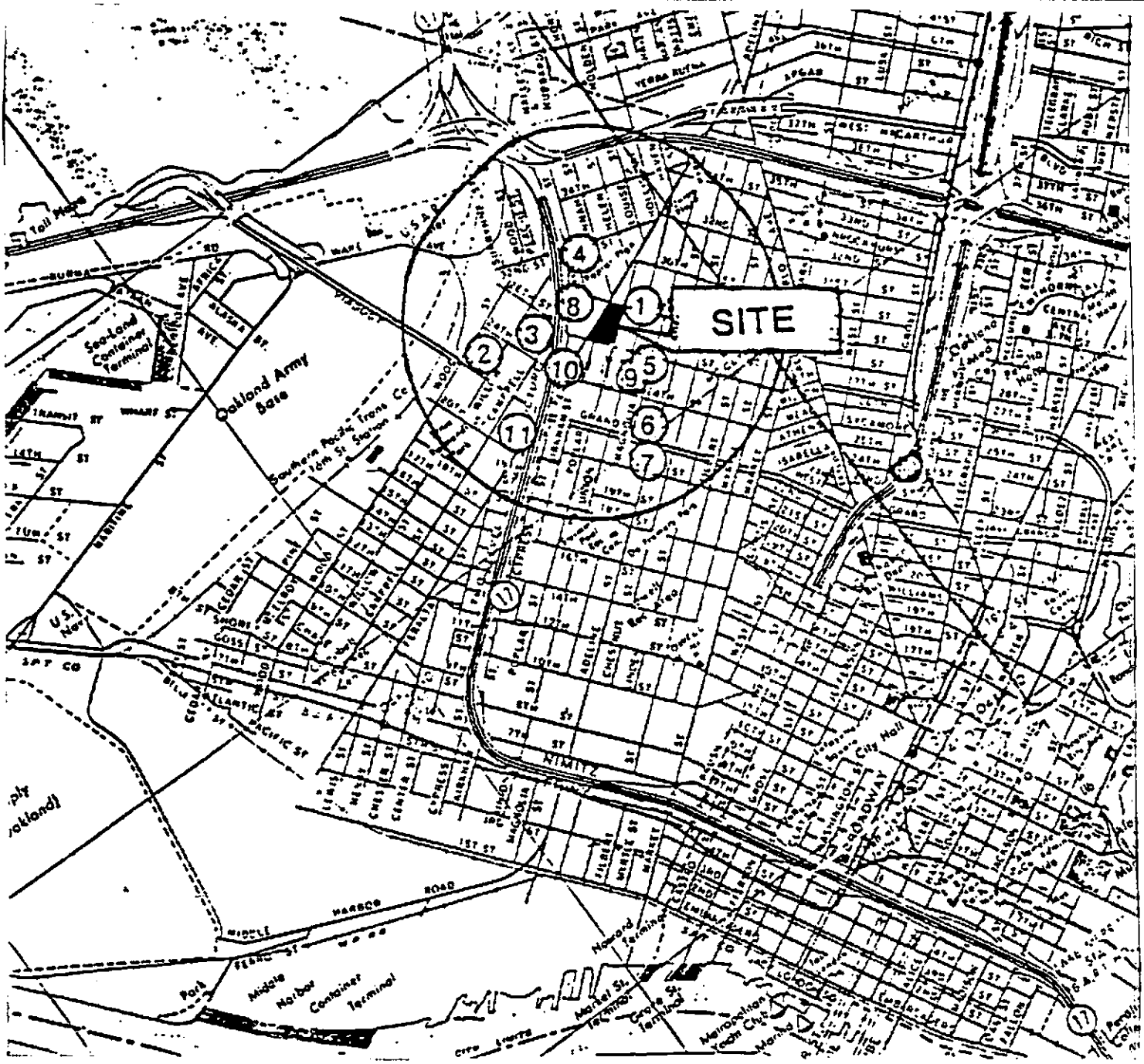

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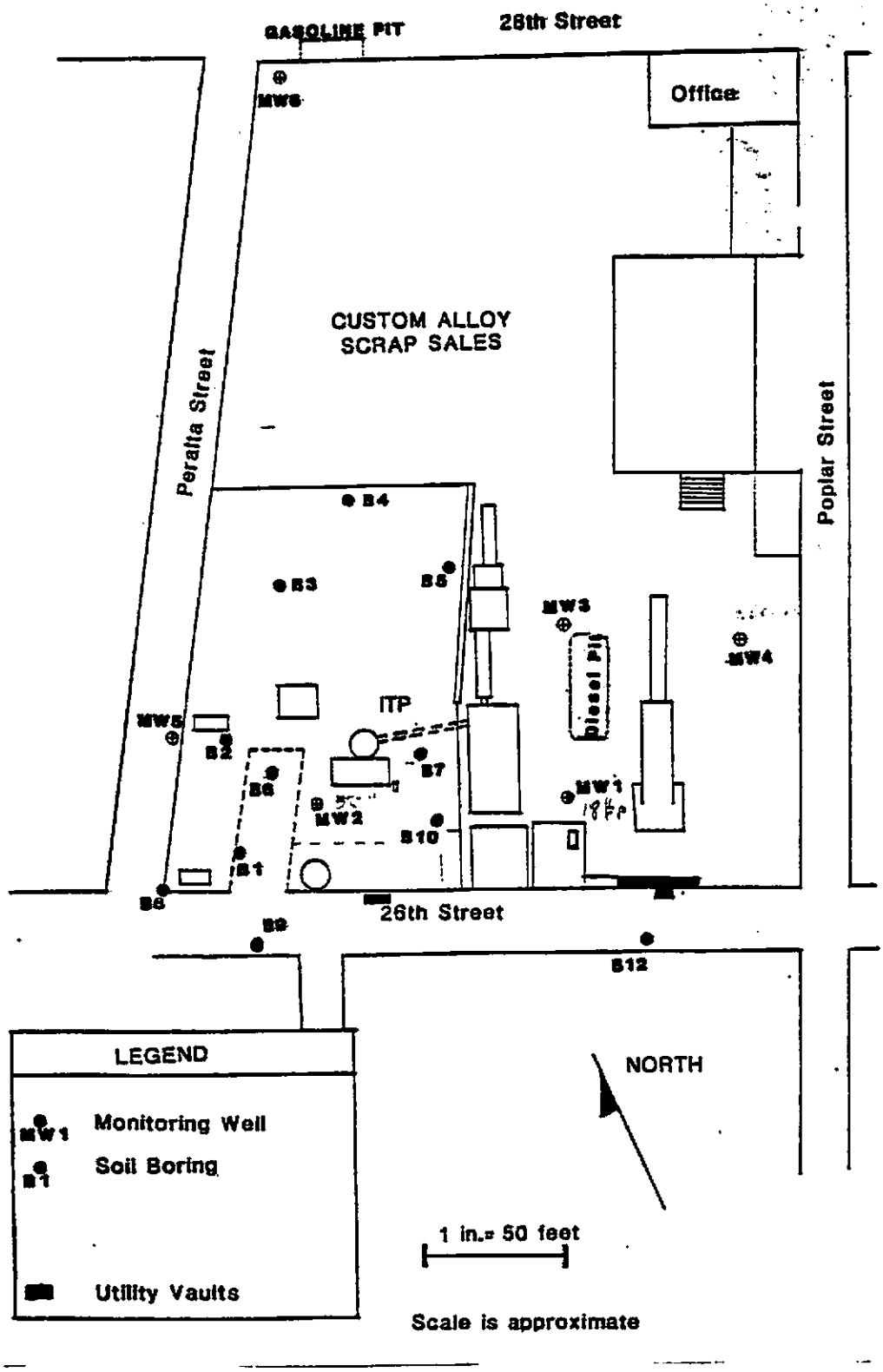
PROJECT:

SITE LOCATION
CUSTOM ALLOY SCRAP SALES, INC.
2730 Peralta Street
Oakland, California

PLATE
1



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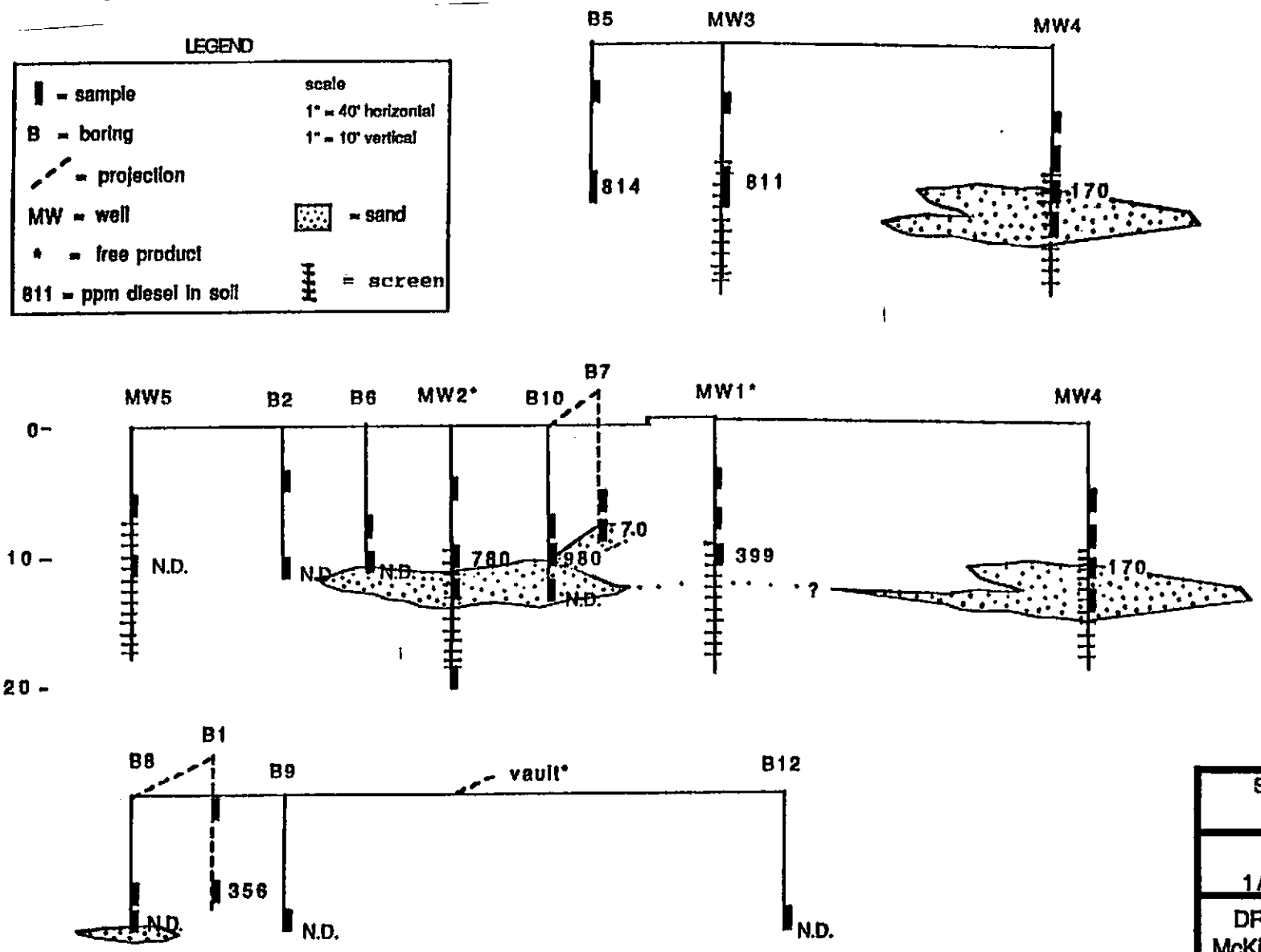
PROJECT:

BORING & MONITORING WELL LOCATIONS
CUSTOM ALLOY SCRAP SALES, INC.
2730 Peralta Street
Oakland, California

PLATE 2



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PROJECT NO.:
Sand lenses and soil contamination

CASS CROSS SECTIONS
CUSTOM ALLOY SCRAP SALES, INC.
2730 Peralta Street
Oakland, California

PLATE
3

TABLE 1

Comparison of soil metal concentrations to relevant crustal abundance for the elements.
Custom Alloy Scrape Sales, Oakland, California

BORING	DEPTH (Feet)	Pb (ppm)	Zn (ppm)	Cu (ppm)	Cr (ppm)
B1	4.0	ND	27	14	----
B2	4.0	<20	22	13	----
B3	3.5	240	560	22	----
B4	3.5	15	31	18	----
B5	4.0	42	52	19	----
B10	10.0	10	33	ND	21
AVE. CRUSTAL ABUND.		13	70	55	100
USGS GRANITE (G-1)		49	45	13	22
USGS DIABASE (W-1)		8	82	110	120

Abbreviations

Cu: Copper
Cr: Chromium
Pb: Lead
Zn: Zinc

Note: All concentrations expressed in milligrams per kilogram (mg/kg), or parts per million (ppm).

References:

1. Average crustal abundance and USGS rock concentration data obtained from Manual of Mineralogy, 19th Edition, C.S. Hurlbut, Jr., and C. Klein, 1977, John Wiley & Sons, New York, New York.

2. Principles of Geochemistry, Brian Mason, 1966, John Wiley & Sons, New York, New York.