



August 12, 1998

Ms. Caroline Kwan
U.S. Environmental Protection Agency
Region II
Emergency Remedial Response Division
290 Broadway, 20th Floor
New York, New York 10007-1866

**RE: ISLAND CHEMICAL SITE
ST. CROIX, U.S. VIRGIN ISLANDS
SUPPLEMENTAL REMEDIAL INVESTIGATION (PHASE IV RI)**

Dear Ms. Kwan:

On June 30, 1998, a meeting between the U.S. Environmental Protection Agency (EPA), CDM Federal Programs Corporation (CDM Federal), the National Oceanic and Atmospheric Administration (NOAA), Berlex Laboratories, Inc. (Berlex), and McLaren/Hart, Inc. (McLaren/Hart) was held at EPA's Region II office in New York City to discuss past characterization activities at the Island Chemical Site (the Site) located in St. Croix, U.S. Virgin Islands. Upon reviewing the data collected to date, EPA raised a concern during the meeting about potential chloroform impacts to groundwater in the deep overburden and bedrock. Specifically, EPA was concerned with the possible vertical migration of chloroform (a chlorinated solvent that is denser than water) and the potential infiltration of chloroform as a dense non-aqueous phase liquid (DNAPL) into the deep overburden and bedrock water-bearing zones at the Site. Previously, the shallow overburden aquifer (point where groundwater was first encountered at the various sample locations which was approximately 20 to 35 feet below ground surface [bgs]) had been investigated, as well as the deep overburden aquifer (through the installation of three monitoring wells to a depth of approximately 75 feet bgs). However, the zone between the deep monitoring wells and the top of bedrock (approximately 75 to 100 feet bgs) had not been specifically identified by EPA as requiring characterization.

Subsequently, several conference calls were held between EPA, CDM Federal, Virgin Islands Department of Planning and Natural Resources (VIDPNR), Berlex, and McLaren/Hart to discuss the characterization of the deep overburden in the vicinity of the Process Pit Area, in the downgradient direction of predominant groundwater flow across the site, and in the direction of potential offsite production well pumping influences (i.e., Charlie's Concrete, Fairplains wells, and Virgin Islands Port Authority [VIPA] wells). Based on these discussions, McLaren/Hart has prepared this letter work plan (on behalf of Berlex) to address the issues discussed and agreed to

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during the conference calls. The work described herein as the Phase IV Remedial Investigation (RI) will be performed in accordance with Harding Lawson Associates' (HLA's) *Draft Remedial Investigation Work Plan Addendum - Phase III* (Work Plan) and associated supporting documents (e.g., Quality Assurance Project Plan [QAPP], Health and Safety Plan [HASP], and Sampling and Analysis Plan [SAP]) dated July 25, 1997.

The following supplemental investigative activities are proposed for the Phase IV RI work at the Site:

- vertical screening of groundwater to the top of bedrock;
- installation of monitoring well clusters (shallow and deep) based on screening results;
- packer testing and groundwater sampling of production well P-1;
- continuous groundwater level measurements in selected onsite monitoring/production wells;
- manual groundwater level measurements in all onsite and offsite wells during the course of work (synoptic rounds of measurements);
- groundwater sampling of existing onsite monitoring wells MW-2, MW-3, and MW-7, as well as all newly-installed wells;
- groundwater sampling of selected offsite production/public supply wells;
- acquisition of local production well information through file reviews and interviews with well owners; and
- acquisition of local precipitation information.

OBJECTIVES

The objectives (in **bold text**) of the Phase IV RI are to address the following data needs identified by EPA during the meeting and conference calls with EPA, CDM Federal, and VIDPNR.

- **Further evaluate the horizontal and vertical extent of chloroform impacts from the Process Pit Area.** This will be accomplished through vertical screening/groundwater sampling and lithologic evaluation within the "source area" (area of high chloroform concentrations in the shallow overburden), to the east-southeast of the Process Pit Area (predominant groundwater flow direction and potential offsite pumping influence by Charlie's Concrete wells), and to the south and west of the Process Pit Area (potential offsite pumping influences by Fairplains and VIPA wells, respectively). This data will be used to strategically locate monitoring well clusters for groundwater sampling, plume delineation, and long-term monitoring points.
- **Characterize groundwater conditions in onsite production well P-1 through packer testing.** Historical groundwater results will be evaluated through the collection of samples above and below the packer (i.e., overburden vs. bedrock groundwater concentrations).

- **Further evaluate the local flow direction(s), as well as any influences from offsite pumping and heavy precipitation events, in the underlying aquifer at the Site.** This will be conducted through continuous and manual groundwater level measurements and review of local precipitation information.
- **Further evaluate Site Target Compounds (toluene/ethylbenzene/xylenes [TEX], acetone, methylene chloride, and chloroform) in groundwater.** This will be conducted by collecting groundwater samples from newly-installed monitoring wells, selected existing onsite monitoring wells, and selected offsite production/public supply wells.
- **Evaluate influences on the Site and groundwater flow.** This will be conducted by obtaining precipitation data and available information on offsite production well use in the area to evaluate influences on the Site and groundwater flow.
- **Evaluation of potential remedial action alternatives for the feasibility study will be aided by collecting soil and groundwater samples, as appropriate.**

Following completion of these tasks, McLaren/Hart will evaluate the findings and present the results to EPA, CDM Federal, and VIDPNR in the Draft RI Report, along with the results of the previous RI activities (Phases I through III).

SCREENING CRITERIA

The Safe Drinking Water Act, as amended in 1986, requires EPA to publish Maximum Contaminant Level Goals (MCLGs) for contaminants that may have an adverse effect on the health of persons and that are known or anticipated to occur in public water systems. MCLGs are set at a level that no known or anticipated adverse effects on the health of persons occur and that allow an adequate margin of safety. At the same time EPA publishes an MCLG, which is a non-enforceable health goal, it also must promulgate a National Primary Drinking Water Regulation that includes either a Maximum Contaminant Level (MCL) or a required treatment technique. A treatment technique may be set only if it is not economically or technologically feasible to ascertain the level of a contaminant. An MCL must be set as close to the MCLG as feasible with the use of the best available technology, treatment techniques, cost, and other criteria as appropriate.

In July 1994, EPA proposed a Stage I Disinfectants/Disinfection Byproducts Rule (D/DBP) to reduce the level of exposure of disinfectants and disinfection byproducts in community water systems. Based on the evidence of carcinogenicity in animals, an MCLG of zero was proposed for chloroform in the 1994 proposed rule. Among other issues, the rule also proposed a reduction of the MCL for total trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) from 100 µg/l to 80 µg/l.



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Several reports regarding the toxicity of chloroform became available after the 1994 proposed rule was published. In response to this new information, EPA performed a reassessment of chloroform. These findings, which have been peer-reviewed, were presented in a Notice of Data Availability (NODA) in March 1998. In the NODA, EPA considered revising the MCLG for chloroform from zero to 300 µg/l, but still maintained an MCL for total trihalomethanes of 80 µg/l. This rule is expected to be published as final in November 1998.

In light of this chemical-specific information on chloroform, McLaren/Hart believes that the most technically feasible application of EPA guidance for chloroform at the Site would be a target cleanup goal of 300 µg/l. McLaren/Hart acknowledges the fact that EPA may enforce the MCL of 80 µg/l as the cleanup level for this Site. McLaren/Hart disagrees with this approach; however, for the purposes of this investigation McLaren/Hart will utilize 80 µg/l as the screening criteria for chloroform plume delineation. If all vertical screening depth concentrations of chloroform are less than 80 µg/l, additional points will not be installed (beyond the proposed five locations). Likewise, if deeper overburden chloroform concentrations do not exceed 80 µg/l, characterization of the bedrock aquifer will not be performed.

PROPOSED SUPPLEMENTAL RI ACTIVITIES (PHASE IV RI)

The tasks to be completed during this phase of work are discussed below in more detail. Specifics of monitoring well/additional screening point locations and other activities may be modified based on physical restrictions and on the findings of the various phases of each task. Work will be conducted following the procedures outlined in the previously-approved Work Plan (dated July 25, 1997) and associated supporting documents, and in consultation with EPA and CDM Federal oversight personnel.

Vertical Groundwater Screening

Hydropunch® screening techniques will be used to further characterize the horizontal and vertical extent of chloroform in groundwater. Five vertical screening points will be positioned to provide groundwater data in the Process Pit Area (presumed source area for chloroform), in the downgradient direction of predominant groundwater flow across the site, and in the direction of possible offsite production well pumping influences. The proposed locations (as depicted on the attached figure) are as follows:

- near existing Geoprobe location GWPP-27 (to be named GWPP-27A),
- near existing Geoprobe location GWPP-29 (GWPP-29A),
- near existing Geoprobe location GWPP-14 (GWPP-14A),
- between existing shallow monitoring wells MW-3 and MW-5 (GWPP-36), and
- between existing Geoprobe locations GWPP-33 and GWPP-34 (GWPP-37).

Exact locations will be field-determined based on accessibility and in consultation with CDM Federal oversight personnel.

Each location will be drilled using mud-rotary techniques (as outlined in the EPA-approved 1997 Work Plan). Depth-discrete Hydropunch® samples will be collected at 10-foot intervals, upon reaching the desired starting depth. The starting depth at location GWPP-27A (source area point) will be approximately 75 feet bgs since groundwater above this zone has been characterized through previous investigative activities, including the installation of a deep monitoring well (MW-7) to 74 feet bgs. The starting depth for all other locations will be approximately 5 feet below the groundwater interface. Depth to groundwater will be estimated at each location through groundwater elevation measurements from nearby monitoring wells or through groundwater elevation measurements of nearby former Geoprobe points. A slide hammer will drive the Hydropunch® sampler (sampler) to approximately 4 feet into the formation or until refusal is encountered. The sampler will be removed from the boring between each sample interval and decontaminated using procedures described in the EPA-approved SAP which is in Appendix B of the 1997 Work Plan.

When the targeted sample depth is reached, the sampler will be opened by pulling back the outside sleeve of the tool. After allowing sufficient time for groundwater to fill the sample chamber, a disposable polyvinyl chloride (PVC) bailer or disposable PVC pipe with a decontaminated check-valve will be lowered into the borehole to retrieve a groundwater sample. The sample will be analyzed for the Site Target Compounds, using EPA Method 8260, by an onsite gas chromatograph (GC)/mass spectrometer (MS). The Standard Operating Procedures (SOP) used for the GC/MS during previous investigative activities at the Site was forwarded to EPA in correspondence dated March 13, 1998. The Site Target Compounds include chloroform, acetone, methylene chloride, and TEX. Co-located confirmation samples will be collected at a rate of 10% and will be analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) by Pace Analytical (offsite laboratory previously utilized for chemical analyses). All samples will be collected, preserved, and handled as described in the EPA-approved 1997 Work Plan.

The borings will be advanced to the top of bedrock (approximately 100 feet), where a groundwater sample will be collected to characterize the overburden groundwater travelling along the top of the bedrock. All borings will be abandoned upon completion (if not used as the location for installation of a monitoring well) using the procedures outlined in the EPA-approved 1997 Work Plan.

Additional screening points may be installed pending results of the initial five screening locations. The exact locations will be field-determined in consultation with EPA and CDM Federal oversight personnel.

Monitoring Well Installation

Two monitoring well clusters (shallow and deep) will be installed, using hollow-stem auger or mud rotary drilling techniques, in the general vicinity of GWPP-29A (to be named MW-11/12) and GWPP-37 (MW-13/14). These wells will be installed and developed using the procedures



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outlined in the EPA-approved 1997 Work Plan. Shallow monitoring wells (MW-11 and MW-13) will be constructed of 4-inch diameter, PVC screen (10-foot length) and riser and will extend approximately 5 feet below the determined depth to water from the vertical screening point at that location (i.e., well screen will be positioned across the static water level). The total depth and screen interval of the deep monitoring wells (MW-12 and MW-14 – also constructed of 4-inch diameter PVC screen and riser) will be based on vertical groundwater screening results and will be determined in consultation with EPA and CDM Federal oversight personnel. The water level measuring points will be marked on each monitoring well and later surveyed, along with establishing the horizontal and vertical control for each monitoring well.

Additional deep overburden wells may be installed in the vicinity of GWPP-14A and GWPP-36 pending results of the vertical groundwater screening results. The exact locations and depths of the wells will be field-determined and documented in consultation with EPA and CDM Federal oversight personnel.

Sample Collection for Remedy Screening Purposes

Remedy screening during the RI phase provides a qualitative engineering assessment of the potential feasibility of a technology (i.e., go/no go decision). As part of the evaluation of remedial technologies for the Site (i.e., bioremediation, soil vapor extraction/air sparging, etc.), McLaren/Hart will collect samples during the Phase IV field effort for geotechnical and bioremediation parameters.

During the Phase III investigation, soil samples were collected from the vadose zone in the AST and Process Pit Areas for geotechnical analyses. Additional soil samples (up to a total of five) will be collected from the saturated zone at multiple depths ("fringe zone" to the top of bedrock) during the Phase IV field effort. Shelby tube samples will be collected from either the screening point locations or monitoring wells for the following parameters:

- grain size,
- moisture content,
- total organic carbon,
- porosity,
- Atterburg limits,
- hydraulic conductivity, and
- bulk density.

Equipment and procedures for collecting the Shelby tube samples will be in accordance with the EPA-approved 1997 Work Plan. Storage, shipping, and handling of these samples will follow the methods outlined in the EPA-approved SAP. The analysis of the Shelby tube soil samples will be performed offsite by Raytheon Environmental Services Laboratory located in Boothwyn, Pennsylvania.

Additionally, groundwater samples (up to a total of 5) will be collected at multiple locations and depths (within the source area, downgradient of the source area, and downgradient of plume) to evaluate various technologies that may be potentially feasible at the Site (i.e., enhanced bioremediation, natural attenuation, etc.). Samples will be collected from either the vertical screening point locations or monitoring wells (existing or newly-installed) for the following parameters:

- alkalinity,
- ammonia,
- biochemical oxygen demand,
- chemical oxygen demand,
- chloride,
- heterotrophic plate count,
- methane,
- nitrate/nitrite,
- total phosphorous,
- sulfate/sulfide,
- total and ferrous iron,
- total dissolved solids,
- total organic carbon, and
- total suspended solids.

Equipment and procedures for collecting the bioremediation samples will be in accordance with the collection of groundwater samples, as outlined in the EPA-approved 1997 Work Plan. Storage, shipping, and handling of these samples will follow the methods outlined in the EPA-approved SAP. The analysis of the groundwater bioremediation samples will be performed by Pace Analytical (offsite laboratory previously utilized for chemical analyses). Table 1 presents the method numbers, holding times, preservation requirements, sample containers, etc. for the bioremediation parameters.

The following parameters will be measured in the field with a water quality meter (i.e., flow-through cell) following the same procedures as those used during monitoring well purging/sampling:

- dissolved oxygen (DO),
- temperature,
- turbidity,
- Eh (reduction/oxidation [redox] potential),
- specific conductance, and
- pH.



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Packer Testing

In order to isolate the overburden zone from the fractured shallow bedrock, packer testing will be conducted at onsite production well P-1. Packer testing will consist of the placement of a sliding-head inflatable rubber packer at the base of the steel casing, thus isolating the open bedrock hole from the cased-off overburden. Based on the results of the borehole video inspection, the depth of the bottom of the casing is 98 feet bgs.

A steel riser pipe with packer assembly and submersible pump will extend from the lower zone (bedrock) through the water to the surface. After packer inflation, a submersible pump will be used to evacuate water from the bedrock portion of the well. Samples will be collected with a bailer within the riser pipe. A submersible pump also will be placed in the well outside the packer riser pipe to evacuate the overburden zone. Samples from this zone will be collected with a bailer.

Water level measurements will be recorded manually (using an electronic water level indicator) in order to monitor the hydraulic head of the borehole intervals above and below the isolated zones under static and pumping conditions. Packer testing of the selected intervals will include measurement of the static water levels and the collection of groundwater samples. For each test interval, the packer assembly will be lowered into place and the packers will be inflated with nitrogen or an equivalent. When water level measurements indicate stabilization (i.e., minimal fluctuation over a short period of time), each test interval will be purged of a minimum of one test zone volume. Field groundwater quality measurements (pH, temperature, specific conductance, Eh, DO, and turbidity) will be made during pumping to ensure a representative sample.

Groundwater samples will be collected during the packer testing directly from the pump discharge line and analyzed for the Site Target Compounds by the onsite GC/MS and for total dissolved solids by Pace Analytical (offsite laboratory).

A degree of uncertainty exists as to the representativeness of data collected from the zone below the packer (bedrock zone). Production well P-1 has been drilled into the bedrock, but based on the video inspection, the well is only open to the first few feet of the bedrock. Therefore, during the purging of the isolated bedrock, water from the overburden may be pulled into the bedrock through a hydraulic connection of the two zones. If a connection exists, the water sample collected from below the packer may actually represent water not from the bedrock, but from the deeper overburden zone of the aquifer or a mixture of the two. Therefore, due to the methods described above, there is no way to definitively determine which zone the water truly represents. This must be taken into consideration when interpreting the results of this testing.

Manual and Automatic Groundwater Elevation Measurements

To aid in the evaluation of shallow and deep overburden regional flow direction in the vicinity of Site, water levels will be measured in the onsite and offsite wells. Water levels will be measured

from onsite wells MW-1 through MW-10, P-1 and P-2, and all offsite production wells identified in the Work Plan before drilling activities begin onsite. An additional round of onsite and offsite water level measurements will be made upon completion of the four new monitoring wells (MW-11 through MW-14). Additional onsite water level measurements may be collected periodically, specifically after any significant rain event(s), to evaluate the potential change in groundwater flow direction and/or gradients. Water level contour maps will be prepared based on the collected data and presented in the Draft RI Report.

Telog® automatic water level monitoring devices will be installed in existing deep monitoring wells MW-7 and MW-8, and production well P-2 upon initiation of field activities. These are onsite deep wells that were monitored for a nine-week timeframe between January and March 1998. In addition, Telogs® will be placed in deep wells MW-12 and MW-14 after installation, development, and sampling activities are completed. The Telogs® will be removed from all wells upon completion of field activities. Hydrographs will be prepared from this data and presented in the Draft RI Report.

P1
2 new wells

Groundwater Quality Sampling -- Onsite Wells

Groundwater samples will be collected from the four new monitoring wells (MW-11 through MW-14) and from existing monitoring wells (MW-2, MW-3, and MW-7). These selected wells will provide additional data to evaluate current chloroform concentrations in the shallow and deep overburden. McLaren/Hart will utilize low flow (minimal drawdown) procedures as outlined in the March 3, 1998 correspondence to EPA. The samples will be analyzed for the Site Target Compounds by the onsite GC/MS. Confirmation samples will be collected at a rate of 10% and will be analyzed by Pace Analytical for TCL VOCs. All samples will be collected, preserved, and handled as described in the EPA-approved 1997 Work Plan and SAP.

P1

Since groundwater sampling will be conducted throughout the investigation, the newly-installed monitoring wells will likely be sampled within a few days after development (versus the conventional two-week timeframe). The expedited groundwater sampling is proposed in an effort to collect additional data while still moving forward with other Phase IV RI activities. Therefore, no other onsite groundwater quality sampling is proposed.

Groundwater Sampling -- Off-Site Wells

Groundwater samples will be collected from selected offsite production wells in the vicinity of the Site to define concentrations of chloroform in the deep overburden. These wells include:

- *Charlie's Concrete #1 and #2 (2 wells)* - located to the east of the Site, across the River Gut (these wells have historically shown a pumping influence on the overburden aquifer at the Site);
- *VIPA #1 and #2 (2 wells)* - located to the northwest of the Site (these wells may cause a potential pumping influence on the overburden aquifer at the Site); and



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- *Fairplains Well Field (maximum of 3 wells)* - located southeast of the Site (these wells have exhibited detectable concentrations of chloroform in the past).

All of the above wells have been field-located by McLaren/Hart personnel, except for the Fairplains wells. With the aid of VIDPNR and Virgin Islands Water and Power Authority (WAPA) personnel, McLaren/Hart will attempt to locate these wells in the field. Based on the information available, one or more of the Fairplains wells may be screened at the same depth in the same area. In that case, in consultation with CDM Federal oversight personnel, one or two of the wells may be removed from the sampling program in order to eliminate duplicative results.

McLaren/Hart will purge these offsite production wells either with the existing dedicated pump or with a decontaminated submersible pump. At least one well casing volume will be evacuated before sampling. These wells will be sampled either directly through the existing pump discharge line or by a dedicated bailer, and will be analyzed for the Site Target Compounds by the onsite GC/MS. Confirmation samples will be collected at a rate of 10% and will be analyzed for TCL VOCs by Pace Analytical (offsite laboratory).

In addition to the wells listed above, the analytical results of Carino's Water Service Well (collected by CDM Federal in March 1998) will be used to evaluate the extent of chloroform in offsite production wells in the vicinity of the Site.

Investigation Derived Waste (IDW)

Phase III IDW

On December 29, 1997 and March 22, 1998, McLaren/Hart forwarded correspondence to EPA regarding IDW generated during the Phase III RI at the Site. These letters provided analytical results for water, soil, and mud samples collected from the drums staged onsite and the proposed procedures to address the IDW.

McLaren/Hart collected two sample sets (aboveground storage tank [AST] and non-AST) from the onsite drums in January 1998. Each set consisted of one soil, one water, and one mud sample for analysis of Toxicity Characteristic Leaching Procedure (TCLP) and Resource Conservation and Recovery Act (RCRA) characteristics. Based on the results, the mud, soil, and non-AST water samples were determined to be RCRA non-hazardous material. Therefore, the drums containing these materials are proposed to be emptied and spread over the area of the Site from which they were generated. The AST water sample that was determined to be RCRA hazardous material will be separated into two categories: decontamination fluids and AST development/purge water. One additional composite sample from each new category will be collected and analyzed for TCLP and RCRA characteristics. Upon receipt of the results, the water from these samples will be handled in accordance with the guidance described in the December 1997 correspondence.

EPA has provided verbal approval of procedures proposed above. Upon approval from VIDPNR, McLaren/Hart will implement these procedures during the Phase IV RI field work.

Phase IV IDW

It is anticipated that several drums of IDW including mud, soil, and water will be generated during the implementation of the proposed Phase IV RI activities. The drums will be separated by matrix (e.g., mud, soil, and water) and staged onsite. A composite sample will be collected for each matrix and analyzed for the Site Target Compounds using the onsite GC/MS. These samples will not be analyzed for a full set of TCLP/RCRA parameters since these parameters were analyzed for during the January 1998 event and the results are representative of current Process Pit (non-AST) water, mud, and soil conditions.

If the samples collected during the Phase IV RI are classified as RCRA non-hazardous, the materials from the drums will be emptied and spread over the area of the Site from which they were generated. RCRA hazardous waste will be staged onsite, pending determination of appropriate disposal means.

Construction Details/Pumping Information -- Offsite Wells

Construction details and historical pumping information for offsite production wells will be collected through file reviews and interviews with well owners. With the aid of VIDPNR and WAPA, McLaren/Hart will attempt to consolidate all information available concerning the construction details (i.e., total well depth, screen length and depth, construction date, construction materials, etc.) and pumping information (i.e., pump rate, frequency of pumping, etc.) for offsite production wells. These wells include:

- Former WAPA well located directly south of the Site (1 well),
- Charlie's Concrete #1 and #2 (2 wells),
- VIPA #1 and #2 (2 wells),
- Carino Water Service (1 well),
- Fairplains Well Field (up to 9 wells),
- Negro Bay Well Field (up to 10 wells),
- Meridian Engineering # 1 and #2 (2 wells),
- USGS wells located near the intersection of E. Airport Road and M.E. Highway (2 wells),
- Carr's (1 well), and
- Zenon Construction #1 (1 well).

Precipitation Information

Precipitation information from the National Weather Service post at Henry Rohlsen Airport will be provided for the two-week period preceding the initiation of field work, as well as the entire duration of the onsite investigation.



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ANTICIPATED SCHEDULE

McLaren/Hart anticipates the activities outlined above (assuming no extenuating circumstances) to be completed in approximately 15 calendar days. Similar to previous investigations, McLaren/Hart intends to work 6 to 7 days a week to expedite the investigation process. Table 2 presents the anticipated sequence of activities and approximate duration of each task.

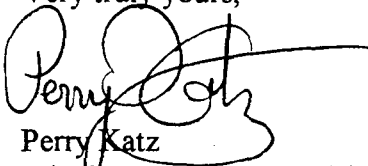
PROJECT COMMUNICATION

The proposed schedule is dependent upon coordination between EPA, CDM Federal, VIDPNR, McLaren/Hart, and Berlex through timely evaluation of onsite GC/MS data during daily conference calls between the above-mentioned parties. We anticipate a morning conference call to discuss work to be completed that day and results from the previous day, and an afternoon conference call to discuss work completed that day. Both McLaren/Hart and Berlex feel that this increased level of coordination ensures effective communication regarding the variety of issues that will arise during the Phase IV RI. In addition, this level of coordination will require EPA oversight personnel who will be able to accurately and expeditiously review and interpret field/lab data and who have the authority to make field decisions about the direction of the field program as it is proceeding. We strongly believe close coordination will be required between the respective field teams and their office counterparts in order to facilitate data interpretation and subsequent appropriate decision-making. This approach is certain to provide benefits to all.

As we have discussed, Berlex would like to finalize the investigation phase of this project during this mobilization in a harmonious and productive team-work effort with EPA and CDM Federal in order to move into the remediation phase in a timely and thorough manner.

Please review and approve our proposal or contact either of us at (908) 647-8111 if you have any questions or concerns.

Very truly yours,


Perry Katz
Principal Environmental Scientist

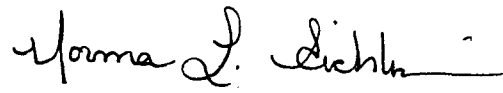
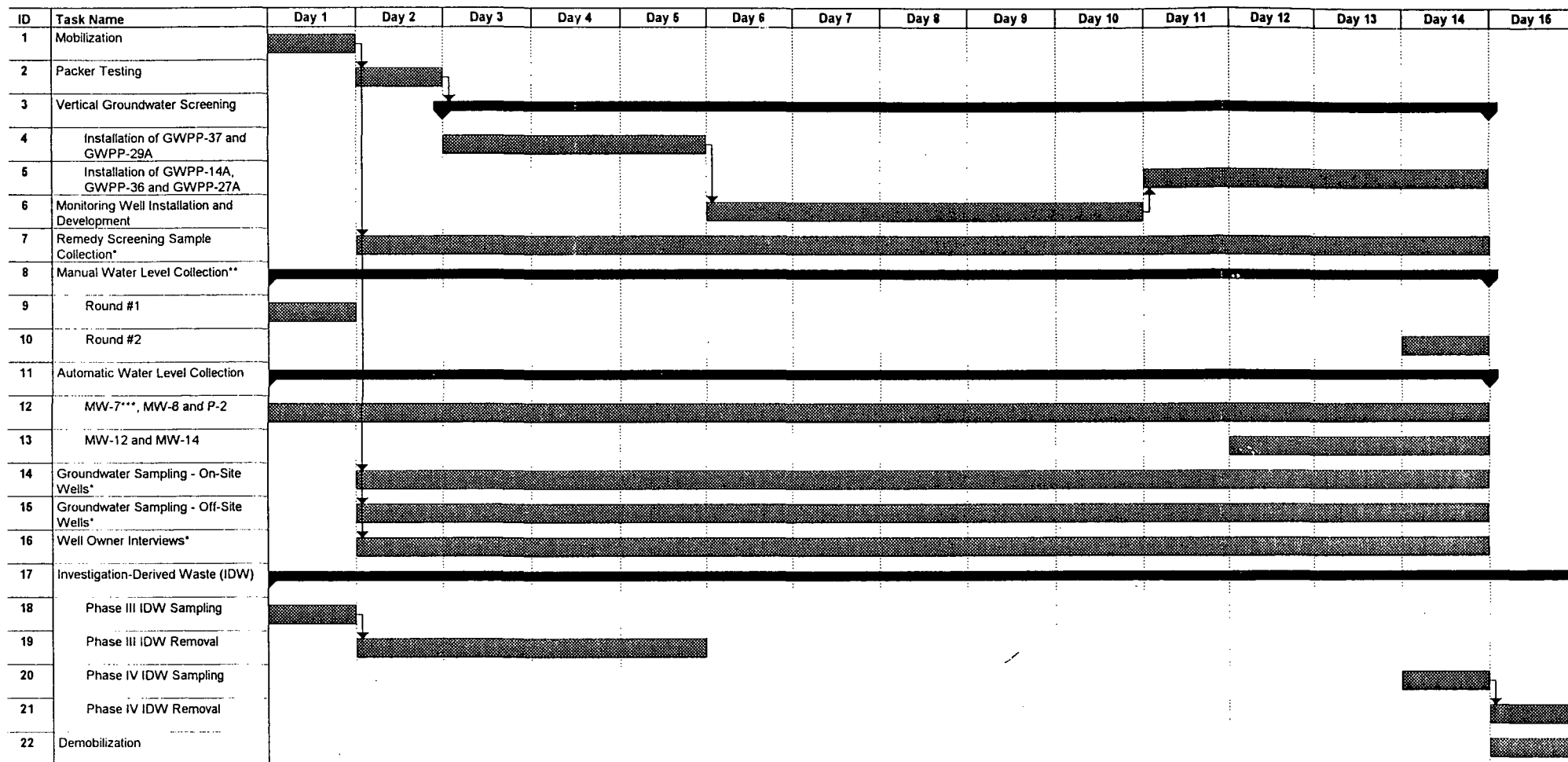

Norma Eichlin
Senior Engineer

TABLE 1
ISLAND CHEMICAL SITE
SAMPLE COLLECTION REQUIREMENTS AND ANALYTICAL METHODS

Parameter	Method	Reporting Limit	Holding Time	Preservative/Container
Alkalinity	EPA 310.1	10 mg/l	14 Days	1 - 1 Liter plastic bottle
Sulfate	SW 846 - 9036	10 mg/l	28 Days	
Chloride	EPA 325.1	5.0 mg/l	28 Days	
Total Suspended Solids (TSS)	EPA 160.2	4.0 mg/l	7 Days	
Total Dissolved Solids (TDS)	EPA 160.1	10 mg/l	7 Days	
Biochemical Oxygen Demand (BOD)	EPA 405.1	2.0 mg/l	48 Hours	1 - 1 Liter plastic bottle
Sulfide	SW 846 - 9030	1.0 mg/l	7 Days	1 - 500 ml plastic bottle preserved with ZnAc-NaOH pH>9
Ammonia	EPA 350.1	0.1 mg/l	28 Days	500 ml plastic bottle
Nitrite/Nitrate	EPA 353.2	0.05 mg/l	28 Days	
Total Phosphorus	EPA 365.4	0.1 mg/l	28 Days	
Total Organic Carbon (TOC)	SW 846 - 9060	1.0 mg/l	28 Days	
Chemical Oxygen Demand (COD)	EPA 410.4	5.0 mg/l	28 Days	
Total Iron	SW 846 - 6010	0.1 mg/l	180 Days	500 ml plastic bottle preserved with HNO ₃
Dissolved Iron	SW 846 - 6010	0.1 mg/l	180 Days	500 ml plastic preserved with HNO ₃ (filtered)
Heterotrophic Plate Count	SM 9215C M	Not Applicable	24 Hours	100 ml plastic bottle

TABLE 2
ISLAND CHEMICAL SITE - PHASE IV INVESTIGATION
TENTATIVE PROJECT SCHEDULE



Project: Phase IV
Date: Wed 8/12/98

*Activities will be performed intermittently throughout duration of field activities **Additional rounds, as appropriate, after significant rain events, etc ***Telogs will removed from MW-7 during sampling of MW-2 and MW-7

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ROUTE 66
MELVIN EVANS HIGHWAY



⑨ MW-10

MW-8

⑥ MW-6

1-6

9 MW-1

GWPP-34

GWFP-37 ♀ MW-13/14

GWPP-33

P-1

GWPP-29A ♂ x ♀ GWPP-29
MW-11/12

GWPP-29
MW-11/12

GWFP-14
GWFP-14A

RIVER GUT
(Intermittent)

LEGEND

- | | |
|---|---|
|  | PRODUCTION WELL LOCATION |
|  | EXISTING SHALLOW MONITORING WELL LOCATION |
|  | EXISTING DEEP MONITORING WELL LOCATION |
|  | EXISTING GEOPROBE LOCATION |
|  | PROPOSED VERTICAL SCREENING LOCATION |
|  | PROPOSED MONITORING WELL CLUSTER
LOCATION (SHALLOW/DEEP) |
|  | STORMWATER INLET |
|  | EXISTING ABOVEGROUND STORAGE TANK
LOCATION |
|  | FORMER ABOVEGROUND STORAGE TANK
LOCATION |

SCALE

50 25 0 50 FEET



VIRGIN ISLAND CHEMICAL SITE
ST. CROIX, U.S. VIRGIN ISLANDS

McLAREN/HART, INC.
WARREN, NEW JERSEY

DRY: T.J.O.	CHRT: A.O.	APP'D: P.K.
SCALE: AS SHOWN		DATE: 08/10/00

PROPOSED VERTICAL SCREENING/MONITORING WELL LOCATIONS