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December 21, 1998

Mr. Richard Gardineer, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21st Street
Long Island City, NY 11101

Re: Revised Workplan for Remediation
Milhan Realty Corporation - 2 Ingraham Street, Brooklyn, New York

Dear Mr. Gardineer:

Following Ms. Munteanu-Ramnic's November 16 letter and our December 7 meeting, please find attached a revised Workplan for the 2 Ingraham Street Site, incorporating: one new well (MW-5) to be installed directly downgradient of SB-1; seven additional soil samples; dust collection in bags (rather than stockpiles on sheeting); covering of soil stockpiles with polythene sheeting; the resume of the QA Officer; preparation of a Data Usability Summary Report; and the additional QA/QC equipment blanks requested.

Please call me if you have any questions.

Sincerely,
AKRF Engineering P.C.

Marcus Simons
Technical Director

MS\C:\Files\MISC\ing-dec5.doc

cc: Mr. Vadim Brevdo, NYSDEC Region 2
Ms. Iona Munteanu-Ramnic, NYSDEC Region 2
Mark Chertok, Esq., Sive, Paget & Riesel, P.C.
Mr. Carl Savryn, Milhan Realty

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DEC. 23, '98

1. INTRODUCTION

The Voluntary Cleanup site is the northwest quadrant of 2 Ingraham Street in the East Williamsburg section of Brooklyn, New York (Block 3084, Lot 1). The block is bounded by Ingraham Street, Bogart Street, Harrison Place and Morgan Avenue (see site location and site plan, Figures 1 and 2) The entire block is zoned for manufacturing and consists of a single story, 80,000 square foot warehouse (with partial basement). Jayar Plating, a chrome and nickel plating company, occupied the northwestern quadrant of the building from 1981 (replacing a previous metal plating operation which had occupied the same location from the 1950's) until they ceased operations in 1990. The remainder of the building was used for umbrella manufacture (with no on-premises metal working). In 1991, all aboveground plating equipment (including tanks and drums) was removed. The entire building has been vacant since 1991.

An investigation was performed by AKRF in October 1997 (*Site Investigation Report*, December 1997) to determine whether any remediation was necessary to address soil and/or groundwater contamination associated with the former metal plating operations in the northwestern quadrant of the site. Three previous studies were summarized in the *Site Investigation Report*: Phase I Environmental Assessment (ERD Environmental - November 1996); Limited Phase II (ERD Environmental - February 1997); and Focused Phase II (Excel Environmental Resources - May 1997).

This Remedial Work Plan presents the conceptual plan for remediation of the site. The goal of the remediation is to remove metals-contaminated soil that exceed either Toxicity Characteristic Hazardous Waste Levels or are listed wastes (i.e., plating sludges) or exceed site specific soil cleanup objectives.

2. OVERVIEW OF REMEDIATION PLAN

The site investigation performed by AKRF in 1997 (*Site Investigation Report*, December 1997) established that the former plating operations conducted in the northwest quadrant of the site resulted in metals contamination in the vicinity of the trench. Both soil and groundwater were found to contain elevated levels of metals.

The proposed work plan involves excavation and removal of the following materials: either soils with levels exceeding TCLP-metals hazardous waste criteria or sludges which are listed wastes (i.e., plating sludges) or soils which exceed site specific soil cleanup objectives (SSSCOs), developed in Attachment B. Where soils are removed, confirmatory post-excavation testing will be performed.

The basic remediation methods for the site will be:

- Delineation of Contaminated Areas
- Excavation and Disposal of Contaminated Soil
- End Point Sampling

All investigation and remediation operations on the site will be performed in accordance with the

project Health and Safety Plan (Attachment D).

3. REMEDIATION APPROACH

The following steps will be performed:

1. A new 2-inch diameter well screened across the water table will be installed with a motorized drill rig at location MW-5 (as close as practical to the building's wall, either inside or outside the wall depending on access/utility issues). One week after development, three well volumes will be purged and the well sampled according to DEC guidance for total and dissolved (laboratory filtered) TAL metals and hexavalent chromium. If levels of dissolved metals are below the SSGCOs (see Attachment A), no groundwater cleanup or further groundwater monitoring will be required.

2. The concrete from two portions of the trench will be removed by mechanical means to expose the immediately underlying soils. These two portions (as depicted in Figure 2 detail) are: the location of former boring SB-1 and the floor drain. Excavated stained concrete will be stockpiled (on plastic) separately from non-stained concrete. The stained concrete will be tested for TCLP metals. In the vicinity of SB-1 five grab samples of the top 2 inches of the newly exposed soil will be collected for analysis (one from the bottom, one from midway up each sidewall and one from each end of the excavation, see Figure 2 detail). Similarly in the vicinity of the floor drain, five samples will be collected (one from the bottom, one from midway up each sidewall, one from midway up the endwall, and one from the southern end of this excavation). Each sample will be tested for TAL metals (with samples held by the laboratory until it is determined whether TCLP sampling is required). In each excavation, a photoionization detector (PID) will be used to determine organic vapor levels. If organic vapors are detected at a concentration of greater than 10 ppm, at the location where the highest level of organic vapors is detected, a sample (as well as an equipment blank and trip blank) will be collected and analyzed for Target Compound List volatile organic compounds.

   No soil excavation will be performed in the event that laboratory data indicates no exceedance of TCLP thresholds or SSSCOs (Attachment B). Where sampling indicates an exceedance, soils will be excavated (and stockpiled on polythene sheeeting, covered with 6-mil polythene sheeting, which will be weighted and repaired, as necessary) and further endpoint (TAL and TCLP-metal) sampling will be performed. For any additional excavations, additional sampling will be at the rate of one grab sample from approximately each 15 feet of sidewall and each 15 by 15 foot area of bottom.

3. Four additional sections of the trench-bottom (trench bottom samples shown on Figure 2) will be removed to provide access to the soils immediately underlying the concrete. At each location, one sample from 0 to 2 inches below the concrete will be collected and analyzed for TAL metals and hexavalent chromium. Samples will be held by the laboratory until it is determined whether TCLP sampling is required.

4. If any sludge (i.e., more waste than soil) is encountered during any excavation it will be removed, stockpiled separately and disposed of as a listed hazardous waste.

5. Soil and concrete samples from the stockpiles will be collected and submitted for analysis for disposal characterization. The number and type of samples and the parameters analyzed will depend on disposal facility requirements. All tested material which exceeds TCLP-thresholds will be transported off-site by a licensed hauler and disposed of in a regulated hazardous waste disposal facility, in accordance with all local, State and Federal regulations. Any materials which require disposal off-site, but which do not meet the definition of hazardous waste, will be taken off-site to a facility approved to take such materials in accordance with all local, State and Federal regulations. All concrete and soils which do not exceed TCLP-thresholds or SSSCOs will be backfilled in the trench.

6. At the completion of the soil excavation (when the end point samples meet the clean-up objectives), the floor drain opening and the trench itself will be backfilled with new (liquid) concrete to an elevation equal to the surrounding grade. All site wells will be closed in accordance with NYSDEC guidance. In areas where damaged/stained concrete was removed, if necessary, sufficient additional concrete will be removed to allow a reliable patch of new clean concrete.

7. Any remaining stained concrete will be steam cleaned. Any potentially contaminated water will be tested prior to disposal. Then using a combination of sweeping, vacuuming, and/or mechanical means, any stained loose concrete from the floors or walls will be collected, placed in plastic bags and tested for TCLP metals.

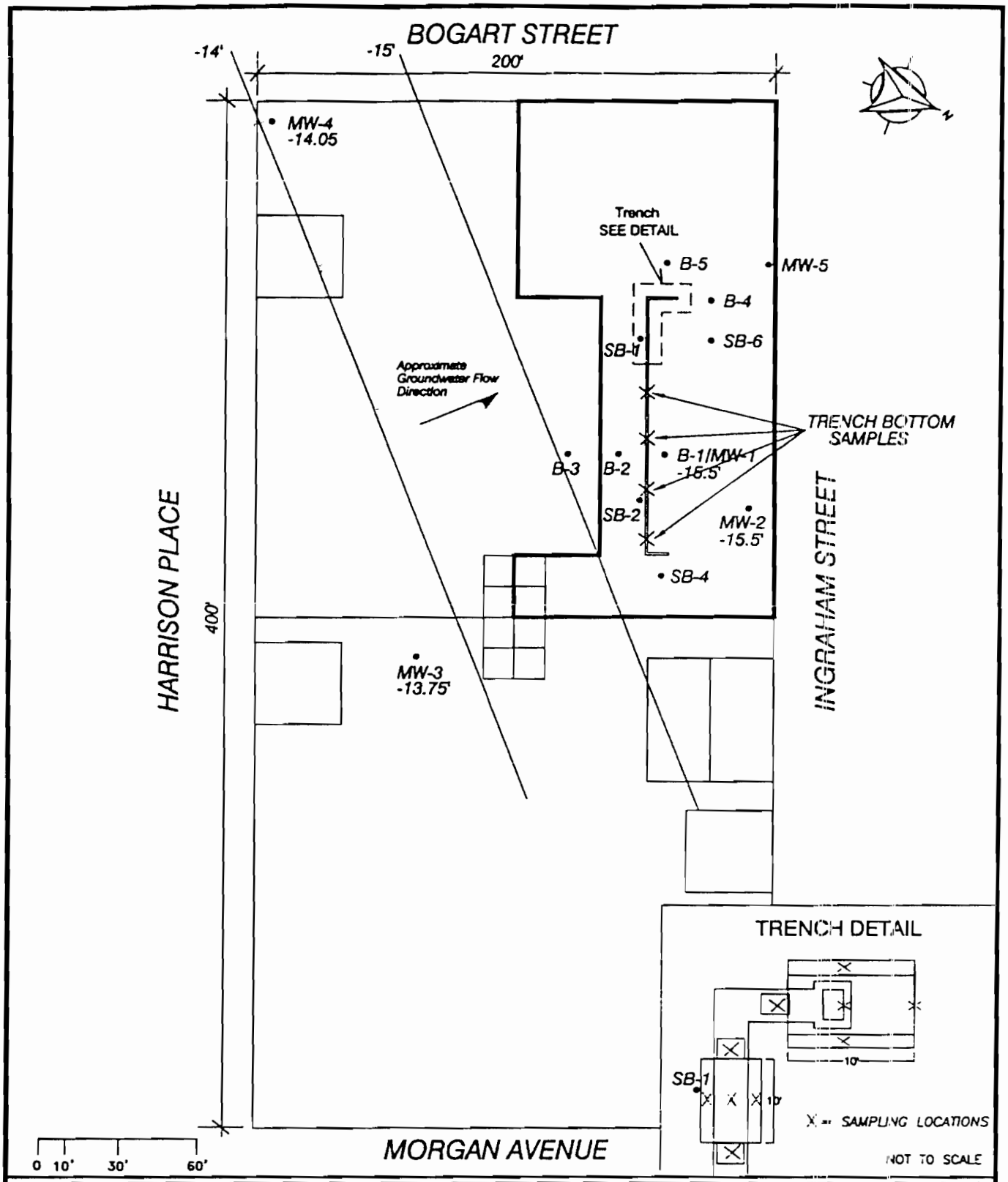
QA/QC

All samples will be properly containerized, each container will be properly labeled, sealed, and refrigerated at approximately 4°C for shipment to the laboratory. Field equipment blanks will be collected at the rate of one per twenty samples (and at least one per sampling event). All methods, bottles, preservatives, holding times will be per the NYSDEC ASP. A chain of custody will be maintained throughout the field sampling, transport of samples to the laboratory, and during lab analysis.

Samples will be analyzed by a New York State Department of Health ELAP-certified laboratory with Category B deliverables for the parameters outlined above using Method 95.1 (VOCs), TAL metals, cyanide and TCLP metals. Dr. Andrew Rudko's resume (the QA Officer) is included as Attachment C. A Data Usability Summary Report will be prepared as per NYSDEC's DUSR guidelines.

Report

A report will be prepared and submitted to NYSDEC describing the remedial activities, including daily logs, a Data Usability Summary Report (per NYSDEC's DUSR guidelines), laboratory analysis reports, waste manifests and photographs.



2 INGRAHAM STREET

APPROXIMATE
SAMPLING LOCATIONS

AKRF, Inc.

Environmental Consultants
117 East 29 Street New York, N.Y. 10016

DATE
12/15/98

PROJECT No.
03639-0001

FIGURE No.
2

Attachment A
Development of Site Specific Groundwater Cleanup Objectives

ATTACHMENT A - Development of Site Specific Groundwater Cleanup Objectives (SSGCO)

Although the exact discharge point/area of the site's groundwater to Newtown Creek/English Kills can not be determined, the following assumptions were made:

1 over the long-term there is complete mixing of the groundwater discharged from the site and the Creek/Kills and tidal water entering from New York harbor

i.e., $C(t+1) = [C(t)Vl + CsVs + CmVm]/[Vl + Vs + Vm]$

where
- $C(t)$ = concentration after t tidal cycles
- Cs = concentration entering creek from site
- Cm = concentration in tidal/makeup water (assumed to be 0)
- Vl = volume of creek at low tide
- Vs = volume entering from site per tidal cycle
- Vm = volume entering creek due to tides (other sources assumed negligible)

implies $Ceq = CsVs/[Vs + Vm]$

or $DAF = Cs/Ceq = 1 + [Vm/Vs]$

where
- Ceq = equilibrium concentration in Creek/Kills
- DAF = dilution/attenuation factor

2 the well downgradient of SB-1 is representative of all groundwater passing under the trench and no attenuation/sorption occurs between the site and the creek

Calculation of Vm (from Nautical Chart 12238)

Sections	length [naut. Miles]	length [m]	width [m]	area [m2]	mean tidal range [m]	volume [m3]
A	0.53	982	100	98,156	1.25	122,664
B	0.30	556	80	44,448	1.25	55,546
C	0.37	685	80	54,819	1.25	68,506
D	0.78	1,445	70	101,119	1.25	126,367
E	0.23	426	150	63,894	1.25	79,847
F	0.14	259	130	33,706	1.25	42,122
G	0.13	241	50	12,038	1.25	15,044
K	0.27	500	50	25,002	1.28	32,007
L	0.17	315	50	15,742	1.28	20,152
M	0.36	667	50	33,336	1.28	42,675
Total	3.28	6,075		482,261		604,930

Calculation of Vs

			Units	metric equiv.	unit	Source
a	Hydraulic Conductivity	0.00001	cm/s	0.0086	m/day	based on heavy clayey soils
b	Gradient	0.017	unitless	0.017	unitless	Figure 2
c	Porosity	0.15	unitless	0.15	unitless	typical for clayey soils
d	Width of trench perp. to flow	100	feet	30.48	m	Figure 2
e	Thickness of Aquifer	50	feet	15.24	m	USGS 81-1186

Flow per 12.4 hour tidal cycle
Vs = a x b x d x e x (12.4/24) / c 0.235 cubic meters

DAF = 1 + Vm/Vs = 2,574,087

	SD Std. [ppb]	DAF	SSGCO (ppb)	
Chromium	No Std	2,574,087	NA	
Hex. Chromium	1200	2,574,087	3,088,904,615	limited to 1,000,000,000 ppb
Nickel	74	2,574,087	190,482,451	
Mercury	7E-04	2,574,087	1,802	

Attachment B
Development of Site Specific Soil Cleanup Objectives

ATTACHMENT B - Development of Site Specific Soil Cleanup Objectives (SSSCO)

Consistent with the approach used in NYSDEC TAGM 4046 for organics:

SSSCO = 100 x kd x SSGCO, where kd is the partition coefficient between water and soil media

	SSGCO (ppb)	kd (l/kg) see Note 1	SSSCO (ppm)	
Cr	NA	3,700,000	NA	
Cr (6+)	1,000,000,000	16	1,600,000,000	limited to 1,000,000 ppm
Ni	190,482,451	250	4,762,061,282	limited to 1,000,000 ppm
Hg	1,802	150	27,028	

Note 1 :
from Table C-4 EPA Soil Screening Guidance: Users Guide (Publication 9355.4-23 July 1996) at pH 7.3 (site soil geometric mean)

Attachment C
Resume of QA Officer

[redacted] ANDREW D. RUDKO, Ph. D. [redacted]

Andrew D. Rudko, Ph.D., is a vice president of AKRF, Inc. with almost 20 years' experience in environmental analysis and management, with particular emphasis on hazardous materials, environmental site assessments and audits, air quality, waste disposal, and noise.

Dr. Rudko's current and recent experience includes management of several projects involving assessment of soil and groundwater contamination problems on major development sites. He directed the site assessment work on the 90-acre site of the proposed Queens West development project being sponsored by the New York State Urban Development Corporation, the New York City Public Development Corporation, and the Port Authority of New York and New Jersey. This site comprises more than 10 blocks of industrial property along the East River in Queens. Former uses on the site include oil refineries, paint manufacturers, and railyards. The site assessment included site inspections and research on past land uses to identify potential sources of contamination, and a review of earlier site testing data. This was followed by development and implementation of extensive soil and groundwater testing programs.

For the New York City Department of Environmental Protection, Dr. Rudko directed the preparation of Phase I site assessments for more than a dozen industrial sites throughout New York City proposed for use as sewage sludge processing facilities. These assessments included research on past land uses, searches of public records and databases, and site inspections. The program was designed to develop preliminary data for the environmental impact statement and to determine the need for testing programs on these sites.

Dr. Rudko was project director for the site assessment work the firm performed for the New York City School Construction Authority, which is engaged in a program to develop new schools throughout the city. He has directed assessments on many school sites in the Bronx, Brooklyn, and Queens. Four of these properties formerly contained industrial or automotive-related uses. Sites included a former gas station, a truck salvage yard, and a former plastics factory. Testing programs were recommended, developed, and implemented for these sites, and remedial actions were recommended where necessary. At the former plastics factory site, the testing program included soil and groundwater sampling, testing of building floors for PCB contamination, and location and removal of old underground gasoline and oil tanks, with screening of surrounding soil for possible petroleum contamination.

Dr. Rudko has also directed numerous property assessments for private parties to identify potential environmental liabilities associated with vacant or occupied properties. Assessments have been performed for major corporations, prominent real estate developers, and leading environmental law firms. He directed Phase I environmental assessments for several major commercial properties in the New York City area, including the AT&T building, the Plaza Hotel, One Seaport Plaza, New York Plaza, the former General Electric building, the site of the proposed Trump Riverside South development, and many others. Dr. Rudko has been providing environmental consulting services to Home Depot, Inc. and Price-Costco, Inc. in connection with their development of major retail facilities at locations throughout the New York metropolitan area. Many of these locations are former industrial properties that have required remedial actions prior to redevelopment. In addition, he also directed Phase I environmental assessments of several major medical facilities in connection with new financing through bonds issued by the New York State Medical Care Facilities Finance Agency. Facilities include Presbyterian Hospital, Mt. Sinai Medical Center, St. Lukes/Roosevelt Hospital Center, Brooklyn Hospital, and Syosset Hospital. He directed Phase I and Phase II assessments for the New York Times in preparation for the development of its major new printing facility in New York City. Assessments were prepared for three alternative sites: a former railyard in the Bronx later used as an illegal landfill for demolition debris; a site in Queens comprising six industrial properties, several with multiple tenants; and a large city-owned site in Queens.

He has been responsible for assessing impacts on public health for a number of projects involving the use of hazardous chemicals, biohazards, and radioactive materials. These projects include an engineering and physics research center on the campus of Columbia University, a new laboratory building for biomedical research at Rockefeller University, and the proposed Audubon Research Park in upper Manhattan.

Dr. Rudko's experience includes several projects involving the environmental impacts of solid waste disposal facilities. He designed and managed a testing program to determine whether toxic pollutants were being emitted into the atmosphere from the 2,900-acre Fresh Kills Landfill on Staten Island. He also participated in studies of the environmental impacts of various proposals to dispose of New York City sewage sludge, and of several proposed resource recovery facilities.

Previously, Dr. Rudko was a senior environmental scientist at Parsons Brinckerhoff Quade and Douglas, Inc. He was responsible for environmental analyses for a variety of development, transportation, and solid waste disposal projects throughout the country. These included projects in New York, New Jersey, Maryland, Virginia, Washington, D.C., and Florida.

Education

Cornell University, B.S., Biochemistry, 1965; Columbia University, Ph.D., Biochemistry, 1972.

Membership in Professional Organizations

National Ground Water Association

Years of Experience

With AKRF: 12. With other firms: 8.