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FOR INCLUSION IN THE ADMINISTRATIVE RECORD

Re: Novak Sanitary Landfill Site ("Site"); Comments on the May 1993 Proposed Remedial Action Plan ("PRAP")

Dear Ms. Moseley and Mr. Lee:

The following comments on the PRAP are submitted to the United States Environmental Protection Agency ("EPA") on behalf of the Novak RI/FS PRP Group ("Group"). These comments have been prepared by the Chairperson of the Group, Lawrence W. Diamond of Hannoch Weisman; the Project Coordinator, Mark Travers of de maximis, inc.; and the Group's consultants, Geraghty & Miller, Inc. and Vincent Uhl Associates, Inc.

The Group's comments are segregated into two groupings. This first grouping is entitled "Priority Comments," signifying that the Group considers these comments to be of a substantive nature and that the issues they address are, in the Group's opinion, of relatively greater import than those raised in the second grouping, which we have captioned "Additional Comments." Accordingly, the fact that a comment appears in the second grouping should not be construed to mean that the group considers such comment to be insignificant, but only that is of less importance relative to those comments that appear in the first grouping. In

addition, the absence of a comment regarding a particular issue does not necessarily constitute agreement with EPA's position regarding that issue.

The Group understands that these comments will be made a part of the Administrative Record in this matter.

I. PRIORITY COMMENTS

Many of the following comments arise from the differences between the PRAP and the Recommended Alternative in Section 7 of the final Feasibility Study ("FS") for this Site, and therefore address issues of particular significance to the Group. The comments within this section are presented in the order in which the issues arise in the PRAP.

A. Page 3, Paragraph 2

"VOCs were detected in several on-site wells at levels above safe drinking water standards. VOCs detected in six (6) of the off-site home wells were at trace levels and did not exceed safe drinking water standards."

Comment

EPA should include additional explanation of the well sampling and results. Specifically, EPA should define "safe drinking water standards" to assist in the public's understanding of the significance of these levels. EPA's reference to several on-site wells should specifically note that VOCs were detected in only two (2) on-site monitoring wells at concentrations above the referenced safe drinking water standards. These wells are MW-2A and MW-6, both of which are adjacent to the Trench Fill Area. None of the sampling results from wells in the Old Mine and Demolition Fill Areas exceeded the standards.

B. Page 12, Paragraph 1

"Construction of a cap over the Old Mine, Demolition Fill, Surface Fill and Trench Areas at the Site would further restrict potential pathways of exposure, and would reduce *infiltration* of surface water into the landfill contents....In the Trench Fill Area, the great reduction of infiltration would significantly reduce the recharge of the groundwater *mound* beneath the area, in time reducing the mound, which also serves as a transport mechanism for constituents released from the landfill contents."

Comment

EPA should clarify its discussion of the effect of the cap by explaining that the construction of a cap over the Landfill will serve to reduce the infiltration of precipitation and not of surface water per se, given the absence of significant surface water bodies at the Site.

Further, not only will the groundwater mound be reduced, but the direction of groundwater flow in the vicinity of the Trench Fill Area will no longer be radial, but will again be northward in conformance with regional groundwater flow conditions.

C. Page 12, Paragraph 3

"Further protection to human health would be provided by requiring, at an anticipated minimum, annual monitoring of 11 active residential wells. Should groundwater monitoring determine human health risks are present at a residence in excess of safe drinking water standards *(MCLs)* or remediation based risk benchmarks described in the RI/FS, the most implementable alternative water supply ... would be provided to affected residences."

Comment

1. EPA should explain that, upon connection of any residences to the South Whitehall Township water distribution system, there no longer will be any need to monitor the wells of the residences connected to public water. At that point, monitoring a minimum of 11 wells annually would be excessive, and the monitoring requirements should be adjusted downward.

2. The Record of Decision ("ROD") should provide that the determination of which residential wells will be sampled, and the schedule for doing so, will occur during Remedial Design ("RD").

3. It is unclear what is meant by the term "implementable". In the absence of any other explanation, the Group understands this term to refer to the most cost-effective alternative, given that either alternative will be protective, and that the criteria applied by EPA to make this evaluation will only be those criteria set forth in the National Contingency Plan ("NCP").

4. In addition, the ROD should provide that, during RD, there should be an evaluation of whether groundwater monitoring is the most appropriate means of addressing the protection of human health from the potential migration of constituents via groundwater.

D. Page 12, Paragraph 4, continuing on Page 13

"In order to restrict access, a security fence would be installed around the property to prevent potential contact with landfill contents and seep areas by trespassers as well as to protect the control systems and equipment on-site. Deed restrictions would restrict residential development and installation of drinking water wells within site boundaries."

Comment

Fencing at access locations is sufficient to restrict access to the Site, for the following reasons:

1. After capping, there will no longer be any exposed landfill contents or seep areas to contact.

2. The Site is a municipal landfill not a hazardous waste disposal site.

3. The natural topography at the Site restricts access to certain portions of the Site. Specifically, two sides of the Site have steep terrain and are heavily wooded, effectively preventing vehicle traffic, and controlling individual trespassers nearly as effectively as a fence.

4. This conclusion is supported by EPA's May 3, 1989 comments to the RI/FS Work Plan. At the time, when Site conditions were believed worse than has been determined through performance of the RI/FS, EPA merely requested an evaluation of whether site security was a concern, and if so, a proposal to secure the Site. As reflected in EPA's July 1989 RI/FS Work Plan Approval, the result of this evaluation and discussions with EPA was that fencing of the Site was not warranted. EPA concluded that the natural and topographical restrictions, limited site access and the lack of any evidence of trespassers demonstrated that there was no need for additional site security or fencing.

Given that Site conditions are better than expected, that no other relevant facts have changed since issuance of the Work Plan Approval, and that Site conditions will be substantially improved through capping and other aspects of the remedial action, there is no basis for requiring a perimeter fence around the entire Site. EPA should remove this action from its proposed alternative.

E. Page 13, Paragraph 1

"Surface water controls, such as *swales, terraces* and *retention ponds*, would also be constructed to provide proper surface-water management. In addition, site restoration will include specific measures to promote wildlife habitat diversity without jeopardizing the integrity of the cap."

Comment

Alternative 4 in the FS does not provide for "specific measures to promote wildlife habitat diversity." Alternative 4 provides that the remedial alternative components will be supplemented, to the extent required by the NCP, by a habitat impact assessment in order to minimize disturbance to existing habitats and/or by actions to mitigate, restore, protect and preserve appropriate site environmental features after the project remedial measures are implemented.

As established in the RI/FS and PRAP, remedial alternatives for the Site were developed and evaluated in consideration of the nine criteria established in the NCP. None of the NCP criteria require restoration or remedial actions to include specific measures to promote wildlife habitat diversity, although the remedial actions may be enhanced, where legally required, based on the results of a habitat impact assessment. Therefore, EPA should clarify its statements regarding this issue to provide that restoration of habitat eliminated by the RA will be conducted if determined to be appropriate and legally required.

F. Page 13, Paragraph 3

"During Remedial Design, additional sampling and assessment of environmental risk will be performed on the sediments and water in all on-site surface storm-water and leachate drainages and other standing water areas outside of the proposed landfill cap area. Also, a baseline environmental characterization will be conducted for all site areas to be unavoidably impacted by remedial activities to aid in design and implementation of site

restoration. Contaminated sediments will be removed to other parts of the landfill as fill material while contaminated water will be treated with the leachate."

Comment

1. There are no "leachate drainages" referenced in the RI/FS report. The Group assumes that EPA is referring to "leachate seeps". If EPA is referring to something other than leachate seeps by utilizing the phrase "leachate drainages", EPA should define the term to assist in the public's understanding of the PRAP.

The only leachate seeps identified on the Site are within the footprint of the proposed area to be capped. Therefore, there is no reason to conduct any additional sampling or assessment of the environmental risk of these seeps.

The only additional sampling and assessment of environmental risk for on-site surface storm-water and other standing water areas outside the proposed landfill cap area should be that necessary to conduct a habitat impact assessment. Sampling and analysis of on-site surface water and sediments has already demonstrated that there was no need to establish preliminary remediation goals for these media, and that "No Action" is the appropriate General Response for these media.

2. The term "baseline environmental characterization" is inconsistent with the terminology utilized in the FS. EPA should correct this inconsistency by referring to a "habitat impact assessment." This correction is particularly important because further studies related to site habitat were extensively discussed during finalization of the RI/FS. The results of those discussions with EPA are reflected in Section 7 of the FS, which provides that a habitat impact assessment would be conducted during Remedial Design ("RD"). The objective of this assessment would be to assess the unavoidable impacts of remedial actions on existing habitat, not to further evaluate the extent of potential site impacts or to assess environmental risk. This activity and its purpose are distinguishable from a baseline environmental characterization, which is typically a precursor to the risk assessment portion of the RI/FS. The assessment of environmental risk conducted during the RI/FS, and in conformance with the approved work plan, is adequate, and no further environmental assessment activities are warranted.

3. It is premature to determine that the appropriate disposal method for water that may be found to be contaminated is the same as that for collected leachate. EPA should clarify this statement to provide that the management of any such surface water will be determined after any necessary sampling and analysis of the surface water.

G. Page 13, Paragraph 4, continuing on Page 14

"Toxicity and flow of landfill gas will be monitored routinely to determine whether flaring of the gas and/or an active collection system are necessary. If at any time, constituents of the gas or flow of the gas are such that flaring and/or an active system is necessary, such system(s) will be added."

Comment

Future monitoring of landfill gas should be conducted to assess releases from a passive landfill gas venting system (the type appropriate for this RA) in consideration of air quality ARARs, not toxicity and flow. Furthermore, while it is appropriate that the results of landfill gas monitoring undertaken subsequent to cap construction be utilized to assess whether additional remedial actions are necessary for landfill gas management, the selection of any such remedial actions should not be limited to flaring or an active gas extraction system. It is possible that other alternatives for landfill gas management may be found appropriate. The ROD should, therefore, provide that an evaluation of whether landfill gas monitoring results indicate a need for actions beyond the passive gas venting system will be undertaken, if necessary, during the five (5) year review process, and that the most appropriate additional remedial action for landfill gas management will be selected at that time, if in fact any further action is required.

H. Page 14, Paragraph 1

"Permanent wells would be installed prior to construction of the cap in the Surface Fill and Trench Fill Areas to pump leachate into temporary on-site storage tanks. Any leachate observed in the Old Mine and Demolition Fill Areas during Remedial Design would also be remediated."

Comment

Section 7 of the approved FS provides for removal of leachate from the landfill on a one-time basis. The objective of this one-time removal is to eliminate the driving force and transport mechanism for constituents from the landfill to the ground water, and subsequently accelerate remediation of groundwater beneath the landfill. Once this one-time removal of leachate is complete, the potential migration of leachate from the landfill will be greatly reduced, if not entirely eliminated. The PRAP appears to outline a program for leachate management that encompasses ongoing leachate removal.

The referenced paragraph suggests that EPA is proposing a leachate management program that provides for the leachate collection wells to remain open for further assessment of the need for additional leachate collection beyond the one-time removal event. This approach, however, varies from statements made by EPA at the public meeting and the text of Table 2 of the PRAP, which provides for an ongoing leachate removal program.

Ongoing leachate removal is not warranted given the level of leachate reduction that will be accomplished by the one-time removal and the reduction of infiltration resulting from installation of the cover system. In addition, it is arbitrary to require removal of leachate from areas other than the Surface Fill and Trench Fill Areas, solely based on existence of leachate, given that the results of the RI and the most recent groundwater monitoring do not indicate an impact downgradient of the Old Mine and Demolition Fill Areas. If conditions do not change downgradient of the Old Mine or Demolition Fill Areas, removal of the leachate from these areas should not be considered. The ROD should, therefore, provide that leachate removal and management will be addressed in the manner provided in Alternative 4 of the FS.

I. Page 14, Paragraph 2

"However, if contaminant levels in off-site wells increase to levels above cleanup requirements for a statistically significant period of time, further remedial activities will be implemented. It is also anticipated that the ground water in the on-site wells will achieve restoration to background levels in fifteen (15) years whereby the State *Applicable or Relevant and Appropriate Requirements (ARARs)* requiring such restoration will be achieved."

Comment

The independent evaluation undertaken by the Groups' consultants indicates the EPA's estimate of 15 years for the return of groundwater to "background" conditions is within the correct order of magnitude.

J. Page 14, Paragraph 3

"...Monitoring would include constituents sampled during the RI/FS (i.e., *TCL* VOCs, *TAL* metals/inorganics and groundwater chemistry parameters.) In addition, if routine monitoring is still underway at the Pheasant Hills Community Well and the Bridgeview East Well, those results would also be incorporated into the groundwater monitoring program. Any residences found to be affected by contamination in the groundwater would be provided with residential treatment units or waterline hook-ups, according to which option was most implementable."

Comment

1. EPA should more clearly explain that the Site is not the source of the nitrate/nitrite levels found at the Pheasant Hills well, and that the monitoring program will not include this well because the well is no longer being used as a drinking water source.

It is the Group's understanding that the Bridgeview East well is no longer being utilized by South Whitehall Township for water supply. The well should, therefore, be excluded from the monitoring program. See May 24, 1993 Memorandum from Vincent Uhl Associates, Inc. to de maximis, inc., Section entitled "Current Public Water and Domestic Well Usage Proximate to the Site", a copy of which was provided to EPA as an attachment to the Group's May 25, 1993 correspondence to EPA (copy enclosed as Exhibit "A").

2. As noted above, the PRAP should identify that once residences with private wells are connected to the public water supply, monitoring of the wells will cease and the wells will be properly abandoned. As noted above in the comment to Page 12, Paragraph 3, it is unclear what criteria will be used to evaluate the most "implementable" alternative, and that comment is incorporated here by reference. EPA also has not explained what criteria it will use to determine whether a residence is "affected". The Group understands that this evaluation will be

based upon the Decision Tree For Implementing Alternative Water Supplies, Appendix C of the FS.

3. EPA has stated that groundwater monitoring would include TCL VOCs, TAL metals/inorganics and groundwater chemistry parameters. EPA should limit the analytical parameters to TCL VOCs. This limitation is appropriate because it is based upon EPA's determination during the RI/FS process that the only off-site groundwater constituents of concern are VOCs, and that no additional sampling and analysis for other parameters was warranted.

K. Page 15, Paragraph 6

"The Old Mine Areas, which have been closed since 1972, and the Surface Fill and Trench Fill Areas, which received waste through 1988, would be capped consistent with current PADER requirements for municipal waste landfill caps."

Comment

On page 2 of the PRAP, EPA states that, "Prior to 1972, the Landfill owners filled, covered and closed the Old Mine Area." (Emphasis added.) In paragraph 6, page 15, EPA again acknowledges that the Old Mine Areas (presumably including the Demolition Fill Area) have been closed since 1972. Furthermore, these two distinct disposal units, and the time periods of their usage, were defined clearly by EPA in its review of historical aerial photography for the Site. As such, it is clear that these areas were closed prior to the October 11, 1988 date upon which the then-new municipal waste landfill closure regulations became applicable to landfills still operating as of that date.

In addition, the Demolition Fill Area, which received demolition wastes, would only require a two-foot soil cover under the current demolition fill closure regulations, assuming those regulations applied. This conclusion is based upon the fact that the absence of groundwater impacts downgradient from this area demonstrates that the Demolition Fill Area does not present a risk of groundwater contamination. In the absence of such risk, the current regulations require only a two-foot soil cover, rather than a single barrier cap, for demolition fill areas. See 25 PA Code §§277.161(a), 277.233, 277.251(a).

Therefore, there is no basis upon which EPA can reasonably conclude that either of these areas is subject to single barrier cap closure regulations or that those regulations are an

ARAR for those areas. EPA should modify its proposed remedial action to provide that the Old Mine and Demolition Fill Areas only require that a two-foot soil cover be maintained.

L. Page 16, Paragraph 1

"The proposed alternative will comply with the background remedial action levels for groundwater based on Pennsylvania's Hazardous Waste Regulations 25 PA Code §§264.90 - 264.100, specifically 25 PA Code §264.97(i) and (j) and 264.100(a)(9)."

Comment

Both EPA and PADER have taken the position that the Pennsylvania requirement for groundwater containing hazardous substances is that all groundwater be remedied to "background" quality as specified in 25 PA Code §264.90 - §264.100, specifically 25 PA Code §264.97 (i) and (j) and 264.100(a)(9). The Group does not agree that this requirement is an ARAR or that this regulation requires all groundwater to be remedied to background levels. Assuming, however, that this requirement continues to be considered an ARAR for purposes of any groundwater remediation (active or passive) at this Site, the Group believes that the ARAR should be waived under Section 121(d)(4) of CERCLA and §300.430(f)(1)(ii)(c) of the National Contingency Plan because compliance with such a requirement would be, for example, technically impracticable from an engineering perspective due to the geologic setting of the Site.

M. Page 16, Paragraph 3

"Alternative 4A is typical of remedial actions at other municipal waste landfills.... Contaminants collected through leachate pumping and groundwater pumping will be removed from the Site and treated prior to disposal."

Comment

1. EPA should correct the first sentence of this paragraph by explaining that this remedy is actually more protective than that typically undertaken at municipal waste landfills because it includes re-closure of a closed landfill (the Old Mine and Demolition Fill Areas), an action that is not typical.

2. EPA should delete the reference to groundwater pumping in this sentence because the proposed alternative does

not include groundwater pumping. Further, the leachate recovery wells that are proposed for the Surface Fill and Trench Fill Areas will be installed to shallow depths within both of these areas. These wells will be completed many tens of feet above the top of the zone of saturation (water table) in the underlying bedrock aquifer system. As such, no pumping of groundwater will take place during this process.

Continued leachate removal, beyond the initial one-time event, will not result in a measurable impact on groundwater quality and, therefore, will not be cost-effective.

N. Page 16, Paragraph 6

"Alternative 4A would be protective of the community in the short-term in that the perimeter fence would prevent access to the Site."

Comment

A perimeter fence would not prevent access, but only would restrict it. As noted above, fencing at site access locations and the natural topography at the Site will similarly restrict access, and, therefore, is protective of the community in the short-term. Therefore, EPA should modify the proposed alternative to provide for fencing at access locations rather than around the entire Site.

O. Page 17, Paragraph 2

"Cost. The present worth cost for Proposed Alternative 4A is $16,105.149."

Comment

The Group has evaluated EPA's cost estimate for the Proposed Alternative, and has concluded that the estimate apparently does not include certain components of the selected Remedial Alternative. A more accurate present worth cost estimate for the Proposed Alternative is $17,500,000. This figure takes into account the expansion of remedial actions in the PRAP from those provided for in Section 7 of the FS, to the extent this is possible without having been provided with an opportunity to review EPA's cost analysis.

II. ADDITIONAL COMMENTS

The comments within this section address clarifications and/or editorial changes to certain aspects of the PRAP. The comments are presented in the order in which issues arise in the PRAP.

A. Page 1, Paragraph 1

"This remedy will address the long-term threat caused by the unlined municipal *landfill* and provide long-term monitoring of *ground water.*"

Comment

The reference in this paragraph to an "unlined municipal landfill" does not clearly explain that the Site is, in fact, a permitted sanitary landfill which utilizes the natural renovation design concept, a concept that relies upon the natural environment rather than an engineered liner for leachate control.

B. Page 1, In a Nut Shell..., Proposed Solution

"*Cap* Landfill, Upgrade gas vents...."

Comment

EPA should clarify this statement to reflect that implementation of the proposed plan will involve installation of a new landfill gas vent system and methodology, rather than an upgrade of the existing system.

C. Page 2, Paragraph 2

"The Site consists of an inactive landfill situated atop highly *fractured bedrock* in a rural and agricultural area."

Comment

This statement does not adequately explain that a portion of the landfill, the Old Mine and Demolition Fill Areas, is closed, while the Surface Fill and Trench Fill Areas are inactive.

D. Page 2, Paragraph 3

"The creek also *recharges* the groundwater underlying the Site."

Comment

EPA should clarify that Jordan Creek is not the sole source of groundwater recharge at the Site. Jordan Creek, by virtue of its being a losing stream, serves as one source of recharge to the bedrock system underlying the Site. Other recharge sources include infiltration of precipitation over the region and groundwater flux from the south.

E. Page 2, Paragraph 6

"In 1972, PADER issued a permit to NSL which allowed the expansion of landfill operations."

Comment

The PADER permit was actually a permit allowing the operation of a natural renovation landfill at the Surface Fill and Trench Fill Areas, rather than expansion of the landfill (Permit No. 100534, issued March 24, 1972).

F. Page 3, Paragraph 2

"Two maps (see Figure 2 on pages 10 & 11) were submitted as part of the RI/FS and illustrate the results of the historical sampling in the vicinity of the Site."

Comment

Figure 2 of the PRAP was not submitted with the RI/FS Report, but is instead a compilation of sampling results separately prepared by EPA's contractor.

G. Page 4, Figure 1 - Comment

Figure 1 appears to indicate that the Old Mine Area is located northeast of the Hilda Novak residence, while it is actually located to the south of the residence.

H. Page 5, Paragraph 2

"As is common with landfills, several contaminants are contributing to the risk at the Novak Sanitary Landfill Site. The principal VOCs contributing to the risk include vinyl chloride; chloromethane; 1,2-dichloroethylene; 1,1,1-trichloroethane; carbon tetrachloride; trichloroethylene; benzene; and tetrachloroethylene. Metals contributing to risk include barium, cadmium, chromium, copper, lead, manganese, mercury , and nickel."

Comments

1. The principal contributors to risk, as identified in this paragraph of the PRAP, are inconsistent with the findings of the Baseline Risk Assessment ("BRA"), and appear to be based solely upon historical information and the NPL listing. The primary contributors to risk at the Site (using the criteria of hazard quotient ("HQ") greater than 1 or an excess lifetime cancer risk ("ELCR") greater than 10^{-6}) are as follows:

VOCs: vinyl chloride; chloroform; benzene; carbon tetrachloride; 1,2-dichloropropane; and trichloroethylene

sVOCs: polycyclic aromatic hydrocarbons ("PAHs")

Metals: antimony, arsenic, beryllium, and cadmium.

A chart commenting on the discrepancies between the PRAP and the BRA is enclosed as Exhibit "B". EPA should modify its list of the principle contributors to risk to be consistent with the results of the BRA.

2. EPA's use of the term "principle threats" here and "long-term threats" in other portions of the PRAP is potentially misleading and does not appear to be consistent with the use of the terms in the NCP. "Principle threats" are characterized in the NCP (including the Preamble to the NCP) as those resulting from materials that cannot be reliably controlled in place, such as liquid, highly mobile materials and high concentrations of toxic compounds, e.g., those several orders of magnitude above levels that allow for unrestricted use and unlimited exposure. In contrast, the Human Health Evaluation Manual, Part C, Risk Evaluation of Remedial Alternatives, defines long-term risks as "risks that remain after remedy implementation is complete (i.e.,

residual risks)" (emphasis added). EPA should modify its use of these terms to be consistent with these definitions.

I. Pages 5-7, Headings

In the sections presenting the results of the BRA, on pages 5 through 7 of the PRAP, the headings should be "Ground Water" and "Soil", rather than "Groundwater Ingestion" and "Soil Ingestion", because inhalation exposure to groundwater and dermal and inhalation exposure to soil are included in the calculations. This revision is also consistent with the "Air" and "Leachate, Surface Water & Sediments" headings which follow. The subheadings in the "Soil", "Air" and "Leachate, Surface Water & Sediments" sections should say "Residents" rather than "Resident".

In the "Ground Water Ingestion" subsection, the subheading "Current Exposure Offsite" should be entitled "Current Residents Offsite" to be consistent with the other subheadings. "Future Exposure Onsite" should be entitled "Potential Current Residents Onsite" to be consistent with the BRA. Similarly, the first sentence in this section should read "potential current adult" rather than "potential future adult."

J. Page 6, Paragraph 3

Soil Ingestion: "...Excess lifetime cancer risks from incidental soil ingestion ranged from $7x10^{-5}$ for potential on-site adult residents to $2x10^{-6}$ for current adolescent trespassers.... The hazard indexes for this exposure route ranged from 6 for on-site resident adults to 0.2 for off-site residents and trespassers."

Comment

The first sentence should be revised to read "incidental soil ingestion, dermal contact, and particulate inhalation" rather than just "incidental soil ingestion". In this sentence, a value of $7x10^{-5}$ is incorrectly presented as the ELCR for the adult resident. The value is actually the sum of the ELCRs calculated for the adult and child residents (as stated in the footnote of Table A-79). This point should be clarified by revising the first sentence of this section to read "$7x10^{-5}$ for potential on-site adult and child residents." For the same reason, the third sentence in this section should be revised to read: "The hazard indices for this exposure route ranged from 6

for on-site adult and child residents to 0.2 for off-site trespassers."

K. Page 6, Paragraph 4

Air: "... Excess lifetime cancer risks from inhalation of potentially contaminated air ranged from $7x10^{-5}$ for potential on-site adult residents to $7x10^{-7}$ for current adolescent trespassers.... The hazard indices for this exposure route ranged from 0.6 for an on-site resident to 0.006 for trespassers."

Comment

The ELCR value presented as the risk for potential on-site adult residents is actually the combined cancer risk for adult and child residents. To clarify this, the first sentence in the air risk section should be revised to read: "$7x10^{-5}$ for potential on-site adult and child residents." The maximum hazard index for this exposure route was 0.5 for a future hypothetical child resident. The third sentence should be revised to state: "for on-site adult and child residents."

L. Page 7, Paragraph 1

Leachate, Surface Water & Sediments: "...The hazard indices for this exposure route ranged from 4.3 for on-site resident children to 0.5 for on-site resident adults."

Comment

The hazard index for exposure of child resident should be rounded to one significant figure, i.e., 4 instead of 4.3, even though it is the result of summing 4 (child exposure to leachate) and 0.3 (child exposure to surface water and sediments). These risk values are uncertain estimates of risk, and the use of additional significant figures implies inappropriate certainty in value.

EPA has added the risk for the adult and child residents to calculate a total residential risk from exposure to these media. It is inappropriate to sum these together because the adult resident scenario spans a 30-year exposure period which overlaps with the 6-year child resident scenario. To obtain a total residential risk across age groups, the adult exposure period should be 24 years so that addition to the 6-year child

exposure yields a total of 30 years, as was done in the soil exposure scenarios.

M. Page 9, Table 2 - Comments

The title for Alternative #5 identifies the on-site treatment of leachate. On-site treatment of leachate was not included in Remedial Alternative 5 of the FS, and this reference should, therefore, be corrected.

The landfill gas descriptions for Alternatives #7 and #8 identify the implementation of a gas collection layer. A gas collection layer was not included in Remedial Alternatives 7 and 8 of the FS, and this reference should, therefore, be corrected.

The groundwater description for Alternative #8 identifies a general groundwater pump and treat system. Such a groundwater pump and treat system was not included in Remedial Alternative 8 of the FS, and this reference should be corrected to reference the pump and treat system for the mound that was included in Remedial Alternative 8.

N. Page 12, Paragraph 1

"The proposed alternative provides protection to human health and the environment by specifically addressing each environmental medium of concern at the NSL Site."

Comment

To assist in the public's understanding of the PRAP, EPA should define "medium of concern" by explaining that a medium is of concern if the ELCR exceeds 10^{-4} or the hazard index exceeds 1. Based on this definition, ground water would be the only medium of concern based on cancer risk considerations. For non-cancer health effects, ground water, surface soil, and seep areas would be media of concern.

O. Page 12, Paragraph 3

"...In addition, routine monitoring of the landfill's gas, leachate, and structural stability would insure the remedy's integrity as well as continue to safeguard public health."

Comment

The FS does not include any references to structural stability, and it is unclear what EPA means by this reference. The Group does not believe any inspection of "structural stability", other than periodic inspection of the integrity of the cap, is warranted.

P. Page 13, Paragraph 1

"In order to contain the landfill contents, a cap would be constructed over the [Site]. Before construction of the cap or any surface regrading, materials from existing drainages outside the proposed cap which present an environmental risk will be moved so as to be contained by the cap."

Comment

1. The primary purpose of the cap is to minimize infiltration rather than to contain the landfill contents. Installation of a cap will also reduce subsequent leaching and preclude access to the landfill contents. EPA should incorporate these purposes into its explanation of the proposed capping.

2. EPA should expand its reference to moving materials from existing drainages by stating that other landfill materials, in addition to those from existing drainages, will be consolidated onto the landfill prior to capping.

Q. Page 14, Paragraph 2

"However, if contaminant levels in off-site wells increase to levels above cleanup requirements for a statistically significant period of time, further remedial activities will be implemented."

Comment

EPA should identify the off-site wells to which it is referring in this paragraph by specifying whether they are residential, community or monitoring wells. EPA should also explain what is meant by a "statistically significant period of time."

R. Page 15, Paragraph 3

"Removal of the leachate prior to construction of the cap would eliminate direct contact with the seep areas...."

Comment

EPA should revise this sentence to state that construction of the cap in conjunction with collection of the leachate will eliminate direct exposure to the leachate seep areas.

In addition to the comments on the PRAP, the Group believes that certain additional documents should be included in the Administrative Record because these documents contain information relevant to the components of the remedial action proposed in the PRAP. A number of these documents were identified in Mark Travers' May 21, 1993 letter to EPA regarding this issue. A copy of that letter and the enclosures thereto are enclosed as Exhibit "C". There are a number of more recent documents which also should be included in the Administrative Record, specifically: (1) May 25, 1992 letter from Mark Travers and Lawrence Diamond to Cesar Lee and Betsy Lukens Re: RI/FS Meeting (Exhibit "A"); (2) May 25, 1993 letter from Cesar Lee to Mark Travers, approving the RI/FS (copy enclosed as Exhibit "D"); (3) results of the most recent round of residential well sampling, transmitted to EPA on June 11, 1993 (copy enclosed as Exhibit "E"). The Group hereby requests that each of these documents be included in the Administrative Record.

Please feel free to call if you have any questions regarding these comments.

Very truly yours,

HANNOCH WEISMAN

LAWRENCE W. DIAMOND
Chairperson
Novak RI/FS PRP Group

de maximis, inc.

Mark A. Travers/jap

MARK A. TRAVERS
Project Coordinator

Enclosures

Exhibit A

de maximis, inc.
2045 Lincoln Highway, #308
St. Charles, IL 60174
(708) 879-3919
Fax (708) 879-0830

May 25, 1993

OVERNIGHT COURIER

For Inclusion in the Administrative Record

Mr. Cesar Lee
Remedial Project Manager
United States Environmental Protection Agency
841 Chestnut Building
Philadelphia, PA 19107

Ms. Betsy Lukens, Esquire
Office of Regional Counsel
United States Environmental Protection Agency
841 Chestnut Building
Philadelphia, PA 19107

Subject: **Remedial Investigation/Feasibility Study Meeting**
Novak Sanitary Landfill Site
South Whitehall Township, Pennsylvania

Dear Mr. Lee & Ms. Lukens:

On behalf of the representatives of the Novak RI/FS PRP Group ("Group"), we would like to thank you for arranging the meeting of May 6, 1993. The purpose of this letter is to summarize discussions at the May 6 meeting and highlight the issues addressed at that time.

The goals of the meeting were: (1) to confirm the conclusions of the Remedial Investigation and Feasibility Study ("RI/FS"); (2) to confirm that the United States Environmental Protection Agency ("U.S. EPA") and the Pennsylvania Department of Environmental Resources ("PADER") concur that the site conditions have been thoroughly and sufficiently defined; (3) to clarify the inconsistency between the most recent U.S. EPA and PADER comments and previous comments to the RI and FS reports; (4) to review the analyses supporting the conclusion that a ground water pump and treat system is technically impracticable at this Site and that the purported Pennsylvania Applicable or Relevant and Appropriate Requirement ("ARAR") of "background" for groundwater should therefore be waived[1]; (5) to discuss the basis for the recommended alternative of soil cover for the Old Mine and Demolition Fill Areas; (6) to confirm that the Group had fully complied with the requirements of Administrative Order on Consent ("AOC"). U.S. EPA and PADER indicated concurrence with the interpretations presented in the RI and FS reports. In addition, U.S. EPA confirmed that the Group had completed its obligations under the AOC and a letter of confirmation would be forthcoming.

[1]Both the U.S. EPA and PADER have taken the position that the Pennsylvania requirement for groundwater containing hazardous substances is that all groundwater be remedied to "background" quality as specified in 25 PA Code 264.90 - 264.100, specifically 25 PA Code 264.97 (i) and (j) and 264.100 (a)(9). The Group does not agree that this requirement is an ARAR or that this regulation requires all groundwater to be remedied to background levels. Assuming, however, that this requirement continues to be considered an ARAR for purposes of any groundwater remediation (active or passive) at this site, the Group believes that the ARAR should be waived under Section 121 (d)(4) of CERCLA and §300.430 (f)(1)(ii)(c) of the National Contingency Plan because compliance with such a requirement would be, for example, technically impracticable from an engineering perspective due to the geologic setting of the site.

As discussed during the May 6 meeting, the recommended alternative outlined in Section 7 of the FS provides for remedial measures that will have an immediate and long-term positive impact on groundwater quality and flow at this site. The remedial measures that will directly impact groundwater quality and flow include:

1) recovery of leachate from the surface fill and trench fill areas; (i.e., secondary source removal)

2) stormwater management; and

3) capping of the surface fill and trench fill areas to reduce current infiltration by 98 percent.

The analyses of alternatives performed during preparation of the FS included consideration of a groundwater pump and treat system. These analyses indicated that installation of a series of pumping wells for treatment of groundwater will not contribute to the rate of groundwater restoration because the bedrock aquifer system in the vicinity of the groundwater mound is characterized by very low hydraulic properties (e.g., hydraulic conductivity) and low well yields. Groundwater pumping wells may provide some level of containment; however, containment is not warranted because risks downgradient are within an acceptable range. In addition, a groundwater containment system comprised of pumping wells would likely be inefficient due to the very low well yields.

As discussed in the enclosed memorandum prepared by Vincent Uhl Associates (Attachment 1), changes in groundwater flow will be detectable in the first few years following implementation of the recommended remedial measure. As discussed in Attachment 1 and the enclosed memorandum prepared by Geraghty & Miller (Attachment 2), groundwater quality at this site will naturally restore to a quality essentially equivalent to "background" quality given: (1) the low levels of VOCs detected in the groundwater; (2) the significant reduction of infiltration through installation of a cap over the Trench and Surface Fill Area; and (3) leachate removal. This restoration of groundwater quality will occur as the combined result of dispersion of any remaining leachate constituents through the aquifer and natural bioremediation within the aquifer. For the reasons described in Attachment 1, a pump and treat system, given the anticipated ineffectiveness of removal operations, would not appreciably increase the rate of restoration.

The discussions at our meeting of May 6 did not include specific reference and comparison to other municipal landfills where similar conditions exist and similar remedial alternatives were considered. However, the Group's analyses of remedial alternatives for the Novak Sanitary Landfill ("NSL") followed U.S. EPA guidance for conducting remedial investigations and feasibility studies at municipal landfill sites, and, therefore, did indeed involve a review of remedial measures at various other municipal landfill sites. The Dorney Road (Oswald) Landfill was considered the most appropriate comparison due to proximity of the sites and the similarity of waste streams (i.e., municipal waste), as well as the groundwater quality and hydrogeologic regime. Well yields at both sites are low, in fact, the well yields at NSL are lower. Groundwater quality at both sites has been impacted by volatile organics. In addition, neither of the sites has an acceptable direct discharge point for treated ground water. While Jordan Creek is relatively near the

NSL site, PADER (Water Division) has stated that it would not be receptive to permitting a discharge into Jordan Creek because it periodically goes dry and is a losing stream.

The conditions at the NSL support a technical impracticability waiver, the type of waiver granted at the Dorney Road (Oswald) Landfill. Regardless of the U.S. EPA's conclusions with respect to the applicability of "background" as an ARAR or whether a technical impracticability, or other ARARs waiver should be granted, a pump and treat system is not feasible at this Site and is unnecessary given the other remedial actions proposed and protections provided to potential receptors. Removal of leachate from the landfill, an active step not feasible at the Dorney Road (Oswald) Landfill, and capping/covering will allow the aquifer to naturally achieve a quality essentially equivalent to background. Moreover, allowing the aquifer to naturally achieve background quality is comparable to the remedy proposed at the East Mt. Zion site, a site at which a pump and treat system could have been installed, but at which U.S. EPA concluded it was apparently unworkable. At the East Mt. Zion site, the Pennsylvania ARAR for groundwater was not waived, and a groundwater pump and treat system was not installed. A similar situation exists at the NSL, although at NSL, an additional measure of protection is provided by the leachate removal.

The addition of a groundwater pump and treat system at the NSL will not increase the level of protection to human health or environment. A groundwater pumping system would not be "fail safe" because of the aquifer conditions at this site are tight and, regardless of the number of pumping wells, there would be no assurance of containing all impacted groundwater. In addition, such a system would not increase the rate or level of aquifer restoration. Only monitoring at the point of use would effectively assure protection of human health and the environment. In fact, a groundwater pump and treat system *is neither feasible nor technically practicable* with respect to achieving the purported Pennsylvania ARAR for groundwater or any other ARAR for groundwater. This conclusion of technical impracticability is based on the following facts:

1. The aquifer is tight. Well yields in the area of the trench and surface fill areas are low (sustained yields of less than 1 gpm).

2. Inefficiencies of any groundwater pump and treat system.

3. A groundwater pumping system would not increase the rate or ultimate level of aquifer restoration.

4. Lack of feasible alternatives for discharge of treated groundwater. The nearest discharge point (to a public sewer line) is nearly two miles from the site and the PADER has informed Group representatives that obtaining a permit to discharge to Jordan Creek would be very difficult, if not impossible.

The Group also explained the bases for its conclusion that soil cover is an appropriate remedial alternative for the Old Mine and Demolition Areas given the conditions present in these areas. First, there have been no groundwater impacts detected immediately downgradient of these areas. If no actions were taken at all, conditions would most likely remain acceptable. Therefore, the remedial measures proposed can only improve the currently acceptable groundwater quality while further limiting the potential for future impacts to human health and the environment.

Second, an additional level of protection of human health is provided by monitoring residential groundwater supply wells proximate to the site and, if necessary, installing point of use groundwater treatment units. Significantly, South Whitehall Township is in the process of providing public water to the residences along portions of Orefield Road, Limekiln Road, and River Road (see Figure 2 to Attachment 1: South Whitehall Township Water Distribution System). The provision of public water has resulted, within the last year, in South Whitehall Township discontinuing the use of the Pheasant Hill, Bridgeview East, and Bridgeview West groundwater supply wells, and the installation of the Cornerstone Well. This installation of public water supply lines ensures that most residences proximate to the site either have, or will soon be provided with, public water; the few remaining residences will be protected by the proposed residential well monitoring program. Finally, the proposed soil cover complies with ARARs for these areas because: (1) the Old Mine Area was closed in the early 1970's, a number of years prior to the October 11, 1988 "trigger" date after which time currently operating municipal solid waste landfills would be subject to the then-new single barrier cap closure requirement; (2) the Demolition Area, which received only demolition wastes, also apparently closed prior to the "trigger" date. Even assuming this area is subject to current demolition fill closure regulations, the demonstrated absence of goundwater impacts downgradient from this area supports the conclusion that the two foot soil cover is the appropriate ARAR.

In conclusion, the remedial measures proposed for the NSL are the most appropriate in consideration of the conditions identified during the RI. The Group's consultants have evaluated all appropriate remedial measures. This evaluation resulted in development of a recommended alternative that is the most cost effective alternative while providing levels of protection to human health and the environment that are comparable to those in other remedial alternatives evaluated in the FS. The recommended alternative provided in the FS report includes the following:

1. leachate recovery (i.e., secondary source removal);

2. capping of the Surface Fill Area and Trench Fill Area;

3. maintenance of the cover over the Old Mine Area and Demolition Fill Area including additional soil cover where necessary to achieve a 2' cover;

4. landfill gas management;

5. on-site and residential groundwater monitoring (installation of point of use treatment units, as necessary); and

6. site access and deed restrictions.

This recommended alternative meets CERCLA's objective to provide for protection of human health and the environment. CERCLA provides for the evaluation of remedial alternatives supported by risk assessment. The risk assessment for the NSL RI/FS was utilized to develop a "fail safe" system for protection of human health. This "fail safe" provides for protection of residential locations proximate to the

site through groundwater monitoring (site and residential) and installation of ground water treatment units (point of use), as necessary, which will ensure that the public is not at risk through exposure to ground water which exceeds levels of concern. Along with leachate removal and capping activities, this will provide immediate, visible assurances to the public that adequate efforts are being undertaken to protect human health and the environment.

We trust that the information provided at our meeting, and summarized above and in the enclosed memoranda proved useful and that this letter and the enclosed will prove valuable in development of the Record of Decision for the NSL. If you or your staff have any questions, please call.

Sincerely,
de maximis, inc.

Mark A. Travers
Project Coordinator
Novak RI/FS PRP Group

Hannoch Weisman

Lawrence W. Diamond, Esquire
Chairperson
Novak RI/FS PRP Group

Attachments

cc: P. Anderson, U.S. EPA
J. Newbaker, U.S. EPA
M. Heffron, Dynamac Corporation
J. L. Hosmer, Geraghty & Miller, Inc.
J. Parker, Hannoch Weisman
V. Uhl, Vincent Uhl Associates
M. Mustard, PADER
A. Hartzell, PADER

c:\winword\3009\Thaku

ATTACHMENT 1

PROFESSIONAL GROUNDWATER HYDROLOGISTS AND ENVIRONMENTAL ENGINEERS

Vincent W. Uhl, CPG, PH
Jaclyn A. Baron
Anthony J. Rana, PG
Andrew C. Mills, PE

May 24, 1993

To: Mark Travers: de maximis
From: Vincent Uhl and Jaclyn Baron
VWU JAB
Re: Remedial Investigation/Feasibility Study Meeting
May 6, 1993
Novak Sanitary Landfill
South Whitehall Township, Pennsylvania

This memo serves to summarize certain technical matters that were presented at the meeting on May 6, 1993 attended by representatives of the Novak RI/FS PRP Group, the U.S. EPA, PADER, and technical consultants.

The marginal nature of the bedrock aquifer system in the vicinity of the mound, as evidenced by the very low hydraulic properties and consequent marginal well yields, points to the impracticability of pump and treat as an effective remedial method at this site. Further, a pump and treat system would not be a significant factor in terms of the time frame for groundwater quality improvement at this site. Rather, groundwater quality improvement will take place as a result of the placement of the cap over the Surface and Trench Fill Areas, leachate removal (secondary source control), and natural processes in the groundwater system including dilution, dispersion and biodegradation.

CURRENT CONDITIONS

Relatively low to non-detectable VOC concentrations have been noted in monitoring wells in the vicinity of the groundwater mound that is centered over the Trench Fill Area.

VOCs have not been detected in monitoring wells downgradient of the north/northeast portion of the landfill. Groundwater quality in this area has not been impacted by the groundwater flux off the mound.

1078 Taylorsville Road, PO Box 93 • Washington Crossing, PA 18977 • Telephone (215) 321-2210 • Fax (215) 321-3312

MOUNDING ANALYSIS

A groundwater mound is present below the Trench Fill Area (Figure 4-15 from RI attached) as a result of the enhanced recharge from landfill activities as well as the inherent low hydraulic properties of the bedrock system in this area. Computer modelling was performed to first simulate the present mounding condition and secondly to simulate the decline of the mound after a single barrier cap had been installed on the Trench and Surface Fill Areas.

The initial analysis involved calibration of an analytical model to simulate present mounding of the water table under the Trench Fill Area. A low transmissivity (18 ft^2/day) was necessary to simulate mounding of the water table over an 8-year time frame since the trench operations began.

This low transmissivity, which was needed to calibrate the model, is consistent with the results from the pumping tests run on monitoring wells in the vicinity of the mound. These tests also indicated very low specific capacities reflective of the low transmissivity of the bedrock system.

Once the model was calibrated to present conditions, the future decline of the mound was then simulated. This simulation involved the predicted infiltration (from the Feasibility Study) through a single barrier cap installed over the Trench and Surface Fill Areas. This model also assumed that the leachate presently within the trenches had been removed as is recommended in the Feasibility Study.

The model predicted that within 6 years after capping, the mound would decline such that groundwater flow would return to the general south to north direction consistent with the regional flow picture that has been developed for the site and area in the RI (Figure 4-13).

Based on the model predictions, a water-level contour map was developed for a period 6 years after the cap had been installed (Figure 1 attached). This map depicts the return to natural groundwater flow conditions.

Given the transient groundwater flow picture immediately following the placement of a cap, and the

relatively short timeframe in which the mound is expected to dissipate, the installation of a pump and treat system around the mound would serve no useful purpose. The placement of the cap as discussed above will result in a return to natural groundwater flow conditions at the site with a direction of groundwater flow from south to north.

GROUNDWATER FLOW AND QUALITY IMPROVEMENT: AFTER A CAP HAS BEEN INSTALLED AND LEACHATE REMOVED

The factors that will result in an improvement in groundwater quality conditions under the landfill and a gradual return towards background conditions are discussed below.

Groundwater flow will be from south to north with clean groundwater flowing in from the south under the landfill.

The effect of the cap will be to reduce the present infiltration by 98 percent.

Groundwater quality improvement under the landfill will occur as a result of:

(1) Source control (secondary) by the virtual elimination of leachate entering the groundwater as a result of reduced infiltration over the landfill.

(2) Dilution: which will take place by the natural groundwater flow/flux from the south mixing with the low to non-detectable VOC groundwater under the site. This will be the major driving force in terms of groundwater quality improvement and return to background conditions.

(3) Hydrodynamic Dispersion: which is a natural process that occurs due to mechanical mixing during fluid advection and also causes dilution of concentrations.

(4) Biodegradation.

PUMP AND TREAT VERSUS NATURAL RENOVATION AFTER CAPPING

Natural renovation will take place as a result of the four factors discussed above, i.e. source control (secondary), dilution, dispersion and biodegradation.

A pump and treat system installed downgradient of the former mound would not enhance any of the natural renovation factors noted above. It would simply serve to attempt to contain groundwater movement to the north.

As such, a pump and treat system installed downgradient of the former groundwater mound will not effectively change the timeframe to return towards background conditions. This is because the pumping system would not significantly influence travel times and groundwater flux under the landfill as a consequence of the low hydraulic conductivity of the bedrock system. As a result of this low hydraulic conductivity, the only noticeable increase in the rate of groundwater movement would be limited to the immediate vicinity of the pumping wells.

Furthermore, a pump and treat system would not remove a substantial mass of constituents given: (1) the low to nondetectable concentrations present in groundwater under the landfill, (2) the remediation of the source (secondary) of these constituents via the placement of the cap and removal of the leachate and (3) the drawing in of clean water to the pumping system from areas to the north/northeast.

In summary, constituent concentrations would decline as a result of the placement of the cap over the landfill (leachate removal), and renovation via natural processes. A pump and treat system would not effectively alter the renovation processes or timeframe.

CURRENT PUBLIC WATER AND DOMESTIC WELL USAGE PROXIMATE TO THE SITE

The Cornerstone Well now serves as the principal source of supply for the areas to the west and north of the NSL. The South Whitehall Township (SWTP) Bridgeview East and Bridgeview West supply wells have been taken out of service and the township plans to abandon them by July 1993.

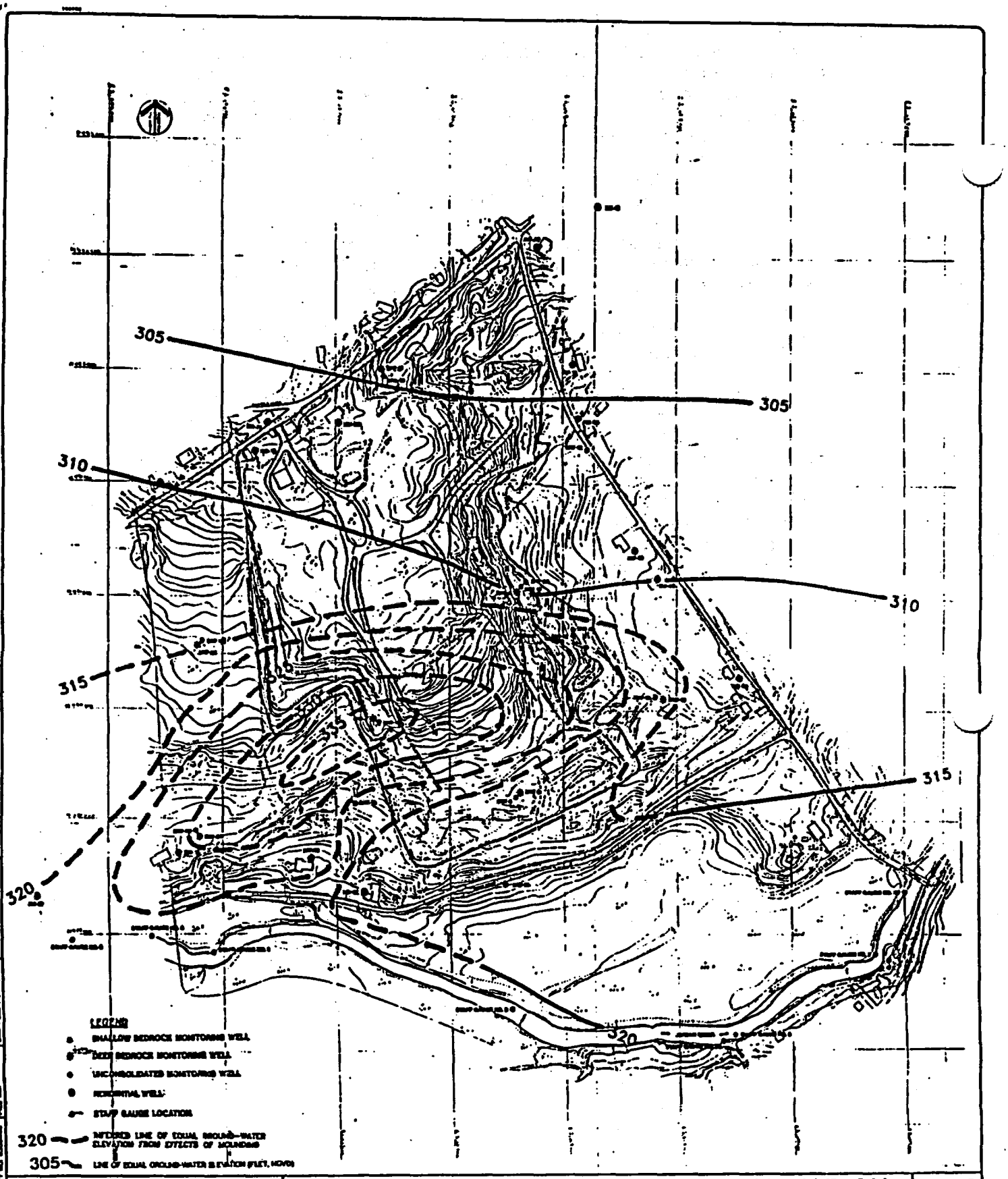
The present Cornerstone Well pump is sized to provide 350 to 380 gallons per minute. After this well was put in service in 1992, the remaining residences along Orefield Road west of the NSL (PRNs 71, 112, 113 and 128) and some additional to the northwest of the NSL (PRNs 7, 29, and 30) near the existing mains were connected to the SWTP system.

The Pheasant Hill community supply well has been taken out of service and the Pheasant Hill Estates community has been connected to the SWTP system. The means of this connection is a 12-inch main extending from the Russell Estates (North Woods) community along Orefield Road to the Carole Lane piping (refer to Figure 2 attached). The Pheasant Hill well is also scheduled to be abandoned in July 1993 by the township.

At present, there are no plans to extend the 12-inch Lime Kiln Road main further east, and this would only be considered by the SWTP were the property (Puchyr) immediately west of the NSL to be developed. Therefore, the Spenser, Hass and Hilda Novak residences continue to rely on private wells.

To the south of the NSL, the 8-inch River Road main has been extended to the easternmost end of the property owned by SWTP. This main was extended to supply SWTP's park located between Jordan Creek and River Road. This main now extends past the two Pidstawksi residences (RW-118 and RW-119), to the southwest of the NSL, and SWTP has notified these residents that they must connect to the SWTP water supply system (refer to Figure 2 attached).

The areas east of the public water supply mains, including the residences along Lapp Road, will continue to rely on private wells for the foreseeable future.

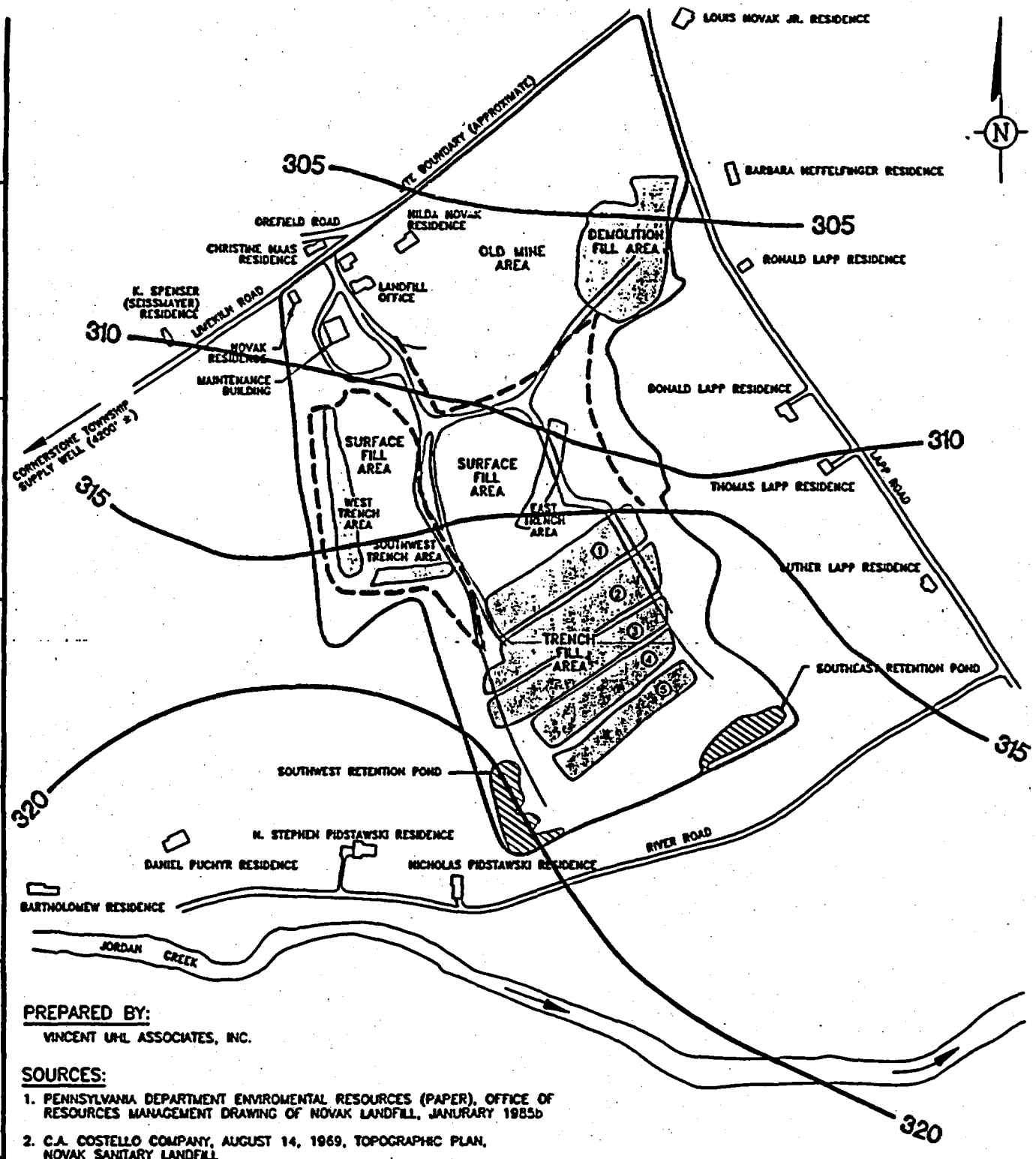


GERAGHTY & MILLER, INC.
Environmental Services

SHALLOW WATER-LEVEL CONTOUR MAP ON JULY 8, 1991 WITH EFFECTS OF MOUNDING

NOVAK SANITARY LANDFILL
SOUTH WHITEHALL TOWNSHIP, PENNSYLVANIA

FIGURE 4-15



PREPARED BY:

VINCENT UHL ASSOCIATES, INC.

SOURCES:

1. PENNSYLVANIA DEPARTMENT ENVIROMENTAL RESOURCES (PAPER), OFFICE OF RESOURCES MANAGEMENT DRAWING OF NOVAK LANDFILL, JANURARY 1985b
2. C.A. COSTELLO COMPANY, AUGUST 14, 1969, TOPOGRAPHIC PLAN, NOVAK SANITARY LANDFILL
3. UNITED STATES ENVIROMENTAL PROTECTION AGENCY, 1989c, SITE ANALYSIS, NOVAK SANITARY LANDFILL, OREFIELD, PENNSYLVANIA FIGURES 8 AND 9, PP 21-22

NOTE: DRAWING NOT TO SCALE

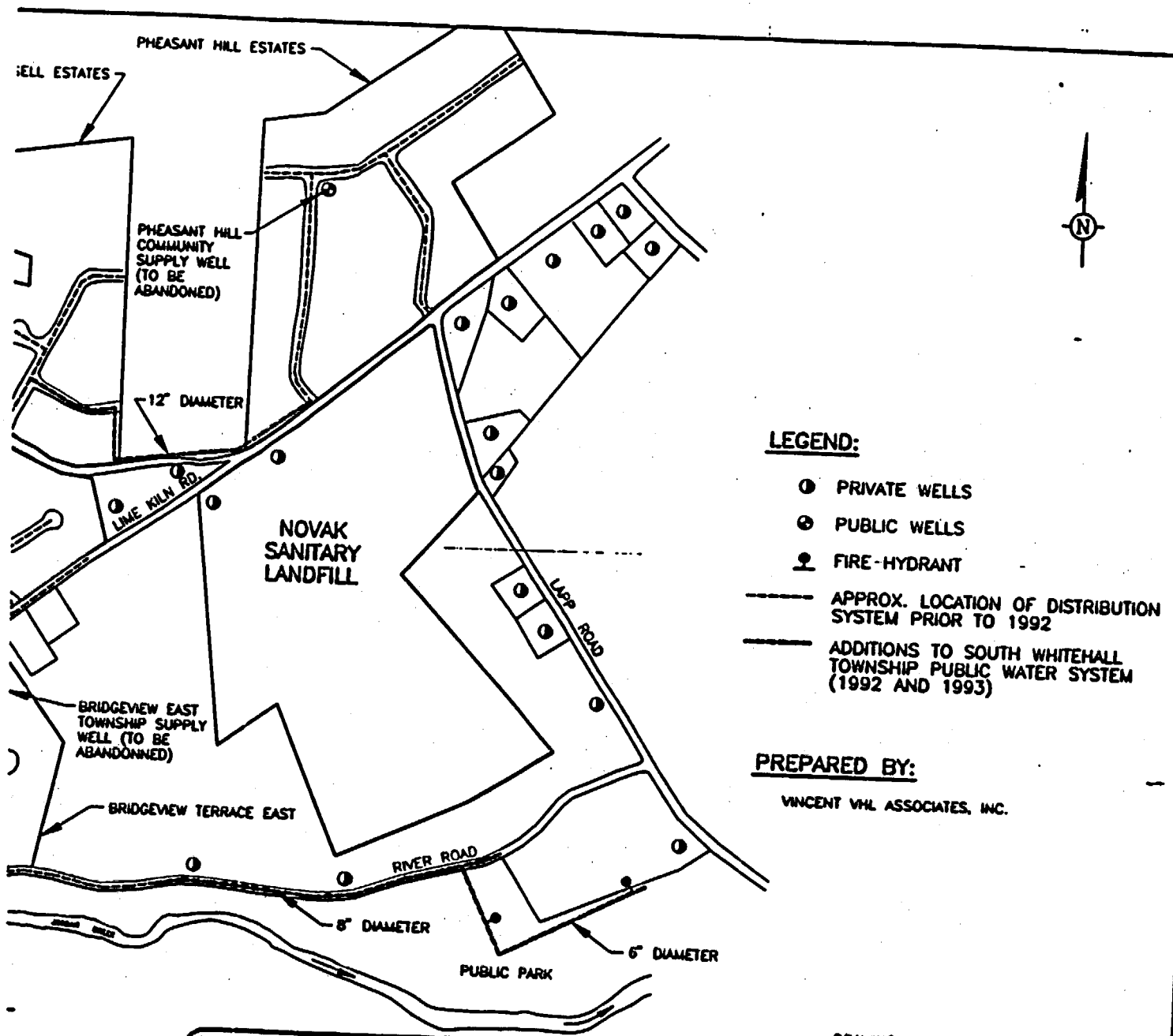
GERAGHTY & MILLER, INC.
Environmental Services

SHALLOW WATER-LEVEL CONTOUR MAP 6 YEARS AFTER A SINGLE BARRIER CAP IS IN PLACE

NOVAK SANITARY LANDFILL
SOUTH WHITEHALL TOWNSHIP, PENNSYLVANIA

FIGURE 1

DWG DATE: 05-20-93 | PROJCT NO.: MD290.01 | FILE NO.: A13-13 | DRAWING: FIG.1 | CHECKED: CHECKER | APPROVED: MANAGER | DRAFTER: TMW


PHEASANT HILL ESTATES
ELL ESTATES
PHEASANT HILL COMMUNITY SUPPLY WELL (TO BE ABANDONED)
12" DIAMETER
LIME KILN RD.
NOVAK SANITARY LANDFILL
LAPP ROAD
BRIDGEVIEW EAST TOWNSHIP SUPPLY WELL (TO BE ABANDONNED)
BRIDGEVIEW TERRACE EAST
RIVER ROAD
8" DIAMETER
6" DIAMETER
PUBLIC PARK
N
LEGEND:
PRIVATE WELLS
PUBLIC WELLS
FIRE-HYDRANT
APPROX. LOCATION OF DISTRIBUTION SYSTEM PRIOR TO 1992
ADDITIONS TO SOUTH WHITEHALL TOWNSHIP PUBLIC WATER SYSTEM (1992 AND 1993)
PREPARED BY:
VINCENT VHL ASSOCIATES, INC.
DRAWING NOT TO SCALE
GERAGHTY & MILLER, INC.
Environmental Services
SOUTH WHITEHALL TOWNSHIP
WATER DISTRIBUTION SYSTEM
NOVAK SANITARY LANDFILL
SOUTH WHITEHALL TOWNSHIP, PENNSYLVANIA
FIGURE
2

ATTACHMENT 2

MEMORANDUM

TO: Mark A. Travers; de maximis, inc.

FROM: J. Lawrence Hosmer; Geraghty & Miller, Inc.
Joseph A. Keller; Geraghty & Miller, Inc.

DATE: May 24, 1993

SUBJECT: Novak Sanitary Landfill; South Whitehall Township, Pennsylvania

---

This memorandum was prepared to summarize the anticipated effects of the recommended alternative of the Novak Sanitary Landfill (NSL) RI/FS (Geraghty & Miller, Inc.; 1992) on ground-water quality at the NSL. Specifically, it considers the effects of reduced infiltration, caused by construction of a single-barrier cover system over the Surface Fill and Trench Fill Areas, on ground-water constituent concentrations. This evaluation is presented for illustration purposes, based on data collected during the RI/FS, but represents anticipated real-world conditions.

In determining the effectiveness of the proposed cover system on long-term ground-water quality at the NSL, the effects of reduced infiltration and ground-water flux on ground-water constituent concentrations within the underlying ground-water regime was evaluated. With construction of the single-barrier cap, including the recommended gas venting layer, over the Surface Fill and Trench Fill Areas during the proposed remedial action, infiltration will be reduced from an annual total of 884,000 cubic feet per year (cf/yr)[12.6 gallons per minute (gpm)] to 18,000 cf/yr (0.3 gpm) [refer to the attached illustration entitled "Infiltration Reduction"]. Based on the hydrogeologic evaluations of the aquifer, a ground-water flux of 6 gpm was estimated for the aquifer in the vicinity of the Trench Fill Area. However, a ground-water flux of 15 gpm was estimated as representative of the aquifer in the vicinity of the northern boundary of the landfill.

Utilizing the analytical data from monitoring wells 1A, 2,6,7,8 and 9, located within the vicinity of the ground-water mound, which demonstrate the highest constituent concentrations, a statistical evaluation concluded that on the order of 5 parts per billion (ppb) is the upper boundary for constituent concentrations within the 98 percent confidence interval (one standard deviation). Therefore, considering that ground-water quality at the site will either remain the same or improve, 98 percent of the sampled ground-water analytes should yield concentrations at or below 5 ppb for each analyte. Utilizing this concentration in association with the reduced average infiltration of 0.3 gpm and the ground-water flux of 6 gpm in the vicinity of the Trench Fill Area, a constituent concentration of 0.5 ppb is projected for the future ground-water quality in the vicinity of the Trench Fill Area. This value, indicative of "worst case" concentrations, is below the typical method detection limit of 1 ppb and, by definition, is below the capability of the instrument to measure the analyte concentration (i.e., is non-detectable).

In conclusion, it is apparent that construction of the single-barrier cover system over the Trench Fill and Surface Fill Areas will reduce infiltration sufficiently to minimize constituent transport to the underlying aquifer such that constituent concentrations in the aquifer will be reduced to non-detectable or "background" concentrations. It is our opinion that the recommended cover will serve in lieu of a ground-water pump and treatment system to effect natural restoration of the aquifer at the NSL.

JLH/JAK:mdf

Exhibit B

Table A-1. COCs on USEPA List Not Posing An Unacceptable Risk.

Chloromethane	The maximum ELCR calculated for chloromethane was 1.7E-11 (Table A-73). No HQs were calculated due to a lack of an appropriate reference dose (RfD).
1,2-Dichloroethylene	The maximum HQ was 0.38 (Table A-49). No ELCR was calculated since this is not regulated as a potential carcinogen.
1,1,1-Trichloroethane	The maximum HQ was 0.0083 (Table A-69); not carcinogenic.
Tetrachloroethylene	The maximum ELCR was 2.3E-06 (Table A-45); the maximum HQ was 0.025 (Table A-49).
Barium	The maximum HQ was 0.18 (Table A-35), and the maximum on-site HQ was 0.091 (Table A-23); not a carcinogen.
Chromium	Maximum ELCR was 5.9E-07 (Table A-65); maximum HQ was 0.52 (same table).
Copper	The maximum HQ was 0.060 (Table A-46); not a carcinogen.
Lead	The USEPA LEAD4 model indicated a geometric mean blood lead level of 2.45 micrograms/dL, with 100 percent of modeled children having a blood lead level less than 10 micrograms/dL (Table A-78). Therefore, lead is not of concern.
Manganese	Maximum HQ was 0.36 (Table A-46); not a carcinogen.
Mercury	Maximum HQ was 0.17 (Table A-23); not a carcinogen.
Nickel	Maximum ELCR was 2.4E-08 (Table A-65); maximum HQ was 0.12 (Table A-33); maximum on-site HQ was 0.11 (Table A-23).

Table numbers refer to tables in the Baseline Risk Assessment.

Table A-2. Primary Contributors to Risk Omitted from USEPA List[1,2].

Chloroform	Maximum ELCR was 1.8E-05 (Table A-51).
1,2-Dichloropropane	Maximum ELCR was 8.8E-06 (Table A-45).
PAHs	Maximum ELCR was 1.5E-05 (Table A-73).
Antimony	Maximum HQ was 3.6 (Table A-73).
Arsenic	Maximum ELCR was 4.7E-05 (Table A-65).
Beryllium	Maximum ELCR was 4.2E-05 (Table A-46).

Table numbers refer to tables in the Baseline Risk Assessment.

1 Constituents with maximum ELCRs greater than 1×10^{-6} but less than 4×10^{-6} were not included on our list. Constituents falling into this category are: bromodichloromethane (ELCR was 1.4E-06 in Table A-22); tetrachloroethylene (ELCR was 2.3E-06 in Table A-45); trans-1,3-dichloropropane (ELCR was 4.2E-06 in Tables A-44 and A-60); 1,4-dichorobenzene (ELCR was 3.7E-06 in Table A-44); methylene chloride (ELCR was 1.5E-06 in Table A-69); and 1,2-dichloroethane (ELCR was 2.7E-06 in Table A-69).

2 Constituents evaluated for non-carcinogenic effects with HQs approximately equal to 1 were not included in our list. Vanadium, arsenic and fluoride had maximum HQs of 1.2 (Table A-65), 0.99 (Table A-65) and 0.88 (Table A-49), respectively.

Exhibit C

de maximis, inc.
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St. Charles, IL 60174
(708) 879-3919
Fax (708) 879-0830

May 21, 1993

VIA FACSIMILE AND
OVERNIGHT COURIER

Mr. Cesar Lee
Remedial Project Manager
United States Environmental Protection Agency
841 Chestnut Building
Philadelphia, PA 19107

Subject: **Documents for Inclusion in the Administrative Record;**
Novak Sanitary Landfill Site

Dear Mr. Lee:

Enclosed is an index of documents exchanged between the Novak RI/FS PRP Group ("Group") and U.S. EPA subsequent to November 4, 1992; the date of submittal of the Final Remedial Investigation and Feasibility Study reports, and the most recent date of documents in the Administrative Record. Copies of the documents referenced in the index are enclosed with the original of this letter for your ease of reference. The documents constitute the more recent documents referenced in the Group's May 6, 1993 letter, and as such should be considered a supplemental to that letter. The Group requests these documents be included in the administrative record for the reasons outlined in the May 6, 1993 correspondence.

Thank you for your attention to this matter. Please call if you have any questions.

Sincerely,
de maximis, inc.

Mark Travers/bms

Mark A. Travers

MAT/bms

Enclosures

cc: Julie Parker, Esq., Hannoch Weisman (index only)
Betsy Lukens, Esq. (index only)

c:\wisword\3009\Adm.Ltr

LIST OF DOCUMENTS FOR PLACEMENT IN THE ADMINISTRATIVE RECORD
May 21, 1993

DATE	TO	FROM	SUBJECT
11/5/92	Cesar Lee	Joe Keller	Revisions to Novak Sanitary Landfill RI/FS
11/6/92	Mark Travers	Cesar Lee	Copy of memo from Wayne Walters to Cesar Lee regarding Proposed plan - Reply - Fowarded
11/10/92	Cesar Lee	Mark Travers	October 1992 Monthly Progress Report
1/10/93	Cesar Lee	Mark Travers	December 1992 Monthly Progress Report
2/10/93	Cesar Lee	Mark Travers	January 1993 Monthly Progress Report
2/11/93	Mark Travers	Cesar Lee	Novak Sanitary Landfill - "Final" RI/FS Approval
2/12/93	Cesar Lee	Mark Travers	Re: Old Mine Area and the Construction/Demolition Area at the Novak Sanitary Landfill site
3/10/93	Cesar Lee	Mark Travers	February 1993 Monthly Progress Report
3/25/93	Mark Travers	Cesar Lee	Attachment A - E in response to letter from Mark Travers dated February 12, 1993 Enc: 3 copies
4/10/93	Cesar Lee	Mark Travers	March 1993 Monthly Progress Report
4/26/93	Cesar Lee	Mark Travers	Draft Agenda for Novak RI/FS Meeting (4/28/93)

LIST OF DOCUMENTS FOR PLACEMENT IN THE ADMINISTRATIVE RECORD
May 21, 1993

DATE	TO	FROM	SUBJECT
4/26/93	Cesar Lee	Mark Travers	U.S. EPA Correspondence dated March 25, 1993 Encompassing and Evaluating Government Comments on Novak Sanitary Landfill Site RI/FS
5/10/93	Cesar Lee	Mark Travers	April 1993 Monthly Progress Report

GERAGHTY & MILLER, INC.
Environmental Services

Ground Water *Engineering* *Hydrocarbon* *Remediation* *Education*

November 5, 1992

Mr. Cesar Lee
United States Environmental Protection Agency
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Re: Revisions to Novak Sanitary Landfill RI/FS
Novak Sanitary Landfill
South Whitehall Township, Pennsylvania

Dear Mr. Lee:

Transmitted herewith are revisions to the referenced report as discussed in the cover letter provided under separate cover by Mr. Mark Travers of de maximis, inc.

The revisions provided herewith include the following:

- One (1) set of Revision No. 01 (Dated November 3, 1992) to the June 1992 RI Report with revisions highlighted with "red-lining" and strike-outs;
- Four (4) sets of Revision No. 01 (Dated November 3, 1992) to the June 1992 RI Report;
- One (1) set of Revision No. 01 (Dated November 3, 1992) to the July 1992 FS Report with revisions highlighted with "red-lining" and strike-outs; and
- Four (4) sets of Revision No. 01 (Dated November 3, 1992) to the July FS Report.

Should you have any questions or comments regarding these submittals, please contact Mr. Travers.

Very truly yours,

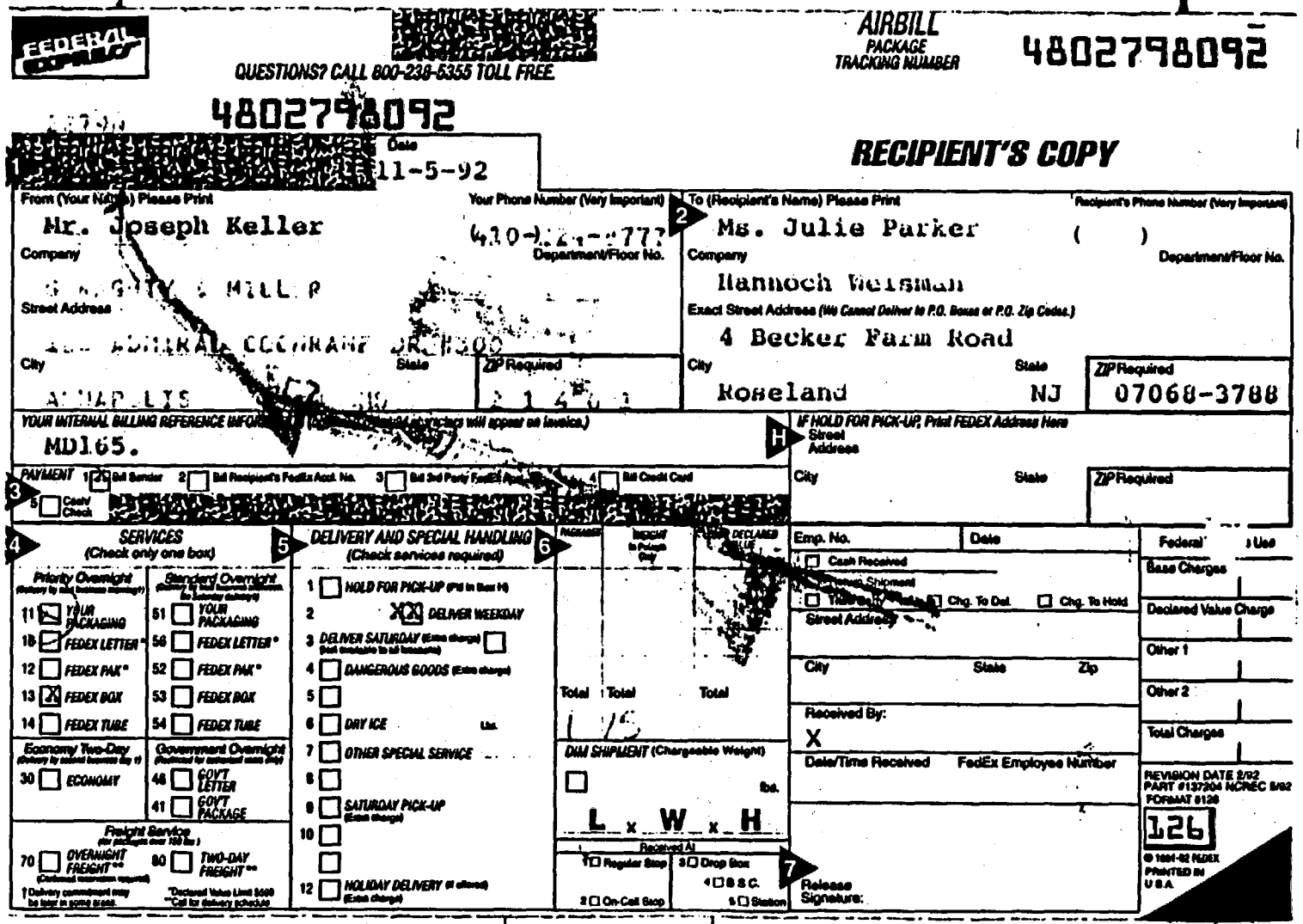
GERAGHTY & MILLER

Joseph A. Keller

Joseph A. Keller, P.E.
Project Manager

JAK/dlw
RI/FS.LTR/NOVAK.N38
cc: M. Heffron, Dynamac (1 set)
M. Mustard, PADER (1 set)
K. Crowley, PADER (1 set)
D. Brems, PADER (1 set)
L. Diamond, Hannoch Weisman (1 set)
J. Parker, Hannoch Weisman (1 set)
M. Travers, de maximis, inc. (1 set)

180 Admiral Cochrane Drive, Suite 300 • Annapolis, Maryland 21401 • (410) 224-8777 • FAX: (410) 224-4778



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1 Date: 11-5-92

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Your Phone Number (Very Important): 410-[illegible]-7772

Company: [illegible] & MILLER

Department/Floor No.:

Street Address: [illegible] ADMIRAL COCHRAN DR. #300

City: ANNAPOLIS

State: MD

ZIP Required: [illegible]

2 To (Recipient's Name) Please Print: Ms. Julie Parker

Recipient's Phone Number (Very Important): ( )

Company: Hannoch Weisman

Department/Floor No.:

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- 12 [ ] FEDEX PAK*
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†Delivery commitment may be later in some areas. *Declared Value Limit $500 **Call for delivery schedule

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		Package	Weight in Pounds Only	Declared Value
1	[ ] HOLD FOR PICK-UP (Fill in Box H)			
2	[X] DELIVER WEEKDAY			
3	[ ] DELIVER SATURDAY (Extra charge) (Not available to all locations)			
4	[ ] DANGEROUS GOODS (Extra charge)			
5	[ ]			
6	[ ] DRY ICE		lbs.	
7	[ ] OTHER SPECIAL SERVICE			
8	[ ]			
9	[ ] SATURDAY PICK-UP (Extra charge)			
10	[ ]			
11	[ ]			
12	[ ] HOLIDAY DELIVERY (If offered) (Extra charge)			
	Total	Total	Total	

DIM SHIPMENT (Chargeable Weight)

[ ] lbs.

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Date/Time Received FedEx Employee Number

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Declared Value Charge

Other 1

Other 2

Total Charges

REVISION DATE 2/92 PART #137204 NCREC 5/92 FORMAT 6128

126

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3009-03

Re: Novak Landfill

From: Wayne Walters (WWALTERS)
To: CLee
Date: Friday, November 6, 1992 9:34 am
Subject: proposed plan -Reply -Forwarded

Forwarded mail received from: LBULATAO

Ceasar,
Here is a proposed plan and the RPM to talk to regarding the plan. Also there is the OSWER Directive 9355.0-02 which tells you how to prepare a proposed plan and ROD. If you don't have a copy let me know and I'll get you one.

Wayne

CC: ELukens

Files: m0:MESSAGE

From: Laura Bulatao (LBULATAO)
To: WWALTERS
Date: Friday, November 6, 1992 9:10 am
Subject: proposed plan -Reply

If your preferred alternative is a cap and cover system for the landfill, you could talk to Steve Hirsh (x0549) about the Michaelsville Landfill at Aberdeen Proving Ground. Actually, you might want to talk to him anyway because he's one of the most experienced and knowledgeable RPMs around. Good luck!

From: Wayne Walters (WWALTERS)
To: CLee
Date: Friday, November 6, 1992 9:36 am
Subject: proposed plan -Reply -Forwarded

Forwarded mail received from: PLAZOS
Here's another. Also I recommend you talk to Fran she's very good.

CC: ELukens

Files: m0:MESSAGE

From: Pamela Lazos (PLAZOS)
To: WWALTERS
Date: Thursday, November 5, 1992 3:35 pm
Subject: proposed plan -Reply

Fran Costanzi -- Dorney Road -- I have a copy of the PRAP if you are so inclined to review it.

Rec'd 11/24/92

From: Cesar Lee (CLEE) CL
To: FCOSTANZ, SHIRSH
Date: Friday, November 6, 1992 2:49 pm
Subject: Michaelsville/Dorney Proposed Plans

Fran & Steve,
Your attorneys nominated Michealsville Landfill & Dorney Road as ideal landfill "Proposed Plans" that matches what I'll have to draft to ORC's tastes. Can you direct me to where I can get a copy? Thanks.

x-8257

cc: E. Lorenz (3RC21) 11/24/92
M. Heffern, Dynamac
M. Mustard, PADER
M. Tenbus, de maximus

Attachments - Michealsville Landfill Proposed Plan
Dorney Road Proposed Plan

~~20, 21, 24, 25~~ Probable

Cesar Lee

Superfund Program Proposed Plan

Dorney Road Landfill

Upper Macungie Township, PA

August 1991

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the preferred alternative for remediating the Dorney Road Landfill Site. In addition, the Plan includes summaries of other alternatives analyzed for this Site. This document is issued by the U. S. Environmental Protection Agency (EPA), the support agency for site activities, in consultation with the Pennsylvania Department of Environmental Resources (PADER), the lead agency. This remedy will protect current users of contaminated *ground water* and provide long term monitoring of ground water. EPA will select a final remedy for the Site only after the public comment period has ended and the information submitted during this time has been reviewed and considered.

EPA, in consultation with PADER, may modify the preferred alternative or select another response action presented in this Plan and the RI/FFS report based on new information or public comments. The public is therefore encouraged to review and comment on all the alternatives identified here.

EPA has prepared this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the *Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)*. This document summarizes information that can be found in greater detail in the *Remedial Investigation and Focused Feasibility Study (RI/FFS)* report and other documents contained in the *Administrative Record* file for this Site. EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted there. The Administrative Record file, which contains information upon which the selection of the response action will be based, is available at either of the following locations:

Upper Macungie Twp. Bldg.
8330 Schantz Road
Breinigsville, PA
(215) 395-4892
Hours: Mon-Fri
7:30AM-4PM

Margaret Leva
Admin. Record Coordinator
U. S. EPA - Region III
841 Chestnut Building
Philadelphia, PA 19107
(215) 597-3037
Hours: Mon-Fri
8:30 AM-4:30 PM

Dates to remember:
Mark Your Calendar

August 8 - September 6, 1991
Public comment period on alternatives in Proposed Plan.

August 13, 1991
Public meeting at Upper Macungie Township Municipal Bldg., 8330 Schantz Road, Breinigsville, 7:30PM

A glossary of terms that may be unfamiliar to the general public is provided in the pullout pages of this Proposed Plan. The terms are in *bold italics* in the text to highlight their availability in the glossary.

AR308670

Remediation Studies and Activities

After the Army closed the MLF in 1980, inspections of the landfill cap and condition were made by the Harford County Department of Health in 1981, the Maryland Department of Health and Mental Hygiene in 1983, the Army Environmental Hygiene Agency in 1985, the U.S. Army Waterways Experiment Station from 1987 through 1990, and the MDE in 1991.

These studies of MLF pointed to a need to remediate the cover to:

- minimize seepage of liquids through the landfill;
- ensure the cover will function with minimum maintenance;
- promote drainage and minimize erosion or abrasion of the cover;
- accommodate settling and subsidence so that the cover's integrity is maintained; and
- provide adequate venting for any methane gases produced by the landfill wastes.

Proposed remedial action alternatives are:

Alternative 1 $0.00
No action

Consideration of "no action" is required by law; in this case it is useful for comparison purposes.

Alternative 2 $7,442,400
Redress the Landfill Cap

Redress the existing cap with a minimum of three-foot-thick, low-permeability, compacted clay, graded to provide adequate surface drainage and stabilized with topsoil and grass. A gas venting system also would be incorporated.

Alternative 3 $9,616,600
Install a New Cap Using Off-Post Clay in Accordance with MDE Requirements for Sanitary Landfill Closure

Install a new, multilayered cap system that would include:

- a compacted, two-foot earthen material layer of low permeability;
- a low-permeability, one-foot-thick clay cap;
- a minimum six-inch drainage layer;
- a final two-foot minimum topsoil cover with a four percent minimum slope and vegetation to stabilize it; and
- gas venting.

Alternative 4 $10,001,000
Install a New Cap in Accordance with RCRA Requirements for Hazardous Waste Landfill Closure

Construct a capping system that would include:

- a compacted, two-foot-thick clay layer of low permeability;
- a minimum 20-mil-thick layer of synthetic geomembrane;
- a minimum one-foot-thick drainage layer;
- a final two-foot minimum topsoil cover with a four percent minimum slope and vegetative stabilization; and
- gas venting.

Alternative 5 $9,207,200
Install a New Cap in Accordance with MDE Requirements for Sanitary Landfill Closure Using a Geosynthetic Membrane

Install a new cap in accordance with MDE requirements that would include:

- a compacted, two-foot-thick earthen material layer of low permeability;
- a minimum 20-mil-thick layer of synthetic geomembrane;
- a minimum one-foot drainage layer;
- a final two-foot minimum topsoil cover with a four percent minimum slope and vegetation to stabilize it; and
- gas venting.

In addition, an assessment of excavation alternatives also was performed. The excavation alternatives included:

Alternative 1A
Excavating and Hauling Waste Offsite

Alternative 2A
Excavating and Incinerating Waste

Alternative 3A
Excavating Waste, Lining Cavity, Replacing Waste, and Capping Landfill

The primary purpose of the selected alternative is to reduce contaminants entering ground water, surface water and soil. This also will prevent airborne spread of contaminants from the landfill and incidental contact with contaminants near the surface. Based on its effectiveness in limiting risks associated with the MLF site under current and future land use conditions, protection of human health and the environment, compliance with applicable or relevant and appropriate requirements, and cost effectiveness, the preferred alternative is Alternative 5: Install a new cap in accordance with MDE requirements for sanitary landfill closure using a geosynthetic membrane.

This study focuses on the landfill as a source of contamination and not on the contaminants present in the ground water, surface water or soil. The Army will conduct further studies to determine the nature and extent of contamination at the MLF site.

For example, under future land use conditions, the ingestion, skin contact and inhalation of contaminants from ground water is a potential human exposure pathway that presents potential cancer risks in both shallow and deep ground water. The PRA noted that the future use of ground water beneath MLF is unlikely. However, the evaluation of risks associated with the ingestion of ground water was performed because future pumping of off-site wells at a high rate could potentially draw upon ground water beneath MLF.

Lesar Lee

FACT SHEET

U.S. ARMY ABERDEEN PROVING GROUND

APRIL 1992

Michaelsville Landfill Remediation Action Plan

Contents of Fact Sheet

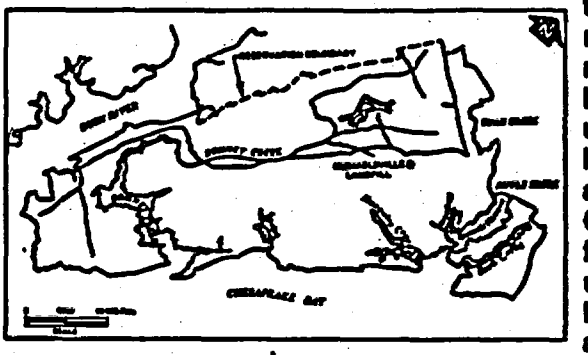
Overview

Michaelsville Landfill (MLF) is no longer in use in the Aberdeen Area (AA) of the Aberdeen Proving Ground (APG). The landfill was used as a disposal ground for domestic refuse from APG. In addition, MLF is suspected to have received limited amounts of solvents, pesticides, paints, motor oils, and transformer oils, and minor amounts of excess chemical reagents. The current clay cover has allowed surface water to pool and infiltrate through the landfill, carrying some degree of contamination into the underlying aquifer. The selected remedy will minimize ground and surface water contamination from the landfill.

Site Description

APG is located along the western shores of the Chesapeake Bay in Harford and Baltimore Counties, Maryland, approximately 15 miles northeast of Baltimore. APG covers a total land and water area of 72,500 acres and is divided into two areas. The northern portion of APG is referred to as the Aberdeen Area, and the southern portion is referred to as the Edgewood Area (EA).

APG was established in 1917 as the Ordnance Proving Ground and was designated a formal military post in 1919. APG's primary mission has been and continues to be the testing and development of weapons, munitions, vehicles, and a wide variety of military support materiel.



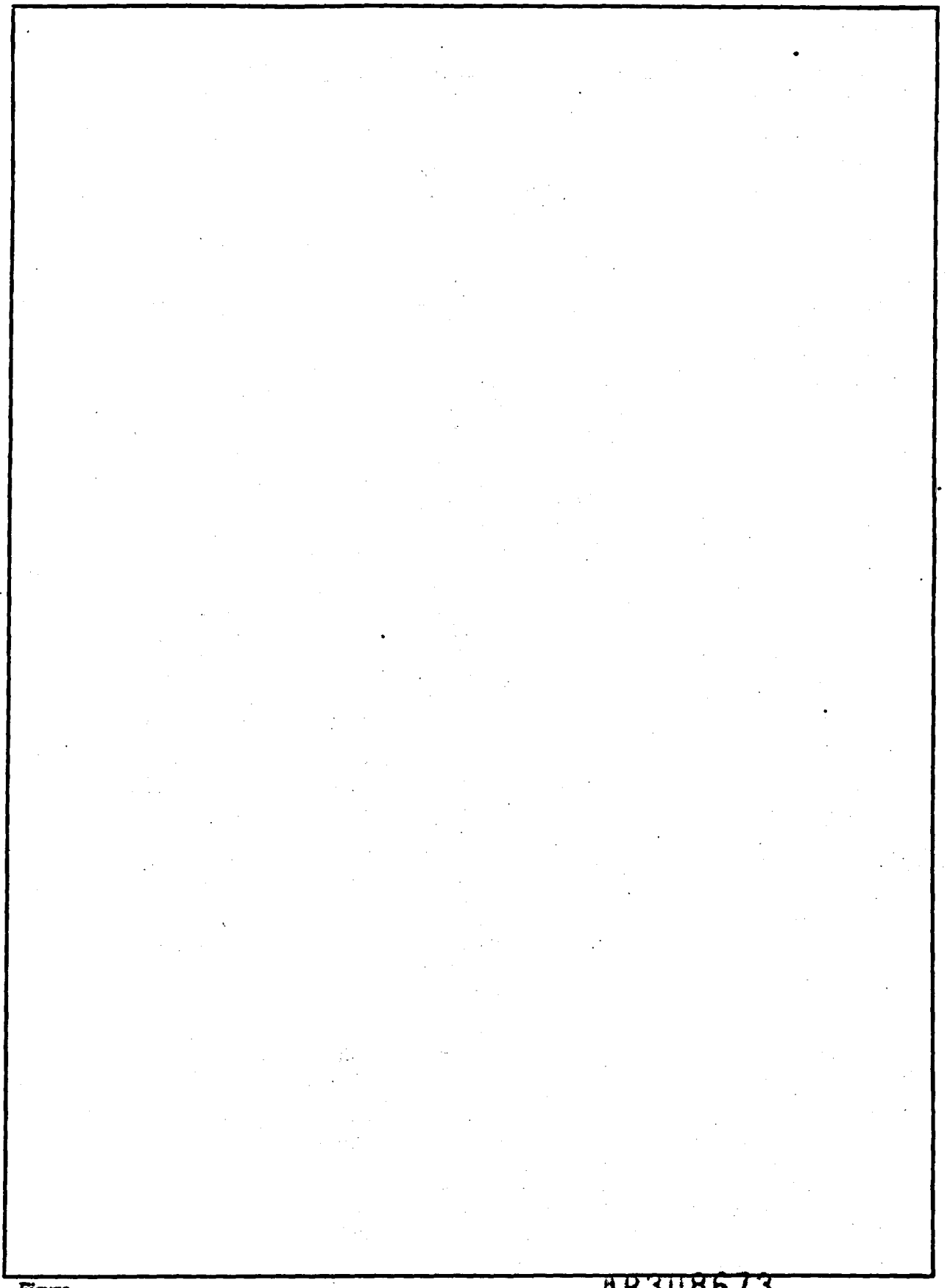
MLF is a 20-acre area located between Michaelsville Road and Trench Warfare Road. The site was used as a landfill for domestic and non-industrial APG wastes from about 1969 until the Army closed it in 1980. Trench and fill methods were used for waste disposal, where wastes were covered with soil and compacted with a bulldozer. While the majority of materials reportedly disposed of in the MLF were trash from non-industrial sources at APG, other materials may have been disposed in limited quantities, including solvents, waste motor oils, polychlorinated biphenyl (PCB) transformer oils, paints, and pesticides.

A soil cover was installed in the early 1980's which supports small trees, grass and shrubs. The cover has been eroded and has developed small depressions which allow water to enter the landfill and emerge as seepage. Several drainage ditches that drain into a tributary of Romney Creek are located around the landfill and receive run-off from the seepage.

The landfill lies above several layers of clay, silt, sand, and gravel, which comprise two separate aquifers. Thick layers of clay between the two aquifers are thought to retard water movement between the upper and lower aquifers. Ground water flow in the upper and lower aquifers is generally south and east, with infrequent flow to northeast and north-northeast. Overall, regional ground water is flowing southeast toward the Chesapeake Bay and away from nearby city wells.

Wildlife in the area of the landfill probably includes deer, turkey, song birds, rabbits, field mice, bald eagles, small shorebirds, aquatic invertebrates, amphibians, and fish. Hunting is allowed on and near the landfill, and trapping is allowed around a tributary of Romney Creek approximately 3,000 feet southwest of the landfill.

APG barracks are located approximately one mile north of the landfill, and on-post family housing is located about two miles north of the landfill. The City of Aberdeen lies approximately four miles north of the landfill, and Perryman is approximately 2.5 miles west of the landfill. All of these residential areas are outside of the fenced, controlled area of the AA.



Figure

SITE BACKGROUND

The Dorney Road Landfill Site is located in Upper Macungie Township, Lehigh County, with a portion of the Site extending into Longswamp Township, Berks County, as shown in the figure. The Site is located approximately eight miles southwest of Allentown, Pennsylvania.

The Site, which contains an inactive, unpermitted municipal landfill, is located in a area of highly *fractured bedrock*, and is surrounded by farm fields. Area residences use ground water as the water supply source. Dorney Road runs along the eastern boundary of the Site. No perennial streams exist in the vicinity of the Site.

The Site initially operated as an open pit iron mine. Waste disposal operations began in 1959, with waste being dumped in the abandoned iron mine. Landfill operations continued until December 1978, although a landfill permit was never approved for the Site.

SCOPE AND ROLE OF ACTION

PADER, the lead agency for the RI/FFS, conducted an investigation in 1986-1988 to evaluate the nature and extent of the contamination and develop a remedial strategy. The site work has been divided into two manageable components called *Operable Units (OUs)*. These are as follows:

- OU 1: Landfill Waste, Soil and Surface Water
- OU 2: Ground Water

The remedy for OU 1 was documented in the *Record of Decision (ROD)* issued in September 1988. That selected remedy consists of constructing a *synthetic membrane cap* over the landfill, in accordance with the Pennsylvania Municipal Waste Management Regulations. The remedy also included controlling and monitoring Site runoff, installing a perimeter fence, ground water monitoring and placing restrictions on the deed to the property. In September 1990, EPA issued a Unilateral Administrative Order to seven *Potentially Responsible Parties (PRPs)* after unsuccessful negotiations. A second Order was issued in January 1991 to an eighth PRP. The Orders require the PRPs to implement the remedy described in the ROD for OU 1. OU 1 addressed the relatively low, long term threat caused by the unlined municipal landfill. The PRPs have begun implementing the remedy for OU 1.

This Proposed Plan discusses the second of two operable units planned for the Site. The investigation for OU 2 was conducted from 1989 to the present. The remediation objective for OU 2 is to prevent human exposure to contaminated ground water. Two secondary objectives were to: 1) protect uncontaminated ground water by minimizing further migration, and 2) restore contaminated ground water to safe levels for future use.

SUMMARY OF SITE RISKS

Monitoring data collected during the RI was used to characterize the nature and extent of ground water contamination at the Dorney Road Landfill Site.

As is common with landfills, several contaminants are contributing to the risk at the Dorney Road Landfill Site. The principle *Volatile Organic Compounds (VOCs)* contributing to the risk include vinyl chloride; chloromethane; 1,2-dichloroethene; 1,1,1-trichloroethane; carbon tetrachloride; trichloroethene; benzene; and tetrachloroethene. Metals contributing to the risk include cadmium, chromium, lead, manganese, and mercury.

A risk assessment was conducted assuming that the ground water associated with the Dorney Road Landfill Site is used as a domestic water supply source. Residents who currently, or at some time in the future, will rely on private ground water wells drawing water from the contaminated *aquifer* are the principal human receptors of concern. The routes of exposure, which are ingestion and inhalation during showering, were evaluated in the risk assessment. Potential human health problems are identified by calculating the risk level and ***hazard index***. Potential carcinogenic risks are identified by the risk level. A 1×10^{-6} level indicates one additional chance in 1,000,000 that an individual will develop cancer above the expected normal rate of 250,000 in 1,000,000. The risk calculated is the maximum risk that is reasonably expected to occur. The hazard index identifies the potential for the most sensitive individuals to be adversely affected by non-carcinogenic chemicals. If the hazard index exceeds one (1.0), there may be concern for potential non-carcinogenic effects. As a rule, the greater the value of the hazard index above 1.0, the greater the level of concern. Changes in the hazard index, however, must be one or more orders of magnitude (e.g., 10 times greater), to be significant.

The principal risk analysis results may be summarized as follows:

- The excess lifetime cancer risk for a human receptor currently exposed to contaminants in the ground water immediately downgradient (approximately 2,500 feet), from the Dorney Road Landfill is 1.14×10^{-5}. This means that approximately one additional person out of 100,000 is at risk of developing cancer caused by 30 years of exposure to site related contaminants averaged over a lifetime (70 years), if the ground water is not remediated or treated. Remedial action is generally warranted when the calculated carcinogenic risk level exceeds 1×10^{-4}. At the 1×10^{-4} level, one additional person out of 10,000 is at risk of developing cancer caused by a lifetime of exposure to contaminants in the ground water.

- Cancer risk levels associated with contamination in areas further downgradient from the landfill are currently less than 1×10^{-6}, and therefore are also considered protective by EPA.

- There is minimal risk for someone currently exposed to non-carcinogenic contaminants immediately downgradient from the Site, as the hazard index ranges from 0.11 to 0.37, depending on the age group calculated.

- Estimated future risk from the contaminated ground water is 1.65×10^{-4}. This estimate assumes someone would frequently be exposed to ground water from wells in the field directly across the road from the landfill. The hazard index ranges from 0.85 to 2.7, representing slight future non-carcinogenic risk under this scenario.

- Since the residential well sampling began, one of the residential wells has had levels slightly higher than one of the ***Maximum Contaminant Levels (MCLs)***. The MCL for trichloroethene is 5 micrograms per liter (μg/l), and during various samplings, 9, 7, and most recently 5 μg/l was found in samples from the well.

It is important to note that risk is based on a theoretical human in a theoretical circumstance. Most residents now living in the vicinity of the Dorney Road Site are not being exposed to contaminated ground water.

SUMMARY OF ALTERNATIVES

An initial list of remedial response actions and associated technologies was identified and screened to meet the ground water specific remedial objectives. The technologies that passed the screening were assembled into five remedial alternatives. Alternative 1, No Action, provides a baseline

to which other alternatives can be compared. Alternatives 2 and 3 were developed to prevent human exposure to contaminated ground water. Alternatives 4 and 5 were developed to address remediation of contaminated ground water. Each alternative was evaluated on the assumption that the PRPs would close the unlined landfill, including installation of a cap, in accordance with the first ROD.

Alternative 1 - No Action

*Capital Cost: $0**
Operation and
Maintenance (O&M) Costs: $14,160 (annually)*
$32,536 (every 5 years)*
*Present Worth: $268,796**
*Time to Implement: None**

This alternative is considered in the detailed analysis to provide a baseline to which the other remedial alternatives can be compared. This alternative involves taking no action at the Dorney Road Site to contain, remove, or remediate the contaminated ground water. Under this alternative, both residential and existing monitoring wells would be monitored. No remediation of ground water would be performed and the potential risk to users of ground water would continue.

For costing purposes, it was assumed that 4 existing monitoring wells would be sampled on a quarterly basis. In addition, 5 residential wells would be sampled on a quarterly basis for a 30-year period. Because this alternative would result in contaminated ground water remaining on site, 5-year site reviews, pursuant to Section 121(c) of CERCLA, would be required to monitor the effectiveness of this alternative.

Alternative 2 - Alternate Water Supply

*Capital Cost: $0**
O & M Costs: $15,469 (annually)*
$33,845 (every 5 years)*
*Present Worth: $288,193**
*Time to Implement: one month**

This alternative considers providing an alternative water supply to affected residences in order to reduce the potential risk to human health. Periodic monitoring of ground water from monitoring wells and residential wells as described in Alternative 1 would provide a warning system for downgradient users, should the contaminant plume spread into uncontaminated areas. For this alternative, bottled water service would be supplied to affected residences. Bottled water would be used for consumption and cooking. Ground water would continue to be used for aesthetic purposes (bathing, washing clothes, etc.), and therefore a potential health risk may occur though this risk would be reduced.

For costing purposes, it was estimated that one residence will receive bottled water. Ground water monitoring and five year reviews would also be required as described in Alternative 1.

* All costs and implementation times are estimates.

Alternative 3 - Wellhead Treatment

*Capital Cost: $1,400**
O & M Costs: $14,410 (annually)*
$32,786 (every 5 years)*
*Present Worth: $274,040**
*Time to Implement: one month**

This alternative consists of providing wellhead treatment units for residences with contaminated wells. Because contaminated ground water at the Site presents a potential human health risk from both ingestion and inhalation (ie. during showering), this alternative involves treating contaminated ground water at the well, before it is used in the residence. At this time, the proposed treatment units would consist of small activated carbon units placed in-line to remove VOCs. Other comparable treatment units could be used depending on the specific site related contaminants found in the residential well. Proper maintenance and monitoring would be required to ensure the effectiveness and safety of these units. This maintenance would involve removing and replacing spent carbon. Spent carbon would be returned to the vendor for regeneration.

For costing purposes, it was assumed that one residence would receive a treatment unit. Ground water monitoring and five year reviews would also be required as described in Alternative 1.

Alternative 4 - Plume Containment

*Capital Costs: $3,768,945**
O & M Costs: $539,335 (year 1)*
$528,535 (years 2-30)*
$552,411 (every 5 years)*
*Present Worth: $11,968,534**
*Time to Implement: 88 years**

The plume containment alternative was developed to prevent increased contamination of ground water and protect uncontaminated ground water by extracting and treating the contaminated ground water beneath and adjacent to the landfill. Under this alternative, approximately six extraction wells would be installed approximately 360 feet east of the landfill, and approximately six injection wells would be installed downgradient from these extraction wells. Any portion of the plume downgradient of these wells would be remediated in a passive manner, allowing natural processes such as degradation, attenuation and dilution to reduce contaminant levels. Actual locations and flows would have to be determined during the design phase. The proposed treatment system for the extracted water would include an ion exchange unit to remove metals and an air stripper for VOC removal.

For costing purposes, it was assumed the wells would extract approximately 300 gallons per minute. Ground water monitoring and five year reviews would also be required as described in Alternative 1, with additional monitoring to evaluate the effectiveness of the plume containment system.

* All costs and implementation times are estimates.

Alternative 5 - Aquifer Restoration

*Capital Costs: $7,785,004**
O & M Costs: $1,093,213 (year 1)*
$1,069,213 (years 2-30)*
$1,093,089 (every 5 years)*
*Present Worth: $24,310,746**
*Time to Implement: 70+ years**

This alternative is similar to Alternative 4, except that approximately 15 extraction wells would be used for ground water removal, and the treated ground water would be reinjected, using approximately 14 injection wells. Under this alternative, the ground water injection wells would, in theory, establish a closed loop system where all reinjected water is controlled and eventually recaptured. In theory, such a system would reduce restoration times by flushing contaminants from the ground. In actuality, this is would be difficult in complex geology, since it is often not possible to control the reinjected water. Because of the uncertainties associated with the volume of contamination, aquifer properties, and source characteristics, the treatment times are difficult to predict. The proposed treatment system would be the same as described in Alternative 4.

For costing purposes, it was assumed that the wells would extract approximately 750 gallons per minute. Ground water monitoring and 5-year site review would also be provided, as described under Alternative 1, with the additional monitoring required to evaluate the effectiveness of the remediation.

EVALUATION OF ALTERNATIVES

The preferred alternative for OU 2 is Alternative 3, providing wellhead treatment to current users whose well water exceeds either: primary MCLS, health-based risk levels outside of EPA's acceptable risk range, or a hazard index greater than 1.0. An extensive ground water monitoring program is proposed for the monitoring wells and residential wells. Should levels of Site related contaminants increase above protective levels in currently existing residences within the plume area, EPA proposes that wellhead treatment also be supplied to these residences. EPA is proposing to waive, based on technically impracticability, PADER's Hazardous Waste Regulations in which the ground water goal is to remediate the contaminant levels to background. EPA is also proposing to waive MCLs in the off-site ground water. Based on current information, this proposed remedy would provide the best balance among the alternatives with respect to the nine criteria that EPA uses to evaluate alternatives. This section profiles the performance of the preferred alternative against the nine criteria, noting how it compares to the other alternatives under consideration. A glossary of the nine criteria is provided in the shaded box.

Overall Protection of Human Health and the Environment. All of the alternatives, with the exception of the no action alternative, would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through treatment or engineering controls. The preferred alternative would reduce the potential health risk caused by contaminated ground water by treating the water with activated carbon. Monitoring of the ground water and residential wells further downgradient from the Site would provide assurance of the protectiveness of the remedy. Alternative 2 would only continue to be protective as long as residents continued to use the bottled water.

Because the no action alternative is potentially not protective of human health and the environment, it is not considered further in this analysis.

* All costs and implementation times are estimates.

GLOSSARY OF EVALUATION CRITERIA

Threshold Criteria

- Overall Protection of Human Health and Environment - addresses whether a remedy provides adequate protection and describes how risks are eliminated, reduced, or controlled.
- Compliance with ARARs - addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of environmental statutes.

Primary Balancing Criteria

- Long-Term Effectiveness and Permanence - refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals are achieved.
- Reduction of Toxicity, Mobility, or Volume Through Treatment - is the anticipated performance of the treatment technologies a remedy may employ.
- Short-Term Effectiveness - addresses the period of time needed to achieve protection and any adverse impacts on human health and environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability - the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost - includes estimated capital, operation and maintenance costs, and present worth costs.

Modifying Criteria

- State Acceptance - indicates whether, based on its review of the backup documents and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative.
- Community Acceptance - will be assessed in the Record of Decision following a review of any public comments received on the RI/FS report and the Proposed Plan.

Compliance with *Applicable or Relevant and Appropriate Requirements (ARARs)*. Alternatives 4 and 5 would ultimately achieve ARARs at the Site. Alternative 2 and the preferred alternative would comply with MCLs for samples drawn from residential faucets. The preferred alternative would not comply with the background remedial action levels based on Pennsylvania's Hazardous Waste Regulations. Also, neither alternative would remediate ground water to MCLs. EPA is proposing to waive the requirement to remediate to background levels and to MCLs based on technical impracticability. These ARARs would be waived for several reasons, including: 1) the lack of suitable discharge areas

within a reasonable distance from the Site and 2) the lack of confidence in the reliability of reinjection of treated water within the vicinity of the Site. MCLs would be met prior to use of the ground water by residents.

Discharge of treated ground water to surface water or to a Publicly Owned Treatment Works (POTW) was screened out earlier in the feasibility analysis process due to a lack of suitable discharge areas. No surface water bodies or POTWs of adequate size were located within a reasonable distance from the Site. The Site is located in an area of highly fractured bedrock. Reinjection of treated ground water would be an unreliable process, since reinjected water would be likely to travel along fractures and would be difficult to control and monitor. In a worse case scenario, the reinjected water might flow back towards the landfill and cause higher levels of contaminants to be flushed out.

Construction of an extraction, treatment and reinjection system would also cause the destruction of land designated as prime farmland. EPA is required to consider the impact of its actions on significant agricultural lands, such as the area surrounding the Site.

Long-term Effectiveness and Permanence. Alternatives 3, 4, and 5 would all be effective in the long term if properly operated and maintained, although only Alternatives 4 and 5 would attempt to permanently remediate the ground water. The long term effectiveness of Alternativeness 4 and 5 would also be dependent on the degree of success in reinjecting the treated water. Alternative 2 would only continue to be effective as long as residents provided with bottled water continued to use it.Under the preferred alternative, the residences supplied with a home treatment unit would not be exposed to contaminated ground water. The long-term effectiveness at these residences would be dependent on proper operation and maintenance of the unit.

Other residences further downgradient would be protected by a monitoring system, which would both monitor the effectiveness of source controls measures from OU 1 and act as an early warning system should contaminants spread further from the landfill. The effectiveness of the remedy is also dependent on limiting the installation and use of wells immediately downgradient from the landfill, as this could alter ground water flow in the area around the Site.

Reduction of Toxicity, Mobility, or Volume Through Treatment. Only Alternatives 4 and 5 would reduce the toxicity, mobility and volume of contaminants in the ground water through treatment. The preferred alternative does not significantly reduce the toxicity, mobility or volume of the contaminants through treatment, except in the residences which are provided with the treatment systems. Over time, the contaminants in the ground water are expected to decrease as infiltration through the source is limited by the cap.

Short-term Effectiveness. Alternatives 4 and 5 would only be effective in reducing risk after a long time, since it potentially would be years before the aquifer is remediated. The ground water extraction alternatives would theoretically require approximately 70 to 88 years to remediate the ground water to background levels. Both Alternative 2 and the preferred alternative would reduce the risk associated with exposure to contaminants in the drinking water almost immediately.

Implementability. Ground water remediation can be very difficult, especially in complex geologic areas, such as in the fractured bedrock area of the Dorney Road Landfill Site. Extensive pre-design studies would be necessary to determine actual extraction and reinjection well placement and other design information for Alternatives 4 and 5.

The preferred alternative is easily implementable since home treatment units are a fairly common, accepted technology. Alternative 2 would also be easy to implement.

Cost. The highest cost option is Alternative 5, with a *present worth* cost estimate of $24,310,748. Alternative 2 is estimated to cost $288,193, and Alternative 4 is estimated to cost $11,968,534. Capital costs and annual operation and maintenance costs associated with the preferred alternative are $1,400 and $14,410 annually, including monitoring. The present worth cost estimate for the preferred alternative is $274,040.

State Agency Acceptance. PADER supports the preferred alternative with comment.

Community Acceptance. Community acceptance of the preferred alternative will be evaluated after the public comment period ends, and will be described in the ROD Responsiveness Summary for OU 2.

SUMMARY OF THE PREFERRED ALTERNATIVE

In summary, the preferred alternative is believed to provide the best balance of trade-offs among the alternatives with respect to the nine evaluation criteria. Based on the information available at this time, therefore, EPA believes the preferred alternative would protect human health and the environment, would be cost-effective, would utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. With the exception of the background and MCL ARARs that EPA proposes to waive, this alternative complies with ARARs. The preferred alternative will not satisfy the preference for treatment as a principle element.

THE COMMUNITY'S ROLE IN THE SELECTION PROCESS

EPA solicits input from the community on the cleanup methods proposed for each Superfund response action. EPA has set a public comment period from August 8 through September 6, 1991, to encourage public participation in the selection process. The comment period includes a public meeting at which PADER, with EPA, will present the RI/FFS Reports and Proposed Plan, answer questions, and accept both oral and written comments.

A public meeting is scheduled for 7:30 PM on August 13, 1991, and will be held at the Upper Macungie Township Building, 8330 Schantz Road, in Breinigsville, Pennsylvania. The Township Building is located on Schantz Road one mile west of Route 100.

Comments will be summarized and responses provided in the Responsiveness Summary section of the ROD. The ROD is the document that presents EPA's final selection for cleanup. To send written comments or obtain further information, contact:

Alan Brown
Community Relations Coordinator
U. S. EPA - Region III
841 Chestnut Building (3EA21)
Philadelphia, PA 19107
(215) 597-6925

Frances L. Costanzi
Remedial Project Manager
U. S. EPA - Region III
841 Chestnut Building (3HW22)
Philadelphia, PA 19107
(215) 597-3923

GLOSSARY

Administrative Record: An official compilation of documents, data, reports, and other information that is considered important to the status of and decisions made relative to a Superfund site. The public has access to this material.

Applicable or Relevant and Appropriate Requirements (ARARs): The federal and state requirements that a selected remedy must attain. These requirements may vary among sites and alternatives.

Aquifer: A zone below the surface of the earth capable of producing water, as from a well.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or Superfund: A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Act created a trust fund, known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Fractured Bedrock: Breaks in underground rock formations caused by intense folding or faulting.

Ground Water: Water found beneath the earth's surface in geologic formations that are fully saturated. When it occurs in sufficient quantity, ground water can be used as a water supply.

Hazard Index: A value used to evaluate the potential for non-carcinogenic effects that occur in humans.

Maximum Contaminant Levels (MCL): These are enforceable standards for water systems under the Safe Drinking Water Act that apply to specific contaminants which EPA has determined have an adverse effect on human health above certain levels.

National Priorities List (NPL): EPA's list of the nation's top priority hazardous waste sites that are eligible to receive federal money for response under Superfund.

Operable Unit (OU): A portion of a Superfund site that has been conceptually separated from the rest of the site to allow for easier management.

Potentially Responsible Parties (PRPs): Those identified by EPA as potentially liable under CERCLA for cleanup costs. PRPs may include generators and present or former owners/operators of certain facilities or property where hazardous wastes have been stored, treated or disposed of, as well as those who accepted hazardous waste for transport and selected the facility.

Present Worth: A term used to indicate the discounting of sums to be received in the future to their present value equivalent, or the amount which will accumulate to that sum if invested at prevailing interest rates.

Record of Decision (ROD): A legal document that describes the final remedial actions selected for a Superfund site, why the remedial actions were chosen and others not, how much they cost, and how the public responded.

Remedial Investigation/Focused Feasibility Study (RI/FFS): A two-part study of a hazardous waste site that supports the selection of a remedial action for a site. The first part, the RI, identifies the nature and extent of contamination at the site. The second part, the FFS, identifies and evaluates alternatives for addressing the contamination.

Synthetic Membrane Cap: A layer of soil and synthetic materials placed over contaminated areas to reduce or eliminate the amount of precipitation that seeps through contaminated materials. By reducing the infiltration, the cap reduces the movement of contaminants from the site. Capping also prevents direct human contact with the contamination.

Volatile Organic Compounds (VOCs): Organic liquids that readily evaporate under atmospheric conditions. Examples include vinyl chloride and trichloroethene (TCE).

de maximis, inc.

9041 Executive Park Drive
Suite 401
Knoxville, TN 37923
(615) 691-5052
Fax (615) 691-6485

November 10, 1992

VIA FACSIMILE AND CERTIFIED MAIL

RECEIVED
NOV 16 1992

Mr. Cesar Lee (3HW21 CL)
United States Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Reference: **Novak Sanitary Landfill Site**
October 1992 Monthly Progress Report

Dear Mr. Lee:

Pursuant to the Administrative Order by Consent, enclosed are three (3) copies of the monthly progress report for the Novak Sanitary Landfill Site for October 1992.

If you or your staff have further questions concerning this report, please contact me at (615) 691-5052. Thank you for your assistance.

Best regards,
de maximis, inc.

Mark A. Travers
Senior Project Director

MAT/mdm

Enclosures

cc: Lawrence W. Diamond, Esquire, Hannoch Weisman
Julie Parker, Esquire, Hannoch Weisman
Meg Mustard, PADER
Mike Heffron, Dynamac Corporation
Joseph Keller, Geraghty & Miller, Inc.

File:mproct92.nvk/dsk:2/3009-07

November 10, 1992

MONTHLY PROGRESS REPORT
de maximis, Inc.

PROJECT NAME: Novak Sanitary Landfill Site
South Whitehall Township, Pennsylvania

TIME PERIOD COVERED: October 1992

ACTIONS TAKEN TOWARD COMPLIANCE WITH AOC/PLANS AND PROCEDURES COMPLETED:

- Preparation and submittal of monthly progress report for September 1992. The monthly progress report was submitted on October 10, 1992.
- The Group received the "Revised" U.S. EPA comments regarding the remedial investigation and feasibility study reports, and response to force majeure/request for schedule extension on October 21, 1992. Receipt of the U.S. EPA's letter established the due date for submittal of the "Revised Remedial Investigation and Feasibility Study Report" as November 3, 1992.
- Revision of the Remedial Investigation and Feasibility Study reports in consideration of discussions with the U.S. EPA and the U.S. EPA comments.

ACTION ITEMS FOR FOLLOWING MONTH:

- Submittal of the "Revised" Final Remedial Investigation and Feasibility Study Reports on November 3, 1992.

ANTICIPATED DELAYS/PROBLEMS:

- The Group submitted a force majeure report/request for schedule extension on October 9, 1992 as a result of the U.S. EPA comments dated September 25 and September 28, 1992. The issues raised by the force majeure report/request for schedule extension were resolved by the U.S. EPA's comments to the Remedial Investigation and Feasibility Study reports dated October 20, 1992, therefore no delays are anticipated.

RESULTS OF SAMPLING/TESTING:

- None.

File:mproct92.nvk/dsk:2/3009-07

de maximis, inc.
9041 Executive Park Drive
Suite 401
Knoxville, TN 37923
(615) 691-5052
Fax (615) 691-6485

January 10, 1993

VIA FACSIMILE

Mr. Cesar Lee (3HW21 CL)
United States Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Reference: **Novak Sanitary Landfill Site**
December 1992 Monthly Progress Report

Dear Mr. Lee:

Pursuant to the Administrative Order by Consent, enclosed are three (3) copies of the Monthly Progress Report for the Novak Sanitary Landfill Site for December 1992.

If you or your staff have further questions concerning this report, please contact me at (615) 691-5052. Thank you for your assistance.

Best regards,
de maximis, inc.

Mark A. Travers/dm

Mark A. Travers
Senior Project Director

MAT/mdm

cc: Lawrence W. Diamond, Esquire, Hannoch Weisman
Julie Parker, Esquire, Hannoch Weisman
Meg Mustard, PADER
Mike Heffron, Dynamac

File:mprdec.92/dsk:3009

MONTHLY PROGRESS REPORT
de maximis, inc.

PROJECT NAME: Novak Sanitary Landfill Site
South Whitehall Township, Pennsylvania

TIME PERIOD COVERED: December 1992

ACTIONS TAKEN TOWARD COMPLIANCE WITH AOC/PLANS AND PROCEDURES COMPLETED:

- Preparation and submittal of Monthly Progress Report for November 1992. The monthly progress report was submitted on November 10, 1992.
- The Final Remedial Investigation and Feasibility Study reports were submitted to the U.S. EPA on November 4, 1992.
- Responded to questions and draft comments from Remedial Project Manager regarding RI/FS Report.

ACTION ITEMS FOR FOLLOWING MONTH:

- Submittal of the Monthly Progress Report
- Limited residential ground water supply well sampling and analysis during the week of January 18, 1993.

ANTICIPATED DELAYS/PROBLEMS:

- None anticipated.

RESULTS OF SAMPLING/TESTING:

- None this period.

File:mprdec.92/dsk:3009

file

de maximis, inc.
2045 Lincoln Highway
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St. Charles, Illinois 60174
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(708)879-0830 facsimile

RECEIVED
FEB 17 1993

February 10, 1993

VIA FACSIMILE

Mr. Cesar Lee (3HW21 CL)
United States Environmental Protection Agency\
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Subject: Novak Sanitary Landfill Site
January 1993 Monthly Progress Report

Dear Mr. Lee:

Pursuant to the Administrative Order by Consent, enclosed are three (3) copies of the Monthly Progress Report for the Novak Sanitary Landfill site for December 1992.

If you or your staff have any questions, please do not hesitate to contact me.

Best regards,
de maximis, inc.

Mark A. Travers
Senior Project Director

MAT/

cc: Lawrence W. Diamond, Esq., Hannoch Weisman
Julie Parker, Esq., Hannoch Weisman
Joseph Keller, Geraghty & Miller, Inc.
Meg Mustard, Pennsylvanaia Department of Natural Resources
Micheal Heffron, Dynamac Corporation
Vincent Uhl, Vincent Uhl Associates

MONTHLY PROGRESS REPORT
Prepared by *de maximis, inc.*

PROJECT NAME: Novak Sanitary Landfill Site
South Whitehall Township, Pennsylvania

TIME PERIOD COVERED: January 1993

ACTIONS TAKEN TOWARD COMPLIANCE WITH THE CONSENT DECREE/PLANS AND PROCEDURES COMPLETED:

- Preparation and submittal of the monthly progress report for December 1992. The report was submitted within the time period provided for in the Administrative Order by Consent.
- Submittal of various draft revisions to the Final Remedial Investigation and Feasibility Study report in response to questions and comments from the U.S. EPA during January 1993. A final set of revisions were submitted to the U.S. EPA on February 3, 1993.
- A limited number of residential ground water supply wells in the vicinity of the Novak Sanitary Landfill site were sampled on January 28, 1993 per the verbal request of the U.S. EPA in December 1992.

ACTION ITEMS FOR THE FOLLOWING MONTH:

- Preparation and submittal of the Monthly Progress Report.
- Receive and begin validation of the results of analyses of ground water samples collected from the residential supply wells.

ANTICIPATED DELAYS/PROBLEMS:

- None Anticipated

RESULTS OF SAMPLING/TESTING:

- None this Period

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Office of Superfund
SE Pennsylvania Remedial Section

Direct Dial (215) 597-8257
Mail Code 3HW21

Re: 3b, 3d

February 11, 1993

FEDERAL EXPRESS
Mr. Mark Travers
de maximus, inc.
2045 Lincoln Highway
Number 308
St. Charles, IL 60174

SUBJECT: Novak Sanitary Landfill
Final RI/FS Approval

Dear Mr. Travers,

This to confirm our receipt of your letter dated January 28, 1993 and submission of your Final RI/FS. The Final RI/FS was entered into the Information Repository on February 5, 1993. Since the agency does not have the resources to examine if each of all the resolved comments have been assimilated, please assure the contents of the following documents have been incorporated.

1. Revision No. 01 dated 11/3/92 which is part of de maximis' letter dated November 4, 1992 [see Attachment 1]

2. Geraghty & Miller's (G&M) 11/25/92 Letter of Transmittal (which includes Revised backup data tables to Revision No. 01 concerning Risk Assessment), inadvertently not submitted with de maximis' 11/4/92 letter. [1] [see Attachment 2]

3. Fax from M. Travers to C. Lee & M. Mustard dated 12/4/92 (Revision No. 02 dated 12/3/92) [see Attachment 3]

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1 It should be noted that the revised backup data tables submitted by G&M dated 11/25/92 were not highlighted. As previously relayed to you, we have attempted our best efforts to complete a thorough review despite that condition.

4. Fax from M. Travers to C. Lee dated 1/3/93. [see Attachment 4]

5. Fax from M. Travers to C. Lee dated 1/11/93. [see Attachment 5]

6. Fax from C. Lee to M. Travers dated 1/22/93. [see Attachment 6]

You may regard this as an approval of the Final RI/FS if the above revisions have been incorporated.

The following are our Comments to your letter dated November 4, 1992 (de maximis' responses to EPA's comments dated October 20, 1992). Since they are not required for the submittal of the Final RI/FS, no further responses will be solicited from you.

Please call if you have any questions.

Sincerely,

Cesar Lee (3HW21)
Remedial Project Manager

Attachments

cc: R. Smith (3HW13)
R. Davis (3HW13)
J. Newbaker (3HW13)
E. Lukens (3RC21)
C.K. Lee (3HW51)
M. Heffron, Dynamac
M. Mustard, PADER
P. Flores (3AT11)

CL:cl/021193.NOV

Comments on de maximis' November 4, 1992 letter

COMMENTS ON "7.7 SEDIMENT AND SURFACE WATER SAMPLING"

The de maximis November 4, 1992 letter, response to Comment No. 2 on pg. 4 of 19 (first paragraph) continues to justify comparison of soil to sediment levels especially in the same watershed. It is true that soils are one source of contamination of down gradient sediments, but sediments are depositional areas that may concentrate a contaminant to a level greatly exceeding that found in the source soil. Due to differences in chemistry and physical attributes of sediment to soil, the environmental risk of a contaminant in sediment can not be compared or inferred from the risk associated with soil. 1

Since this item is not required for the submittal of the Final RI/FS, no further response is necessary from de maximis.

1.3.3 Landfill Gas

Page 1-29:

The de maximis November 4, 1992 letter on pg. 11 of 19 (first paragraph), response to Comments concerning Landfill Gas. Federal Register/Vol. 56 No. 196/page 51052 [see Attachment 7], line 19 states the requirement for "...the owner or operator to conduct subsurface and facility structure gas monitoring at least quarterly..." This is definitely not in the ambient air space as claimed. 2

Since this item is not required for the submittal of the Final RI/FS, no further response is necessary from de maximis.

4.0 DEVELOPMENT OF SITE WIDE REMEDIAL ALTERNATIVES

GENERAL COMMENTS

The de maximis November 4, 1992 letter, response to Comment No. 3 on pg. 14 of 19 on developing remedial alternatives to protect and enhance the current habitat and landscape conditions - The response states the selected remedy may be enhanced as deemed legally required. It should be clarified that the intent is not to enhance but to restore, preserve, and protect site environmental features and to require mitigation for unavoidable impacts to site environmental features associated with implementing site remedial actions. Such mitigation should account for the time required for environmental mitigation features to become fully operational. 4

Since this item is not required for the submittal of the Final RI/FS, no further response is necessary from de maximis.

7.0 REMEDIAL ALTERNATIVES SELECTION AND RECOMMENDATION

The de maximis November 4, 1992 letter on pg. 16 of 19 (first paragraph), response to Comments concerning Remedial Alternatives Selection and Recommendation. Since NSL's natural attenuation overlies on a fractured limestone bedrock, § 258.40's requirement to maintain less than a 30 cm-depth of leachate over a non-existing bottom liner should be followed. If not, an alternative leachate collection system should be considered because some VOCs have been observed in the residential groundwater samples. 2

Verbal communications is not acceptable. Documentation of that conversation should be provided. 2

Since this item is not required for the submittal of the Final RI/FS, no further response is necessary from de maximis.

Comments on Geraghty & Miller's 11/25/92 Letter of Transmittal (Revised backup data tables) that supplements de maximis' November 4, 1992 letter

Table A-79:

The use of footnote (c) in Table A-79 does not make sense. The revised table now includes two conflicting lifetime cancer risk estimates for current on-site residents exposed to surface soil and air, both ostensibly based on 24 years of adult exposure and 6 years of childhood exposure. The intent of the original comment was to have a single set

of lifetime cancer risk estimates for all exposure routes. The table contains only a conflicting pair of estimates for two exposure routes.

As before, this is only a presentation problem. Since this item is not required for the submittal of the Final RI/FS, no further response is necessary from de maximis.

Pg. 2-11 of the Revised FS:

Pg. 2-11 of the revised FS implies that Region III's recommendations are more stringent than national EPA guidance. This argument is based on a misinterpretation of national guidance in OSWER Directive 9355.0-30. This directive makes it clear that EPA risk managers are free to address risks lower than 10^{-4}, at their discretion. The directive states that EPA may "decide that a baseline risk level less than 10^{-4} is unacceptable due to site specific reasons and that remedial action is warranted". Region III's request for PRGs for all exposure routes which contributed to a receptor exceeding 10^{-6} lifetime cancer risk is intended to document the cost-benefit ratios of such decisions. Whether action is warranted below a 10^{-4} risk is EPA's decision, not the PRPs'.

It is not necessary to change the language in the revised FS, but be aware that Region III's recommendations were based on a national EPA directive, not some local caprice. Gehaghty and Miller's interpretation of this directive is overly generous to the PRPs. Since this item is not required for the submittal of the Final RI/FS, no further response is necessary from de maximis.

file
RWD
2/12/93
JOP

de maximis, inc.
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St. Charles, Illinois 60174
(708)879-3919
(708)879-0830 facsimile

FACSIMILE COVER SHEET

DATE: *February 12, 1993*

FILE #: *3009-04*

TO: *[redacted] Esquire*

ORGANIZATION: *Hannoch Weisman*

FACSIMILE #: *1-207-994-7198*

PAGES: *4 (including this cover page)*

FROM: *Mark A. Travers*

ORGANIZATION: *de maximis, inc.*

Please deliver this facsimile immediately. If you have difficulty with this transmission, please call (708)879-3919

NOTES:

Please review.

Thanks

FAX

DELIVER IMMEDIATELY

de maximis, inc.
2045 Lincoln Highway
Suite 308
St. Charles, Illinois 60174
(708)879-3919
(708)879-0830 facsimile

February 12, 1993

VIA FACSIMILE

Mr. Cesar Lee (3HW21 CL)
United States Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Subject: Novak Sanitary Landfill Site
South Whitehall Township, Pennsylvania

Dear Mr. Lee:

As a result of our recent conversations regarding the Old Mine Area and the Construction/Demolition Area at the Novak Sanitary Landfill site, I thought it might be useful if the information pertaining to these areas be summarized in a single document. I also thought it might be helpful if the information related to the Novak RI/FS PRP Group's ("Group's") position on the technical impracticality of ground water pump and treat was summarized. Therefore, with the authorization of the Group, Vincent Uhl Associates prepared the enclosed summaries of ground water conditions at the Novak Sanitary Landfill. The enclosed are two brief memoranda pertaining to the hydrogeologic and ground water quality conditions in the vicinity of the Old Mine Area and the Construction/Demolition Area, and the feasibility of ground water recovery (i.e., pump and treat).

It is apparent by the ground water conditions downgradient of the at the Old Mine Area and the Construction/Demolition Area that closure activities conducted by the Novak Sanitary Landfill, Inc. at the Old Mine Area, have been effective in mitigating the degradation of the ground water. The ground water monitoring locations proximate to these disposal areas are essentially unimpaired, with the exception of the former ground water supply well at the unoccupied Novak residence. Ground water quality conditions at the former ground water supply well at the unoccupied Novak residence are not considered the result of a release from the Old Mine Area or the Construction/Demolition Areas, but likely the result of a release from the surface fill area or the maintenance area currently utilized by Mr. Louis Novak, Jr., for his trucking business (Valley Hauling). Therefore, the remedial measures recommended for the Old Mine Area are different from remedial measures recommended for the Trench Fill and Surface Fill Areas. The remedial activity recommended for the Old Mine Area and the Construction/Demolition Areas would involve the maintenance or repair of the existing cover to promote the runoff of precipitation. Essentially, the conditions at the Old Mine Area that require remedial action are typical of any landfill cover that has not been maintained. If the existing cover is repaired and maintained consistent with current practice at closed landfills, ground water quality downgradient would not be expected to deteriorate from the current essentially unimpaired condition. The existing cover at the Old Mine Area is effective, even in its currently unmaintained condition, therefore the added investment of more than one million dollars for a single barrier

cap is unwarranted. The recommended remedial measures for the Construction/Demolition Area are consistent with current requirements for construction/demolition fills.

In conclusion, the Old Mine Area is a disposal area that was previously closed, apparently in accordance with the requirements existing at that time. Since the Old Mine Area was closed, and the closure has apparently been effective, repair and maintenance of the existing cover is the most appropriate remedial measure. With respect to the Construction/Demolition Area, under the current regulations, the appropriate closure for an area accepting this type of waste is soil cover, rather than a single barrier cap. Finally, the basis for the recommended remedial measures for these two disposal areas differs, therefore, any evaluation the recommended remedial measures for these two disposal areas should be conducted independently.

The second enclosure, which relates to the practicality of a ground water pump and treat system, provides a summary of the hydrogeologic conditions that exist at the Novak Sanitary Landfill site and a potential ground water recovery scenario. The scenario indicates an estimate of the minimum number of recovery wells that would need to be installed to capture the impacted ground water. It should be understood that this is the minimum number of recovery wells needed to capture the impacted ground water, not restore the ground water to background conditions. If the number of recovery wells installed proved effective in capturing the impacted ground water, 10's to 100's of pore volumes of ground water would need to be removed from the fractured bedrock aquifer (assuming favorable hydrogeologic conditions) to have any impact on the ground water quality.

However, favorable conditions do not exist at this site. The recovery wells would be installed in a fractured bedrock, where the concentrations of constituents are low to trace, and the specific capacities of existing monitoring wells are low. The ability to form a capture zone in the fractured bedrock would be extremely limited by the irregular nature of the fractures in the bedrock. It would be difficult to predict with any accuracy the extent and locations of all fractures containing impacted ground water and accurately locate recovery wells to reach all fractures. Finally, it is not appropriate to make a significant expenditure in attempt to prove, through installation, that a ground water pump and treat system is impractical when the essentially the same level of protection could be provided to the population potentially at risk by other means (ground water monitoring and installation of point of use treatment if necessary. The point of use monitoring would be more reliable form of protection. In conclusion, the information obtained during the remedial investigation and feasibility study supports a technical impracticality waiver without further analyses. This waiver is supported by a technical impracticality waiver described in U.S. EPA publication 9234.2-03 FS entitled "Overview of ARARs – Focus on ARAR Waivers". The publication describes a technical impracticability waiver which is essentially a description of the conditions at the Novak Sanitary Landfill site.

As a final note, the potential risk to the population through ground water may be non-existent in the near future. Several of the ground water monitoring locations, which are also ground water supply wells, are currently or will in the near future be replaced with a public water supply. Public water lines have been extended along River Road and Lime Kiln Road.

If you or your staff has any questions, please do not hesitate to contact me.

Best regards,
de maximis, inc.

Mark A. Travers
Senior Project Director

MAT/

Enclosures

cc (w/enclosures): Lawrence W. Diamond, Esq., Hannoch Weisman
Julie Parker, Esq., Hannoch Weisman
Joseph Keller, Geraghty & Miller, Inc.
Meg Mustard, Pennsylvanaia Department of Natural Resources
Micheal Heffron, Dynamac Corporation
Vincent Uhl, Vincent Uhl Associates

de maximis, inc.

9041 Executive Park Drive
Suite 401
Knoxville, TN 37923
(615) 691-5052
Fax (615) 691-6485

March 10, 1993

VIA FACSIMILE AND
OVERNIGHT COURIER

Mr. Cesar Lee (3HW21 CL)
United States Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Subject: **Novak Sanitary Landfill Site**
February 1993 Monthly Progress Report

Dear Mr. Lee:

Pursuant to the Administrative Order by Consent, enclosed are three (3) copies of the Monthly Progress Report for the Novak Sanitary Landfill site for February 1993.

If you or your staff have any questions, please do not hesitate to contact me.

Best regards,
de maximis, inc.

Mark A. Travers
Senior Project Director

MAT/bms

cc: Lawrence W. Diamond, Esq., Hannoch Weisman
[redacted]
Joseph Keller, Geraghty & Miller, Inc.
Meg Mustard, Pennsylvania Department of Natural Resources
Michael Heffron, Dynamac Corporation
Vincent Uhl, Vincent Uhl Associates

c:\winword\3009\mthlet.

MONTHLY PROGRESS REPORT
Prepared by *de maximis, inc.*

PROJECT NAME: Novak Sanitary Landfill Site
South Whitehall Township, Pennsylvania

TIME PERIOD COVERED: February 1993

ACTIONS TAKEN TOWARD COMPLIANCE WITH THE CONSENT DECREE/PLANS AND PROCEDURES COMPLETED:

- Preparation and submittal of the monthly progress report for January 1993. The report was submitted within the time period provided for in the Administrative Order by Consent.
- Submittal of letter to the U.S. EPA which included two short letter reports regarding the Old Mine Area and the viability of ground water pump and treat..
- Receipt of U.S. EPA approval of the remedial investigation and feasibility study reports. The approval was dated February 11, 1993.

ACTION ITEMS FOR THE FOLLOWING MONTH:

- Preparation and submittal of the Monthly Progress Report.
- Receive and begin validation of the results of analyses of ground water samples collected from the residential supply wells.

ANTICIPATED DELAYS/PROBLEMS:

- None Anticipated

RESULTS OF SAMPLING/TESTING:

- None this Period

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Office of Superfund
SE Pennsylvania Remedial Section

Direct Dial (215) 597-8257
Mail Code 3HW21

Re: 3d

March 25, 1993

FEDERAL EXPRESS
Mr. Mark Travers, Designated Project Coordinator
de maximus, inc.
2045 Lincoln Highway
Number 308
St. Charles, IL 60174

SUBJECT: Novak Sanitary Landfill

Dear Mr. Travers,

Enclosed (Attachments A - E) are three (3) copies of our response to your letter dated February 12, 1993. Please call if you have any questions.

Sincerely,

Cesar Lee (3HW21)
Remedial Project Manager

Attachments

cc: P. Anderson (3HW21)
J. Newbaker (3HW13)
E. Lukens (3RC21)
J. Banks (3HW11)
C.K. Lee (3HW51)
M. Heffron, Dynamac
M. Mustard, PADER
S. Huling, EPA/Ada
E. Freed, EPA/HQ (5202G)

CL:cl/0325932.NOV

Technical Review Comments and Recommendations:

In order to evaluate whether the RI/FS supports an ARAR waiver based on the technical impracticability of a pump and treat system at the NSL, the ground water clean-up standards, i.e. ARARs' that have been identified and the ARARs' that are requested should be identified. The design of a ground water pump and treat system is based on the remedial objectives (i.e. clean-up standards). In the documents submitted, neither are clearly identified. Based on discussions with you, the state of Pennsylvania has specified that current ground water standards are to achieve background concentrations (non-detectable for organic compounds). However, the requested (alternative) clean-up standards (ARARs') have not been identified. Correspondingly, an alternative strategy to achieve alternative clean-up standards has not been presented. This is essential to evaluate whether a TI waiver is warranted. The RI/FS does not adequately address the issue of TI with respect to pump and treat at the NSL. A significant amount of information is presented in the RI/FS. But a logical progression of steps or information/data of why pump and treat will not effectively achieve clean-up standards has not been presented.

Clearly the presence of a landfill on the fractured bedrock system presents serious technical challenges in ground water remediation. The RI/FS does not: (1) clearly address the impact of the landfill leachate on the ground water; or (2) clearly address whether pump and treat could contain, capture, or completely remove the plume. These are important observations and issues that should be clearly identified and presented logically. Comments and recommendations addressing this issue and other general ground water issues are presented below.

1. Page 1-26 of the FS indicates that the data collected from the leachate during the 1990 RI were not sufficient to support the development of site-wide remedial alternatives. Leachate samples were collected and analyzed from two locations; the surface seep near trench 5, and the standing liquid in the landfill gas vent pipes. The leachate quality data were compared to data collected in the EPA Subtitle D study for landfill leachate (unavailable in the EPA-RSKERL library). It was concluded that the NSL leachate was considered very mild leachate relative to typical sanitary landfills.

It is reasonable to assume that the leachate samples collected are not representative of the strength of the leachate in the NSL. The sample collected at the seep does not necessarily represent leachate that has leached through a representative cross-section of the landfill material. The same observation can be made with respect to the sample collected in the gas vent pipes. It is reasonable to expect that the leachate quality at the bottom of the landfill is more concentrated in organic and inorganic constituents present in the landfill. This leachate would represent the quality of the leachate that infiltrates into the ground water.

MW-11	51'	*MW-20	49'
*MW-12	50'	*MW-21	50'
*MW-13	50'	*MW-22	48'
*MW-14	46'	*MW-23	13'

* off-site monitoring wells

Table 4-1 of the RI indicates that fractured intervals were encountered during drilling of the following wells: MW-7, 8, 10-14, 16-23 and that a large cavity was present in MW-15. There are two observations that can be made from this information. First, it is apparent from the construction details and the boring log information that ground-water samples represent ground water over a large vertical distance. Secondly, fractures and joints in the bedrock clearly indicate the strong liklihood that preferential pathways exist in the subsurface.

Sampling of the monitoring wells involved evacuation of at least three well volumes prior to sample collection, and samples were not collected from the "stagnant well water" prior to well evacuation. Based on 40-50' of standing water in each well (6" ID), this would involve the evacuation of approximately 175-220 gallons of well water. Assuming contaminant migration occurred in preferential pathways (i.e. present in one stratigraphic cross-section or fracture/joint), water coming from other non-contaminated sections will dilute the ground water in the well casing. Current ground water quality data, therefore, may represent an "average" (diluted) concentration in the well.

Based on the monitoring well construction, ground water sample collection protocol, and the highly heterogeneous nature (fractured, karst, preferential pathways, etc.) of the subsurface material, it is not too surprising that ground water samples did not indicate higher levels of contamination. Data presented in Tables 5-12 thru 5-15, indicate that volatile organic compounds have been detected in ground water monitoring wells 1C, 6-9, 13, 15, 16, 19, 20, and 22. Monitoring wells 13, 16, 19, 20, and 22 are not located within the property boundary.

Ground water sampling at low flow rates, from discrete intervals in monitoring wells prior to well evacuation would improve the resolution of ground water contaminant data. Similar results using packers would help delineate the contaminant plume, identify preferential pathways, and minimize purge volume. Assuming additional sampling of wells at discrete intervals were to be performed, samples collected at or near the fractured intervals would provide the best information to develop a 3-dimensional contamination plume. These fractured intervals have been identified in Table 4-1 of the RI. Additionally, discrete interval samples collected at or near the water table may identify the relative magnitude of the contamination resulting from landfill leachate just reaching the saturated zone.

4. Well development procedures which resulted in ground water drawdown has been used to evaluate aquifer characteristics instead

respect to TI evaluation based on the RI/FS information. These are as follows:

(1) Fractured flow systems are complex, and understanding contaminant transport in these systems provides an additional level of complexity. In an effort to delineate the ground water contamination plume in these systems, additional work and the careful planning and execution of field work is necessary to generate useful data. The impact of the landfill on the ground water is currently unclear. Additional work is necessary to more clearly define the areal and vertical extent of the plume and the magnitude of its concentration. This information is also necessary to evaluate the potential effectiveness of pump and treat.

(2) The size and the precarious nature of the NSL with respect to the proximity of numerous residential ground water wells (250 wells within a one half mile radius of the NSL) makes this TI waiver request rather sensitive. It is absolutely necessary that every step is taken to acquire definitive data which can be used to evaluate the impact of the NSL on the ground water. Presently, these data do not exist. A TI waiver, and therefore, relaxed ground water quality standards places a great deal of responsibility and public trust in the hands of EPA.

(3) EPA Publication 9234.2-03/FS (December, 1989) entitled, "Overview of ARARs" indicates that a TI waiver may be used when compliance with an ARAR is technically impractical from an engineering perspective. The waiver can be used if either of the two criteria can be met: (1) engineering feasibility, in which the current engineering methods necessary to construct and maintain an alternative that will meet the ARAR cannot reasonable be implementd; and (2) reliability, in which the potential for the alternative to continue into the future is low, either because of continued reliability of technical and institutional controls is doubtful, or because of inordinate maintenance costs.

An example is provided in this reference for a TI waiver in fractured bedrock. MCLs' were waived because their attainment was technically impracticable for several reasons, including: (1) dificulty in predicting the extent and locations of fractures; (2) the inability to locate and extract the pockets of waste; (3) excessive timeframes for clean-up; and (4) the irregular nature of the fractures that made effective placement of extraction wells difficult. At the NSL site: (1) fractures have been identified; (2) additional effort to locate the plume(s) of the contaminant area(s) is necessary; (3) timeframes have not been evaluated; and (4) fractures that have been identified, discrete interval sampling could be useful to effectively emplace an extraction system.

In light of the above information, it is not recommended that a Technical Impracticability waiver is granted with respect to the Novak Sanitary Landfill. Prior to granting such a waiver, EPA must have absolutely defendable data that such a waiver is warranted. Presently, this data is not available. This recommendation should

Comments Rec'd from [redacted] 3/23/93

de maximis, inc.
2045 Lincoln Highway
Suite 308
St. Charles, Illinois 60174
(708)879-3919
(708)879-0830 facsimile

[redacted]
Pls comment by
3/3/93
CL
RETURN TO ME

FACSIMILE COVER SHEET

DATE: *February 12, 1993*

FILE #: *3009-03*

TO: *Cesar Lee* CL

ORGANIZATION: *United States Environmental Protection Agency - Region III*

FACSIMILE #: *1-215-597-9890*

PAGES: *14 (including this cover page)*

FROM: *Mark A. Travers* MT

ORGANIZATION: *de maximis, Inc.*

NOTES:

I thought the enclosed may be useful considering some of the issues we have discussed recently. If you have any questions, please call.

Mark

ATTACHMENT 1 & 2

cc: [redacted] ← Pls comment by 3/3/93

FROM FIG. 2-2 OLD MINE AREA $\frac{20}{400} = \frac{1}{20}$ ~ 5%

OVER VEGETATIVE COVER CRACK RUNOFF SYSTEM

DEMOLITION FILL AREA $\frac{20}{100} = \frac{1}{5}$ ~ 20% HIGHER SLOPE

RI REPORT FIG 3-6 SHOWED A LOT OF STANDING WATER AREAS. IT MEANS LACK OF MAINTENANCE. AND THE INTEGRITY OF COVER IS UNKNOWN

In conclusion, the Old Mine Area is a disposal area that was previously closed, apparently in accordance with the requirements existing at that time. Since the Old Mine Area was closed, and the closure has apparently been effective, repair and maintenance of the existing cover is the most appropriate remedial measure. With respect to the Construction/Demolition Area, under the current regulations, the appropriate closure for an area accepting this type of waste is soil cover, rather than a single barrier cap. Finally, the basis for the recommended remedial measures for these two disposal areas differs, therefore, any evaluation the recommended remedial measures for these two disposal areas should be conducted independently.

INSTALL LEACHATE WELL(S)

The second enclosure, which relates to the practicality of a ground water pump and treat system, provides a summary of the hydrogeologic conditions that exist at the Novak Sanitary Landfill site and a potential ground water recovery scenario. The scenario indicates an estimate of the minimum number of recovery wells that would need to be installed to capture the impacted ground water. It should be understood that this is the minimum number of recovery wells needed to capture the impacted ground water, not restore the ground water to background conditions. If the number of recovery wells installed proved effective in capturing the impacted ground water, 10's to 100's of pore volumes of ground water would need to be removed from the fractured bedrock aquifer (assuming favorable hydrogeologic conditions) to have any impact on the ground water quality.

ACTUALLY, THIS SITE IS NOT SUITABLE FOR LANDFILL

THE PUMP & TREAT IS ONLY KEEPING THE LEACHATE LESS THAN 1'.

However, favorable conditions do not exist at this site. The recovery wells would be installed in a fractured bedrock, where the concentrations of constituents are low to trace, and the specific capacities of existing monitoring wells are low. The ability to form a capture zone in the fractured bedrock would be extremely limited by the irregular nature of the fractures in the bedrock. It would be difficult to predict with any accuracy the extent and locations of all fractures containing impacted ground water and accurately locate recovery wells to reach all fractures. Finally, it is not appropriate to make a significant expenditure in attempt to prove, through installation, that a ground water pump and treat system is impractical when the essentially the same level of protection could be provided to the population potentially at risk by other means (ground water monitoring and installation of point of use treatment if necessary. The point of use monitoring would be more reliable form of protection. In conclusion, the information obtained during the remedial investigation and feasibility study supports a technical impracticality waiver without further analyses. This waiver is supported by a technical impracticality waiver described in U.S. EPA publication 9234.2-03 FS entitled "Overview of ARARs -- Focus on ARAR Waivers". The publication describes a technical impracticability waiver which is essentially a description of the conditions at the Novak Sanitary Landfill site.

As a final note, the potential risk to the population through ground water may be non-existent in the near future. Several of the ground water monitoring locations, which are also ground water supply wells, are currently or will in the near future be replaced with a public water supply. Public water lines have been extended along River Road and Lime Kiln Road.

If you or your staff has any questions, please do not hesitate to contact me.

Best regards,
de maximis, inc.

Mark A. Travers
Senior Project Director

Table B-1. Gas Vent Data, Novak Sanitary Landfill.

Recd from [redacted] 2/24/93

VENT NUMBER[1,2]	HEIGHT OF VENT ABOVE GROUND	DEPTH OF VENT (FT)	DEPTH TO LIQUID (FT)	DEPTH OF LIQUID (FT)[3]	DEPTH OF LIQUID BELOW GRADE (FT)
GV-1	5.5	10.5	8.8	1.7	3.3
GV-2	6.0	10.4		•	
GV-3	5.9	10.4		•	
GV-4	6.4	10.5		•	
GV-5	5.5	10.5		•	
GV-6	5.0	10.4	6.8	3.6	1.8
GV-7	5.0	10.5	8.4	2.1	3.4
GV-8	6.0	10.4		•	
GV-9	4.9	10.4		•	
GV-10	5.4	10.4		•	
GV-11	5.7	10.3		•	
GV-12	5.8	9.4		•	
GV-13	6.8	10.6		•	
GV-14	5.2	9.1		•	
GV-15	7.5	10.8		•	
GV-16	4.9	9.2		•	
GV-17	5.0	9.2		•	
GV-18	4.6	8.5		•	
GV-19	2.7	7.1		•	
GV-20	5.0	9.0		•	
GV-21	4.6	8.6		•	
GV-22	5.0	9.0		•	
GV-23	4.7	8.3		•	
GV-24	7.1	10.6		•	
GV-25	5.9	10.5		•	
GV-26	5.5	10.3	10.2	0.10	4.7
1-E	BROKEN AT LAND SURFACE -- NOT MEASURED				
2-E	BROKEN AT LAND SURFACE -- NOT MEASURED				
6-E	9.0	19.8	17.2	2.6	8.2
7-E	14.3	19.9		•	
8-E	12.2	20.0	18.8	1.2	6.6
9-E	12.2	19.6		•	
10-E	7.7	19.7	18.5	1.2	10.8
1-W	BENT APPROXIMATELY 45 DEGREES -- NOT MEASURED				
2-W	7.3	19.3	12.2	7.1	4.9
4-W	10.0	19.8	14.7	5.1	4.7
5-W	13.3	19.6	17.8	1.8	4.5
7-W	11.2	19.9		•	
8-W	4.7	19.6	11.7	7.9	7.0
9-W	8.0	9.4		•	
10-W	5.5	19.9	17.0	2.9	11.5
A	13.3	19.5		•	
B	13.0	31.9	23.2	8.7	10.2
Q	6.3	10.4		•	
R	4.8	10.4		•	
S	4.8	10.3		•	
T	4.2	10.6	10.4	0.2	6.2
U	5.0	10.6	10.1	0.5	5.1
V	4.6	10.5	10.3	0.2	5.7
W	3.8	11.3	8.9	2.4	5.1
X	6.4	10.4		•	
Y	7.9	10.1		•	
Z	9.0	10.5		•	

EVEN ABOUT 11 FT. BGS, THERE ARE LEACHATE MOUNDING

* No standing water detected in vent.

[1] Vent number C through P, inclusive do not exist.

[2] GV-series vents are located in West Trench, Southwest Trench, and Surface Fill Areas; E-series, W-series and vents A and B are located in the Trench/Fill Area; Vents Q through Z are located in the

[3] Measured from bottom of vent.

AR308706

ATTACHMENT B (Transcription)

TABS-LWELNOVAK-AFFEN

Table A–1 (continued). Soil Gas Survey Results, Novak Sanitary Landfill.

Rec'd from [redacted] 2/24/92

DATE	LOCATION NUMBER	TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATION (PPM) INSTANTANEOUS READING	2 MIN. READING	4 MIN. READING	PERCENT OF LOWER EXPLOSIVE LIMIT FOR METHANE INSTANTANEOUS READING	1 MIN. READING
September 11, 1991	49	3.8	1.0	--	100	100
(continued)	49a	3.9	2.2	--	0	0
	49b	3.8	1.3	--	13	9
	49c	4.0	2.0	--	5	7
	50	4.0	3.3	--	0	0
	51	4.4	2.3	--	0	0
	52	3.2	2.8	--	0	0
	53	4.8 (1)	1.3	--	12	8
	54	4.8	0.9	--	75	72
	55	4.8 (1)	0.8	--	0 •	0
	56	6.4	2.0	--	100	35
	56a	--	--	--	0	0
	57	6.0	0.6	--	100	40
	57a	9.0	2.6	--	100	90
	57b	8.2	7.0	--	0	0
	58	8.9 (2)	1.2	--	90	0
	59	7.8 (2)	1.4	--	30	0
	59.5	1.2	1.0	--	0 •	3
	60	7.8	3.2	--	0 •	12
	60.5	6.0 (2)	4.2	--	15	2
	61	7.0	5.0	--	0	0
	61.5	6.4	5.4	--	0	0
	62	6.2	5.6	--	0	0
	63	5.4	3.6	--	0	0
	64	4.2	2.6	--	0	0
	65	4.2	4.0	--	0	0
	66	>20	4.6	--	0	0
	67	5.4	5.6	--	0	0
	68	5.6	5.2	--	0	0
	69	5.2	4.9	--	0	0
	70	6.2	5.3	--	0	0
	71	6.2	4.5	--	0	0
	72	5.6	5.0	--	30	30
	73	5.7	4.5	--	0	0
	74	5.4	4.8	--	3	1
	75	5.8	4.4	--	0	0
	76	4.2	3.8	--	0	0
	77	4.6	4.6	--	0	0
	78	4.9	3.9	--	0	0
	79	4.0	3.5	--	0	0
	80	4.0	3.6	--	0	0
	81	4.2	2.9	--	0	0
	82	3.9	3.6	--	2	2
September 9, 1991	83	3.2	2.2	--	0	2.5
September 13, 1991	18.5(3)	5.0	2.8	--	0	0
	17.5(3)	3.4	2.9	--	0	3

MEANS SOME VOC EXISTED

• Meter initially read 100% (first few pumps), then dropped to zero or recorded level.

(1) Dynamac split sample

(2) Taken at approximately 30 sec. (initial reading unstable)

(3) Sample requested by USEPA.

ATTACHMENT B (Page 7 of 8)

[redacted]

March 5, 1993

Mr. Cesar Lee
Remedial Project Manager
U.S. EPA Region III (3HW21)
841 Chestnut Building
Philadelphia, PA 19107

Re: de maximis letter, February 12, 1993
Novak Sanitary Landfill NPL Site
South Whitehall Township
Lehigh County

Dear Cesar:

[redacted] received the February 12, 1993 de maximis letter, with attachments generated by Vincent Uhl Associates, Inc., concerning the Novak Sanitary Landfill NPL Site on February 17, 1993. The following comments result from the Department's review of the above referenced document:

de maximis letter

1. Page 1, Paragraph 2, Sentence 3. This sentence states that a release from the surface fill area or the maintenance area is the likely cause of the groundwater contamination at the unoccupied Novak residential well. There is no evidence given to support either of these areas as the cause of the contamination. This statement should be supported by facts.

2. Pages 1 and 2. The question of whether or not the existing cover over the Old Mine area is effective under current conditions is not the determining factor in whether or not a municipal cap should extend over this area. The question which is germaine is whether a single barrier cap over the entire landfill will better fulfill the nine evaluation criteria. Especially important among these criteria is protection of human health and the environment and long term effectiveness and permanance. A single barrier cap over all areas of contamination including the Old Mine area would be more protective, more effective and certainly more permanent than the existing cover.

3. Page 2. Paragraph 1. It is unclear which regulations are referred to in this paragraph.

4. Page 2, Paragraph 3. This paragraph sets forth the reasons for not installing a GW extraction system at the Novak site. The third and fourth sentences spell out the difficulty of designing a GW extraction system in a fractured bedrock aquifer. The Department acknowledges that it would entail a degree of difficulty higher than a system installed in a sand and gravel aquifer. However, difficulty by itself is not a reason to claim a technical waiver.

6. Page 3, Section 2.0: Hydrogeologic Characteristics, Last Paragraph. This paragraph does discuss the time frame of active restoration of the bedrock aquifer, but only in the most general of terms, "exceedingly long time (many decades)" and "extremely lengthy". Again there is no analysis of an active versus passive restoration of the aquifer, which is necessary if the Department is to consider a waiver of its ARAR.

If you have any questions concerning the above comments you can contact me at the above-listed telephone number.

Sincerely,

[redacted]

- An EPA Publication on the design and construction of RCRA/CERCLA final covers (EPA/625/425/4-91/025) states that RCRA Subtitle C landfills should be capped with a 20-mil geomembrane liner , in addition to other layers. RCRA Subtitle C requirements are typically used at CERCLA sites because RCRA regulates the same or similar wastes found at many CERCLA sites. Since there is documentation of RCRA hazardous waste (F001 and F006) being disposed at the Novak Landfill from at least one generator (G.E.), the RCRA requirements are applicable.

- It is also important to note that the landfill is located in an area of karst topography. According to today's regulations, a new landfill would not be permitted to be constructed in a karst area because of the unstable hydrogeologic conditions associated with this type of geology.

Due to the fact that the Old Mine Area and Demolition Fill Areas were the oldest portions of the landfill to be operating prior to the implementation of RCRA and there is documentation of hazardous waste disposal in the landfill, and the landfill is situated in a karst area, this area should be closed with a single barrier cap. While it is true that there is not much groundwater degradation in this area, it is also true that monitoring wells may not have been placed in fractures in which contaminated groundwater is migrating. As stated in De Maximus's letter, "it would be difficult to predict, with any accuracy, the extent and location of all fractures containing impacted groundwater..". A single barrier cap should be installed in order to reduce the amount of water infiltrating through the waste and transporting contaminants in the future.

Sincerely,

[redacted]

cc: [redacted]

ATTACHMENT 1

ORIGINAL (Red)

Identification of Hazardous Waste Site — Side Two

F Waste Quantity

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☐ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount: Not Known

Total Facility Area: Not Known

G Known, Suspected or Likely Releases to the Environment

Place an X in the appropriate boxes to indicate any known, suspected or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☒ Likely ☐ None

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

N

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

This is a private landfill site, still in operation for municipal trash, which we used in the late 50's. Some of the hauling was in a company owned and driven truck, mostly hauled by contract hauler...

ATTACHMENT D (Page 5 of 6)

205189

Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other."

Name: Peter M. Lubin, Plant Manager

Street: 1801 South 12th Street

City: Allentown State: PA Zip Code: 18105

Signature: Peter M. Lubin Date: 6/4/8.

☐ Owner, Present
☐ Owner, Past
☐ Transporter
☐ Operator, Present
☐ Operator, Past
☐ Other

EPA Form AR308712

In the absence of such information, an interim groundwater remedial action limited in scope to addressing source control/contaminant mass removal in the vicinity of the groundwater mound should be considered. This would permit the collection of a data base sufficient to determine what the final remediation should be and what ARARs may be met. Alternatively, if implementing the remedy in stages is undesirable, a contingent groundwater remedy providing a detailed and objective level or situation at which a waiver could be triggered could be considered. Both scenerios acknowledge that the practicability of achieving cleanup goals throughout the site cannot be determined until the extraction system has been implemented and plume response monitored over time.

I am not aware of any Superfund guidance or precedent setting circumstance condoning the use of statistics on monitoring well sampling results for the purpose of triggering groundwater remedial actions in cases where the triggers such as ARARS have clearly been exceeded (as is the case at NSL). Although the RCRA program may use statistical analysis to trigger groundwater clean-ups at permitted facilities, it is not clear whether such a scenerio is applicable at Superfund sites. The Toxicologist assigned to the site may be able to provide further insight into this issue.

Please let me know if you would like my assistance in developing an appropriate groundwater strategy for inclusion in the Proposed Plan or if you would like to discuss any of these issues in greater detail.

cc: [redacted]

de maximis, inc.
2045 Lincoln Highway, #308
St. Charles, IL 60174
(708) 879-3919
Fax (708) 879-0830

April 10, 1993

VIA FACSIMILE AND
OVERNIGHT COURIER

Mr. Cesar Lee (3HW21 CL)
United States Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Subject: Novak Sanitary Landfill Site
March 1993 Monthly Progress Report

Dear Mr. Lee:

Pursuant to the Administrative Order by Consent, enclosed are three (3) copies of the Monthly Progress Report for the Novak Sanitary Landfill site for March 1993.

If you or your staff have any questions, please do not hesitate to contact me.

Best regards,
de maximis, inc.

Mark A. Travers
Senior Project Director

MAT/bms

Enclosure

cc: [redacted]
Julie Parker, Esq., Hannoch Weisman
Joseph Keller, Geraghty & Miller, Inc.
Meg Mustard, Pennsylvanaia Department of Natural Resources
Micheal Heffron, Dynamac Corporation
Vincent Uhl, Vincent Uhl Associates

c:\winword\3009\LTRMPR

MONTHLY PROGRESS REPORT
Prepared by *de maximis, inc.*

PROJECT NAME: Novak Sanitary Landfill Site
South Whitehall Township, Pennsylvania

TIME PERIOD COVERED: March 1993

ACTIONS TAKEN TOWARD COMPLIANCE WITH THE CONSENT DECREE/PLANS AND PROCEDURES COMPLETED:

- Preparation and submittal of the monthly progress report for March 1993. The report was submitted within the time period provided for in the Administrative Order by Consent.
- Receipt of letter from U.S. EPA on March 26, 1993, regarding previous correspondence to the U.S. EPA which included two short letter reports pertaining to the Old Mine Area and the viability of a ground water pump and treat system.

ACTION ITEMS FOR THE FOLLOWING MONTH:

- Preparation and submittal of the Monthly Progress Report.
- Validation of the results of analyses of ground water samples collected from the residential supply wells. The results will be transmitted to the U.S. EPA following completion of the data validation.
- Meeting of the Novak RI/FS PRP Group and the U.S. EPA to discuss completion of the RI/FS and recent correspondence from the U.S. EPA.

ANTICIPATED DELAYS/PROBLEMS:

- None Anticipated

RESULTS OF SAMPLING/TESTING:

- None this Period

DRAFT AGENDA
NOVAK RI/FS MEETING
APRIL 28, 1993

U.S. EPA CORRESPONDENCE DATED MARCH 25, 1993 (with accompanying comments)

- *GROUND WATER PUMP AND TREAT*
- *CAPPING REQUIREMENTS FOR THE OLD MINE AREA AND THE DEMOLITION FILL AREAS*

ADMINISTRATIVE RECORD OMISSIONS

THE RI/FS APPROVAL

ANTICIPATED LIST OF ATTENDEES:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Cesar Lee
Patrick Anderson
Elizabeth Lukens, Esquire

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES

Meg Mustard
PADER Hydrogeologist

DYNAMAC CORPORATION (U.S. EPA OVERSIGHT CONTRACTOR)

Michael Heffron

NOVAK RI/FS PRP GROUP

Lawrence W. Diamond, Esquire
Julie A. Parker, Esquire
Mark A. Travers, de maximis, inc.
Vincent Uhl, Vincent Uhl Associates
Lawrence Hosmer, Geraghty & Miller, Inc.

de maximis, inc.

2045 Lincoln Highway, #308
St. Charles, IL 60174
(708) 879-3919
Fax (708) 879-0830

April 26, 1993

VIA FACSIMILE

Mr. Cesar Lee (3HW21)
Remedial Project Manager
Southeast Pennsylvania Remedial Section
Hazardous Waste Management Division
United States Environmental Protection Agency
841 Chestnut Street
Philadelphia, PA 19107

Subject: U.S. EPA Correspondence Dated March 25, 1993
Encompassing and Evaluating Government Comments on
Novak Sanitary Landfill Site RI/FS

Dear Mr. Lee:

The enclosed document has been prepared on behalf of the Novak RI/FS PRP Group ("Group") in response to the subject correspondence and accompanying comments. The response was considered critical in light of the nature and significance of the comments and their departure from previous government comments. The enclosed should not be considered an all inclusive response or a final official response.

We look forward to discussing this with you and your staff at our meeting on Wednesday, April 28, 1993. The proposed agenda and list of attendees for this meeting is also enclosed.

Sincerely,
de maximis, inc.

Mark A. Travers

MAT/bms
Enclosure

cc: Joseph Keller, Geraghty & Miller
Lawrence Hosmer, Geraghty & Miller
Vincent Uhl, Vincent Uhl Associates
Lawrence W. Diamond, Esquire, Hannoch Weisman
Julie A. Parker, Esquire, Hannoch Weisman
Member Representatives of the Novak RI/FS PRP Group
Cesar Lee, U.S. EPA Region III
Patrick Anderson, U.S. EPA Region III
Elizabeth Lukens, Esquire, U.S. EPA Region III
Jay Newbaker, U.S. EPA Region III
Meg Mustard, PADER
Michael Heffron, Dynamac Corporation

AGENDA
NOVAK RI/FS MEETING
APRIL 28, 1993

U.S. EPA CORRESPONDENCE DATED MARCH 25, 1993, WITH ACCOMPANYING COMMENTS

- GROUND WATER PUMP AND TREAT
- CAPPING REQUIREMENTS FOR THE OLD MINE AREA AND THE DEMOLITION FILL AREA

ADMINISTRATIVE RECORD OMISSIONS

RI/FS APPROVAL

ANTICIPATED LIST OF ATTENDEES:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Cesar Lee
Patrick Anderson
Elizabeth Lukens, Esquire
Jay Newbaker

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES

Meg Mustard
PADER Hydrogeologist

DYNAMAC CORPORATION (U.S. EPA OVERSIGHT CONTRACTOR)

Michael Heffron

NOVAK RI/FS PRP GROUP

Lawrence W. Diamond, Esquire, Hannoch Weisman
Julie A. Parker, Esquire, Hannoch Weisman
Mark Travers, de maximis, inc.
Vincent Uhl, Vincent Uhl Associates, Inc.
Lawrence Hosmer, Geraghty & Miller, Inc.

RESPONSE TO U.S.EPA CORRESPONDENCE DATED MARCH 25, 1993; NOVAK SANITARY LANDFILL SITE RI/FS

1.0 BACKGROUND

In February, 1993, de maximis, inc. and Vincent Uhl Associates, Inc. submitted a document to the United States Environmental Protection Agency (U.S.EPA) Region III that: (a) discussed the practicability of groundwater recovery at the Novak Sanitary Landfill (NSL) site; and (b) provided a summary of hydrogeologic and groundwater quality conditions in the vicinity of the Old Mine Area. This document was reviewed and commented on by the U.S.EPA Region III, Pennsylvania Department of Environmental Resources (PADER), and Dynamac Corporation (consultant to U.S.EPA Region III), all of whom had previously reviewed and commented on the draft Remedial Investigation/Feasibility Study (RI/FS). In addition, personnel at the Robert S. Kerr Environmental Research Laboratory (ERL) in Ada, Oklahoma prepared a memorandum that addressed the practicability of groundwater recovery based on review of the RI/FS.

This response document is formatted in four sections. Section 2.0 presents an Executive Summary. In Sections 3.0 and 4.0, comments from all four parties pertaining to (1) groundwater recovery practicability and (2) the Old Mine Area are addressed. Section 5.0 provides a discussion of other issues that are raised in the ERL document. Specific comments from U.S.EPA Region III, PADER, and Dynamac are in bold type followed by our responses.

2.0 EXECUTIVE SUMMARY

2.1 Practicability of Groundwater Recovery[1]

- There is a pronounced groundwater mound beneath and proximate to the Trench Fill Area in the upper portion of the bedrock aquifer system. The RI groundwater monitoring program indicated that the highest constituent concentrations in on-site groundwater are within this mounded area. In offsite monitoring and residential wells within and near the mound, MCLs were not exceeded.

1. The Novak RI/FS PRP Group ("Group") has consistently maintained that Pennsylvania's purported ARAR of "background" for groundwater is not, in fact, an ARAR. Nevertheless, due to the government's apparent insistence that "background" is an ARAR, the Group has prepared this response to demonstrate that the existing data supports a waiver of this purported ARAR.

- The results from short-term pumping tests, conducted on wells that characterize this mound, indicate that: (1) the bedrock aquifer system in this area is marginal; (2) pumping at very low rates (less than 3 gallons per minute) for very short durations (less than 2 hours) resulted in the shallow monitoring wells nearly pumping dry; (3) sustained well yields in the vicinity of the mound will be very low (less than 1 gallon per minute); and (4) it would obviously require many recovery wells even to attempt to contain the groundwater in the vicinity of the mound given the marginal nature of the underlying bedrock aquifer system.

- These results in and of themselves, without further study and elaboration, strongly point to the impracticability of a pump and treat remedy.

- The comments from U.S.EPA, PADER, DYNAMAC and ERL have all concerned data considered lacking for the requested waiver decision. However, it is telling that none of these commenters have opined that, given the provision of additional data, pump and treat could be practicable and should be implemented.

2.2 Old Mine Area and Demolition Fill Area

The requirements for covering of the Old Mine Area and the Demolition Fill Area should be viewed independently even though the final Feasibility Study recommends maintenance of the existing cover over both areas as a single recommendation. This is appropriate since the two areas are different types of operating units.

Finally, the recommendation for maintenance of the existing cover over these areas is supported by the following facts:

- Current groundwater conditions downgradient of the Old Mine Area and the Demolition Fill Area indicate that the existing cover is protective of human health and the environment.

- The cover existing over the Old Mine Area is consistent with the Pennsylvania requirements for covering sanitary landfills at the time Novak Sanitary Landfill, Inc. ceased operations in the Old Mine Area fill.

- The cover over the Demolition Fill Area is consistent with current Pennsylvania requirements for final cover over demolition fill areas.

- The current cover over these areas, with the proper maintenance, is as permanent as a single barrier cap with consistent maintenance.

3.0 PRACTICABILITY OF GROUNDWATER RECOVERY

3.1 U.S.EPA REGION III COMMENTS: March 9, 1993 Memorandum

2nd Paragraph: "Briefly, the memorandum summarized the extent of groundwater contamination and groundwater flow conditions at the site but presented little new information regarding the practicability of groundwater recovery operations. Using specific capacity data gathered from short term pumping tests in a number of monitoring wells, 58 pumping wells were deemed necessary to effectively remediate the aquifer. This prediction, however, was based upon drawdown data gathered during well development procedures only using data from the pumping well instead of properly performed long-term aquifer tests using observation wells. This information is therefore of limited use."

3rd Paragraph: "Properly designed pumping tests and subsequent capture zone analysis would be needed to accurately determine the number of wells necessary to achieve aquifer restoration. This data is commonly gathered during predesign field investigations after a remedy has already been selected."

Response: The intent of the February 1993 document from de maximis and Vincent Uhl Associates was to focus on and summarize the RI data in regard to the practicability of groundwater recovery (as discussed with the U.S.EPA); not to present new information.

The short-term RI pumping tests were not conducted during well development as stated in the U.S.EPA, PADER and ERL comments, with only one exception (MW-23). The tests on the remainder of the wells were conducted during pre-sampling evacuation after the well had been developed. Therefore these test data represent fully developed well conditions.

Although the data from these short-term tests have acknowledged limitations with respect to exact determination of certain aquifer properties, these test data are not

uncertain with respect to one salient feature, that is, that very large drawdowns resulted from very short periods (less than 2 hours) and very small rates (less than 3 gallons per minute) of pumping. Further as illustrated in Table 1 (attached), several of the shallow monitoring wells nearly pumped dry during this short-term low-rate pumping.

The short-term pumping tests data have unmistakeable implications, namely that: (1) well yields at the landfill, especially in the vicinity of the mound, are very low, and sustained yields of less than 1 gallon per minute (gpm) can be expected; and (2) it would obviously require many recovery wells to attempt to contain the groundwater in the vicinity of the mound at less than 1 gpm individual rates of pumping.

Even without further study and elaboration, these short term tests strongly point to the impracticability of a pump and treat remedy.

4th Paragraph: "Although the fractured nature of the bedrock aquifer and low levels of groundwater contamination may make aquifer restoration very difficult or even unattainable, there is insufficient data contained in the RI/FS Report to make an objective evaluation of a technical impracticability waiver. Ideally, the RI/FS Report would have specifically addressed whether pump and treat could contain, capture, or completely remove the groundwater contaminants, possibly employing groundwater modeling to estimate restoration time-frames."

Response: At the draft stages of both the RI and FS, U.S.EPA apparently ruled out further investigations related to aquifer restoration based on the available (draft RI/FS) information. The following two quotes are examples of this position:

> "The limited pump test program of the RI, under other [emphasis added] circumstances, might be considered inadequate, but the distribution and magnitude of contamination in the ground water system (see Figures 5-1 and 5-2 of the RI Report) does not seem to warrant the consideration of a pump and treat system, the typical precursor condition to a long-term pump test."

(General Comment b. in U.S.EPA letter of January 17, 1992 to Mark Travers (de maximis) with report summarizing EPA's and PADER's review of the Draft RI Report for the NSL).

RESPONSE TO U.S.EPA CORRESPONDENCE DATED MARCH 25, 1993;
NOVAK SANITARY LANDFILL SITE RI/FS

"Like the Draft RI for this site, I found the FS to be well written and well documented with no gaps regarding evaluation of alternatives for all media of concern. I agree with the assessment of a limited action for groundwater at this site, as the monitoring data from on-site and off-site wells shows no MCL violations. A pump-and-treat system at this site to bring low levels of contaminants "down" to background levels may not be cost-effective. There is no guarantee that a significant reduction in groundwater concentrations would occur if a pump-and-treat system was installed in addition to the proposed cap."

(U.S.EPA Internal Memorandum from Mindi Snoparsky, Geologist, to Cesar Lee re. Review of Novak Sanitary Landfill, dated February 10, 1992).

Given (1) our understanding of the very marginal nature of the bedrock aquifer system, (2) the low constituent concentrations which do not exceed MCLs in offsite areas, and (3) the perceived U.S.EPA position that conditions at the site "do not seem to warrant the consideration of a pump and treat system", it did not appear necessary to proceed with acquiring additional pumping test data. Based on the RI/FS data, we agree with USEPA's stated doubts regarding the potential effectiveness of a recovery system. No new pertinent data have been developed since early 1992, when the U.S.EPA's comments above were written.

5th Paragraph: "In the absence of such information, an interim groundwater remedial action limited in scope to addressing source control/contaminant mass removal in the vicinity of the groundwater mound should be considered. This would permit the collection of a data base sufficient to determine what the final remediation should be and what ARARs may be met. Alternatively, if implementing the remedy in stages is undesirable, a contingent groundwater remedy providing a detailed and objective level or situation at which a waiver could be triggered could be considered. Both scenarios acknowledge that the practicability of achieving cleanup goals throughout the site cannot be determined until the extraction system has been implemented and plume response monitored over time."

Response: Source control including leachate extraction and a single barrier cap is a component of the recommended remedial action. A groundwater remedial action, i.e. a

recovery system, even if it were to be "interim" and/or "in the vicinity of the groundwater mound" could hardly be considered "limited in scope". It is important to first determine whether such a system is viable prior to implementation. It is our opinion that the available data are sufficient to indicate that such a system would not be viable given the constraints imposed by the very poor hydraulic characteristics of the marginal bedrock aquifer underlying the mounded area.

3.2 PADER COMMENTS: Letter of March 5, 1993 to U.S.EPA

"5. Page 1, Section 2.0: Hydrogeologic Characteristics, Paragraph 2, Last Sentence. This sentence contradicts information presented in the RI. The RI states that the mounding is due to the presence of water in the trenches, which provides a continuous recharge to the underlying aquifer."

Response: The sentence referred to above (Vincent Uhl Associates document of February 11, 1993 regarding Groundwater Recovery Feasibility), reads.."This pronounced mound in the water table is present primarily due to the low hydraulic conductivity of the underlying bedrock." This does not contradict the RI at Page 4-55. The sentence in the RI to which PADER refers addresses the source of recharge to the mound, while the sentence above addresses how the low hydraulic properties of the bedrock system underlying the trench fill area affect the magnitude of the mound. Simply stated, mounding is controlled/affected by the location and magnitude of recharge and the hydraulic characteristics of the aquifer system. If hydraulic conductivity and transmissivity are moderate to high, the extent and magnitude of mounding would be much less than for a system with lower hydraulic conductivity and transmissivity, as is present at the site in the vicinity of the trenches.

5. Second Paragraph: "The hydrogeologic characteristics of the bedrock aquifer as summarized from the RI should be viewed as only preliminary, as stated on Page 4-61 in the RI. The reasons for this preliminary designation of the data is based on short duration of the "pumping tests" and the low pumping rates. It should be further noted that these "pumping tests" were conducted on the monitoring wells during the development of these wells (see page 4-57)."

RESPONSE TO U.S.EPA CORRESPONDENCE DATED MARCH 25, 1993;
NOVAK SANITARY LANDFILL SITE RI/FS

Response: For clarification, the hydrogeologic characteristics of the bedrock aquifer are considered to be well defined by the technical consultants directly involved with the NSL project as well as by the government personnel and technical consultants that have been involved with project oversight. General Comment a. in the U.S.EPA letter of January 17, 1992 to Mark Travers (de maximis) with the report which summarizes U.S.EPA's and PADER's review of the Draft RI report for the NSL states:

> "The regional and local geology and ground water system are well defined, and the analyses and conclusions relating to new data collected in the RI converge with those of prior studies in the area."

As Page 4-61 of the RI states, it is the hydraulic characteristics that should be viewed as preliminary insofar as longer term pumping tests were not conducted as part of the RI. As discussed above (pages 3 and 4), this preliminary analysis was indeed sufficient to arrive at the sound technical conclusion that sustained well yields from wells at and in the vicinity of the mound would be extremely low. To illustrate this, Monitoring Well MW-6, when pumped at 2 gpm for 80 minutes experienced 64+ feet of drawdown from an original static water level of approximately 75 feet. Thus, after pumping at a rate of 2 gpm for 80 minutes, this well, which is 150 feet deep, had a water level 11 feet from the bottom of the well; in other words, pumping at this low rate over a very short duration almost caused this well to pump dry. These test data demonstrate that the sustained yield of MW-6 would be much less than 2 gpm and that the bedrock system at this location is very tight.

Table 1 (attached) further demonstrates that Monitoring Wells MW-1C and MW-16 when pumped for short durations at low rates of flow almost pumped dry.

5. Paragraph 3: "Since this preliminary data was used to generate specific capacity and transmissivity for the bedrock aquifer, it should be viewed as questionable. Step drawdown tests (to determine appropriate pumping rates) and long duration pump tests should be conducted on select monitoring wells to obtain more complete data on the aquifer's characteristics, before making any decisions concerning the technical impracticability waiver."

Response: We fail to understand why the existing pumping test data should be viewed as questionable. No concrete reasons are stated in the PADER comment as to why the data should be viewed as such. We agree that longer term pumping tests would provide a more complete understanding of aquifer hydraulic characteristics that would be necessary to design a recovery system. But it is important to realize that these longer term tests would (1) need to be run at very low pumping rates (less than 1 gpm) if pumping is to be sustained for as long as 1 to 2 days, (2) would result in very little drawdown at limited distances (few 10's of feet) from the pumping well(s), and (3) would not appreciably change the current view/results/understanding that we are dealing with a marginal bedrock aquifer system that is characterized by very low hydraulic properties and is not suitable for a recovery system.

4.0 OLD MINE AREA and DEMOLITION FILL AREA

4.1 PADER Letter of March 5, 1993 to U.S.EPA Region III.

"1. Page 1, Paragraph 2, Sentence 3. This sentence states that a release from the surface fill area or the maintenance area is the likely cause of the groundwater contamination at the unoccupied Novak residential well. There is no evidence given to support either of these two areas as the cause of the contamination. This statement should be supported by facts."

Response: In fact, the unoccupied Novak residential well is hydraulically downgradient of the surface fill area and the maintenance area (RI Figures 4-15 and 4-17) and as such it is reasonable that one or both of these areas would be the source of constituents in this well.

"2. Pages 1 and 2. The question of whether or not the existing cover over the Old Mine area is effective under current conditions is not the determining factor in whether or not a municipal cap should extend over this area. The question which is germaine is whether a single barrier cap over the entire landfill will better fulfill the nine evaluation criteria. Especially important among these criteria is protection of human health and the environment and long term effectiveness and permanance [sic]. A single barrier cap over all areas of contamination including the Old Mine area would be more protective, more effective and certainly more permanent than the existing cover."

Response: Proper maintenance of the existing soil cover would be permanent and would be effective in protecting human health and the environment. Secondly, it is the conclusion of the Novak RI/FS PRP Group ("Group") that the Old Mine Area and Demolition Area must be viewed independently with respect to remedy selection. The cover over the Old Mine Area is consistent with the requirements for closure of landfills at the time the Novak Sanitary Landfill, Inc. ceased operations in this area. The current Pennsylvania requirements for closure of demolition fills establish cover consistent with the cover which currently exists over the demolition fill.

4.2 DYNAMAC COMMENTS: March 8, 1993 Letter to U.S.EPA Region III

"o General Electric (G.E.) submitted a Notification of Hazardous Waste Site Form to EPA on June 6, 1981 identifying Novak Landfill as its destination for Hazardous waste F006 (Waste water treatment sludges), and F001 (Spent halogenated solvents used in degreasing) (See Attachment No. 1). Additional documentation identifies that G.E. used the Novak Landfill for waste disposal between 1956 and 1960."

Response: The Group as a whole and G.E., in its June 16, 1992 correspondence to the U.S.EPA[1], have responded to this comment previously. This comment incorporates no new information, therefore it should not be raised again and used as the basis here for a decision on cover.

"o An EPA publication on the design and construction of RCRA/CERCLA final covers (EPA/625/425/4-91/025) states that RCRA Subtitle C landfills should be capped with a 20-mil geomembrane liner, in addition to other layers. RCRA Subtitle C requirements are typically used at CERCLA sites because RCRA regulates the same or similar wastes found at many CERCLA sites. Since there is documentation of RCRA hazardous waste (F001 and F006) being disposed at the Novak Landfill from at least one generator (G.E.), the RCRA requirements are applicable."

1. G.E. has informed us that they will be submitting a separate response to the U.S.EPA regarding this comment.

Response: The Novak Sanitary Landfill site is not a RCRA Subtitle C Landfill. The conclusion of Dynamac that "RCRA Subtitle C requirements are typically used at CERCLA sites because RCRA regulates the same or similar wastes found at many CERCLA sites" is not correct. In addition, the final RI/FS previously concluded that the RCRA Subtitle C requirements for landfill closure is not an ARAR, a conclusion U.S.EPA did not dispute. Subtitle C requirements only apply to Subtitle C sites. This is well documented by previous RODs of the USEPA for sites in Pennsylvania Region III and nationwide. Examples include: Old City of York Landfill in York, Pennsylvania; Dorney Road (Oswald) Landfill in Upper Macungie, Pennsylvania; and the East Mt. Zion Landfill in Springettsbury Township, Pennsylvania.

"o It is also important to note that the landfill is located in an area of karst topography. According to today's regulations, a new landfill would not be permitted to be constructed in a karst area because of the unstable hydrogeologic conditions associated with this type of geology."

Response: Section 4.4.5 of the RI "Karst-Related Features" provides a detailed discussion of karst-related features which are summarized in the last paragraph of that section: "The only features considered characteristic of karst that occur in the immediate vicinity of the site are the closed depressions and a few possible sinkholes. No caves, swallow holes, springs, large well-developed sinkholes or underground drainage were observed in the field during the conduct of the RI or noted in the review of the extensive regional literature. In summary, the field observations and pertinent technical literature indicate an immature degree of karst development within the site vicinity."

5.0 OTHER ISSUES

5.1 Robert S. Kerr Environmental Research Laboratory Memorandum of February 23, 1993 to U.S.EPA Region 3.

The ERL comments as provided in their February 23, 1993 memorandum to the U.S.EPA Region III are based on review of the RI/FS documents with respect to whether these documents support an ARAR waiver. ERL was apparently not provided with the February 1993 de maximis and Vincent Uhl Associates document that discuss the Old Mine Area and Groundwater

Recovery Feasibility. Responses are provided for the five principal comments presented in the ERL memorandum.

1.0 Leachate Quality

We agree that a bottom leachate sample may show higher concentrations. However, a substantial unsaturated zone (up to 65 feet of clay overburden and bedrock) is present between the bottom of the trenches and the top of the water table. Percolation of the leachate through this unsaturated interval will result in an alteration of water quality, by natural renovation, between the bottom of the trenches and the zone of saturation. Secondly, there are monitoring well clusters (MW-6/8 and MW-1C/7) that certainly provide information on groundwater quality proximate to the trenches.

The site-wide remedial alternatives presented by ERL in the first paragraph on Page 3 of their memorandum, namely minimizing the amount of water infiltrating into the landfill and leachate removal, are part of the recommended remedial alternative in the FS. Section 7 of the FS, "Remedial Alternative Selection and Recommendation", clearly lays out the elements of the selected remedy (Remedial Alternative (4) which includes removal of leachate in the Surface Fill and Trench Fill Areas and the construction of a single-barrier cap in both of these areas which would reduce infiltration by approximately 98 percent.

2.0 Definition of Groundwater Flow Conditions

Response: The ERL comment on page 3 states: "....the basis of this mound appears to be from only one well.." This statement is incorrect. Pages 4-53 to 4-56 of the RI describe in detail the well clusters that indicate a mound in the water table at and near the landfill, and a table in the text summarizes water level conditions and head differences for all of the monitoring well clusters at the NSL. A review of this table in the text indicates to the reader that all of the well clusters were considered when constructing the shallow water-level contour map that depicts the mound (Figure 4-15). As indicated on the table, there are downward heads at quite a few clusters, especially in the vicinity of the trenches.

RESPONSE TO U.S.EPA CORRESPONDENCE DATED MARCH 25, 1993;
NOVAK SANITARY LANDFILL SITE RI/FS

3.0 Impact of Landfill Leachate on groundwater quality: the horizontal and vertical extent of the "plume"; and the technical viability of the current monitoring well network

Response: We will begin by first addressing the technical viability of the current monitoring well network that has been used to characterize the vertical and horizontal extent of impact to groundwater from the landfill. First of all Monitoring Wells MW-1C, MW-2A, MW-5, and MW-6 are not wells that were installed as part of the RI; these wells were in existence prior to the site being listed by the USEPA. Three of these wells (MW-1C, MW-2A, and MW-6) were used during the RI for water-level measurement and water-quality sampling purposes. MW-5 was not used specifically because of its long saturated open-hole interval. Note that the saturated open hole interval of MW-2A is 65 feet and not 142 feet as noted on the table in the ERL memorandum (Page 3).

A review of the open-hole intervals on pages 3 and 4 of the ERL memorandum indicates that most wells have open-hole intervals from 40 to 50 feet. The exceptions are MW-15 which is completed in overburden in the unsaturated zone, and MW-23 which was completed with an open-hole interval of 12 feet because of highly fractured rock and the inability to drill deeper with the air-rotary or mud-rotary methods. The rationale for the monitoring wells is clearly spelled out in Section 3.5 of the RI. To summarize, the system consists of shallow monitoring wells that are open-hole over similar intervals from the top of the water table to a depth of 40 to 50 feet, and deeper wells that are likewise open hole over similar intervals at depth. This well system allows for a characterization of site shallow and deeper groundwater flow and quality conditions, as opposed to a system of wells completed at different random depths that often provide complicated data that preclude a clear interpretation of groundwater flow conditions.

The next ERL issue with respect to the wells appears to be how representative are water-quality sampling results from monitoring wells with open-hole intervals from 40 to 50 feet in length as opposed to sampling from a series of wells with more limited open-hole intervals and/or using packers to isolate specific fracture zones.

An expanded version of Table 4-1 (RI) is attached; included in this table are the open-hole interval and average static water level (1991) for each well. Review of this expanded table indicates that for the wells in the vicinity of the landfill and within the mounded area: (1) many of the fracture zones noted during drilling were above

the water table, and (2) many fracture zones below the water table were dry during drilling or exhibited only seepage. In summary, for all of the monitoring wells installed as part of the RI in the vicinity of the mound (MW-7, -8, -9, -13, -16, -17, -18, -19, -20, and -21), no measureable flow was noted in fracture zones that were observed in the open-hole interval during drilling. Fracture zones in the open-hole intervals of these wells are characterized as dry or seepage. As such, there are not discrete major water-bearing fracture zones in these wells that lend themselves to the application of straddle packers for the collection of water samples.

In addition, the short-term pumping test results were consistent with the drilling observations in that they showed very low well yields and significant water-level drawdown for the wells in the mounded area. The area of the mound is obviously a very low permeability area.

In contrast, the monitoring wells to the north of the landfilled areas, ie Wells MW-10/11, MW-12 and MW-22/23 yielded more water, and showed less drawdown and higher specific capacities. These same wells showed discernable water-bearing fractures during the drilling process that yielded from 10 to more than 30 gallons per minute. A review of expanded Table 4-1 indicates that over the completed open-hole interval, only one discernable water-bearing fracture zone was noted in MW-11 (219 to 214 ft bmsl); MW-12 (277 to 270 ft bmsl); and MW-23 (256 to 233 ft bmsl). If multiple water-bearing fracture zones had been noted in a well, we could see the merit of employing a straddle packer to determine quality conditions of each fracture (water bearing) interval. We do not see its purpose in a well with only one major water-bearing fracture interval.

The monitoring well system installed was approved in the RI Work Plan. We consider this monitoring system to be appropriate and adequate for the characterization of groundwater flow and quality conditions at the site. Further, the monitoring wells monitor sensible representative portions of the underlying bedrock aquifer system. Given the observed conditions at the site during the drilling program, a fracture by fracture study is not appropriate to characterize groundwater flow and quality.

4. Pumping Tests

Response: The comments on this subject have been addressed in previous responses in Section 3.0 of this document.

5. Residential Well Sampling

Response: The quality assurance and quality control disclaimers reported for the data are required by the USEPA protocols for data validation. These data "qualifiers" are not out of the ordinary; particularly for the low-level residential wells analyses. The qualifiers indicate that these data are valid and acceptable for use under USEPA's stringent QA/QC rules and regulations. Blank samples are analyzed in recognition of the fact that samples often contain unavoidable artifacts, particularly those associated with laboratory fugitive contamination.

Evacuation of wells prior to sampling is the accepted practice in groundwater assessment programs. The stagnant water in the well column is not sampled expressly because of the likelihood of loss of volatiles within the well which would yield a non-representative sample. We do not understand the concern because we do not see the distinction between the water which enters the well during evacuation and the water which would normally enter the well from the formation during routine or periodic usage.

Table 1. Summary of Static Versus Pumping Water Levels in Shallow Monitoring Wells Around the Trench Fill Area.

Monitoring Well Number	Well Depth Elevation (feet amsl)	Pumping Rate (gpm)	Pumping Test Duration (minutes)	Measuring Point Elevation (feet amsl)	Static Water Level (feet bmp)	Pumping Water Level (feet bmp)	Pumping Water Level Elevation (feet amsl)	Remaining Water Column (feet)
MW-1C	291	3	8	434.10	81.46	129.77	304.33	13.33
MW-6	244	2	80	395.68	75.33	139.74	255.94	11.94
MW-16	298	1.3	22	401.83	85.17	101.10	300.73	2.73
MW-2A	250	3	12	425.86	112.19	141.25	284.61	34.61

amsl - Above Mean Sea Level.
gpm - Gallons Per Minute.
bmp - Below Measuring Point (top of casing).

Table 4-1 (Revised). Depth, Thickness of, and Yield from Fractured Intervals Encountered During Drilling, Novak Sanitary Landfill, South Whitehall Township, Pennsylvania.

Well	Orientation of Fracture Trace	Depth of Fractured Interval (feet bgs)	Thickness of Fractured Interval (feet)	Ground Surface Elevation (NGVD)	Approximate Elevation of Fractured Interval (NGVD)	Approximate Yield of Ground Water Observed During Drilling (gpm)	Open Hole Interval (ft, NGVD)	Static-Water Level (ft, NGVD) (1991)
MW-7	NA	95 to 130	35	433.0	338 to 303	18 **		
		146 to 155	10		288 to 278	NM **		
		170 to 175	5		263 to 258	NM **		
		180 to 190	10		253 to 243	NM **	239 to 199	330
MW-8	NA	190	<1	393.1	203	Dry	232 to 194	316
MW-9	NA	Not Observed	NA	423.2	NA	NA	238 to 198	310
MW-10	N5W	77 to 87	10	454.0	377 to 367	Dry *		
		90 to 98	8		364 to 356	Dry *		
		115 to 160	45		339 to 294	NM		
		165 to 180	15		289 to 274	NM	319 to 269	307
MW-11	N5W	125 to 130	5	453.6	329 to 324	Dry *		
		135 to 142	7		319 to 312	Dry *		
		235 to 240	5		219 to 214	21	250 to 199	306
MW-12	N60E	54 to 65	11	395.4	341 to 330	Dry *		
		84 to 85	1		311 to 310	Dry *		
		106 to 107	1		289 to 288	NM		
		109 to 115	6		286 to 280	NM		
		118 to 125	7		277 to 270	10 to 15	320 to 270	307
MW-13	N65E	91 to 93	2	372.2	281 to 279	Dry		
		99 to 100	1		273 to 272	Dry	322 to 272	324
MW-14	N15W	18 to 19	1	339.4	321 to 320	Dry *		
		22 to 24	2 (void)		317 to 315	>30	323 to 277	317
MW-16	N10W	52 to 58	6	399.5	347 to 341	Dry *		
		80 to 90	10		319 to 309	Seepage		
		95 to 101	6		304 to 298	Seepage	348 to 298	320

NGVD - National Geodetic Vertical Datum.
bgs - Below ground surface.
gpm - Gallons per minute.
NA - Not applicable.
NM - Not measured.
* - Fracture Zone in Unsaturated Zone.
** - Fracture Zone above Open Hole Interval.

Table 4-1 (Revised). Depth, Thickness of, and Yield from Fractured Intervals Encountered During Drilling, Novak Sanitary Landfill, South Whitehall Township, Pennsylvania.

Well	Orientation of Fracture Trace	Depth of Fractured Interval (feet bgs)	Thickness of Fractured Interval (feet)	Ground Surface Elevation (NGVD)	Approximate Elevation of Fractured Interval (NGVD)	Approximate Yield of Ground Water Observed During Drilling (gpm)	Open Hole Interval (ft, NGVD)	Static-Water Level (ft, NGVD) (1991)
MW-17	N10W	50 to 70	20	399.5	349 to 329	Dry *		
		80 to 82	2		319 to 317	1 **		
		85 to 100	15		314 to 299	Seepage **		
		115 to 120	5		284 to 279	Seepage **		
		125 to 130	5		274 to 269	Seepage **		
		170 to 175	5		229 to 224	Seepage	245 to 195	314
MW-18	N70E	104 to 105	1	382.9	279 to 278	Dry	318 to 267	approx. 295
MW-19	N70E	39 to 40	1	382.4	343 to 342	Dry *		
		45 to 49	4		337 to 333	Dry *		
		135 to 140	5		247 to 242	Dry	247 to 198	314
MW-20	N65E	90 to 110	20	393.0	303 to 283	Dry	327 to 278	330
MW-21	N65E	18 to 21	3	392.5	374 to 371	Dry *		
		88 to 90	2		304 to 302	Dry **		
		125 to 130	5		267 to 262	5 to 6 **		
		160 to 165	5		232 to 227	Dry		
		170 to 180	10		222 to 212	2		
		183			209	Dry	250 to 199	321
MW-22	N65E	75 to 105	30	436.0	361 to 331	Dry *		
		155 to 162	7		281 to 274	NM	324 to 274	314
MW-23	N65E	90 to 115	25	436.0	346 to 321	Dry *		
		130 to 145	15		306 to 291	NM **		
		165 to 170	5		271 to 266	NM **		
		180 to 203	23		256 to 233	15 to 34	245 to 233	314

NGVD - National Geodetic Vertical Datum.
bgs - Below ground surface.
gpm - Gallons per minute.
NA - Not applicable.
NM - Not measured.
* - Fracture Zone in Unsaturated Zone.
** - Fracture Zone above Open Hole Interval.

de maximis, inc.
2045 Lincoln Highway, #308
St. Charles, IL 60174
(708) 879-3919
Fax (708) 879-0830

May 10, 1993

VIA FACSIMILE AND
OVERNIGHT COURIER

Mr. Cesar Lee (3HW21 CL)
United States Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Subject: Novak Sanitary Landfill Site
April 1993 Monthly Progress Report

Dear Mr. Lee:

Pursuant to the Administrative Order by Consent, enclosed are three (3) copies of the Monthly Progress Report for the Novak Sanitary Landfill site for April 1993.

If you or your staff have any questions, please do not hesitate to contact me.

Best regards,
de maximis, inc.

Mark A. Travers/bms

Mark A. Travers
Senior Project Director

MAT/bms

Enclosure

cc: Lawrence W. Diamond, Esq., Hannoch Weisman
~~June Parker, Esq., Hannoch Weisman~~
Joseph Keller, Geraghty & Miller, Inc.
Meg Mustard, Pennsylvanaia Department of Natural Resources
Micheal Heffron, Dynamac Corporation
Vincent Uhl, Vincent Uhl Associates

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MONTHLY PROGRESS REPORT
Prepared by *de maximis, inc.*

PROJECT NAME: Novak Sanitary Landfill Site
South Whitehall Township, Pennsylvania

TIME PERIOD COVERED: April 1993

ACTIONS TAKEN TOWARD COMPLIANCE WITH THE CONSENT DECREE/PLANS AND PROCEDURES COMPLETED:

- Preparation and submittal of the monthly progress report for March 1993. The report was submitted within the time period provided for in the Administrative Order by Consent.
- Verbal correspondence with U.S. EPA regarding finalization of the RI and FS reports.
- Letter to U.S. EPA responding to March 26, 1993 correspondence from U.S. EPA.

ACTION ITEMS FOR THE FOLLOWING MONTH:

- Preparation and submittal of the Monthly Progress Report.
- Validation of the results of analyses of ground water samples collected from the residential supply wells. The results will be transmitted to the U.S. EPA following completion of the data validation.

ANTICIPATED DELAYS/PROBLEMS:

- None Anticipated

RESULTS OF SAMPLING/TESTING:

- None this Period

Exhibit D

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Office of Superfund
SE Pennsylvania Remedial Section

Direct Dial (215) 597-8257
Mail Code 3HW21

Re: 3b, 3d

May 25, 1993

FEDERAL EXPRESS
Mr. Mark Travers, Designated Project Coordinator
deMaximis, Inc.
2045 Lincoln Highway
Number 308
St. Charles, IL 60174

SUBJECT: Novak Sanitary Landfill
Final RI/FS Approval

Dear Mr. Travers,

By letter dated February 11, 1993, EPA stated that your final Remedial Investigation and Feasibility Study report ("RI/FS") submittal, dated January 28, 1993, was approved on the condition that certain itemized revisions were made. EPA has subsequently reviewed all of the relevant tables in the RI/FS and inserted corrected tables where necessary. EPA approves the final RI/FS submitted under cover letter dated January 28, 1993 with the following modifications:

1. Table 1-4A as corrected by EPA (see Attachment A).

2. Table 2-58A as corrected by EPA (see Attachment A).

3. Contents of Geraghty and Miller's letter dated April 26, 1993 containing "TABLES (Continued)" and Figure A-1.

4. Contents of deMaximis letter dated May 4, 1993 containing sections of Appendix H.

5. Tables 5-7, 5-8, 5-9, 5-11, 5-16, 5-17 & 5-18, which were missing in the final RI dated January 21, 1993, but were contained in the June 1992 draft version.

The modified RI/FS is approved pursuant to Section VIII.G of the Administrative Order by Consent, Docket No. III-89-10-DC, ("Consent Order").

The following are in reference to your resubmitted Tables 1-4 and 2-58 (Attachment A) as attached to Geraghty and Miller's letter dated April 26, 1993.

Rationale for Correction of Table 2-58A

1. Your facsimile dated April 30, 1993 (Attachment B) did not justify using "Preliminary Remediation Goals ("PRGs") for Target Risk (a)" values when Proposed MCLs or Non-Zero MCLGs were available.

2. Your facsimile overlooked page 1 of the same guidance (Attachment C), OSWER Directive 9285.7-01B, which cites the following:

   "The recommended approach for developing remediation goals is to identify PRGs at scoping, modify them as needed at the end of the RI or during the FS based on site-specific information from the baseline risk assessment, and ultimately select remediation levels in the Record of Decision (ROD)..."

3. Pages 2-19 and 2-20 of the January 21, 1993 final FS cites that you must follow the "Decision Tree" on Figure 2-1 (Attachment D) in obtaining the values for Table 2-58.

Based on the above rationale, EPA has revised your submitted Table 2-58 (Attachment E) to reflect values that EPA deems appropriate. We are also revising the chemical chart to reflect the newer MCLs that were effective since July 17, 1992. The values obtained for Risk Based Calculations ("RBCs") are as demonstrated in Attachment F using Acetone as a typical example.

Rationale for Correction of Table 1-4A

1. A November 3, 1992 draft FS (Attachment G) has been included to show the accurate values.

Since the above issues do not require resubmittal by deMaximis, no further response is necessary. Please call if you have any questions.

Sincerely,

Cesar Lee (3HW21)
Remedial Project Manager

Attachments

cc: P. Anderson (3HW21)
R. Smith (3HW13)
R. Davis (3HW13)
J. Newbaker (3HW13)
E. Lukens (3RC21)
C.K. Lee (3HW51)
P. Flores (3AT11)
M. Heffron, Dynamac
M. Mustard, PADER
D. Henne, DOI
A. Conte, USDI
K. Erickson, NOAA

CL:EL:PA:cl/052593.NOV

ATTACHMENT "A"

Table 1-4A. Potential Federal Chemical-Specific To-Be-Considered Criteria for Remediation, if Necessary, at the Novak Sanitary Landfill (Phase V National Primary Drinking Water Regulations)

Chemical Name	PHASE V NPDWR TBC CRITERIA (ug/L) (PENDING MCL)	PHASE V NPDWR TBC CRITERIA (ug/L) (PENDING MCLG)
Organics		
Adipates [Diethylhexyl)adipate]	400	400
Dalapon	200	200
Dichloromethane	5	0 (a)
Dinoseb	7	7
Diquat	20	20
Endothall	100	100
Endrin	2	2
Glyphosate	700	700
Hexachlorobenzene	1	0 (a)
Hexachlorocyclopentadiene	50	50
Oxamyl (Vydate)	200	200
PAHs [Benzo(a)pyrene]	0.2	0 (a)
Phthalates [Di(ethylhexyl)phthalate]	6	0 (a)
Picloram	500	500
Simazine	4	4
1,2,4-Trichlorobenzene	70	70
1,1,2-Trichlorethane	5	3
2,3,7,8-TCDD	$3x10^{-8}$	0 (a)
Inorganics		
Antimony	6	6
Beryllium	4	4
Cyanide	200	200
Nickel	100	100
Sulfate	Deferred	Deferred
Thallium	2	0.5

(a) Maximum Contaminant Level Goals of zero are not be considered relevant and appropriate.

Note: These Phase V NPDWR Final Rule was published on July 17, 1992. These NPDWR will become effective January 17, 1994. Therefore, these NPDWRs are potentially relevant and appropriate requirements until the effective date, January 17, 1994 has passed. After that date these NPDWRs may be relevant and appropriate requirements.

Table 2-58A. Summary of Preliminary Remediation Goals for Ground Water, Novak Sanitary Landfill, South Whitehall Township, Pennsylvania

Constituent	Preliminary Remediation Goal (ug/l)	Source
Volatile Organic Compounds:		
Acetone	3,200	RBC
Benzene	5	SDWA MCL; PADER WSC
Chlorobenzene	100	PADER WSC
Chloroethane	NE	
1,1-Dichloroethylene	7	SDWA MCL; PADER WSC
1,2-Dichloroethane	5	SDWA MCL; PADER WSC
1,2-Dichloropropane	5	Phase II NPDWR
trans-1,3-Dichloropropylene	0.034	PRG for Target Risk (a)
Ethylbenzene	700	Phase II NPDWR
Methylene Chloride	5.4	RBC
4-Methyl-2-Pentanone	NE	
Styrene	100	Phase II NPDWR
Tetrachloroethylene	5	Phase II NPDWR; PADER WSC
Toluene	1,000	Phase II NPDWR
1,1,1-Trichloroethane	200	SDWA MCL; SDWA Non-Zero MCLG; PADER WSC
Trichloroethylene	5	SDWA MCL; PADER WSC
Vinyl Chloride	2	SDWA MCL; PADER WSC
Xylene(s) total	10,000	Phase II NPDWR
Semi-Volatile Organic Compounds:		
1,2-Dichlorobenzene	600	PADER WSC
1,3-Dichlorobenzene	600	PADER WSC
1,4-Dichlorobenzene	75	PADER WSC
Diethylphthalate	29,000	RBC
Di-N-butylphthalate	3,700	RBC
Bis(2-ethylhexyl)phthalate	0.43	PRG for Target Risk (a)
4-Methylphenol	180	RBC
Naphthalene	1,500	RBC
1,2,4-Trichlorobenzene	70	SDWA MCL & Non-Zero MCLG

Table 2-58A(Cont). Summary of Preliminary Remediation Goals for Ground Water, Novak Sanitary Landfill, South Whitehall Township, Pennsylvania

Constituent	Preliminary Remediation Goal (ug/l)	Source
Metals and Inorganics:		
Aluminum	NE	
Antimony	6	SDWA MCL & Non-Zero MCLG
Arsenic	50	SDWA MCL; PADER WSC
Barium	1,000	SDWA MCL; PADER WSC
Beryllium	4	SDWA MCL(p)
Cadmium	5	Phase II NPDWR; SDWA Non-Zero MCLG
Calcium	NE	
Chromium	50	SDWA MCL, PADER WSC
Cobalt	NE	
Copper	1,300	SDWA Non-Zero MCLG(l)
Iron	NE	
Lead	15	SDWA MCL; PADER WSC
Magnesium	NE	
Manganese	200	
Mercury	2	SDWA MCL; SDWA Non-Zero MCLG; Phase II NPDWR; PADER WSC
Nickel	100	PADER WSC
Potassium	NE	
Selenium	10	SDWA MCL, PADER WSC
Silver	50	SDWA MCL, PADER WSC
Sodium	NE	
Thallium	2	SDWA MCL
Vanadium	260	RBC
Zinc	11,000	RBC
Cyanide	200	PADER WSC

TABLES\SECTBL\NOVAICN\61 (p) = proposed (l) = listed for regulation

(a) A risk-based preliminary remedial goal was selected as the Preliminary Remedial Goal (PRG) for this constituent because an ARAR-based preliminary remedial goal (i.e., SDWA MCL, PADER WSC, etc.) was not established for the constituent at the time the FS Report was submitted to the USEPA (July 8, 1992). A constituent concentration corresponding to a target risk point of departure of $1x10^{-6}$ was utilized for establishing the PRG. Constituent concentrations corresponding to various target risks protective of human health are provided in Tables 2-5 through 2-38.

NE - ARAR remedial goals and health-based remedial goals are not established

ATTACHMENT "B"

de maximis, inc.
2045 Lincoln Highway
Suite 308
St. Charles, Illinois 60174
(708)879-3919
(708)879-0830 facsimile

FACSIMILE COVER SHEET

DATE: 4/30/93

3HW21.

FILE #: 3009 - 03

TO: Cesar Lee 8257 Called.

ORGANIZATION:

FACSIMILE #: 215-597-9890

PAGES: 3 *(including this cover page)*

FROM: Mark Travers

ORGANIZATION:

Please deliver this facsimile immediately. If you have difficulty with this transmission, please call (708)879-3919

NOTES:

Enclosed is the RG Guidance. Not page from guidance.

AR308747

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 13 1991

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

OSWER Directive 9285.7-01B

MEMORANDUM

SUBJECT: Human Health Evaluation Manual, Part B: "Development of Risk-based Preliminary Remediation Goals"

FROM: Henry Longest II, Director
Office of Emergency and Remedial Response

Bruce Diamond, Director
Office of Waste Programs Enforcement

TO: Regional Waste Management Division Directors

Purpose

The purpose of this directive is to transmit the Risk Assessment Guidance for Superfund (RAGS), Human Health Evaluation Manual, Part B: "Development of Risk-based Preliminary Remediation Goals" to be used in the remedial investigation and feasibility study (RI/FS) process. This guidance supplements the Human Health Evaluation Manual, Part A--Baseline Risk Assessment, and Part C--Risk Evaluation of Remedial Alternatives.

Background

As a first step in the FS, section 300.430(e) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) calls for the development of remedial action objectives and preliminary remediation goals (PRGs). As part of the revision to the 1986 Superfund Public Health Evaluation Manual, a workgroup was formed to define the role of risk assessment in setting PRGs. The interim guidance distributed today incorporates numerous comments received over the last two years from Regional and Headquarters management on the role of risk and ARARs in the goal setting process.

8712-8715 for using ARARs as PRGs; see also 53 *Federal Register* 51394); and

- CERCLA Compliance Manuals (EPA 1988a and 1989a).

2.4.1 CHEMICAL-, LOCATION-, AND ACTION-SPECIFIC ARARs

The Agency has identified three general types of federal and state ARARs:

- chemical-specific, are usually health- or risk management-based numbers or methodologies that, when applied to site-specific conditions, result in the establishment of numerical values (e.g., chemical-specific concentrations in a given medium);
- location-specific, are restrictions placed upon the concentration of hazardous substances or the conduct of activities solely because they are in special locations (e.g., wetlands); and
- action-specific, are usually technology- or activity-based requirements or limitations on actions taken with respect to hazardous wastes.

This guidance primarily addresses only chemical-specific ARARs since it focuses on the identification of chemical-specific concentrations that represent target goals (e.g., PRGs) for a given medium.

2.4.2 SELECTION OF THE MOST LIKELY ARAR-BASED PRG FOR EACH CHEMICAL

This section briefly describes which, if any, of several potential ARAR values for a given chemical is generally selected as the most likely ARAR-based PRG (and therefore the most likely PRG at this point). Although the process for identifying the most likely ARAR-based PRG is specific to the medium, in general the process depends on two considerations: (1) the applicability of the ARAR to the site; and (2) the comparative stringency of the standards being evaluated. The previously cited documents should be carefully considered for specific recommendations on identifying ARARs.

Ground Water. SDWA maximum contaminant levels (MCLs), non-zero MCLGs, state drinking water standards, and federal water quality criteria (FWQC) are common ARARs (and, therefore, potential PRGs) for ground water. Other types of laws, such as state anti-degradation laws, may be PRGs if they are accompanied by allowable concentrations of a chemical. (Although state anti-degradation laws that are expressed as qualitative standards may also be potential ARARs, they generally would not be considered PRGs.)

As detailed in the NCP (see next box), the first step in identifying ground-water PRGs is to determine whether the ground water is a current or potential source of drinking water. If the aquifer is a potential source of drinking water, then potential ARARs generally will include the federal non-zero MCLG, MCL, or state drinking water standard, and the most stringent (i.e., the lowest concentration) is identified as the most likely ARAR-based PRG.

NCP ON GROUND-WATER GOALS
(NCP Preamble;
55 *Federal Register* 8717, March 8, 1990)

"Ground water that is not currently a drinking water source but is potentially a drinking water source in the future would be protected to levels appropriate to its use as a drinking water source. Ground water that is not an actual or potential source of drinking water may not require remediation to a 10^{-4} to 10^{-6} level (except when necessary to address environmental concerns or allow for other beneficial uses; . . .)."

If the aquifer is not a potential source of drinking water, then MCLs, MCLGs, state drinking water requirements, or other health-based levels generally are not appropriate as PRGs. Instead, environmental considerations (i.e., effects on biological receptors) and prevention of plume expansion generally determine clean-up levels. If an aquifer that is not a potential source of drinking water is connected to an aquifer that is a drinking water source, it may be appropriate to use PRGs to set clean-up goals for the point of interconnection.

For chemicals without MCLs, state standards, or non-zero MCLGs, the FWQC may be potentially relevant and appropriate for ground water when that ground water discharges to surface water that is used for fishing or shellfishing.

ATTACHMENT "C"

Publication 9285.7-01B
December 1991

Risk Assessment Guidance for Superfund: Volume I — Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)

Interim

Office of Emergency and Remedial Response
U.S. Environmental Protection Agency
Washington, DC 20460

CHAPTER 1

INTRODUCTION

The purpose of this guidance is to assist risk assessors, remedial project managers (RPMs), and others involved with risk assessment and decision-making at Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites in developing preliminary remediation goals (PRGs). This guidance is the second part (Part B) in the series *Risk Assessment Guidance for Superfund: Volume I — Human Health Evaluation Manual* (RAGS/HHEM).

Part A of this series (EPA 1989d) assists in defining and completing a site-specific baseline risk assessment; much of the information in Part A is necessary background for Part B. Part B provides guidance on using U.S. Environmental Protection Agency (EPA) toxicity values and exposure information to derive risk-based PRGs. Initially developed at the scoping phase using readily available information, risk-based PRGs generally are modified based on site-specific data gathered during the remedial investigation/feasibility study (RI/FS). Part C of this series (EPA 1991d) assists RPMs, site engineers, risk assessors, and others in using risk information both to evaluate remedial alternatives during the FS and to evaluate the selected remedial alternative during and after its implementation. Exhibit 1-1 illustrates how the three parts of RAGS/HHEM are all used during the RI/FS and other stages of the site remediation process.

The remainder of this introduction addresses the definition of PRGs, the scope of Part B, the statutes, regulations, and guidance relevant to PRGs, steps in identifying and modifying PRGs, the communication and documentation of PRGs, and the organization of the remainder of this document.

1.1 DEFINITION OF PRELIMINARY REMEDIATION GOALS

In general, PRGs provide remedial design staff with long-term targets to use during analysis and selection of remedial alternatives. Ideally, such goals, if achieved, should both comply with applicable or relevant and appropriate requirements (ARARs) and result in residual risks that fully satisfy the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) requirements for the protection of human health and the environment. By developing PRGs early in the decision-making process (before the RI/FS and the baseline risk assessment are completed), design staff may be able to streamline the consideration of remedial alternatives.

Chemical-specific PRGs are concentration goals for individual chemicals for specific medium and land use combinations at CERCLA sites. There are two general sources of chemical-specific PRGs: (1) concentrations based on ARARs and (2) concentrations based on risk assessment. ARARs include concentration limits set by other environmental regulations (e.g., non-zero maximum contaminant level goals [MCLGs] set under the Safe Drinking Water Act [SDWA]). The second source for PRGs, and the focus of this document, is risk assessment or risk-based calculations that set concentration limits using carcinogenic and/or noncarcinogenic toxicity values under specific exposure conditions.

1.2 SCOPE OF PART B

The recommended approach for developing remediation goals is to identify PRGs at scoping, modify them as needed at the end of the RI or during the FS based on site-specific information from the baseline risk assessment, and ultimately select remediation levels in the Record of Decision (ROD). In order to set chemical-specific PRGs in a site-specific context, however, assessors must answer fundamental questions about the site. Information on the chemicals that are present onsite, the specific contaminated media, land-use assumptions, and the exposure assumptions behind pathways of individual exposure is necessary in order to develop chemical-specific PRGs. Part B provides guidance for considering this information in developing chemical-specific PRGs.

ATTACHMENT "D"

- Whether environmental effects are adequately addressed.

- Whether the exposure analysis conducted as part of the baseline risk assessment adequately addresses each significant pathway of human exposure.

USEPA Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites provides decision trees for selecting between ARAR-based and health-based preliminary remediation goals for carcinogens and non-carcinogens in ground water. This guidance was utilized in developing the decision tree presented in Figure 2-1. This decision tree includes a comparison of the final remedial goal for a given constituent with the background concentration for that constituent. This consideration has been made to ensure that the preliminary remediation goals for the site are not less than naturally occurring or background concentrations. Since ground water was the only medium for which both ARAR-based and risk-based potential preliminary remediation goals were identified, a decision tree for selecting preliminary remediation goals was prepared only for the ground-water.

2.3.4.1 Preliminary Remediation Goals For Ground Water

Ground-water quality at the residential wells currently attains ARAR-based preliminary remediation goals for drinking water supplies and exhibits human health risks below the respective remediation-based risk benchmarks for excess lifetime cancer risks and non-carcinogenic health risks. Therefore, from a potable water perspective, ground water at the residential wells currently attains preliminary remediation goals and does not warrant remediation.

Preliminary remediation goals for the aquifer were determined using the logic provided in Figure 2-1. The results of the evaluation, including the criteria which directed

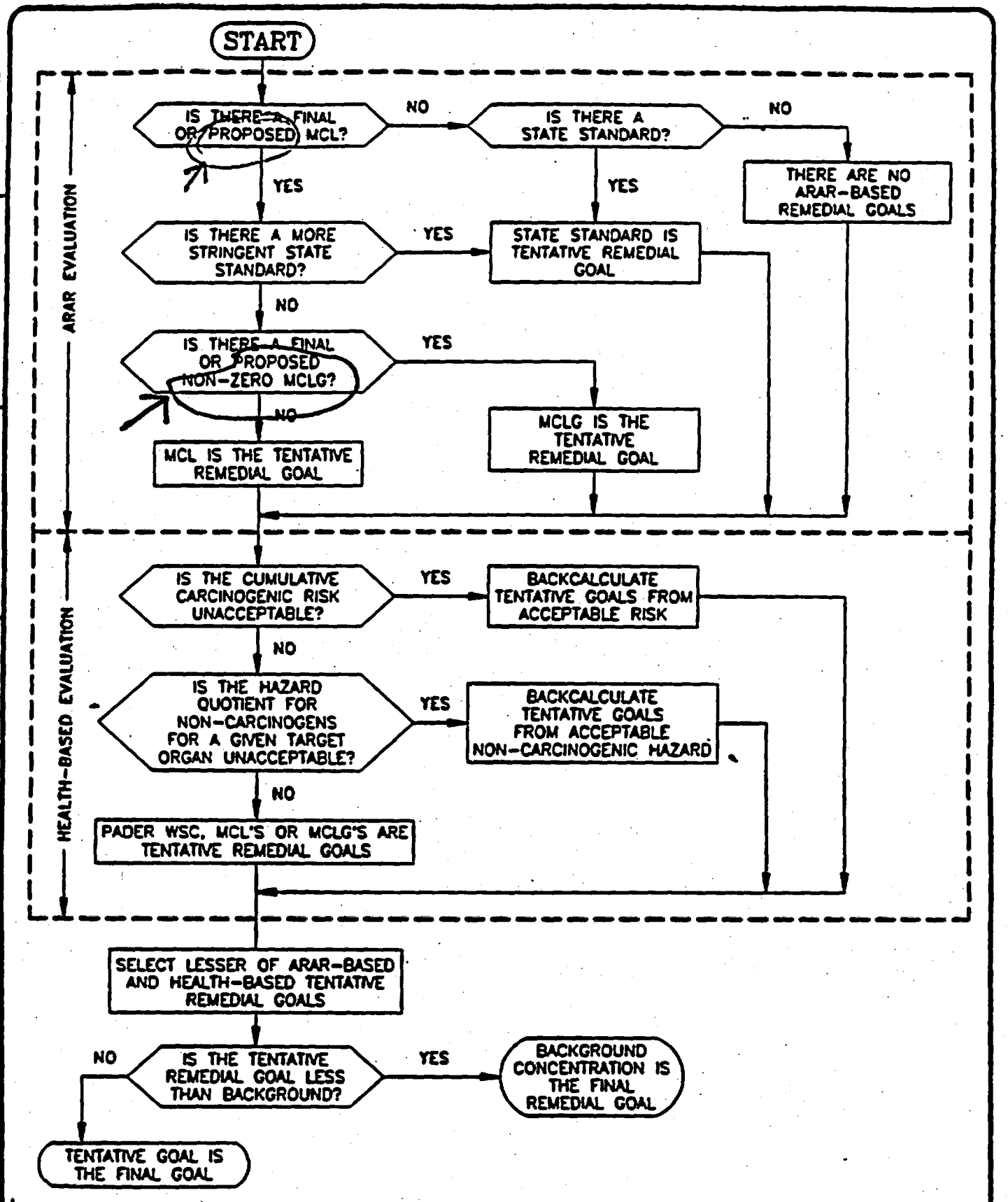
the selection of the preliminary remediation goals, are presented in Table 2-58. In addition, Table 2-59 presents the results of the evaluation with consideration given to 25 PA code §264.90 (i) and (j) and 264.100 (a) (9). However, as stated previously, the PRP Group does not consider that 25 PA code §264.90 (i) and (j) and 264.100 (a) (9) are ARARs or that these regulations require all ground water to be remediated to background levels. Assuming however that this requirement continues to be considered an ARAR by the USEPA for purposes of any ground water remediation (active or passive) at the site, the PRP Group believes that this ARAR should be waived under Section 121 of CERCLA.

2.3.4.2 Preliminary Remediation Goals For On-Site Surface-Water

Since there are no ARAR-based preliminary remediation goals for on-site surface-waters and estimated health risks were below remediation-based risk benchmarks, there are no preliminary remediation goals established for on-site surface water at the NSL. Therefore, evaluation of remedial alternatives for surface-water at the NSL will be directed by the general and site-specific remedial action objectives previously identified for surface water at the NSL.

2.3.4.3 Preliminary Remediation Goals For Soils

Since there are no ARAR-based preliminary remediation goals for on-site soils and estimated health risks associated with on-site soils were below either remediation-based risk benchmarks or estimated health risks associated with background soils, there are no preliminary remediation goals established for soils at the NSL.



DRAFTER: T. WELLS | APPROVED: J. CLAYPOOL | CHECKED: J. KELLER | DRAWING: 2-1 | FILE NO.: A12-12 | PROJECT NO.: MD185.01 | DWG DATE: -27-92

GERAGHTY & MILLER, INC.
Environmental Services

DECISION TREE FOR SELECTING REMEDIAL GOALS FOR GROUND WATER

NOVAK SANITAR

AR308756

FIGURE 2-1

ATTACHMENT "E"

Table 2-58. Summary of Preliminary Remediation Goals for Ground Water, Novak Sanitary Landfill, South Whitehall Township, Pennsylvania

Constituent	Preliminary Remediation Goal (ug/l)	Source
Volatile Organic Compounds:		
Acetone	3,200 ~~NE~~	RBC
Benzene	5	SDWA MCL; PADER WSC
Chlorobenzene	100	PADER WSC
Chloroethane	NE	
1,1-Dichloroethylene	7	SDWA MCL; PADER WSC
1,2-Dichloroethane	5	SDWA MCL; PADER WSC
1,2-Dichloropropane	5	Phase II NPDWR
trans-1,3-Dichloropropylene	0.034	PRG for Target Risk (a)
Ethylbenzene	700	Phase II NPDWR
Methylene Chloride	5.4 ~~NE~~	RBC
4-Methyl-2-Pentanone	NE	
Styrene	100	Phase II NPDWR
Tetrachloroethylene	5	Phase II NPDWR; PADER WSC
Toluene	1,000	Phase II NPDWR
1,1,1-Trichloroethane	200	SDWA MCL; SDWA Non-Zero MCLG; PADER WSC
Trichloroethylene	5	SDWA MCL; PADER WSC
Vinyl Chloride	2	SDWA MCL; PADER WSC
Xylene(s) total	10,000	Phase II NPDWR
Semi-Volatile Organic Compounds:		
1,2-Dichlorobenzene	600	Phase II NPDWR; PADER WSC
1,3-Dichlorobenzene	600	PADER WSC
1,4-Dichlorobenzene	75	PADER WSC
Diethylphthalate	29,000 ~~NE~~	RBC
Di-N-bytylphthalate (-butylphthalate)	3,700 ~~NE~~	RBC
Bis(2-ethylhexyl)phthalate	0.43	PRG for Target Risk (a)
4-Methylphenol	180 ~~NE~~	RBC
Naphthalene	1,500 ~~NE~~	RBC
1,2,4-Trichlorobenzene	70 ~~NE~~	SDWA MCL & Non-Zero MCGL

Table 2-58 (Cont). Summary of Preliminary Remediation Goals for Ground Water, Novak Sanitary Landfill, South Whitehall Township, Pennsylvania

Constituent	Preliminary Remediation Goal (ug/l)	Source
Metals and Inorganics:		
Aluminum	NE	
Antimony	6 ~~NE~~	SDWA MCL & Non-Zero MCLG
Arsenic	50	SDWA MCL; PADER WSC
Barium	1,000	SDWA MCL; PADER WSC
Beryllium	4 ~~0.0099~~	~~PRG for Target Risk~~ SDWA MCL(p)
Cadmium	5	Phase II NPDWR; SDWA Non-Zero MCLG
Calcium	NE	
Chromium	50	SDWA MCL, PADER WSC
Cobalt	NE	
Copper	1,300 ~~NE~~	SDWA Non-Zero MCLG
Iron	NE	
Lead	15 ~~50~~	SDWA MCL; PADER WSC
Magnesium	NE	
Manganese	200 ~~NE~~	SDWA Non-Zero MCLG(1)
Mercury	2	SDWA MCL; SDWA Non-Zero MCLG; Phase II NPDWR; PADER WSC
Nickel	100	PADER WSC
Potassium	NE	
Selenium	10	SDWA MCL, PADER WSC
Silver	50	SDWA MCL, PADER WSC
Sodium	NE	
Thallium	2 ~~NE~~	SDWA MCL
Vanadium	260 ~~NE~~	RBC
Zinc	11,000 ~~NE~~	RBC
Cyanide	200	PADER WSC

TABL2-58.TBL/NOVAK.N461

(p) = proposed (1) = Listed for regulation

(a) A risk-based preliminary remedial goal was selected as the Preliminary Remedial Goal (PRG) for this constituent because an ARAR-based preliminary remedial goal (i.e., SDWA MCL, PADER WSC, etc.) was not established for the constituent at the time the FS Report was submitted to the USEPA (July 8, 1992). A constituent concentration corresponding to a target risk point of departure of $1x10^{-6}$ was utilized for establishing the PRG. Constituent concentrations corresponding to various target risks protective of human health are provided in Tables 2-5 through 2-38.

NE - ARAR remedial goals and health-based remedial goals are not established.

ATTACHMENT "F"

Contaminant	Oral RfD (mg/kg/d)		Inhaled RfD (mg/kg/d)		Oral Potency Slope 1/(mg/kg/d)		Inhaled Potency Slope 1/(mg/kg/d)		VOC	Tap water (µg/l)	Ambient air (µg/m3)	Fish (mg/kg)	Commercial/ Industrial soil (mg/kg)	Residential soil (mg/kg)
Acephate	4.00e-03	i			8.70e-03	i				9.2	0.92	0.36	330	140
Acetaldehyde			2.57e-03	i			7.70e-03	i		21	1			
Acetone	1.00e-01	i								3700	370	140	100000	7800
Acetone cyanohydrin	7.00e-02	h	2.86e-03	a						2600	10	95	72000	5500
Acetonitrile	6.00e-03	i	1.43e-02	a						220	52	8.1	6100	470
Acetophenone	1.00e-01	i	5.71e-06	y					y	0.042	0.021	140	100000	7800
Acifluorfen	1.30e-02	i								470	47	18	13000	1000
Acrolein	2.00e-02	h	5.71e-06	i						730	0.021	27	20000	1600
Acrylamide	2.00e-04	i			4.50e+00	i	4.55e+00	i		0.018	0.0018	0.0007	0.64	0.27
Acrylic acid	8.00e-02	i	8.57e-05	i						2900	0.31	110	82000	6300
Acrylonitrile			5.71e-04	i	5.40e-01	i	2.38e-01	i		0.15	0.034	0.0058	5.3	2.2
Alachlor	1.00e-02	i			8.00e-02	h				1	0.1	0.039	36	15
Alar	1.50e-01	i								5500	550	200	150000	12000
Aldicarb	2.00e-04	i								7.3	0.73	0.27	200	16
Aldicarb sulfone	3.00e-04	x								11	1.1	0.41	310	23
Aldrin	3.00e-05	i			1.70e+01	i	1.72e+01	i		0.0047	0.00047	0.00019	0.17	0.07
Ally	2.50e-01	i								9100	910	340	260000	20000
Allyl alcohol	5.00e-03	i								180	18	6.8	5100	390
Allyl chloride	5.00e-02	h	2.86e-04	i						1800	1	68	51000	3900
Aluminum	2.90e+00	o								110000	11000	3900	3000000	230000
Aluminum phosphide	4.00e-04	i								15	1.5	0.54	410	31
Amdro	3.00e-04	i								11	1.1	0.41	310	23
Ametryn	9.00e-03	i								330	33	12	9200	700
m-Aminophenol	7.00e-02	h								2600	260	95	72000	5500
4-Aminopyridine	2.00e-05	h								0.73	0.073	0.027	20	1.6
Amitraz	2.50e-03	i								91	9.1	3.4	2600	200
Ammonia			2.86e-02	i						1000	100			
Ammonium sulfamate	2.00e-01	i								7300	730	270	200000	16000
Aniline			2.86e-04	i	5.70e-03	i				10	1	0.55	500	210
Antimony and compounds	4.00e-04	i								15	1.5	0.54	410	31
Antimony pentoxide	5.00e-04	h								18	1.8	0.68	510	39
Antimony potassium tartrate	9.00e-04	h								33	3.3	1.2	920	70
Antimony tetroxide	4.00e-04	h								15	1.5	0.54	410	31
Antimony trioxide	4.00e-04	h								15	1.5	0.54	410	31
Apollo	1.30e-02	i								470	47	18	13000	1000
Aramite	5.00e-02	h			2.50e-02	i	2.49e-02	i		3.2	0.32	0.13	110	48
Arsenic	3.00e-04	i								11	1.1	0.41	310	23
Arsenic (as carcinogen)					1.75e+00	i	1.51e+01	i		0.046	0.00053	0.0018	1.6	0.68
Assure	9.00e-03	i								330	33	12	9200	700

Key to Data Sources: i=IRIS x=Withdrawn from IRIS h=HEAST a=HEAST alternate method y=Withdrawn from HEAST e=EPA-ECAO o=Other EPA documents

ATTACHMENT "G"

Table 1-4. Potential Federal Chemical-Specific To-Be-Considered Criteria for Remediation, if Necessary, at the Novak Sanitary Landfill (Phase V National Primary Drinking Water Regulations)

Chemical Name	PHASE V NPDWR TBC CRITERIA (ug/L) (PENDING MCL)	PHASE V NPDWR TBC CRITERIA (ug/L) (PENDING MCLG)
Organics		
Adipates [Diethylhexyl)adipate]	400 ~~500~~	400 ~~500~~
Dalapon	200	200
Dichloromethane	5	0 (a)
Dinoseb	7	7
Diquat	20	20 ~~2~~
Endothall	100	100
Endrin	2	2
Glyphosate	700	700
Hexachlorobenzene	1	0 (a)
Hexachlorocyclopentadiene	50	50
Oxamyl (Vydate)	200 ~~20~~	200 ~~20~~
PAHs [Benzo(a)pyrene]	0.2	0 (a)
Phthalates [Di(ethylhexyl)phthalate]	6 ~~X~~	0 (a)
Picloram	500	500
Simazine	4 ~~X~~	4 ~~X~~
1,2,4-Trichlorobenzene	70 ~~X~~	70 ~~X~~
1,1+2Trichlorethane	5	3
2,3,7,8-TCDD	3×10^{-8} ~~0.00005~~	0 (a)
Inorganics		
Antimony	6 ~~1.5~~	~~3~~ 6
Beryllium	4 ~~X~~	~~X~~ 4
Cyanide	200	200
Nickel	100	100
Sulfate	~~400,000/500,000~~	~~400,000/500,000~~
Thallium	~~2~~ 2	0.5

(a) Maximum Contaminant Level Goals of zero are not be considered relevant and appropriate.

tab1-4/novaktabs

Table 1-4. Potential Federal Chemical-Specific To-Be-Considered Criteria for Remediation, if Necessary, at the Novak Sanitary Landfill (Phase V National Primary Drinking Water Regulations)

Chemical Name	PHASE V NPDWR TBC CRITERIA (ug/L) (PENDING MCL)	PHASE V NPDWR TBC CRITERIA (ug/L) (PENDING MCLG)
Organics		
Andipates [Diethylhexyl)adipate]	400	400
Dalapon	200	200
Dichloromethane	5	0 (a)
Dinoseb	7	7
Diquat	20	20
Endothall	100	100
Endrin	2	2
Glyphosate	700	700
Hexachlorobenzene	1	0 (a)
Hexachlorocyclopentadine	50	50
Oxamyl (Vydate)	200	200
PAHs [Benzo(a)pyrene]	0.2	0 (a)
Phthalates [Di(ethylhexyl)phthalate]	6	0 (a)
Picloram	500	500
Simazine	4	4
1.2.4-Trichlorobenzene	70	70
1.1.2-Trichlorethane	5	3
2.3.7.8-TCDD	$3x10^{-8}$	0 (a)
Inorganics		
Antimony	6	6
Beryllium	4	4
Cyanide	200	200
Nickel	100	100
Sulfate	Deferred	Deferred
Thallium	2	0.5

(a) Maximum Contaminant Level Goals of zero are not to be considered relevant and appropriate.

Note: These Phase V NPDWR Final Rule was published on July 17, 1992. These NPDWR will become effective January 17, 1994. Therefore, these NPDWRs are potentially relevant and appropriate requirements until the effective date, January 17, 1994 has passed. After that date these NPDWRs may be relevant and appropriate requirements.

Exhibit E

de maximis, inc.
2045 Lincoln Highway, #308
St. Charles, IL 60174
(708) 879-3919
Fax (708) 879-0830

June 11, 1993

Mr. Cesar Lee
United States Environmental Protection Agency
841 Chestnut Street
Philadelphia, PA 19107

Subject: **Residential Groundwater Supply Well Sampling**
Novak Sanitary Landfill Site

Dear Mr. Lee:

Enclosed is the validated results of the Supplemental Residential Ground Water Supply Well Sampling and Analysis. If you have any questions, please call.

Sincerely,
de maximis, inc.

Mark A. Travers

MAT/bms

Enclosures

cc: Julie Parker, Esq., Hannoch Weisman
Joe Keller, Geraghty & Miller
Michael Heffron, Dynamac Corporation
Meg Mustard, PADER

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Summary of Analytical Results for Volatile Organic Compounds in Selected Residential Wells on January 28, 1993;
Novak Sanitary Landfill, South Whitehall Township, Pennsylvania.

Concentrations are shown in µg/L.

TARGET COMPOUND LIST VOLATILE ORGANIC COMPOUNDS	RW-01 N. STEPHEN PIDSTAWSKI	RW-02 NICHOLAS PIDSTAWSKI	RW-03 LUTHER LAPP	RW-04 RONALD COLE	RW-06 THOMAS LAPP	RW-06R THOMAS LAPP	RW-12 KATHY SPENSER	TRIP BLANK
Methylene Chloride	1 B	0.9 B	1 B	0.9 B	1 B	0.6 B	1 B	0.8 J
Acetone	2 B	3 B	4 B	3 B	2 B	5 B	2 B	
Toluene	0.2 B						0.3 B	0.2 J
1,2-Dichloroethane	0.4 J	0.3 J	0.6 J	0.3 J	0.2 J	0.9 J	0.2 J	
1,1-Dichloroethane			2 J		0.7 J	0.7 J		
1,2-Dichloroethylene (Total)			2 J		0.5 J	0.5 J		
1,1,1-Trichloroethane			2 J		0.5 J	0.6 J		
Tetrachloroethylene			1 J		0.2 J	0.3 J		
Trichloroethylene			1 J		0.3 J	0.3 J		
Chloroform								0.2 J
Styrene								0.2 J
TENTATIVELY IDENTIFIED VOLATILE ORGANIC COMPOUNDS								
Unknown Alkane	2 J							
Pentadecane		2 J						
Trichlorofluoromethane			2 J					
Benzaldehyde				1 J				
Unknown					1 J	1 J		2 J

B - This result is qualitatively suspect since this compound was detected in field and/or laboratory blanks at similar levels.
J - Quantitation is approximate due to limitations identified during the quality assurance review (data validation).
Samples were analyzed by National Environmental Testing, Inc., Bedford, Massachussetts, and validated by Environmental Standards, Inc., Valley Forge, Pennsylvania.

Environmental Standards, Inc.

Specialists in Environmental Risk Assessment, Hydrogeology and Data Validation

The Commons at Valley Forge, Unit 4, 1220 Valley Forge Rd.
P.O. Box 911, Valley Forge, PA 19481 (215) 935-5577

QUALITY ASSURANCE REVIEW OF THE SAMPLES COLLECTED JANUARY 28, 1993 FOR THE NOVAK SANITARY LANDFILL

April 19, 1993

Prepared for:

VINCENT UHL ASSOCIATES, INC.
1078 Taylorsville Road
P.O. Box 93
Washington Crossing, PA 18977

Prepared by:

ENVIRONMENTAL STANDARDS, INC.
1220 Valley Forge Road
P.O. Box 911
Valley Forge, PA 19482

TABLE OF CONTENTS

Introduction

This quality assurance review is based upon a rigorous examination of all data generated from the samples which were collected by Vincent Uhl Associates, Inc., on January 28, 1993, for residential wells located near the Novak Sanitary Landfill. The samples that have undergone a rigorous quality assurance review are listed on Table 1.

This review has been performed with guidance from the "Functional Guidelines for Organic Data Review with Modifications for Use Within Region III" (U.S. EPA, June 1991) and the "Functional Guidelines for Evaluating Inorganics Analyses with Modifications for Use Within Region III" (U.S. EPA, July, 1988).

The reported analytical results are presented as a summary of the data in Section 2. Data were examined to determine the usability of the analytical results and also to determine compliance relative to requirements specified in the analytical methods. Qualifier codes have been placed next to results so that the data user can quickly assess the qualitative and/or quantitative reliability of any result. Details of this quality assurance review are presented in the narrative section of this report. This report was prepared to provide a critical review of the laboratory analyses and reported chemical results. Rigorous quality assurance reviews of laboratory-generated data routinely identify various problems associated with analytical measurements, even from the most experienced and capable laboratories. The nature and extent of problems identified in this critical review should not be interpreted to mean that those results that do not have qualifier codes are less than valid.

TABLE 1

SAMPLES INCLUDED IN THIS QUALITY ASSURANCE REVIEW

Vincent Uhl Sample Number	Laboratory Sample Number	Date of Sample Collection	Fractions Analyzed
RW-01	71494	1/28/93	V
RW-02	71495	1/28/93	V
RW-03	71497	1/28/93	V
RW-04	71498	1/28/93	V
RW-06	71496	1/28/93	V
RW-06R (Replicate)	71501	1/28/93	V
RW-12	71493	1/28/93	V
RW-12MS (Matrix Spike)	71493MS	1/28/93	V
RW-12MSD (Matrix Spike Duplicate)	71493MSD	1/28/93	V
TRIPBLANK	71502	1/28/93	V
RW-08T	715005	1/28/93	Pb
RW-08D	715045	1/28/93	Pb*
RW-09T	714995	1/28/93	Pb
RW-09D	715035	1/28/93	Pb*

Notes:

V - Target Compound List (TCL) Volatiles, CLP OLM01.8.
Pb - Total Lead, CLP ILM02.0.
Pb* - Dissolved Lead, CLP ILM02.0.

Section 1 Quality Assurance Review

A. Organic Data

The organic analyses of 9 groundwater samples and one aqueous trip blank collected from residential wells near the Novak Sanitary Landfill were performed by National Environmental Testing, Inc. (Cambridge Division) of Bedford, Massachusetts. These samples were analyzed for the Target Compound List (TCL) volatile compounds in accordance with the U.S. EPA Contract Laboratory Program (CLP) protocols (OLM01.8) as specified in Table 1. In addition, mass spectral library searches were performed on up to seven extraneous chromatographic peaks for the volatile fraction.

The findings offered in this report are based upon a rigorous review of holding times, blank analysis results, surrogate and matrix spike/matrix spike duplicate recoveries, GC/MS tuning and system performance, internal standard areas, the quantitation of positive results, reported quantitation limits, retention times, Tentatively Identified Compounds (TICs), field replicate results and overall system performance. The analytical results for the TCL compounds are provided in Section 2, Part A.

Overall, the data quality is good. Method criteria and reporting requirements were met for the data package received with the exception of the following. It should be noted that the following items are contractual in nature and may not necessarily affect data usability. Data usability is addressed in a subsequent section.

Correctable Deficiencies

1. The laboratory reported QC limits (80% - 120%) for the volatile system monitoring compound recoveries (Form II) that were not the contract-required QC limits (SOW390, Document OLM01.8, D-48).

2. There is a peak in the volatile chromatograms of all samples that elutes in the first two minutes of the analytical run. This peak appears to be greater than 10% in height of the nearest internal standard. Per CLP protocol (SOW390, Document OLM01.8, B-10), this peak, although probably due to an air peak (carbon dioxide) or a solvent front, should have been library-searched.

3. The GC/MS instrument ID was not reported on all of the volatile reconstructed ion chromatograms and mass spectra as required (SOW390, Document OLM01.8, B-11).

4. The laboratory did not report on the initial calibration summary form (Form VI) on 2/3/93 at 15:45 the actual concentrations of the volatile calibration standards reported from the corresponding Form V. Similarly, the corresponding continuing calibration Form VIIs are incorrect and do not reflect the actual concentration of the standards used by the laboratory. The CLP 3/90 Forms need to be corrected by the laboratory to reflect the low-level standards actually used.

Comments

1. As mentioned in the case narrative, the laboratory established its own QC limits of 80-120 percent for all the volatile surrogate compound recoveries (Correctable Deficiency #1). These new limits caused all of the surrogate recoveries to meet criteria; however, the data reviewer qualified the data based on the protocol-established limits of 88-110% for toluene-d_8.

2. The laboratory used a 25 mL purge for volatile analysis instead of a 5 mL purge as specified in the protocol (SOW390, Document OLM01.8, D-15). However, the use of this larger amount of purge sample allowed the laboratory to achieve much better (lower) detection limits for the volatile compounds and was performed in compliance with QAPP (Dec. 30, 1989).

With respect to data usability, the principal areas of concern include blank contamination, surrogate recoveries and calibrations. Based on a rigorous review of the data provided, the following organic data qualifiers are offered. It should be noted that the following data usability issues represent an interpretation of the quality control results obtained from the project samples. Validation guidelines routinely specify areas of the data that require qualification, yet the methods used for analysis do not require any corrective action by the laboratory. Accordingly, the following data usability issues should not necessarily be construed as an indication of laboratory performance.

Organic Data Qualifiers

- Due to the presence of methylene chloride and acetone in a method blank and toluene in a trip blank, the reported results for these compounds in the following samples are qualitatively questionable and have been flagged "B" on the data tables.

Compound	Applicable Samples
acetone and methylene chloride	all project samples
toluene	RW-01 and RW-12

- The reported detection limits for 2-butanone and 2-hexanone for all samples reported as "not-detected" are unreliable and have been flagged "R" on the data tables. Low response factors (<0.05) were observed for 2-butanone in all initial and continuing calibrations and for 2-hexanone in the continuing calibration associated with this data set.

- The actual detection limits for the volatile compounds in samples RW-03 and RW-06R may be higher than reported and the "not-detected" results have been flagged "UL" on the data tables. Similarly, the positive results for the volatile compounds in these samples should be considered estimated and have been flagged "J" on the data tables. Low recoveries were obtained for the volatile surrogate compound toluene-d_8 (84% and 82%, respectively) in the analyses of samples RW-03 and RW-06R.

- One replicate was supplied with the volatile organic analysis for sample RW-06. The results show good laboratory precision between the two samples as follows.

Concentrations (μg/L)

Compound	Sample RW-06	Replicate RW-06R	RPD	Notes
acetone	2	5 J	85.7%	2
1,1-dichloroethane	0.7 J	0.7 J	0%	1
total 1,2-dichloroethene	0.5 J	0.5 J	0%	1
1,2-dichloroethane	0.2 J	0.9 J	127%	2
1,1,1-trichloroethane	0.5 J	0.6 J	18.2%	1
trichloroethene	0.3 J	0.3 J	0%	1
tetrachloroethene	0.2 J	0.3 J	40%	2

NOTES:

J - This result is considered estimated.
1 - The RPD is within 20%; acceptable replicate precision.
2 - Results are within ± CRQL; replicate is considered acceptable.

- Tentatively Identified Compounds (TICs) have been evaluated and are presented in Section 2. The majority of the TICs appear to be non-target volatile organic compounds and unknowns. The reported concentrations of all TICs should be considered estimated and have been flagged "J" on the TIC table.

A complete support documentation of this organic quality assurance review is presented in Section 3 of this report.

B. Inorganic Data

The inorganic analysis of two aqueous ground water samples for total and dissolved lead, collected as part of the Novak Sanitary Landfill Investigation, was performed by National Environmental Testing, Inc. (Cambridge Division), Bedford, Massachusetts. These samples were analyzed in accordance with the U.S. EPA Contract Laboratory Program (CLP) protocols (OLM01.8) as specified in Table 1.

A rigorous review of sample holding times, blank analysis results, calibrations, pre- and post-digestion spike recoveries, laboratory duplicate analyses, instrument sensitivity, sample preparation, the quantitation of results and overall system performance was performed with no apparent contractual issues or data usability problems. The analytical results are presented in Section 2, Part B.'

Lead was not detected in any blank or sample above the reported instrument detection limit (IDL). The matrix spike/matrix spike duplicate (MS/MSD) analyses displayed acceptable results. Furthermore, the laboratory followed the protocol SOW390 for GFAA analysis and acceptable recoveries were obtained. All results and information are correct as reported on the QC forms.

A complete support documentation of this inorganic quality assurance review is presented in Section 4 of this report.

C. Conclusions

This quality assurance review has identified several aspects of the analytical data that required qualification. To confidently use any of the analytical data within these sample sets, the data user should understand the qualifications and limitations of the results. The Project Chains-of-Custody and Case Narrative are presented in Section 5.

Report prepared by:

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Quality Assurance Chemist

Report reviewed by:

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Report reviewed and approved by:

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Date: 4/19/95

SECTION 2

ANALYTICAL RESULTS

A. ORGANIC DATA

)LATILE OR NIC ANALYSIS

ncent Uhl Sample Number		RW-01	RW-02	RW-03	RW-04	RW-06	RW-06R	RW-12	TRIPBLANK
boratory Sample Number		71494	71495	71497	71498	71496	71501	71493	71502
marks							Replicate		Trip Blank
its		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
)LATILE COMPOUNDS	Quantitation Limit								
loromethane	2			UL			UL		
omomethane	2			UL			UL		
nyl Chloride	2			UL			UL		
loroethane	2			UL			UL		
thylene Chloride	2	1 B	0.9 B	1 B	0.9 B	1 B	0.6 B	1 B	0.8 J
etone	2	2 B	3 B	4 B	3 B	2 B	5 B	2 B	
rbon Disulfide	2			UL			UL		
-Dichloroethene	2			UL			UL		
-Dichloroethane	2			2 J		0.7 J	0.7 J		
tal 1,2-Dichloroethene	2			2 J		0.5 J	0.5 J		
loroform	2			UL			UL		0.2 J
-Dichloroethane	2	0.4 J	0.3 J	0.6 J	0.3 J	0.2 J	0.9 J	0.2 J	
utanone	2	R	R	R	R	R	R	R	R
,1-Trichloroethane	2			2 J		0.5 J	0.6 J		
rbon Tetrachloride	2			UL			UL		
modichloromethane	2			UL			UL		
,2,2-Tetrachloroethane	2			UL			UL		
-Dichloropropane	2			UL			UL		
s-1,3-Dichloropropene	2			UL			UL		
chloroethene	2			1 J		0.3 J	0.3 J		
romochloromethane	2			UL			UL		
2-Trichloroethane	2			UL			UL		
zene	2			UL			UL		

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)LATILE ORG[illegible]C ANALYSIS

ncent Uhl Sample Number		RW-01	RW-02	RW-03	RW-04	RW-06	RW-06R	RW-12	TRIPBLANK
boratory Sample Number		71494	71495	71497	71498	71496	71501	71493	71502
marks							Replicate		Trip Blank
iits		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
)LATILE COMPOUNDS	Quantitation Limit								
-1,3-Dichloropropene	2			UL			UL		
)moform	2			UL		-	UL		
lexanone	2	R	R	R	R	R	R	R	R
Methyl-2-Pentanone	2			UL			UL		
rachloroethene	2			1 J		0.2 J	0.3 J		
luene	2	0.2 B		UL			UL	0.3 B	0.2 J
lorobenzene	2			UL			UL		
ylbenzene	2			UL			UL		
rene	2			UL			UL		0.2 J
al Xylenes	2			UL			UL		
ntitation Limit Multiplier		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
e of Sample Collection		1/28/93	1/28/93	1/28/93	1/28/93	1/28/93	1/28/93	1/28/93	NA
e Sample Received by Laboratory		1/30/93	1/30/93	1/30/93	1/30/93	1/30/93	1/30/93	1/30/93	1/30/93
e of Sample Analysis		2/4/93	2/4/93	2/4/93	2/4/93	2/4/93	2/4/93	2/4/93	2/4/93
rument Used for Analysis		5970G	5970G	5970G	5970G	5970G	5970G	5970G	5970G

TES:

Compound was not detected.

This result is qualitatively suspect since this compound was detected in field and/or laboratory blanks at similar levels.

Unreliable result - Compound may or may not be present in this sample.

Quantitation is approximate due to limitations identified during the quality assurance review (data validation).

This analyte was not detected, but the detection limit is probably higher than due to a low bias identified during the quality assurance review.

Not Applicable.

NTATIVEI DENTIFIED COMPOUNDS - ESTIMATED CONCENTRATIONS -page 1 of 1

cent Uhl Sample Number	RW-01	RW-02	RW-03	RW-04	RW-06	RW-06R	RW-12	TRIPBLANK
oratory Sample Number	71494	71495	71497	71498	71496	71501	71493	71502
narks								Trip Blank
ts	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LATILE CONSTITUENTS								
cnown alkane	2 J							
tadecane		2 J						
chlorofluoromethane			2 J			-		
zaldehyde				1 J				
cnown					1 J	1 J		2 J

B. INORGANIC DATA

RGANIC ANALYSIS

ent Uhl Sample Number		RW-08T	RW-08D	RW-09T	RW-09D
ratory Sample Number		71500S	71504S	71499S	71503S
arks		Total	Dissolved	Total	Dissolved
s		ug/L	ug/L	ug/L	ug/L
RGANIC ELEMENTS	Detection Limit (Aq)				
l F	2				

ES:

Analyte was not detected.

This result is qualitatively suspect since this analyte was detected in field and/or laboratory blanks at similar levels.

Unreliable result - Analyte may or may not be present in this sample.

Quantitation is approximate due to limitations identified during the quality assurance review (data validation).

This analyte was not detected, but the detection limit is probably higher than due to a low bias identified during the quality assurance review.

Graphite Furnace Atomic Absorption Spectrophotometry.

SECTION 3

ORGANIC DATA SUPPORT DOCUMENTATION

Organic Analyses Support Documentation

Env. Project Name: Vincent Ubl
Sample Collection Dates: 1-28-93
Job Number: 9301-735
Project Manager: D. Lancaster
Laboratory: Canberg.

Reviewed By: L. Wenrick
Approved By:
Completion Date: 3-19-93

Applicable Sample No's.: ☒ Refer to Attached Table 1

Sample No.	Lab Control No.

Deliverables:
- CLP ☒
- Tier I ☐
- Tier II ☐
- Limited ☐
- Other ____

The following table indicates criteria which were examined, the identified problems, and support documentation attachments.

	Criteria Examined in Detail (Check (✓) If Yes or Footnote Letter for Comments Below)				Problems Identified (Check (✓) If Yes or Footnote Number for Comments Below)				Support Documentation Attachments (Check (✓) If Yes — or Identify Attachment No.)			
	CLP VOA Method	CLP BNA Method	CLP PEST / PCB Method	CLP Other Method	CLP VOA Method	CLP BNA Method	CLP PEST / PCB Method	CLP Other Method	CLP VOA Method	CLP BNA Method	CLP PEST / PCB Method	CLP Other Method
Holding Times	X											
Blank Analysis Results: Target Compounds	X								X			
Blank Analysis Results: TICs	X											
System Mntr. Cmpds. &/or Surrogate Spike Rslts.	X				X				X			
Matrix Spike / Matrix Spike Duplicate Results	X								X			
Duplicate Analysis Results ☐ Field ☐ Lab	X								X			
Qualitative Identification: Target Compounds	X											
Qualitative Identification: TICs	X											
DFTPP & BFB Mass Tuning	X								X			
GC Instrument Performance	X								X			
Initial Calibrations	X				X				X			
Continuing Calibrations	X				X				X			
Quantitation of Results	X											
Pest / PCB Linearity Check												
DDD / Endrin Breakdown		✓										
Surrogate Retention Time Shifts	X								X			
Internal Standards Performance	X								X			
Resolution Check Standards												
Analytical Sequence												
Florisil Cartridge Check & GPC Calibration												
GC Column Agreement												
Others:												

Comments: Data is acceptable unless otherwise qualified.

Environmental Standards, Inc.

BLANK ANALYSIS RESULTS FOR TARGET ORGANIC COMPOUNDS

Fraction (1)	Matrix (Aq., S)	Blank Type (2)	Blank Sample Number	Contaminant	Concentration (units)	Qualification Limit 5x	Qualification Limit 10x
V	Aq	MB	VBLK020493G	methylene chloride	1 ug/L		10
		TB	TRIPBLANK				
				methylene chloride	0.8		8
				chloroform	0.2		2
				toluene	0.2		2
				styrene	0.2		2
				(unknown @ 30.57 min.)			

1 – V = Volatile; S = Semivolatile; P = Pesticide/PCB; O = Other: ______

Aq. = Aqueous; S = Solid

2 – MB = Method Blank; TB = Trip Blank; EB = Equipment Rinse Blank; FB = Field Blank
IB = Instrument Blank; SB = Storage Blank

* = Inferred from instrument printouts and/or supporting data.

Notes: ______

Environmental Standards, Inc.

AR300786

JAN. 1993 Rev. 0

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CAMBRG Contract: VINCENT_UHL

Code: CAMBRG Case No.: FM767 SAS No.: SDG No.:

	EPA SAMPLE NO.	SMC1 (TOL)#	SMC2 (BFB)#	SMC3 (DCE)#	OTHER	TOT OUT
01	RW01	96	102	91	0	0
02	RW02	95	102	89	0	0
03	RW03	84*	94	84	0	1
04	RW04	89	100	90	0	0
05	RW06	94	102	92	0	0
06	RW06R	82*	106	96	0	1
07	RW12	102	97	89	0	0
08	TRIPBLANK	96	104	90	0	0
09	RW12MS	98	105	92	0	0
10	RW12MSD	94	101	91	0	0
11	VBLK0204936	100	102	89	0	0

flag +'s J ND's UL

flag +'s J ND's UL

	QC LIMITS
SMC1 (TOL) = Toluene-d8	(~~88-110~~) 80-120
SMC2 (BFB) = Bromofluorobenzene	(~~86-115~~)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(~~76-114~~)

↓ *CL 2-16-93

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

AR308787

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: CAMBRG Contract: VINCENT_UHL

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.:

Matrix Spike - EPA Sample No.: RW12

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	10.00	0	10.10	101	61-145
Trichloroethene	10.00	0	11.90	119	71-120
Benzene	10.00	0	11.50	115	76-127
Toluene	10.00	0.3000	11.10	108	76-125
Chlorobenzene	10.00	0	11.20	112	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	10.00	10.10	101	0	14	61-145
Trichloroethene	10.00	11.90	119	0	14	71-120
Benzene	10.00	11.40	114	1	11	76-127
Toluene	10.00	10.80	105	3	13	76-125
Chlorobenzene	10.00	11.00	110	2	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

Values outside of QC limits

PD: 0 out of 5 outside limits
pike Recovery: 0 out of 10 outside limits

OMMENTS: 71493,V,,VINCENT 25M
CLP,FM767,,RW-12,L,W,ALS 4 MFW 93.00231

4A

VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK020493G

Lab Name: CAMBRG Contract: VINCENT_UHL

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.:

Lab File ID: G9462 Lab Sample ID: 6340-020493

Date Analyzed: 02/04/93 Time Analyzed: 1152

GC Column: CAP ID: 0.750(mm) Heated Purge: (Y/N) N

Instrument ID: HP5970G

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	RW01	71494	G9464	1341
02	RW02	71495	G9465	1424
03	RW03	71497	G9467	1552
04	RW04	71498	G9468	1638
05	RW06	71496	G9466	1508
06	RW06R	71501	G9469	1723
07	RW12	71493	G9463	1257
08	TRIPBLANK	71502	G9470	1809
09	RW12MS	71493MS	G9471	1855
10	RW12MSD	71493MSD	G9472	1941

COMMENTS: 6340-020493, V, BLANK
CLP, , , VBLK020493G, L, W, ALS 3 25ML MFW

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: CAMBRG Contract: VINCENT_UHL

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.:

Lab File ID: G9453 BFB Injection Date: 02/03/93

Instrument ID: HP5970G BFB Injection Time: 1500

GC Column: CAP ID: 0.750(mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	21.8
75	30.0 - 66.0% of mass 95	51.6
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	79.2
175	4.0 - 9.0% of mass 174	6.9 (8.7)1
176	93.0 - 101.0% of mass 174	77.6 (98.0)1
177	5.0 - 9.0% of mass 176	5.1 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD010	6302-020193	G9454	02/03/93	1545
02	VSTD004	6302-020193	G9455	02/03/93	1630
03	VSTD002	6302-020193	G9456	02/03/93	1715
04	VSTD020	6302-020193	G9457	02/03/93	1801
05	VSTD040	6302-020193	G9458	02/03/93	1847

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: CAMBRG Contract: VINCENT_UHL

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.:

Instrument ID: HP5970G Calibration Date(s): 02/03/93 02/03/93

Heated Purge: (Y/N): N Calibration Times: 1545 1847

GC Column: CAP ID: 0.75 (mm)

LAB FILE ID: RRF10 = G9456 RRF20 = G9455
RRF50= G9454 RRF100= G9457 RRF200= G9458

COMPOUND	RRF1Q	RRF2Q	RRF5Q	RRF10Q	RRF20Q	RRF	% RSD
Chloromethane	0.430	0.462	0.490	0.399	0.345	0.425	13.3
Bromomethane *	1.375	1.400	1.409	1.310	1.151	1.329	8.0*
Vinyl Chloride *	0.850	0.863	0.909	0.775	0.671	0.814	11.4*
Chloroethane	0.676	0.647	0.695	0.620	0.550	0.638	8.9
Methylene Chloride	1.453	1.325	1.276	1.219	1.096	1.274	10.3
Acetone	0.094	0.089	0.108	0.066	0.057	0.083	25.2
Carbon Disulfide	3.578	3.417	3.776	3.461	3.105	3.467	7.1
1,1-Dichloroethene *	1.689	1.686	1.712	1.570	1.368	1.605	8.9*
1,1-Dichloroethane *	2.780	2.733	2.832	2.753	2.454	2.710	5.5*
1,2-Dichloroethene (total)	1.758	1.733	1.806	1.747	1.562	1.721	5.4
Chloroform *	4.020	3.808	3.804	3.634	3.252	3.704	7.8
1,2-Dichloroethane *	1.551	1.542	1.539	1.531	1.357	1.504	5.
Butanone	0.011	0.022	0.029	0.030	0.026	0.024	32.1
1,1,1-Trichloroethane *	0.664	0.659	0.653	0.654	0.595	0.645	4.4*
Carbon Tetrachloride *	0.634	0.637	0.648	0.659	0.609	0.637	2.9*
Bromodichloromethane *	0.532	0.524	0.534	0.537	0.492	0.524	3.5*
1,2-Dichloropropane	0.241	0.242	0.237	0.241	0.220	0.236	3.9
cis-1,3-Dichloropropene *	0.354	0.352	0.354	0.359	0.328	0.349	3.5*
Trichloroethene *	0.451	0.449	0.454	0.454	0.410	0.444	4.3*
Dibromochloromethane *	0.401	0.392	0.387	0.409	0.376	0.393	3.2*
1,1,2-Trichloroethane *	0.165	0.167	0.159	0.166	0.152	0.162	3.9*
Benzene *	0.645	0.642	0.637	0.638	0.580	0.628	4.3*
trans-1,3-Dichloropropene *	0.242	0.246	0.249	0.250	0.234	0.244	2.7*
Bromoform *	0.230	0.243	0.224	0.249	0.234	0.236	4.2*
4-Methyl-2-Pentanone	0.114	0.109	0.096	0.105	0.096	0.104	7.7
2-Hexanone	0.070	0.063	0.052	0.057	0.051	0.059	13.5
Tetrachloroethene *	0.607	0.557	0.561	0.572	0.515	0.562	5.9*
1,1,2,2-Tetrachloroethane *	0.286	0.262	0.224	0.239	0.220	0.246	11.2*
Toluene *	0.733	0.692	0.694	0.666	0.599	0.677	7.3*
Chlorobenzene *	0.894	0.873	0.884	0.885	0.800	0.867	4.4*
Ethylbenzene *	0.432	0.406	0.426	0.416	0.378	0.412	5.2*
Styrene *	0.800	0.798	0.772	0.780	0.717	0.773	4.4*
Xylene (total) *	0.522	0.505	0.522	0.502	0.456	0.501	5.4*
Toluene-d8	1.079	1.218	1.140	1.100	1.066	1.121	5.5
Bromofluorobenzene	0.610	0.685	0.598	0.604	0.588	0.617	6.3
1,2-Dichloroethane-d4	1.285	1.464	1.373	1.252	1.234	1.322	7.3

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: CAMBRG Contract: VINCENT_UHL

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.:

Lab File ID: G9459 BFB Injection Date: 02/04/93

Instrument ID: HP5970G BFB Injection Time: 0825

GC Column: CAP ID: 0.750(mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	18.6
75	30.0 - 66.0% of mass 95	49.7
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.9
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	89.1
175	4.0 - 9.0% of mass 174	7.9 (8.9)1
176	93.0 - 101.0% of mass 174	88.4 (99.2)1
177	5.0 - 9.0% of mass 176	5.7 (6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD010	6302-020493	G9460	02/04/93	0902
02	VBLK020493G	6340-020493	G9462	02/04/93	1152
03	RW12	71493	G9463	02/04/93	1257
04	RW01	71494	G9464	02/04/93	1341
05	RW02	71495	G9465	02/04/93	1424
06	RW06	71496	G9466	02/04/93	1508
07	RW03	71497	G9467	02/04/93	1552
08	RW04	71498	G9468	02/04/93	1638
09	RW06R	71501	G9469	02/04/93	1723
10	TRIPBLANK	71502	G9470	02/04/93	1809
11	RW12MS	71493MS	G9471	02/04/93	1855
12	RW12MSD	71493MSD	G9472	02/04/93	1941

7A

VOLATILE CONTINUING CALIBRATION CHECK

VBLK020493G
RW12
RW01
RW02
RW06
RW03
RW04
RW06R
TRIPBLANK
RW12MS
RW12MSD

Lab Name: CAMBRG Contract: VINCENT_UHL

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.:

Instrument ID: HP5970G Calibration date: 02/04/93 Time: 0902

Lab File ID: G9460 Init. Calib. Date(s): 02/03/93 02/03/93

Heated Purge: (Y/N) N Init. Calib. Times: 1545 1847

GC Column: CAP ID: 0.75 (mm)

COMPOUND	RRF	RRF50	MIN RRF	%D	MAX %D
Chloromethane	0.425	0.455		-7.1	
Bromomethane	1.329	1.281	0.100	3.6	25.0
Vinyl Chloride	0.814	0.807	0.100	0.9	25.0
Chloroethane	0.638	0.602		5.6	
Methylene Chloride	1.274	1.217		4.5	
Acetone	0.083	0.071		14.5	
Carbon Disulfide	3.467	3.390		2.2	
1,1-Dichloroethene	1.605	1.611	0.100	-0.4	25.0
1,1-Dichloroethane	2.710	2.453	0.200	9.5	25.0
1,2-Dichloroethene (total)	1.721	1.619		5.9	
Chloroform	3.704	3.334	0.200	10.0	25.0
1,2-Dichloroethane	1.504	1.300	0.100	13.6	25.0
2-Butanone	0.024	0.026		-8.3	
1,1,1-Trichloroethane	0.645	0.570	0.100	11.6	25.0
Carbon Tetrachloride	0.637	0.575	0.100	9.7	25.0
Bromodichloromethane	0.524	0.456	0.200	13.0	25.0
1,2-Dichloropropane	0.236	0.200		15.2	
cis-1,3-Dichloropropene	0.349	0.302	0.200	13.5	25.0
Trichloroethene	0.444	0.403	0.300	9.2	25.0
Dibromochloromethane	0.393	0.340	0.100	13.5	25.0
1,1,2-Trichloroethane	0.162	0.138	0.100	14.8	25.0
Benzene	0.628	0.566	0.500	9.9	25.0
trans-1,3-Dichloropropene	0.244	0.212	0.100	13.1	25.0
Bromoform	0.236	0.204	0.100	13.6	25.0
4-Methyl-2-Pentanone	0.104	0.079		24.0	
2-Hexanone	0.059	0.044		25.4	
Tetrachloroethene	0.562	0.535	0.200	4.8	25.0
1,1,2,2-Tetrachloroethane	0.246	0.200	0.500	18.7	25.0
Toluene	0.677	0.633	0.400	6.5	25.0
Chlorobenzene	0.867	0.828	0.500	4.5	25.0
Ethylbenzene	0.412	0.392	0.100	4.9	25.0
Styrene	0.773	0.726	0.300	6.1	25.0
Xylene (total)	0.501	0.470	0.300	6.2	25.0
Toluene-d8	1.121	1.098		2.1	
Bromofluorobenzene	0.617	0.569	0.200	7.8	25.0
1,2-Dichloroethane-d4	1.322	1.217		7.9	

flag "R" all ND's

low sens. flag 2,5: ND's U

flag R assoc

All other compounds must meet a minimum RRF of 0.010.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CAMBRG Contract: VINCENT_UHL

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.:

Lab File ID (Standard): G9460 Date Analyzed: 02/04/93

Instrument ID: HP5970G Time Analyzed: 0902

GC Column: CAP ID: 0.75 (mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA	#	RT	#	IS2(DFB) AREA	#	RT	#	IS3(CBZ) AREA	#	RT	#
	12 HOUR STD	23000		5.93		153000		8.27		112000		18.57	
	UPPER LIMIT	46000		6.43		306000		8.77		224000		19.07	
	LOWER LIMIT	11500		5.43		76500		7.77		56000		18.07	
	EPA SAMPLE NO.												
01	RW01	22100		6.00		140000		8.34		105000		18.64	
02	RW02	23600		6.02		144000		8.30		110000		18.67	
03	RW03	22500		5.97		136000		8.30		105000		18.57	
04	RW04	24300		5.93		145000		8.25		113000		18.57	
05	RW06	24200		6.02		153000		8.34		116000		18.67	
06	RW06R	22300		5.97		132000		8.25		103000		18.57	
	RW12	19200		6.07		137000		8.39		97600		18.70	
	TRIPBLANK	23100		5.98		141000		8.27		107000		18.57	
09	RW12MS	22700		5.93		140000		8.22		105000		18.57	
10	RW12MSD	22600		6.02		141000		8.30		107000		18.62	
11	VBLK020493G	23100		6.07		146000		8.39		108000		18.70	

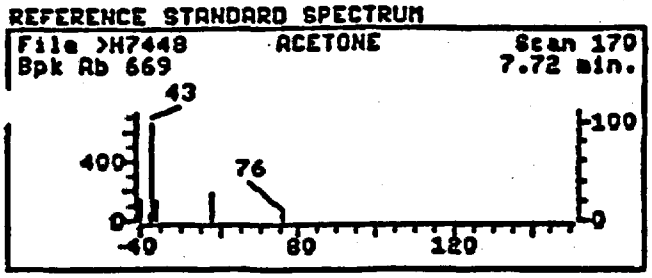
IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = +0.50 minutes of internal standard RT.
RT LOWER LIMIT = -0.50 minutes of internal standard RT.

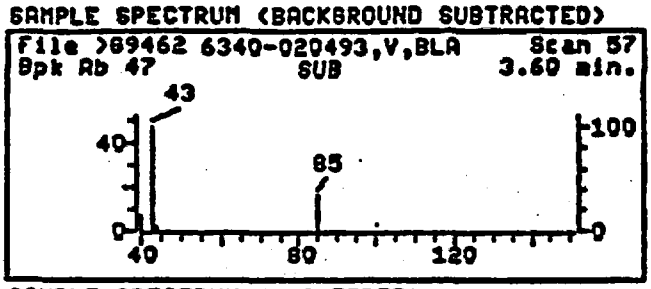
Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

 AR308794

REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



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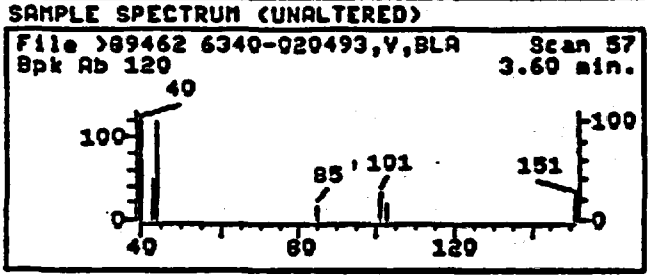
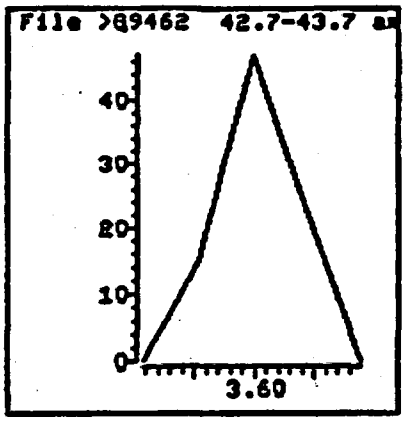




Data File: >G9462::G2 Quant Output File: ^G9462::QT
Name: 6340-020493,V,BLANK
Misc: CLP,,,VBLK020493G,L,W,ALS 3 25ML MFW
Quant Time: 930204 12:29 Quant ID File: LOVOAD::P2
Injected at: 930204 11:52 Last Calibration: 930204 11:08

Compound No: 10
Compound Name: C035 ACETONE
Scan Number: 57
Retention Time: 3.60 min.
Quant Ion: 43.0
Area: 229
Concentration: 1.39 UG/L
q-value: 100

FF

QUANT REPORT

Operator ID: MARK Quant Rev: 6 Quant Time: 930204 13:41
Output File: ^G9460::QU Injected at: 930204 09:02
Data File: >G9460::G3 Dilution Factor: 1.00000
Name: 6302-020493,V,CAL,NE
Misc: CLP,6000,,VSTD010,ALS 1 5ul/25ML MFW

ID File: LOVOAD::P2
Title: VOLATILE ORGANIC ANALYSIS EPA 624, INST=HP5970G
Last Calibration: 930204 11:08

	Compound	R.T.	Q ion	Area	Conc	Units
1)	*CI01 BROMOCHLOROMETHANE IS-1	5.93	128.0	22971	10.00	UG/L
2)	C010 CHLOROMETHANE	2.78	50.0	10455	10.00	UG/L
3)	C015 BROMOMETHANE	3.05	94.0	29466	10.00	UG/L
4)	C020 VINYL CHLORIDE	2.83	62.0	18561	10.00	UG/L
5)	C025 CHLOROETHANE	3.05	64.0	13857M	10.00	UG/L
6)	CXXX TRICHLOROFLUOROMETHANE	3.15	101.0	69744	10.00	UG/L
7)	C071 ACROLEIN	3.47	56.0	934	100.00	UG/L
8)	C074 ACRYLONITRILE	4.10	53.0	13226	100.00	UG/L
9)	C030 METHYLENE CHLORIDE	3.92	84.0	27997	10.00	UG/L
10)	C035 ACETONE	3.51	43.0	1637	10.00	UG/L
11)	C040 CARBON DISULFIDE	3.88	76.0	77960	10.00	UG/L
12)	C176 METHYL TERT-BUTYL ETHER	4.06	73.0	25953	10.00	UG/L
13)	C045 1,1-DICHLOROETHENE	4.15	96.0	37058	10.00	UG/L
14)	C050 1,1-DICHLOROETHANE	4.61	63.0	56426	10.00	UG/L
15)	C051 TRANS-1,2,DICHLOROETHENE	4.15	96.0	37058	10.00	UG/L
16)	C198 TETRAHYDROFURAN	6.20	42.0	9447M	10.00	UG/L
17)	C199 CYCLOHEXANE	6.20	56.0	39164	10.00	UG/L
18)	C055 CIS-1,2-DICHLOROETHENE	5.43	96.0	37168	10.00	UG/L
19)	C053 TOTAL 1,2-DICHLOROETHENE	4.15	96.0	74392M	20.00	UG/L
20)	C060 CHLOROFORM	5.66	83.0	76683	10.00	UG/L
21)	C065 1,2-DICHLOROETHANE	7.39	62.0	29893	10.00	UG/L
22)	CS15 D4-1,2-DICHLOROETHANE SS1	7.12	65.0	27997	10.00	UG/L
23)	C110 2-BUTANONE (MEK)	5.29	72.0	596	10.00	UG/L
24)	*CI10 1,4-DIFLUOROBENZENE IS-2	8.26	114.0	153260	10.00	UG/L
25)	C115 1,1,1-TRICHLOROETHANE	6.30	97.0	87225	10.00	UG/L
26)	C120 CARBON TETRACHLORIDE	6.75	117.0	87991	10.00	UG/L
27)	C125 VINYL ACETATE	4.70	43.0	18491	9.78	UG/L
28)	C130 BROMODICHLOROMETHANE	10.45	83.0	69744	10.00	UG/L
29)	C140 1,2-DICHLOROPROPANE	9.67	63.0	30556	10.00	UG/L
30)	C175 2-CHLOROETHYLVINYLETHER	12.00	63.0	1634	10.00	UG/L
31)	C143 CIS-1,3-DICHLOROPROPENE	12.50	75.0	49112	10.60	UG/L
32)	C150 TRICHLOROETHENE	8.99	130.0	61706	10.00	UG/L
33)	C155 DIBROMOCHLOROMETHANE	16.47	129.0	51978M	10.00	UG/L
34)	C160 1,1,2-TRICHLOROETHANE	14.88	97.0	21124	10.00	UG/L
35)	C165 BENZENE	7.25	78.0	86672	10.00	UG/L
36)	C172 TRANS-1,3-DICHLOROPROPENE	14.47	75.0	30489	9.40	UG/L
37)	C180 BROMOFORM	22.27	173.0	31239	10.00	UG/L
38)	*CI20 D5-CHLOROBENZENE IS-3	18.57	117.0	111630	10.00	UG/L
39)	C205 4-METHYL-2-PENTANONE	12.14	43.0	8897	10.00	UG/L
40)	C210 2-HEXANONE (MPK)	15.38	43.0	4906	10.00	UG/L
41)	C220 TETRACHLOROETHYLENE	15.47	164.0	59969	10.00	UG/L
42)	C225 1,1,2,2-TETRACHLOROETHANE	23.55	83.0	22413	10.00	UG/L
43)	CS05 D-8 TOLUENE (SS-2)	13.05	98.0	123030	10.00	UG/L

QUANT, REPORT

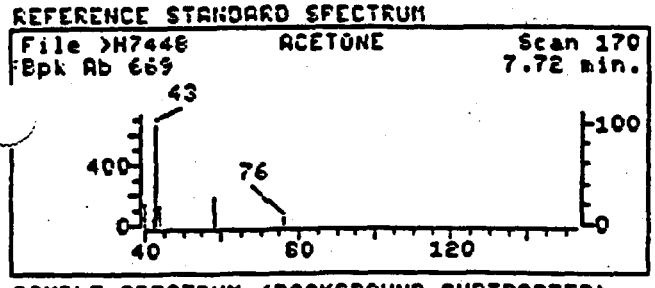
Operator ID: MARK Quant Rev: 6 Quant Time: 930204 17 ?
Output File: ^G9462::QT Injected at: 930204 11 2
Data File: >G9462::G2 Dilution Factor: 1.00000
Name: 6340-020493,V,BLANK
Misc: CLP,,,VBLK020493G,L,W,ALS 3 25ML MFW

ID File: LOVOAD::P2
Title: VOLATILE ORGANIC ANALYSIS EPA 624, INST=HP5970G
Last Calibration: 930204 11:08

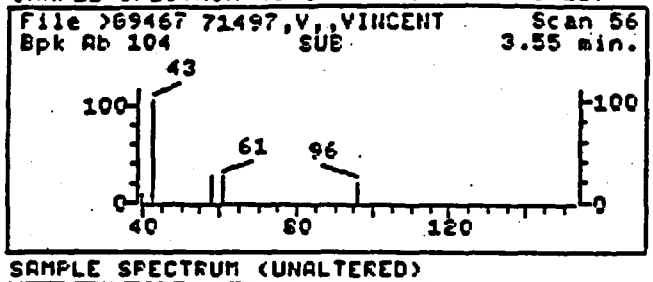
	Compound	R.T.	Scan#	Area	Conc	Units
1)	*CI01 BROMOCHLOROMETHANE IS-1	6.06	111	23104	10.00	UG/L
9)	C030 METHYLENE CHLORIDE	4.01	66	3315	1.18	UG/L
10)	C035 ACETONE	3.60	57	229	1.39	UG/L
22)	CS15 D4-1,2-DICHLOROETHANE SS1	7.29	138	25139	8.93	UG/L
24)	*CI10 1,4-DIFLUOROBENZENE IS-2	8.39	162	145945	10.00	UG/L
38)	*CI20 D5-CHLOROBENZENE IS-3	18.70	388	107573	10.00	UG/L
43)	CS05 D-8 TOLUENE (SS-2)	13.18	267	117967	9.95	UG/L
47)	CS10 BROMOFLUOROBENZENE (SS-3)	23.58	495	62750	10.21	UG/L

* Compound is ISTD

REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



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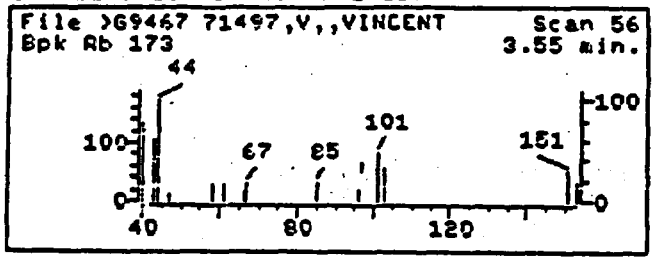

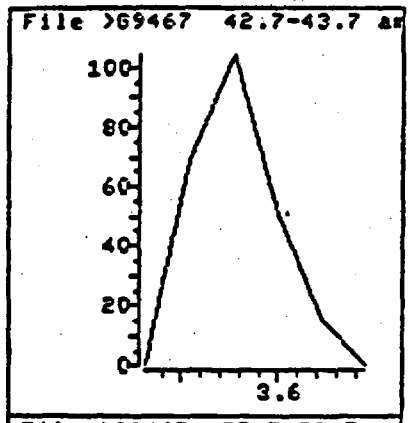

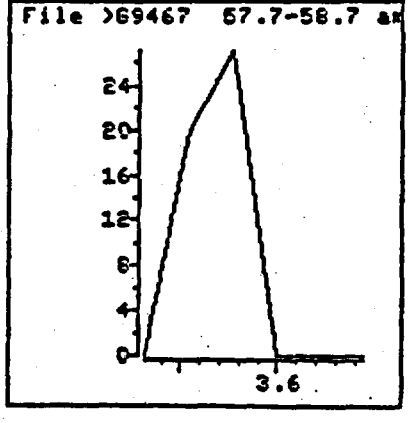

Data File: >G9467::G2 Quant Output File: ^G9467::QT
Name: 71497,V,,VINCENT 25M
Misc: CLP,FM767,,RW-03,L,W,ALS & MFW 93.00231
Quant Time: 930204 16:29 Quant ID File: LOVOAD::P2
Injected at: 930204 15:52 Last Calibration: 930204 11:08

Compound No: 10
Compound Name: C035 ACETONE
Scan Number: 56
Retention Time: 3.55 min.
Quant Ion: 43.0
Area: 657
Concentration: 4.09 UG/L
q-value: 100

AR308798

SECTION 4

INORGANIC DATA SUPPORT DOCUMENTATION

Inorganic Analyses Support Documentation

ESI Project Name: Vincent Uhl
Sample Collection Dates: 1-28-93
Job Number: 9301-735
Project Manager: D. Lancaster
Laboratory: Camkrg

Reviewed By: L. Wenrick
Approved By:
Completion Date: 3-19-93

Applicable Sample No's.: ☒ Refer to Attached Table 1

Sample No.	Lab Control No.

Deliverables:
- CLP ☒
- Tier I ☐
- Tier II ☐
- Limited ☐
- Other ☐ _____

The following table indicates criteria which were examined, the identified problems, and support documentation attachments.

	Criteria Examined in Detail (Check (✓) If Yes or Footnote Letter for Comments Below)					Problems Identified (Check (✓) If Yes or Footnote Number for Comments Below)					Support Documentation Attachments (Check (✓) If Yes — or Identify Attachment No.)				
	ICP or A.A. Metals	Furnace Metals	Cold Vapor Mercury	Cyanide	Other Method	ICP or A.A. Metals	Furnace Metals	Cold Vapor Mercury	Cyanide	Other Method	ICP or A.A. Metals	Furnace Metals	Cold Vapor Mercury	Cyanide	Other Method
Holding Times		✓													
Blank Analysis Results		✓										✓			
Matrix Spike (Predigestion) Results															
Duplicate Analysis Results ☐ Field ☐ Lab		✓										✓			
Quantitation of Results		✓													
Detection Limits / Sensitivity		✓										✓			
Initial Calibrations		✓										✓			
Continuing Calibrations		✓										✓			
Laboratory Control Standards (LCS)		✓										✓			
ICP Linear Range Analysis															
ICP Interference Checks															
ICP Serial Dilutions															
ICP Post-Digestion Spike															
GFAA Post-Digestion Spikes		✓										✓			
GFAA Duplicate Burns		✓													
GFAA Standard Additions															
CRDL Standards		✓										✓			
Others:															

Comments: Data is acceptable unless otherwise qualified.

Environmental Standards, Inc.

JAN. 1993 Rev. B

BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

MATRIX (Aq., S)	BLANK TYPE (✓)						BLANK SAMPLE NUMBER	CONTAMINANT	CONCENTRATION (units)	QUALIFICATION LIMIT
	METHOD			TRIP	EQUIPMENT	FIELD				5x
	ICB	CCB	PREP.							
Aq	✓	✓	✓				SDG 4040CW	none found		

Aq. = Aqueous; S = Solid

Notes: _____

U.S. EPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Initial Calibration Source: SPEX, IVE.TR

Continuing Calibration Source: CONTRACTOR

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	25.0	24.50	98.0	50.0	47.85	95.7	48.60	97.2	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Initial Calibration Source: SPEX, IVENTR

Continuing Calibration Source: CONTRACTOR

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	50.65	101.3	47.95	95.9	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Initial Calibration Source: SPEX, IVENTR

Continuing Calibration Source: CONTRACTOR

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	49.70	99.4	50.50	101.0	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Initial Calibration Source: SPEX, IVENTR

Continuing Calibration Source: CONTRACTOR

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	49.00	98.0	48.75	97.5	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2B
CRDL STANDARD FOR AA AND ICP

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

AA CRDL Standard Source: CONTRACTOR

ICP CRDL Standard Source:

Concentration Units: ug/L

	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
Analyte	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	3.0	2.95	98.3					
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

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3
BLANKS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	P
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

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3
BLANKS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg):

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U	2.0	U	2.0	U			F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

3
BLANKS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg):

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U	2.0	U					F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

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5A

SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

RW09TS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	75-125	21.9500		2.0000	U	20.00	109.8		F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

Comments:

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6
DUPLICATES

EPA SAMPLE NO

RW09TD

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Matrix (soil/water): WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Calcium								NR
Chromium								NR
Cobalt								NR
Copper								NR
Iron								NR
Lead		2.0000	U	2.0000	U			F
Magnesium								NR
Manganese								NR
Mercury								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Vanadium								NR
Zinc								NR
Cyanide								NR

7
LABORATORY CONTROL SAMPLE

Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Solid LCS Source:

Aqueous LCS Source: CAMBRG

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	20.0	16.55	82.8					
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								
Cyanide								

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10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

ICP ID Number: Date: 01/06/93

Flame AA ID Number:

Furnace AA ID Number: P3

Analyte	Wavelength (nm)	Background	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	283.30	BZ	3	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

P3: Perkin-Elmer Zeeman/5000 AA (Furnace) B

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13
PREPARATION LOG

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Method: F

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSW	02/02/93		100
PBW	02/02/93		100
RW08D	02/02/93		100
RW08T	02/02/93		100
RW09D	02/02/93		100
RW09T	02/02/93		100
RW09TD	02/02/93		100
RW09TS	02/02/93		100

14

ANALYSIS RUN LOG

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Instrument ID Number: P3 Method: F

Start date: 02/04/93 End date: 02/05/93

EPA Sample No.	D/F	Time	% R	Analytes
S0	1.00	1721		X
S3.00	1.00	1725		X
S50.00	1.00	1730		X
S100.00	1.00	1734		X
S50.00	1.00	1739		X
ICV	1.00	1743		X
ICB	1.00	1748		X
CRA	1.00	1752		X
CCV	1.00	1757		X
CCB	1.00	1801		X
ZZZZZZ	1.00	1806		
ZZZZZZ	1.00	1810		
ZZZZZZ	1.00	1815		
ZZZZ	1.00	1819		
ZZZZZZ	1.00	1824		
ZZZZZZ	1.00	1828		
ZZZZZZ	1.00	1833		
ZZZZZZ	1.00	1837		
ZZZZZZ	1.00	1842		
CCV	1.00	1846		X
CCB	1.00	1851		X
ZZZZZZ	1.00	1855		
ZZZZZZ	1.00	1860		
ZZZZZZ	1.00	1904		
ZZZZZZ	1.00	1909		
ZZZZZZ	1.00	1913		
ZZZZZZ	1.00	1918		
ZZZZZZ	1.00	1922		
ZZZZZZ	1.00	1927		
ZZZZZZ	1.00	1931		
CCV	1.00	1936		X
CCB	1.00	1940		X

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14

ANALYSIS RUN LOG

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: FM767 SAS No.: SDG No.: 4040CW

Instrument ID Number: P3 Method: F

Start date: 02/04/93 End date: 02/05/93

EPA Sample No.	D/F	Time	% R	Analytes
PBW	1.00	1945		X
PBWA	1.00	1949	102.5	X
LCSW	1.00	1954		X
LCSWA	1.00	1958	114.8	X
RW09T	1.00	2003		X
RW09TA	1.00	2007	140.2	X
RW09TS	1.00	2012		X
RW09TD	1.00	2016		X
RW09TDA	1.00	2021	121.0	X
CCV	1.00	2025		X
CCB	1.00	2030		X
[illegible]3T	1.00	2034		X
[illegible]8TA	1.00	2039	140.0	X
09D	1.00	2043		X
RW09DA	1.00	2048	119.2	X
RW08D	1.00	2052		X
RW08DA	1.00	2057	118.5	X
ZZZZZZ	1.00	2101		
ZZZZZZ	1.00	2106		
ZZZZZZ	1.00	2110		
ZZZZZZ	1.00	2115		
CCV	1.00	2119		X
CCB	1.00	2124		X
ZZZZZZ	1.00	2128		
ZZZZZZ	1.00	2133		
ZZZZZZ	1.00	2137		
ZZZZZZ	1.00	2142		
ZZZZZZ	1.00	2146		
ZZZZZZ	1.00	2151		
ZZZZZZ	1.00	2155		
ZZZZZZ	1.00	2160		
ZZZZZZ	1.00	2204		

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14
ANALYSIS RUN LOG

Lab Name: NET-CAMBRIDGE DIVISION   Contract:

Lab Code: CAMBRG   Case No.: FM767   SAS No.:   SDG No.: 4040CW

Instrument ID Number: P3   Method: F

Start date: 02/04/93   End date: 02/05/93

EPA Sample No.	D/F	Time	% R	AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	2209																									
CCV	1.00	2213													X												
CCB	1.00	2218													X												
ZZZZZZ	1.00	2223																									
ZZZZZZ	1.00	2227																									
ZZZZZZ	1.00	2232																									
ZZZZZZ	1.00	2236																									
ZZZZZZ	1.00	2241																									
ZZZZZZ	1.00	2245																									
ZZZZZZ	1.00	2250																									
ZZZZZZ	1.00	2254																									
ZZZZZZ	1.00	2259																									
CCV	1.00	2303													X												
CCB	1.00	2308													X												
ZZZZZZ	1.00	2312																									
ZZZZZZ	1.00	2317																									
ZZZZZZ	1.00	2321																									
ZZZZZZ	1.00	2326																									
ZZZZZZ	1.00	2330																									
ZZZZZZ	1.00	2335																									
ZZZZZZ	1.00	2339																									
ZZZZZZ	1.00	2344																									
ZZZZZZ	1.00	2348																									
ZZZZZZ	1.00	2353																									
CCV	1.00	2357													X												
CCB	1.00	0002													X												

AR308817

SECTION 5

PROJECT, CASE NARRATIVE AND CHAINS-OF-CUSTODY

TABLE 3
VOLATILES ORGANICS NARRATIVE SUMMARY
FM 767

GENERAL COMMENTS: No comments were necessary.

SURROGATES: QC limits are not established for this low level method. The laboratory has established its' own limits of 80 - 120 percent. All samples met this criteria.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE(s): All spike recoveries were within QC limits for the MS/MSD analysis. All RPDs were within the required limits. No corrective action is required as per the SOW.

BLANKS: A method blank was analyzed for each twelve hour time period on each GC/MS system used for analysis. No blank contained greater than five times the CRQL of Methylene Chloride, Acetone, and 2-Butanone, or greater than or equal to the CRQL of any other volatile target compound.

TUNE: All instrument performance check criteria were met prior to the start of sample analysis.

CALIBRATION: All compounds met the required minimum RF's and maximum RPD's or %D.

INTERNAL STANDARDS: All internal standard areas and retention times were within the QC limits.

HOLDING TIMES: All samples were analyzed within contract required holding times.

DILUTIONS: No dilutions were necessary.

pH Values: A pH of 1 was determined for all volatile analyses.

NET

TABLE 2

METALS NARRATIVE SUMMARY

FM 767

GENERAL COMMENT: No comments were necessary.

HOLDING TIMES: All samples were digested/distilled and analyzed within contractual holding times.

QUALITY CONTROL:

All ICVs and CCVs were within the CLP 3/90 control limits for all analytes.

A CRDL standard was analyzed for each AA and ICP instrument run for all required elements (not applicable for CN analysis).

The absorbance value of the ICB and CCBs did not exceed the CRDL for all analytes.

DIGESTION SPIKE: The digestion spike recoveries were within the 25 percent control limits for all analytes analyzed. Exceptions are granted in a situation where the sample concentration exceeds the spike concentration by a factor of four or more. In this case, the data is reported unflagged.

All analytes that did not meet the specified criteria were flagged with an "N" for the associated samples.

DUPLICATE: The result of duplicate sample analysis were within 20 percent RPD for all analytes. All analytes that did not meet the specified criteria were flagged with a "*" for the associated samples.

A control limit of 20 percent RPD is not used when the either the original or duplicate sample values are less than 5 times the CRDL. Control limits are not applicable when both values are below the CRDL.

NET

LCS and PREPARATION BLANK: The LCS and preparation blank analyzed were found to be within the acceptable limits.

MSA: No samples required analysis by method of standard additions for the furnace elements.

93.000.32 (2155)

CHAIN OF CUSTODY RECORD

PROJECT NAME NOVAK SANITARY LANDFILL (NSL)
COMPANY VINCENT URL ASSOCIATES
ADDRESS 1078 TAYLORSVILLE RD, PO BOX 93,
PHONE (215) 321-2210 WASHINGTON CROSSING, PA 18977

NET NATIONAL ENVIRONMENTAL TESTING, INC.
Cambridge Division, 12 Oak Park, Bedford, MA 01730

ALL SAMPLES COLLECTED JANUARY 28, 1993

SAMPLED BY
ANTHONY RANA (Print Name) _____ (Signature)
JACKIE BARON (Print Name) Jaclyn A. Baron (Signature)

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER O/P	GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	ANALYSES: Volatile Organics	Extractable Organics	Pesticides-PCBs	Metals	Cyanide	Phenols					COMMENTS
RW-12	1/28	1340	SPENCER	40 ml	G	✓		4	H_2O	HCl	✓										Low-Level CLP
RW-12 (MS)	1/28	1340	SPENCER	"	"	"		3	"	"	✓										MATRIX SAVE &
RW-12 (MSD)	1/28	1340	SPENCER	"	"	"		3	"	"	✓										" DUPLICATE
RW-01	1/28	1450	N. STEPHEN PIOTROWSKI	"	"	"		4	"	"	✓										Low-Level CLP
RW-02	1/28	1520	NICHOLAS PIOTROWSKI	"	"	"		4	"	"	✓										Low-Level CLP
RW-06	1/28	1650	THOMAS LAPP	"	"	"		4	"	"	✓										Low-Level CLP
RW-03	1/28	1730	LUTHER LAPP	"	"	"		4	"	"	✓										Low-Level CLP
RW-04	1/28	1750	COLE	"	"	"		4	"	"	✓										Low-Level CLP
RW-09D	1/28	1535	LOU NOVAK	1/2 L	P	✓		1	H_2O	HNO_3				Lead (Dissolved)							Filtered Sample
RW-09T	1/28	1540	LOU NOVAK	1/2 L	P	✓		1	H_2O	HNO_3				Lead (Total)							
RW-08D	1/28	1820	HILDA NOVAK	1/2 L	P	✓		1	H_2O	HNO_3				Lead (Dissolved)							Filtered Sample
RW-08T	1/28	1825	HILDA NOVAK	1/2 L	P	✓		1	H_2O	HNO_3				Lead (Total)							
RW-06R	1/28	1655	THOMAS LAPP REPLICATE	40 ml	G	✓		4	H_2O	HCl	✓										Low-Level CLP
TRIP BLANK	1/28			40 ml	G	✓		2	H_2O	HCl	✓										Low-Level CLP

Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received by
[signature]	1/29/93 1045			1/30/93 9:30	[signature]
Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received for Laboratory by

Method of Shipment: FEDERAL EXPRESS

Remarks:

PT 1 — ORIGINAL PT 2 NET Project Manager—Yellow PT 3—Customer Copy—Pink

COOK

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