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EPA Superfund Record of Decision:

Marion (Bragg) Dump Site, OU 2 & 3
Marion, IN
9/30/1997

Responsiveness Summary, Record of Decision
Marion (Bragg) Dump Site
Grant County, Indiana
Operable Units 2 and 3

I. Overview

The U.S. Environmental Protection Agency (USEPA) issued a Proposed Plan in June 1997 for Operable Units (OUs) 2 and 3 for the Marion (Bragg) Dump site (the Site), Grant County, Indiana, a former municipal dump. The Proposed Plan, the reports covering the periodic monitoring that had been performed between February 1990 and September 1996, and other documents were placed in the repository at the Marion Public Library. A notice of the availability of the documents was published in the Marion Chronicle-Tribune on June 27, 1997. The public comment period lasted 60 days, including the extension granted, and ended on August 27, 1997. A public meeting was held on July 16, 1997.

OU 2 is the groundwater at the Site and OU 3 is the on-site pond; OU 1 is the surface soils and the on-site wastes. An interim remedy had been selected for OU 1 in a 1987 Record of Decision (ROD). This remedy has been implemented. The major components of this remedy are: common fill was placed on the waste disposal area to provide for proper surface water run-off, a compacted clay cap was installed in the waste disposal area, the cap was covered with topsoil, and a vegetative layer was established to minimize erosion; rip-rap was installed along part of the river bank to the south to stabilize the bank; a perimeter fence was installed to minimize unauthorized access to the Site; new monitoring wells were installed on the Site and the old ones were abandoned; and deed restrictions were obtained in the Consent Decree of April 1991 that protect the constructed elements of the remedy and prevent the future use of groundwater from the shallow aquifer on the Site. Also, monitoring of the groundwater, the on-site and the large off-site ponds, and the Mississinewa River have been carried out since the beginning of the on-site work in order to obtain the additional data needed for the selection of a remedy for OUs 2 and 3.

"No action" has been selected for the remedy for OU 2 and OU 3. USEPA has determined that no further action is necessary to ensure protection of human health and the environment.

Some of comments that have been received have objected to the selection of a no action remedy for OUs 2 and 3. However, no information has been furnished to persuade USEPA to change to another remedy.

II. Background on Community Involvement

The remedial investigation (RI) and feasibility study (FS) reports, which included a proposed plan, and a fact sheet announc-

ing USEPA's recommended alternative for OU 1 were released for public comment in August 1987. The RI and FS reports were made available to the public in the repository at the Marion Library. A public comment period lasting 5 1/2 weeks was held that ended on September 11, 1987. A public meeting was held on August 19, 1987. A Responsiveness Summary that addressed the comments received from various potentially responsible parties (no others commented) was included with the Record of Decision that was issued for OU 1 on September 30, 1987.

Prior to the construction of the remedy selected for OU 1, community interest in the Site increased. While the remedy was being constructed, several availability sessions were held in order to keep the community informed about the work going on. One of these was a visit to the Site during which those attending the session were escorted along the western fence and the work going on was described. Also, USEPA participated in two meetings with the community that were organized by the U.S. congressman representing the district.

When the proposed Consent Decree was lodged with the court in 1990, a 30-day comment period was provided, which was announced in a notice in the Federal Register, during which the public was given the opportunity to comment on the proposed settlement to implement the remedy. This was extended an additional 30 days in response to requests for an extension. A fact sheet was issued in August 1990 concerning the proposed Consent Decree. An availability session was held on August 21, 1990, which had been announced with a notice in the local newspaper on August 16, 1990. The comments received were responded to when the motion to enter the Consent Decree was filed with the court.

The release of the Proposed Plan for OUs 2 and 3 and the accompanying opportunities for public participation are described above. At the July 16, 1997 public meeting, representatives from USEPA and the Indiana Department of Environmental Management (IDEM) answered questions about the Site.

III. Summaries of Comments Received and USEPA's Responses

This section summarizes the comments received during the comment period, both written and oral. The administrative record contains a copy of the transcript of the July 16, 1997 public meeting as well as all of the written comments.

1. **Comment**. Jeff Symmes, West Lafayette, Indiana, at the public meeting requested an extension of the comment period for at least an additional 30 days; originally the period was to run from June 27, 1997 through July 28, 1997. He stated that the letters (apparently meaning the fact sheet that was sent to the people on the mailing list) were not sent out until June 30, 1997. He also stated that there were two boxes of documents that were not mailed to the repository till July 1, 1997.

Record of Decision Declaration

Site Name and Location

Marion (Bragg) Dump Site
Grant County, Indiana
Operable Units 2 and 3

Statement of Basis and Purpose

This decision document presents the selected remedial action for Operable Units (OUs) 2 and 3 for the Marion (Bragg) Dump site (the Site), Grant County, Indiana, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), and, to the extent practicable, the National Contingency Plan. This decision is based on the administrative record file for the site.

Description of the Remedy

"No action" has been selected for the remedy for OUs 2 and 3 for the Marion (Bragg) Dump site, a former municipal dump. The major components of the remedy for OU 1, which have already been implemented, are: common fill was placed on the waste disposal area to provide for proper surface water run-off, a compacted clay cap was installed in the waste disposal area to prevent air emissions, to prevent contact with the wastes, and to minimize infiltration of precipitation, the cap was covered with topsoil, which included matting in areas of possible exposure to 100-year floodwaters, and a vegetative layer was established to minimize erosion; rip-rap was installed along part of the river bank to the south to stabilize the bank in order to minimize possible exposure of wastes; a perimeter fence was installed to minimize unauthorized access to the Site; new monitoring wells were installed on the Site and the old ones were abandoned; and deed restrictions were obtained in the Consent Decree of April 1991 that protect the constructed elements of the remedy and prevent the future use of groundwater from the shallow aquifer on the Site. Also, monitoring of the groundwater, the on-site and the large off-site ponds, and the Mississinewa River have been carried out since the beginning of the on-site work in order to obtain the additional data needed for the selection of a remedy for OUs 2 and 3. A deed restriction is presently being sought under the 1991 Consent Decree for the shallow groundwater under the cemetery to the west of the Site to prevent the future use of this groundwater since groundwater from the Site may flow under a small part of this cemetery before entering the Mississinewa River.

Under the "no action" remedy, monitoring of the groundwater, the on-site and large off-site ponds, and the river will continue in accordance with the requirements of the 1991 Consent Decree.

Declaration Statement

No further remedial action is necessary to ensure protection of human health and the environment.

Because the remedies for OUs 1, 2, and 3 will result in hazardous substances remaining on-site above health-based levels, a review of the remediation taken is required every five years dating from the commencement of remedial action in 1989 to ensure that the remedy continues to provide adequate protection of human health and the environment.

The U.S. Environmental Protection Agency has determined that its response at the Site is complete. Therefore, the Site now qualifies for inclusion on the Construction Completion List.

State Concurrence

The State of Indiana has indicated that it concurs with the selected remedy and is preparing a letter of concurrence. The concurrence is premised upon the expectation that the deed restriction that is being sought under the 1991 Consent Decree for the cemetery property to the west, which will prevent the use of the groundwater in the shallow aquifer there, will be obtained. This addresses IDEM's concern over the risk to human health and the environment that might exist if this groundwater is available for use.

9/30/97
Date

William E. Muno
Superfund Division Director

Record of Decision Summary
Marion (Bragg) Dump Site
Operable Units 2 and 3

I. Site Description

The Marion (Bragg) Dump site (the Site) is located just outside the southeastern city limits of Marion, Indiana. The dump occupies approximately 45 acres of the 72-acre Site along the bank of the Mississinewa River. The northern end of the Site is within the estimated 100-year flood plain.

The Site is bordered on the north and east by the Mississinewa River (see Figure 1). A cemetery is located along the western border and private property lies south of the Site. A residence and two asphalt plants, Marion Paving Company and Dobson Construction Company, were located on the southwest corner of the site during the time of the remedial investigation. During the remedial action for Operable Unit (OU) 1, Marion Paving moved and the residence was torn down. A large (15 acre) pond is in the center of the property. This on-site pond is occasionally used for recreational purposes, such as boating and fishing. At one time the on-site pond received discharges associated with air pollution control operations at the Marion Paving Company. A large pond of similar size is located off-site, adjacent to the southern Site boundary.

II. Site History, Enforcement Activities, and Current Status

The Site was used as a sand and gravel quarry from 1935 until approximately 1961. During the period from 1949 through 1970, Radio Corporation of America (RCA) leased and used portions of the Site for industrial refuse disposal. Concurrently, during the period from 1957 to 1975, Bragg Construction leased a separate portion of the Site which it used for disposal of municipal wastes. Periodic inspections by the Indiana State Board of Health (ISBH) indicated that operations at the dump were continually conducted in an unacceptable manner. ISBH specifically noted the disposal of hazardous or prohibited wastes including acetone, plasticizers, lacquer thinners, and enamels. Drummed wastes were allegedly emptied from the drums and "worked" into the other wastes with a bulldozer. Other typical violations included lack of daily cover, placing wastes in standing water (pond encroachment), and burning refuse. In 1975 Bragg Construction stopped operating the landfill. The landfill was covered with a sandy/silty material and seeded. The landfill was never formally closed under the auspices of ISBH.

In 1975, Waste Reduction Systems, a division of Decatur Salvage, Inc., constructed a transfer station on the premises in order to transfer solid wastes to an approved landfill. The transfer station was closed in 1977. In January 1980, ISBH issued a letter

stating that the transfer station had been closed in an acceptable manner.

In September 1983 the Marion (Bragg) Dump was placed on the National Priorities List (NPL). A remedial investigation (RI) and a feasibility study (FS) were conducted under the authorization of the U.S. Environmental Protection Agency (USEPA), beginning in 1985. The reports for both were issued in August 1987. Following a public meeting and a public comment period on the FS report, USEPA issued a Record of Decision (ROD) on September 30, 1987 for an interim remedial action that would address the surface soils and on-site wastes (OU 1).

In August 1987, special notice letters were issued to those that USEPA had determined were potentially responsible parties (PRPs). USEPA began negotiations with a number of these PRPs that resulted in a mixed funding settlement contained in a Consent Decree. This Consent Decree was entered in April 1991. In this settlement, the Generator Defendants (six of the PRPs) were to design and construct the remedy and conduct the investigations and monitoring and the City Defendant (City of Marion, Indiana) was to maintain the Site. A second Consent Decree was entered in March 1997 under which five PRPs agreed to pay a portion of the past costs.

The remedial design began in March 1989. During the remedial action (RA) that was performed primarily during 1990 and 1991, Marion Paving Company moved off the Site, and therefore its discharge to the on-site pond was eliminated; the residence located next to Marion Paving was torn down; common fill was placed on the waste disposal area to provide for proper surface water runoff; a compacted clay cap was installed in the waste disposal area to prevent air emissions, to prevent contact with the wastes, and to minimize infiltration of precipitation; the cap was covered with topsoil, which included matting in areas of possible exposure to 100-year floodwaters, and a vegetative layer was established to minimize erosion; rip-rap was installed along part of the river bank to the south to stabilize the bank in order to minimize possible exposure of wastes; a perimeter fence was installed to minimize unauthorized access to the Site; and new monitoring wells were installed on the Site and the old ones were abandoned. The installation of this cover system modified the stratigraphy at the Site that is described below.

III. Highlights of Community Participation

The RI and FS reports, which included a proposed plan, and a fact sheet announcing USEPA's recommended alternative for OU 1 were released for public comment in August 1987. The RI and FS reports were made available to the public in the repository at the Marion Library. A 5 1/2 week long public comment period was held that ended on September 11, 1987. A public meeting was held on August 19, 1987. Only comments from potentially responsible parties were received during this comment period. A Responsiveness

Summary that addressed these comments was included with the Record of Decision that was issued for OU 1 on September 30, 1987.

Prior to the construction of the remedy selected for OU 1, some members of the community became interested in the Site. While the remedy was being constructed, several availability sessions were held in order to keep the community informed about the work going on. One of these was a visit to the Site during which those attending the session were escorted along the western fence and given a description of the work going on. Also, USEPA participated in two meetings with the community that were arranged by the U.S. congressman representing the district.

The Proposed Plan for OUs 2 and 3 was released to the public in June 1997 and this, the reports covering the periodic monitoring that had been performed between February 1990 and September 1996, and other documents were placed in the repository at the Marion Public Library. The notice of the availability of the documents was published in the Marion Chronicle-Tribune on June 27, 1997. The public comment period was initially set to run from June 27, 1997 through July 28, 1997, but it was subsequently extended to run through August 27, 1997, as a result of a request for an extension. A public meeting was held on July 16, 1997, at which representatives from USEPA and the Indiana Department of Environmental Management (IDEM) answered questions about the Site. Responses to the comments received during the comment period are included in the Responsiveness Summary that is a part of this Record of Decision. This decision document presents the selected alternative for OUs 2 and 3 for the Marion (Bragg) Dump site chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), and, to the extent practicable, the National Contingency Plan. The remedy decision for the Site is based on the administrative record.

IV. Scope and Role of These Operable Units

In the ROD issued in 1987 at the conclusion of the feasibility study, USEPA identified three operable units: OU 1 was the surface soils and the on-site wastes; OU 2 was the groundwater; and OU 3 was the on-site pond. An interim remedy was selected only for OU 1 in the 1987 ROD. Selections of remedies for OU 2 and OU 3 were deferred until additional data concerning the risks associated with the on-site pond and with the discharge of groundwater to the Mississinewa River could be obtained. Doing this permitted USEPA to immediately address the problems associated with possible contact with the contamination in the surface soils and the on-site wastes and with the continual leaching of contamination from these areas into the groundwater. Also, the added data on the groundwater, the river, and the on-site pond that was considered to be necessary in order to properly determine what, if anything, needed to be done regarding these issues could be obtained. The effects of the source control measures being implemented for OU 1 would also be taken into account before reme-

dies for OUs 2 and 3 were selected.

The remedy selected in the 1987 ROD has been implemented. In addition to the actions described above, deed restrictions were obtained in the Consent Decree of April 1991 that protect the constructed elements of the remedy and prevent the future use of groundwater from the shallow aquifer on the Site. Also, monitoring of the groundwater, the on-site and the large off-site ponds, and the Mississinewa River have been carried out since the beginning of the on-site work in order to obtain additional data on the contamination in the on-site pond and on the effects of the discharge of the groundwater to the Mississinewa River. Monitoring will continue to be done after this Record of Decision for OUs 2 and 3 is issued. Additionally, institutional controls preventing the use of the shallow groundwater under the cemetery west of the Site are presently being sought.

V. Site Characteristics and Summary of Site Risks

The stratigraphy at the Marion (Bragg) Dump at the time of the remedial investigation consisted of landfill wastes (0-32 feet thick) over outwash deposits (6-64 feet thick), a glacial till (54 to 63 feet thick), and bedrock, the surface of which was 89 to 125 feet below ground surface. It was estimated that the dump contains approximately 1.1 million cubic yards of waste. At least 4 percent of this is believed to be perennially saturated in the upper aquifer. The saturated areas are to the east, west, and north of the pond. South of the pond, a water filled gravel pit was allegedly filled with demolition debris.

Outwash deposits (sands and gravel) constitute the upper aquifer, which also extends into the wastes. This unconfined water table aquifer is 18 to 42 feet thick. The average hydraulic conductivity was estimated as 4.27×10^{-2} cm/sec. The gradient in this aquifer is toward the Mississinewa River on both sides of the river. The Mississinewa River is a hydraulic barrier, causing the groundwater beneath the site to discharge to the river, without allowing flow to pass beyond the river. The Mississinewa River receives groundwater discharges from both sides of the river and upward from the bottom.

The on-site and the large off-site ponds are hydraulically connected to the groundwater. The presence of the on-site and the large off-site ponds creates a hydraulic anomaly in that water flows from this off-site pond, through the aquifer, and into the on-site pond from the south. The on-site pond discharges radially from its west, north and east sides, with the water then entering the Mississinewa River.

The outwash deposits are underlain by a very low permeability glacial till. This till is approximately 54 to 63 feet thick. The hydraulic conductivity ranges from 1.0×10^{-7} cm/sec to 2.88×10^{-8} cm/sec. This till layer is considered a confining unit.

The glacial till layer is underlain by limestone bedrock. The thickness of this layer is uncertain, but it was first encountered at 88 feet below ground surface. This bedrock layer constitutes a second aquifer. This confined aquifer provides an upward vertical water gradient through the glacial till.

During the remedial investigation, the groundwater was investigated by sampling 4 off-site background monitoring wells, three of which were on the opposite side of the river and one of which was upgradient of the Site, 13 on-site monitoring wells, 2 on-site monitoring wells designated as leachate wells (which actually functioned as groundwater wells inside the waste boundaries), and 13 off-site water supply wells. Several of the on-site monitoring wells, although near the waste boundaries, were actually installed through wastes. The groundwater in the upper aquifer at the Site was found to contain organic and inorganic contaminants at concentrations above background levels; however, the number and concentrations of contaminants were relatively low. The organics that were found most frequently were benzene, trichloroethene, and bis(2-ethylhexyl)phthalate. Most of the heavy metals were detected only once in the groundwater at the Site; these detections were generally below the maximum contaminant levels (MCLs), which are presented here as points of reference, where available, but above the fresh water aquatic life criteria. Arsenic was an exception. Its concentrations were above the MCL in a few samples, and it was detected frequently at lower concentrations.

In the public health evaluation done for the RI, in the scenario used that considered the groundwater in the shallow aquifer at the Site as a possible drinking water source (the Site being used as a recreational area), the maximum estimated excess lifetime cancer risk exceeded 10^{-4} due to arsenic. (The USEPA has established the carcinogenic risk range of 10^{-4} to 10^{-6} as the acceptable level for exposures to potentially carcinogenic substances.) Without arsenic, the maximum risk was estimated to be less than 10^{-6}. The hazard index for noncarcinogenic effects was less than one, the point at which there may be a level of concern for potential noncarcinogenic health effects. Other parameters for the groundwater that were at levels that might be of some concern were chemical oxygen demand (COD) and ammonia concentrations; there are no drinking water standards for these parameters.

Also during the RI, the on-site and large off-site ponds and the river were sampled. (Background samples were also obtained from three small off-site ponds on the property south of the landfill.) The only sample from the on-site and large off-site ponds that exceeded water quality criteria was one that represented a leachate seep that discharged directly into the on-site pond. With the installation of the landfill cap, this leachate seep was eliminated.

For the scenarios evaluated concerning use of the two large ponds, the carcinogenic risks were not above the 10^{-6} point of

departure and the hazard indexes were less than one.

Pond sediments contained several inorganic constituents, phthalates, and low levels of polycyclic aromatic hydrocarbons (PAHs). As discussed in the ROD for OU 1, comparison of the sediment results to a database for inorganics from the Great Lakes Harbor sediments resulted in only the sediment location at the leachate seep being a location of concern. (This database provides relative concentration ranges for comparing non-polluted, moderately polluted, and heavily polluted sediments.)

The river did not generally show signs of being impacted by the substances on the target compound list (TCL) and target analyte list (TAL), the lists of substances usually analyzed for at Superfund sites, during the time of the remedial investigation. Other water quality indicators were also analyzed for. The COD did not vary significantly between upstream, near-site, and downstream points. Ammonia was detected above water quality criteria in two samples, but both were taken in areas where the river flow at the time may have been impeded.

No human health risk was estimated for contact with the water in the Mississinewa River during the RI since only one sample with a slightly elevated (compared to background) sodium concentration was obtained. However, consideration of the amount of dilution that the river water provided for the groundwater discharge to the river indicated that under a low-flow situation there was a potential risk to the river due to arsenic and ammonia. Because of this, USEPA decided that more data was needed before making a recommendation for the ponds and the groundwater.

As stated above, several of the groundwater monitoring wells on the Site that had been used during the RI had been installed through wastes. To eliminate the possibility of the groundwater being contaminated by the wastes in the immediate vicinity of the wells, the on-site and "leachate" monitoring wells were abandoned during the remedial action and new downgradient ones were installed along the edges of the wastes by the river; two new background monitoring wells (wells MB-9 and MB-10) were also installed. The locations of these wells are shown on Figure 1. One of the wells (MB-8) was installed through wastes since the edge of the wastes was very close to the river bank at this location, but special efforts were taken to minimize any effects from the wastes around the well. All the wells were installed in the upper aquifer, with some being installed at the water table (the shallow wells) and the others being installed near the bottom of this upper aquifer (the deep wells); at these wells the aquifer was in the neighborhood of 10 to 25 feet thick. Because of the limitations on the locations that could be used for the background monitoring wells at the Site, one (well MB-9) was installed very close to the wastes. Both of these wells were installed at the water table.

Beginning in February 1990, samples of groundwater, river (and

creek) water, and pond water have been collected and analyzed semiannually for the TCL volatile organic compounds (VOCs) and semivolatile organic compounds (SVOC) and TAL substances and indicator parameters suggested by the state's landfill regulations. In the quarters following the semiannual sampling, samples of the groundwater have been obtained and analyzed for the indicator parameters (total suspended solids (TSS), COD, ammonia, and chloride). Reports have been submitted to the USEPA and IDEM with the results of these samplings. Selected results for a few parameters are presented in Table 1 for river and creek and pond samples and in Table 2 for groundwater samples for the semiannual sampling events through September 1996. One point to note about the sampling results is that for a specific location in the groundwater or the ponds, there are generally some fluctuations in the concentrations with time; in the case of the river and creek, the concentrations sometimes change significantly all along the river from one sampling event to the next because of outside (upstream) influences. The data for the downgradient groundwater wells and the on-site pond, which do show concentrations for many substances that are greater than the background concentrations, indicate generally a decrease in these concentrations with time.

In the groundwater samples taken from the new wells, volatile organic compounds (VOCs) are found in wells MB-1 and MB-2, the wells along the western boundary toward the north. Vinyl chloride, trichloroethene, total 1,2-dichloroethene, and benzene consistently have been detected in these wells. Arsenic concentrations have also been found at levels substantially above background in wells MB-2, MB-6, MB-7, and MB-8 and at lower levels in other wells. Well MB-6 has had the highest levels of arsenic, which have decreased since 1990. COD and sodium levels also appear to have decreased in almost all of the downgradient wells since 1990. The ammonia levels appear to have decreased or remained essentially unchanged in the downgradient wells since 1990.

In the two ponds that are being monitored, ammonia, arsenic, and VOCs have generally not been detected. Chloride and sodium concentrations in the on-site pond are generally higher than those in the off-site pond; both have generally been decreasing in the on-site pond. The sodium concentrations have been below the DWEL guidance level of 20,000 μg/l in the last four sampling events (DWEL is the drinking water equivalent level and is a lifetime exposure concentration that is considered protective of adverse, non-cancer health effects assuming all of the exposure to a contaminant is from a drinking water source). The chloride concentrations have always been about an order of magnitude below the secondary maximum contaminant level (SMCL) of 250 mg/l (SMCL are unenforceable federal guidelines regarding taste, odor, color, and certain other non-aesthetic effects of drinking water).

In the sampling of the Mississinewa River and Lugar Creek, VOCs have not been detected and there have been only occasional de-

tects of bis(2-ethylhexyl)phthalate, which may be a laboratory contaminant, at low concentrations. (The creek has been sampled so that if there are any unusual sampling results in the river, it can be determined if they might have been caused by something coming from the creek, which enters the river opposite the Site and downstream of the upstream monitoring point; the creek samples also provide background information.) Arsenic has not been detected in the river during the last four sampling events at detection levels as low as 2.3 µg/l. Ammonia generally has been a non-detect in the river; during the last four sampling events there was only one ammonia detection in the river. Except in the August 1990 sampling, there do not appear to be any trends with position in the COD concentrations in the river. Generally there do not appear to be any trends with position in the chloride and sodium concentrations in the river either, but there are a couple of instances when there have been indications of increases as one goes downstream; since usually there is no trend with position in these concentrations, it cannot be concluded that the sodium and chloride in the groundwater were the causes of the increases. As indicated above, nothing can be said about trends with time in the river because of upstream influences.

During the August 1990 sampling event, sediment samples were taken from the river and creek at the same locations that were used for water samples. No VOCs were reported for the sediment samples. Thirteen TCL semivolatile organic compounds were detected in the 6 sediment samples, all at concentrations below the contract required quantitation limit levels that a laboratory must be able to routinely and reliably detect and quantitate; some of the detections were in samples from the two background locations. The detection frequencies ranged from 1 out of 6 to 4 out of 6. Bis(2-ethylhexyl)phthalate and di-n-butylphthalate were the most frequently detected SVOCs. A number of PAHs were detected in the sediment samples. The sample from location SW-3 contained the widest variety and highest concentrations of TCL SVOCs, a number of them being PAHs. However, PAHs were not identified in any of the groundwater, river water, or pond water samples during that sampling event or any other sampling event through February 1992, except for one detection in a background groundwater well. A number of TAL metals were detected in the sediment samples as one would expect (many metals are naturally occurring). The arsenic, beryllium, cobalt, lead, and zinc concentrations were all estimated values below the contract required detection limits. (These are J-qualified concentrations, which means that there is some uncertainty in the reported concentrations, but not in the identity of the chemical, usually because the concentrations are below the what the laboratory is required to detect or quantitate. The J qualifier is the most commonly encountered data qualifier in Superfund data packages, except, possibly, for the U qualifier. The U qualifier means the material was analyzed for but was not detected at the associated numerical value). Cyanide was not detected in any samples. The river sediment TAL metals concentrations appeared to be similar in samples collected from upstream, nearsite, and downstream

sampling locations.

In October 1989 the Central Regional Laboratory of USEPA Region 5 conducted an instream biological assessment of the water quality in the Mississinewa River near the Site. USEPA's Standard Operating Procedures for conducting rapid assessments of fish using the ecoregion approach were used to evaluate the biotic integrity of the fish community based on Karr's index of biotic integrity. The study was conducted during normal flow conditions. Three stations were located in the river, one upstream, one opposite the Site, and one downstream, and two stations were located in Lugar Creek. Because of the poor biotic integrity of the river, the reference station was selected from a composite of "least impacted" stations of similar sized rivers from the Eastern Corn Belt Plain ecoregion. The Index of Biotic Integrity (IBI) was used to compare the different locations. For tne river locations, the upstream and downstream stations had IBI ratings of "poor" and the nearsite station was rated "fair". In the report for the study, it was stated that no significant environmental impact was attributable to the Site.

In the 1987 ROD for OU 1, additional studies were indicated that consisted of fish bioassay work for the river, the on-site pond, and the large off-site pond and general toxicity studies for the river. The purpose of these studies was to fully evaluate the possible effects of the site groundwater on these surface waters and the aquatic environment in these waters after the implementation of the OU 1 remedy. When the Consent Decree for implementing the remedial action for OU 1 and the remedial action plan (RAP) attached to it were developed, it was agreed that the additional studies would be implemented in a phased approach so that the more complex fish bioassay and toxicity studies would be conducted only if the water quality and sediment samplings detected levels of bioaccumulative contaminants associated with the site groundwater that were exceeding water quality standards in the river and the on-site pond. The RAP includes decision trees that were created to trigger the performance of the additional studies when certain requirements were met. As discussed in this ROD, evaluations of the results of the samplings and analyses of river water, river sediments, groundwater, and water from the two large ponds have not demonstrated significant impacts on the surface waters. As a result, there has not been a need for the additional studies. Given the trends in the monitoring data collected since the OU 1 remedy was implemented, USEPA no longer believes that these studies are or will be necessary. USEPA does not expect that such studies would result in new information relevant to the impacts of any releases from the Site.

As mentioned earlier, the Consent Decree that was negotiated for conducting the remedial design, remedial action, and operation and maintenance for OU 1 contained a deed restriction that includes prohibiting the installation of shallow drinking water wells on the Site. This is in the form of a covenant running with the land that is to be binding upon all persons who acquire

any interest in the Site, and it was signed by the owners of the Site. The covenant and the restrictions under it were granted for the benefit of and shall be enforceable by the Marion-Bragg Generator Group, the group of defendants who performed the remedial action and remedial design and are performing the continuing Site sampling. The strip of land between the waste boundary and the river is part of this property and therefore drinking water wells are now prohibited there. This strip of land is narrow; in the southeast corner of the Site it consists only of the fairly steep river bank. Much of this strip of land lies within the 100-year floodplain. This strip of land is in a remote location with limited accessibility and would only be useful to someone making use of the rest of the Site. However there are restrictions on the use of the rest of the Site included in the covenant running with the land that bar any use of the land that may threaten the effectiveness, protectiveness, or integrity of the work that was performed during the remedial action. It is for these reasons that USEPA has determined that that limited portion of the shallow aquifer lying under the strip of land between the waste boundary and the river is not a future source of drinking water and consequently drinking water standards are not relevant and appropriate requirements for the Site. It must also be remembered that even though these site conditions preclude the use of the groundwater here, institutional controls have been implemented which prevent groundwater from this aquifer under both the waste management area and this narrow strip of land from being used. The only risk estimated during the RI that exceeded the USEPA acceptable risk range was that for the use of the groundwater as a possible drinking water source in a recreational use scenario. With the institutional controls that have been established, this is no longer a realistic scenario.

Also, an institutional control is presently being sought for the shallow groundwater under the cemetery to the west of the Site to prevent the future use of this groundwater. Some of the groundwater from the Site may flow under the northern part of this cemetery property before it enters the river, and this prohibition of the use of the groundwater there will further ensure the protection of human health.

In summary, the monitoring that has been performed since 1990 has not demonstrated any impacts on the water quality of the Mississinewa River. The two substances of primary concern in the groundwater that might adversely affect the river are arsenic and ammonia. Dissolved arsenic has not been detected in the river samples. The MCL and the acute and chronic aquatic criteria for arsenic are all significantly above the detection limit for arsenic. Ammonia has been detected very infrequently at low concentrations, but these detections are not necessarily attributable to the groundwater from the Site since there are some sources of ammonia that are due to natural causes. The one detection of ammonia in the river during the last four sampling events did result in a slight exceedance of the chronic aquatic criteria but the acute aquatic criteria was not exceeded.

Similarly, the monitoring has not demonstrated any problems with the water in the on-site pond. Arsenic, ammonia, and VOCs have generally not been detected, and the concentrations of sodium and chloride, which are indicators of contamination, have generally been decreasing. The reports on the water quality conditions for the last four semiannual samplings have not shown applicable water quality criteria being exceeded in this pond.

VI. Description of the "No Action" Alternative

The "no action" alternative is the selected alternative for the Site for OU 2 and OU 3. The groundwater at the Site poses no current or future risk to human health or the environment because: 1) contaminant levels have been low over most of the plume and are generally decreasing; 2) site-related contaminants have not materially affected the concentrations in the adjacent Mississinewa River; 3) applicable water quality criteria have not been reported as having been exceeded within the past two years in the on-site pond or the large off-site pond; 4) there are no current users of the groundwater at the Site or in the northeast corner of the cemetery to the west; and, 5) future use of the groundwater at the Site is precluded by the conditions at the Site and by existing institutional controls, and future use of groundwater in the northeast corner of the cemetery to the west is unlikely because of its location, and an institutional control is being sought for the prevention of the use of this groundwater. Since the future use of the land is as a landfill, there is no reason to assume that future wells may be drilled into the landfill to furnish a potable water supply, and there are institutional controls in place to maintain this restriction. Even if an action were selected to restore the groundwater for use as a potable water supply, the National Contingency Plan states that the cleanup levels established to do this would only have to be attained beyond the edge of the waste management area, not beneath the landfill wastes.

In this selected alternative, no additional remedies will be carried out at the Site. This ROD is intended as the final ROD for the Site. The remedial work performed for OU 1 must be maintained under the requirements of the 1991 Consent Decree, which will provide some assurances that the dump will not likely impose an effect on the surface waters; no impact has been seen so far. Monitoring of the groundwater, river water, and the on-site pond will continue for an indefinite period in accordance with the requirements contained in the 1991 Consent Decree, which are based upon the 1987 ROD. The monitoring will be extensive enough and will continue long enough to ensure that contamination from the wastes does not become a detriment to the river or the on-site pond.

Table 1. Selected Results, River (and Creek) and Ponds

A. Results for February 1990

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene										
1,2-dichloroethene (total)							5U	5U	5U	5U
trichloroethene										
vinyl chloride										
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	5J	10U	10U
arsenic (dis.)	3.9U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U
barium (dis.)	52.2J	67.6J	57.9J	59.6J	32.1J	22.1J	159J	173J	60.6J	61.2J
iron (dis.)	10.8J	20.1J	4.0U	4.0U	163	262	4.0U	18.5J	10.6J	7.9J
manganese (dis.)	23.9	31.0	16.1J	21.2	14.9J	133	8.7J	16.4	1.0U	1.0U
sodium (dis.)	10600	10400	12400	13900	11600	25400	32800	31100	10000	11600
ammonia-nitrogen, mg/l	1.0L	1.0L	1.0L	1.0L	1.0L	1.0L	1.0L	1.1	1.0L	1.0L
COD, mg/l	50L	50L	50L	50L	50L	50L	50L	50L	50L	50L
chloride, mg/l	27	27	28	29	28	47	28	29	16	5

B. Results for August 1990

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene										
1,2-dichloroethene (total)							5U	5U	5U	5U
trichloroethene										
vinyl chloride										
bis(2-ethylhexyl)phthalate	2J	3J	10U	4J	10U	10U	10U	10U	10U	10U
arsenic (dis.)	2.0U	2.9U	2.0UJ	2.7UJ	2.2UJ	2.0UJ	2.0U	2.0UJ	2.0UJ	2.0UJ
barium (dis.)	36.0J	35.6J	35.4J	34.8J	42.3J	33.2J	150J	148J	51.4J	70.3J
iron (dis.)	71.6J	77.0J	69.8J	45.6J	857	49.8J	16.1J	51.0J	13.3J	8.0J
manganese (dis.)	4.1J	5.0J	2.7J	1.0U	12.3J	5.0J	3.6J	4.6J	1.0U	4.0J
sodium (dis.)	5790	5700	5690	5630	5770	6540	33400	33200	10100	10300
ammonia-nitrogen, mg/l	0.41	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L
COD, mg/l	110	51	74	63	50	66	50L	50L	50L	50L
chloride, mg/l	15	10	15	20	15	20	26	28	15	15

C. Results for February 1991

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene										
1,2-dichloroethene (total)							5U	2J	5U	5U
trichloroethene										
vinyl chloride										
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0UJ	3.0U	4.8J	3.0U
barium (dis.)	39.4J	37.4J	36.6J	29.2J	29.3J	29.4J	61.5J	68.3J	63.6J	62.6J
iron (dis.)	68.4J	75.8J	62.9J	81.4J	83.0J	113	24.0J	47.4J	20.3J	23.7J
manganese (dis.)	15.7	14.2J	12.1J	4.1J	5.0J	16.9	44.3	56.5	5.7J	6.7J
sodium (dis.)	12300	10700	9820	5650	5740	11000	17900	18700	10000	9890
ammonia-nitrogen, mg/l	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L
COD, mg/l	20U	20U	20U	29	34	29	29	23	20U	20U
chloride, mg/l	25	20	20	18	17	24	18	18	14	15

Table 1 (cont.). Selected Results, River (and Creek) and Ponds

D. Results for August 1991

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene										
1,2-dichloroethene (total)							10U	9J	10U	10U
trichloroethene										
vinyl chloride										
bis(2-ethylhexyl)phthalate	10U	10U	10U	2J	18UJ	2J	22J	10U	10U	10U
arsenic (dis.)	5.0U	5.0U	5.0U	5.0UJ	5.0U	5.0UJ	5.0U	5.0UJ	5.0U	5.0U
barium (dis.)	91.6J	89.4J	90.6J	85.0J	93.7J	71.1J	108J	211	81.4J	40.4J
iron (dis.)	39.6J	20.8J	12.5J	27.1J	110	10.0U	10.0U	14.6J	1430	20.8J
manganese (dis.)	7.3J	5.4J	9.6J	3.9J	14.4J	32.0	1.0U	249	753	1.3J
sodium (dis.)	45700	42100	46600	42500	41700	24800	31300	30300	11300	10800
ammonia-nitrogen, mg/l	0.2	0.1	0.085	0.17	0.18	0.14	0.5L	0.5L	0.5L	0.5L
COD, mg/l	73	76	82	84	91	46	40	29	20U	20U
chloride, mg/l	50	50	50	55	60	45	25	30	15	5

E. Results for February (SW) and June (PW) 1992

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene							10U	10U	10U	10U
1,2-dichloroethene (total)							10U	19	10U	10U
trichloroethene							10U	1J	10U	10U
vinyl chloride							10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	17U	10U	10U	10U	32J	10U	10U	14U
arsenic (dis.)	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.6J	3.0U
barium (dis.)	70.4J	67.9J	71.5J	70.5J	69.3J	55.7J	150	170R	21.2	20.8
iron (dis.)	23.8J	20.1J	25.7J	201.J	19.0U	23.8J	21.0U	21.0U	21.0U	21.0U
manganese (dis.)	22.3	20.7	22.2	21.4	21.4	89.4	2.0UJ	82.3R	2.0U	2.0U
sodium (dis.)	24300	20300	23200	22200	21500	23100	26200	26000R	10100	9950
ammonia-nitrogen, mg/l	0.5L	0.5L	0.5L	0.5L	0.5L	0.5L	0.5	0.5U	0.5U	0.5U
COD, mg/l	20U	120	22	20U	77	20U	20U	20U	20U	20U
chloride, mg/l	40	40	42	40	30	3U	21	21	13	12

F. Results for September 1992

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	52U	10U	10U
arsenic (dis.)	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0U	4.0UJ	4.0U
barium (dis.)	54.4	76.4J	66.3J	76.8J	75.2J	50.8	38.9	37.5	53.9	53.8
iron (dis.)	46.0U	56.8J	46.8J	76.8J	76.8J	46.0U	46.0U	46.0U	46.0U	46.0U
manganese (dis.)	8.9	6.7	6.8	7.0	7.7	23.7	2.9J	43.5	2.6J	2.3J
sodium (dis.)	9270J	9460J	9440J	9440J	9610J	11800J	10700	10800	10300	10400
ammonia-nitrogen, mg/l	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
COD, mg/l	20	20	20	20	20U	23	30	27	21	20U
chloride, mg/l	19	19	19	19	19	21	9.4	9.9	12	13

Table 1 (cont.). Selected Results, River (and Creek) and Ponds

G. Results for March 1993

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	10U	10U	10U	10U	10U	10U	1J	1J	10U	10U
trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U	3.0U
barium (dis.)	47.4	75.1	60.4	75.4	95.0	39.2	124	125	43.9	47.7
iron (dis.)	133	157	133	66.4	78.5	163	30.2	36.2	18.1J	24.2J
manganese (dis.)	14.7	14.6	13.3	11.0	11.4	6.6	5.5	11.7	1.0U	1.1J
sodium (dis.)	9970	9830	9570	9430	9260	7210	16000	15900	8400	8980
ammonia-nitrogen, mg/l	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	NA	NA
COD, mg/l	28	40	28	22	40	52	16	22	NA	NA
chloride, mg/l	21	21	21	21	24	14	14	13	NA	NA

H. Results for September 1993

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	5.2U	5.2U	5.2U	5.2U	5.2U	5.2U	5.2U	5.2U	5.2U	5.2U
barium (dis.)	83.5	83.4	82.8	81.9	81.2	57.3	113	116	46.4	46.3
iron (dis.)	64.9	10.7U	25.9	19.5J	10.7U	19.4J	38.9	38.9	10.7U	26.0
manganese (dis.)	14.7	9.5	9.4	6.7	5.6	39.6	2.1J	1.6J	1.4U	1.4U
sodium (dis.)	27900	28300	27700	27300	26500	19500J	20000	20700	9360	9280
ammonia-nitrogen, mg/l	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
COD, mg/l	20UJ	28J	22J	20UJ	16J	31J	40J	22J	20UJ	20U
chloride, mg/l	38	39	38	38	38	32	17	17	12	12

I. Results for March 1994

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	10U	10U	10U	10U	10U	10U	2J	2J	10U	10U
trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	2J	10U	10U	3J	10U	10U	10U	10U	10U
arsenic (dis.)	3.4U	3.4U	3.4U	3.4U	3.4U	3.4U	3.4U	3.4U	3.4U	3.4U
barium (dis.)	57.0	53.2	55.3	53.8	52.6	37.6	146	143	47.0	47.0
iron (dis.)	30.4	26.8	26.6	14.6J	15.8J	19.2J	16.9J	19.9J	12.1U	12.1U
manganese (dis.)	27.9	27.9	25.8	26.7J	25.8	47.9	7.9J	17.1	6.7U	15.0U
sodium (dis.)	15100	14500	15000	15000	15000	29100J	19300	18900	8730	8700
ammonia-nitrogen, mg/l	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
COD, mg/l	20U	20U	20U	20U	20U	20U	20U	20U	20U	20U
chloride, mg/l	32	31	32	31	31	57	17	15	2.0U	10

Table 1 (cont.). Selected Results, River (and Creek) and Ponds

J. Results for September 1994

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	10U	10U	10U	10U	10U	10U	10U	1J	10U	10U
trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	10.0U	10.0U	10.0U	10.0U	3.5J	10.0U	3.4U	2.3J	10.0U	2.8J
barium (dis.)	93.4	92.2	90.2	89.7	89.0	68.6	146	128	47.4	47.8
iron (dis.)	4.8UJ	4.8UJ	4.8UJ	4.8UJ	4.8UJ	4.8UJ	16.9J	4.8UJ	4.8UJ	4.8UJ
manganese (dis.)	11.0J	13.6J	7.8J	6.6J	5.4J	28.9J	7.9J	1.2J	0.1U	0.1U
sodium (dis.)	36300J	36000	36300	36100J	35000J	22700	19300	21700	10600	10800
ammonia-nitrogen, mg/l	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
COD, mg/l	39J	22J	110U	100U	100U	100U	100U	100U	100U	100U
chloride, mg/l	51	52	53	52	35	50	20	19	13	12

K. Results for March 1995

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	10U	10U	10U	10U	10U	10U	10U	1J	10U	10U
trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	6J	10U
arsenic (dis.)	3.5U	3.5U	3.5U	3.6U	3.5U	3.5U	3.5U	3.5U	3.5U	3.5U
barium (dis.)	72.2	72.6	72.5	75.4	73.4	72.4	147	150	34.8	34.4
iron (dis.)	27.2U	27.2U	10.3U	27.2U	27.2U	27.2U	27.2U	27.2U	27.2U	27.2U
manganese (dis.)	11.4	11.4	7.6	11.2	11.2	12.7	1.0	2.9	0.4U	0.4U
sodium (dis.)	21100	21100	32500	20700	20500	20600	19100	19100	9940	9870
ammonia-nitrogen, mg/l	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
COD, mg/l	20U	20U	20U	R	20U	20U	20U	20U	20U	20U
chloride, mg/l	42	41	40	40	39	39	18	16	11	9.9

L. Results for September 1995

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	1J	10U	10U	4J	1J	10U	10U	2J	10U
arsenic (dis.)	2.7U	2.7U	2.7U	2.7U	2.7U	2.7U	2.7U	2.7U	3.9U	3.9J
barium (dis.)	93.0	80.4	75.1	83.2	75.7	69.0	114	109	50.9	50.9
iron (dis.)	9.7U	9.7U	10.3U	9.7U	9.7U	9.7U	9.7U	9.7U	34.7U	46.5U
manganese (dis.)	22.6	12.5	7.6	7.5	7.9	19.4	0.2U	0.78U	0.2U	0.48U
sodium (dis.)	38600J	34500	32500	33900	30900	21200	18600	18400	10800	11000
ammonia-nitrogen, mg/l	0.5U	2.0	0.5U	R	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
COD, mg/l	25	21	17	29	21	19	27	27	15	22
chloride, mg/l	60	60	57	55	53	34	19	19	14	14

Table 1 (cont.). Selected Results, River (and Creek) and Ponds

M. Results for March 1996

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	1J	10UJ	10UJ	10UJ	10UJ	1J	10UJ	10U	10U	10U
arsenic (dis.)	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ	3.0UJ
barium (dis.)	42.6	41.5	44.7	44.4	40.7	45.3	152J	158J	42.7J	42.2
iron (dis.)	11.4U	10.9U	10.9U	10.9U	10.9U	10.9U	10.9U	10.9U	10.9U	10.9U
manganese (dis.)	6.1	6.1	6.4	7.8	5.8	53.4	0.67	2.3	0.23J	0.2U
sodium (dis.)	8760J	8710J	9180J	9300J	8350J	18500J	17500J	18100J	11400J	11400
ammonia-nitrogen, mg/l	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.19	0.22	0.1U	0.1U
COD, mg/l	10U	17.4	12.7	26.8	26.8	10U	18.2J	20.6J	10U	21.8U
chloride, mg/l	28.0	28.2	28.2	28.1	27.9	46.0	20.2	20.2	14.7	14.5

N. Results for September 1996

Substance	River (SW-5 is Upstream) and Creek (SW-6)						On-site Pond		Off-site Pond	
µg/l except as noted	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	PW-1	PW-2	PW-3	PW-4
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	2.3U	2.3U	2.3U	2.3U	2.3U	2.3U	2.3U	2.3U	2.3U	2.3U
barium (dis.)	62.7	67.5	50.9	53.0	55.4	52.8	149	148	41.8	40.6
iron (dis.)	25.5U	25.5U	25.5U	25.5U	25.5U	25.5U	R	25.5U	25.5U	25.5U
manganese (dis.)	13.3	9.6	9.1	9.2	8.6	27.7	11.1J	9.9U	8.4	3.9U
sodium (dis.)	27900J	30600J	23300J	24900J	22900J	18100J	18700J	18800J	12500J	12400J
ammonia-nitrogen, mg/l	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
COD, mg/l	14.7J	16.6J	11.9J	10UJ	14.4J	14.4J	19.2J	22.3J	12.8J	13.5J
chloride, mg/l	49.4	45.6	39.0	42.9	32.0	32.0	22.6	21.1	15.1	19.1

Notes: Blank spaces for data through February 1992 indicate the substance was analyzed for but was not detected. The sample quantitation or detection limit was not specified in the report.

Qualifiers: U means the material was analyzed for but was not detected above the level of the associated value, which is either the sample quantitation limit or the sample detection limit; L means the material was analyzed for but was not detected above the associated value, which is the sample detection limit; R means the data is unusable (the analyte may or may not be present) due to serious deficiencies; J means the associated value is an estimated quantity; N indicates the presence of the analyte that has been "tentatively identified".

"dis." means the dissolved portion; the sample was field filtered.

Table 2. Selected Results for Groundwater Monitoring Wells

A. Results for February 1990

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	5U	2J	5U	5U	5U	1J	5U	5U	5U	5U
1,2-dichloroethene (total)	140	5	5U	5U	5U	5U	5U	5U	5U	2J
trichloroethene	18	5U	5U	5U	5U	5U	5U	5U	5U	5U
vinyl chloride	22	12	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	3J	10U	2J	2J	2J	8J	10U	2J
arsenic (dis.)	11.3	51.7	24.7	8.3J	3.0U	435	3.9J	114	3.0U	3.0U
barium (dis.)	193J	825	595	359	212	539	461	155J	44.3J	101J
iron (dis.)	2990	9070	4580	1840	13.4J	13100	274	4280	80.6J	26.7J
manganese (dis.)	671	1190	324	330	313	433	264	163	305	13.7J
sodium (dis.)	23400	43600	46200	40800	41600	118000	148000	134000	10500	16300
ammonia-nitrogen, mg/l	1.0L	16.0	7.1	1.0L	3.1	5.6	20.0	9.8	1.0L	1.0L
COD, mg/l	56	170	230	160	140	250	160	320	300	50L
chloride, mg/l	25	40	30	30	30	67	70	36	15	40

B. Results for August 1990

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	5U	5	5U	5U	5U	2J	5U	5U	5U	5U
1,2-dichloroethene (total)	57	21	5U	5U	5U	1J	5U	5U	5U	5U
trichloroethene	73	5U	5U	5U	5U	5U	5U	5U	5U	5U
vinyl chloride	4J	47	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	6J	3J	10U	10U	10U	3J	15	7J	10U	10U
arsenic (dis.)	12.2U	71.0	15.9J	18.9J	2.1J	420	79.6	127	4.4UJ	2.0U
barium (dis.)	177J	876	817	596	439	444	698	284	68.7J	96.5J
iron (dis.)	2700	15400	9180J	4280J	14.5J	13100	8270	5320	389	22.8J
manganese (dis.)	683	157	165	161	505	98.0	142	69.5	783	6.6J
sodium (dis.)	17700	34500	33400	33600	32500	76700	100000	200000	10800	11400
ammonia-nitrogen, mg/l	0.5L	12.0	8.5	2.0	2.5	11.0	12.0	3.5	0.6	0.5L
COD, mg/l	50L	60	120	54	60	200	170	200	120	50L
chloride, mg/l	24	31	34	35	31	49	56	57	15	22

C. Results for February 1991

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	5U	2J	5U	5U	5U	1J	5U	5U	5U	5U
1,2-dichloroethene (total)	28J	5U	5U	5U	5U	5U	5U	5U	5U	5U
trichloroethene	79	5U	5U	5U	5U	5U	5U	5U	5U	5U
vinyl chloride	10U	15	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	27.0J	26.0J	29.1J	24.3J	7.9J	232J	12.5J	182J	6.0J	3.0UJ
barium (dis.)	136J	862	1060	693	246	332	741	402	74.4J	98.2J
iron (dis.)	2030	11800	10400	5250	20.0U	11100	13300	7120	1520	37.0J
manganese (dis.)	566	290	295	195	258	85.1	320	88.9	833	1.7J
sodium (dis.)	9230	27100	45400	41500	22800	52900	128000	543000	10400	13000
ammonia-nitrogen, mg/l	0.5L	10.0	8.1	2.2	3.1	9.9	9.9	7.3	0.5L	0.5L
COD, mg/l	22	64	58	23	56	41	100	260	38	20U
chloride, mg/l	18	22	33	35	19	35	71	360	17	18

Table 2 (cont.). Selected Results for Groundwater Monitoring Wells

D. Results for August 1991

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10L	6J	10L	10L	10L	10L	10L	10L	10L	10L
1,2-dichloroethene (total)	21	5J	10L	10L	10L	10L	10L	10L	10L	10L
trichloroethene	72	10L	10L	10L	10L	10L	10L	10L	10L	10L
vinyl chloride	10U	12J	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	18	10U	10U	10U	10U
arsenic (dis.)	13.0J	70.4J	30.7	32.4	5.0U	226	99.6	251	7.8J	5.0UJ
barium (dis.)	179J	702	682	530	283	214	601	232	40.7J	88.9J
iron (dis.)	2640	15200	9440	4100	10.0U	8800	10100	3020	10.0U	10.0U
manganese (dis.)	778	129	140	164	537	89.9	69.3	36.6	1.2J	1.0U
sodium (dis.)	17400	35200	33300	33300	30500	38300	77400	271000	12700	15500
ammonia-nitrogen, mg/l	0.7	14.0	7.3	2.2	0.5L	5.9	6.6	14.0	0.5L	0.5L
COD, mg/l	20U	58	40	20U	130	46	55	160	40	20U
chloride, mg/l	35	25	25	20	15	30	70	70	10	10

E. Results for February 1992

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	5J	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	71	2J	10U	10U	10U	10U	10U	2J	10U	10U
trichloroethene	62	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	1J	4J	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	14U	10U	10U	10U	10U	10U	16U	10U	10U
arsenic (dis.)	11.0	267*	29.0	17.6	3.0U	352*	79.3	225*	6.6J	3.0U
barium (dis.)	169J	1020	860	507	468	306	530	174J	86.9J	94.6J
iron (dis.)	2500	34000	10800	3730	525	12800	6490	2440	1810	23.8J
manganese (dis.)	745	241	155	156	632	94.2	66.4	35.3	704	2.0U
sodium (dis.)	13700	31300	33300	37100	31300	46800	114000	180000	12700	21200
ammonia-nitrogen, mg/l	0.5L	0.5L	0.5L	1.8	2.4	3.2	6.6	6.6	6.4	0.5L
COD, mg/l	54	42	95	77	48	100	48	150	86	20U
chloride, mg/l	27	24	25	35	30	40	50	50	15	35

F. Results for September 1992

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	2J	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	25	8J	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	68	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10UJ	10U	10U	10U	10U	10U	21U	10U	10UJ	10UJ
arsenic (dis.)	9.9J	42.2	17.6J	15.4	4.0U	181J	62.8J	117J	5.2J	4.0UJ
barium (dis.)	153	637	635	482	205	391	508	299	72.4	83.0
iron (dis.)	1950	13100	7790	2940	46.0U	17900	5550	4600	571	46.0U
manganese (dis.)	696	189	154	170	535	112	567	55.5	685	1.0U
sodium (dis.)	12100	29600	29400	28800	23800	49700	68800	298000	10500	19600
ammonia-nitrogen, mg/l	0.5J	7.3	6.4	0.7	3.9	9.7	9.7	4.8	0.5U	0.5U
COD, mg/l	47	27	45	33	60	75	69	150	84	81
chloride, mg/l	14	24	21	21	16	33	33	150	13	14

Table 2 (cont.). Selected Results for Groundwater Monitoring Wells

G. Results for March 1993

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	32	6J	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	76	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	1J	15	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	15U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	10.0	91.2	30.4	17.2	3.0U	249	32.1	138	6.3	3.0UJ
barium (dis.)	159	642	620	446	256	341	498U	195	60.7	76.1
iron (dis.)	2160	21900	8500	3250	187	16600	4830	3970	2050	13.0U
manganese (dis.)	706	288	206	160	482	92.4	198	42.4	637	1.0U
sodium (dis.)	13900	23100	23300	25100	20400	34000	84800	138000	9140	18600
ammonia-nitrogen, mg/l	0.5U	10.0	5.2	0.8J	0.5U	1.4	5.6	6.9	0.5U	0.5U
COD, mg/l	20U	39	45	22J	20U	34	40	120	28	20U
chloride, mg/l	17	16	18	17	14	22	63	26	11	13

H. Results for September 1993

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	5J	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	30	5J	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	76	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	20	15	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	14U	16UJ	38U	10U	10U	22U	22U	10U
arsenic (dis.)	16.1	51.6	34.0	23.5	5.2U	184	124	143	12.5J	5.2U
barium (dis.)	165	577	669	461	253	260	598	248	67.8	79.6
iron (dis.)	2040	18200	11000	3850	889	14400	10800	5660	1570	25.9
manganese (dis.)	717	239	160	188	687	83.1	53.4	69.6	728	1.4U
sodium (dis.)	17600	21200	20800	20100	19900	27100	69500	156000	10200	20000
ammonia-nitrogen, mg/l	0.5U	8.7	6.0	2	1.7	3.9	8.3	5.2	0.5U	0.5U
COD, mg/l	20UJ	22J	28J	20UJ	20UJ	28J	28J	90J	20UJ	20UJ
chloride, mg/l	16	17	16	17	37	20	34	40	11U	16

I. Results for March 1994

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	2J	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	39	3J	10U	10U	10U	10U	10U	1J	10U	10U
trichloroethene	74	10U	10U	10U	10U	2J	10U	10U	10U	10U
vinyl chloride	10U	7J	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	11.4	84.2	32.9	21.0	4.0J	205	90.3	144	6.9	3.7J
barium (dis.)	154	572	669	490	264	332	576	205	58.5	79.0
iron (dis.)	1970	24200	10900	3950	527	17900	9860	5790	2050	12.5
manganese (dis.)	706	320	164	188	424	90.4	57.9	65.8	610	6.7U
sodium (dis.)	16000	20000	22600	22000	19500	34200	64000	103000	9360	18200
ammonia-nitrogen, mg/l	0.5U	8.8	4.8	1.5U	0.5U	3.8	8.8	4.3	0.5U	0.5U
COD, mg/l	20U	33	38	30	25	37	29U	69	20U	20U
chloride, mg/l	20	17	20	18	13	25	25	26	12	16

Table 2 (cont.). Selected Results for Groundwater Monitoring Wells

J. Results for September 1994

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	3J	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	51	12	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	61	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	3J	24	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	10.9	99.4	36.7J	22.7	11.2	R	100	143J	10.8	1.9U
barium (dis.)	155	403	581	490	353	R	562	170	72.7	200U
iron (dis.)	1870	13300	9310	4000	2550	14400	9410	5070	1980	4.8UJ
manganese (dis.)	704	114	142J	190	443J	78.9J	51.0J	R	R	1.5J
sodium (dis.)	16600	21800	20800	21300	19600	26600J	50400	R	10000	R
ammonia-nitrogen, mg/l	0.5U	5.0	4.1	0.7	1.3	2.8	7.6	0.5U	0.5U	0.5U
COD, mg/l	100U	20J	38J	110	100U	27J	29J	230	62J	100U
chloride, mg/l	20	17	17	25	17	20	20J	20	6	20

K. Results for March 1995

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	2J	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	95	1NJ	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	38	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
arsenic (dis.)	10.4J	133	36.6	21.6J	12.8J	214	91.2	124	8.9	3.5U
barium (dis.)	153	579	724	452J	385	352	542	148	70.8	99.6
iron (dis.)	1730	22000	13100	3610	2450	16800	7550	4490	1730	27.2U
manganese (dis.)	679	304	190	189	471	73.6	60.4	59.0	602	0.4U
sodium (dis.)	17700J	25400J	21400J	20200J	22200J	29500J	44800J	61100J	9560J	20500J
ammonia-nitrogen, mg/l	0.5U	6.9	3.4	1.4	0.5U	3.9	5.2	0.5U	0.5U	0.5U
COD, mg/l	20U	20U	20U	20U	20U	33	20U	95	41	20U
chloride, mg/l	22	20	18	20	19	21	21	39	3	31

L. Results for September 1995

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	110	10U	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	36	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	5J	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10U	R	3J	10U	4J	3J	1J	4J
arsenic (dis.)	7.7	91.9	27.7	16.5	173	16.9	120	120	5.6	2.7U
barium (dis.)	139	517	571	439	313	R	551	157	73.5	136
iron (dis.)	1710	14000	9400	3760	63.4	4170	9520	4880	1570	9.7U
manganese (dis.)	648	125	147	189	R	R	41.6	55.2	540	0.2U
sodium (dis.)	16000J	22100J	19500	19200	R	18400	38400	62500	8710	17700
ammonia-nitrogen, mg/l	0.5U	8.4	5.3	2.0U	3.2	3.9	6.4	1.4U	0.7U	0.5U
COD, mg/l	9.7	53	21	9.7	17	29	23	84	36	9
chloride, mg/l	22	23	18	18	17	21	22	17	13	29

Table 2 (cont.). Selected Results for Groundwater Monitoring Wells

M. Results for March 1996

Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	1J	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	170J	2J	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	27J	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	20J	10U	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	3J	1J	1J	10U	2J	2J	1J	0.7J
arsenic (dis.)	6.4J	51.2	25.1	15.5	3.0U	185	34.4	121	5.2J	3.0U
barium (dis.)	171J	426	R	470J	291J	376J	520J	200J	70.9	99.1J
iron (dis.)	2020	7560	8600J	3490	199	15800	3510	6600	2100	10.9U
manganese (dis.)	771J	255	R	191	443	69.1	38.4	75.1	542	0.2U
sodium (dis.)	19500J	24400	21100	20100	22000	32500J	35400	73400J	10300	18300
ammonia-nitrogen, mg/l	0.1U	7.6	4.6	2.0	1.0	4.6	3.9	3.1	0.41	2.0
COD, mg/l	10U	40.6	10U	12U	10U	30.0	16.2	50.0	10U	10U
chloride, mg/l	30.1	22.8	21.6	21.9	20.7	24.6	20.9	25.1	14.0	22.0

N. Results for September 1996

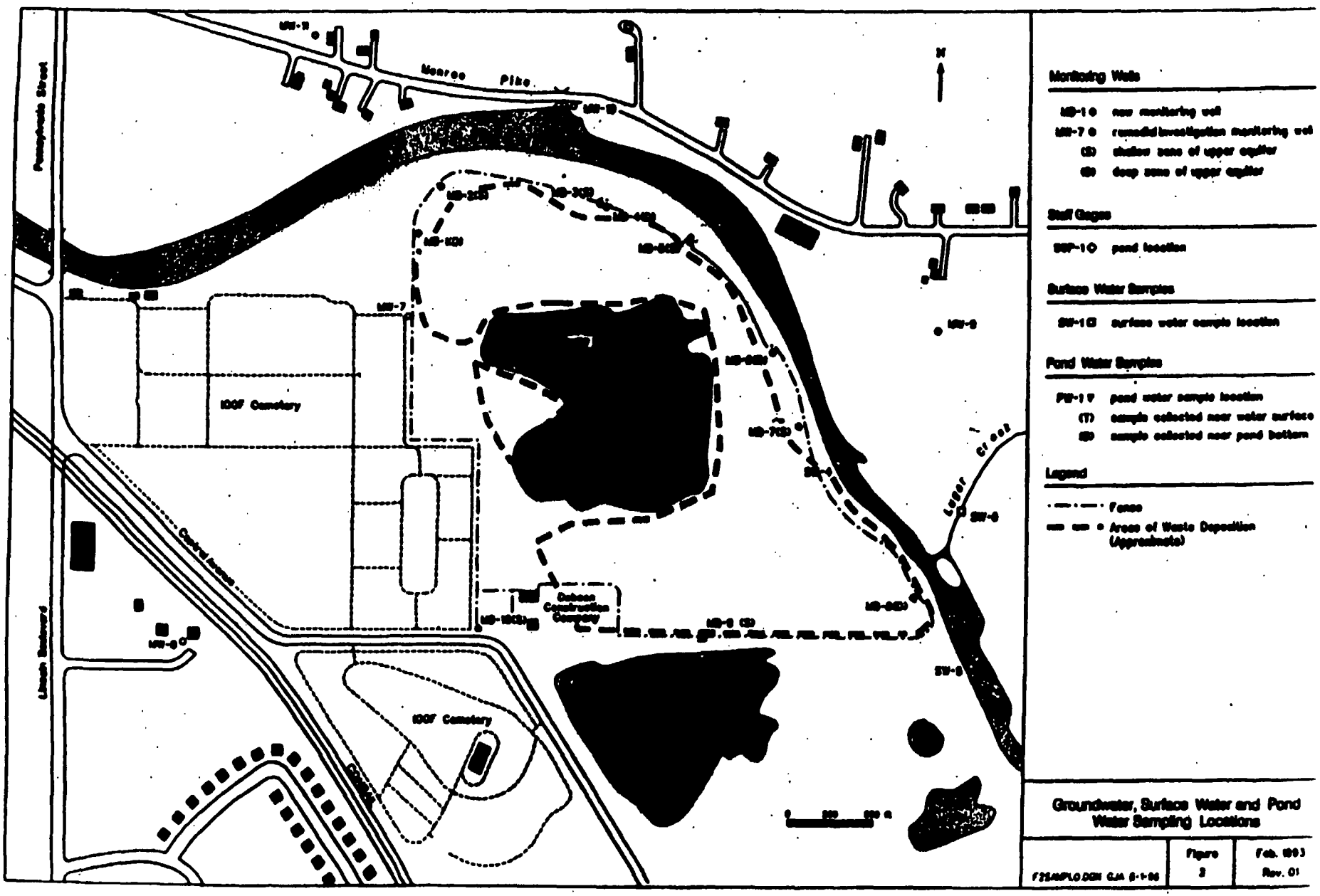
Substance	Downgradient Groundwater Wells								Background	
µg/l except as noted	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10
benzene	10U	2J	10U	10U	10U	10U	10U	10U	10U	10U
1,2-dichloroethene (total)	84	10U	10U	10U	10U	10U	10U	10U	10U	10U
trichloroethene	38	10U	10U	10U	10U	10U	10U	10U	10U	10U
vinyl chloride	10U	1J	10U	10U	10U	10U	10U	10U	10U	10U
bis(2-ethylhexyl)phthalate	10U	10U	10UJ	10U	10U	10U	10U	10U	2J	10U
arsenic (dis.)	9.1J	8.4	29.3	16.3	10.3	162	110	99.2	7.9	2.3U
barium (dis.)	139J	135	583	479	479	330	617	263	69.0	97.0
iron (dis.)	1890J	1890	10500	3550	3130	13300	12600	6590	2350	25.5U
manganese (dis.)	418J	R	188	217	444	60.5	61.7	95.0	575	1.3U
sodium (dis.)	16000J	15800	21000	20300	20400	30000	40900	94400	10700	15700
ammonia-nitrogen, mg/l	0.1U	11.0	5.5	1.8	3.0	4.9	5.0	3.3	0.45	0.1U
COD, mg/l	10UJ	28.3J	12.8J	10.9J	10.3J	12.2J	21.1J	62.2J	10UJ	10UJ
chloride, mg/l	23.6	26.3	22.3	22.6	21.1	22.4	29.5	24.8	14.4	28.8

Notes: Qualifiers: U means the material was analyzed for but was not detected above the level of the associated value, which is either the sample quantitation limit or the sample detection limit; L means the material was analyzed for but was not detected above the associated value, which is the sample detection limit; R means the data is unusable (the analyte may or may not be present) due to serious deficiencies; J means the associated value is an estimated quantity; N indicates the presence of the analyte that has been "tentatively identified"; * indicates that the QA/QC ta were missing for these ICP samples.

"dis." means the dissolved portion; the sample as field filtered.

Samples for wells MB-5 and MB-6 may have been switched in September 1995.

Figure 4
Sampling Locations
Marion (Bragg) Landfill



Attachments

Responsiveness Summary

Attachment A: Responsiveness Summary on the Proposed Consent Decree

Administrative Record Index--Original

Administrative Record Index--Update #1

Administrative Record Index--Update #2

Administrative Record Index--Update #3

USEPA Response. Black & Veatch Special Projects Corp., USEPA's contractor, mailed the fact sheets to the parties on the mailing list for the Site on June 27, 1997. Black & Veatch sent a copy of the fact sheet overnight to the Marion Public Library on June 26, 1997. The documents that were added to the Administrative Record for the Site were mailed to the Marion Public Library with a transmittal letter dated June 26, 1997. The advertisement announcing the public comment period appeared in the Marion Chronicle-Tribune on June 27, 1997.

An extension of the public comment period, for an additional 30 days through August 27, 1997, was granted. This was announced in an advertisement that was in the Marion Chronicle-Tribune on July 28, 1997.

2. **Comment.** Dorothy Alabach, Valparaiso, Indiana, mentioned an "office memorandum" (apparently a reference to a letter or memorandum mentioned earlier in the meeting with comments concerning a meeting with USEPA that was sent from one person at IDEM to another person there; a copy was not furnished at the meeting) and said that she thought that both agencies had dropped the ball protecting the public. She said that there was criticism concerning getting documents to the State and that there was a lack of cooperation (apparently between the two agencies). She claimed that there were late changes made to the final forms of the Consent Decree and the 1987 ROD for OU 1 by the USEPA or the Settling Defendants that compromised the integrity of the clean-up. She also requested that a copy of the transcript of the meeting be mailed to her.

USEPA Response. USEPA does not believe that USEPA and IDEM have failed to protect the public while implementing the remedy for OU 1 and obtaining the information needed in order to propose remedies for OUs 2 and 3.

Under the terms of the Consent Decree, USEPA, in consultation with the State, generally has the primary responsibility when dealing with the Settling Defendants. During the negotiations for the Consent Decree and during the implementation of the work for OU 1, USEPA worked closely with the State. USEPA carefully reviewed comments from the State and considered them. USEPA did not embrace all of the State's comments. In many of the instances where USEPA did not agree with the State, USEPA provided the State with written responses to the State's comments.

There were no significant changes made to the remedy contained in the draft ROD for OU 1 with which the State concurred. The Settling Defendants had no more input to that ROD than any other citizen had the opportunity for; all had the opportunity to comment on the Proposed Plan. The ROD for OU 1 did indicate that USEPA intended to undertake additional studies of the potential impacts of Site contaminants on the river and ponds. Subsequently, during negotiations of the Consent Decree, a phased approach to such studies was agreed to by the parties. USEPA believes the

phased study is appropriate and that results of sampling sediments and groundwater and surface water show that fish analyses are not necessary. There were no changes made in the Consent Decree after the document had been agreed upon and went out for the signatures of all the parties except for one small change that was made in Paragraph XIX, which is clearly marked and initialed.

Those attending the public meeting were told that they could request that a copy of the transcript be mailed to them. Ms. Alabach was sent such a copy.

3. **Comment**. At the public meeting, Marijean Stephenson, Marion, Indiana, also requested a copy of the transcript and requested that she be notified by mail of any extension of the comment period. She was surprised to see that the PRPs are doing the water testing and that the samples are sent to a lab determined by the PRPs. She questioned the amount of USEPA's oversight and assurances of independent validation of the data.

She also asked if test results were being averaged, and where in the law does it state that you can do that. She wanted to know what concentration was needed to require further action. What happens if the remedy selected fails to contain the waste on site or if the integrity of the cap is damaged. Why have there not been regular informational meetings or at least why has the public not been kept informed? She thought that nothing had been added to the files in the repository for about five years. Does one have to have a TAG to know what is going on?

USEPA Response. When an agreement has been reached with a group of potentially responsible parties (PRPs) to carry out required remedial work at a Superfund site, it is generally agreed that the group will do all of the required work. This is done under the supervision and oversight of the lead agency. How much oversight is exercised depends upon the situation. At this Site, as the work has gone on, the amount of oversight has been decreasing as the PRP group (those PRPs that settled with the agencies in the 1991 Consent Decree) has continued to demonstrate its ability to do the work in a professional manner.

The PRP group does indeed have a contractor take the samples. This contractor is required to use procedures that have been approved by USEPA. The PRP group has selected the laboratory that analyzes the samples; this selection was approved by USEPA. The laboratory uses procedures that have been approved by USEPA. The PRP group has a contractor that validates the data. This contractor is required to use the USEPA validation procedures. When the data is submitted to USEPA and IDEM it is reviewed. So far, USEPA has had no basis to question the data submitted by the PRP group.

The results for each sample are reported; sample results reported to the agencies have not been averaged, as can be seen from the reports in the repositories. Data can be averaged for the pur-

pose of making decisions, dependent on the context in which the information is used. There is no law that specifically addresses the use of sample result averages for response action decisions.

The primary purpose of the sampling is to determine what is happening with time to the groundwater and the on-site pond regarding the quality of the water and to determine if there are any impacts on the Mississinewa River in the neighborhood of the Site. No specific concentrations have been set to trigger some remedial action. Impacts on the river and concentrations in the on-site pond above acceptable levels would require consideration of possible action. In the on-site pond, acceptable levels are primarily the various surface water criteria. Additional groundwater analyses may be required under certain conditions.

If the remedy fails to contain the wastes, then the Site will have to be reevaluated. But it is necessary to remember that containing the wastes and containing contaminated groundwater are two different things. There is contamination in the groundwater and this groundwater is discharging to the river. However, there has been no measurable effect on the river, that is, the river water monitoring has not been showing increases in concentrations in the river with position. If the cap is damaged, the PRP group will have to repair it.

There have been no informational meetings for the public or fact sheets issued since the construction for OU 1 was finished since there did not appear to be any new information to provide the public. USEPA does admit that there were delays in finalizing data which led to delays in placing sample results in the repository, but there had been no inquiries from the local public about the Site for a considerable period of time.

One does not have to have a Technical Assistance Grant (TAG) to know what is happening at a site.

4. **Comment**. Dorothy Alabach also commented on splitting samples. She stated that citizens have the right to have laboratory representation, not just the PRPs.

USEPA Response. Split samples are one of the tools available to the agencies when overseeing remedial work, that is, the PRPs' sampling contractor takes a sample and the agency takes a part of it. The samples are separately analyzed by different laboratories. The agency does not generally split all samples, only some of them.

The agencies are representing the people when working with a group of PRPs at a site, and if sample splitting is determined to be necessary, the agencies will be the ones doing this.

5. **Comment**. Jeff Symmes made a comment about the Superfund program. He believes that the government agencies are controlled by the polluters. He said that legislation is being prepared to

place the liability on the citizens and there are no public hearings to let citizens participate in the preparation of the legislation. He said that the politicians are going to do away with over 10,000 sites in the country and that Indiana has delisted 1350 sites and have maybe 100 sites they might even look at. He mentioned the Fivecoate Landfill (Howard County Landfill), where he claimed radioactive materials and toxic chemicals have been dumped; he claimed that this site is not being looked at. He attacked the politicians in Washington. He said that the staff at the agencies have too many sites assigned to them to do an adequate job, and that the managers of the agencies are controlling and manipulating the country, poisoning the world.

USEPA Response. USEPA acknowledges this comment but has no response to present here since the comment does not pertain to the proposed action at the Marion (Bragg) Dump site.

6. **Comment**. Marijean Stephenson commented further. She questioned the appropriateness of a site's project manager saying that a site is not that bad. She is a nurse and would not say to a patient that he/she wasn't really that sick.

USEPA Response. There is a claim, reportedly in the 1989 IDEM memorandum mentioned above, that the remedial project manager for USEPA had said that this Site is not that bad. Whether or not it was said is not known. However, USEPA is mandated to address all Superfund sites with the same diligence, and any such comment has no impact on the level of cleanup required for a site.

Sites are scored under the Hazard Ranking System. The score that is obtained reflects the information known at the time of the scoring. The score provides a measure of relative rather than absolute risk for the site. In a National Priorities List (NPL) from 1989, this Site was ranked 567 out of 848 sites. This Site was scored at 35.25. A score of 28.5 was needed for a site to be placed on the NPL. The maximum score on that list was 75.6. Characterizing the relative risk of a site is similar to listing the condition of a patient as being critical, serious, stable, etc.

7. **Comment**. Richard Atcheson of Marion, in a message dated July 17, 1997, commented that he supports the no-action proposal. He said that massive expenditures on low level threats are not in the best interests of the public. He also mentioned that there is a severe problem locally with illegal dumping and he felt that the trash dumping along River Road is a greater threat to the Mississinewa River than is this Site. He further stated that no one he talks with seems worried about the Site and he thinks that the general public is satisfied with the containment. The general public ends up paying for all the clean-ups and USEPA only hears from a vocal minority.

USEPA Response. USEPA acknowledges Mr. Atcheson's comments in support of the selected response.

8. **Comment**. Emery Patterson of Marion, in a message dated July 25, 1997, listed three main concerns that he has with the Proposed Plan. First, he said that it was documented that over 50,000 drums of chemical and industrial waste went into the Site, and he wanted to know what happened to it; how much has already leached from the Site and how much remains and what are the health implications for people and wildlife. He believes that it is absurd to think that this Site has not had some impact on the environment. He states that he has never seen any documents that would explain, for example, that certain chemicals can bioaccumulate and cause renal failure; all he has seen are tables with ppm measurements and sampling data. Secondly, he claims that orange leachate persists at the edge of the water of the Mississinewa River near the north corner of the Site. He expressed concern about this when the Site was being capped and he said that his claim that it was leachate was dismissed. He asked if testing had been done. He wants to know how it was determined what this orange phenomenon is and if it will be tested. Thirdly, how was the list of chemicals to be analyzed for for the groundwater and pond water generated? He mentioned that cadmium is used locally in the manufacture of picture tubes. Were the chemicals used locally used as a basis for the testing? He mentioned observing waste glass from RCA along the southwest bank of the on-site pond. The glass had had a phosphorescent slurry applied to it and he wanted to know how these chemicals have impacted this pond. He believes that common sense has been lacking in the investigation of the Site.

USEPA Response. First, 50,000 drums is higher than has usually been attributed to the Site, which is around 30,000 drums. But even 50,000 full 55-gallon drums would only constitute 1.2% of the estimated volume of this dump. What has happened to the contents of these drums is not fully known. Reportedly, the contents of at least some of the drums were dumped on the ground. Some of the reported materials were fairly volatile and most of this has probably left the Site, either through evaporation or dissolved or emulsified in the groundwater. Some of the substances may still be attached to other materials, including soils, in the landfill. What can be said about these materials is that the analyses of the groundwater do not indicate that these materials are presently leaving the Site at any great rate with the groundwater. And, as has been stated in this ROD, USEPA believes that no further action is needed here to ensure protection of human health and the environment. This is not saying that this Site has never had an impact on the environment.

In the remedial investigation report, bioconcentration was addressed. Discussions of many of the chemicals found at the Site were also presented. Exposures to some of these chemicals may affect the kidneys.

Years ago when there was a claim that leachate was appearing along the river in the northwestern corner of the Site, two samples of the sediments in this area and a sample of water from

well MB-2 were taken. The results of the tests on these samples and a discussion of the work that was done are in the report, *Detection of Iron Bacteria in River Sediment, Soil and Well Water Samples*, Barbara J. Butler and Colin I. Mayfield, June 18, 1991, a copy of which is in the Administrative Record. It was concluded, "It is quite possible that the iron staining observed at the field site from which the samples were taken is biologically-mediated." It also needs to be noted that similar staining could be found along this river well upstream of the Site (near the 38th Street bridge) at the time.

The commenter has expressed a belief that leachate has appeared at the edge of the river. When the RI was done there were three wells installed in the waste disposal area. The water levels measured in two of them (the othe: was generally or always dry) gave elevations that one would approximately expect for the water table at those points, indicating that there was little or no accumulation of leachate in the landfill. What leachate there might be would be expected to primarily flow down to the groundwater rather than take the fairly long path to the river at the northwest corner of the Site.

The substances analyzed for in the semi-annual samplings of the various water samples since the remedial action was started for OU 1 have been those substances usually analyzed for at Superfund sites, the target compound list (TCL) and target analyte list (TAL) substances, except that pesticides and polychlorinated biphenyls (PCBs) were not included since they were not found during the RI. In the quarterly monitoring between these semi-annual events, several indicator parameters in groundwater have been analyzed for; also, if anything from the semi-annual monitoring needs confirmation, it would be analyzed for. Some phosphors contain cadmium and zinc. Cadmium and zinc are two of the TAL substances. The levels of these two substances at the Site were not seen as a problem.

USEPA believes that it, in consultation with IDEM, has investigated the Site responsibly.

9. **Comment**. Glenn and Joan Baird, in a note dated July 30, 1997, said that the decision to do nothing at the Site is the wisest and best and urged USEPA to stick to that decision.

USEPA Response. USEPA acknowledges their comment. This ROD does select the "no action" remedy for these two operable units.

10. **Comment**. Mark Travers of de maximis, inc., commented on behalf of the Marion (Bragg) Landfill Group (Group) (the Generator Defendants), in a letter dated July 31, 1997. The Group believes the no-action remedy is appropriate because no impacts on the river have been detected, no issues with the on-site pond have been detected, the groundwater poses no current or future risk to human health or the environment, and the existing monitoring systems will assure that the remedy continues to protect

human health and the environment. The Group also believes that a reduction in the extent of monitoring is appropriate and this is supported by the conditions documented by the monitoring that has been done. Contaminant levels in the groundwater have remained low, site related constituents have not affected the river, and water quality criteria in the on-site pond have not been exceeded for the past two years.

USEPA Response. USEPA agrees that the no action alternative for OUs 2 and 3 is appropriate. However, USEPA has made the determination that there is no risk to human health on the assumption that groundwater in the upper aquifer under the northwest corner of the cemetery to the west will not be used. To assure this, USEPA believes that it is important that a deed restriction, which the Group is seeking, be obtained to prevent the use of the groundwater in the area to which contaminated groundwater from the Site might flow.

USEPA will continue to evaluate further the results of the monitoring in order to determine what level of monitoring is now appropriate.

11. **Comment**. IDEM commented, in a August 20, 1997 letter from John Rose, Assistant Commissioner, Office of Environmental Response, that IDEM does not support the "no action" proposal because there are no restrictions on groundwater usage for the property underneath which groundwater from the Site travels prior to its discharge into the Mississinewa River. Therefore, IDEM feels that a risk to human health and the environment would remain. IDEM said that it could support the "no action" proposal if groundwater use restrictions were in place on the property affected by the Site.

USEPA Response. The Settling Defendants are pursuing a deed restriction on the cemetery property to the west of the Site. This is the only downgradient property under which groundwater from the upper aquifer under the Site might pass before entering the Mississinewa River, and this only happens in the northeastern part of the property. Presently, this is a wooded area that lies mostly, if not entirely, in the floodplain and the only access to it is through the cemetery. USEPA expects that this deed restriction will be obtained.

On September 30, 1997, IDEM notified USEPA that it will provide a letter of concurrence on the ROD on the basis that this deed restriction will be obtained.

12. **Comment**. Marijean Stephenson, in a letter dated August 26, 1997, resubmitted comments that had been submitted earlier with regard to the Consent Decree proposed in 1990. She submitted, as her own, the comments of: 1) David Hudak of the U.S Department of the Interior, Fish and Wildlife Service; 2) Larry Davis, for USWA Local #6786, HEC, PAHLS, and HEAL; and 3) James Simon of the Natural Resources Defense Council. She said that she did not

believe the comments were ever given serious consideration or adequately addressed by USEPA, the Department of Justice, or any other person or agency involved with decisions concerning the future of this Site.

USEPA Response. First, it is necessary to respond to Ms. Stephenson's letter. Except for the comments from the Fish and Wildlife Service, the comments that she has submitted, as well as others, were responded to in Exhibit A (Response to Comments) of the Memorandum of the United States in Support of Motion to Enter Consent Decree, 1991. It is USEPA's opinion that these comments on that proposed Consent Decree were seriously considered and adequately addressed at that time. The U.S. Fish and Wildlife Service's comments that Ms. Stephenson has included with her letter were not comments submitted by the U.S. Fish and Wildlife Service on the proposed Consent Decree but are earlier comments of the U.S. Fish and Wildlife Service that were an enclosure with their comment letter on the proposed Consent Decree. None of the U.S. Fish and Wildlife Service's comments were addressed in the 1991 Response to Comments because U.S. Fish and Wildlife withdrew its comments from the public comment file in a February 27, 1991 letter; note that these comments of U.S. Fish and Wildlife on the proposed Consent Decree were comments on the litigation.

The specific comments are discussed briefly below.

a. **Comment**. U.S. Fish and Wildlife Service comments, letter of August 25, 1989 from David Hudak. In comments that he characterized as of a technical assistance nature only, Mr. Hudak said that he believes that there is a valuable fish and wildlife habitat in and adjacent to the Site. He summarized the selected remedy for OU 1 and pointed out that there was to be, according to the ROD: 1) quarterly sampling of surface waters at 3 on-site pond locations and 5 river locations; 2) additional studies consisting of fish bioassay work for on-site and off-site ponds and the river; and, 3) general toxicity tests on river ammonia levels. He said that in a telephone conversation in 1989 he learned that these additional studies might not be done. He did not feel that the selected remedial actions would be adequate to protect the environment. He believed that bioassay work, tissue residue levels, and ammonia toxicity modeling should be done. He also said that he was pleased to learn that the original plan of a levee for flood control had been revised, which will lessen the impact on the riparian forest corridor.

USEPA Response. The OU 1 ROD requirements for determining the effect of the landfill on the on-site pond, the river, and the groundwater and for evaluating what protection or remediation of the on-site pond or the river might be necessary was considered further when the specifics for implementing the remedial action were being determined during Consent Decree discussions. This resulted in the decision-tree approach contained in the remedial action plan that was included with the 1991 Consent Decree. It is USEPA's opinion that this approach satisfies the goal of the

OU 1 ROD that the aquatic environment of the river and the ponds not be adversely affected by migration of the contaminants that remain in place as part of the OU 1 remedy. USEPA believes that the levels of ammonia in the river, where it has generally been undetected, have not made it necessary to perform any toxicity tests. And the overall level of contamination in the river and the on-site pond have not been such that bioassay studies were needed. See the discussion in section V of this ROD for OUs 2 and 3 about the results of the semi-annual sampling that has taken place since February 1990. Also, the instream biological assessment of the water quality in the river near the Site did not show any significant environmental impact that was attributable to the Site.

b. Larry Davis submitted a 18 page letter, dated October 8, 1990, with comments on the proposed Consent Decree. The response that was attached to the "Memorandum of the United States in Support of Motion to Enter Consent Decree" filed for the proposed Consent Decree in 1991 is attached hereto as Attachment A. The section in this attachment dealing with the comments of Healthy Environment for All Life, Hoosier Environmental Council, and PAHLS serves here as the summary of the technical points raised in Mr. Davis's letter and USEPA's responses to them.

c. James Simon of the Natural Resources Defense Council submitted two letters dated October 9, 1990 furnishing comments on the proposed Consent Decree; the second letter merely corrected some errors in the first letter. The section in Attachment A dealing with the Natural Resources Defense Council serves here as the summary of the points raised in Mr. Simon's letters and the responses to them.

13. Larry Davis, of Hebron, Indiana, submitted a 16 page letter containing comments along with a 48 page attachment that covered some of the history of the site that he had put together. The attachment was apparently the same as the document that he had submitted when he commented on the proposed Consent Decree in 1990 entitled "Selected Site History Document Summary". The letter submitted here was dated September 22, 1997, but the correct date was probably September 2, 1997. This date was almost a week after the comment period, which had been extended beyond the normal 30 days to 60 days, had ended. Because the comment letter was so late, specific responses are not provided. USEPA has reviewed the letter for possible new information or critical remarks not already made by other commentators that might impact remedy selection and has concluded that there are none. The letter will be placed in the Administrative Record, however.

Marion (Bragg) Dump Site
Operable Units 2 and 3
Responsiveness Summary
Attachment A

UNITED STATES DEPARTMENT OF JUSTICE
RESPONSE TO COMMENTS
ON THE PROPOSED CONSENT DECREE
UNITED STATES V. YOUNT, ET AL., F 90-00142

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- B. Natural Resources Defense Council
- C. Healthy Environment for All Life, Hoosier Environmental Council, and PAHLS

I. RESPONSES TO TECHNICAL COMMENTS

The following persons or entities have submitted comments on the Decree which relate to U.S. EPA's remedy and other technical issues:

- Healthy Environment for All Life, Hoosier Environmental Council, and PAHLS (collectively "Citizens Groups")
- Residents from the local community ("Residents")
- Natural Resources Defense Council ("NRDC")

These responses will address these technical comments. The primary technical comments are also addressed in the text of the motion to enter. Comments which relate to a variety of legal issues are only addressed in the text of the motion to enter.

A. Residents' Comments

Comment: The clay cap is not sufficiently protective of the environment because it does not prevent or contain groundwater contamination.

Response: The proposed Decree, in accordance with the ROD for the site, implements an interim remedy at the site. Under the Decree, the settling PRPs have agreed to construct a low permeability cap and cover over designated areas at the site, and to perform further monitoring to determine if the surface water and groundwater require remediation.

U.S. EPA concluded in the ROD that installing a cap at the site will help reduce groundwater contamination by minimizing the leaching of contaminants into the groundwater. However, should monitoring results identify contamination which indicates that remediation of groundwater and surface water may be required, U.S. EPA will address groundwater contamination in accordance with the requirements of CERCLA, including all applicable public participation provisions.

B. NRDC's Comments

1. Comment: The Natural Resources Defense Council ("NRDC") requested confirmation that the actions described in the proposed Decree represent only an interim remedy for the site, and that any decision as to a final remedy will be made pursuant to the public participation requirements of CERCLA.

Response: The remedy selected for this site and encompassed by the proposed Decree is an interim remedial action. As the ROD explains, this

site has three media of concern: surface soils and on-site wastes, groundwater, and the on-site pond. The proposed Decree addresses the surface soil contamination and on-site wastes by capping the site. The purpose of the cap is to promote rain runoff, thereby reducing infiltration and prevent direct contact with contaminated surface soils and surface wastes.

The determination of what remediation will be done, if any, of the groundwater and the surface water is not covered by the proposed Decree. Rather, as directed by the ROD, since the extent of groundwater and surface water contamination and the effect of the cap on that contamination could not be determined fully without further monitoring, the proposed Decree provides for further monitoring and studies at the site. Should monitoring of the groundwater and surface water reveal that additional remedial work may be needed, a remedy addressing the groundwater and/or surface water will be developed in accordance with the requirements of CERCLA and the National Contingency Plan (NCP), including all community relations and public participation requirements.

2. Comment: The proposed Decree does not require compliance with the National Pollutant Discharge Elimination System ("NPDES") permitting requirements of the Clean Water Act, 33 U.S.C. §1311, et seq., and a final remedy must comply with NPDES requirements.

Response: First, CERCLA does not require an NPDES permit for any migration of groundwater to the River. Under Section 121(e)(1) of CERCLA, 42 U.S.C. §9621(e)(1), Federal, State and local permits are not required for remedial actions conducted entirely on-site, such as in this case.

Second, the Clean Water Act does not require an NPDES permit for this site. The NPDES program requires permits only for the discharge of pollutants from a "point source", 40 C.F.R. § 122.1(b). The chronic migration of water from an aquifer to a nearby river over a one-half mile stretch of river bank is not a point source discharge under 40 C.F.R. §122.2.

Third, in any case, the interim remedy does not address the groundwater and surface waters on the site. Thus, NRDC's comment is premature. Should monitoring reveal that remediation of these media may be required, any applicable or relevant and appropriate requirements ("ARARs") will be identified in connection with the proposal and selection of any subsequent remedy.

C. Citizens Groups' Comments

1. Comment: The Remedial Design/Remedial Action (RD/RA) Workplan, and the documents required under the RD/RA Workplan (such as the sampling and analysis plan and health and safety plan), are not available for public review and comment. Thus, since the Workplan and the documents required under it provide the details of the remedy, they cannot adequately comment on the proposed Decree.

Response: First, notwithstanding the fact that the RD/RA Workplan has not been made public yet, the Citizens Groups, who prepared extensive comments on the proposed Decree, have had access to considerable information regarding the details of the remedy. The RI/FS Reports, the ROD, the proposed Decree, and the Remedial Action Plan attached to the proposed Decree all provide substantial details about the site and the interim remedy for the site. Moreover, the effectiveness and protectiveness of the interim remedy will be determined by how well the remedy is implemented, not by the details in the Workplan and its associated documents.

Second, the fact that the final RD/RA Workplan is not available prior to entry of this decree is not unusual. CERCLA and its regulations provide for public participation before U.S. EPA issues a ROD and after a consent decree has been lodged. In most cases, however, the RD/RA Workplan is not finalized until after a court enters the consent decree. Typically, after a decree has been entered, the parties performing the cleanup submit the RD/RA Workplan to U.S.

EPA for its review and approval. Thus, the public does not review the Workplan or any of the documents required under the Workplan (such as the sampling and analysis plan or the health and safety plan) prior to commenting on the Consent Decree.

In this case, Section VII(D) of the proposed Decree provides that the Workplan will be finalized after entry of the Decree. Once the Workplan is finalized, it will be annexed to the Decree in accordance with Section VII(D)(1), and U.S. EPA will place a copy of the Workplan in the local information repository. The public may then review the Workplan.

2. Comment: The integrity of the Facility is questionable as additional landfill material was unearthed along the River bank, requiring modifications to the remedial work of which the public has not yet been informed.

Response: In the spring of 1990, as a result of severe weather conditions, a few trees near the River bank.fell, unearthing landfill material. In response, and in accordance with the ROD and Remedial Action Plan, U.S. EPA is considering installing protection for part of the bank to minimize the chances of landfill materials entering the river. Such minor supplemental measures are often taken during the course of remedial action and are not significant alterations of the interim remedy selected in the ROD.

3. Comment: The remedy selected in the ROD fails to prevent groundwater contamination or its migration off-site.

Response: As noted above, the proposed Decree does not address the Contamination in the groundwater at the site, except to require groundwater monitoring. Based on the further monitoring, U.S. EPA will determine, if the surface water and groundwater require remediation. The capping of the site should reduce groundwater contamination by minimizing the leaching of contaminants into the groundwater. However, if monitoring results indicate that remediation of groundwater and surface water are required, U.S. EPA will proceed, in accordance with CERCLA and the NCP, with appropriate measures at that time.

4. Comment: The City of Marion was "coerced" into accepting the costs of operation and maintenance of the landfill. Moreover, these costs are potentially open ended, and information related to the city's potential liability has not been made available to the public.

Response: The City of Marion decided to take responsibility for the cost of operation and maintenance of the remedy, instead of contributing to the substantial cost of designing and constructing the various elements of the remedy. The City made this choice during the course of negotiations. Presumably, in analyzing the risks associated with being a PRP at the site, the City decided that the terms of the proposed Decree were advantageous. U.S. EPA did not coerce the City or any other PRP into agreeing to the terms of the settlement embodied in the proposed Decree. Indeed, to the contrary, several PRPs which were involved in the,negotiations ultimately decided not to participate in the settlement. Finally, the estimated costs for operation and maintenance of the interim remedy has been made public. It is contained in the FS Report.

5. Comment: U.S. EPA has failed to respond to comments from the State regarding various documents, including the Draft Quality Assurance Project Plan, the Draft Sampling and Analysis Plan, the Draft Groundwater Monitoring Plan and the Draft Remedial Design/Remedial Action Work Plan.

Response: U.S. EPA has worked closely with the State in developing the remedial design and implementing the interim remedy for this site. U.S. EPA has carefully reviewed and considered all comments received from the State and provided the State with copies of U.S. EPA's comments on

draft documents received from the settling PRPs. Moreover, particularly where U.S. EPA has disagreed with the State's views, U.S. EPA has provided a written response to the State's comments explaining any differences of position. In addition, the State has regularly attended the meetings with the settling PRPs regarding implementation of the remedy.

6. Comment: U.S. EPA has not issued a notice of significant changes, although such changes have been made, such as noncompliance with applicable or relevant and appropriate requirements ("ARARs"), including the environmental regulations of the State of Indiana.

Response: It is difficult to address this comment because it is not entirely clear from the comments what specific changes the commenter alleges have been made which are allegedly "significant changes." However, U.S. EPA has made no changes to the terms of the proposed Decree since it was signed. Nor have "significant changes" been made to the interim remedy selected in the ROD during design and implementation of the remedy.

Under Section 300.435(c)(2) of the National Contingency Plan, U.S. EPA need only issue an explanation of significant differences where, after the adoption of the ROD, the remedial or enforcement action taken, or the settlement or Consent Decree entered into, differs significantly from the remedy selected in the ROD with respect to scope, performance or cost. See 40 C.F.R. § 300.435(c)(2). Here, U.S. EPA has not altered the remedy significantly since the issuance of the ROD (see e.g., Response to Comment C-3, supra), and the RAP is fully consistent with the goals and directives of the ROD (see Response to Comment C.8, infra). Moreover, U.S. EPA has certainly complied with all ARARS, including all State regulations, in selecting and implementing the remedy for this site. The ARARs for this interim remedy are set forth in the ROD, and Section VII(C) of the Consent Decree requires the settling PRPs to comply with all ARARs during remedial design and remedial action at the site.

7. Comment: The Remedial Action Plan ("RAP"), attached to the Decree as Appendix B, is not consistent with the ROD and/or the Decree in the following respects:

a. Comment: The RAP provides that monitoring will "show" the effectiveness of the remedy, while the ROD provides that monitoring will "determine" the remedy's effectiveness. Thus, the RAP is predisposed to find no environmental or human health impacts.

Response: In this context, both words mean essentially the same thing. Under both the ROD and the RAP, U.S. EPA's objective is to analyze the data obtained from monitoring in order to determine whether or not additional remedial action will be needed at the site to address the groundwater and surface waters. By using the term "show" rather than "determine", the RAP does not alter this objective nor does it predetermine monitoring results.

b. Comment: The RAP does not comport with the ROD with regard to the manner in which leachate seeps and uncovered hazardous materials are addressed during the interim remedy.

Response: There is essentially no difference in the way that the RAP and the ROD address leachate seeps and drums or other hazardous wastes. First, both provide that contaminated leachate seeps and sediments will be removed and/or covered by the cap. The ROD provides that, if leachate seeps are not eliminated, seep collection will be required. Under the RAP and the proposed Decree, if the leachate seeps are not contained, additional work regarding the seeps will be required under Section IX of the Decree.

Second, the ROD provides that during the course of regrading any drums or other hazardous wastes, if present, would be removed according to RCRA. Here, under the RAP, if drums containing liquids are found, the drums must be set

aside and sampled. If the liquid is hazardous, it will dealt with as hazardous waste under RCRA. EPA recognizes that such liquid hazardous wastes (in containers that may eventually leak) may pose a threat to the groundwater at the site. If the liquid is not hazardous, it still will be taken off-site, but as a non-hazardous waste. Any solid waste, after years of exposure near the surface, is more than likely to be fairly insoluble in water and therefore does not present a viable threat to the groundwater. As a result, such waste will be covered in the course of regrading. Moreover, as outlined above, if the groundwater contamination requires remediation, a final groundwater remedy will be selected.

In any case, it is important to note that since the settling defendants brought in fill and less excavation was done, during the installation of the cap, only one drum which contained liquid waste was uncovered and characterized.

c. Comment: The RAP incorrectly reported that the RI and the ROD concluded that there is no potential for contamination of upgradient private-use wells and that the impacts of contaminants from the upper aquifer on the River are minimal.

Response: The RAP does not state that the RI and ROD reached this conclusion. The RAP states that there is little, if any, potential for contamination of private-use wells which are upgradient from the groundwater and surface water at the site, and presents support for this statement.

Second, the RAP does not state that the ROD concludes the impacts on the River are minimal. However, both the RI and ROD provide information that would support such a conclusion. Section 5.3.2.2 of the RI states that exposure pathways associated with the river are considered to be negligible, leading to the conclusion that the effects on the river are minimal. Moreover, Section II(D)(4)(b) of the ROD states that the RI/FS concludes there is no currently identified risk to the River, although the potential for such risk exists.

d. Comment: New monitoring wells have been installed at the site and the old monitoring wells have been abandoned. Therefore, it is not possible to compare the results obtained during the RI with the results that will be obtained in the future.

Response: Both the FS and the ROD, recommended the installation of new monitoring wells. The purpose of the monitoring wells is to determine whether further action is required to remedy groundwater contamination at the site. To make this determination, U.S. EPA will not compare results from different monitoring wells over time. Rather, U.S. EPA will analyze the results of groundwater monitoring that is done after the cap has been installed and then determine whether further action is necessary.

e. Comment: The results of sampling performed in February of 1990 have not been made available to the public yet.

Response: U.S. EPA received these results after the close of the public comment period. It will make them available to the public shortly.

f. Comment: The Consent Decree calls for thirty years of monitoring of the cap, while the RAP only calls for five years of groundwater sampling.

Response: Paragraph VII(D)(7)(a)(ii) of the proposed Decree states that "[m]onitoring shall continue for a period of at least thirty years after the construction of the cap is complete, unless it can be demonstrated to the U.S. EPA's satisfaction that further monitoring is not necessary." This monitoring, which covers sampling of groundwater and surface

waters, shall be done. The fact that Figure 4-3 of the RAP only shows sampling through five years does not mean that sampling will cease at that time. Rather, sampling will continue until U.S. EPA is satisfied that further monitoring is not necessary.

g. Comment: The RAP calls for sampling of indicator parameters on a semi-annual basis, while the ROD calls for the testing of indicator parameters every quarter and the testing of priority pollutants semiannually.

Response: Figure 4-3 of the RAP shows that analyses for indicator parameters will be done every quarter. These parameters are listed in Table 4-1 of the RAP. The statement in the RAP (Section 4.1.5) that mentions the evaluation of the data to get indicator parameters refers to the addition of certain parameters to the list of indicator parameters on a semi-annual basis. The Target Compound List, a list that U.S. EPA presently uses at Superfund sites, is currently being used for the semi-annual testing. The substances on the Target Compound List are not significantly different from the substances which were analyzed for during the RI at this site.

h. Comment: The ROD does not provide for the averaging of results from water quality analyses of monitoring wells, although the RAP does allow such averaging.

Response: All of the results of the analyses of the monitoring wells will be reported, not just the averages. Averaging of results from the analyses of samples from monitoring wells will be used in making decisions as to what studies will be performed. The ROD does Hot prohibit the use of averaging, which is a technically acceptable approach.

i. Comment: The RAP states only that criteria for the evaluation of groundwater and surface water will include "appropriate standards," while the ROD calls for compliance with all ARARs and for the performance of appropriate bioaccumulation and general toxicity evaluations.

Response: There is nothing in the RAP which indicates that criteria and standards will not be based on ARARS. Under Section XXIV of the Consent Decree, all work must be consistent with the National Contingency Plan. Therefore, properly identified ARARs must be observed. In addition, the RAP does provide for the performance of bioaccumulation studies and other biological studies.

j. Comment: The RAP calls for sampling to occur at an island in the River which the Army Corps of Engineers and the Grant County Commissioners removed during the summer of 1990.

Response: The RAP does not provide for sampling on the island, but downstream of the island. Furthermore, only proposed locations are shown in the RAP and locations are, consequently, approximate. The sampling mentioned is actually taking place opposite the north boundary of the site near the west boundary. For clarification, the Army Corps of Engineers did not remove the island, although they were involved in the permitting process, and the island was removed in the winter and spring of 1990.

k. Comment: The RAP's list of basic parameters excludes PCBs and pesticides. The ROD does not allow for such a reduction of the testing parameters.

Response: The ROD does not preclude the deletion of PCBs or pesticides from the list of parameters for groundwater and surface water testing. During the RI neither pesticides nor PCBs were detected in the groundwater monitoring wells on the site, the leachate wells, or the surface water.

l. Comment: The RAP preconditions the performance of biolog-

ical studies on the failure of the groundwater or surface water to meet certain standards, and limits the parameters that will be studied (Section 4.5.1). The ROD, on the other hand, does not precondition bioassay work and lists the classes of compounds from which parameters are to be selected, which list includes, PCBs.

Response; Under the Decree, as more technically defined in the RAP, biological studies will be performed if EPA determines, after additional study of the groundwater, surface waters and the river sediment, that these media are the same as they were at the time that the RI was done, or worse. Given that the purpose of the additional studies in the ROD was to provide information that can be used in deciding whether any further remedial actions are needed at the site to address groundwater and surface water contamination, this is fully consistent with the ROD.

Moreover, the only additional limitations on one type of biological study, a bioaccumulation study, are that the substances that are being evaluated must be present at the site and have the potential to bioaccumulate (Figure 4-5 of the RAP). The ROD does not prohibit such requirements. In addition, contrary to the commenters' assertion, the ROD makes clear that parameters are to "be selected from" volatiles, PAHs and inorganic constituents. See ROD at 17. In the nomenclature used with the Target Compound List, PCBs do not fall within any of these three classes of substances. Furthermore, as set forth above in Response (k), supra, PCBs were not found in the groundwater or surface water at the site.

m. Comment: The RAP allows for the dilution of contaminants to be considered as an additional "safety factor" when determining if further remedial action is necessary, but the ROD does not permit this.

Response: The RAP does not provide that dilution of contaminants will be considered in determining if further remedial action will be necessary at the site. Decisions regarding further remedial action will be made in accordance with the requirements of the National Contingency Plan.

8. Comment: The Consent Decree and its attachments, in particular the RAP, do not comply with ARARS, as required by Section 121(d)(2)(A) of CERCLA, 42 U.S.C. §9621(d)(2)(A).

Response: Since the Citizens Groups did not specify which ARARs they claim the proposed Decree and its attachments failed to meet, it is very difficult to address this comment. Under CERCLA Section 121(d)(2)(A), a remedy must comply with all applicable or relevant nd appropriate Federal environmental regulations, as well as all State environmental regulations which are more stringent than any Federal standard and which the State has identified to U.S. EPA in a timely manner. The interim remedy selected for this site complies with all identified ARARS, as set forth in Section VI(A) of the ROD. The proposed Decree does not alter the interim remedy, and thus comports with the ARARs set forth in the ROD.

9. Comment: The proposed Decree "seeks provisions in the ROD and Remedial Action Plan (RAP) to establish alternate concentration limits ('ACLs')" for groundwater and surface water at the site under the provisions of Section 121(d)(2)(B)(ii) of CERCLA, 42 U.S.C. §9621(d)(2)(B)(ii).

Response: This comment does not identify what Section of the proposed Decree allegedly refers or relates to ACLs. From the context of the comment, it may be referring to paragraph VII(D)(7)(f)(i) of the proposed

Decree. However, this provision of the proposed Decree does not refer to, let alone establish, ACLs.

In fact, the ROD and the proposed Decree do not refer to or discuss ACLs because, as outlined above, this interim remedy does not address what action may be needed for groundwater or surface waters at the site, except to the extent that it provides for additional study of these media. U.S. EPA need not establish ACLs for an interim remedy which only addresses the surface soils and on-site wastes.

10. Comment: U.S. EPA has "massaged" monitoring results through statistics and geometric means.

Response: There is absolutely no basis for the assertion that U.S. EPA has massaged monitoring data. U.S. EPA has not engaged in any such activity, and has made, and will continue to make, monitoring data available to the public in the information repository.

11. Comment: The proposed Decree fails to analyze the long-term uncertainties and possible failures of the containment and capping aspects of the interim remedy. Because of these unidentified uncertainties, the remedy is not cost-effective.

Response: Contrary to the commenter's assertions, the FS Report and ROD specifically address the long-term effectiveness, as well as the cost-effectiveness, of the selected remedy. In fact, the evaluation of remedial alternatives in the FS demonstrated that more permanent alternatives involving treatment of the soils, such as incineration, were prohibitively expensive and impracticable when compared with the selected interim remedy. See Section VI(B) of the ROD. It should also be noted that containment technologies, such as the cap in this case, are generally considered appropriate for wastes, such as those here, that pose a relatively low long-term threat to human health and the environment. See Section 300.430(a)(1)(iii)(B) of the National Contingency Plan, 40 C.F.R. §300.430(a)(1)(iii)(B).

Further, the ROD makes clear that, because hazardous substances will remain on-site, the interim remedy will require long-term operation and maintenance and, under Section 121(c) of CERCLA, 42 U.S.C. §9621(c), U.S. EPA must conduct periodic reviews of the effectiveness of the remedy. Thus, in addition to the review of monitoring data and studies, these periodic reviews will assess whether the interim remedial action is protective of human health and the environment and determine whether further action is necessary.

In addition, since this is an interim remedy, the long-term effectiveness and permanence of the remedy will best be evaluated when the groundwater issue is resolved. The fact that this is an interim remedy will not create a false sense of security or lead to land use that will complicate future cleanup, as the commenter suggests. To the contrary, a restrictive covenant prevents use of the site in any manner that may threaten the effectiveness, protectiveness or integrity of the interim remedy.

12. Comment: The sampling presently called for in the ROD may be insufficient to detect "hot spots" of contamination at the site.

Response: During the extensive remedial investigation of this site, U.S. EPA found no physical or documentary evidence to indicate the presence of "hot spots" of contamination on the site. Moreover, it has not received any new information since the RI to indicate that there are any such hot spots on the site.

13. Comment: The proposed Decree does not provide specific technical criteria for subsequent decisions, nor does it provide assurances that U.S. EPA will adequately oversee the settling PRPs' work at the site or that the work will be done properly.

Response: The proposed Decree sets up the framework under which the settling PRPs conduct, and U.S. EPA oversees, the remedial design and action at the site. This ROD calls for monitoring of groundwater and surface water to determine if further action is necessary. Decisions as to whether such actions will be necessary will be made in accordance with the National Contingency Plan.

Second, a number of provisions in the proposed Decree ensure that the work at the site will be done properly. For example, under Section VII of the Decree, U.S. EPA will oversee the development of work plans for the site. Further, Section X of the Decree provides for quality assurance, which includes the preparation of a Quality Assurance Project Plan regarding sampling and analysis. In addition, Section XI of the Decree requires the settling generator PRPs to provide to U.S. EPA and the State, on a regular basis, all sampling results and other data, and to give U.S. EPA and the State, upon their request, split or duplicate samples of all samples which the PRPs collect at the site. Section XII of the Decree further elaborates the settlors' reporting obligations.

14. Comment: U.S. EPA has not taken into account in its remedy the oil and gas wells which are purportedly still on the site and the effect these wells may have on the possible contamination of the lower aquifers

Response: U.S. EPA was aware of the possible presence of oil and gas wells at the site even before the RI began. However, U.S. EPA never found any such wells at the site. As the site has been used for gravel and then landfill operations for decades, it is not surprising that none of the wells apparently still exist at the site. Regarding the lower aquifer, U.S. EPA found during the RI that the pressure in the lower aquifer was much higher than in the upper aquifer, leading to the conclusion that there is more than likely no direct connection between the two aquifers in the vicinity of the site. Therefore, there is little danger of contamination of the lower aquifer at the site.

15. Comment: The "land ban" requirements of the Resource Conservation and Recovery Act ("RCRA"), which restrict the disposal and placement of contaminated materials, have not been followed at this site.

Response: As U.S. EPA made clear in the ROD, RCRA land disposal requirements are not triggered by the interim remedy. This is because under U.S. EPA's interpretation of RCRA, consolidation of waste within a unit does not constitute "placement or disposal" under RCRA land disposal restrictions. Here, the interim remedy calls for consolidation and regrading of the material already on-site in preparation for the construction of the cap.

16 Comment: The proposed Decree limits the ability of U.S. EPA and the U.S. Fish and Wildlife service (FWS) to commence an action for natural resource damages.

Response: The proposed Decree does not in any way limit the discretion of any agency to commence a natural resource damages action. To the contrary, the Decree does not address natural resource damages except to expressly reserve, in Section XIX, the natural resource trustee's right to bring a claim for such damages in the future. There is no finding in the Decree, nor will there be any finding during design and implementation of the interim remedy, with respect to natural resource damages which limits the period in which such an action may be brought.

Administrative Record Index -- Marion/Bragg Landfill

Administrative Record for Marion/Bragg Landfill, Grant County, Indiana as of September 30, 1987.

File # 1. PA/SI, HRS

- Raw data for scoring package

2. Site Inventory

- memos from observation during site visits
- file search information obtained during RAMP period including: land ownership, water well records, city township location documentation

3. RAMP (Remedial Action Master Plan) 9/9/83

4. RI/FS initiation

- letter from IDEM requesting project initiation and making Assurances
- RI/FS Statement of Work

5. Work Plan memorandum 6/19/85

6. Community Relation Plan 2/10/86

7. Initial Site Evaluation 8/20/85

8. Groundwater Utilization Survey 7/18/85

9. Draft Geophysical Investigation Fall '85

10. Work Plan - PRP negotiating draft 10/11/85

11. Final Work Plan 4/24/86

12. Final Quality Assurances Project Plan 7/10/86

13. Final Health and Safety Plan 4/24/86

14. Phase II Sampling and Analysis Memorandum 6/2/86

15. Request for applicable, relevant and appropriate requirements for Remedial Alternatives 3/6/87

    USEPA Comments:

    - Water Division 4/28/87
    - Air Division 6/17/87
    - Great Lakes National Program Office 4/27/87
    - Solid Waste Branch 4/15/87

    IDEM Comments: 5/4/87 and 7/27/87

16. Quality Assurance Project Plan - Addendum One for supplemental sampling (May, 1987)

17. General Correspondence File - Contains various comments and correspondence with other Agencies such as; ATSDR, ISBH, IDEM and U.S. Fish and Wildlife Service.

    - ISBH letter identifing water quality standards 7/3/85
    - Fact sheet, Public "Kick-off" meeting 1/30/86
    - ISBH comments to Draft QAPP and Health and Safety Plan 9/25/85
    - ISBH comments to Draft Work Plan 10/9/85
    - ATSDR comments to Draft Work Plan and Draft QAPP 10/23/85
    - Memo from Potentially Responsible Party meeting of 11/7/85
    - ATSDR memo for review of residential drinking water samples 11/9/85
    - ISBH additional comments on Work Plan and QAPP 2/6/86
    - U.S Fish and Wildlife comments on surface water and sediment data 6/10/87

18. Applicable Guidance

19. Comments to Agency Proposed Plan

Uncopied references which are available at the Regional Office in Chicago, Illinois:

1. Guidelines for the Pollutional Classification of Great Lakes Harbor Sediments - April, 1977

2. Raw Data from all RI field investigations

The reader should note that in 1986 the Indiana State Board of Health (ISBH) was reorganized and the Indiana Department of Environmental Management (IDEM) was created.

MK

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR
MARION/BRAGG LANDFILL SITE
GRANT COUNTY, INDIANA

UPDATE #1
JULY 27, 1992

NO.	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	09/12/84	Constantelos, B., U.S. EPA	Kendell, S., Indiana State Budget Agency	Notification of Proposed Superfund Project	2
2	02/15/85	Danielson, T.S., Indiana Board of Health	Adamkus, V., U.S. EPA	Request for Initiation of RI/FS Study	1

ADDENDUM TO THE ADMINISTRATIVE RECORD
MAY 13, 1997

NO.	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	09/30/87	Adamkus, V., U.S. EPA	U.S. EPA	Record of Decision	80

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U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR
MARION (BRAGG) LANDFILL SITE
MARION, GRANT COUNTY, INDIANA

UPDATE #2
JUNE 25, 1997

NO.	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	07/00/87	Camp Dresser & McKee Inc.	U.S. EPA	Remedial Investigation Report for the Marion (Bragg) Landfill Site: Volume 1 of 2 (Text, Tables and Figures) [PUBLIC COMMENT DRAFT]	328
2	07/00/87	Camp Dresser & McKee Inc.	U.S. EPA	Remedial Investigation Report for the Marion (Bragg) Landfill Site: Volume 2 of 2 (Appendices A-K) [PUBLIC COMMENT DRAFT]	471
3	07/00/87	Camp Dresser & McKee Inc.	U.S. EPA	Feasibility Study Report for the Marion (Bragg) Landfill Site [PUBLIC COMMENT DRAFT]	207
4	09/30/87	U.S. EPA	Public	Record of Decision for the Marion (Bragg) Dump Site	71
5	07/00/89	Environmental Resources Management	Marion (Bragg) Landfill PRP Group/U.S. EPA	Quality Assurance Project Plan (QAPP) Monitoring and Additional Studies at the Marion (Bragg) Landfill Site	452
6	01/27/90	U.S. EPA/CRL	U.S. EPA	Superfund Biological Survey: "Instream Fish Water Quality Evaluation" for the Marion Bragg Landfill Site w/Attached February 23, 1990 CRL Review of Region 5 Data Sheets	24
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10	07/31/97	Travers, M., De Maximis, Inc.	Schorle, B., U.S. EPA	Letter re: Marion (Bragg) Landfill Group's Comments on the Proposed Plan for Operable Units 2 and 3 at the Marion (Bragg) Landfill Site	2
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12	08/20/97	Rose, J., IDEM	Schorle, B., U.S. EPA	Letter re: IDEM's Comments on U.S. EPA's Proposed Plan for "No Action" at the Marion (Bragg) Dump Site	1
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U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR
MARION (BRAGG) LANDFILL SITE
MARION, GRANT COUNTY, INDIANA

UPDATE #3
SEPTEMBER 30, 1997

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5	06/00/97	U.S. EPA	File	Marion Bragg Mail List	8
6	06/00/97	U.S. EPA	Public	Proposed Plan for Operable Units 2 and 3 at the Marion (Bragg) Dump Site	14
7	06/27/97	U.S. EPA	Public	Public Notice re: Announcement of (1) July 16, 1997 Public Meeting and (2) Public Comment Period for the Preferred Alternative for Operable Units 2 and 3 at the Marion (Bragg) Dump Site [Chronicle-Tribune]	1
8	07/16/97	U.S. EPA	Public	Transcript of July 16, 1997 U.S. EPA Public Meeting re: the Proposed Plan for the Marion (Bragg) Dump Site w/ Attached Sign-In Sheet (PORTIONS OF THE SIGN-IN SHEET HAVE BEEN REDACTED)	98