DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Davis Glocester-Smithfield Regional (GSR) Landfill
Glocester/Smithfield, Rhode Island

STATEMENT OF PURPOSE

This decision document presents the selected No Action decision for the Davis GSR Landfill Site (the "Site"), located in Glocester and Smithfield,, Rhode Island. This document was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Contingency Plan (NCP); 40 CFR Part 300 et seq. (1990). The Region I Director of the Office of Site Remediation and Restoration has been delegated the authority to approve this Record of Decision. The State of Rhode Island has concurred with the No Action decision.

STATEMENT OF BASIS

This decision is based on the administrative record compiled for the Site which was developed in accordance with Section 113(k) of CERCLA. The administrative record is available for public review at the E. Smithfield Public Library in Esmond, Rhode Island, and at the EPA Region I Office of Site Remediation and Restoration Record Center in Boston, Massachusetts. The administrative record index (attached as Appendix A to the ROD) identifies each of the items which comprise the administrative record upon which the selection of the remedial action is based.

DESCRIPTION OF THE SELECTED REMEDY

EPA has determined that No Action is necessary to address the contamination at the Site. The Site poses no unacceptable current or potential threat to human health or the environment. Groundwater monitoring will be conducted for a period of at least five years to verify that no unacceptable exposures to potential hazards posed by conditions at the Site occur in the future.

DECLARATION

EPA has determined that its response at this site is complete. Therefore, the site now qualifies for inclusion on the Construction Completion List.

As this is a decision for No Action, the statutory requirements of CERCLA Section 121 for remedial actions are not applicable and no statutory five year review will be undertaken.

9-29-97
Date

Harley F. Laing
Director, Office of Site Remediation and Restoration

REGION I

RECORD OF DECISION SUMMARY

SEPTEMBER 1997

RECORD OF DECISION SUMMARY
DAVIS GSR LANDFILL

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I. SITE NAME, LOCATION AND DESCRIPTION

A. General Description

The Davis Glocester-Smithfield Regional (GSR) landfill site (the Site) is approximately 58 acres in size, and the main landfill portion is about 18 acres. The landfill is located at Latitude N41-55" and Longitude W71-35" off Tarkiln Road in the towns of Smithfield and Glocester, Rhode Island (Figure 1). The Site consists mainly of wooded and wetland areas with the landfill being situated on a local high area underlain by glacial deposits and extending into an area created by the partial landfilling of a small valley. The land surrounding the Site is considered semi-rural. Within 1 mile of the Site, the land is predominately wooded with wetlands and cleared areas. Developed land is limited and is dominated by low-density residential use. These residents obtain their water from private wells. The future use of the Site and surrounding land is not expected to change.

The GSR Landfill accepted municipal and commercial wastes from the Boston and Providence areas from 1974 to 1982. The 18-acre main landfill denoted as Landfill Area A, is estimated to be approximately 37-44 feet deep. Monitoring well logs indicate that the contents of the landfill consist mainly of municipal solid waste, including trash, refuse, plastic, paper, wood, glass, bricks, sludge, fiber board, and medical waste. A 3-acre area in the wetlands immediately south of the main landfill contain 10 to 18 feet of trash and is denoted as Landfill Area B. The Site is bordered on the south, east, and west by wetlands, and on the north by wooded rural residential areas. On the east side of the landfill is Nine Foot Brook, which flows south into Waterman Reservoir approximately 2.5 miles downstream. On the west side is an unnamed stream, which flows southwesterly into wetlands that eventually discharge into Nine Foot Brook south of the Site (Figure 2).

B. Geology and Hydrogeology

The region where the Site is located is underlined by granite and granite gneiss bedrock which transmit water through openings that occur primarily as a result of weathering near the surface and joints that extend to greater depths. Bedrock varies in depth throughout the Site; the greatest depth to bedrock encountered during the drilling program was 64 feet below grade, at the south side of the landfill. Bedrock is exposed on the western side of the landfill where the relief steeply rises. In areas beneath or along the periphery of the landfill where bedrock is shallow or at the surface, refuse material may be in direct contact or within a few feet of bedrock, possibly resulting in leachate directly affecting bedrock groundwater. Over the bedrock, the Davis GSR Landfill is underlain primarily by glacial till, consisting of sorted sand and gravel with minor amounts of silt and clay (Figures 3 - 8).

Measurements of groundwater levels indicate an upward gradient of groundwater flow to the

north and east of the landfill as well as in the wetlands south of the unnamed stream. A downward gradient was observed at the Landfill Area B and to the immediate west of Landfill Area A. In general, groundwater recharge occurs in the highland areas and groundwater discharge occurs in low land areas where the streams and wetland are located. Based on the information collected from the site monitoring wells, groundwater in bedrock flows from west to east toward the landfill. Underneath the landfill, the hydraulic gradient in the bedrock flattens, and flow in the bedrock becomes radial, flowing to the east, northeast, and southeast. This radial flow apparently occurs because there is recharge to bedrock from the overburden underneath the landfill. The streams on-site do not appear to significantly affect groundwater flow in bedrock in the immediate area of the landfill because groundwater in the bedrock is semi-confined from overburden deposits (Figure 9). Beneath the landfill, overburden groundwater flows radially in all directions except northwest, which is upgradient. The radial flow is induced due to recharge through the fill creating a groundwater mound. In the overburden aquifer, flow primarily discharges into surface water and wetland areas (Figure 10).

The dominant surface water bodies at the Site are Nine Foot Brook, which originates off-site to the northeast, and the unnamed stream, which originates just northwest of the landfill and flows through wetlands downgradient until it converges with Nine Foot Brook. From the confluence, Nine Foot Brook flows south towards the Waterman Reservoir. These streams are located in topographic lows and receive some groundwater discharge from the underlying aquifer.

A more complete description of the Site can be found in the Remedial Investigation report on Davis GSR Landfill located in the Administrative Record.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use and Response History

The land surrounding the Davis GSR Landfill is considered semi-rural. Limited developed land within one mile of the Site is dominated by low density residential uses, with remaining areas being predominantly wooded with various wetlands and cleared areas. A few residents within 1-mile of the Site have land used for livestock grazing. These small "recreational" farms have limited numbers of cows, goats, and other animals for non-commercial use. Tarkiln Road, Evans Road, Eddy Road, and small portions of Mann School Road, Burlingame Road, and Farnum Road lie within a 1-mile radius of the Davis GSR Landfill. Approximately 50 houses are located within a 1-mile radius of the landfill, all of which draw water from private wells. The majority of the residential wells in the area are drilled into the bedrock, while a few are shallow hand dug wells. Thus, drinking water is derived from both overburden and bedrock aquifers. .

The Davis Liquid Chemical Disposal Superfund Site and the adjacent large tire pile is located approximately 2,500 feet east of the Davis GSR Landfill. EPA and the State are currently

involved in site characterization activities at that Superfund Site and in drummed waste and tire removal activities.

Waterman Reservoir is located approximately 2.5 miles downstream of the Davis GSR Landfill and is fed by the Nine Foot Brook. The reservoir is a 263 acre body of water classified by the State as a Class B water body, meaning it may potentially serve as a public water supply with appropriate treatment.

There are different zoning designations for the Davis GSR Landfill and surrounding land within a 1-mile radius, depending on the town where the land lies. According to the Towns' Zoning Maps, the majority of the Site land in Smithfield is classified as residential conservation or R-200, which requires a 200,000 square foot minimum lot size. A small portion of land southeast of Burlingame Road is classified low density residential or R-80, which requires an 80,000 square foot minimum lot size. The land located in the town of Glocester, where the major portion of the Site is located, is categorized as an agricultural residential zone or A-4 which requires a minimum lot size of 4 acres.

The Davis GSR Landfill was first licensed by the state to receive solid waste in 1974, and acceptance of waste ceased in 1982. In the 1970s and early 1980s, the public expressed concern about Mr. Davis' operation of the landfill and the landfill's effect on the local groundwater drinking supply. In February 1976, the Rhode Island Department of Health (RIDOH) , the predecessor of the Rhode Island Department of Environmental Management (RIDEM) as the licensing and regulatory agency for solid waste management facilities, ordered Mr. Davis, the property owner, to undertake extensive activities in the south wetlands where solid waste was improperly disposed. This mandated activity included construction of trenches, installation of culverts, and excavation and removal of refuse material from the wetland area. In September 1977, RIDOH ordered Mr. Davis to provide plans and a timetable to close the portion of the landfill located in the south wetlands..

In January 1978, RIDEM denied a request by Mr. Davis to renew his solid waste disposal license citing numerous operating violations under "Rules and Regulations for Operating Solid Waste Management Facilities" and failure to comply with previous orders issued by RIDOH in 1976 and 1977. At the request of Mr. Davis a hearing on this denial was held on September 20, 1978. Testimony during this hearing detailed the findings of several inspections conducted by the State in 1978, which showed that Mr. Davis failed to meet the requirements of regulations regarding items such as lift height, daily cover, surface water separation, brush handling, number of bulldozers, fire extinguishers on equipment, intermediate cover, final cover, and bulky waste separation. Mr. Davis appealed this decision and in April 1982, after a number of decisions by the Rhode Island Courts, Rhode Island Supreme Court ruled in favor of RIDEM. Immediately following the court ruling, on April 14, 1982, RIDEM notified Mr. Davis that he was allowed three weeks after the effective date of the original closure decision to submit the required

engineering plans for the final closure of the landfill. At that time the landfill had stopped accepting solid waste, but no closure plans have been filed to this date. A final cover complying with state regulations has not been applied. The existing cover material currently consists of sand and silty sand, and is overgrown with naturally occurring grasses and trees.

In 1985, the Town of Glocester took over the property for non-payment of taxes. On August 19, 1988, the Town canceled all delinquent taxes relating to the property and transferred the property back to Mr. Davis, who remains the current owner of the Site.

Sampling of on-site wells conducted by RIDEM between 1980 and 1982 indicated presence of inorganic and organic groundwater contamination underneath the landfill. Compounds detected included toluene, 1,1-dichloroethane, chloroform, methyl ethyl ketone, 1,1,1-trichloroethane, and benzene. In May 1982, Ecology and the Environment, Inc., a Field Investigation Team (FIT) contractor for EPA, completed a Preliminary Assessment (PA) at the Site which included a recommendation that EPA conduct a Site Inspection (SI) at the Site. The planned November, 1983 SI was impeded by Mr. Davis' refusal to grant permission for access to the property. In June, 1984, NUS Corporation, another FIT contractor, collected a total of 16 samples from nearby six residential wells, three surface water locations, and two soil locations. EPA found no Volatile Organic Compounds (VOCs) in any of the samples. A residential well located on Tarkiln Road was tested by RIDEM in June 1984 and June 1985 and had detected 1,1-dichloroethane contamination of 10 micrograms per liter (ug/l). In October, 1984, NUS collected additional 13 samples, including samples of surface water, soil and residential wells, which were analyzed for VOCs and metals. These samples were collected in the area immediately surrounding the landfill due to the denial of access by the owner. No VOCs were found in the residential wells.

The SI report prepared in October 1985, which incorporated data from EPA and RIDEM's sampling activities conducted to that date, recommended that further investigations should be performed such as sampling on-site monitoring wells, conducting hydrogeological investigation of the area, and installation of additional monitoring wells downgradient from the landfill. The National Priorities List (NPL) Update #3, April 10, 1985, proposed that the Davis GSR Landfill be added to the NPL. On June 10, 1986, EPA added the Davis GSR Landfill site after no comments were received during the public comment period.

RIDOH and EPA also have periodically sampled residential wells in the vicinity of the Site since the early 1980s. In February and November 1988, EPA analyzed samples from 15 residential wells for VOCs and metals No elevated concentrations were detected. The latest sampling by RIDOH was done in 1992 and 1994 for a total of 20 wells. None of the wells confirmed the presence of VOCs. From 1991 to 1993, after site access has been finally obtained, CDM Federal Programs Corporation, a contractor to EPA, conducted an extensive remedial investigation to determine the extent and nature of contamination at the Site. Results of this investigation

concluded that the landfill appears to be a source of numerous chemicals with off-landfill migration confined to the immediate vicinity of the landfill as there is no evidence of contamination downgradient. No distinct plume of groundwater contamination was found to be emanating from the landfill.

B. Enforcement History

Based on investigations conducted by EPA, in 1990 EPA issued 83 104(e) letters to persons believed to have information regarding the Site, including potential generators and transporters. In 1992, EPA issued 62 additional 104(e) letters to candidate potentially responsible parties based upon the information provided from the 1990 104(e) responses, additional interviews, available records and title/deed documentation. In addition, EPA issued selective non-compliance letters in 1991 and 1993.

After investigation of numerous sources of information related to waste transported and disposed of at the Site, EPA has not named any potentially responsible parties at this Site.

III. COMMUNITY PARTICIPATION

In the 1970s and 1980s, during the years of the landfill operation, community concern with the activities at the landfill has been moderate to high. In the recent Site history, however, community concern and involvement has been low. In the 1992, a community group "Dump the Dump" was awarded the Technical Assistance Grant (TAG) for both Davis Liquid and Davis GSR Superfund Sites, but no activities or expenditure of funds by the group have occurred to date. EPA has kept the community and other interested parties apprised of the Site activities through informational meetings, fact sheets, press releases and public meetings.

On June 18, 1997, EPA made the draft administrative record available for public review at EPA's offices in Boston and at the E. Smithfield Public Library at 50 Esmond Street, Smithfield, Rhode Island. EPA published a notice and brief analysis of the Proposed Plan in the Woonsocket Call on June 11, 1997, and made the Plan available to the public at the E. Smithfield Public Library. EPA also mailed copies of the Press Release and the Proposed Plan to the members of the public on the Davis GSR Landfill mailing list on June 16, 1997.

On June 23, 1997, EPA held an information session and public meeting to discuss the results of the Remedial Investigation and to present the Agency's Proposed Plan. Also during this meeting, the Agency answered questions on the Proposed Plan from the public. From June 24 through August 22, 1997, the Agency held a 30-day public comment period to accept public comment on the proposal presented in the Proposed Plan and on any other documents previously released to the public. On July 15, 1997, the Agency held a public hearing and accepted oral comments on the Proposed Plan. The comments and the Agency's response to comments are included in the

Responsiveness Summary in Appendix D. A transcript of this hearing is attached as part of Appendix D.

IV. SCOPE AND ROLE OF NO ACTION REMEDY

This Record of Decision reflects EPA's determination that no further CERCLA action is required at the Davis GSR Landfill Site. The baseline risk assessment concluded that conditions at the Site pose no unacceptable risk to human health and the environment. Based on the levels of organics and metals that were detected in the soils, sediments, surface water, groundwater, and air and the unlikely future exposure to the groundwater in a limited area in the wetlands immediately adjacent to the landfill, EPA has determined that the potential for adverse ecological and human health risks from site groundwater and other media to be unlikely. Limited monitoring of groundwater, including residential well monitoring, will be conducted for a period of at least five years. The scope and frequency of the monitoring will be adjusted as necessary, based on the sampling results.

The decision by EPA not to pursue further action at the Site is not a determination that no action is warranted under other regulations and statutes. EPA has determined that the CERCLA cleanup authority is not the appropriate mechanism to handle the closure of this municipal waste landfill. The State's authority under their laws and regulations is in no way limited by EPA's No Action decision.

EPA has the authority to revisit the No Action decision even if the Site is removed from the NPL. This could occur if future conditions indicate that an unacceptable risk to human health or the environment would result from the exposure to contaminants at the Site.

V. SUMMARY OF SITE CHARACTERISTICS

The significant findings of the Remedial Investigation are summarized below. To maintain consistency with the Remedial Investigation Report, the levels of organic contaminants are reported in parts per billion (ppb), while levels of metals in aqueous media are reported in ppb and in soils are reported in parts per million (ppm).

A. Landfill Source and Soil

The Davis GSR Landfill was apparently constructed on a small hill, almost completely surrounded by wetlands. Portions of the hill were displaced to make room for refuse, which was also deposited in the perimeter wetlands south of the main landfill. A large portion of the landfill area was built on sand and gravel overburden, with the perimeter area of the filled wetlands on peat. The Landfill does not have a bottom liner, leachate collection system, or an engineered cover. The side slopes are very steep in many locations. Intermittent leachate seeps emanate from the side slopes onto surface soil; this flow along with runoff from the landfill migrates into nearby surface water and

sediments. The thickness of the existing cover material ranges from 0 to 18 inches and consists of fine to medium grained sand with traces of gravel and organic soils. Vegetative cover at the landfill varies widely across the site, with heavy underbrush, trees, and grasses established over the majority of the surface area. Steep slopes have been covered with large boulders/rip rap. Erosion does not appear to be a major concern at this landfill.

Waste depositions limits were established from surficial indicators and test borings conducted during the well installation program. The main landfill (Landfill Area A) is approximately 18 acres with depth ranging from 44 feet in the southern portion to 37 feet in northern portion. The volume of the landfill above the fill-native ground interface was estimated at 700,000 cubic yards (cy). Logs from the monitoring wells installed in July 1992 showed encounters with municipal solid waste and soil layers; some solid waste was also evident on top of the northern portion of the landfill as well as along some steeper slopes. Based on aerial photos and field observations, on-site borrow used for intermediate landfill cover appears to have been mined from the area immediately northwest of the landfill. Apparent settlement at a differential rate resulted in settlement cracks and areas of depression observed on top of the northern and southern portions of the landfill.

In Landfill Area B soil fill material and trash were observed from the ground surface to a depth of 10 to 18 feet below ground surface. Below fill soils, on the average, trash was observed from a depth of 8 feet to a depth of 16 feet. Based on the defined limits, Landfill Area B is about 3 acres with total volume estimated at 70,000 cy. In addition, miscellaneous forms of solid waste, such as tires, bales of wires, and various scrap metal have been placed around the landfill.

To identify source contamination, two rounds of leachate sampling was conducted and a leachate production model was used to perform a water balance analysis. A total of nine leachate locations was identified by visible staining at the seeps. Eight locations were identified as non-aqueous (stained soil), and one location was an aqueous seep. Three volatile organic compounds in four soil leachate samples were detected at levels below 100 ppb. Phthalates and PAHs were more prevalent, with the diethylphthalate found at the highest concentration of 750 ppb. Low levels of pesticides and PCBs were also detected in several locations. The metals detected in all leachate soil samples were aluminum, barium, calcium, iron, magnesium, manganese, and vanadium. High concentrations of iron were consistent with the rust-colored staining observed at the leachate seeps.. Arsenic, cobalt, copper, lead, nickel, potassium, and zinc were detected frequently, while mercury was only detected once. Locations along western slope of the landfill tended to exhibit the highest metal concentrations. The only aqueous leachate sample located on the eastern slope of the landfill had few organic compounds found at minimal levels in the low ppb range. The concentrations of many metals, including iron, manganese, lead, nickel, and zinc at that location were elevated compared to concentrations that would be expected to occur naturally in groundwater. A fairly random distribution of compounds in the leachate indicates that these chemical concentrations are due to a variety of different sources from within the landfill.

Leachate discharge rates were evaluated using the HELP model which generates a water balance based on the expected precipitation condition and the landfill characteristics. Mass loading of contaminants from the landfill source area to the groundwater beneath the landfill is expected to be highly variable, and is likely to continue at present although waste disposal was stopped in 1982. Due to inherent variability of factors controlling leachate generation, it is not possible to accurately estimate the length of time over which the landfill will continue as a source of contamination.

Ten source area soil borings were performed to evaluate the subsurface soil quality (Figure 11). A total of 14 volatile compounds were detected in samples taken from Landfill Area A, with most detections found on the northwestern perimeter of the landfill. The highest concentrations were toluene (120 ppb), chlorobenzene (160 ppb), ethylbenzene (440 ppb), and total xylenes (440 ppb). These maximum concentrations were found at two locations from depths of 8 to 10 feet and 24.5 to 26.5 feet. Landfill Area B included detections of 11 organic compounds, with highest concentrations detected at depths from 8 to 12 feet. The highest concentrations detected were toluene (2,000 ppb), chlorobenzene (450 ppb), ethylbenzene (450 ppb), and total xylenes (700 ppb). Similarly, 28 and 14 semivolatile compounds, mostly PAHs, phenols and phthalates, were detected in Landfill Area A and Landfiil Area B, respectively. Highest concentrations included total PAHs at 1,050,100 ppb and phenols of 10,000 ppb at the Landfill Area A, and phthalates at 9,000 ppb at Landfill Area B. A few elevated levels of PCBs and pesticides were detected sporadically in the source area. Concentrations of inorganics in excess of those typically found in regional soils include arsenic, calcium, chromium, copper, iron, lead and zinc. Heavy metals, found primarily in Source Area A, include mercury, nickel, and silver. The contaminant distribution appears to be typical of the random pattern normally associated with landfills.

Off-landfill soil quality was evaluated at 14 soil boring locations, including soil borings along the unnamed stream, Nine Foot Brook, and two background locations north of the Site. Four volatile organic compounds at concentrations below 100 ppb, and one semivolatile compound, benzo(a)pyrene, at 1,700 ppb were detected at a depth of 4-6 feet at the confluence of the unnamed stream and Nine Foot Brook Toluene was detected at less than 5 ppb at three locations near the Nine Foot Brook Acetone was also detected at four locations along the Brook, as well as in the background samples. Bis (2-ethylhexyl) phthalate was detected northeast of the landfill at the concentrations similar to the levels found in the background. No pesticides or PCBs were detected in any soil sample at these locations. Three metal concentrations near the unnamed stream exceeded the regional levels: beryllium (2.4 ppm), calcium (11,500 ppm), and selenium (12.5 ppm) at 4-6 feet depth. Analytes that exceeded site-specific background in these locations include barium, beryllium, cobalt, nickel, selenium, and vanadium. Soil borings east of the landfill, along Nine Foot Brook, contained the greatest number of inorganics exceeding background levels. Two inorganic compounds exceeded regional levels: antimony (5.4 ppm) and zinc (56.1 ppm) were found near the unnamed stream. Similar to locations at the unnamed stream. a number of metals exceeded the background concentrations as well.

A total of 16 surficial soil samples were collected on and immediately adjacent to the landfill. Surficial soils contained virtually no VOCs and a few semivolatiles scattered throughout the landfill and surrounding area. Overall, three VOCs, eight different PAHs and four phthalates were detected at several locations, at levels generally below 100 ppb. Several pesticides were also detected, primarily along the easterly perimeter of the landfill, with the highest detection of 4,4'-DDE at 10 ppb. PCBs were detected at five locations, with the highest found level of Aroclor-1260 at 310 ppb just northeast of the landfill. Several inorganic constituents were found to exceed background concentrations. Mercury and silver were prevalent throughout the Site and copper and zinc were found in select locations.. On the other hand, beryllium and lead levels exceeded these found regionally, while non-background samples of these compounds were below the mean regional values.. Three additional compounds, calcium, iron, and manganese were found to exceed the background and regional criteria.

To further characterize the source contamination, the landfill soil gas survey conducted over Landfill Area A at 83 grid points spaced on a 100 feet grid measured selected VOCs present below the landfill surface. Over 97 percent of the landfill surface had levels below 50 ppm, with 62 percent of the area having levels below 10 ppm of total volatile organics. One area, approximately 3,800 sq. ft or 0.5 percent in size, had levels greater than 100 ppm.

B. Ground Water

The geologic investigation included bedrock formation mapping, subsurface drilling, bedrock coring, and a geophysical survey. Hydrogeologic investigation performed at the Site included synoptic water level measurements, slug tests at monitoring wells, and sieve test (grain size) analysis on soil samples.

During the course of the remedial investigation, 32 monitoring wells were installed in a vicinity of the Davis GSR Landfill to monitor groundwater quality and the flow system (Figure 11). Monitoring wells were screened in bedrock and across various depths in the overburden. Groundwater elevations in the surrounding wetlands are at the ground surface or, in dry weather, slightly below the surface. The estimated groundwater elevation in the landfill is approximately 20 feet above the water table elevation in the surrounding wetlands. Synoptic water level elevations recorded in wells located on the landfill depict a groundwater mound that, subject to hydrological variances, has been recorded as much as 40 feet above the water table in the surrounding wetlands. Fractures (faults and joints) were observed on bedrock outcrops to the south and east. Bedrock outcrops were observed in close proximity to refuse in both Landfill Area A and B, indicating there may be some locations where refuse is in contact with or close proximity to bedrock. As would be expected in a wetland with a peat substrate, the hydraulic conductivity at the Site is lowest in Landfill Area B. The groundwater gradient appears to be downward in Landfill Areas A and B, while an upward gradient exists along the unnamed stream, Nine Foot Brook, and wetlands to the south of the landfill.

Three rounds of groundwater sampling for organic and inorganic parameters were conducted in 1992 and 1993. The discussion of the results focuses on Rounds 2 and 3 since all wells at the site were sampled during these rounds using the low-flow purge and sample method. Five overburden monitoring wells were installed to evaluate source groundwater (groundwater under the landfill area, where fill is present). During the three rounds of sampling, between 26 and 45 various organic compounds were detected in the source groundwater wells. The most common volatile compounds detected were BTEX compounds (benzene, toluene, ethylbenzene, and xylenes). The semivolatile compounds detected included PAHs, phenolic compounds, and phthalates. No PCBs were detected in any wells, and pesticides were only found at low concentrations at the Landfill Area B. Most of the individual organic compounds were detected at concentrations below 100 ppb. Organic compounds detected over 100 ppb included acetone (188 ppb), cis-1,2-dichloroethene (115 ppb), xylenes (120 ppb), naphthalene (680 ppb), 4-methylphenol (110 ppb), and phenol (220 ppb). Two source bedrock wells were also installed and sampled in Rounds 2 and 3. As in the source overburden wells, several BTEX and semivolatile compounds were detected. There were no individual compounds detected above 100 ppb in these bedrock wells. The highest concentration detected in source bedrock samples was 39 ppb of ethylbenzene in the north portion of the Landfill Area A. There were no pesticides or PCBs found in source bedrock samples.

Inorganic contaminants were analyzed for both filtered and unfiltered samples. In the overburden and bedrock wells, calcium, iron, magnesium, manganese, potassium, and sodium were detected at the highest concentrations. The concentrations of these metals were elevated with respect to the site-specific background concentrations but were consistent with municipal landfill leachate. Other metals, which were detected above background levels or were not detected in the background, include aluminum, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, silver, vanadium, and zinc. In general, the maximum concentration detected in source bedrock was less than the maximum concentration detected in source overburden.

In addition to monitoring wells installed in the landfill, overburden and bedrock wells were installed immediately adjacent to and further down gradient from the landfill. Six wells (MW104A, MW108A/D, MW112D, and MW114A/D) were installed on-site along the eastern periphery of the landfill near Nine Foot Brook, ten wells (MW115A/B/D, MW117A, MW118A/B/D, and MW119A/B/D) were installed further to the east and south, beyond the wetlands surrounding the Site, one additional well (MW110D) was installed to the west, beyond the unnamed stream, and wells 120A/D and 121A/D were considered background wells.

No volatile or semivolatile organic compounds were detected in wells associated with the unnamed stream (MW110D, MW115A/B/D, and MW117). During Round 2, in the area associated with discharges into Nine Foot Brook (MW104A, MW108A/D, MW114A/D, MW118A/B/D, and MW119A/B/D) organics that were detected include low levels of volatiles and semivolatiles (less than 10 ppb, some below 1 ppb), which were detected in MW104, and MW119A (overburden) and

MW108D and MW112D (bedrock). The highest organic detection, acetone at 220 ppb, occurred at MW108A. One slight exceedance of a regulatory criterion (federal Maximum Contaminant Level (MCL) = 5 ppb) occurred for benzene at MW114A, with a concentration of 6.1 ppb. This location, in the wetland area between the landfill toe and Nine Foot Brook, had the greatest number of detected organic compounds in Round 2 (six volatile, three semivolatile, and one pesticide). Two PAHs were detected at MW112D and MW114D, at concentrations below 10 ppb.

During Round 3, volatile organics were detected at low concentrations (less than 10 ppb) in Nine Foot Brook wells MW104, MW108A, and MW119D. Volatile and semivolatile organics were detected at higher concentrations (up to 160 ppb) at MW112D, MW108D, MW114A, and MW114D. Again, the only MCL that was slightly exceeded was for benzene, which was exceeded in wells (MW112D, MW108D, MW114A, and MW114D) located between the landfill and Nine Foot Brook, with the maximum concentration of 8.9 ppb. No PCBs were detected in any of the wells. VOCs in groundwater were detected only in samples from wells located along the eastern periphery of the landfill, indicating that minimal migration have occurred.

In both bedrock and overburden samples site-specific background concentrations were exceeded for up to 12 metals. None of the detected inorganics exceeded MCLs, although aluminum and iron concentrations were higher than secondary MCLs at several wells. Secondary MCLs, based on aesthetic water quality, are set at concentrations that when exceeded do not cause human health concerns but sometimes cause water to have an unappealing appearance or taste. The Maximum Contaminant Level Goal (MCLG) for manganese was exceeded in several bedrock and overburden wells closest to the landfill. MCLG is a non-enforceable concentration of a drinking water contaminant that is protective of adverse human health affects and allows an adequate margin of safety. Locations exceeding background most frequently were MW108, MW112 and MW114, all located along the eastern toe of the landfill.

In addition to the contaminant data, conventional water quality parameters such as biological oxygen demand (BOD), total hardness, chemical oxygen demand (COD), total phosphorus, total organic carbon (TOC), total kjeldahl nitrogen (TKN), chloride, bicarbonate, sulfate, total dissolved solids (TDS), and total suspended solids (TSS) were measured. At wells that discharge into the unnamed stream, the conventional parameters are similar in concentration to background wells. However, at wells which discharge into Nine Foot Brook, the conventional parameters exceed the background levels for almost every analysis, indicating that this would be the major vector for movement of the contaminants from the landfill.

The dominant fate and transport mechanism for the volatiles in groundwater at the Davis GSR Landfill are sorption, the partitioning of a compound from groundwater to aquifer solids, and biodegradation. Inorganics in groundwater are likely controlled by sorption and precipitation processes. Statistical analysis on the groundwater data yield no correlation between contaminants, indicating randomness in distribution between contaminants at the same location. However, three

concentric circular clusters of sample locations were identified: a contaminant source inside Landfill Areas A and B; an area along perimeter of the landfill, including wells between the landfill and Nine Foot Brook, and wells in the background and wetlands located further downgradient from the landfill. This analysis show lesser contaminant influence in the groundwater surrounding the landfill and no defined contaminant plume leaving the site.

C. Surface Water and Sediment

In the Spring and Fall of 1992, two phases of surface water sampling were performed at Davis GSR Landfill along the Nine Foot Brook, the unnamed stream, in the wetland downstream from the site, and at the background locations (Figure 12). Each sample was analyzed for volatiles, semivolatiles, pesticides, PCBs, and inorganics. Volatile organics were infrequently detected in the surface water samples, with no detected values in the Phase 1. Two samples had detects for a total of four VOCs, all below 10 ppb. One of these locations (adjacent to the unnamed stream) and location downgradient of the landfill on Nine Foot Brook, also had the only SVOC detected, 4-methylphenol, at 1 ppb and 3 ppb, respectively. No PCBs were found in any sample, and the only pesticide detected was 4,4'-DDT, at 0.1 ppb.

A number of inorganic compounds exceeded either federal or Rhode Island ambient water quality criteria (AWQC) in background and site surface waters. AWQC, which include values for both acute and chronic effects, were developed under the Clean Water Act Section 304 for protection of aquatic life. Iron and lead were found to be prevalent throughout the site; however AWQC was exceeded in both background and site surface waters. Similarly, aluminum exceeded AWQC in background and in 14 of the 17 locations tested. Zinc exceeded AWQC in one location downgradient of the landfill. Other metals exceeding AWQCs , mostly at a single location, include beryllium, copper, mercury, silver, and thallium. Compound found to be prevalent and frequently exceeding background include barium, calcium, iron, magnesium, manganese, potassium and sodium. The downstream sampling location SW014, prior to the confluence of the Nine Foot Brook and the unnamed stream, exhibited the most exceedances of AWQCs. This location, along with SW012 (immediately upstream) also exhibited the only background exceedances of seven inorganics: aluminum, barium, copper, mercury, nickel, zinc and lead. The brook is more slow flowing at these locations, where it broadens into a poorly defined channel, and this area may act as a contaminant sink. Surface water was also screened for parameters such as pH, conductivity, turbidity, dissolved oxygen, and temperature. Conventional parameters, such as total suspended and dissolved solids, hardness, nitrogen, phosphorous, and chloride were also analyzed. In the majority of samples, the conventional parameters yielded values typical of drinking water and appear to correlate with high total suspended solids present at locations such as SW012 and SW014. The pH was found to be near neutral, thus low metal solubility would be expected.

Heavy metals are the primarily inorganic contaminants of concern for surface water at the site. The dominant fate and transport process for heavy metals in surface water are sorption and precipitation.

The statistical analysis performed on the surface water data indicated that the most common naturally occurring metals were strongly correlated: calcium, magnesium, sodium, potassium, iron, and manganese; these chemicals which behave similarly in the environment, were found in proportional quantities at the same location. These metals normally exhibit high concentrations in the environment and, in fact, from this group, only iron exceeded secondary water quality standards. The strong correlation in this group may indicate a natural origin for each of these metals. Distribution of other compounds was found to be random. The surface water data also demonstrated a positive spatial correlation through which three clusters of sampling locations were identified that exhibit the similar chemical characteristics. One large cluster contained all surface water samples nearest to the landfill and most samples downstream. A second large cluster contained more distant surface water samples in the unnamed stream and Nine Foot Brook, along with the background samples. The third and smallest cluster was composed of wetland samples further downstream from the landfill. This pattern seems to correspond with the groundwater flow paths and discharge patterns, indicating that the groundwater is likely to have some influence on surface water contaminant levels.

Three rounds of sediment sampling were performed in 1992 and 1994, generally at locations coinciding with surface water sampling. All sediment samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and inorganics. Similar to surface waters, volatiles were infrequently detected in sediment samples, most below 50 ppb. Compounds detected above 50 ppb, mostly at a single location, include toluene, 2-butanone, and acetone. Several various SVOCs were detected, including PAHs at most locations, including background. Other SVOCs detected at some locations include phthalates, dichlorobenzenes, naphthalenes, and phenols at levels mostly below 100 ppb, with highest concentrations ranging up to 1,400 ppb to the east of the landfill. Total PAH concentrations did not exceed the Ontario Ministry of Environment (MOE) sediment criteria at any locations. MOE sediment criteria established as guidelines for the protection of ecological receptors from exposure to contaminated sediments. Also, none of the individual compounds exceeded the corresponding criteria for that compound.

Several pesticides were detected at up to nine locations, mostly at trace levels, with none exceeding 100 ppb. The greatest number of seven pesticides (six) were found at a sampling location near the confluence of the unnamed stream and Nine Foot Brook. It appears that trace levels of pesticides are clustered in sediments in and around the downgradient standing waters. Agricultural areas, including a former apple orchard approximately 1/4 mile southeast, may be the contributing source to this area. PCBs were detected during the Round 3 at five locations with the highest level of 34 ppb on the west side of the landfill in the proximity of stained surface soils. Overall, phthalates, pesticides, and PAHs were most prevalent to the west and southeast of the landfill.

Inorganic compound found to exceed MOE criteria in the background sediment samples were lead, detected in all four locations, iron, and magnesium. Arsenic, copper, iron, lead, manganese, mercury, and zinc were found exceeding MOE criteria in a few samples either along the unnamed

stream or the Nine Foot Brook, with most MOE exceedances in an area with standing water at the confluence of the Nine Foot Brook and the unnamed stream. In general, the inorganics were more prevalent, with many exceeding background concentrations, in the areas adjacent to the landfill near the leachate seeps, and were diminishing further downstream. High total organic carbon (TOC) values and high fine content in these sediments indicate that the sediments will tend to retain and adsorb organic and inorganic chemicals. .

The dominant fate and transport mechanism for PAHs, pesticides, and inorganics in sediment is adsorption. Statistical analysis of the sediment data showed no chemical compound correlation, indicating random distribution of these compounds. However, cluster analysis yielded two sample clusters indicating one cluster with a common set of background conditions. The second cluster was composed of samples near the west landfill toe, one sample east of the landfill, and downstream samples in the wetlands. This analysis indicates a tendency for transport and deposition of contaminants in the area adjacent to the landfill, near the unnamed stream and its associated wetlands.

D. Air

Landfill gas characterization was conducted to identify areas in the landfill containing elevated concentrations of volatile organic compounds that indicate source areas. In addition, an air quality dispersion analysis was performed for over 30 VOCs to determine possible impacts from the Davis GSR Landfill on the nearby receptors. The worst-case existing toxic air pollutant concentrations from the landfill gas monitoring program were incorporated into the modeling and the resultant highest predicted off-site ambient concentrations were compared to the Rhode Island Annual Acceptable Ambient Levels. The highest off-site VOC concentrations were found to occur at the Landfill Area A northeast property boundary, near the Davis residence, however, none of the VOCs exceeded RIDEM AALs at either the property boundary or at the Davis residence.

VI. SUMMARY OF SITE RISKS

A. Human Health Risk Assessment

A Baseline Human Health Risk Assessment (HHRA) was completed in accordance with EPA's RI/FS streamlined approach and guidance for landfills (USEPA, 1991). The HHRA and ecological risk assessments were performed to estimate the probability and magnitude of potential adverse effects from exposure to contaminants associated with the Site. The public health risk assessment followed a four step process: 1) contaminant identification, which identified those hazardous substances which, given the specifics of the site were of significant concern; 2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; 3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous

substances, and 4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks. The results of the public health risk assessment for the Davis GSR Landfill Superfund Site are discussed below followed by the conclusions of the environmental risk assessment.

Thirty-nine contaminants of concern, listed in Tables B-1 through B-9 in Appendix B of this Record of Decision were selected for evaluation in the risk assessment. These contaminants constitute a representative subset of all the contaminants identified at the Site during the Remedial Investigation. The 39 contaminants of concern were selected to represent potential site related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. A summary of the health effects of each of the contaminants of concern can be found in Appendix G of the Davis GSR Landfill Final Remedial Investigation Report, Volume III, November, 1994.

Potential human health effects associated with exposure to the contaminants of concern were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the Site. The Davis GSR Landfill site consists of 58 acres. Of this 58 acres, approximately 21 acres consist of a landfill portion and 20 acres consisting of wetlands. The landfill is currently inactive and has not been closed or capped in accordance with state or federal regulations. Land within 1 mile of the site is predominantly wooded with various wetlands and some cleared areas. Developed land within 1 mile of the site is characterized by low density residential use and recreational farming. Approximately 50 residences are located within this 1-mile radius on Tarkiln Road, Evans Road, Eddy Road, and small portions of Mann School Road, Burlingame Road, and Farnum Road. The closest four residences to the site are within 0.5 mile of the site. Future uses of the site are expected to prohibit residential development in the immediate area of the site (Figure 13).

The following is a brief summary of the exposure pathways evaluated. A more detailed description can be found in Section 10.4.2 of the Davis GSR Landfill Final Remedial Investigation Report, Volume 1, November, 1994. For contaminated groundwater, a lifetime of consuming 2 liters per day was presumed (future residential exposure scenario). Incidental ingestion and dermal contact with surface water was evaluated to reflect exposure to an adolescent who may wade and play in the Nine Foot Brook, unnamed stream and associated wetlands for 36 days/year for 12 years (current and future trespasser exposure scenario for recreational activities). Incidental ingestion of sediments was evaluated for the same receptor in the same areas as for surface water. Dermal contact with aqueous leachate and ingestion of and dermal contact with leachate soils by a child trespasser were evaluated for an exposure frequency of 36 days/year for 12 years. Dermal contact and incidental ingestion of surface soils was evaluated for a child of 1-6 years, who may be exposed 36 days per year for 12 years. Dermal contact and incidental ingestion of subsurface soils was evaluated for a future construction worker who may be exposed 250 days/yr for 1 year. For the inhalation pathway,

a dispersion model was used to predict the highest ambient air concentrations at the nearest off-site location. The model prediction was used to evaluate potential exposures to current and future residential adults who may spend 30 years breathing the predicted air concentrations. In addition, exposures to an on-site adolescent trespasser who might be exposed to landfill gases for 36 days/yr for 12 years, was evaluated. For each pathway evaluated, an average and a reasonable maximum exposure estimate was generated corresponding to exposure to the average and the maximum concentration detected in that particular medium.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level with the chemical specific cancer factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, the true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g. 1 x 10^{-6} for 1/1,000,000) and indicate (using this example), that an average individual is not likely to have greater that a one in a million chance of developing cancer over 70 years as a result of site-related exposure as defined to the compound at the stated concentration. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The hazard index was also calculated for each pathway as EPA's measure of the potential for non-carcinogenic health effects. A hazard quotient is calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for non-carcinogenic health effects for an individual compound. Reference doses have been developed by EPA to protect sensitive individuals over the course of a lifetime and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. The hazard quotient is often expressed as a single value (e.g. 0.3) indicating the ratio of the stated exposure as defined to the reference dose value (in this example, the exposure as characterized is approximately one third of an acceptable exposure level for the given compound). The hazard quotient is only considered additive for compounds that have the same or similar toxic endpoint and the sum is referred to as the hazard index (HI). For example: the hazard quotient for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage.

Tables 1 through 13 below depict the carcinogenic and noncarcinogenic risk summaries for each media evaluated. Table 1 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in off-landfill (on-site) overburden and bedrock groundwater evaluated to reflect the potential future ingestion of groundwater corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 2 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in surface water in Landfill Area B and off-landfill areas evaluated to reflect a potential current exposure via incidental ingestion corresponding to the average

and the reasonable maximum exposure (RME) scenarios. Table 3 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in surface waters evaluated to reflect the current dermal exposures corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 4 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in sediments in Landfill Area B and off-landfill areas evaluated to reflect a potential current exposure via incidental ingestion corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 5 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in aqueous leachate evaluated to reflect the current dermal exposures corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 6 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in leachate soil evaluated to reflect a potential current exposure via incidental ingestion corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 7 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in leachate soil evaluated to reflect a potential current exposure via dermal contact corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 8 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in surficial soil in Landfill Areas A, B and off-landfill, evaluated to reflect a potential current exposure via incidental ingestion corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 9 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in surficial soil in Landfill Areas A, B and off-landfill, evaluated to reflect a potential current exposure via dermal contact corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 10 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in off-landfill boring soils, evaluated to reflect a potential future exposure via incidental ingestion corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 11 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in off-landfill boring soils, evaluated to reflect a potential future exposure via dermal contact corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 12 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in on-site landfill gas, evaluated to reflect a potential current and future exposure via inhalation corresponding to the average and the reasonable maximum exposure (RME) scenarios. Table 13 depicts the carcinogenic and noncarcinogenic risk summary for the contaminants of concern in off-site landfill gas, evaluated to reflect a potential current and future exposure via inhalation corresponding to the average and the reasonable maximum exposure (RME) scenarios.

TABLE 1

DAVIS GSR LANDFILL SITE
FUTURE GROUNDWATER INGESTION PATHWAY
CARCINOGENIC RISKS TO RESIDENTS

OFF-LANDFILL OVERBURDEN

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Exposure Factor Adult (l/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average Adult	RME Adult
Volatile Organic Compounds									
Benzene	0.0015	0.008	1.2E-02	1.8E-05	9.4E-05	2.9E-02	A	5.1E-07	2.7E-06
Semivolatile Organic Compounds									
1,2,4-Trimethylbenzene	0.0006	0.001	1.2E-02	7.0E-06	1.2E-05	--	D	--	--
1,3,5-Trimethylbenzene	ND	ND	1.2E-02	--	--	--	D	--	--
Inorganics									
Arsenic	0.0029	0.013	1.2E-02	3.4E-05	1.5E-04	1.5E+00	A	5.1E-05	2.3E-04
Barium	0.085	0.288	1.2E-02	1.0E-03	3.4E-03	--	--	--	--
Beryllium	0.00093	0.0013	1.2E-02	1.1E-05	1.5E-05	4.3E+00	B2	4.7E-05	6.6E-05
Chromium	ND	ND	1.2E-02	--	--	--	--	--	--
Lead	0.0029	0.0131	1.2E-02	3.4E-05	1.5E-04	--	B2	--	--
Manganese	0.7	3.42	1.2E-02	8.4E-03	4.1E-02	--	D	--	--
Nickel	0.011	0.061	1.2E-02	1.3E-04	7.2E-04	--	A (inh.)	--	--
							SUM	9.9E-05	3.0E-04

Exposure Factor:

Adults - 2 liters of water per day for 350 days in a 365 day year for 30 years in a 70 year lifetime by a 70 kg adult = 0.012 liter per kg body weight per day.

TABLE 1 (cont'd.)

DAVIS GSR LANDFILL SITE
FUTURE GROUNDWATER INGESTION PATHWAY
NONCARCINOGENIC RISKS TO RESIDENTS

OFF-LANDFILL OVERBURDEN

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Exposure Factor Adult (l/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average Adult	HAZARD INDEX RME Adult
Volatile Organic Compounds									
Benzene	0.0015	0.008	2.7E-02	4.1E-05	2.2E-04	--	--	--	--
Semivolatile Organic Compounds									
1,2,4-Trimethylbenzene	0.0006	0.001	2.7E-02	1.6E-05	2.7E-05	5.0E-02	CNS	3.3E-04	5.5E-04
1,3,5-Trimethylbenzene	ND	ND	2.7E-02	--	--	5.0E-02	CNS	--	--
Inorganics									
Arsenic	0.0029	0.013	2.7E-02	7.9E-05	3.6E-04	3.0E-04	Skin	2.6E-01	1.2E+00
Barium	0.085	0.288	2.7E-02	2.3E-03	7.9E-03	7.0E-02	Cardiovasc.	3.3E-02	1.1E-01
Beryllium	0.00093	0.0013	2.7E-02	2.5E-05	3.6E-05	5.0E-03	None	5.1E-03	7.1E-03
Chromium	ND	ND	2.7E-02	--	--	1.0E+00	None	--	--
Lead	0.0029	0.0131	2.7E-02	7.9E-05	3.6E-04	--	CNS	--	--
Manganese	0.7	3.42	2.7E-02	1.9E-02	9.4E-02	2.3E-02	CNS	8.3E-01	4.1E+00
Nickel	0.011	0.061	2.7E-02	3.0E-04	1.7E-03	2.0E-02	Organ Wt.	1.5E-02	8.4E-02
							SUM	1.2	5.5
							CNS	0.83	4.1
							Skin	0.26	1.2
							Cardiovasc.	0.033	0.11

Exposure Factor:

Adults - 2 liters of water per day for 350 days in a 365 day year by a 70 kg adult = 0.027 liter per kg body weight per day.

DAVIS GSR LANDFILL SITE
FUTURE GROUNDWATER INGESTION PATHWAY
CARCINOGENIC RISKS TO RESIDENTS

OFF-LANDFILL BEDROCK

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Exposure Factor Adult (l/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average Adult	RISK ESTIMATE RME Adult
Volatile Organic Compounds									
Benzene	0.0035	0.0089	1.2E-02	4.1E-05	1.0E-04	2.9E-02	A	1.2E-06	3.0E-06
Semivolatile Organic Compounds									
1,2,4-Trimethylbenzene	0.0007	0.0016	1.2E-02	8.2E-06	1.9E-05	--	D	--	--
1,3,5-Trimethylbenzene	0.0009	0.003	1.2E-02	1.1E-05	3.5E-05	--	D	--	--
Inorganics									
Arsenic	0.0064	0.03	1.2E-02	7.5E-05	3.5E-04	1.50E+00	A	1.1E-04	5.3E-04
Barium	0.21	0.658	1.2E-02	2.5E-03	7.7E-03	--	--	--	--
Beryllium	0.00042	0.00045	1.2E-02	4.9E-06	5.3E-06	4.3E+00	B2	2.1E-05	2.3E-05
Chromium	0.028	0.167	1.2E-02	--	--	--	--	--	--
Lead	0.0039	0.0173	1.2E-02	4.6E-05	2.0E-04	--	B2	--	--
Manganese	1.7	4.28	1.2E-02	2.0E-02	5.1E-02	--	D	--	--
Nickel	0.032	0.127	1.2E-02	3.8E-04	1.5E-03	--	A (inh.)	--	--
							SUM	1.4E-04	5.5E-04

Exposure Factor:

Adult - 2 liters of water per day for 350 days in a 365 day year for 30 years in a 70 year lifetime by a 70 kg adult = 0.012 liters per kg body weight per day.

DAVIS GSR LANDFILL SITE
FUTURE GROUNDWATER INGESTION PATHWAY
NONCARCINOGENIC RISKS TO RESIDENTS

OFF-LANDFILL BEDROCK

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Exposure Factor Adult (l/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average Adult	HAZARD INDEX RME Adult
Volatile Organic Compounds									
Benzene	0.0035	0.0089	2.7E-02	9.6E-05	2.4E-04	--	--	--	--
Semivolatile Organic Compounds									
1,2,4-Trimethylbenzene	0.0007	0.0016	2.7E-02	1.9E-05	4.4E-05	5.0E-02	CNS	3.8E-04	8.8E-04
1,3,5-Trimethylbenzene	0.0009	0.003	2.7E-02	2.5E-05	8.2E-05	5.0E-02	CNS	4.9E-04	1.6E-03
Inorganics									
Arsenic	0.0064	0.03	2.7E-02	1.8E-04	8.2E-04	3.0E-04	Skin	5.8E-01	2.7E+00
Barium	0.21	0.658	2.7E-02	5.8E-03	1.8E-02	7.0E-02	Cardiovasc.	8.2E-02	2.6E-01
Beryllium	0.00042	0.00045	2.7E-02	1.2E-05	1.2E-05	5.0E-03	None	2.3E-03	2.5E-03
Chromium	0.028	0.167	2.7E-02	--	--	1.0E+00	None	--	--
Lead	0.0039	0.0173	2.7E-02	1.1E-04	4.7E-04	--	CNS	--	--
Manganese	1.7	4.28	2.7E-02	4.7E-02	1.2E-01	2.3E-02	CNS	2.0E+00	5.1E+00
Nickel	0.032	0.127	2.7E-02	8.8E-04	4.7E-04	2.0E-02	Organ Wt.	4.4E-02	2.4E-02
							SUM	2.7	8.1
							CNS	2.0	5.1
							Skin	0.58	2.7
							Cardiovasc.	0.082	0.26

Exposure Factor:
Adults - 2 liters of water per day for 350 days in a 365 day year by a 70 kg adult = 0.027 liter per kg body weight per day.

TABLE 2
DAVIS GSR LANDFILL SITE
CURRENT SURFACE WATER INGESTION PATHWAY

Landfill Area B

CARCINOGENIC RISKS TO CHILD TRESPASSERS

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Exposure Factor (l/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Slope Factor (mg/kg/day)-1	Carc. Weight-of Evidence	CANCER ESTIMATE Average	CANCER ESTIMATE RME
Inorganics									
Antimony	ND	ND	2.0E-05	--	--	--	--	--	--
Arsenic	ND	ND	2.0E-05	--	--	1.5E+00	A	--	--
Barium	0.061	0.104	2.0E-05	1.2E-06	2.1E-06	--	--	--	--
Beryllium	ND	ND	2.0E-05	--	--	4.3E+00	B2	--	--
Lead	0.012	0.022	2.0E-05	2.4E-07	4.4E-07	--	B2	--	--
Manganese	2.3	4.39	2.0E-05	4.6E-05	8.8E-05	--	D	--	--
Vanadium	ND	ND	2.0E-05	--	--	--	D	--	--
							SUM	--	--

Exposure Factor = 0.05 of liters of water ingested per hour for 1 hour per day for 36 days per year in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 2.0 x10-5 l/kg/day.

Landfill Area B

NONCARCINOGENIC RISKS TO CHILD TRESPASSERS

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Exposure Factor (l/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Inorganics									
Antimony	ND	ND	1.2E-04	--	--	4.0E-04	Blood	--	--
Arsenic	ND	ND	1.2E-04	--	--	3.0E-04	Skin	--	--
Barium	0.061	0.104	1.2E-04	7.3E-06	1.2E-05	7.0E-02	Cardiovasc.	1.0E-04	1.8E-04
Beryllium	ND	ND	1.2E-04	--	--	5.0E-03	None	--	--
Lead	0.012	0.022	1.2E-04	1.4E-06	2.6E-06	--	CNS	--	--
Manganese	2.3	4.39	1.2E-04	2.8E-04	5.3E-04	2.3E-02	CNS	1.2E-02	2.3E-02
Vanadium	ND	ND	1.2E-04	--	--	7.0E-03	Liver	--	--
							SUM	0.012	0.02

Exposure Factor = 0.05 of liters of water ingested per hour for 1 hour per day for 36 days per year in a 365 day year by a 43 kg child = 1.2 x10-4 l/kg/day

TABLE 2 (cont'd.)
DAVIS GSR LANDFILL SITE
CURRENT SURFACE WATER INGESTION PATHWAY

Off-Landfill

CARCINOGENIC RISKS TO CHILD TRESPASSERS

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Exposure Factor (l/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Slope Factor (mg/kg/day)-1	Carc. Weight-of Evidence	CANCER ESTIMATE Average	CANCER ESTIMATE RME
Inorganics									
Antimony	0.025	0.06	2.0E-05	5.0E-07	1.2E-06	--	--	--	--
Arsenic	0.002	0.0119	2.0E-05	4.0E-08	2.4E-07	1.5E+00	A	6.0E-08	3.6E-07
Barium	0.088	0.544	2.0E-05	1.8E-06	1.1E-05	--	--	--	--
Beryllium	0.001	0.005	2.0E-05	2.0E-08	1.0E-07	4.3E+00	B2	8.6E-08	4.3E-07
Lead	0.016	0.171	2.0E-05	3.2E-07	3.4E-06	--	B2	--	--
Manganese	1	6.46	2.0E-05	2.0E-05	1.3E-04	--	D	--	--
Vanadium	0.0093	0.0682	2.0E-05	1.9E-07	1.4E-06	--	D	--	--
							SUM	1.5E-07	7.9E-07

Exposure Factor = 0.05 of liters of water ingested per hour for 1 hour per day for 36 days per year in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 2.0 x10-5 l/kg/day.

Off-Landfill

NONCARCINOGENIC RISKS TO CHILD TRESPASSERS

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Exposure Factor (l/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Inorganics									
Antimony	0.025	0.06	1.2E-04	3.0E-06	7.2E-06	4.0E-04	Blood	7.5E-03	1.8E-02
Arsenic	0.002	0.0119	1.2E-04	2.4E-07	1.4E-06	3.0E-04	Skin	8.0E-04	4.8E-03
Barium	0.088	0.544	1.2E-04	1.1E-05	6.5E-05	7.0E-02	Cardiovasc.	1.5E-04	9.3E-04
Beryllium	0.001	0.005	1.2E-04	1.2E-07	6.0E-07	5.0E-03	None	2.4E-05	1.2E-04
Lead	0.016	0.171	1.2E-04	1.9E-06	2.1E-05	--	CNS	--	--
Manganese	1	6.46	1.2E-04	1.2E-04	7.8E-04	2.3E-02	CNS	5.2E-03	3.4E-02
Vanadium	0.0093	0.0682	1.2E-04	1.1E-06	8.2E-06	7.0E-03	Liver	1.6E-04	1.2E-03
							SUM	0.014	0.06

Exposure Factor = 0.05 of liters of water ingested per hour for 1 hour per day for 36 days per year in a 365 day year by a 43 kg child = 1.2 x10-4 l/kg/day

TABLE 3
DAVIS GSR LANDFILL SITE
CURRENT SURFACE WATER DERMAL CONTACT PATHWAY

Landfill Area B

CARCINOGENIC RISKS TO CHILD TRESPASSERS

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Kp (cm/hr)	tevent (hr/event)	Conversion Factor (l/cm3)	DAevent Average (mg/cm2-event)	DAevent RME (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Slope Factor (mg/kg/day)-1	Carc. Weight-of Evidence	CANCER ESTIMATE Average	CANCER ESTIMATE RME
Inorganics														
Antimony	ND	ND	0.001	1	1.0E-03	--	--	0.79	--	--	--	--	--	--
Arsenic	ND	ND	0.001	1	1.0E-03	--	--	0.79	--	--	1.5E+00	A	--	--
Barium	0.061	0.104	0.001	1	1.0E-03	6.1E-08	1.0E-07	0.79	4.8E-08	8.2E-08	--	--	--	--
Beryllium	ND	ND	0.001	1	1.0E-03	--	--	0.79	--	--	4.3E+00	B2	--	--
Lead	0.012	0.022	0.001	1	1.0E-03	1.2E-08	2.2E-08	0.79	9.5E-09	1.7E-08	--	B2	--	--
Manganese	2.3	4.39	0.001	1	1.0E-03	2.3E-06	4.4E-06	0.79	1.8E-06	3.5E-06	--	D	--	--
Vanadium	ND	ND	0.001	1	1.0E-03	--	--	0.79	--	--	--	D	--	--
												SUM	--	--

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 0.79 cm2-event/kg-

Landfill Area B

NONCARCINOGENIC RISKS TO CHILD TRESPASSERS

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Kp (cm/hr)	tevent (hr/event)	Conversion Factor (l/cm3)	DAevent Average (mg/cm2-event)	DAevent RME (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Inorganics														
Antimony	ND	ND	0.001	1	1.0E-03	--	--	4.6	--	--	4.0E-04	Blood	--	--
Arsenic	ND	ND	0.001	1	1.0E-03	--	--	4.6	--	--	3.0E-04	Skin	--	--
Barium	0.061	0.104	0.001	1	1.0E-03	6.1E-08	1.0E-07	4.6	2.8E-07	4.8E-07	7.0E-02	Cardiovasc.	4.0E-06	6.8E-06
Beryllium	ND	ND	0.001	1	1.0E-03	--	--	4.6	--	--	5.0E-03	None	--	--
Lead	0.012	0.022	0.001	1	1.0E-03	1.2E-08	2.2E-08	4.6	5.5E-08	1.0E-07	--	CNS	--	--
Manganese	2.3	4.39	0.001	1	1.0E-03	2.3E-06	4.4E-06	4.6	1.1E-05	2.0E-05	2.3E-02	CNS	4.6E-04	8.8E-04
Vanadium	ND	ND	0.001	1	1.0E-03	--	--	4.6	--	--	7.0E-03	Liver	--	--
												SUM	0.0005	0.0009

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year by a 43 kg child = 4.6 cm2-event/kg/day.

TABLE 3 (cont'd.)
DAVIS GSR LANDFILL SITE
CURRENT SURFACE WATER DERMAL CONTACT PATHWAY

Off-Landfill

CARCINOGENIC RISKS TO CHILD TRESPASSERS

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Kp (cm/hr)	tevent (hr/event)	Conversion Factor (l/cm3)	DAevent Average (mg/cm2-event)	DAevent RME (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Slope Factor (mg/kg/day)-1	Carc. Weight-of Evidence	CANCER ESTIMATE Average	CANCER ESTIMATE RME
Inorganics														
Antimony	0.025	0.06	0.001	1	1.0E-03	2.5E-08	6.0E-08	0.79	2.0E-08	4.7E-08	--	--	--	--
Arsenic	0.002	0.0119	0.001	1	1.0E-03	2.0E-09	1.2E-08	0.79	1.6E-09	9.4E-09	1.5E+00	A	2.4E-09	1.4E-08
Barium	0.088	0.544	0.001	1	1.0E-03	8.8E-08	5.4E-07	0.79	7.0E-08	4.3E-07	--	--	--	--
Beryllium	0.001	0.005	0.001	1	1.0E-03	1.0E-09	5.0E-09	0.79	7.9E-10	4.0E-09	4.3E+00	B2	3.4E-09	1.7E-08
Lead	0.016	0.171	0.001	1	1.0E-03	1.6E-08	1.7E-07	0.79	1.3E-08	1.4E-07	--	B2	--	--
Manganese	1	6.46	0.001	1	1.0E-03	1.0E-06	6.5E-06	0.79	7.9E-07	5.1E-06	--	D	--	--
Vanadium	0.0093	0.0682	0.001	1	1.0E-03	9.3E-09	6.8E-08	0.79	7.3E-09	5.4E-08	--	D	--	--
												SUM	5.8E-09	3.1E-08

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 0.79 cm2-event/kg/

Off-Landfill

NONCARCINOGENIC RISKS TO CHILD TRESPASSERS

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Kp (cm/hr)	tevent (hr/event)	Conversion Factor (l/cm3)	DAevent Average (mg/cm2-event)	DAevent RME (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Inorganics														
Antimony	0.025	0.06	0.001	1	1.0E-03	2.5E-08	6.0E-08	4.6	1.2E-07	2.8E-07	4.0E-04	Blood	2.9E-04	6.9E-04
Arsenic	0.002	0.0119	0.001	1	1.0E-03	2.0E-09	1.2E-08	4.6	9.2E-09	5.5E-08	3.0E-04	Skin	3.1E-05	1.8E-04
Barium	0.088	0.544	0.001	1	1.0E-03	8.8E-08	5.4E-07	4.6	4.0E-07	2.5E-06	7.0E-02	Cardiovasc.	5.8E-06	3.6E-05
Beryllium	0.001	0.005	0.001	1	1.0E-03	1.0E-09	5.0E-09	4.6	4.6E-09	2.3E-08	5.0E-03	None	9.2E-07	4.6E-06
Lead	0.016	0.171	0.001	1	1.0E-03	1.6E-08	1.7E-07	4.6	7.4E-08	7.9E-07	--	CNS	--	--
Manganese	1	6.46	0.001	1	1.0E-03	1.0E-06	6.5E-06	4.6	4.6E-06	3.0E-05	2.3E-02	CNS	2.0E-04	1.3E-03
Vanadium	0.0093	0.0682	0.001	1	1.0E-03	9.3E-09	6.8E-08	4.6	4.3E-08	3.1E-07	7.0E-03	Liver	6.1E-06	4.5E-05
												SUM	0.0005	0.0022

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year by a 43 kg child = 4.6 cm2-event/kg-day.

DAVIS GSR LANDFILL SITE
CURRENT SEDIMENT INGESTION PATHWAY
CARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area B

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME Maximum
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Benzo(a)pyrene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Benzo(b)fluoranthene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Benzo(k)fluoranthene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Chrysene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Indeno(1,2,3-d)pyrene)	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Total Carcinogenic PAHs	ND	ND	*7.2E-08*	--	--	*7.3E+00*	*B2*	--	--
Inorganics									
Antimony	ND	ND	7.2E-08	--	--	--	--	--	--
Arsenic	2.7	3.7	7.2E-08	1.9E-07	2.7E-07	1.5E+00	A	2.9E-07	4.0E-07
Beryllium	0.9	1.3	7.2E-08	6.5E-08	9.4E-08	4.3E+00	B2	2.8E-07	4.0E-07
Manganese	290	426	7.2E-08	2.1E-05	3.1E-05	--	D	--	--
Thallium	0.66	0.66	7.2E-08	4.8E-08	4.8E-08	--	D	--	--
Vanadium	17	26	7.2E-08	1.2E-06	1.9E-06	--	D	--	--
							SUM	5.7E-07	8.0E-07

Exposure Factor:

Ingestion - 200 mg of sediment ingested per day with 100% absorption for SVOCs and Inorganics for 36 days in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child and a conversion factor of kg/10+6 mg= 7.2 x 10-8 kg of soil per kg body weight per day.

DAVIS GSR LANDFILL SITE
CURRENT SEDIMENT INGESTION PATHWAY
NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area B

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	ND	ND	4.7E-07	--	--	--	--	--	--
Benzo(a)pyrene	ND	ND	4.7E-07	--	--	--	--	--	--
Benzo(b)fluoranthene	ND	ND	4.7E-07	--	--	--	--	--	--
Benzo(k)fluoranthene	ND	ND	4.7E-07	--	--	--	--	--	--
Chrysene	ND	ND	4.7E-07	--	--	--	--	--	--
Indeno(1,2,3-d)pyrene)	ND	ND	4.7E-07	--	--	--	--	--	--
Total Carcinogenic PAHs	ND	ND	*4.7E-07*	--	--	--	--	--	--
Inorganics									
Antimony	ND	ND	4.7E-07	--	--	4.0E-04	Blood	--	
Arsenic	2.7	3.7	4.7E-07	1.3E-06	1.7E-06	3.0E-04	Skin	4.2E-03	5.8E-03
Beryllium	0.9	1.3	4.7E-07	4.2E-07	6.1E-07	5.0E-03	None	8.5E-05	1.2E-04
Manganese	290	426	4.7E-07	1.4E-04	2.0E-04	2.3E-02	CNS	5.9E-03	8.7E-03
Thallium	0.66	0.66	4.7E-07	3.1E-07	3.1E-07	8.0E-05	Liver	3.9E-03	3.9E-03
Vanadium	17	26	4.7E-07	8.0E-06	1.2E-05	7.0E-03	Liver	1.1E-03	1.7E-03
							SUM	0.015	0.020

Exposure Factor:

Ingestion - 200 mg of sediment ingested per day with 100% absorption for SVOCs and Inorganics for 36 days in a 365 day by a 43 kg child and a conversion factor of kg/10+6 mg = 4.7 x 10-7 kg of soil per kg body weight per day.

DAVIS GSR LANDFILL SITE
CURRENT SEDIMENT INGESTION PATHWAY
CARCINOGENIC RISKS TO CHILD TRESPASSER

Off-Landfill

Contaminants of Concern	Concentration (mg/kg) Average	Concentration (mg/kg) Maximum	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose (mg/kg/day) Average	Exposure Dose (mg/kg/day) RME	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	0.083	0.083	7.2E-08	6.0E-09	6.0E-09	7.3E+00	B2	4.4E-08	4.4E-08
Benzo(a)pyrene	0.22	0.3	7.2E-08	1.6E-08	2.2E-08	7.3E+00	B2	1.2E-07	1.6E-07
Benzo(b)fluoranthene	0.19	0.19	7.2E-08	1.4E-08	1.4E-08	7.3E+00	B2	1.0E-07	1.0E-07
Benzo(k)fluoranthene	0.2	0.2	7.2E-08	1.4E-08	1.4E-08	7.3E+00	B2	1.1E-07	1.1E-07
Chrysene	0.095	0.095	7.2E-08	6.8E-09	6.8E-09	7.3E+00	B2	5.0E-08	5.0E-08
Indeno(1,2,3-d)pyrene)	0.024	0.024	7.2E-08	1.7E-09	1.7E-09	7.3E+00	B2	1.3E-08	1.3E-08
Total Carcinogenic PAHs	*0.81*	*0.89*	*7.2E-08*	*5.8E-08*	*6.4E-08*	*7.3E+00*	*B2*	*4.3E-07*	*4.7E-07*
Inorganics									
Antimony	8.5	23.3	7.2E-08	6.1E-07	1.7E-06	--	D	--	
Arsenic	7.4	31.4	7.2E-08	5.3E-07	2.3E-06	1.5E+00	A	8.0E-07	3.4E-06
Beryllium	1.7	4.7	7.2E-08	1.2E-07	3.4E-07	4.3E+00	B2	5.3E-07	1.5E-06
Manganese	2016	15600	7.2E-08	1.5E-04	1.1E-03	--	D	--	--
Thallium	1.5	14	7.2E-08	1.1E-07	1.0E-06	--	A (inh.)	--	--
Vanadium	17	60.4	7.2E-08	1.2E-06	4.3E-06	--	D	--	--
Zinc	52	78	7.2E-08	3.7E-06	5.6E-06	--	D	--	--
							SUM	1.8E-06	5.3E-06

Exposure Factor:

Ingestion - 200 mg of sediment ingested per day with 100% absorption for SVOCs and Inorganics for 36 days in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child and a conversion factor of kg/10+6 mg= 7.2 x 10-8 kg of soil per kg body weight per day.

DAVIS GSR LANDFILL SITE
CURRENT SEDIMENT INGESTION PATHWAY
NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Off-Landfill

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	0.083	0.083	4.7E-07	3.9E-08	3.9E-08	--	--	--	--
Benzo(a)pyrene	0.22	0.3	4.7E-07	1.0E-07	1.4E-07	--	--	--	--
Benzo(b)fluoranthene	0.19	0.19	4.7E-07	8.9E-08	8.9E-08	--	--	--	--
Benzo(k)fluoranthene	0.2	0.2	4.7E-07	9.4E-08	9.4E-08	--	--	--	--
Chrysene	0.095	0.095	4.7E-07	4.5E-08	4.5E-08	--	--	--	--
Indeno(1,2,3-d)pyrene)	0.024	0.024	4.7E-07	1.1E-08	1.1E-08	--	--	--	--
Total Carcinogenic PAHs	*0.81*	*0.89*	*4.7E-07*	*3.8E-07*	*4.2E-07*	--	--	--	--
Inorganics									
Antimony	8.5	23.3	4.7E-07	4.0E-06	1.1E-05	4.0E-04	Blood	1.0E-02	2.7E-02
Arsenic	7.4	31.4	4.7E-07	3.5E-06	1.5E-05	3.0E-04	Skin	1.2E-02	4.9E-02
Beryllium	1.7	4.7	4.7E-07	8.0E-07	2.2E-06	5.0E-03	None	1.6E-04	4.4E-04
Manganese	2016	15600	4.7E-07	9.5E-04	7.3E-03	2.3E-02	CNS	4.1E-02	3.2E-01
Thallium	1.5	14	4.7E-07	7.1E-07	6.6E-06	8.0E-05	Liver	8.8E-03	8.2E-02
Vanadium	17	60.4	4.7E-07	8.0E-06	2.8E-05	7.0E-03	Liver	1.1E-03	4.1E-03
Zinc	52	78	4.7E-07	2.4E-05	3.7E-05	3.0E-01	Blood	8.1E-05	1.2E-04
								0.073	0.48

Exposure Factor:

Ingestion - 200 mg of sediment ingested per day with 100% absorption for SVOCs and Inorganics for 36 days in a 365 day by a 43 kg child and a conversion factor of kg/10+6 mg = 4.7 x 10-7 kg of soil per kg body weight per day.

TABLE 5

DAVIS GSR LANDFILL SITE
CURRENT LEACHATE AQUEOUS DERMAL CONTACT PATHWAY

CARCINOGENIC RISKS TO CHILD TRESPASSERS

Landfill Area A

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Kp (cm/hr)	tevent (hr/event)	Conversion Factor (l/cm3)	DAevent Average (mg/cm2-event)	DAevent RME (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Slope Factor (mg/kg/day)-1	Carc. Weight-of Evidence	CANCER ESTIMATE Average	CANCER ESTIMATE RME
Inorganics														
Antimony	0.0136	0.0136	0.001	1	1.0E-03	1.4E-08	1.4E-08	0.79	1.1E-08	1.1E-08	--	--	--	--
Arsenic	0.0036	0.0036	0.001	1	1.0E-03	3.6E-09	3.6E-09	0.79	2.8E-09	2.8E-09	1.5E+00	A	4.3E-09	4.3E-09
Barium	0.758	0.758	0.001	1	1.0E-03	7.6E-07	7.6E-07	0.79	6.0E-07	6.0E-07	--	--	--	--
Lead	0.0191	0.0191	0.001	1	1.0E-03	1.9E-08	1.9E-08	0.79	1.5E-08	1.5E-08	--	B2	--	--
Manganese	1.69	1.69	0.001	1	1.0E-03	1.7E-06	1.7E-06	0.79	1.3E-06	1.3E-06	--	D	--	--
Nickel	0.0987	0.0987	0.001	1	1.0E-03	--	--	0.79	--	--	--	D	--	--
												SUM	4.3E-09	4.3E-09

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 0.79 cm2-event/kg

NONCARCINOGENIC RISKS TO CHILD TRESPASSERS

Landfill Area A

Contaminants of Concern	Concentration Average (mg/l)	Concentration Maximum (mg/l)	Kp (cm/hr)	tevent (hr/event)	Conversion Factor (l/cm3)	DAevent Average (mg/cm2-event)	DAevent RME (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Inorganics														
Antimony	0.0136	0.0136	0.001	1	1.0E-03	1.4E-08	1.4E-08	4.6	6.3E-08	6.3E-08	4.0E-04	Blood	1.6E-04	1.6E-04
Arsenic	0.0036	0.0036	0.001	1	1.0E-03	3.6E-09	3.6E-09	4.6	1.7E-08	1.7E-08	3.0E-04	Skin	5.5E-05	5.5E-05
Barium	0.758	0.758	0.001	1	1.0E-03	7.6E-07	7.6E-07	4.6	3.5E-06	3.5E-06	7.0E-02	Cardiovasc	5.0E-05	5.0E-05
Lead	0.0191	0.0191	0.001	1	1.0E-03	1.9E-08	1.9E-08	4.6	8.8E-08	8.8E-08	--	CNS	--	--
Manganese	1.69	1.69	0.001	1	1.0E-03	1.7E-06	1.7E-06	4.6	7.8E-06	7.8E-06	2.3E-02	CNS	3.4E-04	3.4E-04
Nickel	0.0987	0.0987	0.001	1	1.0E-03	--	--	4.6	--	--	2.0E-02	Liver	--	--
												SUM	0.0006	0.0006

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year by a 43 kg child = 4.6 cm2-event/kg-day.

TABLE 6

DAVIS GSR LANDFILL SITE
CURRENT LEACHATE SOIL INGESTION PATHWAY
CARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area A

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME
Pesticides/PCBs									
PCB Aroclor 1248	0 027	0.045	2.2E-08	5.9E-10	9.9E-10	7.7E+00	B2	4.6E-09	7.6E-09
Inorganics									
Antimony	2.5	2.5	7 2E-08	1.8E-07	1.8E-07	--	--	--	--
Arsenic	1.8	7	7.2E-08	1.3E-07	5.0E-07	1.5E+00	A	1.9E-07	7.6E-07
Barium	137	293	7.2E-08	9.9E-06	2.1E-05	--	--	--	--
Beryllium	0.38	0.61	7.2E-08	2.7E-08	4.4E-08	4.3E+00	B2	1.2E-07	1.9E-07
Manganese	447	1680	7.2E-08	3.2E-05	1.2E-04	--	D	--	--
Vanadium	8	12.4	7.2E-08	5.8E-07	8.9E-07	--	D	--	--
Zinc	72	165	7.2E-08	5.2E-06	1.2E-05	--	D	--	--
							SUM	3.2E-07	9.5E-07

Exposure Factor:

Ingestion - 200 mg of leachate soil ingested per day with 100% absorption for Inorganics and 30% for PCBs for 36 days in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child and a conversion factor of kg/10+6 mg= 7.2 x 10-8 kg of soil per kg body weight per day and 2.2 x 10-8 kg soil per kg body weight per day for PCBs.

DAVIS GSR LANDFILL SITE
CURRENT LEACHATE SOIL INGESTION PATHWAY
NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area A

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Pesticides/PCBs									
PCB Aroclor 1248	0.027	0.045	1.7E-07	4.6E-09	7.7E-09	--	--	--	--
Inorganics									
Antimony	2.5	2.5	4.7E-07	1.2E-06	1.2E-06	4.0E-04	Blood	2.9E-03	2.9E-03
Arsenic	1.8	7	4.7E-07	8.5E-07	3.3E-06	3.0E-04	Skin	2.8E-03	1.1E-02
Barium	137	293	4.7E-07	6.4E-05	1.4E-04	7.0E-02	Cardiovasc.	9.2E-04	2.0E-03
Beryllium	0.38	0.61	4.7E-07	1.8E-07	2.9E-07	5.0E-03	None	3.6E-05	5.7E-05
Manganese	447	1680	4.7E-07	2.1E-04	7.9E-04	2.3E-02	CNS	9.1E-03	3.4E-02
Vanadium	8	12.4	4.7E-07	3.8E-06	5.8E-06	7.0E-03	Liver	5.4E-04	8.3E-04
Zinc	72	165	4.7E-07	3.4E-05	7.8E-05	3.0E-01	Blood	1.1E-04	2.6E-04
							SUM	0.016	0.051

Exposure Factor:

Ingestion - 200 mg of soil ingested per day with 100% absorption for Inorganics and 305 for PCBs for 36 days in a 365 day for 12 years by a 43 kg child and a conversion factor of kg/10+6 mg = 4.7 x 10-7 kg of soil per kg body weight per day. and 1.4 x 10-7 kg soil per kg body weight per day for PCBs.

TABLE 7

DAVIS GSR LANDFILL SITE
CURRENT LEACHATE SOIL DERMAL CONTACT PATHWAY

CARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area A

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RME
Pesticides/PCBs														
PCB Aroclor 1248	0.027	0.045	0.5	0.06	1.0E-06	8.1E-10	1.4E-09	7.9E-01	6.4E-10	1.1E-09	7.7E+00	B2	4.9E-09	8.2E-09
												SUM	4.9E-09	8.2E-09

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 0.79 cm2-event/kg-day.

NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area A

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	RME
Pesticides/PCBs														
PCB Aroclor 1248	0.027	0.045	0.5	0.06	1.0E-06	8.1E-10	1.4E-09	4.6E+00	3.7E-09	6.2E-09	--	--	--	--
												SUM	--	--

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year by a 43 kg child = 4.6 cm2-event/kg-day.

TABLE 8

DAVIS GSR LANDFILL SITE
CURRENT SURFICIAL SOIL INGESTION PATHWAY
CARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area A

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME Maximum
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Benzo(a)pyrene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Benzo(b)fluoranthene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Benzo(k)fluoranthene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Chrysene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Indeno(1,2,3-d)pyrene)	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Total Carcinogenic PAHs	*ND*	*ND*	*7.2E-08*	--	--	*7.3E+00*	*B2*	--	--
Pesticides/PCBs									
PCBs (total)	0.015	0.015	2.2E-08	3.3E-10	3.3E-10	7.7E+00	B2	2.5E-09	2.5E-09
Inorganics									
Arsenic	ND	ND	7.2E-08	--	--	1.5E+00	A	--	--
Barium	30	45.8	7.2E-08	2.2E-06	3.3E-06	--	--	--	--
Beryllium	0.29	0.5	7.2E-08	2.1E-08	3.6E-08	4.3E+00	B2	9.0E-08	1.5E-07
Cadmium	ND	ND	7.2E-08	--	--	--	--	--	--
Manganese	124	172	7.2E-08	8.9E-06	1.2E-05	--	D	--	--
Mercury	0.089	0.19	7.2E-08	6.4E-09	1.4E-08	--	D	--	--
Nickel	3.2	7.8	7.2E-08	2.3E-07	5.6E-07	--	A (inh.)	--	--
Thallium	ND	ND	7.2E-08	--	--	--	D	--	--
Vanadium	6.5	11.3	7.2E-08	4.7E-07	8.1E-07	--	D	--	--
Zinc	101	318	7.2E-08	7.3E-06	2.3E-05	--	D		
							SUM	9.2E-08	1.6E-07

Exposure Factor:

Ingestion - 200 mg of soil ingested per day with 100% absorption for SVOCs and Inorganics and 30 % for PCBs for 36 days in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child and a conversion factor of kg/10+6 mg= 7.2 x 10-8 kg of soil/kg bw/day for SVOCs and Inorganic and 2.2x10-8 kg of soil/kg bw/day for PCBs.

DAVIS GSR LANDFILL SITE
CURRENT SURFICIAL SOIL INGESTION PATHWAY
NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area A

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	ND	ND	4.7E-07	--	--	--	--	--	--
Benzo(a)pyrene	ND	ND	4.7E-07	--	--	--	--	--	--
Benzo(b)fluoranthene	ND	ND	4.7E-07	--	--	--	--	--	--
Benzo(k)fluoranthene	ND	ND	4.7E-07	--	--	--	--	--	--
Chrysene	ND	ND	4.7E-07	--	--	--	--	--	--
Indeno(1,2,3-d)pyrene)	ND	ND	4.7E-07	--	--	--	--	--	--
Total Carcinogenic PAHs	*ND*	*ND*	*4.7E-07*	--	--	--	--	--	--
Pesticides/PCBs									
PCBs (total)	0.015	0.015	1.4E-07	2.1E-09	2.1E-09	--	--	--	--
Inorganics									
Arsenic	ND	ND	4.7E-07	--	--	3.0E-04	Skin	--	--
Barium	30	45.8	4.7E-07	1.4E-05	2.2E-05	7.0E-02	Cardiovasc.	2.0E-04	3.1E-04
Beryllium	0.29	0.5	4.7E-07	1.4E-07	2.4E-07	5.0E-03	None	2.7E-05	4.7E-05
Cadmium	ND	ND	4.7E-07	--	--	1.0E-03	Kidney	--	--
Manganese	124	172	4.7E-07	5.8E-05	8.1E-05	2.3E-02	CNS	2.5E-03	3.5E-03
Mercury	0.089	0.19	4.7E-07	4.2E-08	8.9E-08	3.0E-04	CNS	1.4E-04	3.0E-04
Nickel	3.2	7.8	4.7E-07	1.5E-06	3.7E-06	2.0E-02	Organ Wt	7.5E-05	1.8E-04
Thallium	ND	ND	4.7E-07	--	--	8.0E-05	Liver	--	--
Vanadium	6.5	11.3	4.7E-07	3.1E-06	5.3E-06	7.0E-03	Liver	4.4E-04	7.6E-04
Zinc	101	318	4.7E-07	4.7E-05	1.5E-04	3.0E-01	Blood	1.6E-04	5.0E-04
							SUM	0.0034	0.0051

Exposure Factor:

Ingestion - 200 mg of soil ingested per day with 100% absorption for SVOCs and Inorganics and 30% for PCBs for 36 days in a 365 day by a 43 kg child and a conversion factor of kg/10+6 mg = 4.7 x 10-7 kg of soil/kg bw/day for SVOCs and Inorganics and 1.4x10-7 kg of soil/kg bw/day for PCBs.

DAVIS GSR LANDFILL SITE
CURRENT SURFICIAL SOIL INGESTION PATHWAY
CARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area B

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME Maximum
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Benzo(a)pyrene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Benzo(b)fluoranthene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Benzo(k)fluoranthene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Chrysene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Dibenz(a,h)anthracene	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Indeno(1,2,3-d)pyrene)	ND	ND	7.2E-08	--	--	7.3E+00	B2	--	--
Total Carcinogenic PAHs	*ND*	*ND*	*7.2E-08*	--	--	*7.3E+00*	*B2*	--	--
Pesticides/PCBs									
PCBs (total)	0.042	0.052	2.2E-08	9.2E-10	1.1E-09	7.7E+00	B2	7.1E-09	8.8E-09
Inorganics									
Arsenic	ND	ND	7.2E-08	--	--	1.5E+00	A	--	--
Barium	57	57.6	7.2E-08	4.1E-06	4.1E-06	--	--	--	--
Beryllium	0.18	0.2	7.2E-08	1.3E-08	1.4E-08	4.3E+00	B2	5.6E-08	6.2E-08
Cadmium	ND	ND	7.2E-08	--	--	--	--	--	--
Manganese	217	282	7.2E-08	1.6E-05	2.0E-05	--	D	--	--
Mercury	0.055	0.065	7.2E-08	4.0E-09	4.7E-09	--	D	--	--
Nickel	6.9	10.9	7.2E-08	5.0E-07	7.8E-07	--	A (inh.)	--	--
Thallium	ND	ND	7.2E-08	--	--	--	D	--	--
Vanadium	8.6	9.6	7.2E-08	6.2E-07	6.9E-07	--	D	--	--
Zinc	81	118	7.2E-08	5.8E-06	8.5E-06	--	D	--	--
							SUM	6.3E-08	7.1E-08

Exposure Factor:

Ingestion - 200 mg of soil ingested per day with 100% absorption for SVOCs and Inorganics and 30 % for PCBs for 36 days in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child and a conversion factor of kg/10+6 mg= 7.2 x 10-8 kg of soil/kg bw/day for SVOCs and Inorganic and 2 2x10-8 kg of soil/kg bw/day for PCBs.

DAVIS GSR LANDFILL SITE
CURRENT SURFICIAL SOIL INGESTION PATHWAY
NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area B

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	ND	ND	4.7E-07	--	--	--	--	--	--
Benzo(a)pyrene	ND	ND	4.7E-07	--	--	--	--	--	--
Benzo(b)fluoranthene	ND	ND	4.7E-07	--	--	--	--	--	--
Benzo(k)fluoranthene	ND	ND	4.7E-07	--	--	--	--	--	--
Chrysene	ND	ND	4.7E-07	--	--	--	--	--	--
Indeno(1,2,3-d)pyrene)	ND	ND	4.7E-07	--	--	--	--	--	--
Total Carcinogenic PAHs	*ND*	*ND*	*4.7E-07*	--	--	--	--	--	--
Pesticides/PCBs									
PCBs (total)	0.042	0.052	1.4E-07	5.9E-09	7.3E-09	--	--	--	--
Inorganics									
Arsenic	ND	ND	4.7E-07	--	--	3.0E-04	Skin	--	--
Barium	57	57.6	4.7E-07	2.7E-05	2.7E-05	7.0E-02	Cardiovasc.	3.8E-04	3.9E-04
Beryllium	0.18	0.2	4.7E-07	8.5E-08	9.4E-08	5.0E-03	None	1.7E-05	1.9E-05
Cadmium	ND	ND	4.7E-07	--	--	1.0E-03	Kidney	--	--
Manganese	217	282	4.7E-07	1.0E-04	1.3E-04	2.3E-02	CNS	4.4E-03	5.8E-03
Mercury	0.055	0.065	4.7E-07	2.6E-08	3.1E-08	3.0E-04	CNS	8.6E-05	1.0E-04
Nickel	6.9	10.9	4.7E-07	3.2E-06	5.1E-06	2.0E-02	Organ Wt.	1.6E-04	2.6E-04
Thallium	ND	ND	4.7E-07	--	--	8.0E-05	Liver	--	--
Vanadium	8.6	9.6	4.7E-07	4.0E-06	4.5E-06	7.0E-03	Liver	5.8E-04	6.4E-04
Zinc	81	118	4.7E-07	3.8E-05	5.5E-05	3.0E-01	Blood	1.3E-04	1.8E-04
							SUM	0.0057	0.0072

Exposure Factor:

Ingestion - 200 mg of soil ingested per day with 100% absorption for SVOCs and Inorganics and 30% for PCBs for 36 days in a 365 day by a 43 kg child and a conversion factor of kg/10+6 mg = 4.7 x 10-7 kg of soil/kg bw/day for SVOCs and Inorganics and 1.4x10-7 kg of soil/kg bw/day for PCBs.

DAVIS GSR LANDFILL SITE
CURRENT SURFICIAL SOIL INGESTION PATHWAY
CARCINOGENIC RISKS TO CHILD TRESPASSER

Off-Landfill

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME Maximum
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	0.076	0.076	7.2E-08	5.5E-09	5.5E-09	7.3E+00	B2	4.0E-08	4.0E-08
Benzo(a)pyrene	0.064	0.064	7.2E-08	4.6E-09	4.6E-09	7.3E+00	B2	3.4E-08	3.4E-08
Benzo(b)fluoranthene	0.086	0.086	7.2E-08	6.2E-09	6.2E-09	7.3E+00	B2	4.5E-08	4.5E-08
Benzo(k)fluoranthene	0.063	0.063	7.2E-08	4.5E-09	4.5E-09	7.3E+00	B2	3.3E-08	3.3E-08
Chrysene	0.074	0.074	7.2E-08	5.3E-09	5.3E-09	7.3E+00	B2	3.9E-08	3.9E-08
Indeno(1,2,3-d)pyrene)	0.22	0.27	7.2E-08	1.6E-08	1.9E-08	7.3E+00	B2	1.2E-07	1.4E-07
Total Carcinogenic PAHs	*0.58*	*0.63*	*7.2E-08*	*4.2E-08*	*4.6E-08*	*7.3E+00*	*B2*	*3.1E-07*	*3.3E-07*
Pesticides/PCBs									
PCBs (total)	0.073	0.31	2.2E-08	1.6E-09	6.8E-09	7.7E+00	B2	1.2E-08	5.3E-08
Inorganics									
Arsenic	1.9	3.9	7.2E-08	1.4E-07	2.8E-07	1.5E+00	A	2.1E-07	4.2E-07
Barium	43	55.7	7.2E-08	3.1E-06	4.0E-06	--	--	--	--
Beryllium	0.42	0.85	7.2E-08	3.0E-08	6.1E-08	4.3E+00	B2	1.3E-07	2.6E-07
Cadmium	0.35	0.79	7.2E-08	2.5E-08	5.7E-08	--	--	--	--
Manganese	359	656	7.2E-08	2.6E-05	4.7E-05	--	D	--	--
Mercury	0.11	0.18	7.2E-08	7.9E-09	1.3E-08	--	D	--	--
Nickel	3.5	7.3	7.2E-08	2.5E-07	5.3E-07	--	A (inh.)	--	--
Thallium	0.17	0.36	7.2E-08	1.2E-08	2.6E-08	--	D	--	--
Vanadium	13	21.8	7.2E-08	9.4E-07	1.6E-06	--	D	--	--
Zinc	179	800	7.2E-08	1.3E-05	5.8E-05	--	D	--	--
							SUM	6.5E-07	1.1E-06

Exposure Factor:

Ingestion - 200 mg of soil ingested per day with 100% absorption for SVOCs and Inorganics and 30 % for PCBs for 36 days in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child and a conversion factor of kg/10+6 mg= 7.2 x 10-8 kg of soil/kg bw/day for SVOCs and Inorganic and 2.2x10-8 kg of soil/kg bw/day for PCBs

DAVIS GSR LANDFILL SITE
CURRENT SURFICIAL SOIL INGESTION PATHWAY
NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Off-Landfill

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	0.076	0.076	4.7E-07	3.6E-08	3.6E-08	--	--	--	--
Benzo(a)pyrene	0.064	0.064	4.7E-07	3.0E-08	3.0E-08	--	--	--	--
Benzo(b)fluoranthene	0.086	0.086	4.7E-07	4.0E-08	4.0E-08	--	--	--	--
Benzo(k)fluoranthene	0.063	0.063	4.7E-07	3.0E-08	3.0E-08	--	--	--	--
Chrysene	0.074	0.074	4.7E-07	3.5E-08	3.5E-08	--	--	--	--
Indeno(1,2,3-d)pyrene)	0.22	0.27	4.7E-07	1.0E-07	1.3E-07	--	--	--	--
Total Carcinogenic PAHs	*0.58*	*0.63*	*4.7E-07*	*2.7E-07*	*3.0E-07*	--	--	--	--
Pesticides/PCBs									
PCBs (total)	0.073	0.31	1.4E-07	1.0E-08	4.3E-08	--	--	--	--
Inorganics									
Arsenic	1.9	3.9	4.7E-07	8.9E-07	1.8E-06	3.0E-04	Skin	3.0E-03	6.1E-03
Barium	43	55.7	4.7E-07	2.0E-05	2.6E-05	7.0E-02	Cardiovasc.	2.9E-04	3.7E-04
Beryllium	0.42	0.85	4.7E-07	2.0E-07	4.0E-07	5.0E-03	None	3.9E-05	8.0E-05
Cadmium	0.35	0.79	4.7E-07	1.6E-07	3.7E-07	1.0E-03	Kidney	1.6E-04	3.7E-04
Manganese	359	656	4.7E-07	1.7E-04	3.1E-04	2.3E-02	CNS	7.3E-03	1.3E-02
Mercury	0.11	0.18	4.7E-07	5.2E-08	8.5E-08	3.0E-04	CNS	1.7E-04	2.8E-04
Nickel	3.5	7.3	4.7E-07	1.6E-06	3.4E-06	2.0E-02	Organ Wt.	8.2E-05	1.7E-04
Thallium	0.17	0.36	4.7E-07	8.0E-08	1.7E-07	8.0E-05	Liver	1.0E-03	2.1E-03
Vanadium	13	21.8	4.7E-07	6.1E-06	1.0E-05	7.0E-03	Liver	8.7E-04	1.5E-03
Zinc	179	800	4.7E-07	8.4E-05	3.8E-04	3.0E-01	Blood	2.8E-04	1.3E-03
							SUM	0.013	0.024

Exposure Factor:

Ingestion - 200 mg of soil ingested per day with 100% absorption for SVOCs and Inorganics and 30% for PCBs for 36 days in a 365 day by a 43 kg child and a conversion factor of kg/10+6 mg = 4.7 x 10-7 kg of soil/kg bw/day for SVOCs and Inorganics and 1.4x10-7 kg of soil/kg bw/day for PCBs.

TABLE 9

DAVIS GSR LANDFILL SITE
CURRENT SURFICIAL SOIL DERMAL CONTACT PATHWAY

CARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area A

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME
Pesticides/PCBs														
PCB Aroclor 1248	0.015	0.015	0.5	0.06	1.0E-06	4.5E-10	4.5E-10	7.9E-01	3.6E-10	3.6E-10	7.7E+00	B2	2.7E-09	2.7E-09
Inorganics														
Cadmium	ND	ND	0.5	0.01	1.0E-06	--	--	7.9E-01	--	--	--	B1 (inh.)	--	--
												SUM	2.7E-09	2.7E-09

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 0.79 cm2-event/kg-day

NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area A

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Pesticides/PCBs														
PCB Aroclor 1248	0.015	0.015	0.5	0.06	1.0E-06	4.5E-10	4.5E-10	4.6E+00	2.1E-09	2.1E-09	--	--	--	--
Inorganics														
Cadmium	ND	ND	0.5	0.01	1.0E-06	--	--	4.6E+00	--	--	1.0E-03	Kidney	--	--
												SUM	--	--

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year by a 43 kg child = 4.6 cm2-event/kg-day.

DAVIS GSR LANDFILL SITE
CURRENT SURFICIAL SOIL DERMAL CONTACT PATHWAY

CARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area B

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion[1] Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME
Pesticides/PCBs														
PCB Aroclor 1248	0.042	0.052	0.5	0.06	1.0E-06	1.3E-09	1.6E-09	7.9E-01	1.0E-09	1.2E-09	7.7E+00	B2	7.7E-09	9.5E-09
Inorganics														
Cadmium	ND	ND	0.5	0.01	1.0E-06	--	--	7.9E-01	--	--	--	B1 (inh.)	--	--
												SUM	7.7E-09	9.5E-09

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 0.79 cm2-event/kg-day

NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Landfill Area B

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Pesticides/PCBs														
PCB Aroclor 1248	0.042	0.052	0.5	0.06	1.0E-06	1.3E-09	1.6E-09	4.6E+00	5.8E-09	7.2E-09	--	--	--	--
Inorganics														
Cadmium	ND	ND	0.5	0.01	1.0E-06	--	--	4.6E+00	--	--	1.0E-03	Kidney	--	--
												SUM	--	--

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year by a 43 kg child = 4.6 cm2-event/kg-day

DAVIS GSR LANDFILL SITE
CURRENT SURFICIAL SOIL DERMAL CONTACT PATHWAY

CARCINOGENIC RISKS TO CHILD TRESPASSER

Off-Landfill

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME
Pesticides/PCBs														
PCB Aroclor 1248	0.073	0.31	0.5	0.06	1.0E-06	2.2E-09	9.3E-09	7.9E-01	1.7E-09	7.3E-09	7.7E+00	B2	1.3E-08	5.7E-08
Inorganics														
Cadmium	ND	ND	0.5	0.01	1.0E-06	--	--	7.9E-01	--	--	--	B1 (inh.)	--	--
												SUM	1.3E-08	5.7E-08

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 days per year in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 0.79 cm2-event/kg-day.

NONCARCINOGENIC RISKS TO CHILD TRESPASSER

Off-Landfill

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
Pesticides/PCBs														
PCB Aroclor 1248	0.073	0.31	0.5	0.06	1.0E-06	2.2E-09	9.3E-09	4.6E+00	1.0E-08	4.3E-08	--	--	--	--
Inorganics														
Cadmium	0.35	0.79	0.5	0.01	1.0E-06	1.8E-09	4.0E-09	4.6E+00	8.1E-09	1.8E-08	1.0E-03	Kidney	8.1E-06	1.8E-05
												SUM	0.0000081	0.000018

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 36 day per year in a 365 day year by a 43 kg child = 4.6 cm2-event/kg-day.

DAVIS GS[illegible]ANDFILL SITE
FUTURE BORING SOIL INGESTION PATHWAY
CARCINOGENIC RISKS TO ADULT WORKER

Off-Landfill

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RISK ESTIMATE RME
SVOCs									
Bis(2-ethylhexyl)phthalate	0.32	0.32	6.9E-09	2.2E-09	2.2E-09	1.40E-02	B2	3.1E-11	3.1E-11
Noncarcinogenic PAHs									
Fluoranthene	ND	ND	6.9E-09	--	--	--	D	--	--
Fluorene	ND	ND	6.9E-09	--	--	--	D	--	--
Phenanthrene	ND	ND	6.9E-09	--	--	--	D	--	--
Pyrene	ND	ND	6.9E-09	--	--	--	D	--	--
Carcinogenic PAHs									
Benzo(a)anthracene	0.2	0.22	6.9E-09	1.4E-09	1.5E-09	7.3E+00	B2	1.0E-08	1.1E-08
Benzo(a)pyrene	0.33	1.7	6.9E-09	2.3E-09	1.2E-08	7.3E+00	B2	1.7E-08	8.6E-08
Benzo(b)fluoranthene	0.2	0.22	6.9E-09	1.4E-09	1.5E-09	7.3E+00	B2	1.0E-08	1.1E-08
Benzo(k)fluoranthene	0.2	0.22	6.9E-09	1.4E-09	1.5E-09	7.3E+00	B2	1.0E-08	1.1E-08
Chrysene	0.2	0.22	6.9E-09	1.4E-09	1.5E-09	7.3E+00	B2	1.0E-08	1.1E-08
Indeno(1,2,3-cd)pyrene	0.2	0.22	6.9E-09	1.4E-09	1.5E-09	7.3E+00	B2	1.0E-08	1.1E-08
TOTAL cPAHs	1.3	2.8		9.2E-09	1.9E-08			6.7E-08	1.4E-07
Pesticides/PCBs									
Dieldrin	0.22	0.22	2.1E-09	4.6E-10	4.6E-10	1.6E+01	B2	7.4E-09	7.4E-09
PCB Aroclor 1248	1.6	1.6	2.1E-09	3.4E-09	3.4E-09	7.7E+00	B2	2.6E-08	2.6E-08
Inorganics									
Antimony	2.7	5.4	6.9E-09	1.9E-08	3.7E-08	--	--	--	--
Arsenic	2.1	8.7	6.9E-09	1.4E-08	6.0E-08	1.5E+00	A	2.2E-08	9.0E-08
Barium	26	87.6	6.9E-09	1.8E-07	6.0E-07	--	--	--	--
Manganese	100	214	6.9E-09	6.9E-07	1.5E-06	--	D	--	--
Nickel	1.9	4.2	6.9E-09	1.3E-08	2.9E-08	--	A (inh.)	--	--
Selenium	1.5	12.5	6.9E-09	1.0E-08	8.6E-08	--	D	--	--
Silver	ND	ND	6.9E-09	--	--	--	D	--	--
Vanadium	5.8	16.5	6.9E-09	4.0E-08	1.1E-07	--	D	--	--
Zinc	27	53.4	6.9E-09	1.9E-07	3.7E-07	--	D	--	--
							SUM	1.2E-07	2.6E-07

Exposure Factor:
Ingestion - 50 mg of leachate soil ingested per day with 100% absorption for SVOCs and Inorganics and 30% for Pesticides/PCBs for 250 days in a 365 day year for 1 year in a 70 year lifetime by a 70 kg adult and a conversion factor of kg/10+6 mg= 6.9 x 10-9 kg of soil per kg body weight per day for SVOC and Inorganics, and 2.1 x 10-9 kg of soil per kg body weight per day for Pesticides/PCBs.

TABLE 10 (cont'd.)
DAVIS GSR LANDFILL SITE
FUTURE BORING SOIL INGESTION PATHWAY
NONCARCINOGENIC RISKS TO ADULT WORKER

Off-Landfill

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Exposure Factor Ingestion (kg/kg/day)	Exposure Dose Average (mg/kg/day)	Exposure Dose RME (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	HAZARD INDEX RME
SVOCs									
Bis(2-ethylhexyl)phthalate	0.32	0.32	4.9E-07	1.6E-07	1.6E-07	2.0E-02	Liver	7.8E-06	7.8E-06
Noncarcinogenic PAHs									
Fluoranthene	ND	ND	4.9E-07	--	--	4.0E-02	Kidney	--	--
Fluorene	ND	ND	4.9E-07	--	--	4.0E-02	Blood	--	--
Phenanthrene	ND	ND	4.9E-07	--	--	4.0E-02	Body Wt.	--	--
Pyrene	ND	ND	4.9E-07	--	--	3.0E-02	Kidney	--	--
Carcinogenic PAHs									
Benzo(a)anthracene	0.2	0.22	4.9E-07	9.8E-08	1.1E-07	--	--	--	--
Benzo(a)pyrene	0.33	1.7	4.9E-07	1.6E-07	8.3E-07	--	--	--	--
Benzo(b)fluoranthene	0.2	0.22	4.9E-07	9.8E-08	1.1E-07	--	--	--	--
Benzo(k)fluoranthene	0.2	0.22	4.9E-07	9.8E-08	1.1E-07	--	--	--	--
Chrysene	0.2	0.22	4.9E-07	9.8E-08	1.1E-07	--	--	--	--
Indeno(1,2,3-cd)pyrene	0.2	0.22	4.9E-07	9.8E-08	1.1E-07	--	--	--	--
TOTAL PAHs	1.3	2.8		6.5E-07	1.4E-06				
Pesticides/PCBs									
Dieldrin	0.22	0.22	1.5E-07	3.3E-08	3.3E-08	5.0E-05	Liver	6.6E-04	6.6E-04
PCB Aroclor 1248	1.6	1.6	1.5E-07	2.4E-07	2.4E-07	--	--	--	--
Inorganics									
Antimony	2.7	5.4	4.9E-07	1.3E-06	2.6E-06	4.0E-04	Blood	3.3E-03	6.6E-03
Arsenic	2.1	8.7	4.9E-07	1.0E-06	4.3E-06	3.0E-04	Skin	3.4E-03	1.4E-02
Barium	26	87.6	4.9E-07	1.3E-05	4.3E-05	7.0E-02	Cardiovasc.	1.8E-04	6.1E-04
Manganese	100	214	4.9E-07	4.9E-05	1.0E-04	2.3E-02	CNS	2.1E-03	4.6E-03
Nickel	1.9	4.2	4.9E-07	9.3E-07	2.1E-06	2.0E-02	Organ Wt.	4.7E-05	1.0E-04
Selenium	1.5	12.5	4.9E-07	7.4E-07	6.1E-06	5.0E-03	Selenious	1.5E-04	1.2E-03
Silver	ND	ND	4.9E-07	--	--	5.0E-03	Skin	--	--
Vanadium	5.8	16.5	4.9E-07	2.8E-06	8.1E-06	7.0E-03	Liver	4.1E-04	1.2E-03
Zinc	27	53.4	4.9E-07	1.3E-05	2.6E-05	3.0E-01	Blood	4.4E-05	8.7E-05
							SUM	0.010	0.029

Exposure Factor:
Ingestion - 50 mg of leachate soil ingested per day with 100% absorption for SVOCs and Inorganics and 30% for Pesticides/PCBs for 250 days in a 365 day year by a 70 kg adult and a conversion factor of kg/10+6 mg= 4.9 x 10-7 kg of soil per kg body weight per day for SVOCs and Inorganics and 1.5 x 10-7 kg of soil per kg body weight per day for Pesticides/PCBs.

TABLE 11

DAVIS GSR LANDFILL SITE
FUTURE BORING SOIL DERMAL CONTACT PATHWAY

CARCINOGENIC RISKS TO ADULT WORKER

Off-Landfill

Contaminants of concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Average	RME	Cancer Slope Factor (mg/kg/day)-1	Weight of Evidence	RISK ESTIMATE Average	RME
Pesticides/PCBs														
PCB Aroclor 1248	1.6	1.6	0.5	0.06	1.0E-06	4.8E-08	4.8E-08	2.8E-01	1.3E-08	1.3E-08	7.7E+00	B2	1.0E-07	1.0E-07
												SUM	1.0E-07	1.0E-07

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 250 days per year in a 365 day year for 1 year in a 70 year lifetime by a 70 kg adult = 0.28 cm2-event/kg-day

NONCARCINOGENIC RISKS TO ADULT WORKER

Off-Landfill

Contaminants of Concern	Concentration Average (mg/kg)	Concentration Maximum (mg/kg)	Adherence Factor (mg/cm2-event)	Absorption Factor	Conversion Factor (kg/mg)	DAevent Average (mg/cm2-event)	DAevent Maximum (mg/cm2-event)	Exposure Factor (cm2-event/kg-day)	Average	RME	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Average	RME
Pesticides/PCBs														
PCB Aroclor 1248	1.6	1.6	0.5	0.06	1.0E-06	4.8E-08	4.8E-08	2.0E+01	9.6E-07	9.6E-07	--	--	--	--
												SUM	--	--

Exposure Factor = 2000 cm2 skin surface area for contact per event for 1 event/day for 250 days per year in a 365 day year by a 70 kg adult = 20 cm2-event/kg-day

TABLE 12

DAVIS GSR LANDFILL SITE
ON-SITE LANDFILL GAS INHALATION PATHWAY
CARCINOGENIC RISKS TO TRESPASSERS

Contaminants of Concern	Modeled Concentration (mg/m3)		Exposure Factor	Exposure Dose (mg/kg/day)		Cancer	Weight	RISK ESTIMATE	
	Landfill Area A	Hot Spot	Child (m3/kg/day)	Landfill Area A	Hot Spot	Slope Factor (mg/kg/day)-1	of Evidence	Landfill Area A Child	Hot Spot Child
Volatile Organic Compounds									
Benzene	4.30E-04	1.70E-05	6.5E-04	2.8E-07	1.1E-08	2.9E-02	A	8.1E-09	3.2E-10
1,2-Dichloropropane	3.10E-06	2.30E-05	6.5E-04	2.0E-09	1.5E-08	9.1E-02	B2	1.8E-10	1.4E-09
1,4-Dichlorobenzene	8.30E-05	3.00E-05	6.5E-04	5.4E-08	2.0E-08	--	C	--	--
Dichlorodifluoromethane	3.30E-06	2.50E-05	6.5E-04	2.1E-09	1.6E-08	--	D	--	--
Ethylbenzene	5.10E-04	4.90E-05	6.5E-04	3.3E-07	3.2E-08	--	D	--	--
Methylene Chloride	2.30E-06	1.80E-05	6.5E-04	1.5E-09	1.2E-08	1.65E-03	B2	2.5E-12	1.9E-11
Tetrachloroethylene	4.50E-06	3.40E-05	6.5E-04	2.9E-09	2.2E-08	2.0E-03	B2	5.9E-12	4.4E-11
Toluene	2.90E-05	5.00E-05	6.5E-04	1.9E-08	3.3E-08	--	D	--	--
1,1,1-Trichloroethane	3.60E-06	2.80E-05	6.5E-04	2.3E-09	1.8E-08	--	D	--	--
Trichloroethylene	3.60E-06	2.70E-05	6.5E-04	2.3E-09	1.8E-08	6.0E-03	B2	1.4E-11	1.1E-10
Vinyl Chloride	3.40E-06	2.00E-03	6.5E-04	2.2E-09	1.3E-06	3.0E-01	D	6.6E-10	3.9E-07
							SUM	9.0E-09	3.9E-07

Exposure Factor:
Inhalation - 0.83 m3 of air inhaled per hour for 2 hours per day of exposure for 36 days of exposure in a 365 day year for 12 years in a 70 year lifetime by a 43 kg child = 6.5x10-4 m3/kg/da

TABLE 12

DAVIS GSR LANDFILL SITE
ON-SITE LANDFILL GAS INHALATION PATHWAY
NONCARCINOGENIC RISKS TO TRESPASSERS

Contaminants of Concern	Modeled Concentration (mg/m3)		Exposure Factor	Exposure Dose (mg/kg/day)		Reference Dose	Toxicity	HAZARD INDEX	
	Landfill Area A	Hot Spot	Child (m3/kg/day)	Landfill Area A	Hot Spot	(mg/kg/day)	Endpoint	Landfill Area A Child	Hot Spot Child
Volatile Organic Compounds									
Benzene	4.30E-04	1.70E-05	3.8E-03	1.6E-06	6.5E-08	--	--	--	--
1,2-Dichloroethane	3.10E-06	2.30E-05	3.8E-03	1.2E-08	8.7E-08	--	--	--	--
1,4-Dichlorobenzene	8.30E-05	3.00E-05	3.8E-03	3.2E-07	1.1E-07	2.3E-01	Liver	1.4E-06	5.0E-07
Dichlorodifluoromethane	3.30E-06	2.50E-05	3.8E-03	1.3E-08	9.5E-08	5.7E-02	Liver	2.2E-07	1.7E-06
Ethylbenzene	5.10E-04	4.90E-05	3.8E-03	1.9E-06	1.9E-07	2.9E-01	Fetotox.	6.7E-06	6.4E-07
Methylene Chloride	2.30E-06	1.80E-05	3.8E-03	8.7E-09	6.8E-08	--	--	--	--
Tetrachloroethylene	4.50E-06	3.40E-05	3.8E-03	1.7E-08	1.3E-07	--	--	--	--
Toluene	2.90E-05	5.00E-05	3.8E-03	1.1E-07	1.9E-07	1.0E-01	Liver	1.1E-06	1.9E-06
1,1,1-Trichloroethane	3.60E-06	2.80E-05	3.8E-03	1.4E-08	1.1E-07	2.9E-01	Liver	4.7E-08	3.7E-07
Trichloroethylene	3.60E-06	2.70E-05	3.8E-03	1.4E-08	1.0E-07	--	--	--	--
Vinyl Chloride	3.40E-06	2.00E-03	3.8E-03	1.3E-08	7.6E-06	--	--	--	--
							SUM	9.4E-06	5.1E-06

Exposure Factor:
Inhalation - 0.83 m3 of air inhaled per hour for 2 hours per day of exposure for 36 days of exposure in a 365 day year by a 43 kg child = 3.8 x10-3 m3/kg/day.

DAVIS GSR LANDFILL SITE
OFF-SITE LANDFILL GAS INHALATION PATHWAY
CARCINOGENIC RISKS TO RESIDENTS

Contaminants of Concern	Modeled Concentration (mg/m3)		Exposure Factor	Exposure Dose (mg/kg/day)		Cancer	Weight	RISK ESTIMATE	
	Off-site	Residence	Adult (m3/kg/day)	Off-site	Residence	Slope Factor (mg/kg/day)-1	of Evidence	Off-site Adult	Residence Adult
Volatile Organic Compounds									
Benzene	2.01E-05	1.25E-05	1.2E-01	2.4E-06	1.5E-06	2.9E-02	A	7.0E-08	4.4E-08
1,2-Dichloropropane	1.63E-07	1.02E-07	1.2E-01	2.0E-08	1.2E-08	9.1E-02	B2	1.8E-09	1.1E-09
1,4-Dichlorobenzene	3.90E-06	2.43E-06	1.2E-01	4.7E-07	2.9E-07	--	C	--	--
Dichlorodifluoromethane	1.74E-07	1.09E-07	1.2E-01	2.1E-08	1.3E-08	--	D	--	--
Ethylbenzene	2.37E-05	1.48E-05	1.2E-01	2.8E-06	1.8E-06	--	D	--	--
Methylene Chloride	1.22E-07	7.65E-08	1.2E-01	1.5E-08	9.2E-09	1.65E-03	B2	2.4E-11	1.5E-11
Tetrachloroethylene	2.39E-07	1.49E-07	1.2E-01	2.9E-08	1.8E-08	2.0E-03	B2	5.7E-11	3.6E-11
Toluene	1.40E-06	8.71E-07	1.2E-01	1.7E-07	1.0E-07	--	D	--	--
Trichloroethylene	1.89E-07	1.18E-07	1.2E-01	2.3E-08	1.4E-08	6.0E-03	B2	1.4E-10	8.5E-11
Vinyl Chloride	1.87E-06	1.18E-06	1.2E-01	2.2E-07	1.4E-07	3.0E-01	D	6.7E-08	4.2E-08
							SUM	1.4E-07	8.7E-08

Exposure Factor:
Inhalation - 20 m3 of air inhaled per day for 365 days in a 365 day year for 30 years in a 70 year lifetime by a 70 kg adult = 1.2x10-1 m3/kg/day.

TABLE 13 (cont'd.)

DAVIS GSR LANDFILL SITE
LANDFILL GAS INHALATION PATHWAY
NONCARCINOGENIC RISKS TO RESIDENTS

Contaminants of Concern	Modeled Concentration Off-site (mg/m3)	Modeled Concentration Residence (mg/m3)	Exposure Factor Adult (m3/kg/day)	Exposure Dose Off-site (mg/kg/day)	Exposure Dose Residence (mg/kg/day)	Reference Dose (mg/kg/day)	Toxicity Endpoint	HAZARD INDEX Off-site Adult	HAZARD INDEX Residence Adult
Volatile Organic Compounds									
Benzene	2.01E-05	1.25E-05	2.7E-01	5.4E-06	3.4E-06	--	--	--	--
1,2-Dichloroethane	1.63E-07	1.02E-07	2.7E-01	4.4E-08	2.8E-08	--	--	--	--
1,4-Dichlorobenzene	3.90E-06	2.43E-06	2.7E-01	1.1E-06	6.6E-07	2.3E-01	Liver	4.6E-06	2.9E-06
Dichlorodifluoromethane	1.74E-07	1.09E-07	2.7E-01	4.7E-08	2.9E-08	5.7E-02	Liver	8.2E-07	5.2E-07
Ethylbenzene	2.37E-05	1.48E-05	2.7E-01	6.4E-06	4.0E-06	2.9E-01	Fetotox.	2.2E-05	1.4E-05
Methylene Chloride	1.22E-07	7.65E-08	2.7E-01	3.3E-08	2.1E-08	--	--	--	--
Tetrachloroethylene	2.39E-07	1.49E-07	2.7E-01	6.5E-08	4.0E-08	--	--	--	--
Toluene	1.40E-06	8.71E-07	2.7E-01	3.8E-07	2.4E-07	1.0E-01	Liver	3.8E-06	2.4E-06
Trichloroethylene	1.89E-07	1.18E-07	2.7E-01	5.1E-08	3.2E-08	--	--	--	--
Vinyl Chloride	1.87E-06	1.18E-06	2.7E-01	5.0E-07	3.2E-07	--	--	--	--
							SUM	3.1E-05	1.9E-05

Exposure Factor:
Inhalation - 20 m3 of air inhaled per day for 365 days in a 365 day year by a 70 kg adult = 2.7x10-1 m3/kg/day.

Table B-10 in Appendix B depicts the carcinogenic and non-carcinogenic risk summary for all media evaluated to reflect present and potential future exposure pathways corresponding to the average and the reasonable maximum exposure (RME) scenarios.

B. Ecological Risk Assessment

A Baseline Ecological Risk Assessment was conducted to assess potential risks to ecological resources near the landfill. Three natural resources in the immediate vicinity of the landfill are of concern in the ecological assessment: the surrounding wetlands and streams, the aquifers underlying the landfill, and the forested land around the Site.

Contaminant concentrations in sediments found at the Davis GSR wetlands were compared to Sediment Quality Criteria (SQC), established to provide guidance for the protection of ecological receptors from either direct or indirect exposure to contaminated sediments. Various sediment quality criteria and guidelines were used to select contaminants of concern in sediments, including Ontario MOE sediment criteria, most abundant for metals, EPA Interim Sediment Criteria, established for a limited number of organic compounds, and National Oceanic and Atmospheric Administration (NOAA) Sediment Effect Levels, developed as guidance values only and are not intended for use in deriving regulatory standards. For both, the Nine Foot Brook and unnamed stream, several inorganics exceeded SQC at a location, but there are only sporadic exceedances for the organic compounds, indicating possible adverse effect on the benthic invertebrate community. To investigate these possible impacts further, in July 1993, a benthic macroinvertebrate survey was conducted at three locations in the wetlands. The survey showed that the benthic invertebrate community was moderately impaired at one of these locations. The stress on the community appeared to be only moderate because pollution-sensitive species had not been replaced by pollution-tolerant species. Since this survey was performed during drought, the impairment observed may reflect changes in habitat quality and/or availability, rather than being directly attributable to sediment contamination from the Davis GSR landfill.

Contaminant concentrations detected in site surface water were compared to chronic Ambient Water Quality (AWQC), also referred to as the Criteria Criterion Continuous Concentration (CCC), which is a lower, more protective value than acute AWQC. AWQC are used to quantify levels at which toxicity to aquatic organisms may occur. For every surface water sampling location there was at least one inorganic chemical concentration that exceeded AWQC CCC. When a CCC is exceeded, deterious effects to resident species may or may not have occurred, depending on whether the elevated contaminant concentrations are persistent. In addition, co-factors, such as TSS and hardness, influence bioavailability and the toxicity of total inorganics in surface water. A majority of the total inorganic compounds that exceeded AWQC CCC were detected in fall 1992, when high levels of TSS were also measured during low flow and minimal flushing period, indicating that these concentrations are probably not persistent throughout the year

To assess potential risks to benthic invertebrates, the implication of comparison with SQCs and AWQC CCC were evaluated with consideration to the value of the wetlands and the availability of additional surrounding wetlands. A qualitative assessment of the wetland was performed using the WETII Model, which uses several factors to evaluate the ecological significance of the wetland area. Aquatic diversity/abundance were rated low as the streams near the landfill are generally slow and shallow and do not appear to provide viable fish habitat. Wildlife diversity/abundance were also rated low, except for high effectiveness for breeding and migration, since palustrine wetlands are generally expected to provide abundant habitat for wetland-dependent wildlife. If a reduction of aquatic biota or benthic invertebrate populations occurs in these wetlands, it is not expected to dramatically affect the food supply of the higher species. .

Species-specific food-chain exposure models for the short-tailed shrew, the American woodcock, and the red-tailed hawk, indicate that populations of these three key species of wildlife are not expected to be impacted by the landfill.

Summary of Conclusions Concerning Site Risks

The only samples which showed concentrations of chemical contaminants (arsenic) which were at the upper end of the acceptable risk range (i.e., 10^{-4}) or a hazard index (manganese) which may present a level of concern for a human health drinking water scenario (HI=8.4), assuming that groundwater at this location is ingested as a sole source of drinking water, were detected at monitoring wells located in the wetlands between the landfill and the Nine Foot Brook. This is a very conservative estimate of future exposure, however, as this location is immediately adjacent to the landfill. Exposure to groundwater as a drinking water source in this limited area is unlikely due to the steep slopes and proximity to the wetlands which would preclude development and use of groundwater at this location for future water supplies. At this location, near the toe of the landfill, MCLs were slightly exceeded for the following compounds: benzene, chromium, and nickel. A secondary MCL was exceeded for manganese.

The estimated cancer risk associated with exposure to contamination at the Site falls within EPA's acceptable risk range (10^{-4} to 10^{-6}). All current and future risks attributable to exposures associated with inhalation of landfill gas, and ingestion of, or contact with, the surficial soils, surface water and sediment are below the lower end of the acceptable risk range (i.e., 10^{-6}). No current health risks are associated with exposure to groundwater at the Site, since the contaminated groundwater is not being used for drinking water. No plume of contamination was found emanating from the landfill. The risk of groundwater ingestion as a drinking water source was estimated at the upper end of the acceptable risk range (i.e., 10^{-4}) attributable largely to the presence of arsenic, which is present, however, at levels below those established as safe in the Safe Drinking Water Act.

The Site specific conditions at the Davis GSR Landfill Site support the decision to take no further action. All of the estimated maximum cancer risks to human health associated with exposure to

contamination at the Site fall within EPA's acceptable risk range. In addition, non-cancer adverse health effects are not likely at this Site since the future use of site groundwater is very unlikely due to existing topographical and wetland considerations and no contaminated groundwater plume is found migrating off-site. Thus no exposure and hence no unacceptable risks are expected to occur.

Results of the ecological risk assessment also indicate that, given the abundance of surrounding water bodies and wetlands, it is unlikely that a reduction in viable wetland habitat associated with the landfill would adversely impact waterfowl, wetland insectivores (such as the shrew), and wetland-dependent birds.

This site is not expected at the present time or in the future to present an imminent and substantial endangerment to public health, welfare, or the environment. Thus, a no action decision has been chosen for this site.

VII. DESCRIPTION OF NO ACTION ALTERNATIVE

There are no construction activities associated with the No Action decision. Monitoring of groundwater, however, will be conducted to verify that no unacceptable exposures occur in the future. At a minimum, five years of monitoring, including residential well monitoring, will be performed.

VIII. DOCUMENTATION OF SIGNIFICANT CHANGES

EPA presented a Proposed Plan (preferred alternative) on June 23, 1997 for the Site based on the results of both the human health risk assessment and ecological risk evaluation performed as part of the remedial study. The Proposed Plan described EPA's proposal to take no further action under CERCLA at the Davis GSR Landfill Site. No significant changes have been made to the No Action recommendation described in the Proposed Plan.

IX. STATE ROLE

The Rhode Island Department of Environmental Management has reviewed the preferred alternative and has indicated its support for the No Action decision. The State of Rhode Island concurs with the selected remedy for the Davis GSR Landfill Site. A copy of the declaration of concurrence is attached as Appendix C.

DAVIS GSR LANDFILL SUPERFUND SITE

APPENDIX A

ADMINISTRATIVE RECORD INDEX

Davis GSR Landfill

NPL Site

Administrative Record
INDEX

Compiled: June 16, 1997
ROD Issued: September 29, 1997

Prepared By
EPA New England
Office of Site Remediation & Restoration
U.S. Environmental Protection Agency

With Assistance From
ads
2070 Chain Bridge Road
Vienna, VA 22182

INTRODUCTION

This is Index to the Administrative Record compiled at the time that the Record of Decision (ROD) was signed for the Davis Glocester-Smithfield Regional (GSR) Landfill Superfund site. Included in the Index are citations for site-specific documents used by Environmental Protection Agency (EPA) staff in selecting the response action described in the ROD. Within the Administrative Record, documents are arranged in order by the Document Number that appears at the end of each citation in the Index.

The Administrative Record is available for public review at the EPA Region I Office of Site Remediation and Restoration (OSRR) Records Center, 90 Canal Street, Boston, MA, and the Davis GSR Landfill Superfund site records repository, currently located at the East Smithfield Public Library, 50 Esmond Street, Esmond, RI. The staff of the EPA Region I OSRR Records Center asks that you set up an appointment in advance to review the Administrative Record by calling telephone number (617) 573-5729.

Access to certain documents in the Administrative Record is limited. Documents cited in the Index with the notation, [Available in EPA Records Center], are stored only at the EPA Region I OSRR Records Center. Documents cited in the Index with the notation, [Confidential], are documents available only for judicial review and are stored only at the EPA Region I OSRR Records Center.

Questions concerning the content of the Davis GSR Landfill Administrative Record should be addressed to the EPA Region I OSRR staff member assigned oversight responsibility for this site.

An Adminsitrative Record is required pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA).

Davis GSR Landfill Administrative Record: Table of Contents

01.02 PRE-REMEDIAL RECORDS - PRELIMINARY ASSESSMENT

Title:	Potential Hazardous Waste Site Identification and Preliminary Assessment with National Priorities List Checklist of Data Requirements.		
Addressee:	US EPA/REGION I		
Authors:	DENNIS DUMONT - ECOLOGY & ENVIRONMENT, INC.		
Date:	April 16, 1982		
Format:	FORM	No. Pgs:	7
AR No.	01.02.1	Document No.	000001

Title:	CERCLIS Pre-Remedial Site Management Form (Version 1.0).		
Date:	December 10, 1987		
Format:	FORM	No. Pgs:	1
AR No.	01.02.2	Document No.	000002

01.03 PRE-REMEDIAL RECORDS - SITE INSPECTION

Title:	NUS Sampling Activity at Davis GSR Landfill and VOA Screening Results.		
Authors:	NUS CORPORATION		
Date:	July 27, 1984		
Format:	REPORT, STUDY	No. Pgs:	9
AR No.	01.03.1	Document No.	000003

Title:	Sampling Data Results, Case No. 3407, for October 15 to October 17, 1984 Sampling Round.		
Addressee:	US EPA/REGION I		
Authors:	SPECTRIX CORPORATION		
Date:	January 11, 1985		
Format:	SAMPLING & ANALYSIS DATA	No. Pgs:	209
AR No.	01.03.2	Document No.	000004

Title:	Additional Purge Data for Case No. 3407.		
Addressee:	US EPA/REGION I		
Authors:	SPECTRIX CORPORATION		
Date:	May 14, 1985		
Format:	SAMPLING & ANALYSIS DATA	No. Pgs:	94
AR No.	01.03.3	Document No.	000005

Title:	Final Site Inspection Report, Davis GSR Landfill, Glocester, Rhode Island.		
Authors:	NUS CORPORATION		
Date:	October 31, 1985		
Format:	REPORT, STUDY	No. Pgs:	97
AR No.	01.03.4	Document No.	000006

01.04 PRE-REMEDIAL RECORDS - RECORDS RELATED TO CERCLIS

Title:	National Priorities List Site, Davis GSR Landfill.		
Authors:	US EPA/REGION I		
Format:	FACT SHEET, PRESS RELEASE	No. Pgs:	1
AR No.	01.04.1	Document No.	000011

Title:	Information Requirements for Evaluation of a Proposed Sanitary Landfill.		
Addressee:	WILLIAM DAVIS		
Authors:	FRANK B. STEVENSON - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	July 22, 1974		
Format:	LETTER	No. Pgs:	2
AR No.	01.04.2	Document No.	000012

Title:	Letter Identifying Need for a Permit Application Prior to Development of Wetland Areas on Proposed Sanitary Landfill Site.		
Addressee:	WILLIAM DAVIS		
Authors:	JOHN S. QUINN, JR. - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	July 31, 1974		
Format:	LETTER	No. Pgs:	2
AR No.	01.04.3	Document No.	000013

Title:	Wetlands Issues Pertaining to the Proposed Sanitary Landfill Development in Glocester.		
Addressee:	RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Authors:	ALBERT A. KURLINDEN - RI DNR/PLANNING & DEVELOPMENT		
Date:	August 12, 1974		
Format:	MEMORANDUM	No. Pgs:	2
AR No.	01.04.4	Document No.	000014

Title:	Transmittal Letter for a Consent Order Agreement not to Permit Open Burning at Smithfield Sanitary Landfill.		
Addressee:	DOMENIC TUDINO - ATTORNEY FOR WILLIAM DAVIS		
Authors:	ANTHONY S. DELGIUDICE - RI DEPT OF HEALTH/LEGAL SERVICES		
Date:	October 4, 1974		
Format:	LETTER	No. Pgs:	1
AR No.	01.04.5	Document No.	000015

Title:	Transmittal Letter for Plans Pertaining to the Proposed Glocester Sanitary Landfill.		
Addressee:	RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Authors:	PHILIP S. MANCINI, JR. - AMERICAN ENGINEERING CORP.		
Date:	October 15, 1974		
Format:	LETTER	No. Pgs:	1
AR No.	01.04.6	Document No.	000007

Title:	Solid Waste Disposal Facilities Operating in Compliance with Rhode Island Regulations.		
Addressee:	WILLIAM DAVIS		
Authors:	FRANK B. STEVENSON - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	January 15, 1975		
Format:	LETTER	No. Pgs:	1
AR No.	01.04.7	Document No.	000016

Title:	Summary of a Site Visit to Glocester-Smithfield Regional Landfill.		
Authors:	FRANK B. STEVENSON, JAMES CULLINANE - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	February 20, 1975		
Format:	MEMORANDUM	No. Pgs:	2
AR No.	01.04.8	Document No.	000017

Title:	Glocester-Smithfield Regional Landfill Inspection Results and Recommendations.		
Authors:	CARLETON A. MAINE - RI DOH/WATER SUPPLY & POLLUTION CONTROL		
Date:	February 24, 1975		
Format:	MEMORANDUM	No. Pgs:	2
AR No.	01.04.9	Document No.	000018

Title:	Letter Describing Concerns About the Impact of the New Glocester Landfill on Waterman Lake and Nine Foot Brook.		
Addressee:	JOHN S. QUINN, JR. - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Authors:	JOHN BIGGINS - CITIZENS FOR PRESERVATION WATERMAN LAKE		
Date:	February 27, 1975		
Format:	LETTER	No. Pgs:	3
AR No.	01.04.10	Document No.	000019

Title:	Report on Design and Operation of Sanitary Landfill for William Davis at (GSR) Landfill, Tarklin Road, Glocester, RI.		
Authors:	MICHAEL N. GARRETT & ASSOCIATES		
Date:	June 1976		
Format:	REPORT, STUDY	No. Pgs:	25
AR No.	01.04.11	Document No.	000009

Title:	Mechanical Analysis of Project Site Grab Sample.		
Authors:	GEORGE J GEISSER JR. CORP.		
Date:	November 4, 1976		
Format:	REPORT, STUDY	No. Pgs:	2
AR No.	01.04.12	Document No.	000008

Title:	Operations Plan 1979 to 1981, L & R Resources Corp. Sanitary Landfill, Glocester-Smithfield, Rhode Island [Maps available at EPA Records Center].		
Authors:	ALLINSON INC.		
Date:	1979		
Format:	REPORT, STUDY	No. Pgs:	34
AR No.	01.04.13	Document No.	000010

01.05 PRE-REMEDIAL RECORDS - CORRESPONDENCE RELATED TO CERCLIS

Title:	Letter Addressing Contamination Concerns at Nine Foot Brook and Its Tributary.		
Addressee:	WILLIAM DAVIS		
Authors:	JOHN S. QUINN, JR. - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	February 28, 1975		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.1	Document No.	000020

Title:	Letter from Town of Glocester Detailing Concerns about Pollution in Nine Foot Brook.		
Addressee:	JOHN S. QUINN, JR. - RI DEPT OF HEALTH/DIV OF SOLID WASTE		
Authors:	JOSEPH T. TRAINOR - TOWN OF GLOCESTER		
Date:	March 6, 1975		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.2	Document No.	000022

Title:	Letter Describing Corrective Measures Planned for Glocester Landfill to Comply with Solid Waste Management Regulations.		
Addressee:	JOHN S. QUINN, JR. - RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT		
Authors:	PHILIP S. MANCINI, JR. - AMERICAN ASSOCIATES INC.		
Date:	March 20, 1975		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.3	Document No.	000021

Title:	Solid Waste Regulation Requirements for the Installation of Groundwater Monitoring Wells.		
Addressee:	WILLIAM DAVIS		
Authors:	FRANK B. STEVENSON - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	December 9, 1975		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.4	Document No.	000023

Title:	Letter Summarizing Time Guidelines for Solid Waste Management Regulations.		
Addressee:	WILLIAM DAVIS		
Authors:	FRANK B. STEVENSON - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	December 16, 1975		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.5	Document No.	000024

Title:	Letter Describing the Regulatory Status of Glocester-Smithfield Regional Landfill.		
Addressee:	DENNIS BOUCHARD - ESMOND TOWN COUNCIL		
Authors:	JOHN S. QUINN, JR. - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	January 5, 1976		
Format:	LETTER	No. Pgs:	3
AR No.	01.05.6	Document No.	000025

Title:	Requirements for State Grant-in-Aid Funds for Cities and Towns Presently Using the Davis GSR Facility.		
Addressee:	LEONARD A. KIERNAN - KEENAN, RICE, DOLAN, REARDON & KIERNAN		
Authors:	ANTHONY S. DELGIUDICE - RI DEPT OF HEALTH/LEGAL SERVICES		
Date:	January 12, 1976		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.7	Document No.	000026

Title:	Agreements Reached During an April 19, 1976 Enforcement Meeting Regarding Operations at Glocester-Smithfield Regional Landfill.		
Addressee:	BRUCE GOODWIN - RI DNR/PLANNING & DEVELOPMENT		
Authors:	JOHN S. QUINN, JR. - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	April 19, 1976		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.8	Document No.	000027

Title:	Summary of Items Contained in the February 24, 1976 Consent Order between the Rhode Island Department of Health and William Davis.		
Addressee:	GLENN KUMEKAWA - RHODE ISLAND GOVERNOR'S OFFICE		
Authors:	JOHN S. QUINN, JR. - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	June 4, 1976		
Format:	MEMORANDUM	No. Pgs:	2
AR No.	01.05.9	Document No.	000028

Title:	Response to Senator Pell's Inquiry Into the Operation of the Glocester-Smithfield Regional Landfill.		
Addressee:	CLAIRBORNE PELL - UNITED STATES SENATE		
Authors:	JOHN S. QUINN, JR. - RI DEPT OF HEALTH/SOLID WASTE MANAGEMENT		
Date:	June 21, 1976		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.10	Document No.	000030

Title:	Suggested Self-Monitoring Locations of the Seasonal Streams at the GSR Landfill.		
Addressee:	WILLIAM DAVIS		
Authors:	CARLETON A. MAINE - RI DOH/WATER SUPPLY & POLLUTION CONTROL		
Date:	August 26, 1976		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.11	Document No.	000031

Title:	Corrected Copy of the Solid Waste Management Facility License Issued to William Davis d/b/a GSR Landfill, March 7, 1977, with Transmittal Letter.		
Addressee:	WILLIAM DAVIS - GSR LANDFILL		
Authors:	RHODE ISLAND DEPARTMENT OF HEALTH		
Date:	March 7, 1977		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.12	Document No.	000032

Title:	Denial of Application to Renew Solid Waste Management License for GSR Landfill.		
Addressee:	WILLIAM DAVIS		
Authors:	JOHN S. QUINN, JR. - RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT		
Date:	January 19, 1978		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.13	Document No.	000033

Title:	Request by Mr. Davis for a Hearing on the Determination of His Solid Waste Disposal License.		
Addressee:	JOHN S. QUINN, JR. - RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT		
Authors:	THOMAS C. PLUNKETT - RICE, DOLAN, KIERNAN & KERSHAW		
Date:	January 25, 1978		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.14	Document No.	000034

Title:	Site Plan for Operation for the Calendar Year 1978.		
Addressee:	JOHN S. QUINN, JR. - RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT		
Authors:	WILLIAM DAVIS - GSR LANDFILL		
Date:	January 27, 1978		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.15	Document No.	000035

Title:	Letter Informing Smithfield Town Council of an Application for a Landfill Operation within the Town of Smithfield.		
Addressee:	FRANK G. ELDREDGE -		
Authors:	FRANK B. STEVENSON - RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT		
Date:	June 27, 1978		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.16	Document No.	000036

Title:	Request for Documentation on the Town of Smithfield's Contractual Relationship with the Operator of GSR Landfill.		
Addressee:	FRANK G. ELDREDGE -		
Authors:	JOHN S. QUINN, JR. - RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT		
Date:	July 12, 1978		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.17	Document No.	000037

Title:	Correction of Violations at Davis Landfill.		
Addressee:	LEONARD A. KIERNAN - RICE, DOLAN, KIERNAN & KERSHAW		
Authors:	FRANK B. STEVENSON		
Date:	August 7, 1978		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.18	Document No.	000038

Title:	Town Concerns about Renewal of License to Operate GSR Landfill.		
Addressee:	JOHN S. QUINN, JR. - RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT		
Authors:	JACQUILINE A. ERICSON - TOWN OF GLOCESTER		
Date:	August 24, 1978		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.19	Document No.	000039

Title:	Notice of Deficiencies in Mr. Davis' Application for a Renewal of His License to Operate a Solid Waste Management Facility.		
Addressee:	WILLIAM DAVIS - GSR LANDFILL		
Authors:	FRANK B. STEVENSON - RI DEPT OF HEALTH/DIV OF LAND RESOURCES		
Date:	November 30, 1978		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.20	Document No.	000040

Title:	Summary of Discussions Held on December 11, 1978 between RIDOH and Mr. Davis Regarding Plans for GSR Landfill.		
Addressee:	WILLIAM DAVIS - GSR LANDFILL		
Authors:	FRANK B. STEVENSON - RI DEPT OF HEALTH/DIV OF LAND RESOURCES		
Date:	December 13, 1978		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.21	Document No.	000041

Title:	Glocester Residents Object to Licensing of Davis GSR Landfill.		
Addressee:	JOHN S. QUINN, JR. - RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT		
Authors:	MARILYN LOWNEY		
Date:	April 26, 1979		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.22	Document No.	000042

Title:	Operation of Davis Landfill on Steere Property and Other Concerns.		
Addressee:	JOHN S. QUINN, JR. - RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT		
Authors:	MONROE ALLEN		
Date:	May 7, 1979		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.23	Document No.	000043

Title:	Response to Inquiry into Mr. Davis' Solid Waste Disposal License and Allegations of GSR Dumping Refuse in Smithfield.		
Addressee:	R. DANIEL PRENTISS - RI DEPT OF ENV MGMNT/OFFICE OF DIRECTOR		
Authors:	MONROE ALLEN		
Date:	May 23, 1979		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.24	Document No.	000044

Title:	Letter Iterating Decision to Terminate Mr. Davis' License to Operate GSR Landfill on December 18, 1978.		
Addressee:	WILLIAM DAVIS - GSR LANDFILL		
Authors:	W. EDWARD WOOD - RI DEPT OF ENV MGMNT/OFFICE OF DIRECTOR		
Date:	August 18, 1981		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.25	Document No.	000045

Title:	Request for a US EPA Field Investigation of Conditions at the Davis GSR Landfill.		
Addressee:	JOHN CHAFEE - UNITED STATES SENATE		
Authors:	GLORIA P. NARNEY -		
Date:	November 27, 1981		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.26	Document No.	000149

Title:	US EPA Advised of Smithfield Town Council's Concern About Conditions at Davis GSR Landfill.		
Addressee:	LESTER SUTTON - US EPA/REGION I		
Authors:	JOHN CHAFEE - UNITED STATES SENATE		
Date:	December 4, 1981		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.27	Document No.	000150

Title:	US EPA's Response to Senator Chafee's Inquiry on Behalf of the Smithfield Town Council.		
Addressee:	JOHN CHAFEE - UNITED STATES SENATE		
Authors:	LESTER SUTTON - US EPA/REGION I		
Date:	December 23, 1981		
Format:	LETTER	No. Pgs:	1
AR No.	01.05.28	Document No.	000151

Title:	Letter Identifying a May 6, 1982 Deadline for Submitting Landfill Operation Plans.		
Addressee:	WILLIAM DAVIS - GSR LANDFILL		
Authors:	CARLETON A. MAINE - RI DEPT OF ENV MGMNT/OFFICE OF DIRECTOR		
Date:	April 14, 1982		
Format:	LETTER	No. Pgs:	2
AR No.	01.05.29	Document No.	000046

02.02 REMOVAL RESPONSE - REMOVAL RESPONSE REPORTS

Title:	US EPA/Technical Assistance Team, Davis Landfill, Glocester, Rhode Island.		
Authors:	US EPA/TECHNICAL ASSISTANCE TEAM		
Date:	1988		
Format:	REPORT, STUDY	No. Pgs:	39
AR No.	02.02.1	Document No.	000047

Title:	Removal Assessment, August 24, 1990, Davis Landfill, Glocester/Smithfield, RI [Photographs available at EPA Records Center].		
Addressee:	RICHARD C. BOYNTON - US EPA/REGION I		
Authors:	JOSEPH F. LEMAY, STEPHEN MANGION - US EPA/REGION I		
Date:	September 20, 1990		
Format:	REPORT, STUDY	No. Pgs:	12
AR No.	02.02.2	Document No.	000048

Title:	Davis GSR Landfill NPL Site Investigation, with attachments.		
Authors:	US EPA/REGION I		
Date:	September 20, 1990		
Format:	MEMORANDUM	No. Pgs:	12
AR No.	02.02.3	Document No.	000049

Title:	Removal Program, NPL Site Investigation for Davis GSR Landfill, Glocester, Rhode Island.		
Authors:	US EPA/TECHNICAL ASSISTANCE TEAM		
Date:	November 1990		
Format:	REPORT, STUDY	No. Pgs:	42
AR No.	02.02.4	Document No.	000050

Title:	Davis GSR Landfill: Results of Site Visits on 12/20/90 and 1/3/91.		
Authors:	JOSEPH F. LEMAY - US EPA/REGION I		
Date:	February 7, 1991		
Format:	MEMORANDUM	No. Pgs:	15
AR No.	02.02.5	Document No.	000051

Title:	Methane Emissions from Davis GSR Landfill Noted During a June 26, 1991 Site Inspection, with Landfill Map.		
Addressee:	US EPA/REGION I		
Authors:	CDM/FEDERAL PROGRAMS CORPORATION		
Date:	December 31, 1991		
Format:	SAMPLING & ANALYSIS DATA	No. Pgs:	2
AR No.	02.02.6	Document No.	000099

03.01 REMEDIAL INVESTIGATION - CORRESPONDENCE

Title:	Davis GSR Landfill Superfund Site, 11/11/92 (Round 1) Residential Well Sampling Results, [Available in EPA Records Center].		
Authors:	JOSEPH F. LEMAY - US EPA/REGION I		
Date:	May 28, 1993		
Format:	LETTER		
AR No.	03.01.1	Document No.	000101

Title:	Davis GSR Landfill Superfund Site, 5/12/93 (Round 2) Residential Well Sampling Results [Confidential].		
Authors:	JOSEPH F. LEMAY - US EPA/REGION I		
Date:	January 25, 1994		
Format:	LETTER		
AR No.	03.01.2	Document No.	000102

.02 REMEDIAL INVESTIGATION - SAMPLING & ANALYSIS DATA

Title:	Certificates of Analysis for Surface Water (1974-1982).		
Addressee:	SMITHFIELD CONSERVATION COMMISSION		
Authors:	NEW ENGLAND TESTING LABORATORY, INC.		
Date:	November 9, 1974		
Format:	REPORT, STUDY	No. Pgs:	7
AR No.	03.02.1	Document No.	000179

Title:	Davis GSR Landfill Well Sample Data Results (1980-1984).		
Date:	December 9, 1980		
Format:	MISCELLANEOUS	No. Pgs:	37
AR No.	03.02.2	Document No.	000182

Title:	Groundwater Monitoring at GSR Landfill.		
Addressee:	SEAN O. COFFEY - RI DEPT OF ENVIRONMENTAL MANAGEMENT		
Authors:	FRANK B. STEVENSON - RI DEM/AIR AND HAZARDOUS MATERIALS		
Date:	October 23, 1981		
Format:	MEMORANDUM	No. Pgs:	2
AR No.	03.02.3	Document No.	000180

Title:	Analytical Results from the Davis Landfill.		
Addressee:	BARBARA IKALAINEN - RI DEM/AIR AND HAZARDOUS MATERIALS		
Authors:	CLARA CHOW, PI-YUN TSAI - US EPA/DRINKING WATER BRANCH		
Date:	December 22, 1981		
Format:	MEMORANDUM	No. Pgs:	29
AR No.	03.02.4	Document No.	000181

Title:	Logs for Monitoring Wells Drilled at the Davis GSR Landfill site.		
Addressee:	JOSEPH F. LEMAY - US EPA/REGION I		
Authors:	RON BOYD - GUILD DRILLING CO.		
Date:	January 31, 1991		
Format:	LETTER	No. Pgs:	11
AR No.	03.02.5	Document No.	000184

Title:	Residential Well Analytical Results Summary Organics [Confidential].		
Addressee:	JULIA NAULT - CDM/FEDERAL PROGRAMS CORPORATION		
Authors:	SUSAN HENDERSON - CDM/FEDERAL PROGRAMS CORPORATION		
Date:	February 2, 1993		
Format:	MEMORANDUM	No. Pgs:	35
AR No.	03.02.6	Document No.	000185

Title:	Results of Laboratory Testing on Tap Water Taken by Homeowner Near the Davis GSR Landfill [Confidential].		
Addressee:	JOSEPH F. LEMAY - US EPA/REGION I		
Authors:	RICHARD ARSENAULT		
Date:	June 23, 1993		
Format:	LETTER	No. Pgs:	4
AR No.	03.02.7	Document No.	000187

Title:	Davis GSR Landfill, Glocester, RI [Confidential].		
Addressee:	DANIEL GRANZ - US EPA/ENVIRONMENTAL STUDIES SECTION		
Authors:	SCOTT CLIFFORD - US EPA/LEXINGTON LABORATORY		
Date:	August 9, 1993		
Format:	MEMORANDUM	No. Pgs:	6
AR No.	03.02.8	Document No.	000189

Title: Davis GSR Landfill--Volatile Organics by GC/MS.
Addressee: DAVID S. GRANZ - US EPA/ENVIRONMENTAL STUDIES SECTION
Authors: STEVEN HELLER, SURESH SRIVASTAVA, JOSEPH MONTANARO - US EPA/LEXINGTON LABORATORY
Date: August 10, 1993
Format: MEMORANDUM No. Pgs: 26
AR No. 03.02.9 Document No. 000188

Title: Davis Landfill.
Addressee: DANIEL GRANZ - US EPA/ENVIRONMENTAL STUDIES SECTION
Authors: KATHLEEN M. POLGAR - US EPA/LEXINGTON LABORATORY
Date: September 8, 1993
Format: MEMORANDUM No. Pgs: 3
AR No. 03.02.10 Document No. 000190

03.04 REMEDIAL INVESTIGATION - INTERIM DELIVERABLES

Title: Health and Safety Plan, Davis GSR Landfill.
Addressee: JOSEPH F. LEMAY - US EPA/REGION I
Authors: CDM/FEDERAL PROGRAMS CORPORATION
Date: November 1990
Format: LETTER No. Pgs: 25
AR No. 03.04.1 Document No. 000153

Title: Davis GSR Landfill, Glocester/Smithfield, Rhode Island, Ecological Characterization, Summary Report.
Addressee: JOSEPH F. LEMAY - US EPA/REGION I
Authors: CDM/FEDERAL PROGRAMS CORPORATION
Date: February 1992
Format: LETTER No. Pgs: 121
AR No. 03.04.2 Document No. 000156

Title: Davis GSR Landfill Site, Sampling and Analysis Plan/Quality Assurance Project Plan.
Addressee: JOSEPH F. LEMAY - US EPA/REGION I
Authors: CDM/FEDERAL PROGRAMS CORPORATION
Date: March 1992
Format: LETTER No. Pgs: 24
AR No. 03.04.3 Document No. 000157

Title:	Task 3.6: Phase I Surface Water/Sediment Analysis.		
Addressee:	JOSEPH F. LEMAY - US EPA/REGION I		
Authors:	CDM/FEDERAL PROGRAMS CORPORATION		
Date:	October 7, 1992		
Format:	LETTER	No. Pgs:	5
AR No.	03.04.4	Document No.	000158

Title:	Report on Geophysical Investigations at the Davis GSR Landfill, Smithfield Rhode Island.		
Addressee:	CDM/FEDERAL PROGRAMS CORPORATION		
Authors:	CASWELL EICHLER & HILL, INC.		
Date:	December 1992		
Format:	REPORT, STUDY	No. Pgs:	134
AR No.	03.04.5	Document No.	000138

Title:	Addendum to Sampling Analysis Plan/Quality Assurance Project Plan, March 1992 with Summary Responses April 1992.		
Addressee:	NADINE RANIERE - US EPA/REGION I		
Authors:	CDM/FEDERAL PROGRAMS CORPORATION		
Date:	January 15, 1993		
Format:	LETTER	No. Pgs:	3
AR No.	03.04.6	Document No.	000159

Title:	Addendum to Sampling Analysis Plan/Quality Assurance Project Plan, March 1992 with Summary Responses April 1992.		
Addressee:	NADINE RANIERE - US EPA/REGION I		
Authors:	CDM/FEDERAL PROGRAMS CORPORATION		
Date:	March 26, 1993		
Format:	LETTER	No. Pgs:	8
AR No.	03.04.7	Document No.	000144

Title:	Davis GSR Landfill, Trip Report for Phase II Monitoring Well Installation, Soil Boring and Well Development.		
Addressee:	US EPA/REGION I		
Authors:	CDM/FEDERAL PROGRAMS CORPORATION		
Date:	April 7, 1993		
Format:	REPORT, STUDY	No. Pgs:	52
AR No.	03.04.8	Document No.	000145

Title: Davis GSR, Standard Operating Procedure, Sediment Filtration to Achieve Adequate Percent Solids.
Authors: CDM/FEDERAL PROGRAMS CORPORATION
Date: June 1994
Format: REPORT, STUDY No. Pgs: 8
AR No. 03.04.9 Document No. 000162

03.06 REMEDIAL INVESTIGATION - REMEDIAL INVESTIGATION REPORTS

Title: Davis GSR Landfill Glocester/Smithfield, Rhode Island, Final Remedial Investigation Report, Vol. I
Addressee: US EPA/REGION I
Authors: CDM/FEDERAL PROGRAMS CORPORATION
Date: November 1994
Format: REPORT, STUDY No. Pgs: 952
AR No. 03.06.1 Document No. 000146

Title: Davis GSR Landfill Glocester/Smithfield, Rhode Island, Final Remedial Investigation Report, Vol. II Appendices A-F.
Addressee: US EPA/REGION I
Authors: CDM/FEDERAL PROGRAMS CORPORATION
Date: November 1994
Format: REPORT, STUDY No. Pgs: 983
AR No. 03.06.2 Document No. 000147

Title: Davis GSR Landfill Glocester/Smithfield, Rhode Island, Final Remedial Investigation Report, Vol. III Appendices G-I.
Addressee: US EPA/REGION I
Authors: CDM/FEDERAL PROGRAMS CORPORATION
Date: November 1994
Format: REPORT, STUDY No. Pgs: 472
AR No. 03.06.3 Document No. 000148

Title: Remedial Investigation Report Addendum--Modified Risk Assessment Tables--Davis GSR Landfill, Glocester/Smithfield, Rhode Island.
Addressee: ANNA KRASKO - US EPA/REGION I
Authors: MATTHEW DENTCH - CDM/FEDERAL PROGRAMS CORPORATION
Date: March 20, 1997
Format: LETTER No. Pgs: 25
AR No. 03.06.4 Document No. 000163

03.07 REMEDIAL INVESTIGATION - WORK PLANS AND PROGRESS REPORTS

Title: Davis GSR Landfill, Glocester/Smithfield, Rhode Island, Remedial Investigation/Feasibility Study, Revised Work Plan, Vol. I--Technical Scope of Work.
Addressee: US EPA/REGION I
Authors: RI DEPT OF ENV MGMNT/SOLID WASTE MGMNT
Date: July 1991
Format: REPORT, STUDY No. Pgs: 150
AR No. 03.07.1 Document No. 000164

03.09 REMEDIAL INVESTIGATION - HEALTH ASSESSMENTS

Title: Preliminary Health Assessment for Davis GSR Landfill, Glocester, Glocester County, Rhode Island, RID980731459.
Authors: US PUBLIC HEALTH SERVICE/ATSDR
Date: April 10, 1989
Format: REPORT, STUDY No. Pgs: 4
AR No. 03.09.1 Document No. 000165

04.09 FEASIBILITY STUDY - PROPOSED PLANS FOR SELECTED REMEDIAL ACTION

Title: Proposed Plan for the Davis GSR Landfill Superfund Site.
Authors: US EPA/REGION I
Date: June 1997
Format: REPORT, STUDY No. Pgs: 9
AR No. 04.09.1 Document No. 000191

05.03 RECORD OF DECISION - RESPONSIVENESS SUMMARIES

Title:	Comments on the Proposed Plan for the Davis GSR Landfill Superfund Site.		
Addressee:	ANNA KRASKO - US EPA/REGION I		
Authors:	JOSEPH V. SOUZA, MAUREEN SOUZA		
Format:	FORM	No. Pgs:	2
AR No.	05.03.1	Document No.	000202

Title:	Comments on the Proposed Plan for the Davis GSR Landfill Superfund Site.		
Addressee:	ANNA KRASKO - US EPA/REGION I		
Authors:	MATTHEW D. DESTEFANO - RI DEM/OFFICE OF WASTE MANAGEMENT		
Date:	July 3, 1997		
Format:	LETTER	No. Pgs:	5
AR No.	05.03.2	Document No.	000194

Title:	Comments of the Proposed Plan for the Davis GSR Landfill Superfund Site.		
Addressee:	ANNA KRASKO - US EPA/REGION I		
Authors:	WAYNE FARRINGTON		
Date:	July 16, 1997		
Format:	LETTER	No. Pgs:	2
AR No.	05.03.3	Document No.	000195

Title:	Resolution of the Glocester Town Council Requesting US EPA to Continue Yearly Monitoring of Test Wells for the Next Ten Years.		
Authors:	TOWN OF GLOCESTER		
Date:	July 17, 1997		
Format:	PUBLIC MEETING RECORDS	No. Pgs:	1
AR No.	05.03.4	Document No.	000196

Title:	Comments on the Proposed Plan for the Davis GSR Landfill Superfund Site.		
Addressee:	ANNA KRASKO - US EPA/REGION I		
Authors:	CAROL A. AYALA		
Date:	July 19, 1997		
Format:	LETTER	No. Pgs:	3
AR No.	05.03.5	Document No.	000197

Title:	Request for an Extension of Time to Review US EPA's No Further Action Recommendation in Its Proposed Plan for the Davis GSR Landfill.		
Addressee:	ANNA KRASKO - US EPA/REGION I		
Authors:	JEFFREY H. MINOR - SMITHFIELD TOWN OF		
Date:	July 21, 1997		
Format:	LETTER	No. Pgs:	1
AR No.	05.03.6	Document No.	000198

Title:	Transmittal of Copies of the Extended Comment Period Notice and Proposed Plan for the Davis GSR Landfill.		
Addressee:	PAUL CAVANAUGH		
Authors:	SARAH WHITE - US EPA/ OFFICE OF COMMUNITY RELATIONS		
Date:	July 22, 1997		
Format:	LETTER	No. Pgs:	1
AR No.	05.03.7	Document No.	000199

Title:	Denial of Request for a Six-Month Extension of the Public Comment Period on the Proposed Plan for the Davis GSR Landfill.		
Addressee:	RICHARD POIRIER - SMITHFIELD TOWN COUNCIL		
Authors:	ANNA KRASKO - US EPA/REGION I		
Date:	July 23, 1997		
Format:	LETTER	No. Pgs:	2
AR No.	05.03.8	Document No.	000200

Title:	Comments on the Proposed Plan for the Davis GSR Landfill Superfund Site.		
Addressee:	ANNA KRASKO - US EPA/REGION I		
Authors:	HENRY E. HATCHER		
Date:	July 24, 1997		
Format:	FORM	No. Pgs:	1
AR No.	05.03.9	Document No.	000201

Title:	Comments on the Proposed Plan for the Davis GSR Landfill Superfund Site.		
Addressee:	ANNA KRASKO - US EPA/REGION I		
Authors:	TERI ROZZERO		
Date:	August 20, 1997		
Format:	LETTER	No. Pgs:	1
AR No.	05.03.10	Document No.	000204

Title: Comments on the Proposed Plan for the Davis GSR Landfill Superfund Site.
Addressee: ANNA KRASKO - US EPA/REGION I
Authors: HARVEY LIEBERMAN
Date: August 21, 1997
Format: LETTER No. Pgs: 2
AR No. 05.03.11 Document No. 000205

05.04 RECORD OF DECISION - RECORD OF DECISION

Title: Record of Decision, Davis GSR Landfill Superfund Site.
Authors: US EPA/REGION I
Date: September 29, 1997
Format: REPORT, STUDY
AR No. 05.04.1 Document No. 000206

13.02 COMMUNITY RELATIONS - COMMUNITY RELATIONS PLANS

Title: Community Relations Plan, Davis Glocester-Smithfield Regional (GSR) Landfill Superfund Site, Glocester and Smithfield, Rhode Island.
Addressee: CDM/FEDERAL PROGRAMS CORPORATION
Authors: BARRY LAWSON ASSOCIATES, INC.
Date: November 1991
Format: REPORT, STUDY No. Pgs: 22
AR No. 13.02.1 Document No. 000166

13.04 COMMUNITY RELATIONS - PUBLIC MEETINGS

Title: Community Meeting Summary, Davis GSR Landfill Superfund Site, Smithfield, Rhode Island.
Addressee: US EPA/REGION I
Authors: BARRY LAWSON ASSOCIATES, INC.
Date: March 9, 1992
Format: REPORT, STUDY No. Pgs: 26
AR No. 13.04.1 Document No. 000167

Title:	Public Hearing In Re: Davis GSR Landfill Superfund Site, July 15, 1997.		
Date:	July 15, 1997		
Format:	PUBLIC MEETING RECORDS	No. Pgs:	26
AR No.	13.04.2	Document No.	000193

13.05 COMMUNITY RELATIONS - FACT SHEETS

Title:	EPA Announces No Risks at the Davis GSR Landfill Superfund Site.		
Authors:	US EPA/REGION I		
Date:	June 16, 1997		
Format:	FACT SHEET, PRESS RELEASE	No. Pgs:	2
AR No.	13.05.1	Document No.	000192

16.01 NATURAL RESOURCE TRUSTEE - CORRESPONDENCE

Title:	Acknowledgement of US EPA Trustee Notification for the Davis GSR Landfill Superfund Site.		
Addressee:	GORDON E BECKETT - US EPA/WASTE MANAGEMENT DIVISION		
Authors:	DAVID J NEWTON - US DEPARTMENT OF INTERIOR		
Date:	July 21, 1987		
Format:	LETTER	No. Pgs:	1
AR No.	16.01.1	Document No.	000168

16.04 NATURAL RESOURCE TRUSTEE - TRUSTEE NOTIFICATION FORM AND SELECTION GU

Title:	Notification of Potential Damages to Natural Resources from the Davis GSR Landfill Site.		
Addressee:	WILLIAM PATTERSON - US DEPARTMENT OF INTERIOR		
Authors:	MERRILL S HOHMAN - US EPA/WASTE MANAGEMENT DIVISION		
Date:	June 8, 1987		
Format:	LETTER	No. Pgs:	6
AR No.	16.04.1	Document No.	000169

17.04 SITE MANAGEMENT RECORDS - SITE PHOTOGRAPHS/MAPS

Title:	Site Analysis, Davis Solid Waste Disposal, Glocester, Rhode Island [Available in EPA Records Center].		
Date:	August 1985		
Format:	PHOTO, MICROFORM, VIDEO	No. Pgs:	31
AR No.	17.04.1	Document No.	000170

Title:	Site Analysis, Davis GSR Landfill, Glocester, Rhode Island, Volume I [Available in EPA Records Center].		
Date:	October 1990		
Format:	PHOTO, MICROFORM, VIDEO	No. Pgs:	23
AR No.	17.04.2	Document No.	000171

Guidance Documents

EPA guidance documents may be reviewed at EPA-New England Records Center, Boston, Massachusetts.

1. Interim Guidance on Superfund Selection of Remedy, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. (OSWER Directive 9355.0-19). December 26, 1986.

2. Interim Guidance on Potentially Responsible Party Participation in Remedial Investigations and Feasibility Studies, U.S. Environmental Protection Agency. (OSWER Directive 9835.1a) . May 1988.

3. Community Relations in Superfund: A Handbook (Interim Version), U.S. Environmental Protection Agency. Office of Emergency and Remedial Response (EPA/540/G-88/002), June 1988.

4. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, (Comprehensive Environmental Response, Compensation, and Liability Act), U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. (EPA/540/C-89/004) (9355.3-01). October 1988.

5. Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual, (EPA/540/1-89/001) March 1, 1989.

6. Procedures for Completion and Deletion of National Priorities List Sites , U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. (EPA/540/G-89/002) (9320.2-3A). April 1989.

7. U.S. EPA Region I Supplemental Risk Assessment Guidance for the Superfund Program Part 1: Public Health Risk Assessment and Part 2: Ecological Risk Assessment, (Comprehensive Environmental Response, Compensation, and Liability Act) (EPA/901/5/89-001). June 1989.

8. Interim Final Guidance on Preparing Superfund Decision Documents, U.S. Environmental Protection Agenc, Office of Emergency and Remedial Response. (9355.3-02). July 1989.

9. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual, (OSWER 9285-7-01). September 29, 1989.

10. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A), Interim Final (EPA/540/1/-89-002). December 1989.

11. Guidance for Data Usability in Risk Assessment, Interim Final, (EPA/540/G-90/008). October 1990.

Guidance Documents (continued)

12. Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. (EPA/540/P-91/001). February 1991.

13. Guide to Developing Superfund No Action, Interim Action, and Contingency Remedy RODs, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. (OSWER Directive 9355.3-02FS-3) April 1991.

14. Memorandum from Don R. Clay, Assistant Administrator, U. S. Environmental Protection Agency Office of Solid Waste and Emergency Response to Directors, Waste Management Division, Regions I, IV, V, VII, VIII; Directors, Hazardous Waste Management Division, Regions III, VI, IX; Director, Hazardous Waste Division, Region X (OSWER Directive 9355.0-30), April 22, 1991, (discussing the role of the baseline risk assessment in Superfund remedy selection decisions).

15. Memorandum from Henry L. Longest II, Director, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, to Addressees. (OSWER Directive 9355.7-02). May 23, 1991.

16. Presumptive Remedy for CERCLA Municipal Landfill Sites, U.S. Environmental Protective Agency, Office of Solid Waste and Emergency Response. (EPA/540/F/93/035) (GRO1-1-3). September 1993.

17. Update to the Procedures for Completion and Deletion of National Priorities List Sites Guidance Document Regarding the Performance of Five-Year Reviews. Memo from Henry L. Longest II and Bruce Diamond to Director, Waste Management Division, Regions I, IV, V, VII and VIII. (OSWER Directive 9320.2-3B)

DAVIS GSR LANDFILL SUPERFUND SITE

APPENDIX B

TABLES AND FIGURES

TABLE B-1: SUMMARY OF CONTAMINANTS OF CONCERN IN OFF-LANDFILL GROUNDWATER

Contaminants of Concern	Maximum Concentration (mg/l)	Frequency of Detection
benzene	0.0089	5/17
1,2,4-trimethylbenzene	0.0016	3/17
1,3,5-trimethylbenzene	0.003	1/17
arsenic	0.0299	5/17
barium	0.658	13/17
beryllium	0.0013	4/17
chromium	0.167	1/17
lead	0.0173	2/17
manganese	4.28	16/17
nickel	0.127	6/17

TABLE B-2: SUMMARY OF CONTAMINANTS OF CONCERN IN SURFACE WATER

Contaminants of Concern	Maximum Concentration (mg/l)	Frequency of Detection
antimony	0.06	2/31
arsenic	0.0119	1/31
barium	0.544	31/31
beryllium	0.005	1/31
lead	0.171	18/31
manganese	6.46	31/31
vanadium	0.0682	3/31

TABLE B-3: SUMMARY OF CONTAMINANTS OF CONCERN IN SEDIMENT

Contaminants of Concern	Maximum Concentration (mg/kg)	Frequency of Detection
benzo(a)anthracene	0.083	3/18
benzo(a)pyrene	0.3	5/18
benzo(b)fluoranthene	0.19	4/18
benzo(k)fluoranthene	0.2	4/18
chrysene	0.095	3/18
indeno(1,2,3-cd)pyrene	0.024	1/18
antimony	23.3	6/18
arsenic	31.4	13/18
beryllium	4.7	16/18
manganese	15,600	18/18
thallium	14	3/18
vanadium	60.4	16/18

TABLE B-4: SUMMARY OF CONTAMINANTS OF CONCERN IN AQUEOUS LEACHATE

Contaminants of Concern	Maximum Concentration (mg/L)	Frequency of Detection
antimony	0.0136	1/2
arsenic	0.0036	2/2
barium	0.758	2/2
lead	0.0191	2/2
manganese	1.69	2/2
nickel	0.098	2/2

TABLE B-5: SUMMARY OF CONTAMINANTS OF CONCERN IN LEACHATE SOIL

Contaminants of Concern	Maximum Concentration (mg/kg)	Frequency of Detection
aroclor 1248	0.045	2/18
antimony	2.5	1/18
arsenic	7	7/18
barium	293	18/18
beryllium	0.61	15/18
manganese	1680	18/18
vanadium	12.4	18/18
zinc	165	12/18

TABLE B-6: SUMMARY OF CONTAMINANTS OF CONCERN IN SURFICIAL SOIL

Contaminants of Concern	Maximum Concentration (mg/kg)	Frequency of Detection
benzo(a)anthracene	0.076	2/20
benzo(a)pyrene	0.064	1/20
benzo(b)fluoranthene	0.086	2/20
benzo(k)fluroanthene	0.063	1/20
chrysene	0.074	1/20
aroclor 1254	0.052	4/20
arcolor 1260	0.31	2/20
arsenic	3.9	2/20
barium	57.6	20/20
beryllium	0.85	12/18
cadmium	0.79	3/18
manganese	656	20/20
mercury	0.19	7/20
nickel	10.9	19/20
thallium	0.36	1/20
vanadium	21.8	20/20
zinc	800	18/20

TABLE B-7: SUMMARY OF CONTAMINANTS OF CONCERN IN BORING SOILS

Contaminants of Concern	Maximum Concentration (mg/kg)	Frequency of Detection
benzo(a)anthracene	30	2/48
benzo(a)pyrene	21	4/48
benzo(b)fluoranthene	17	4/48
benzo(k)fluoranthene	22	4/48
bis(2-ethylhexyl)phthalate	120	17/47
chrysene	29	2/48
fluoranthene	98	5/48
fluorene	80	5/48
phenanthrene	150	7/48
pyrene	73	4/48
indeno(1,2,3-cd)pyrene	10	1/48
dieldrin	0.22	2/48
aroclor-1254	1.6	3/48
antimony	5.4	2/43
arsenic	14.3	33/45
barium	545	41/46
manganese	593	45/46
nickel	242	30/46
selenium	12.5	6/45
silver	12.3	7/42
vanadium	29.2	35/46
zinc	1280	30/46

TABLE B-8: SUMMARY OF CONTAMINANTS OF CONCERN IN ON-SITE LANDFILL GAS

Contaminants of Concern	Max. Modeled Ambient Conc. (mg/m^3)	Frequency of Detection
benzene	4.3E-04	2/4
dichlorodifluoromethane	2.5E-05	1/4
1,2-dichloropropane	2.3E-05	1/4
1,4-dichlorobenzene	8.3E-05	1/4
ethylbenzene	5.1E-04	4/4
methylene chloride	1.8E-05	1/4
tetrachloroethylene	3.4E-05	1/4
toluene	5E-05	4/4
1,1,1-trichloroethane	2.8E-05	1/4
trichloroethylene	2.7E-05	1/4
vinyl chloride	2E-03	3/4

TABLE B-9: SUMMARY OF CONTAMINANTS OF CONCERN IN OFF-SITE LANDFILL GAS

Contaminants of Concern	Max. Modeled Ambient Conc. (mg/m^3)	Frequency of Detection
benzene	2.01E-05	2/4
dichlorodifluoromethane	1.7E-07	1/4
1,2-dichloropropane	1.63E-07	1/4
1,4-dichlorobenzene	3.9E-06	1/4
ethylbenzene	2.37E-05	4/4
methylene chloride	1.22E-07	1/4
tetrachloroethylene	2.39E-07	1/4
toluene	1.40E-06	4/4
trichloroethylene	1.89E-07	1/4
vinyl chloride	1.87E-06	3/4

DAVIS GSR LANDFILL
SUMMARY OF RISKS AND HAZARD INDICES

MEDIA / EXPOSURE POINT	RECEPTOR	EXPOSURE PATHWAY	REASONABLE MAXIMUM EXPOSURE			AVERAGE CASE		
			RISK	HAZARD INDEX	TARGET ORGAN HI > 1.0	RISK	HAZARD INDEX	TARGET ORGAN HI > 1.0
Groundwater								
Off-Landfill								
Overburden	Future Resident (Adult)	Ingestion	3.0E-04	5.5	CNS=4.1 Skin=1.2	9.9E-05	1.2	
Bedrock	Future Resident (Adult)	Ingestion	5.5E-04	8.1	CNS=5.1 Skin = 2.7	1.4E-04	2.7	CNS=2.0
Surface Water								
Landfill Area B	Current Trespasser (Child)	Ingestion Dermal Contact	-- --	0.02 0.0005	-- --	-- --	0.012 0.0009	-- --
Off-Landfill	Current Trespasser (Child)	Ingestion Dermal Contact	7.9E-07 3.1E-08	0.06 0.0022	-- --	1.5E-07 5.8E-09	0.014 0.0005	-- --
Sediments								
Landfill Area B	Current Trespasser (Child)	Ingestion	8.0E-07	0.02	--	5.7E-07	0.015	--
Off-Landfill	Current Trespasser (Child)	Ingestion	5.3E-06	0.48	--	1.8E-06	0.073	--
Leachate								
Landfill Area A								
Aqueous	Current Trespasser (Child)	Dermal Contact	4.3E-09	0.0006	--	4.3E-09	0.0006	--
Soil	Current Trespasser (Child)	Ingestion Dermal Contact	9.5E-07 8.2E-09	0.051 --	-- --	3.2E-07 4.9E-09	0.016 --	-- --

DAVIS GSR LANDFILL
SUMMARY OF RISKS AND HAZARD INDICES

MEDIA / EXPOSURE POINT	RECEPTOR	EXPOSURE PATHWAY	REASONABLE MAXIMUM EXPOSURE RISK	REASONABLE MAXIMUM EXPOSURE HAZARD INDEX	REASONABLE MAXIMUM EXPOSURE TARGET ORGAN HI > 1.0	AVERAGE CASE RISK	AVERAGE CASE HAZARD INDEX	AVERAGE CASE TARGET ORGAN HI > 1.0
Surficial Soils								
Landfill Area A	Current Trespasser (Child)	Ingestion	1.6E-07	0.0051	--	9.2E-08	0.0034	--
		Dermal Contact	2.7E-09	--	--	2.7E-09	--	--
Landfill Area B	Current Trespasser (Child)	Ingestion	7.1E-08	0.0072	--	6.3E-08	0.0057	--
		Dermal Contact	9.5E-09	--	--	7.7E-09	--	--
Off-Landfill	Current Trespasser (Child)	Ingestion	1.1E-06	0.024	--	6.5E-07	0.013	--
		Dermal Contact	5.7E-08	0.000018	--	1.3E-08	0.0000081	--
Boring Soils								
Off-Landfill	Future Worker (Adult)	Ingestion	2.6E-07	0.029	--	1.2E-07	0.01	--
		Dermal Contact	1.0E-07	--	--	1.0E-07	--	--
Landfill Gas								
On-site								
Landfill Area A	Trespasser (Child)	Inhalation	9.0E-09	0.0000094	--	--	--	--
Hot Spot	Trespasser (Child)	Inhalation	3.9E-07	0.0000051	--	--	--	--
Off-Site								
Residence	Current Resident (Adult)	Inhalation	8.7E-08	0.000019	--	--	--	--
Residence	Future Resident (Adult)	Inhalation	1.4E-07	0.000031	--	--	--	--

N

Scale: 1" = 2000'

2000 0 2000

FIGURE 1

Davis GSR Landfill

HOMES WITHIN 1/2 MILE AND ONE MILE OF DAVIS GSR SITE

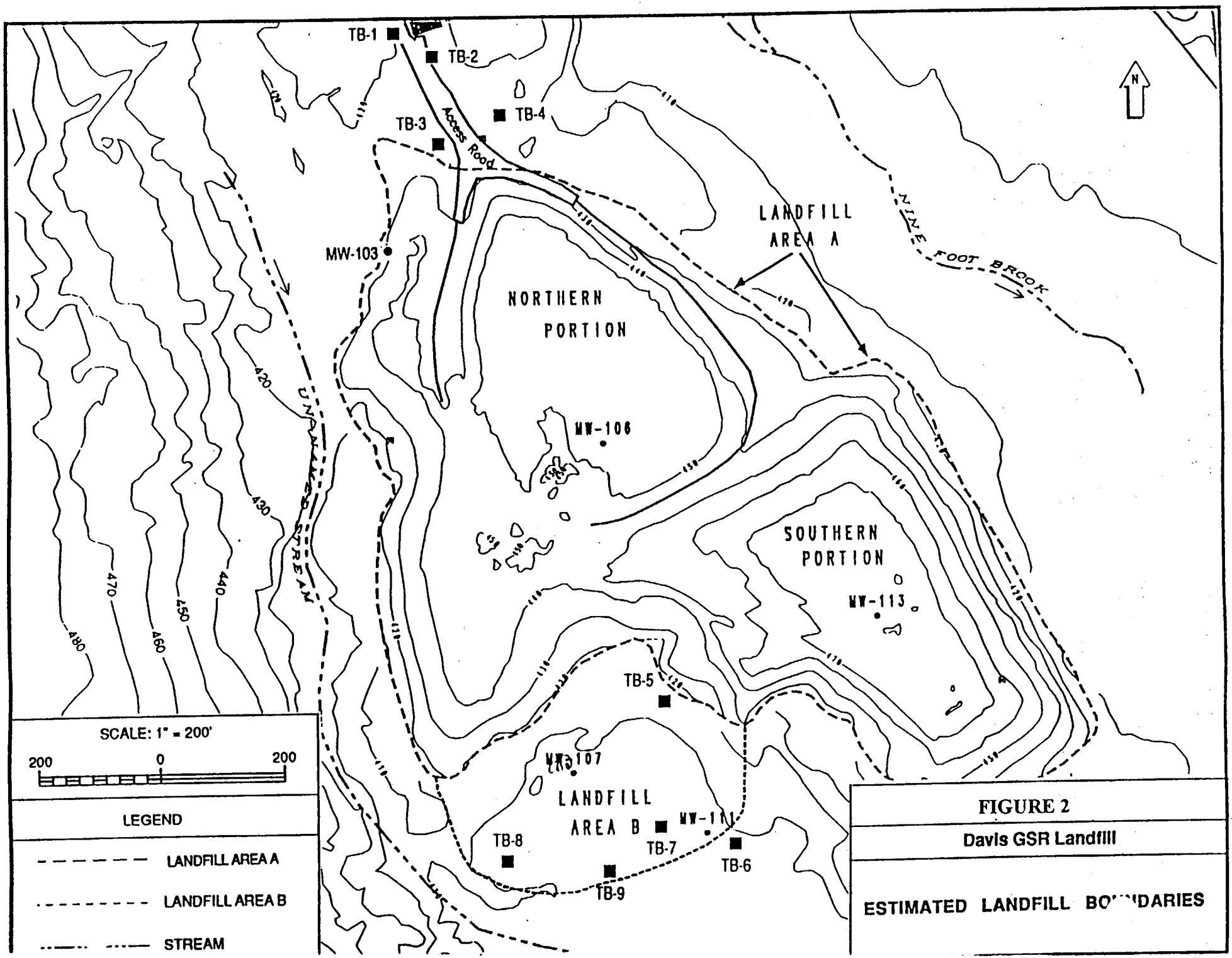


FIGURE 2

Davis GSR Landfill

ESTIMATED LANDFILL BOUNDARIES

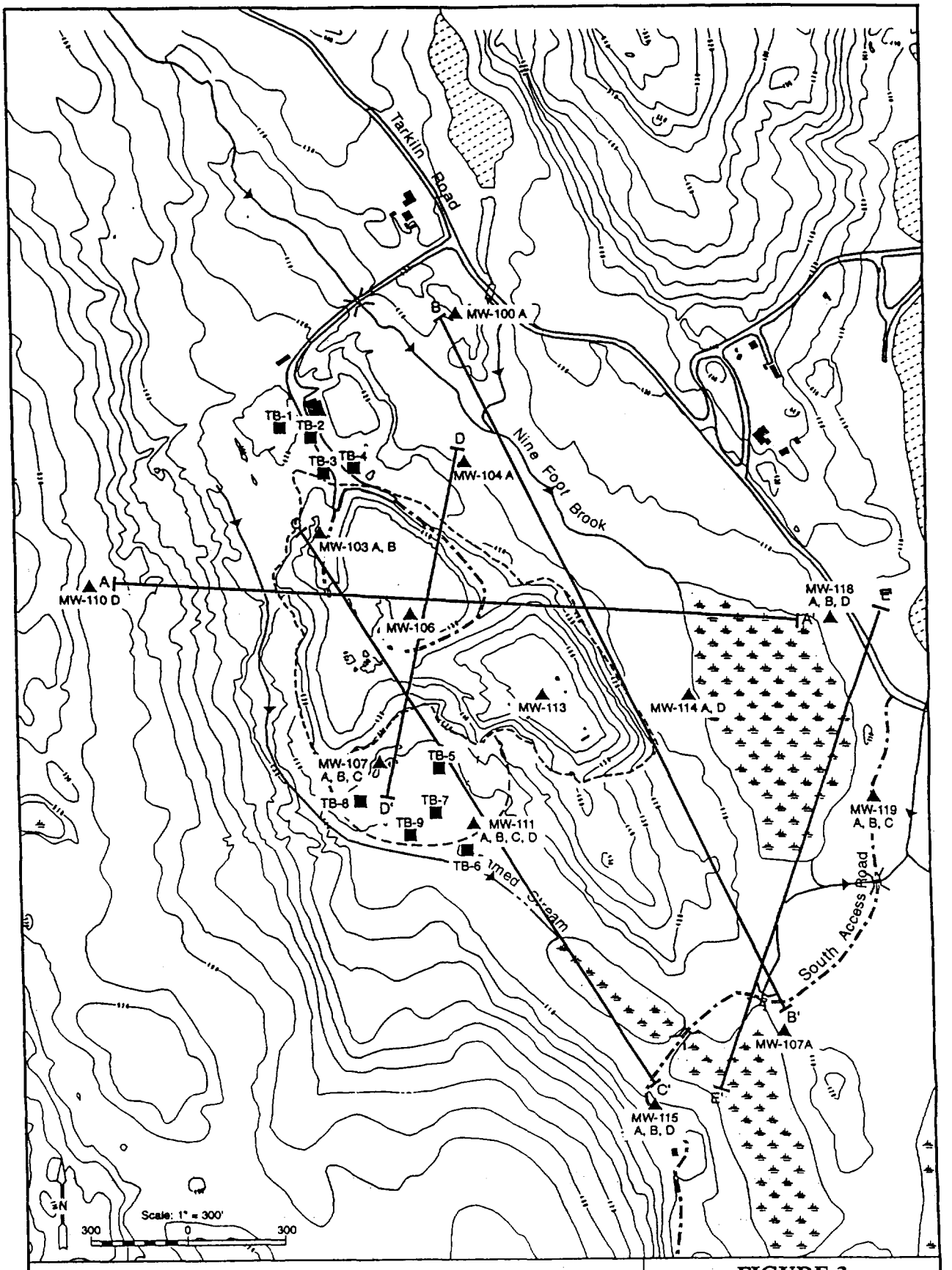
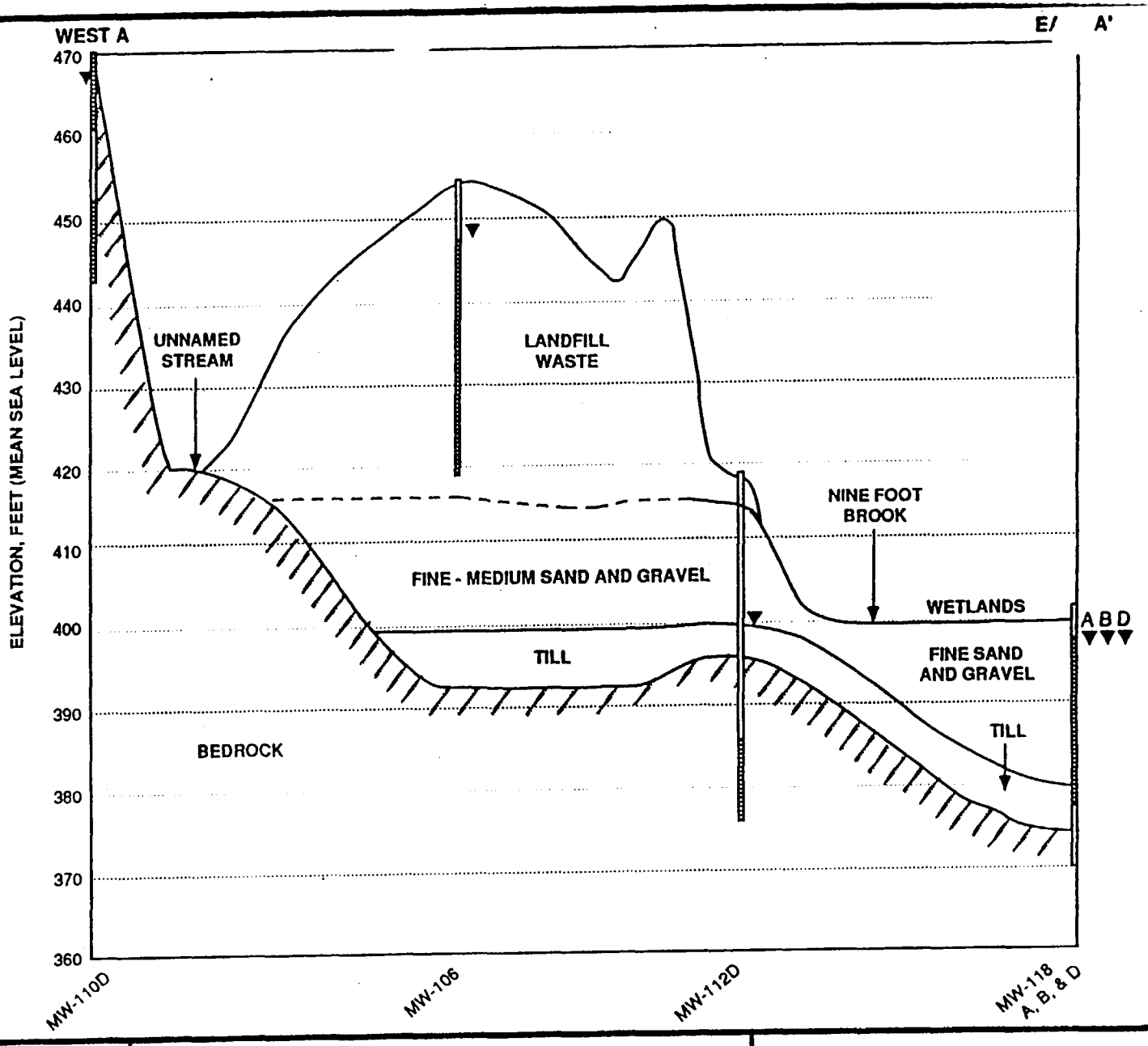


FIGURE 3

Davis GSR Landfill

CROSS SECTION PLAN



LEGEND

- - - - - INFERRED

1" = 300' HORIZONTAL

1" = 20' VERTICAL

▼ Water Level on 4/20/93

FIGURE 4

DAVIS GSR Landfill

CROSS SECTION A

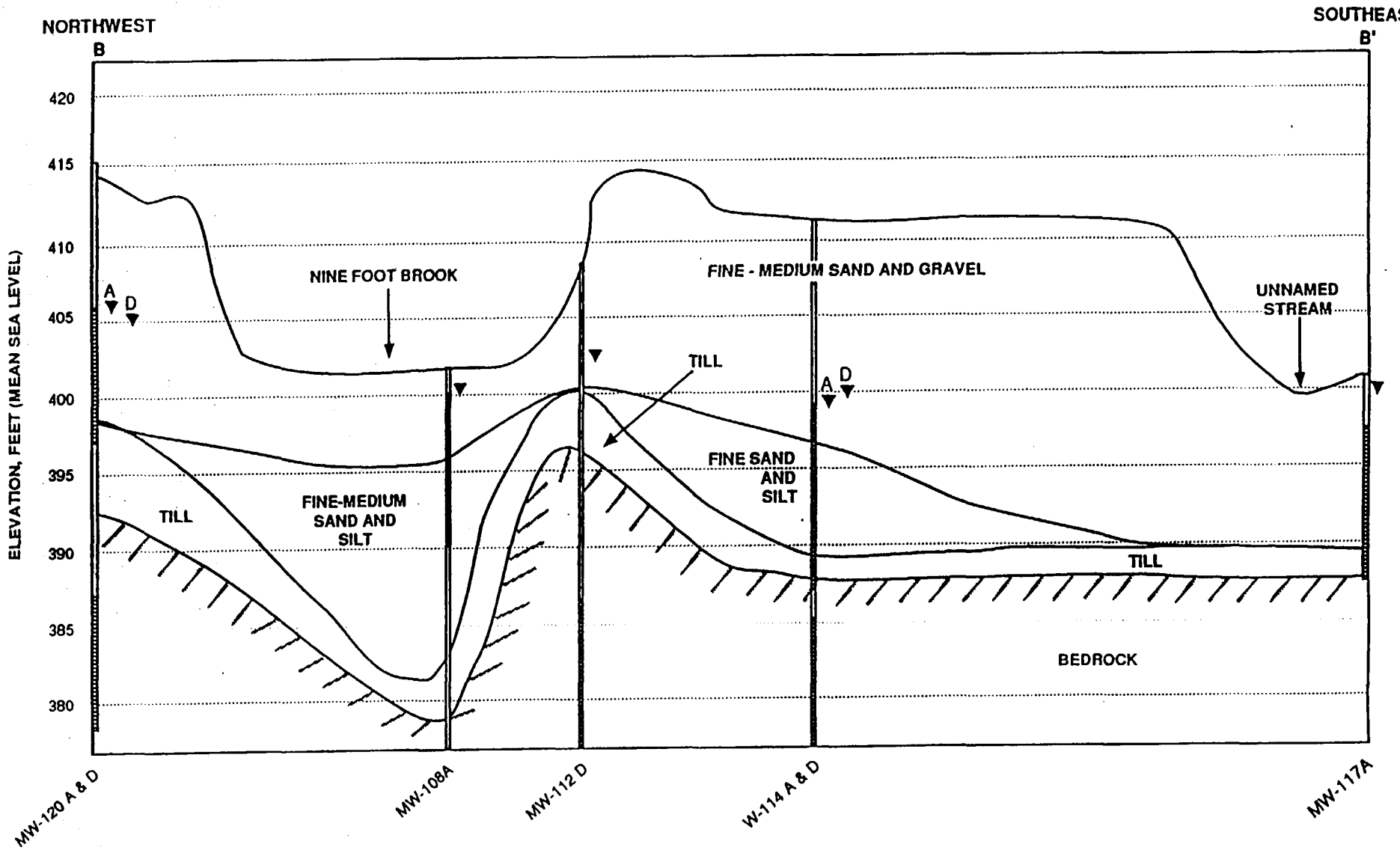


FIGURE 5

DAVIS GSR Landfill

▼ Water Level on 4/20/93

CROSS SECTION B

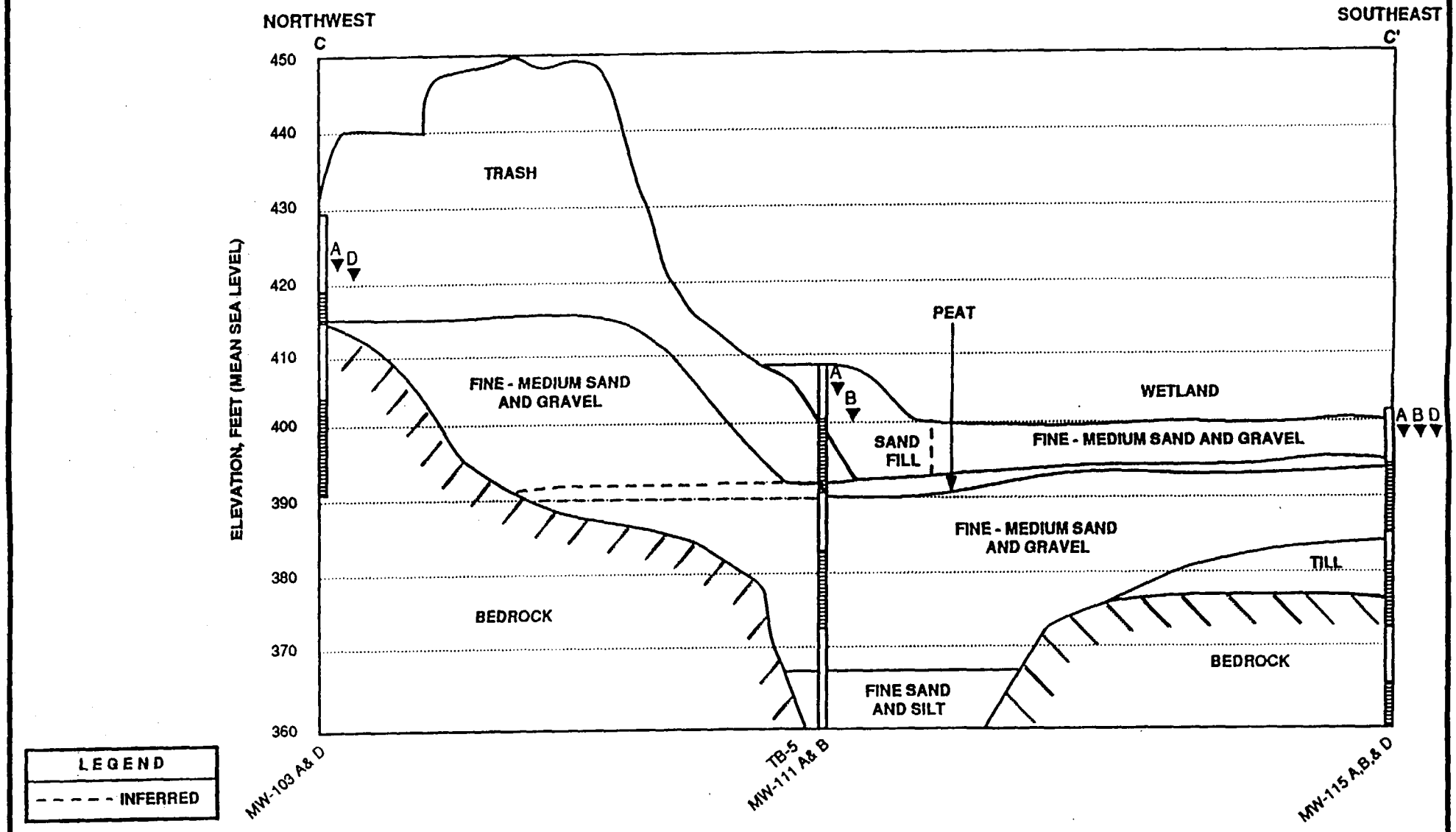
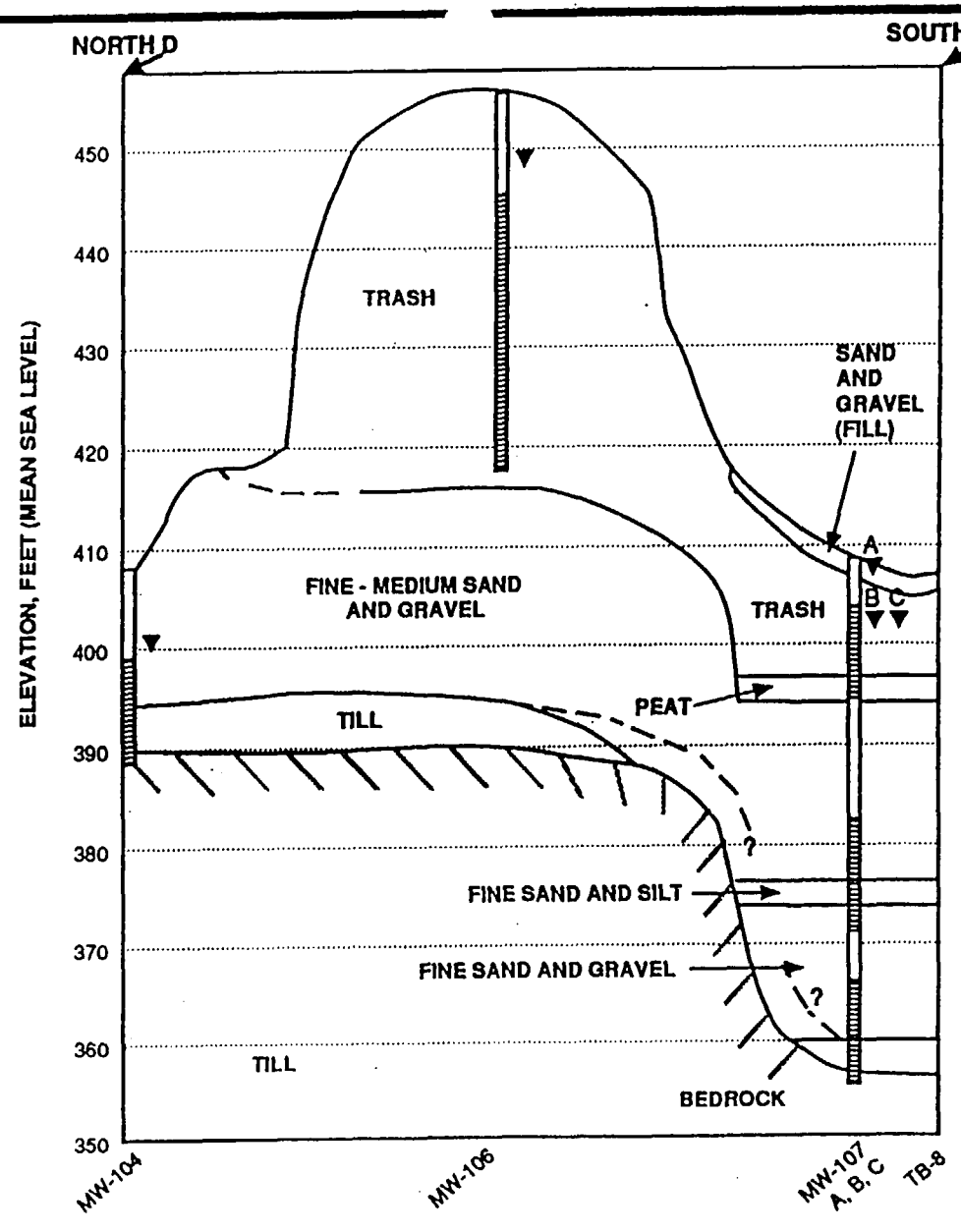


FIGURE 6

DAVIS GSR Landfill

▼ Water Level on 4/20/93

CROSS SECTION C



LEGEND

- - - - - INFERRED

1" = 300' HORIZONTAL

1" = 20' VERTICAL

▼ Water Level on 4/20/93

FIGURE 7

DAVIS GSR Landfill

CROSS SECTION D

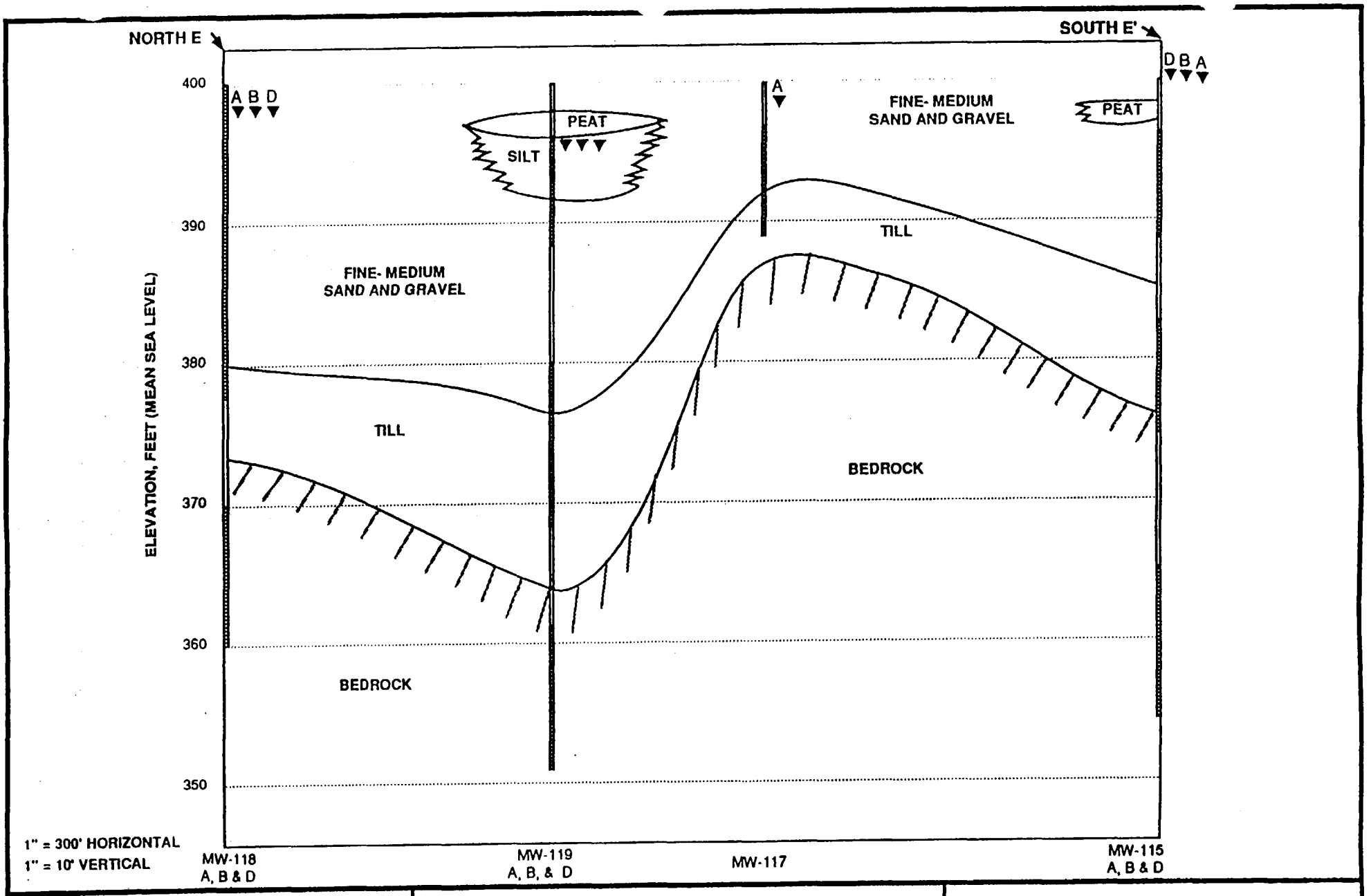


FIGURE 8

DAVIS GSR Landfill

▼ Water Level on 4/20/93

CROSS SECTION E

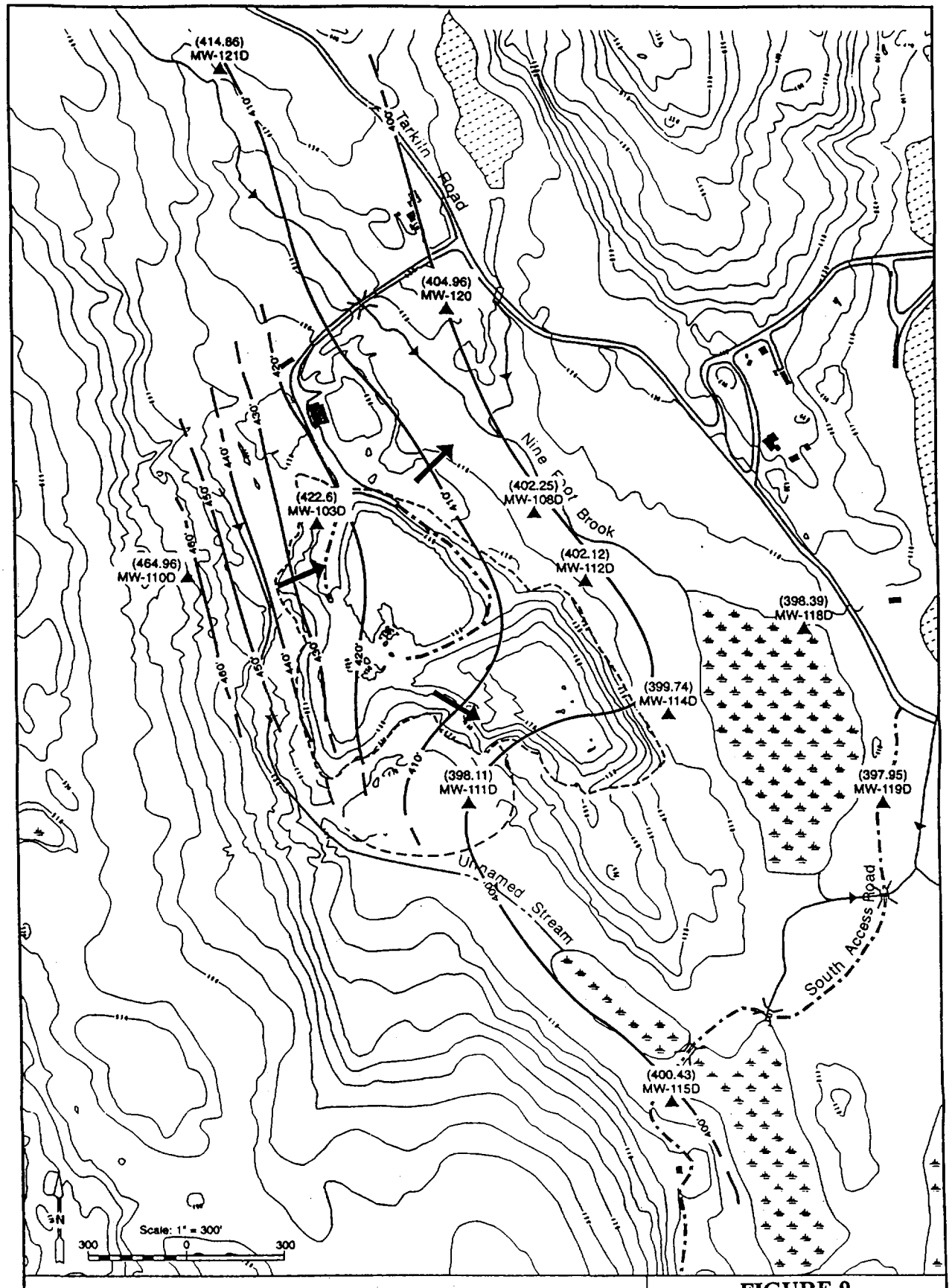


FIGURE 9

Davis GSR Landfill

BEDROCK GROUNDWATER ELEVATION CONTOUR MAP

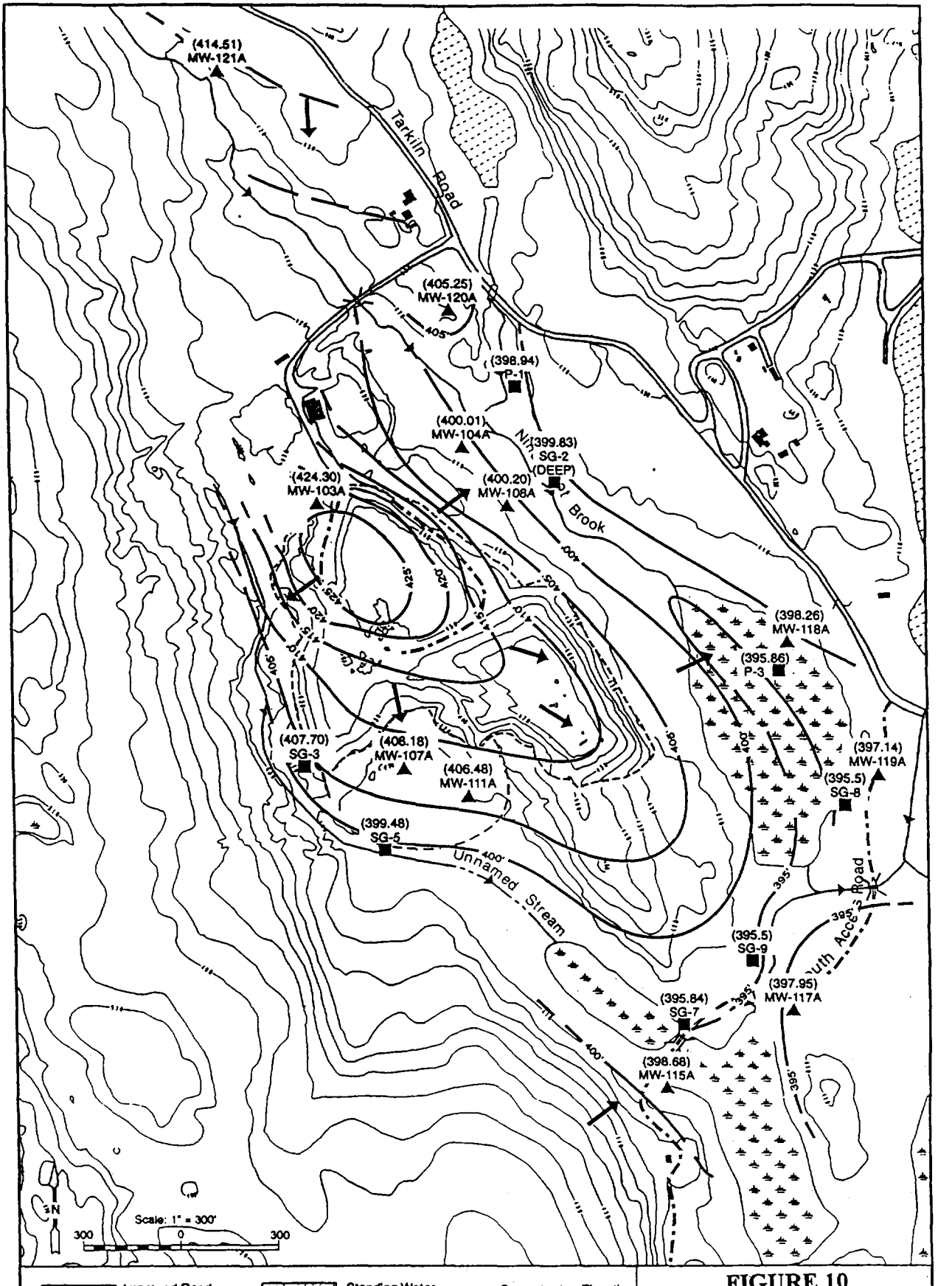


FIGURE 10

Davis GSR Landfill

OVERBURDEN GROUNDWATER
ELEVATION CONTOUR MAP

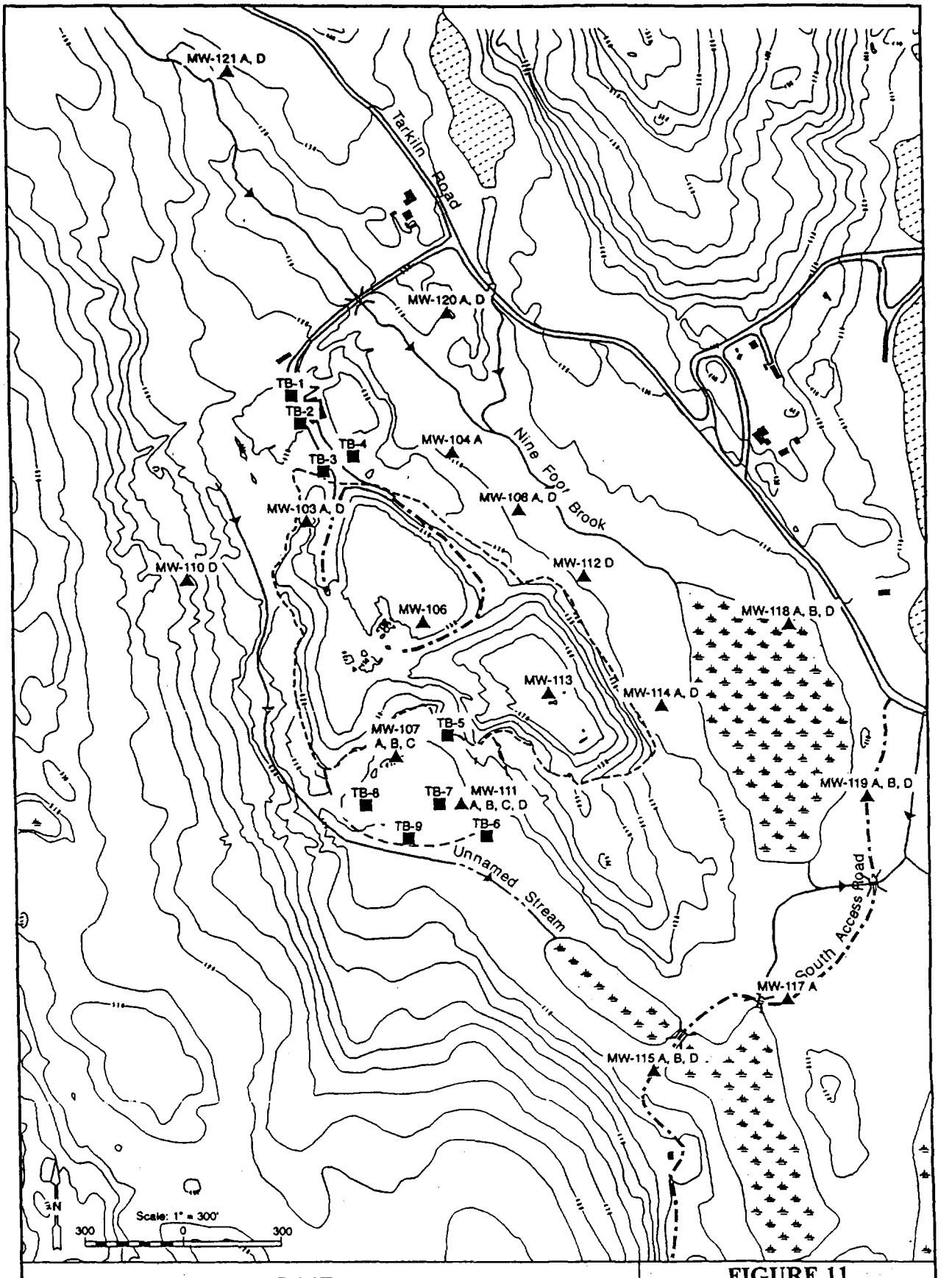


FIGURE 11

Davis GSR Landfill

FINAL MONITORING WELL AND TEST BORING LOCATIONS

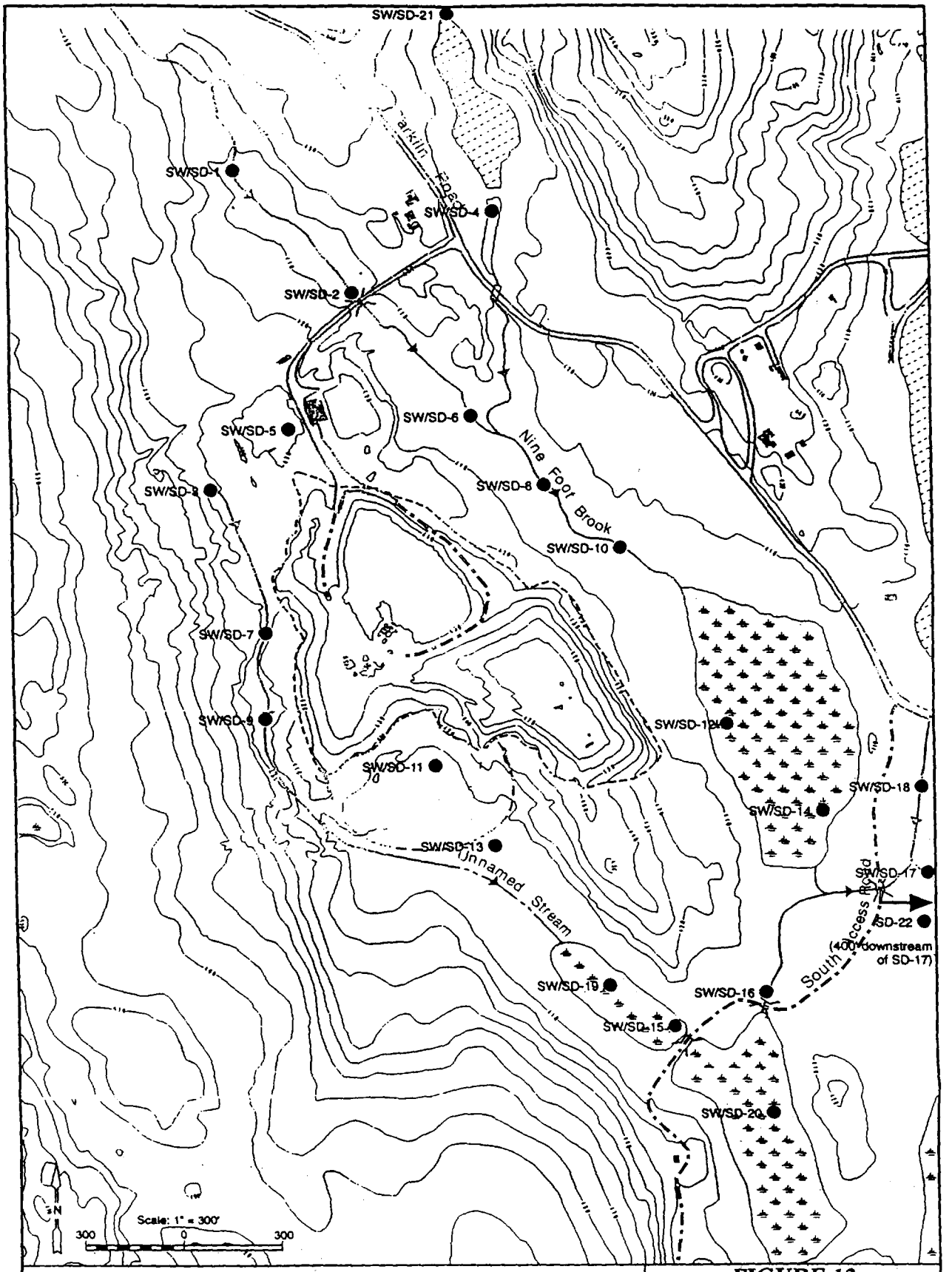


FIGURE 12

Davis GSR Landfill

SURFACE WATER/SEDIMENT SAMPLING LOCATIONS

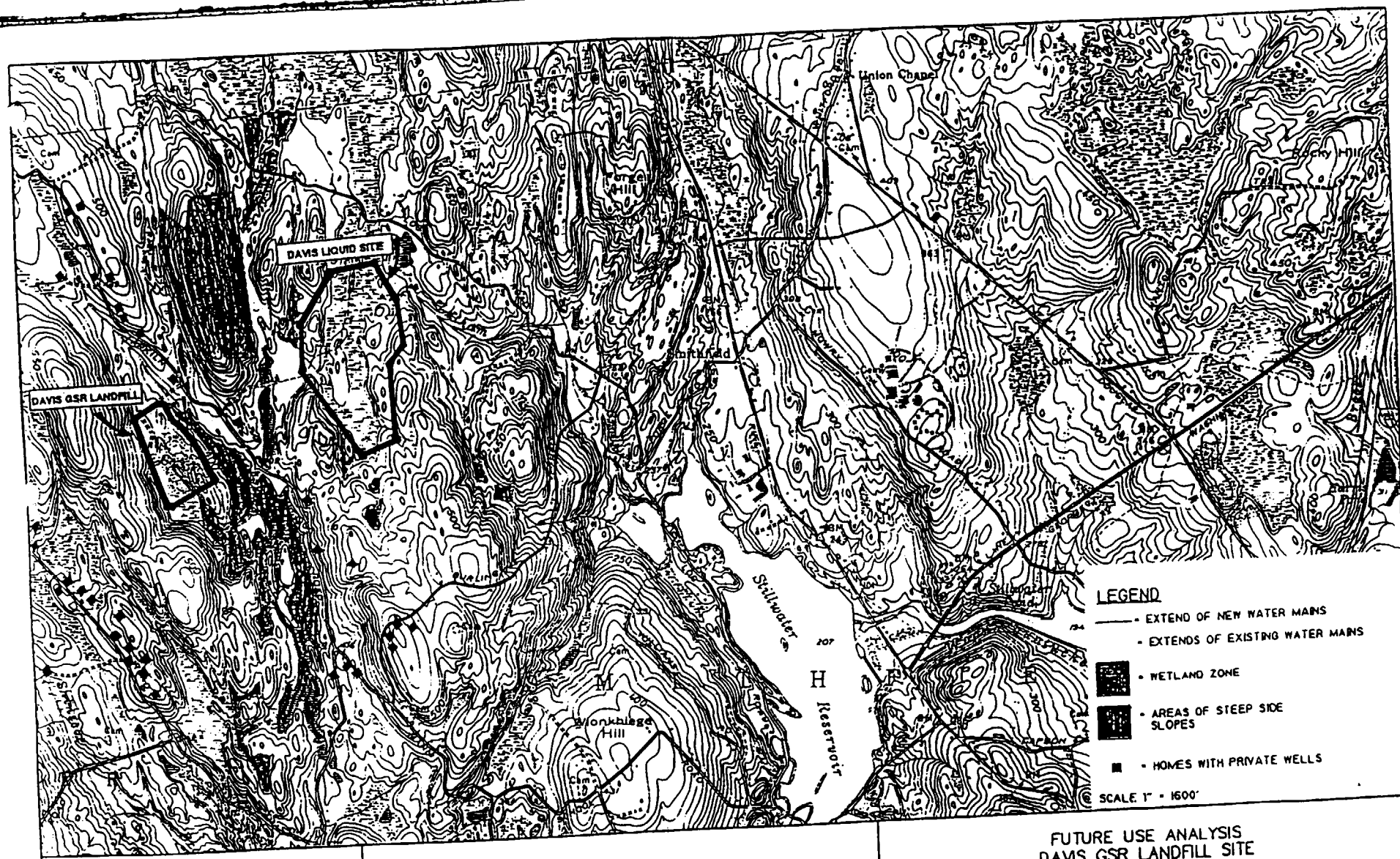


FIGURE 13

AREAS OF POTENTIAL
FUTURE DEVELOPMENTS

FUTURE USE ANALYSIS
DAVIS GSR LANDFILL SITE
GLOCESTER/SMITHFIELD, RHODE ISLAND

DAVIS GSR LANDFILL SUPERFUND SITE

APPENDIX C

RIDEM DECLARATION OF CONCURRENCE

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

26 September 1997

Mr. Harley Laing, Director
Office of Site Remediation & Restoration
U.S. Environmental Protection Agency - New England
John F. Kennedy Federal Building, Mailcode: HIO
Boston, MA 02203

RE: Record of Decision for the Davis GSR Landfill Superfund Site, Glocester/Smithfield, Rhode Island

Dear Mr. Laing,

The Department of Environmental Management (DEM) has completed its review of the Record of Decision (ROD) for the Davis GSR Landfill Superfund Site. The Environmental Protection Agency's (EPA's) selected alternative for the site, as presented in the document, is a No Action decision.

DEM has worked on this site with your Agency from the early investigatory stages up through this current decision milestone. Based upon our review of this ROD and the results of remedial investigation activities conducted to date, we offer our concurrence on the decision. However, based upon our knowledge of the site operator's waste disposal practices at the Davis Liquid Waste Superfund Site, we do so with some reservation. As you are well aware, Mr. William Davis permitted the dumping of thousands of gallons of liquid hazardous waste at the Davis Liquid Waste site and currently, your Agency is overseeing the removal action of thousands of drums containing hazardous wastes. These drums were only recently discovered while implementing the remedial action for the site and were not expected.

Certainly, you can appreciate our concern, as well as the concern of the local communities, for the potential unknowns associated with the Davis GSR Landfill. We have no assurances that the Davis GSR Landfill does not have its own "surprises" similar to those discovered many years later at the Davis Liquid site. Thankfully, all of the monitoring to date indicates that there is no significant source of contamination.

DEM recognizes that CERCLA does not allow for remedial actions based merely upon unknowns and hearsay, however, we are requesting that EPA remain ready to respond at this site in the event that future monitoring indicates a concern.

The Department wishes to specifically emphasize the following aspects of the Record of Decision:

- Monitoring:

  Monitoring is the critical component of this No Action decision. It is the only line of defense provided for in the ROD to protect the local population from unexpected occurrences at the site. EPA and DEM must work together with the local community to design a plan that provides appropriate protection. Such a plan must also include domestic well monitoring. Also, while the ROD states that at least five years of monitoring will be conducted, DEM strongly requests that EPA commit to longer duration.

  EPA and DEM will review the monitoring data on an annual basis. Regular monitoring and review are necessary to evaluate the long-term effectiveness of the remedy and to ensure the continued protection of human health. If this data reveals that there are escalating risks at the Site, then we both must reevaluate the need to conduct additional monitoring and/or other remedial actions at the Site.

- Five-Year Review:

  The ROD states that *no statutory five-year review will be undertaken.* DEM did not concur with this language and requested that EPA commit to conducting a five-year review. Your Agency has since committed to conducting a five-year review and consider further monitoring if necessary. While we recognize that CERCLA does not require such a review as part of a No Action decision, such a review is not prohibited and is the prudent choice with this site and its uncertainties.

- Community Relations:

  Community participation is extremely important to DEM and is required under CERCLA/SARA. During the course of our investigations at this site and, in particular, during the Proposed Plan and ROD phases, there seemed to be poor communication, or lack thereof, between EPA and the local citizens. EPA awarded a Technical Assistance Grant (TAG) to the local community for participation in this site and the Davis Liquid Waste Site, however, the TAG never seemed to be involved in this site.

  DEM believes that there is still a role for the TAG in the activities at this site and we encourage EPA to attempt to keep them involved. We believe that their participation in the development of a site monitoring plan along with the actual review of the data would be extremely beneficial. By providing them with access to the data, they will know firsthand about the performance of the remedy and there will be no illusion that we are not providing them with all the facts. They can also provide us with real-time information regarding

changing site conditions, site access concerns and development issues which might affect the risk to human health and the environment.

Finally, as mentioned in the ROD, this No Action decision does not limit the State's ability to carry out any actions under State authority. For this reason, we have requested that EPA provide us with information gathered as a result of its Potential Responsible Party (PRP) search. In the event that DEM finds it necessary to pursue action under State authority, such information would be valuable in aiding our action.

DEM looks forward to working with EPA in developing and implementing a monitoring plan for the Site in a timely manner.

Sincerely,

James W. Fester, P.E., Associate Director
Bureau of Environmental Protection
Department of Environmental Management

cc: Andrew McLeod, Director, RIDEM
John DeVillars, Regional Administrator, USEPA
Edward Szymanski, DEM, Associate Director
Paul Fogarty, Town Council President, Glocester
Jeffrey Minor, Town Administrator, Smithfield
Terrence Gray, DEM, Office of Waste Management
Claude Cote, Esquire, DEM, Office of Legal Services

gsrrod.doc/siterem

Attachment 1
Community Relations Activities at the Davis GSR Landfill Site

Davis GSR Superfund Site
Chronology of Community Relation Activities

June 1986-	Davis GSR Landfill listed on the Superfund National Priorities List
November 1990-	Information Repository established Greenville and Harmony Public Libraries
December 1990-	Press release announcing start of Remedial Investigation (RI) issued
May 1991-	EPA conducts community interviews with local officials and residents
November 1991-	EPA Community Relations Plan made available to public
November 1991-	Press release issued announcing EPA RI underway at Davis GSR / public is invited to attend meeting.
November 1991-	Fact sheet on remedial investigations issued
December 1991-	Community meeting held to discuss remedial investigations
January 1992-	"Dump the Dump" awarded Technical Assistance Grant (TAG)
1991- 1994-	EPA conducts Remedial Investigation at Davis GSR
May 1997-	Repository relocated to E. Smithfield library
June 1997-	EPA issues notice on RI results and no action proposed plan
June 1997-	EPA issues a press release announcing proposed plan and meetings
June 1997-	EPA mails out proposed plan to community
June 1997-	EPA hold public meeting to discuss results of RI
June-August 1997-	60-day public comment period
June 1997-	Administrative Record placed at E. Smithfield Library
July 1997-	EPA holds formal public hearing to accept comment on the proposed plan

Attachment 2
Transcript of the July 15, 1997 Public Hearing

ENVIRONMENTAL PROTECTION AGENCY

REGION I - NEW ENGLAND

PUBLIC HEARING IN RE:

DAVIS GSR LANDFILL SUPERFUND SITE

----------/

JULY 15, 1997
7:00 P. M.

SMITHFIELD TOWN HALL
SMITHFIELD, RI

BEFORE:

RICHARD BOYNTON

ANNA KRASKO

SARAH WHITE

ORIGINAL

(COMMENCED AT 7:07 P. M.)

MR. BOYNTON: My name is Richard Boynton of the New England EPA office located in Boston and I'll serve as the Hearing Officer for tonight's hearing on the Davis GSR site located in Glocester and Smithfield proposed plan. Also here with me tonight are Anna Krasko, the EPA project manager for the site and Sarah White, EPA's community relations specialist.

The purpose of tonight's hearing is to formally accept oral comments on the Davis GSR proposed plan which was released on June 22nd and was described as a public meeting held at this location on June 23rd. Public comment period began on June 24th and will end on July 23rd. Anna will give a brief overview of the plan and then I'll open the meeting for oral comments.

If you would like to make an oral comment, please state your name and affiliation because we are going to be recording the proceedings for the responsiveness summary which we will put

together after the comment period closes.

Are there -- well, Anna, would you please give a brief overview of the plan?

MS. KRASKO: Thank you, Dick. As Dick just mentioned, last month EPA announced the proposed plan for actions for the Davis GSR landfill superfund site. In its plan EPA recommended that no further cleanup under CERCLA be done at this site because the low levels of contaminants present do not pose an unacceptable threat to human health or the environment.

Before arriving at this conclusion EPA conducted an extensive study of the extent and nature of contamination at the Davis GSR landfill superfund site and determined that the potential for adverse ecological and human health risks from this site is unlikely. EPA proposed, however, that monitoring of the groundwater, including residential well monitoring, be continued to verify that no unacceptable exposures occur in the future.

The state supports EPA's recommendation that no remedial action at the site is

warranted and that monitoring be continued. The proposal by EPA not to pursue further action at this site is not a determination that no action is warranted under other regulations or statutes. It simply means that EPA has determined that the CERCLA cleanup authority is not the appropriate mechanism to handle the closure of this municipal waste landfill. Some actions may be required in the future to satisfy requirements of the pertinent state laws. Thank you.

MR. BOYNTON: Thank you, Anna. Is there anybody here who would like to make an oral comment?

MR. KAVANAUGH: I would like to go on record as indicating --

MR. BOYNTON: Your name please.

MR. KAVANAUGH: My name is Paul Kavanaugh. I live at 251 Log Road in Smithfield and I am the President of Dump to Dump. And I would like to go on record first indicating my presence, and secondly, as a request for a continuation of the comment period because I think that the indications

first off is the fact that the poor turn out tonight is indication to me of the fact that the -- a number of the residents in that area, and there has been a considerable amount of construction within maybe a mile of that site, that they probably don't even have knowledge of the GSR landfill. And I would like to be able to or our organization would like to be able to contact those people so that in fact they can be informed about the location of the GSR landfill and be able to have their comments included into any public hearing, any public record before a final decision can be made.

MR. BOYNTON: For those of you who just arrived late, we opened the hearing and we are hearing oral comments. If you would like to make oral comments just give your name, your address and you can have your oral comments put in the record by our court reporter. If not, you can submit written comments at the address that's in our proposed plan and those will be entered into the record as well. Does anyone else want to make an

oral comment? Mr. Benick?

MR. BENICK: I don't know if it's in the nature of a comment. Is it appropriate to ask a question?

MR. BOYNTON: After I close the formal part of the hearing I'll open it for informal questions and then we can have some dialog on how we did what we did.

MR. BENICK: Okay.

MR. BOYNTON: Mr. Kavanaugh has asked that we extend the comment period, so I'm going to make a decision right now to extend the comment period for an additional 30 days beyond the July 23rd date which was -- we'll keep the record open for that additional time. Yes, sir?

MR. FOGARTY: Paul Fogarty, President of the Glocester Town Council. I was at the last meeting that you had here about three weeks ago and I'm just here again to, you know, express my concerns over being taken off the list. It sounds all nice and everything, but I'm just very leery of it in that there's no plan on testing these wells

and they haven't been tested, was it, since 1994 they haven't been tested, so you are talking three years now and I don't think there is any plans to retest them and no one knows what is buried up there and with the superfund having all the money and the state having no money, you know, I wanted to be -- our Council meeting is Thursday night and we have a resolution we are going to act upon stating this and we'll forward it to you, but we are just very leery of being taken off the -- for both Smithfield and Glocester, the superfund. They are the ones with all the dollars to do everything. And just having the testing is a big thing. It would make the people, you know, like no one knows what is up there. It is buried. Barrels or whatever, it could be barrels that could corrode a while, you know, five years from now and who knows what's in them and with all the water there, Nine Foot Lake, Waterman's Lake is not that far away. Anything could happen. It would be a catastrophe up there and we strongly feel that the government should submit some sort of

plan or whatever that they are still going to monitor this and that they will assume any responsibility if something comes up.

MR. BOYNTON: Are there any other comments for the record? If not, I'll close the hearing, formal part of the hearing and then open it for general questions.

We'll be making a decision after the close of the comment period and tonight I extended the comment period for an additional 30 days. Originally it was to close on July 23rd, so I extended it and did we make a public announce of that?

MS. WHITE: Yes, we will.

MR. BOYNTON: We'll do another press release.

MS. WHITE: To everybody on the mailing list and I'll try to get the additional names from new comers.

MR. BOYNTON: That will keep the record open for an additional 30 days after July 23rd, so if you want to put in written comments, you can send them to the address that's in our proposed plan and we welcome all

your comments and after the comment period closes, we'll take all this information under consideration and we'll make a decision on what we are going to do there which will include how we are going to handle some monitoring and we probably expect to issue that in the fall I would think. Thanks for coming.

(FORMAL MEETING ADJOURNED)

C E R T I F I C A T E

I hereby certify that the foregoing is a true and accurate transcript of the hearing taken before Region I, New England EPA, on July 15, 1997, at 7:00 p. m.

JO ANNE M. SUTCLIFFE, RPR/CSR
Notary Public, State of Rhode Island

ENVIRONMENTAL PROTECTION AGENCY

REGION I - NEW ENGLAND

PUBLIC HEARING IN RE:

DAVIS GSR LANDFILL SUPERFUND SITE

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JULY 15, 1997
7:00 P. M.

SMITHFIELD TOWN HALL
SMITHFIELD, RI

BEFORE:

RICHARD BOYNTON

ANNA KRASKO

SARAH WHITE

ORIGINAL

MR. BOYNTON: Let me just respond to Councilman Fogarty's question. We intend to transfer some money to the state to do some monitoring at the site. We haven't decided what the frequency is, what the progress will be, but we do intend to transfer some money to the state to do some monitoring. Even though the site is delisted, we still can do that. Even though we take a site off the superfund list we can still spend superfund money for that. We intend to do that. We just haven't come up with a monitoring plan. We haven't decided what we are going to do.

MR. KAVANAUGH: What is the purpose of removing a site from the superfund list? Is it a bookkeeping issue?

MR. BOYNTON: Well, it's not a bookkeeping issue. It just that there is no contamination there that would warrant a superfund action. It doesn't exceed any of our acceptable risk parameters for -- there is no cause for us to use the superfund there. So it's no longer necessary to remain on the list. We can still respond to a release just

as if it were a site across the street here which was not on the list. If there is release, we can respond. So being on the list is or off the list doesn't mean you can't respond to a release at the site.

MR. KAVANAUGH: But it is slow.

MR. BOYNTON: No. No. Actually it is faster. If we have a release at a site, we respond immediately if it's an emergency situation. So we can always put it back on the list.

MR. KAVANAUGH: But to detect that emergency might be easier if in fact it is on the list?

MR. BOYNTON: It will be no different. The monitoring program at the site would be based upon what we found in the past and what we believe is there and over the years we haven't found anything.

MR. KAVANAUGH: Okay. But there are two parts of what you just said. One is what we have found there and what we believe is there.

MR. BOYNTON: I don't believe there

is anything left there personally after looking at all the data over the years and looking at all the interviews and all of the information that we got from all the companies that we sent out requests for information to. I don't believe there's any hidden ticking time bomb at that site.

MR. KAVANAUGH: My level of comfort in that response might rise if it were a single site, not associated with the activity that was going on across the site a few hundred yards away and run by the same individual.

MR. BOYNTON: We never found any evidence or any -- we never got any information from anybody that was -- that we could rely that was factual that he was, and I assume you are referring to Mr. Davis, was putting waste over there.

MR. KAVANAUGH: But there was a lot of nighttime activity which starts to indicate that maybe anyone who would record such activity wouldn't be forthcoming certainly to EPA or to anyone else as to what went on.

MR. BOYNTON: The monitoring data didn't show it.

MR. KAVANAUGH: So far it doesn't.

MR. BOYNTON: No. I mean, it's been 20 years. I just don't believe it's there. Of all the sites that I've looked at, and you know, usually you can see something. The level of contamination at this site is so low that I just can't believe there's anything there. I mean, it's just -- it's even lower than some municipal solid waste landfills in Rhode Island. I mean level of contamination.

MR. FOGARTY: Let's suppose ten years from now they find something radically wrong. This is just a -- what happens then? Who is going to take over?

MR. BOYNTON: There is a response by EPA and the state to that release.

MR. FOGARTY: Will the superfund pick it right up?

MR. BOYNTON: If there is a release at that site at any time that causes a hazardous situation, both state and EPA will respond. If they find something in the

groundwater that indicates there's been a release, then they'll respond in some fashion even though it's not on the superfund list. It doesn't have to be on the superfund list. There's many sites that aren't that we respond to.

MR. FOGARTY: What is the normal monitoring period, other sites that have been off the list? How often do they get monitored?

MR. BOYNTON: Annual. If you've been monitoring the site for years and you've found no changes, say, even monthly or quarterly, you go to semiannually and you fin no changes, then you go to annually and you find no changes and you find a decline, then you set up your monitoring program for that. You wouldn't expect to see a change.

MR. FOGARTY: Why hasn't it been tested since 1994?

MR. BOYNTON: We didn't see any reason to do it at that time. The data showed very little contamination.

MR. FOGARTY: Before '94 when was

the last test?

MS. KRASKO: '94 and '92.

MR. BOYNTON: When we were doing the investigation and when we found no problems there naturally we kind of put the site on the back burner because we had more important contamination until finally somebody said let's wrap this site up.

MR. FOGARTY: There is 22 wells?

MR. BOYNTON: I don't know off the top of my head how many wells there are.

MR. FOGARTY: What's the cost to monitor it per year?

MR. BOYNTON: Maybe 40,000, 50,000 if you did annually. If there's 22 wells and you did a full sweep on each well, it has to be a couple thousand dollars a well, right? So I mean, it is a very expensive proposition but I don't think we monitored it for all the parameters. I mean, we didn't find any -- we found one VOC in any -- that had any frequency in our wells and that was benzine and it was much below the mcl. And then all the rest of the stuff was inorganics, manganese and

arsenic which we expect to find were the high ones.

MR. FOGARTY: I think the main concern Glocester has is that when you pull the circuits out of town and leave we don't want to be left and -- we want to make sure there is something to fall back on.

MR. BOYNTON: When we write our decision we'll say what we are going to do in terms of monitoring. I don't know what we'll say, probably the frequency of monitoring and how we are going to do it which will be transfer money to the state to do it. I would want the state to do it. It is a solid waste landfill. It should be regulated by the state and I want the state to oversee it, look at it, monitor it and make decisions on it. I mean, it still comes under the solid waste rules of the state. And those rules and wetlands rules, all of those things should be regulated. It shouldn't be regulated on the superfund I believe. I don't think it should be.

MR. FOGARTY: My problem, you know

how the state is, they are always bogged down.

MR. BOYNTON: I'll give them money now to do work. We give them money now to do work on sites. So -- and each year they give me an application and tell me what they are going to do with the money that I give them, so that's the kind of thing where they come in and say what kind of monitoring they are going to do, how much, and I would say that is worth X and I would transfer the money.

MR. FOGARTY: I feel if so much money, you say $40,000 to monitor every year, if that was allotted, that would make us feel a lot more comfortable knowing that, that that doesn't have to come from the state. I'm just worried, you put it on the state, it gets lost and there's always --

MR. BOYNTON: It can't get lost if I give it to them because they have to report on the financial status report back to the EPA. It comes like in a grant.

MR. FOGARTY: If you have to rely on the state to do it, the $40,000 is going to

get cut.

MR. BOYNTON: I don't have any control over what they do with their money, but the money that we funnel through to them we get reports on it, financial status reports what they are doing for the money.

MR. BOYNTON: More questions? Rick?

MR. BENICK: I was just curious. I applaud your approach to this site. I think it is an over responsible and realistic approach. I was just curious. I tried to go through some of the data and I couldn't confirm whether were there any parameters which exceeded any mcl or any arr in the groundwater at all.

MS. KRASKO: There was benzine and arsenic exceeded the level, but it was still below mcl so it was ~~we feel very ranged~~ well within the range. Benzine was found at about six parts per million or eight parts per million, mcl of five, and it was acceptable.

MR. BENICK: So was the approach as kind of the risk assessment approach where you

assess the risk and determine, properly so in my view, that there was no view to --

MS. KRASKO: No action was taken based on what -- it was based on the base line, base line risk assessment.

MR. BOYNTON: We detected benzine three out of six samples and the maximum, the only one that exceeded the mcl was 8.9 parts per billion, so we had one exceedance which is really for all practical purposes is really not an exceedance when you are talking about five versus ten parts per billion. I mean --

MS. KRASKO: The main point was not just the level but where the contaminants were detected and the detections, ~~were~~ still very low, were right along the perimeter of the landfill and the wetlands length itself, where potential for exposure was minimal.

MR. BOYNTON: I took a look at -- for the median concentration which is the concentration in the middle, the publication put out by Ken Eddy Sciences for solid waste landfills and the median concentration they got for Benzine, 221 parts per million in the

groundwater. That was in the leachate. And as I say ours was like nine parts per billion, so it wasn't anywhere near the kind of range that you would expect.

MS. MAINE: Robin Maine. How much has EPA expended to date at the site?

MR. BOYNTON: 3.8 million.

MS. MAINE: Do you know what the state's figure is on the site or is that a subset of the 3.8?

MR. BOYNTON: I don't know what their figure is, but we've passed through money to them to help us with the work which would be included in the 3.8 million and I don't know what their own figures are. I don't know what the state's figures are.

MS. MAINE: Are you going to be seeking that money --

MR. BOYNTON: We haven't decided what we are going to do in terms of recovering that money or if we will try to recover it. We haven't made a decision on that. Any more questions? Yes, ma'am?

MS. TETREAULT: My name is Beth

Tetreault. I live in Glocester. The land adjacent to the Davis GSR landfill has been willed to the Audubon Society and I was wondering with people or the public had an access to the Audubon land, is there a concern that the traffic will spill over onto the landfill site, and are there any steps being taken to prevent that traffic from going over and making -- degrading the site?

MR. BOYNTON: No, we haven't done anything like that. We didn't find any risk to anybody coming in contact with the surface soils or the sediments or the surface at the site itself.

MS. TETREAULT: I'm not so much concerned about contact from the surface soil, but that is a capped landfill, is that correct?

MR. BOYNTON: It has dirt on the top of it and vegetation; it doesn't have a cap so to speak.

MS. TETREAULT: If you don't stop people having access to the site, people can go in on dirt bikes and they could degrade the

cap that is on that site and then you could have a possibility of contamination from whatever is buried there.

MR. BOYNTON: We didn't -- as I said, under superfund we didn't find any risk or cause to take any action due to people coming in contact with the surface soils or the sediments or the surface water at the site, so we could not spend superfund money to restrict access to the site because it wasn't necessary. There is no risk. The superfund works from hazardous substances. It still is regulated by the state and if the state wanted to restrict access to it, they could. It still comes under the regulations of the state solid waste rules.

MS. TETREAULT: Do you know if the solid waste laws have any regulations about restricting --

MR. BOYNTON: I don't know about that, whether they require restricting access to that site. I don't think people just wandering on the landfill are at risk from a release. According to our risk calculations,

they are not at risk.

MS. TETREAULT: Do you have any figures on how thick the cap is that is on top of the landfill?

MS. KRASKO: Yes. It varies between mostly six to twelve inches over most of the landfill.

MS. TETREAULT: So it's not real deep. It could be degraded fairly rapidly with traffic.

MR. BOYNTON: I don't know. I don't know. It's not --

MS. KRASKO: The vegetation is very thick.

MR. BOYNTON: Yes, sir?

MR. GOFF: John Goff, Glocester Town Council. Does anybody actually know what's buried there?

MR. BOYNTON: From all our investigations mostly municipal industrial solid waste. We didn't have any indications that there are any hazardous substances buried there. There was mostly -- it came from the cities like Providence, some Boston, some

different haulers. We did extensive work on tracking down the state's records. We interviewed about 40 or 50 different people who had -- companies who had brought waste there and we found there is no factual evidence that any hazardous waste went there, just commercial/industrial miscellaneous solids.

MR. GOFF: There is nothing that could have been snuck in?

MR. BOYNTON: Oh, yeah, but there is nothing indicated in the data that anything went there after 20 years. I think if there was a release there, if somebody was in there dumping hazardous waste into the groundwater, we would see something and we haven't. If an occasional drum was thrown in there, it certainly is not showing up in the groundwater, and it's been in there 20 years. I think they stopped dumping there back in '77.

MR. GOFF: Thank you.

MR. BOYNTON: Any more questions?

(INFORMAL MEETING ADJOURNED)

C E R T I F I C A T E

I hereby certify that the foregoing is a true and accurate transcript of the hearing taken before Region I New England EPA, on July 15, 1997, at 7:00 p. m.

JO ANNE M. SUTCLIFFE, RPR/CSR
Notary Public, State of Rhode Island

DAVIS GSR LANDFILL SUPERFUND SITE

APPENDIX D

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
DAVIS GSR LANDFILL SITE

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A. Introduction

The U.S. Environmental Protection Agency (EPA) held a 60-day public comment period from June 24, 1997 to August 22, 1997 to provide an opportunity for interested parties to comment on the Remedial Investigation and the Proposed Plan prepared for the Davis Glocester-Smithfield Regional (GSR) Landfill Superfund Site in Glocester/Smithfield, Rhode Island. In the Proposed Plan issued on June 16, 1997, EPA announced a preference for No Action, other than limited monitoring, at the site. A collection of all documents used by EPA in choosing this alternative were made available for review at the EPA Records Center (90 Canal Street, Boston, MA) and at the E. Smithfield Public Library (50 Esmond Street, Smithfield, Rhode Island). These documents are known collectively as the Administrative Record.

The purpose of this Responsiveness Summary is to document EPA's responses to the comments and questions raised during the public comment period. The comments submitted during the public comment period are available in the Administrative Record for the Davis GSR Landfill Site. EPA considered all of the comments before making a final decision not to take further action under CERCLA at this site.

B. The No Action Alternative

A No Action preferred alternative is being selected by EPA due to the low potential for adverse ecological and human health risks estimated in the baseline risk assessment. The estimated cancer risk associated with exposure to contamination at the Site falls within EPA's acceptable risk range. Cancer risks at a Superfund Site are considered acceptable if a probability of adverse health effects occurring, ranges between ten thousand and one million (10^{-4} to 10^{-6}). All current and future risks attributable to exposures associated with inhalation of landfill gas, and ingestion of, or contact with, the surficial soils, surface water and sediment are below the lower end of the acceptable risk range (i.e., 10^{-6}). No current health risks are associated with exposure to groundwater at the Site, since the contaminated groundwater is not being used for drinking water. No plume of contamination was found emanating from the landfill. The risk of groundwater ingestion as a drinking water source was estimated at the upper end of the acceptable risk range (i.e., 10^{-4}) attributable largely to the presence of arsenic, which is present, however, at levels below those established as safe in the Safe Drinking Water Act.

The hazard index was calculated by EPA as a measure of the potential for non-carcinogenic health effects. The human health risk assessment concluded that non-cancer adverse health effects were unlikely at this Site. The elevated levels of manganese, the main contributor to the future potential noncarcinogenic hazard index of 8.4, were only detected in an wetland area along the periphery of the landfill. This hazard index may present a level of concern for a human health drinking water scenario, assuming that groundwater at this location is ingested as a sole source of drinking water. This is a very conservative estimate of future exposure, however, as this location is immediately adjacent to the landfill. Exposure to groundwater as a drinking

water source in this limited area is unlikely due to the steep slopes and proximity to the wetlands which would preclude development.

Results of the ecological risk assessment indicates that, although contaminants have been found in the sediments and surface waters near the landfill, it is unlikely that a reduction in viable wetland habitat would adversely impact any flora and fauna populations. Results of a conservative food chain modeling also indicated no adverse effects.

EPA has included five years of additional groundwater monitoring under CERCLA authority in the No Action alternative. Groundwater monitoring, including residential well monitoring, will be performed to verify that no unacceptable exposures occur in the future. The scope and frequency of the monitoring will be adjusted as necessary, based on the sampling results.

C. Overview of Community Involvement and Concerns

Community Background

The Davis GSR Landfill Superfund Site is located in a rural residential area. Houses are widely separated, and woods, wetlands, and occasional open fields dominate the rolling landscape around the Site.

The Site itself is located in two towns, Smithfield and Glocester, with a majority located in the latter. The Town of Smithfield consists of five villages: Esmond, Georgiaville, Spragueville, Greenville, and Stillwater. The primary governmental body is the Town Council, whose five members are elected every two years. Glocester is a town of three villages: Chepachet, Harmony, and West Glocester. The town government in Glocester is run by a town council with five members who are elected for two-year terms.

History of Community Involvement and Concerns

Community residents have been involved with both Davis GSR Landfill and the nearby Davis Liquid sites for over 15 years. Residents have attended public meetings and filed complaints on the sites' operation by Mr. Davis with local, state, and federal officials. Some members of the community have opposed the Davis GSR Landfill since it first open. The Waterman Lake Conservation Association opposed the opening of the landfill because of their concern that it would contaminate Waterman Reservoir, a lake used primarily for recreational purposes, about two miles downstream from the Site.

Judging from the comments received during the public comment period, the residents and the local and State offices generally agree with the no action decision, but there is a considerable concern regarding a potential for future migration of contaminants and a preference for continuing monitoring of groundwater.

The level of community activity has significantly subsided since the early 1980s. Some local officials and residents are concerned with the expense and the time required to assess and cleanup the sites.

D. Summary of Public Comments Received During Public Comment Period and Agency Responses

This Responsiveness Summary addresses comments received by EPA during the public comment period (June 24, 1997 through August 22, 1997).

Residents, and Local and State Officials' Comments

One set of comments was received from the State (Rhode Island Department of Environmental management) and oral and written comments were received from the local officials (Town of Smithfield and Town of Glocester). Both oral and written comments were received from residents leaving near the Davis GSR Landfill Site.

Comment 1: Local officials and the State expressed concern about health, safety, and welfare of the residents surrounding the area and felt that EPA should continue to monitor the groundwater on an annual basis for an extended period of time (i.e., 10 years) and to provide the test results to the town. Local officials also felt that additional assurances for the regular monitoring, such as monitoring plan needs to be in place.

EPA's response: Extensive data collected by EPA during implementation of the Remedial Investigation (RI) in the early 1990s and the residential well testing program conducted by RIDOH in the area since the early 1980s found no contaminated groundwater plume emanating from the site or site-related contamination in any of the residential wells. No elevated levels of site-related contaminants were detected in residential bedrock wells east and southeast of the landfill which, based on observed local bedrock flow patterns, is downgradient. As such, the observed concentrations of manganese near the toe of the landfill in bedrock appear to have been sufficiently diluted or dispersed by traveling approximately 2,000 feet downgradient which equates to approximately 4 years of travel time based on the hydrogeological parameters of the fractured bedrock system, where retardation of contaminants is minimal. Thus, since this municipal waste landfill ceased accepting waste in 1982, no changes in groundwater quality are expected in a future.

The EPA's decision that no further action be done at this landfill under CERCLA is issued because the Baseline human health and ecological risk assessment concluded that the site poses no unacceptable risk or threat to human health or the environment and that CERCLA is not an appropriate mechanism to handle this municipal solid waste landfill. As documented in this Record of Decision, EPA and the State will continue limited monitoring of the groundwater, including residential wells, for at least five years under CERCLA authority, to verify that no

unacceptable exposures occur. The testing frequency and parameters are expected to be adjusted as necessary based n the monitoring results. Following the issuance of this Record of Decision, a monitoring plan will be jointly developed by EPA and the State. Based on the data available at this Site, EPA believes that this is a conservative monitoring approach which will provide additional assurances to the residents on the quality of the groundwater leaving the site. Given substantial amount of time lapsed since the landfill stopped accepting the waste in 1982 and the data showing low level of contaminants at this solid waste landfill, EPA believes that such future unacceptable exposures are very unlikely and that 5 years of monitoring under CERCLA would be a conservative approach to provide sufficient level of confidence. Furthermore, the State's authority to handle the closure of this municipal solid waste landfill, including any monitoring programs, is in no way limited by this No Action Record of Decision Some further monitoring beyond the five years, may be required in a future to satisfy State's requirements.

All monitoring results will be available for public review at the E. Smithfield Public Library on 50 Esmond Street, Smithfield, RI, and the EPA's Record Center on 90 Canal Street in Boston, MA.. The town officials can be notified of the results when these are available and copies of the monitoring results can be provided to the town council.

Comment 2: Several residents and local officials commented on the groundwater monitoring, including residential well testing. They felt that the testing of their residential wells has not been done regularly in the recent past and stated that testing of monitoring and residential wells should continue on some prescribed basis.

EPA's response: Residential well monitoring was initiated by the Rhode Island Department of Health (RIDOH) in the early 1980s, in response to the residents' concerns, when little data existed about the extent of contamination associated with this Landfill. Since then, 32 monitoring wells have been installed and sampled and extensive data has been collected on the soil, groundwater, surface water and sediment quality at and adjacent to the landfill. No increases in contaminant levels were detected over time and no contaminant plume was found to be emanating from the landfill, and the low levels of contaminants present were found to pose no unacceptable risk to human health or the environment. Approximately 20 residential wells in the area have also been monitored by EPA and the RIDOH for more than 10 years and none were found to be contaminated. Based upon the data available at this time, EPA and the State are planning to monitor groundwater, including residential wells for at least five years under the CERCLA authority to verify that no unacceptable exposure occurs in the future. The results of this monitoring will be public information.

Additionally, it should be noted that Federal and State laws do not regulate private water supplies. As in any other areas of the State, the residents drinking water from their own wells, are responsible for making sure it is safe to drink. While the residents are not required to do so by law, RIDOH strongly recommends that these residents test their water annually for a few of the more common contaminants. RIDOH provides guidance on home water testing parameters

and frequency, including special situations like wells located near a dump, landfill, or an industrial operation, as well as testing services available in the State.

Comment 3: Some residents and local officials stated that the Site should continue remain on the National Priority List (NPL), due to the uncertainty of what may be buried in the landfill. They felt it would provide additional assurance that the landfill would be monitored properly and actions would be taken if new findings indicate that additional response actions are warranted.

EPA's Response: Since the landfill ceased the operation in 1982, EPA performed extensive site characterization and collected significant amount of data, which indicates that the type and levels of contaminants found at the Davis GSR Landfill are typical of what would be expected at a municipal solid waste landfill and that no contaminant plume is emanating from the Site. The decision to continue the groundwater monitoring, including monitoring of residential wells, as documented in this Record of Decision, will not be affected by the deletion of the Site from the NPL. Furthermore, deletion of a site from the NPL does not preclude eligibility for subsequent remedial action. Section 300.66(c)(8) of the National Contingency Plan (NCP) states that Fund-financed response actions may be taken at sites that have been deleted from the NPL if future conditions warrant such actions without returning the site to NPL. If it is determined that the site should be returned to the NPL due to a threat to human health or the environment, it may be reinstated without re-scoring on the Hazard Ranking System (HRS). The deletion of the Site from the National Priority List (NPL) will include publication of the Notice of Intent to Delete and 30-day public comment period. EPA will accept and evaluate public comments before making a final decision to delete.

Comment 4: The State felt that EPA should assist the "Dump the Dump" local citizens group in the community participation process and the President of this Group expressed disappointment with low turnout at the public meetings concerning the Site and felt that EPA should assist the group in contacting the new residents in the area and providing them with information on the landfill. One commenter also felt that the residents should be given funding to retain a technical advisor to review the information pertaining to the site.

EPA's Response: EPA agrees that strong community participation is desirable in the Superfund process. EPA also feels that it has been responsive to community needs at this project and provided the assistance requested by the local citizens. Below is chronology of the Technical Assistance Grant (TAG) for the local "Dump the Dump" group, documenting EPA's assistance efforts.

12/04/91	Rec'd Letter-of-Intent from F. Monroe Allen, Dump the Dump, to apply for the Technical Assistance Grant
01/01/92	Public Notice published Providence Journal

02/10/92 Ltr to F. Monroe Allen stating that no other group has expressed interest in applying for the TAG, and Dump the Dump has 30 days to apply

02/27/92 Rec'd ltr from F. Monroe Allen requesting a 30 day extension to the application period

02/27/92 Telephoned F. Monroe Allen to grant the extension and offer any assistance necessary

06/22/92 Rec'd application for TAG from Dump the Dump

09/18/92 M. McGagh met with R. Poirier to get signatures on the final documents necessary to process the TAG

09/23/92 TAG awarded ($50,000)

09/08/93 Ltr to R. Poirier requesting the status of the grant since EPA had not heard from the group since the TAG was awarded

Summer '95 Focus Group Mtng: G. Nearney acknowledged that the group had problems, but they had been resolved and TAG activities should pick up.

10/03/95 Ltr to R. Poirier referring to a telephone message of 10/02/95, and a conversation of 10/03/95 regarding the future of the TAG.

Enclosed in that letter were completed applications for an extension of the grant to be signed and returned to EPA for processing.

12/13/95 Ltr to R. Poirier following-up on the 10/03/95 ltr

CY96 Numerous voice mail between O. Beverly of EPA and R. Poirier, Dump the Dump

01/29/97 Ltr from R. Poirier requesting that the TAG be reactivated and EPA's assistance to that end.

Spring 97 Numerous voice mail between O. Beverly, M. McGagh of EPA and R. Poirier, Dump the Dump

07/10/97 Telephone call to R. Poirier, he is currently on vacation until August of 1997, and will call me when he returns.

07/15/97 At the request from P. Cavanough, extended public comment period on the Proposed Plan from its original closing date of July 23, 1997 to August 22, 1997 (request for six-month extension from the Councilman P. Poirier was denied based on the reasons outlined in EPA's July 23, 1997 letter).

07/21/97 Telephone call to P. Cavanough to determine the status of the Dump the Dump group,

left message.

July 1997 Correspondence with P. Cavanough and transmittal of additional copies of the informational documents on an effort to provide information on Davis GSR Landfill to new residents and include them on the EPA's mailing list

Thus, no activities or expenditures under the TAG grant for both Davis GSR and Davis Liquid sites have occurred since 1992. Although the October, 1995 application prepared by EPA for an extension of the grant was never signed by the TAG group, EPA is currently in a process of determining the current status of the group and their contact person. EPA is working with the local residents to extend the grant, which at this point can be used to strengthen participation of this group at the Davis Liquid Superfund Site.

Comment 5: The State requested clarifications on the exposure assumptions used in performing the Baseline Risk Assessment.

EPA's response: The final baseline human health risk assessment has been completed to include all current and potential future exposure scenarios to chemical hazards posed by the Site. The final report includes conservative risk assessment estimates assuming that trespassing children would be exposed to current site conditions (i.e., uncapped) such as exposure to landfill surficial soils, leachate, and landfill gas, while playing or wading at the site. All current and future risks attributable to these exposures were below the lower end of the acceptable risk range (i.e., 10^{-6}) or below a hazard index of 1, in most cases by several orders of magnitude. Estimated maximum cancer risks to human health associated with use of off-landfill groundwater as potential future drinking water source fall within EPA's acceptable risk range. In addition, EPA concluded that non-cancer adverse health effects were not likely at this site. The evaluated future exposure scenarios did not include exposures to contaminated groundwater under the landfill or exposure to contaminants within the landfill since EPA believes that such exposures will not occur due to land use restrictions already in place under the State and local laws and regulations under any future cleanup scenario, including no action decision under CERCLA.

In response to this concern raised during the State's review of the draft Proposed Plan, the final Proposed Plan included the following definition of the Baseline Human Health Risk Assessment under the Glossary of Environmental Terms: "An assessment of the likelihood that people living, working, or playing at or near a Superfund site could experience health problems as a result of their contact with chemicals from the site, assuming no remediation."

Similarly, additional data has been collected and supplemental calculations were performed for the ecological baseline risk assessment, leading to a conclusion that current conditions at the site do not present an unacceptable risk to the ecological receptor populations.

Comment 6: The State asked for clarifications on public release of the draft Feasibility Study

report

EPA's response: Upon review of the revised Feasibility Study prepared by the contractor, EPA concluded that the second draft contains significant number of inconsistencies and incorrect assumptions and analyses, including analysis of the ARARs and No Action alternative, which would require substantial rewriting of the Feasibility Study. As a policy, draft documents are not typically released to the public, as they may not provide accurate reflection of the Agency's position on a number of issues. .EPA believes that significant additional expenditures and time would be required to produce a final FS which could be approved by EPA and released to the public. Such expenditures are not warranted since the proposed decision for no further action at the Davis GSR Landfill site is based on the baseline risk assessment conducted during the RI. That risk assessment supports the determination that no remedial action is necessary to ensure protection of human health and the environment. This Record of Decision provides a summary of site risks explaining the basis for EPA's conclusion that unacceptable exposures to hazardous substances will not occur. Although in this case, work on the Feasibility Study was started prior to completion of the baseline risk assessment, remedial alternatives in the FS are generally not developed for No Action RODs. No Action decisions do not include description of alternatives or comparative analysis of such alternatives because no remedial action is necessary.

Comment 7: One commenter felt that EPA's risk assessment largely focused on the possible human exposures, while ecological impact was not less explored

EPA's Response: EPA performed extensive ecological investigations and baseline ecological risk assessment at the Davis GSR landfill to assess the ecological consequences of the landfill contamination, including assessment of wetland function and values, characterization of habitat and flora and fauna utilizing the area, identification of potential receptors and exposure pathways, performance of site-specific toxicity testing, macroinvertebrates study, and food-chain exposure modeling (see Sections 11 and 12 of the Remedial Investigation report). As summarized in this Record of Decision, risks to benthic and terrestrial invertebrates, aquatic biota, and wildlife were qualitatively and quantatively assessed. Results of the ecological risk assessment indicated that no unacceptable risks to ecological receptors is likely to occur at this site and therefore, did not suggest a need for response action.

Comment 8: One commenter suggested that EPA formally notify the Audubon Society, which owns land adjacent to the site, the future users of the contiguous property on Tarkiln Road, and the local governments of Smithfield and Glocester that trespassing on the site should be strictly prohibited and asked that a no trespassing policy be established in conjunction with the land owner and be aggressively enforced.

EPA's Response: The baseline human health risk assessment conducted by EPA predicts no adverse health impacts would occur to children who may trespass and wade in the wetlands or have skin contact with contaminants in surface water, sediment, surficial soil on the landfill, and

aqueous and soil leachate, and who may breath landfill gas. The assumed exposure doses for the reasonable maximum exposure point concentrations included 0.05 liters of water ingested per hour for 1 hour per day, 2,000 cm^2 skin surface area for contact per event for 1 event/day, 200 mg of sediment and soil ingested per day with 100% adsorption, and 0.83 m^3 of air inhaled per hour for two hours per day of exposure, all for 36 days per year for 12 years in a 70 year lifetime by a 43 kg child. All current and future risks attributable to these exposures were below the lower end of the acceptable risk range (i.e., 10^{-6}) or below a hazard index of 1, in most cases by several orders of magnitude. Thus, even if the site in the future is more accessible, the increased frequency of exposure would not pose unacceptable risk to human health. As such, the baseline human health risk assessment does not provide a technical basis for EPA to establish any restrictive trespassing policies for this site.

The local town officials, the Audubon Society and home owners living in a vicinity of the site are on the EPA's mailing list and are notified of this Record of Decision being issued. This Record of Decision, along with other documents, is available for public review at the E. Smithfield Public Library on 50 Esmond Street in Smithfield, RI. This Record of Decision under EPA's CERCLA authority, however, does not limit in any way the local or State's authority and is not a determination that no action is warranted under other laws and regulations to regulate this former solid waste landfill, including access restrictions.