

398 Olden Avenue Site

Trenton, New Jersey

Remedial Investigation/ Remedial Action Selection Term Contract No. A-73073

Submitted to:



STATE OF NEW JERSEY
Department of
Environmental Protection
Site Remediation Program
and Construction
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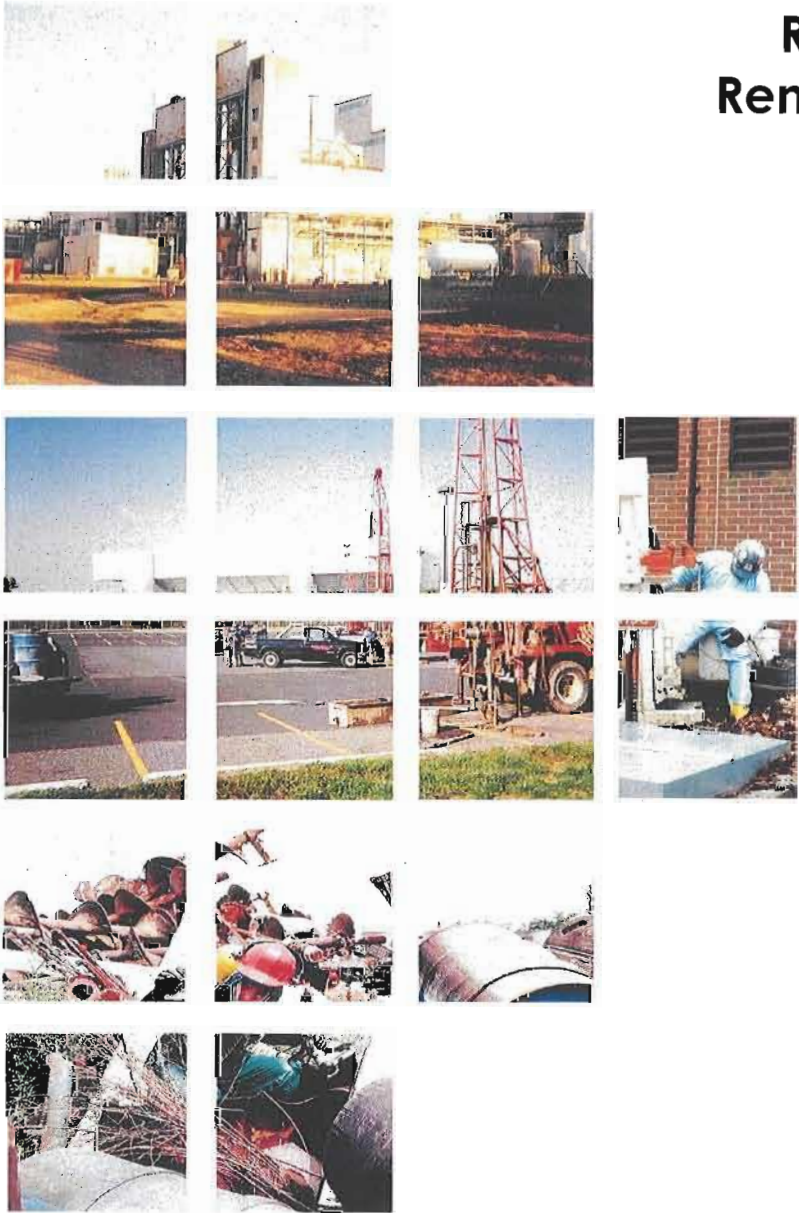




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I. BACKGROUND

The purpose of this Proposed Plan is to present the New Jersey Department of Environmental Protection's (NJDEP) selected remedial action for the 398 Olden Avenue site (Site) in Trenton, Mercer County, New Jersey.

The Remedial Investigation Report (RIR), dated June 2008 documents that a remedial investigation (RI) was conducted by Berger for the NJDEP from December 2003 through August 2006, and evaluates potential remedial actions for the Site (Berger, 2008). A summary of pertinent Site information is presented in this Proposed Plan.

Although referred to as the 398 Olden Avenue Site, the Site consists of two former gasoline filling stations located at 398 and 302 North Olden Avenue in the northeastern portion of Trenton, Mercer County, New Jersey (Figure 1). The 398 North Olden Avenue property (former Frank's Service Station) occupies tax block 22304, lot 15 and is located on the corner of North Olden Avenue and Dickinson Street. The 302 North Olden Avenue property (former Tex's Service Station) occupies tax block 22305, lots 1 and 2 and is located at the intersection of North Olden Avenue and Lawrence Street. A Site Plan showing the Site features is included as Figure 2.

Contamination at the Site was initially suspected in 1993 when gasoline vapors were detected in a Public Service Electric & Gas (PSE&G) conduit and manhole at the corner of Dickinson Street and North Olden Avenue. Further investigation by the NJDEP indicated that the USTs at the abandoned gasoline station at 398 Olden Avenue still contained product. Investigations to date indicate that soil and groundwater beneath both properties have been impacted by gasoline discharges from on-site USTs. Geophysical investigations were performed at each of the former filling stations in July 2000 to locate the USTs for subsequent removal. Prior to tank removal, the NJDEP conducted a soil and groundwater investigation using direct-push technology, which indicated that soil and groundwater contamination existed across both properties. In July 2001, the USTs and surrounding contaminated soils were removed under an NJDEP contract.

Following removal of the USTs, soils on both properties were excavated to groundwater, which was encountered at approximately 13 feet below ground surface (bgs). However, only one (1) of 18 post-excavation samples indicated concentrations of benzene and total xylenes above the *NJDEP Soil Cleanup Criteria, N.J.A.C. 7:26D* (SCC) (NJDEP, 1999). As this sample was collected immediately above the water table, this exceedance was to be delineated during the groundwater investigation. This additional remedial investigation was conducted to characterize



groundwater contamination and assess potential impacts to human and ecological receptors. Results of this investigation are summarized in Section II.

Additionally, in response to a July 25, 2001 report that gasoline odors had been present in the past in nearby residences on Dickinson Street, NJDEP conducted several indoor air sampling events in several residences on the south side of Dickinson Street between July 25, 2001 and December 5, 2003, and no indoor air contamination was found in any of the sampling events. As such, NJDEP concluded that removal of the leaking gasoline tanks and contaminated soil had eliminated subsurface gasoline vapors that had been entering nearby residences. NJDEP determined that no additional indoor air sampling was necessary.



II. SUMMARY OF REMEDIAL INVESTIGATION

A. Overview

A Remedial Investigation (RI) was conducted at the Site to characterize the nature and extent of groundwater contamination and other potentially affected media. The RI activities were conducted from December 15, 2003 through August 2, 2006, and included: installation of temporary wells and monitoring wells; groundwater sampling; surface water/sediment sampling; a site survey; and a receptor evaluation. This section presents a summary of the RI results. The Final RIR (Berger, 2008) is available through the NJDEP Site Remediation Program and the City of Trenton Brownfields Office.

B. Findings

The major findings of the RI are summarized as follows:

1. Groundwater Investigation

Groundwater samples were collected during four events during the RI from monitoring wells and temporary wells. During these events, groundwater elevations were also collected and water level measurements generally indicated a south-southeast flow direction.

Groundwater sampling was conducted between December 2003 and August 2006 (temporary wells were sampled in 2004). In all events, various gasoline-related compounds were detected in exceedance of the *Groundwater Quality Standards* (GWQS) (NJDEP, 2005). Benzene, with the lowest GWQS and the most GWQS exceedances (maximum detection of 76 µg/l), was identified as the indicator compound. This benzene concentration was detected at MW-06 (Figure 2) in 2004, and concentrations at this well decreased to 40 µg/L and 12 µg/L during the 2005 and 2006 sampling rounds, respectively. It is noted that trichloroethene (TCE), Methyl tert-butyl ether (MTBE), Tert-butyl alcohol (TBA), iron and lead were also detected above the GWQS at the Site; however, these compounds are most likely from an off-site source.

2. Surface Water and Sediment Investigation

Five surface water and five sediment samples were collected from various locations along Assunpink Creek (Figure 2). The analytical results of the surface water samples were compared to the *NJDEP Surface Water Quality Standards, N.J.A.C. 7:9B* (SWQS) (NJDEP, 1998a) for



FW-2 waters. The only SWQS exceedance was for bromodichloromethane, which was detected in all surface water samples (including the sample collected upstream of the Site) at approximately the same concentration (1 – 1.2 µg/l), and is not considered to be a site-related compound.

The analytical results of the sediment samples were compared to the *Guidance for Sediment Quality Evaluations* (NJDEP, 1998b). There were no VOC exceedances in any of the samples. A number of polycyclic aromatic hydrocarbons (PAHs) exceed the Lowest Effects Level (LEL) freshwater criteria; however, there were no exceedances of the Severe Effects Level (SEL) freshwater criteria. An LEL exceedance indicates a potential impact to 10% of the benthic community. The following should be noted:

- Several of the PAHs exceeding LEL were not detected in on-site groundwater samples;
- The PAH concentrations within the assumed groundwater flow direction (SED02, SED03, SED04) and upstream (SED05) of the Site are approximately equivalent;
- The Site Investigation and Remedial Action Report (Langan, 2003) of the former Crescent Wire Site at North Olden Avenue and Lawrence Street (now the vacant lot directly south of the Site) indicates that a number of PAHs found in the on-site soil samples collected during the investigation exceeded the NJ Direct Contact Residential Soil Cleanup Criteria and the Impact to Groundwater Criteria. These are the same PAHs detected in sediment samples collected during this RI.

Therefore, the PAHs found in the sediment samples are most likely not due to migration from the Site, and are probably attributable to other off-site sources.

3. Receptor Evaluation

A receptor evaluation was completed as part of the RI. The evaluation included a well search to identify receptors that could be affected by potential off-site migration of contaminants and a Baseline Ecological Evaluation (BEE), which included the inspection of environmentally sensitive areas.

Based on the well search results, only one (1) well was identified within one mile of the Site; however, the well was owned by Acme Hamilton Manufacturing Company (no longer in business), and therefore may have been used for industrial purposes. No other private wells were identified within one-half mile of the Site, and no public supply wells, industrial wells, or irrigation wells were found within one mile of the Site.



The BEE concluded that the results of previous investigations and the RI demonstrated that Contaminants of Ecological Concern (COECs) (i.e., benzene, ethylbenzene, xylene, and naphthalene) do exist both on-site and off-site, and an environmentally sensitive area (Assunpink Creek) also exists adjacent to the Site. However, based upon the data collected during the RI and visual observation, off-site contaminant migration from the Site does not appear to be impacting the surface water and sediments of the environmentally sensitive area.

C. Conclusions

Since the removal of the USTs and impacted soils from the Site in 2001, the potential for vapor migration to nearby residential properties has been greatly diminished. Indoor air sampling of residences on Dickinson Street by the NJDEP from 2001 through 2003 also confirmed that vapor migration to nearby residences was not occurring, and no further complaints of indoor odors have since been reported.

Based on the RI activities (Berger, 2008), it appears that gasoline-related contaminants are present in groundwater above the GWQS. Benzene is the primary contaminant of concern at the Site. The highest concentrations of benzene were detected downgradient of 398 Olden Ave in MW06, in the direction of groundwater flow (south-southeast flow as shown on Figure 2). The migration of contaminants from the groundwater to the environmentally sensitive area does not appear to have yet occurred, as no Site contaminants were detected in surface water and sediment samples collected from several locations in Assunpink Creek.

Remedial action is required to address the groundwater contamination as the existing contamination plume may continue to migrate downgradient toward the Assunpink Creek. The remedial alternative selection for the site is discussed in Section III of this document.



III. REMEDIAL ALTERNATIVE SELECTION EVALUATION (RASE)

This section presents the remedial alternatives selected for evaluation to address gasoline-related contaminants in groundwater at the Site. Three (3) potential remedial alternatives were selected for consideration at the Site: 1) No Action; 2) Pump and Treat; and 3) Oxygen Releasing Compound (ORC) Slurry Injection. Descriptions and evaluation of the alternatives with regard to their applicability and suitability for addressing Site contamination are presented as follows:

Alternative 1 – No Action

The No Action alternative involves leaving the Site in its current condition with no remedial action considered. This remedial alternative does not entail any measures to control exposure to the contaminants of concern at the Site. It relies on natural attenuation to achieve applicable remediation standards, using a groundwater Classification Exception Area (CEA) to control exposure on site, and long-term monitoring to track contaminant migration.

Because this alternative relies solely on natural processes to degrade and disperse contamination, groundwater contamination would likely remain above the standards for a long period of time. Although the RI results suggest that Site contamination currently does not impact the environmentally sensitive area located downgradient of the Site (i.e., Assunpink Creek), the groundwater contamination may migrate to the creek in the future. Additionally, this alternative may be perceived as unprotective by the community. Therefore, this remedial alternative is not considered feasible for the Site.

Alternative 2 – Pump and Treat

The Pump and Treat remedial alternative involves the application of a groundwater pumping system to remove dissolved contaminants from the subsurface and to achieve containment of contaminated groundwater to prevent contaminant migration. The pumped groundwater would then be treated ex-situ using air stripping followed by carbon adsorption. The treated groundwater is assumed to be discharged back into the subsurface (under a New Jersey Pollutant Discharge Elimination System or NJPDES Permit) through an infiltration trench upgradient of the contamination.

This alternative would be relatively costly and difficult to implement. Additionally, this alternative is anticipated to be ineffective due to the relatively low concentrations of contaminants and low permeability of the soil at the Site. As such, this alternative is not considered feasible for the Site.



Alternative 3 – ORC Slurry Injection

The ORC Slurry Injection remedial alternative entails the injection of materials (such as Oxygen Release Compound Advanced (ORC Advanced[®]) by Regenesis Inc., EHC-O[™] by Adventus Americas, Inc., or other similar products) to enhance biodegradation activities of indigenous microorganisms in the subsurface to degrade Site contamination. These products facilitate similar mechanisms to enhance biodegradation (i.e., introducing additional oxygen to the subsurface). Generally, a bench scale treatability study would need to be conducted to determine the most appropriate product for a site.

This alternative is generally cost-effective and easily implemented compared to other conventional remedial alternatives (e.g., groundwater pump and treat). This alternative would also be suited for the Site because the extended lifespan (up to 12 months) of the biodegradation enhancement compounds in subsurface would allow microorganisms to effectively degrade the low-level contaminant concentrations at the Site. Additional injections could be used to further enhance biodegradation if necessary. Applicable remediation standards are anticipated to be achieved within 5 years; thus, this alternative is considered timely. The alternative would likely cause some moderate noise disturbance to nearby residents during the material injection.



IV. PROPOSED REMEDIAL ACTION

A. Summary and Discussion

Based upon the preceding evaluation of remedial alternatives, **Alternative 3**, ORC Slurry Injection, is the proposed remedial action for the 398 Olden Ave. Site. **Alternative 3** is considered to be the most technically feasible and reliable remedy for the low-level groundwater contamination at the Site. **Attachment 1** presents a Conceptual Design of the ORC Slurry Injection remedy. A CEA will also be established to protect human health and the environment until contaminant concentrations are reduced to applicable standards.

The total estimated cost development of this approach is \$300,000, and assumes a 3-year groundwater monitoring period. A detailed cost estimate for this alternative is provided in **Attachment 2**.

B. Community Relations and Public Participation

This Proposed Plan has been prepared for public release. This document and its Attachments have been placed in repository at the office of the City of Trenton municipal clerk. NJDEP will accept public comments on the Proposed Plan during a 30-day public comment period that will be announced and advertised.

At the conclusion of the public comment period, NJDEP will issue a response to comments and a Final Decision Document for the 398 Olden Ave. Site. NJDEP would then proceed to design and implement the approved remedial actions.



V. REFERENCES

Langan (Langan Engineering and Environmental Services, Inc.), 2003. *Site Investigation and Remedial Action Report*, Crescent Wire Site, North Olden Avenue and Lawrence Street, Trenton, NJ, July 9, 2003.

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