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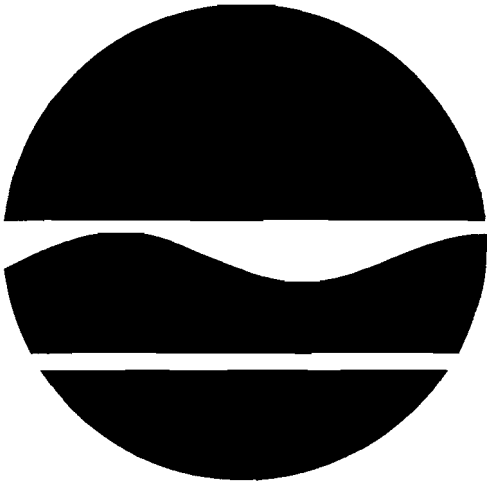
GOLDEN ROAD DISPOSAL SITE

Chili (T), Monroe County, New York
Site No. 8-28-021

PROPOSED REMEDIAL ACTION PLAN

May 2002



Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

PROPOSED REMEDIAL ACTION PLAN

GOLDEN ROAD DISPOSAL SITE
Town of Chili, Monroe County, New York
Site No. 8-28-021
May 2002

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health is proposing a remedy to address the significant threat to human health and the environment created by the presence of hazardous waste at the Golden Road Disposal Site, a class 2 inactive hazardous waste disposal site. As more fully described in Sections 3 and 4 of this document, landfilling operations at the site have resulted in the disposal of a number of hazardous wastes on the south parcel, including toluene and methylene chloride. These disposal activities have resulted in the following significant threats to the public health and/or the environment:

- a significant threat to human health associated with dermal contact, ingestion and/or inhalation of surface and subsurface soils contaminated with hazardous waste on the south parcel;

- a significant threat to the environment associated with migration of fill contaminants to the adjacent wetland on the south.

In order to eliminate or mitigate the significant threats to the public health and/or the environment that the hazardous wastes disposed at the Golden Road Disposal site have caused, the following remedy is proposed:

- **Alternative 3: Hot Spot Remediation with Off-Site Disposal and Site Regrading**: Excavation and off-site disposal of contaminated soils and waste from two locations south of the railroad tracks. Areas to be excavated include the east bank hot spot (test pit 3 area) and the western hot spot (SS-2 area). Removal of contaminated media in these areas would eliminate the threat to human health associated with the potential exposure to these soils and waste. All excavated areas would be filled with clean material and regraded. Flat areas across the fill would be regraded to provide positive overland drainage throughout the fill area, and existing mounds would be flattened to fill in low

spots. The intermittent pond area would be filled. All regrading efforts would mitigate the environmental threat due to migration of fill contaminants to the wetlands. Also, asbestos-containing material and the partially filled drum found on the south parcel would be removed and properly disposed off-site. A long-term groundwater monitoring program would be established to monitor the effectiveness of the remedy. The property owner would be required to place a deed restriction limiting the use of groundwater as a potable or process water from the south parcel without necessary water quality treatment. An annual certification by the property owner would be included as part of the restriction.

The proposed remedy, discussed in detail in Section 7 of this document, is intended to attain the remediation goals selected for this site in Section 6 of this Proposed Remedial Action Plan (PRAP), in conformity with applicable standards, criteria, and guidance (SCGs).

This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The NYSDEC has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in greater detail in the Remedial Investigation (RI), Feasibility Study (FS) and other relevant reports and documents, available at the document repositories.

To better understand the site and the investigations conducted, the public is encouraged to review the project documents at the following repositories:

Chili Public Library
3333 Chili Avenue
Rochester, NY 14624
(585) 889-2200
(585) 889-6166 (for seasonal hours)
Hours: Mon-Thur, 10 am - 9 pm; Fri 10 am - 6 pm; Sat. 10 am - 5 pm

and at:

NYSDEC Region 8 Office
6274 East Avon-Lima Rd
Avon, NY 14414
(585) 226-2466
Contact Lisa LoMaestro Silvestri for an appointment
Hours: Mon - Fri, 8:30 am - 4:45 pm

and at:

NYSDEC Central Office
625 Broadway, 11th Floor
Albany, NY 12233-7017
Ms. Karen Maiurano, Project Manager
(518) 402-9669
Hours: Mon - Fri, 7:45 am - 4:00 pm

The NYSDEC seeks input from the community on all PRAPs. A public comment period has been set from June 7 through July 9, 2002 to provide an opportunity for public participation in the remedy selection process for this site. A public meeting is scheduled for Wednesday, June 19, 2002.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which you can submit verbal or written comments on the PRAP.

The NYSDEC may modify the preferred alternative or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

Comments will be summarized and responses provided in the Responsiveness Summary section of the Record of Decision. The Record of Decision is the NYSDEC's final selection of the remedy for this site. Written comments may be sent to Ms. Maiurano at the above address through July 9, 2002.

SECTION 2: SITE LOCATION AND DESCRIPTION

The Golden Road Disposal Site, site number 8–28-021, is located in a rural residential area on the west side of Golden Road, north of Interstate Route 490, in the Town of Chili, Monroe County (Figure 1). The 19-acre site is divided into two parcels, separated by railroad tracks running generally east to west across the site.

The north parcel (twelve acres) is generally flat with some localized mounds (fill piles), an abandoned residence and junkyard debris, buildings and fuel storage tanks associated with the former Chili Fuels operations. It is bounded by residences to the north and east, railroad tracks to the south, and a wooded area to the west.

The south parcel (seven acres) is an uneven fill area overgrown with brush and trees. It falls off steeply on the south, east and west to a seasonal deciduous forested wetland area. Interstate 490 is located south of the south parcel.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Golden Road Disposal Site was privately run by Howard Fitzsimons from 1955 through 1976. The site received a wide variety of wastes, including drummed chemical wastes, metal slag, fly ash, foundry sand, artillery shell casings and junked vehicles. In addition, drummed waste was disposed on the south parcel. No records have been found to indicate the amount of waste that was disposed at the site. In addition to landfilling activity at the site, the former Chili Fuels was operated from the north parcel of the property.

3.2: Remedial History

During the initial site inspection in 1983 by NYSDEC, over 200 drums in various stages of decay were discovered south of the tracks. Foundry sand was observed on both sides of the tracks as well.

In 1984, the Golden Road Disposal Site was listed as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York (Registry). A "Class 2" site is a site where hazardous waste represents a significant threat to human health or the environment and action is required.

An emergency drum removal and surficial soil and debris removal was carried out on the south parcel in 1985 under the direction of the NYSDEC. A total of 562 drums and containers, and 75 cubic yards of contaminated soil and debris were removed from the site south of the railroad tracks. Analysis of drum contents detected the presence of chlorinated and nonchlorinated solvents, organic solids with low flash points, polychlorinated biphenyls and waste oils.

At the request of the site owner, a parcel about seven acres in size in the northwest portion of the north parcel was removed from the Registry site description in 1995. This action was based on additional sampling conducted by a prospective developer that showed no hazardous waste was present in that area.

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to human health and/or the environment posed by the presence of hazardous waste, the NYSDEC has recently conducted a Remedial Investigation/Feasibility Study (RI/FS).

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

The RI was conducted in two phases. The first phase was conducted between July and September 1999, and the second phase in April 2000. Reports entitled Remedial Investigation Report, February 2000, and Phase II Remedial Investigation Summary Report, June 2000, have been prepared which describe the field activities and findings of the RI in detail. Figure 2 shows all RI sampling locations on both the north and south parcels.

The RI included the following activities over the entire site:

- inventory and sampling of remaining drums found on site;
- electromagnetic survey to look for buried drums;
- radiological survey to screen for radioactive materials;
- test pits in areas of unusual electromagnetic results;
- installation of groundwater monitoring wells to determine groundwater quality and direction of groundwater flow;
- sampling fill material, surface and subsurface soils;
- sampling water and sediments from the wetland area;
- sampling storage tank contents (north parcel) and potential asbestos-containing materials associated with tanks (south parcel);
- basement survey of adjacent residences; and
- sampling private wells in vicinity of site.

The Phase II RI included the following tasks:

- additional fill material sampling (north parcel);
- additional groundwater well installations (south parcel); and
- additional surface water sampling (south parcel).

To determine which media (soil, groundwater, etc.) are contaminated at levels of concern, the RI analytical data were compared to environmental standards, criteria, and guidance values (SCGs). Groundwater, drinking water and surface water SCGs identified for the Golden Road Disposal site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of New York State Sanitary Code. For soils, NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 provides soil cleanup guidelines based on the protection of groundwater, background conditions, and health-based exposure scenarios. In addition, for soils, site specific background concentration levels can be considered for certain classes of contaminants. Guidance values for evaluating contamination in sediments are provided by the 1999 NYSDEC "Technical Guidance for Screening Contaminated Sediments."

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the RI and Phase II RI Summary Reports.

Chemical concentrations are reported in parts per billion (ppb) for groundwater and surface water samples, and parts per million (ppm) for soil and waste samples. For comparison purposes, where applicable, SCGs are provided for each medium.

4.1.1: Site Geology and Hydrogeology

The site is located in a lowland area with poor drainage. Natural surface drainage has been significantly impacted by the construction of Interstate 490 to the south, and the railroad tracks that run through the center of the site. A seasonally dry wetland and wooded area lies west and south of the site adjacent to Interstate 490. In the north parcel, surface water drains to the northeast along the railroad drainage swales. Surface water in the south parcel drains south and west into the deciduous forested wetland area. The railroad berm forms a barrier to surface water flow between the north and south parcels.

Fill material composed primarily of dark foundry sand, ashes and cinders associated with past disposal activities lies over much of the site. Where it has been spread on the north parcel it varies in thickness from 1 foot to 4 feet. Some piles of fill material remain on the north parcel. On the south parcel, scrap metal, slag, wood and plastic are mixed with the foundry sand. Here the fill thickness averages 6 to 8 feet deep, but in two locations it was measured at 12 to 14 feet.

Three native units of unconsolidated material were encountered during subsurface investigation activities. The uppermost unit is fine sand with occasional gravel, ranging from 3 to 7 feet thick. Beneath the upper sand is a silty clay unit from 3 to 10 feet thick. The lowermost unit is silty sand which contains bedrock fragments and ranges from 2 to 4 feet thick. Bedrock, immediately below the lower sand unit, dips to the west and southwest, its top surface from 11 feet (east) to 25 feet (west) below ground surface.

During the initial RI activities on the south parcel in late summer 1999, the upper sand unit was dry, while groundwater was present in the lower sand unit under confined conditions. When additional monitoring wells were installed as part of the spring 2000 Phase II investigation, perched groundwater was present in the upper sand unit. When wet, the upper sand drains laterally to the wetland on the south (figure 3). Groundwater in the lower sand unit flows to the east (figure 4). The silty clay unit between the upper and lower sand units acts as an aquitard, greatly retarding groundwater flow from the upper sand down into the lower sand.

4.1.2: Nature of Contamination

As described in the reports, many soil, groundwater, surface water and sediment samples were collected at the site to characterize the nature and extent of contamination. The main categories of contaminants which exceed their SCGs are volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and metals.

The VOCs of concern are benzene, toluene, ethylbenzene and xylene. Chlorinated solvents previously identified on the south parcel were addressed by the 1985 drum removal. The SVOCs of concern are polycyclic aromatic hydrocarbons (PAHs), including benzo(a)anthracene, benzo(a)pyrene and chrysene. PAHs are SVOCs normally associated with fossil fuel products. PCBs, also previously identified on the south parcel, were addressed by the 1985 drum removal as well. The metals of concern are chromium, nickel and zinc.

4.1.3: Extent of Contamination

Due to the different physical characteristics of the north and south parcels, each will be addressed separately. Tables 1 through 3 summarize the extent of contamination for the north parcel contaminants of concern in fill material, soil and groundwater and compare the data with SCGs for the site. Tables 4 through 8 summarize the extent of contamination in the south parcel soil, sediment, surface water and groundwater and compare the data with SCGs for the site. Data obtained from analysis of waste found in the south parcel are also provided.

North Parcel Waste

Fuel oils were identified in above ground and underground storage tanks, and are likely associated with former Chili Fuel operations. All miscellaneous drums scattered around the north parcel were sampled and analyzed for hazardous waste characteristics. Only one sample came back positive for hazardous waste: a composite sample from two drums was characterized as hazardous due to ignitability (flash point of 28^0 C). All remaining drums contained only residual amounts of various fuel oils. No buried drums were detected.

North Parcel Fill Material

Fill material and fill piles were sampled from depths of 0-2 feet. Because of the soil-like nature of the material, results were compared to soil SCGs (Table 1). There were three detections of two PAHs [benzo(a)anthracene and benzo(a)pyrene] above SCGs in two samples. Several metals also exceeded SCGs, particularly chromium (1,250 ppm) and nickel (783 ppm) in one sample. Toxicity Characteristic Leaching Procedure (TCLP), a test used to determine if waste is hazardous, was performed on selected fill samples,

including the sample that had the highest chromium concentration. The TCLP analysis showed the levels of contaminants were below hazardous waste criteria. Six additional fill samples were collected during the Phase II RI to estimate the lateral extent of these elevated locations of chromium and nickel, and all six Phase II results were lower than the initial samples results. Additionally, separate analyses for hexavalent chromium (the most toxic form of chromium) in these six samples showed non-detectable results, indicating that the chromium present in the fill material is the less toxic trivalent form.

North Parcel Soil

Surface soil was sampled in the vicinity of the above-ground fuel storage tanks (Table 1). Results were similar to fill material, with three PAHs and several metals, including arsenic, nickel and zinc, present above SCGs.

Subsurface soil borings near the underground fuel storage tanks adjacent to the former Chili Fuels building showed the presence of petroleum product. One sample of the contaminated soil was analyzed and showed elevated levels of fuel-associated compounds. Two subsurface soil samples outside the visibly contaminated area associated with the underground tanks showed exceedances of only a few metals (Table 2).

North Parcel Sediments

One sediment sample was collected in the drainage ditch adjacent to the railroad tracks. Due to dry conditions in the ditch throughout field investigations, results were compared to soil cleanup criteria rather than sediment criteria. Three PAHs and several metals were present above SCGs (Table 2). These compounds are frequently associated with routine railroad operations.

North Parcel Groundwater

Five groundwater samples were collected from four wells, as well as from one soil boring located in the area of petroleum-contaminated soil near the former Chili Fuels building. Only the groundwater sample near the building in the area of petroleum contamination had elevated levels of contaminants, and those were the type associated with fuel products (Table 3). The well supplying the residence was sampled as well, and showed only iron, magnesium and sodium above SCGs.

South Parcel Waste

One surficial drum containing liquid waste was identified on the south parcel of the site. Analysis of the material in this drum indicated that it was not a hazardous waste. No buried drums were identified. During excavation of test pit TP-3N on the eastern bank of the south parcel, hundreds of aerosol cans were encountered. Analysis of the

contents from one can (sample TP-3N-CAN, Table 4) detected high levels of several VOCs, including toluene at 220,000 ppm (22%) and methylene chloride at 170,000 ppm (17%). Waste from these cans has leaked and contaminated subsurface soil in its immediate vicinity. This area of discarded cans and contaminated soil on the east bank is considered a hot spot source area.

Three samples of material suspected of containing asbestos were collected from the south parcel. Two of these showed asbestos present above the regulatory standard of 1% (Table 4).

South Parcel Soil

Ten samples of surface soil were collected from the south parcel, including one from an off-site location for use as a background sample. Primary contaminants above SCGs in surface soil were PAHs and metals, which were seen across the site (Table 5). One surface soil location in the southwest corner of the parcel was found to have an elevated concentration of pentachlorophenol (360 ppm), and was identified as a hot spot of contamination. Surface soil collected from the intermittent pond area in the central eastern area of the parcel also showed elevated PAHs, including benzo(a)anthracene at 0.92 ppm and chrysene at 1.3 ppm.

Ten samples of subsurface soil were collected from monitoring well borings and test pits. Elevated levels of PAHs and metals were detected in subsurface samples across the site, and generally at higher levels than in surface soil samples (Table 6). Additionally, VOCs, particularly xylene, ethylbenzene and toluene, were elevated in TP 3N (east bank). This area on the east bank has been identified as a contamination hot spot.

South Parcel Sediment

Eight sediment samples were collected from wetland areas, although only one was wet at the time of sampling. Due to the dry conditions in the wetland during the period of field investigations, the sediment results were compared to soil SCGs (Table 7). Elevated PAHs were detected in several samples, including the railroad ditch [benzo(a)anthracene at 11 ppm, chrysene at 14 ppm] and the intermittent pond [benzo(a)anthracene at 2.6 ppm, chrysene at 4.2 ppm]. Elevated metals also were detected in most of the sediment samples.

South Parcel Surface Water

Due to dry conditions, only one surface water sample from the wetlands south of the fill area was collected during the RI. However, conditions were wetter during Phase II and six surface water samples were collected. No VOCs or SVOCs (including PAHs) were

present above SCGs. Some metals exceeded SCGs, particularly aluminum (up to 1,970 ppb) and iron (up to 72,700 ppb) (Table 8).

South Parcel Groundwater

No VOC or SVOC contaminants were detected in the five groundwater wells monitoring the lower sand unit aquifer, however, iron was detected above SCGs in all of these wells. During Phase II of the RI, four additional monitoring wells were installed in the shallow upper sand unit where there is seasonal perched groundwater. One of these Phase II wells was installed in the area of TP-3N (east bank) where the aerosol waste cans were found during test pit excavations. Elevated levels of VOC and SVOCs consistent with the waste analytical results were detected in this well, including methylene chloride at 600,000 ppb and toluene at 170,000 ppb. It appears that the waste located on the east bank has contaminated shallow perched groundwater, but the impacts do not extend beyond the immediate area.

Off-Site Sampling

Groundwater: Residential well surveys mailed to residents near the Golden Road Disposal site indicated the existence of only two private groundwater wells, including an abandoned residence on the north parcel, and a home on Golden Road located approximately 1000 feet north of the site. Both were sampled and only iron, magnesium and sodium were detected at levels above SCGs. These are common metals and their presence in these wells does not suggest any impacts from the site.

Surface Water: At the request of a nearby resident on Golden Road, a private pond east of the site was sampled (location SW-15 on figure 3). One VOC, methylene chloride, was detected at 9.4 ppb, above the surface water standard of 5 ppb for potable water. No SVOCs were detected. Aluminum and iron were the only metals whose concentrations exceeded surface water standards. These are common metals and their presence in this pond does not suggest any impacts from the site.

4.1.4: Petroleum-Contaminated Soils Removal

As data generated by the RI and Phase II were evaluated, it became apparent that environmental quality in the north parcel was primarily impacted by waste from the former Chili Fuels operations. Related materials and contaminated media include above ground storage tanks, underground storage tanks, petroleum-contaminated soils and groundwater. It was determined that these contaminated media and abandoned storage tanks and drums should be addressed by a removal action through the NYSDEC Spills program, who has the authority to remediate petroleum-contaminated media.

In Fall 2000, NYSDEC contracted with a private consultant to undertake this work. Over the next three months the following activities were completed:

- Residual petroleum product was removed from all above and underground storage tanks. Underground storage tanks were removed, and all tanks were cleaned and staged on site.

- Over 700 cubic yards of petroleum contaminated soil was excavated from the vicinity of the underground tanks. The excavation was backfilled with clean gravel.

- Approximately 250,000 gallons of contaminated groundwater were pumped from the excavation, containerized, treated, and discharged to the sanitary sewer under authority of the Monroe County Department of Public Works.

- Several drums and containers containing residual petroleum products scattered around the north parcel were emptied and cleaned. The waste was consolidated and disposed off site.

- Two drums identified during the RI as containing characteristic hazardous waste were overpacked and shipped off site to a licensed disposal facility.

A report of these activities can be found in the March 8, 2001 "Interim Report of Remedial Operations" (available at the document repositories).

4.2: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 6 of the RI Report.

An exposure pathway is the manner by which an individual may come in contact with a contaminant. The five elements of an exposure pathway are: 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

The potential exposure pathways of concern for the north parcel identified in the RI were primarily associated with carcinogenic PAHs found with petroleum-contaminated soils near the underground fuel storage tanks. However, since these soils have been removed, these potential exposure pathways no longer exist.

Elevated heavy metal concentrations, particularly chromium, nickel and zinc, were ubiquitous across both parcels of the site. The presence of these metals is most likely

associated with the foundry sand that was deposited throughout both parcels, as well as the extensive junkyard debris disposed of on the north parcel. Exposures to elevated levels of metals in surface soil is possible for current and future uses of this site.

Potential risks at the south parcel are primarily associated with elevated VOCs lovated in the east bank (test pit 3N) area. Potential current exposure pathways which exist at the south parcel include:

Direct contact with contaminated surface soils,
Ingestion of contaminated surface and subsurface soils, and
Inhalation of dust from contaminated soils.

Potential future exposure pathways which may exist at the south parcel include:

Direct contact with contaminated surface and subsurface soils,
Ingestion of contaminated surface and subsurface soils, and
Inhalation of dust from contaminated surface and subsurface soils.

Exposure to contaminated dust, soils, and subsurface soils would require persons entering the site, then contacting, ingesting and/or inhaling these materials. Those most likely exposed under current conditions at the site would include site trespassers. Those most likely exposed to future conditions at the site would be site trespassers, construction workers during site regrading.

4.3: Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures and ecological risks which may be presented by the site. The Fish and Wildlife Impact Assessment included in the RI (section 6.2) presents a more detailed discussion of the potential impacts from the site to wildlife resources. The following pathway for environmental exposure and/or ecological risks has been identified: Migration of south parcel fill contaminants to the adjacent deciduous forested wetland.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The Potential Responsible Parties (PRP) for the site, documented to date, include:

- The Estate of Howard P. Fitzsimons, Jr. (former owner and operator)
- Chevron Corporation (generator)
- U.S. Department of Defense (through the US Army Reserves, 98th Battalion, transporter)
- Pneumo-Abex (generator)

The PRPs declined to implement the RI/FS at the site when requested by the NYSDEC. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, the NYSDEC will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the State for recovery of all response costs the State has incurred associated with the site.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all standards, criteria and guidance (SCGs) and be protective of human health and the environment. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Eliminate, to the extent practicable, exposure to hazardous waste and asbestos-containing material;
- Eliminate, to the extent practicable, exposures to hazardous waste-contaminated soil and sediment;
- Prevent, to the extent practicable, the migration of contaminated waste into the adjacent deciduous forested wetland;
- Prevent, to the extent practicable, the erosion and migration of fill material into the adjacent deciduous forested wetland;
- Prevent, to the extent practicable, off-site migration of contaminated shallow groundwater that exceeds NYSDEC Class C Ambient Water Quality Criteria to the adjacent deciduous forested wetland.
- Prevent, to the extent practicable, the use of groundwater from the south parcel without necessary water quality treatment.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Golden Road Disposal site were identified,

screened and evaluated in the report entitled Feasibility Study Report, December 2001. (Please note that the numbering of alternatives differs between the FS Report and the PRAP.)

A summary of the detailed analysis follows. As presented below, the time to implement reflects only the time required to implement the remedy, and does not include the time required to negotiate with responsible parties for implementation of the remedy, design of the remedy, or to procure contracts for design and construction.

7.1: Description of Remedial Alternatives

North Parcel: Excavation of petroleum-contaminated soils and associated groundwater, and removal of the two drums containing hazardous waste from the north parcel has adequately addressed human health and environmental concerns due to hazardous waste disposal north of the railroad tracks, but not potential exposures to chromium. Constituents present in fill material (foundry sand/ash) remaining in the north parcel do not exceed hazardous waste criteria. The parcel remains essentially an abandoned junkyard, and consequential amounts of hazardous waste have not been identified. Therefore, no futher action is proposed for all alternatives on the north parcel.

South Parcel: The potential remedies are intended to address the two hot spots of contaminated soil. These areas include the east bank area where waste leaking from aerosol cans has contaminated an area of subsurface soil and the location of surface soil sample SS-2 on the far west side of the site where pentachlorophenol was identified above soil cleanup guidelines. The remedies would also address perched groundwater at the site.

Alternative 1: No Action

The No Action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued groundwater monitoring of the south parcel only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment. The capital cost is to provide for replacement of monitoring wells after fifteen years.

Present Worth:	$ 71,400
Capital Cost:	$ 2,400
Total O&M Present Worth	$ 69,000
Annual O&M:	$ 4,500
Time to Implement:	Three months

Alternative 2: Surface Cleanup with Institutional Controls

Alternative 2 would include a limited surficial cleanup of the south parcel to remove the asbestos-containing material and the partially filled drum found during the RI. A long-term groundwater monitoring program would be established to monitor site conditions on the south parcel. The property owner would be required to place a deed restriction limiting the use of groundwater as a potable or process water from the south parcel without necessary water quality treatment. An annual certification by the property owner would be included as part of the restriction. No action would take place on the north parcel.

Present Worth:	$ 91,100
Capital Cost:	$ 22,100
Total O&M Present Worth	$ 69,000
Annual O&M:	$ 4,500
Time to Implement:	Three months

Alternative 3: Hot Spot Remediation with Off-Site Disposal and Site Regrading

Alternative 3 would consist of the surficial cleanup on the south parcel described in Alternative 2. In addition, contaminated soils and waste would be excavated from two locations south of the railroad tracks. Areas to be excavated include the east bank hot spot (test pit 3N area) the western hot spot (SS-2 area). All excavations would be backfilled with clean fill and regraded. Excavated material would be taken off site for disposal at an approved facility. Removal of contaminated soils and waste would eliminate threats to human health. Flat areas across the fill would be regraded to provide positive overland drainage throughout the fill area, and existing mounds would be flattened to fill in low spots. The intermittent pond area would be filled. All regrading efforts would mitigate the environmental threat by limiting migration of fill contaminants to the wetlands. A long-term groundwater monitoring program on the south parcel would be established to monitor effectiveness of the remedy. The property owner would be required to place a deed restriction limiting the use of groundwater as a potable or process water from the south parcel without necessary water quality treatment. An annual certification by the property owner would be included as part of the restriction. No action would take place on the north parcel.

Present Worth:	$ 456,200
Capital Cost:	$ 387,200
Total O&M Present Worth	$ 69,000
Annual O&M:	$ 4,500
Time to Implement:	One Year

Alternative 4: Hot Spot Remediation, Off-Site Disposal, Site Regrading and Groundwater Treatment

Alternative 4 consists of the elements of Alternative 3, plus treatment of shallow, perched groundwater in the vicinity of the east bank hot spot (test pit 3N). This groundwater would be collected by pumping from approximately three shallow extraction wells, and treated at a facility to be built on site. Treated water would be piped and discharged into the existing sanitary sewer system along Golden Road. A long-term groundwater monitoring on the south parcel program would be established to monitor effectiveness of the remedy. The property owner would be required to place a deed restriction limiting the use of groundwater as a potable or process water from the south parcel without necessary water quality treatment. An annual certification by the property owner would be included as part of the restriction. No action would take place on the north parcel.

Present Worth:	$ 1,292,200
Capital Cost:	$ 542,200
Total O&M Present Worth	$ 750,000
Annual O&M:	$ 48,800
Time to Implement:	One Year

7.2 Evaluation of Remedial Alternatives for the South Parcel

The criteria used to compare the potential remedial alternatives for the south parcel are defined in the regulation that directs the remediation of inactive hazardous waste disposal sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided, followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is included in the Feasibility Study.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for recommendation.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). *Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.*

By leaving hazardous waste in place, neither Alternative 1 or 2 would comply with SCGs for soil or groundwater. Alternatives 3 and 4 would remove the majority of soil SCG exceedances through hot spot remediation. Alternative 4 would extract and treat contaminated groundwater, however, with the removal of the sources through hot spot remediation, contaminants in groundwater would likely attenuate to standards within a short period of time under Alternative 3.

2. Protection of Human Health and the Environment. *This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.*

Alternatives 1 and 2 would not be protective of human health or the environment because hazardous waste and contaminated soil present on the south parcel would not be remediated. Alternatives 3 and 4 would be protective of human health and the environment because this material would be removed and disposed of at a licensed off-site facility.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. *The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives also is estimated and compared against the other alternatives.*

Alternative 1, No Action, would have no short-term adverse impacts, because there would be no construction activities. Alternative 2 would have insignificant short-term impacts from the surface cleanup. Alternatives 3 and 4 would have greater short-term impacts, due to activities associated with the hot spot removal. Alternative 4 would have the greatest short-term impacts with the construction and operation of a groundwater treatment facility. A site-specific Health and Safety Plan would be implemented for all ground-intrusive activities to protect workers and the community. Measures to protect the wetland during all remedial activities would be implemented as well.

Neither Alternative 1 nor 2 would reach remedial objectives. While both Alternatives 3 and 4 would reach remedial objectives, Alternative 4 would take less time than Alternative 3 to reach groundwater SCGs because any contaminated shallow groundwater left after hot spot remediation would be extracted for treatment rather than left to naturally attenuate.

4. Long-term Effectiveness and Permanence. *This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.*

Alternative 1 has no long-term effectiveness; all waste would remain on site and risks would not change. Alternative 2 has little long-term effectiveness; only the asbestos and surficial drum would be removed from the site, and remaining risks would be

subject to effectiveness of institutional controls. Alternatives 3 and 4 have significant long-term effectiveness due to the hot spot removal of waste and contaminated media.

5. Reduction of Toxicity, Mobility or Volume. *Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.*

Alternative 1 would not reduce the toxicity, mobility or volume of waste at the site. Alternative 2 would only very slightly reduce the volume of waste. Both Alternatives 3 and 4 would significantly reduce the volume of waste at the site through the hot spot removals. Alternative 4 would reduce the volume slightly further by removing and treating contaminated groundwater from the east bank area.

6. Implementability. *The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.*

Alternative 1 would be easily implemented, requiring only a long-term groundwater monitoring plan. The surficial removal included in Alternatives 2, 3 and 4 would be easily implemented. The hot spot remediation of Alternatives 3 and 4, and the groundwater collection and treatment of Alternative 4 are technically implementable with many experienced contractors available. Both Alternatives 3 and 4 would be administratively feasible.

7. Cost. *Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision.*

The costs for each alternative are presented in Table 9. Alternative 1 is the least expensive with a Total Present Worth of $ 71,400, and Alternative 4 is the most expensive at $ 1,292,200.

The final criterion, Community Acceptance, is considered a modifying criterion and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - *Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan are evaluated. A "Responsiveness Summary" will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs*

significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing Alternative 3 as the remedy for this site: Hot Spot Remediation with Off-Site Disposal and Site Regrading. This would include excavation, off-site disposal of hazardous waste and contaminated soil from two hot spots on the south parcel and backfill with clean material. The fill surface would be regraded to improve drainage. A long-term groundwater monitoring program would be established to monitor effectiveness of the remedy. See figure 5 for a conceptual layout of the proposed remedy.

This recommendation is based on the evaluation of the four alternatives developed for this site. Only Alternatives 3 and 4 would comply with the threshold criteria by removing waste and contaminated soil from the hot spot areas. Alternative 4 would go one step further by collecting and treating contaminated shallow groundwater, with a significant cost increase over Alternative 3. However, once the waste and contaminated soil in the eastern hot spot are removed, the source of contamination to shallow groundwater would be eliminated, and it is expected that within a short period of time any residual contaminated shallow groundwater would naturally attenuate to standards. Therefore, the increased cost of Alternative 4 over Alternative 3 is not justified, and Alternative 3 is the recommended remedy.

The estimated present worth cost to implement the remedy is $ 456,200. The cost to construct the remedy is estimated to be $ 387,200 and the estimated average annual operation and maintenance cost is $ 4,500.

The elements of the proposed remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS would be resolved.

2. Surficial cleanup and off-site disposal of the asbestos-containing material (approximately 15 cubic yards) and the partially filled drum found on the south parcel during the RI.

3. Excavation and off-site disposal of waste and contaminated soil (approximately 1,720 cubic yards) from the two hot spots on the south parcel:

    1) east bank (test pit 3N area): All waste material (cans, liquid waste and visibly contaminated soil) and soil exhibiting VOC contamination above

NYSDEC TAGM 4046 soil cleanup guidelines would be removed. Due to very high concentrations of solvents associated with the aerosol can waste, some of the excavated material from the east bank excavation may require pretreatment at the disposal facility prior to disposal.

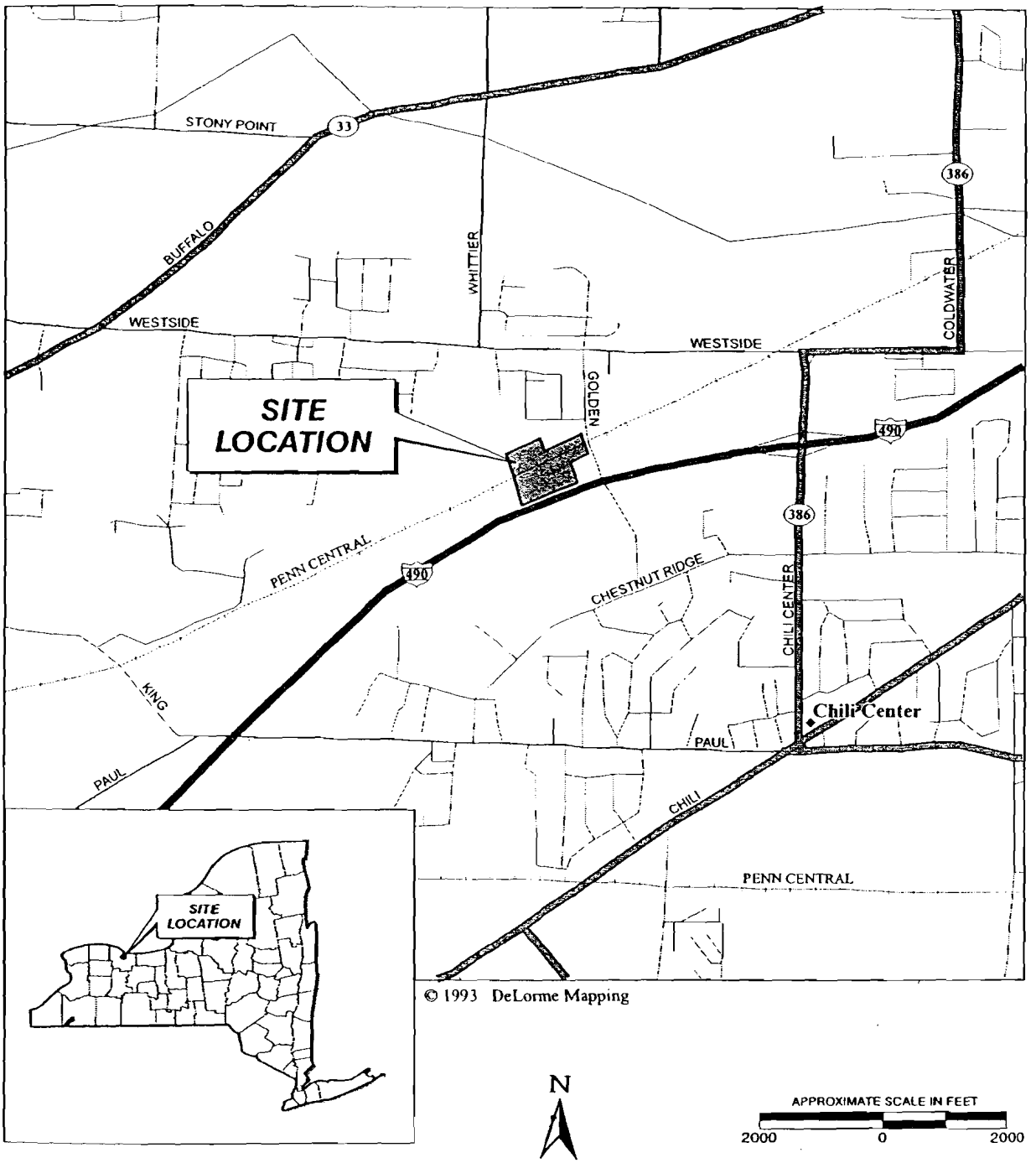
2) SS-2 area: Soil contaminated with pentachlorophenol above the NYSDEC TAGM 4046 soil cleanup guideline would be removed.

All excavated areas would be backfilled with certified clean backfill.

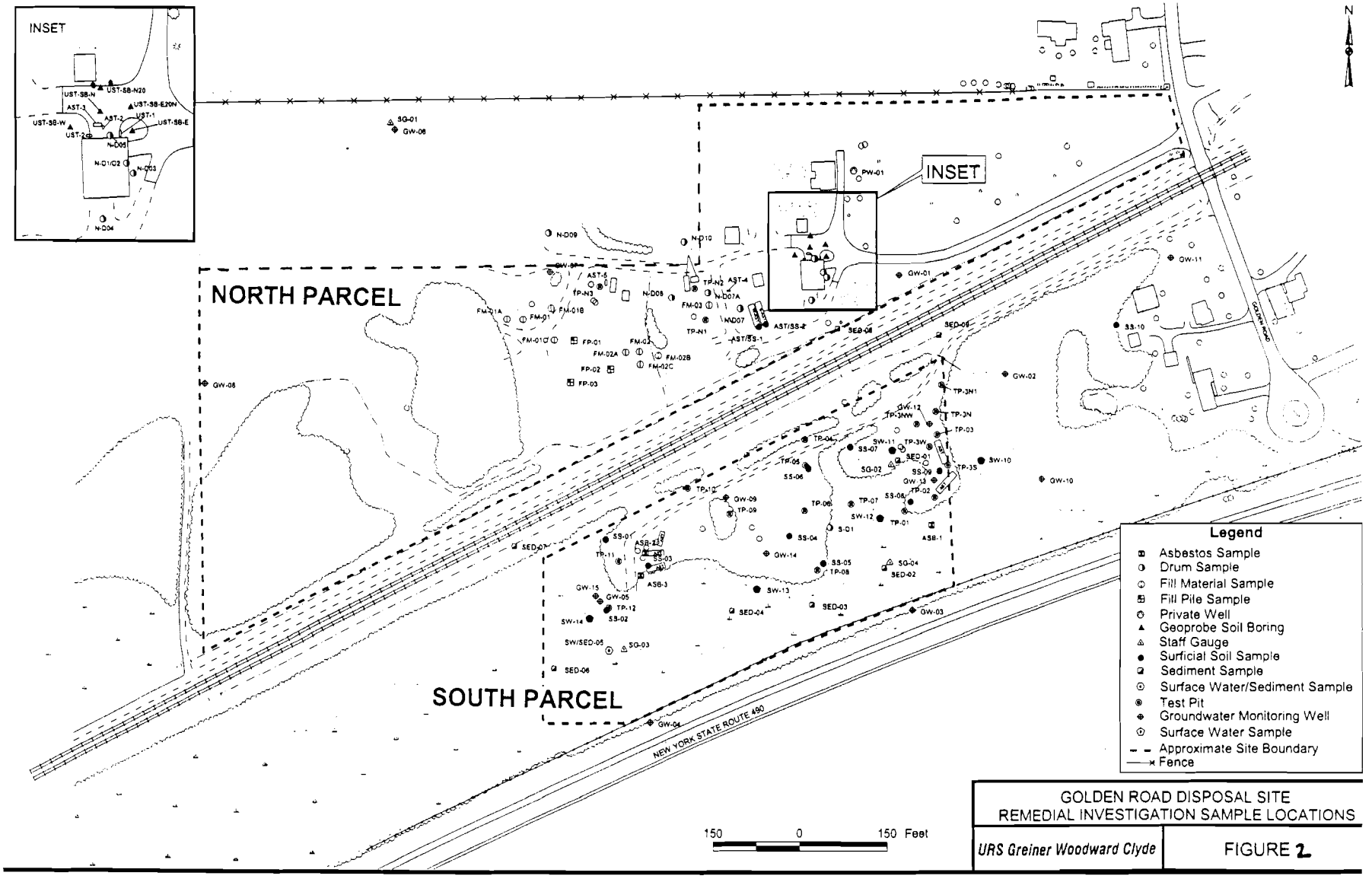
4. Regrade flat areas across fill area in south parcel to provide positive overland drainage throughout the south parcel, flatten existing mounds to fill in low spots, and fill the intermittent pond area. All regrading efforts would mitigate the environmental threat due to migration of fill contaminants to the wetlands.

5. Require that the property owner place a deed restriction limiting the use of groundwater as a potable or process water from the south parcel without necessary water quality treatment. An annual certification by the property owner would be included as part of the restriction to verify that this restriction has been maintained.

6. A long-term groundwater monitoring to monitor effectiveness of the remedy. This program would allow the effectiveness of the hot spot removal and site regrading to be monitored and would be a component of the operation and maintenance for the site.

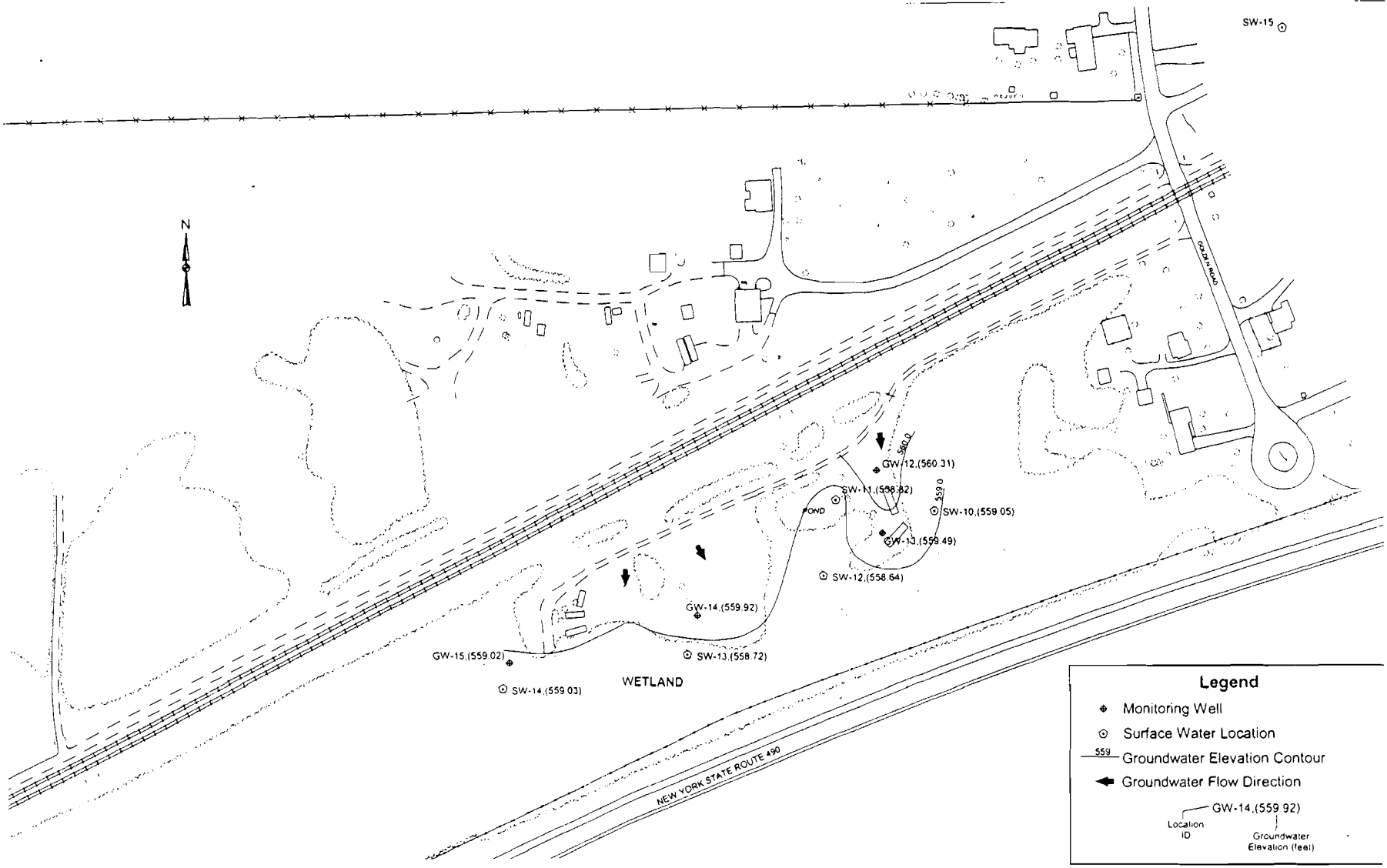


URS Greiner Woodward Clyde	GOLDEN ROAD DISPOSAL SITE SITE LOCATION MAP	FIGURE 1



GOLDEN ROAD DISPOSAL SITE
REMEDIAL INVESTIGATION SAMPLE LOCATIONS

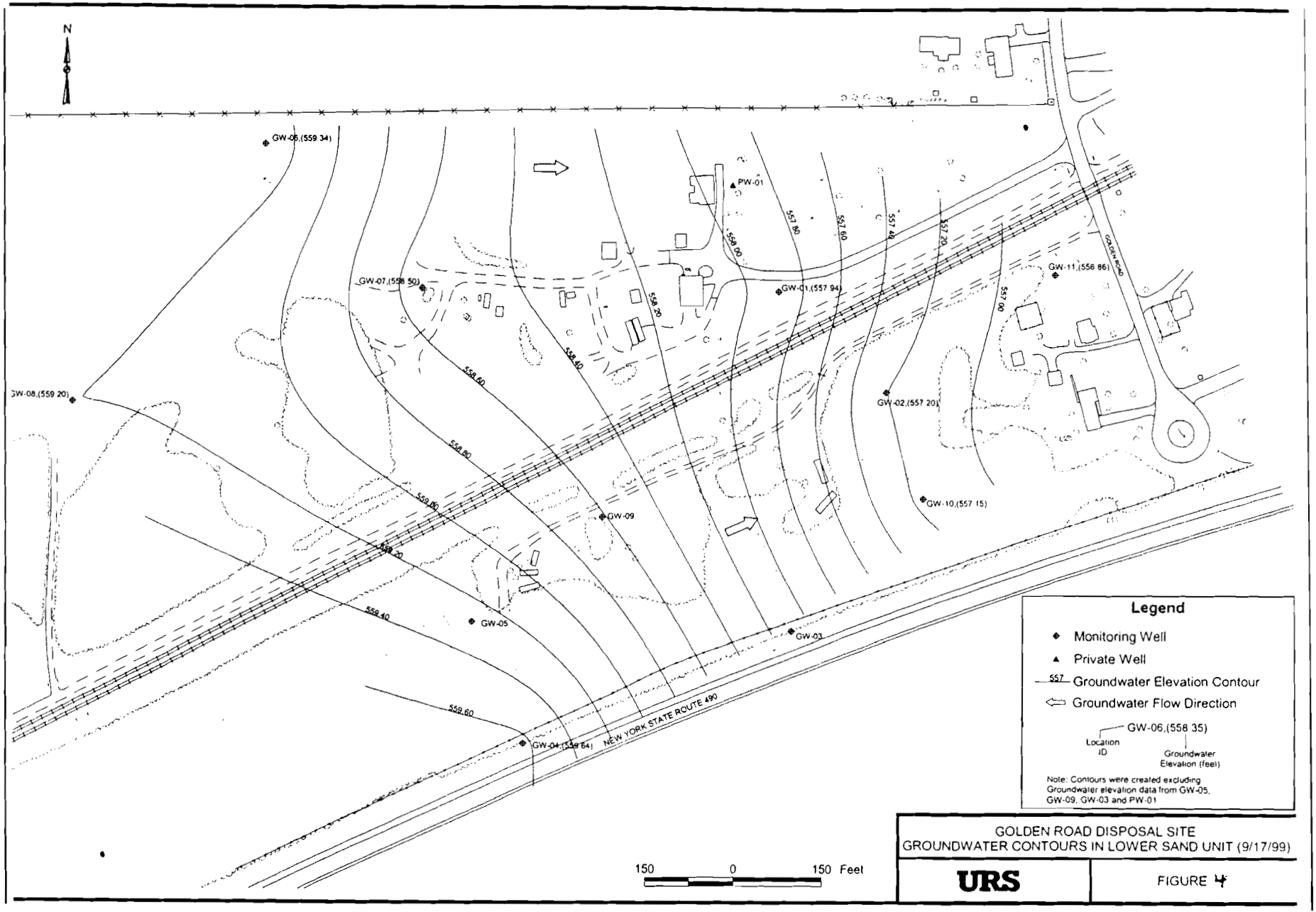
URS Greiner Woodward Clyde | FIGURE 2



GOLDEN ROAD DISPOSAL SITE
GROUNDWATER CONTOURS IN UPPER SAND UNIT (4/20/

URS

FIGURE 3


N
GW-06,(559 34)
PW-01
GW-07,(558 50)
GW-01,(557 94)
GW-11,(556 86)
GW-08,(559 20)
GW-02,(557 20)
GW-10,(557 15)
GW-09
GW-05
GW-03
GW-04,(559 64)
NEW YORK STATE ROUTE 490
GOLDEN ROAD
559.00
557.80
557.60
557.40
557.20
558.20
558.40
558.60
558.80
559.00
559.20
559.40
559.60
Legend
Monitoring Well
Private Well
557 Groundwater Elevation Contour
Groundwater Flow Direction
GW-06,(558 35)
Location ID
Groundwater Elevation (feet)
Note: Contours were created excluding Groundwater elevation data from GW-05, GW-09, GW-03 and PW-01
150 0 150 Feet
GOLDEN ROAD DISPOSAL SITE
GROUNDWATER CONTOURS IN LOWER SAND UNIT (9/17/99)
URS
FIGURE 4

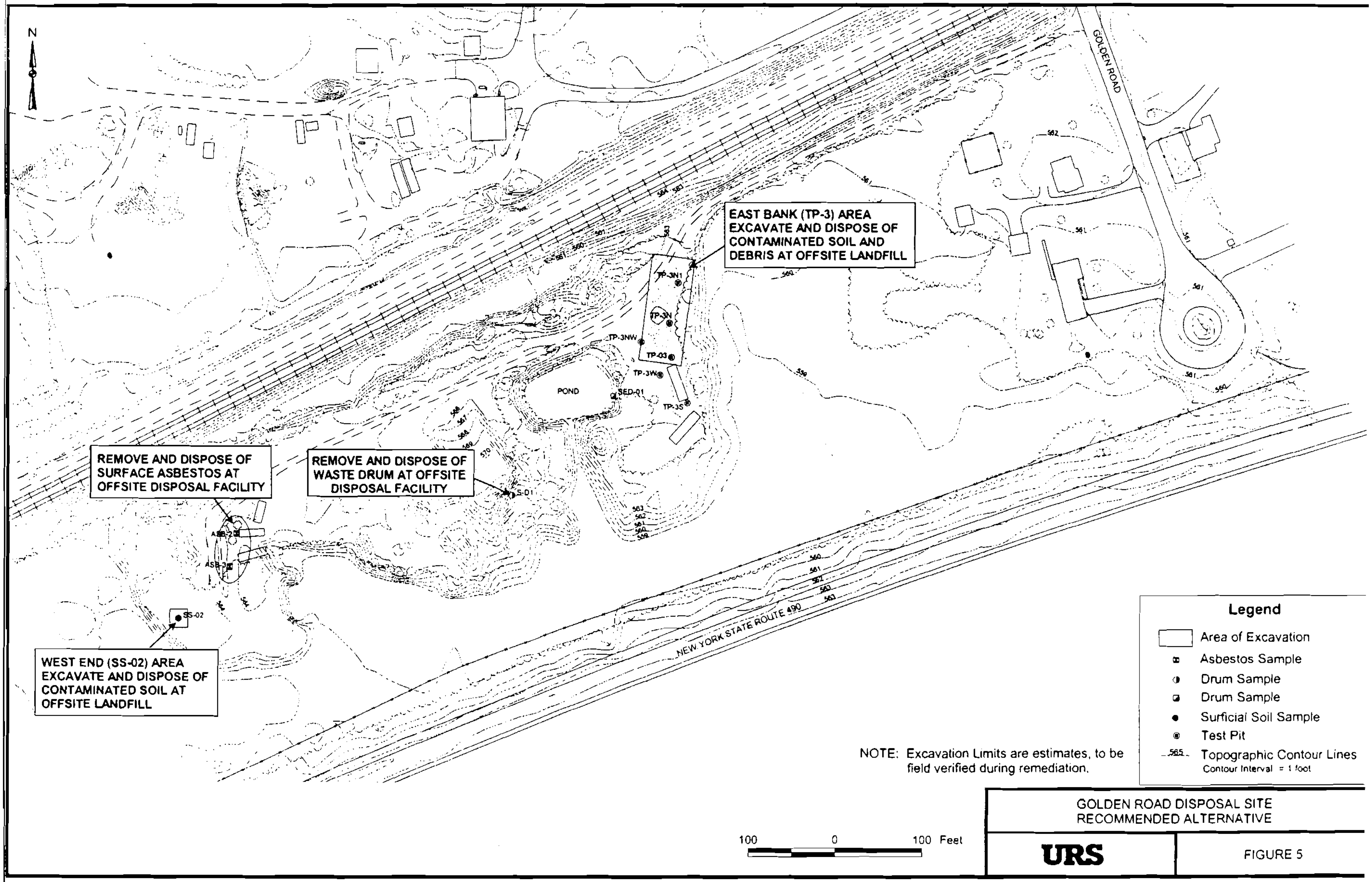

N
GOLDEN ROAD
EAST BANK (TP-3) AREA
EXCAVATE AND DISPOSE OF
CONTAMINATED SOIL AND
DEBRIS AT OFFSITE LANDFILL
TP-3N1
TP-3N
TP-3NW
TP-03
TP-3W
TP-3S
POND
SED-01
REMOVE AND DISPOSE OF
SURFACE ASBESTOS AT
OFFSITE DISPOSAL FACILITY
REMOVE AND DISPOSE OF
WASTE DRUM AT OFFSITE
DISPOSAL FACILITY
S-01
SS-02
WEST END (SS-02) AREA
EXCAVATE AND DISPOSE OF
CONTAMINATED SOIL AT
OFFSITE LANDFILL
NEW YORK STATE ROUTE 490
Legend
Area of Excavation
Asbestos Sample
Drum Sample
Drum Sample
Surficial Soil Sample
Test Pit
565 Topographic Contour Lines
Contour Interval = 1 foot
NOTE: Excavation Limits are estimates, to be field verified during remediation.
100 0 100 Feet
GOLDEN ROAD DISPOSAL SITE
RECOMMENDED ALTERNATIVE
URS
FIGURE 5

Table 1
North Parcel
Nature and Extent of Contamination

Medium of Concern	Category	Contaminant of Concern	Concentration Range (ppm)*	Frequency of Exceeding SCGs/Background	SCG/ Bkgd (ppm)
Fill Material/ Fill Pile	**SemiVolatile Organic Compounds**	Benzo(a)anthracene	ND - 0.31	1 of 6	0.224
	(SVOCs)	Benzo(a)pyrene	ND - 0.35	2 of 6	0.061
	Metals	Aluminum	1,060 - 11,700	1 of 6	8,480*
		Arsenic	2 - 10	1 of 6	7.5
		Beryllium	0.14 - 0.63	1 of 6	0.44*
		Chromium (total) Chromium (hexavalent)	6.2 - 1,250 ND	9 of 12 0 of 6	50
		Copper	8.3 - 46.7	2 of 6	25
		Iron	9,800 - 25,500	3 of 6	12,400*
		Manganese	105 - 358	4 of 6	143*
		Nickel	7.0 - 783	11 of 12	13
Surface Soil	**SVOCs**	Benzo(a)anthracene	ND - 0.73	2 of 2	0.224
		Chrysene	ND - 1.8	2 of 2	0.4
		Benzo(a)pyrene	ND - 0.33	1 of 2	0.061
	Metals	Arsenic	25.5 - 31.6	2 of 2	7.5
		Barium	66.8 - 351	1 of 2	300
		Beryllium	0.8 - 1.5	2 of 2	0.44*
		Copper	33.6 - 55.8	2 of 2	25
		Iron	35,800 - 39,900	2 of 2	12,400*
		Nickel	28 - 42.8	2 of 2	13
		Zinc	222 - 248	2 of 2	128*

* Background values based on SS -10
ND = Non-Detect

Table 2
North Parcel
Nature and Extent of Contamination

Medium of Concern	Category	Contaminant of Concern	Concentration Range (ppm)	Frequency of Exceeding SCGs/Background	SCG/ Bkgd (ppm)***
Subsurface Soil	**Volatile Organic Compounds (VOCs)**	Benzene	ND - 0.14	1 of 3	0.06
		Toluene	ND - 3.6	1 of 3	1.5
		Ethylbenzene	ND - 26	1 of 2**	5.5
		Xylene	0.008 - 170	1 of 2**	1.2
	SVOCs	Naphthalene	ND - 14	1 of 3	13
	Metals	Beryllium	0.49 - 0.51	3 of 3	0.44*
		Iron	14,700 - 16,900	3 of 3	12,400*
		Nickel	11.7 - 14.4	1 of 3	13
Sediment	**SVOCs**	Benzo(a)anthracene	0.76	1 of 1	0.224
		Chrysene	0.95	1 of 1	0.4
		Benzo(a)pyrene	0.66	1 of 1	0.061
	Metals	Aluminum	14,600	1 of 1	8,480*
		Arsenic	14.7	1 of 1	7.5
		Beryllium	1	1 of 1	0.44*
		Copper	65.2	1 of 1	25
		Iron	48,200	1 of 1	12,400*
		Manganese	449	1 of 1	143*
		Mercury	0.28	1 of 1	0.1
		Nickel	84.9	1 of 1	13
		Zinc	554	1 of 1	128*

* Background values based on SS -10
**Results for one sample rejected for quality control
*** Sediment results were compared to TAGM 4046 Soil criteria
ND = Non-Detect

Table 3
North Parcel
Nature and Extent of Contamination

Medium of Concern	Category	Contaminant of Concern	Concentration Range (ppb)	Frequency of Exceeding SCGs/ Background	SCG/ Bkgd (ppb)
Groundwater	**VOCs**	Acetone	ND - 53	1 of 5	50
		Methylene Chloride	ND - 110	1 of 5	5
		Benzene	ND - 2,700	1 of 5	1
		Toluene	ND - 400	1 of 5	5
		Ethylbenzene	ND - 2,400	1 of 5	5
		Xylene	ND - 12,000	1 of 5	5
	SVOCs	Naphthalene	ND - 360	1 of 5	10
	Metals	Arsenic	ND - 49.8	1 of 5	7.5
		Barium	ND -1,040	1 of 5	1,000
		Beryllium	ND - 6.2	1 of 5	3
		Chromium	ND - 182	1 of 5	50
		Iron	134 - 217,000	3 of 5	300
		Lead	ND - 169	1 of 5	25
		Manganese	54.9 - 5,190	2 of 5	300
		Nickel	ND - 191	1 of 5	100
		Thallium	ND - 2.7	1 of 5	0.5

ND = Non-Detect

Table 4
South Parcel
Nature and Extent of Contamination

Medium of Concern	Category	Contaminant of Concern	Concentration Range (ppm)	Frequency of Exceeding SCGs/Background	SCG/ Bkgd (ppm)
Liquid Waste (TP 3N-CAN)	**VOCs**	Methylene chloride	170,000	1 of 1	0.1
		Acetone	58	1 of 1	0.2
		2-Butanone (Methyl ethyl ketone)	380	1 of 1	0.3
		Benzene	120	1 of 1	0.06
		Toluene	220,000	1 of 1	1.5
		Ethylbenzene	32,000	1 of 1	5.5
		Xylene	150,000	1 of 1	1.2
Asbestos		Asbestos	ND - 10.5%	2 of 3	1%

Waste analytical results compared to NYSDEC TAGM 4046 (soil cleanup guidelines)
ND = Non-Detect

Asbestos results compared to 40 CFR Subpart M.

Table 5
South Parcel
Nature and Extent of Contamination

Medium of Concern	Category	Contaminant of Concern	Concentration Range (ppm)	Frequency of Exceeding SCGs/Background	SCG/Bkgd (ppm)
Surface Soil	**VOCs**	Acetone	ND - 0.49	1 of 10	0.2
	SVOCs	Pentachlorophenol	ND - 360	1 of 10	1
		Benzo(a)anthracene	ND - 2.7	4 of 10	0.224
		Chrysene	ND - 3.8	2 of 10	0.4
		Benzo(b)fluoranthene	ND - 5	2 of 10	1.1
		Benzo(k)fluoranthene	ND - 3	1 of 10	1.1
		Benzo(a)pyrene	ND - 3.7	5 of 10	0.61
		Indeno(1,2,3-cd)pyrene	ND - 5	1 of 10	3.2
	Metals	Aluminum	213 - 97,700	1 of 10	8,480
		Antimony	ND - 27.9	5 of 10	0.98*
		Arsenic	ND - 26.8	4 of 10	7.5
		Barium	7.7 - 361	1 of 10	300
		Beryllium	ND - 1.9	3 of 10	0.44*
		Chromium	6.6 - 263	5 of 10	50
		Cobalt	0.36 - 295	1 of 10	30
		Copper	5.9 - 5,380	5 of 10	25
		Iron	1,110 - 18,000	4 of 10	12,400*
		Lead	5.1 - 2,680	2 of 10	88.5*
		Manganese	27.8 - 2,820	4 of 10	143*
		Mercury	ND - 0.14	1 of 10	0.1
		Nickel	10 - 425	8 of 10	13
		Selenium	ND - 4.3	1 of 10	2
		Zinc	9 - 2,250	2 of 10	128*

* Background values based on SS -10
ND = Non-Detect

Table 6
South Parcel
Nature and Extent of Contamination

Medium of Concern	Category	Contaminant of Concern	Concentration Range (ppm)	Frequency of Exceeding SCGs/Background	SCG/ Bkgd (ppm)
Subsurface Soil	**VOCs**	Methylene chloride	ND - 5.4	1 of 10	0.1
		Benzene	ND - 0.084	1 of 10	0.06
		Toluene	ND - 97	2 of 10	1.5
		Ethylbenzene	ND - 81	3 of 10	5.5
		Xylene	0.003 - 610	4 of 10	1.2
	SVOCs	2-Methylphenol	ND - 0.88	2 of 10	0.1
		Benzo(a)anthracene	ND - 8.2	7 of 10	0.224
		Chrysene	ND - 13	7 of 10	0.4
		Benzo(b)fluoranthene	ND - 12	7 of 10	1.1
		Benzo(k)fluoranthene	ND - 11	7 of 10	1.1
		Benzo(a)pyrene	ND - 8.1	7 of 10	0.061
		Indeno(1,2,3-cd)pyrene	ND - 11	2 of 10	3.2
		Dibenzo(a,h)anthracene	ND - 5.6	7 of 10	0.014
	Metals	Beryllium	0.14 - 0.92	2 of 10	0.44*
		Chromium	5.3 - 386	6 of 10	50
		Copper	7 - 599	6 of 10	25
		Nickel	5.8 - 402	9 of 10	13
		Iron	7,270 - 26,800	1 of 10	12,400*
		Zinc	10.2 - 244	1 of 10	128*

* Background values based on SS -10
ND = Non-Detect

Table 7
South Parcel
Nature and Extent of Contamination

Medium of Concern	Category	Contaminant of Concern	Concentration Range (ppm)	Frequency of Exceeding SCGs/Background	SCG/ Bkgd (ppm)***
Sediment	**SVOCs**	Benzo(a)anthracene	ND - 1.1	3 of 8	0.224
		Chrysene	ND - 14	3 of 8	0.4
		Benzo(b)fluoranthene	ND - 11	3 of 8	1.1
		Benzo(k)fluoranthene	ND - 7.9	3 of 8	1.1
		Benzo(a)pyrene	ND - 9.9	6 of 8	0.061
		Indeno(1,2,3-cd)pyrene	ND - 4.3	2 of 8	3.2
	Metals	Antimony	ND - 1.8	1 of 8	0.98*
		Arsenic	1.6 - 10.9	5 of 8	7.5
		Beryllium	0.39 - 0.75	6 of 8	0.44*
		Chromium	8.1 - 390	1 of 8	50
		Copper	32.2 - 112	8 of 8	25
		Iron	10,400 - 27,700	6 of 8	12,400*
		Lead	17.5 - 143	3 of 8	88.5*
		Manganese	83.3 - 591	6 of 8	143*
		Mercury	ND - 0.56	6 of 8	0.1
		Nickel	15.2 - 476	8 of 8	13
		Selenium	ND - 5.1	5 of 8	2
		Zinc	31.8 - 561	7 of 8	128*

* Background values based on SS -10
*** Sediment results were compared to TAGM 4046 Soil criteria
ND = Non-Detect

Table 8
South Parcel
Nature and Extent of Contamination

Medium of Concern	Category	Contaminant of Concern	Concentration Range (ppb)	Frequency of Exceeding SCGs/Background	SCG/ Bkgd (ppb)
Surface Water	**Metals**	Aluminum	113 - 1,970	7 of 7	100
		Cobalt	ND - 12	2 of 7	5
		Copper	2.5 - 40.7	1 of 7	38
		Iron	673 - 72,700	7 of 7	300
		Nickel	1.3 - 2,370	1 of 7	216
		Selenium	ND - 5.6	1 of 7	4.6
		Silver	ND - 2.1	2 of 7	0.1
		Thallium	ND - 11.2	1 of 7	8
Groundwater	**VOCs**	Methylene chloride	ND - 600,000	1 of 9	5
		Acetone	ND - 4,900	1 of 9	50
		1,1-Dichloroethane	ND - 750	1 of 9	5
		2-Butanone	ND - 24,000	1 of 9	50
		Benzene	ND - 780	1 of 9	1
		Toluene	ND - 170,000	1 of 9	5
		Ethylbenzene	ND - 8,800	1 of 9	5
		Xylene	ND - 27,600	1 of 9	5
	SVOCs	2-Methylphenol	ND - 43	1 of 9	1
		2,4-Dimethylphenol	ND - 26	1 of 9	1
		3 & 4-Methylphenol	ND - 83	1 of 9	1
		Naphthalene	ND - 13	1 of 9	10
	Metals	Iron	575 - 57,600	9 of 9	300
		Manganese	ND - 2,310	3 of 9	300
		Mercury	ND - 0.93	1 of 9	0.7
		Thallium	ND - 20.2	3 of 9	0.5

ND = Non-Detect

Table 9
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Present Worth O&M	Total Present Worth
Alternative 1: No Action	$ 2,400	$ 4,500	$ 69,000	$ 71,400
Alternative 2: Surface Cleanup	$ 22,100	$ 4,500	$ 69,000	$ 91,100
Alternative 3: Hot Spot Remediation, Off-site Disposal, Site Regrading	$ 387,200	$ 4,500	$ 69,000	$ 456,200
Alternative 4: Hot Spot Remediation, Off-site Disposal, Site Regrading, Groundwater Treatment	$ 542,200	$ 48,800	$ 750,000	$ 1,292,200