Remediation Cost Estimate Summary

Former Howard Warehouse – Vacant Land
MLC ID 1005

October 27, 2009

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Background Information

The Former Howard Warehouse site is approximately 3.8 acres in size and is vacant. The site is bounded by Garey Street to the north; Brown Street to the east, railroad tracks to the south, and Owen Street (vacated) to the west. The most recent aerial photograph indicated that the site is located in an area of mixed residential and industrial/commercial uses.

Based on information obtained from a Phase I Environmental Site Assessment (ESA) prepared by Conestoga-Rovers & Associates (CRA) and dated September 2006, Nelson Brothers Company, a manufacturer of gasoline engines, occupied the site from approximately 1924 through 1940. General Motors (GM) began leasing the building in 1945, and reportedly subleased the site to Howard Industries and Palace Corporation, automobile trailer and/or portable building manufacturers, and to Sears Roebuck & Company for use as a warehouse. Other occupants that reportedly subleased the property included the United States Navy, Baker Perkins, Kochton Corporation, and General Electric. GM purchased the site in 1979, and many of the companies listed above continued to occupy the building until it was demolished in 1988.

Background information is provided below:

- Site Location

  Former Howard Warehouse/Vacant land
  700 Garey Street, Saginaw, Michigan
  MLC ID 1005

- EPA ID Numbers

  None

- MLC Project Manager

  Ken Richards

- Regulatory Agencies & Contacts

  MDEQ

- Principal Consultant(s)

  CRA

- LFR ARCADIS Lead Site Analysts

  Eric Sager

- Current Phase of Site

  Assessment

Real Estate Information

The following is a summary of the real estate information for the site:

- Current Land Use & Zoning/Permitted Use - Vacant
- Zoning - Industrial
- Building & Improvements – Building demolished in 1988
- Size, age, condition – 3.8 Acres Vacant
- Infrastructure – Unknown
- Demo Cost (as nec. for remediation) – None

Environmental History

The Phase I ESA prepared by CRA identified several recognized environmental conditions (RECs):

- Former Underground Storage Tanks

  One 800-gallon gasoline underground storage tank (UST) was located near the northwestern corner of the building, possibly within the Owen Street right-of-way, and one 1,000-gallon fuel oil UST was located in the courtyard of the building. Files obtained from the Michigan Department of Environmental Quality (MDEQ) indicated that an approximately 300-gallon UST was removed from the site, but the location was not provided. Notes from the MDEQ file indicated that a strong petroleum odor was noted in the excavation and that six samples were collected from the excavation. No information was available regarding the analytical results. The files did not indicate whether soil was excavated.

- Former Aboveground Storage Tank

  One 1,000-gallon aboveground storage tank (AST) was depicted on maps at the northeastern corner of the site building. No other information was available on the AST.

- Former Gasoline Engine Manufacturing Operations

Nelson Brothers Company, a manufacturer of gasoline engines, occupied the site from at least 1924 through 1940. Historical information also indicated that Howard Industries and Palace Corporation, manufacturers of automobile trailers and/or portable buildings, also occupied the site. Based on the Phase I ESA, hazardous wastes would have potentially been generated at the site associated with the manufacturing operations, including machining, painting/spraying, dipping, and acetylene generation processes. A map illustrated that the building was used as a foundry and identified cooling sheds with earthen floors. Transformers were identified in the courtyard of the building. In addition, hydraulic machinery may have been used at the site, and personnel indicated that equipment containing polychlorinated biphenyls was stored at the site. Soil samples were collected at the site in 1988, and the results indicated that several metals were present in concentrations above screening criteria.

- Former Outside Material Storage

  A site map depicted a coal pile outside the south end of the building and adjacent to the railroad tracks. A portion of the site to the east of the building was also apparently used to store fire bricks, pig iron, coke piles, a flask yard, scrap steel, and other materials.

- Potential Subsurface Demolition Debris

  According to information in the Phase I ESA, the 1984 GM purchase order for demolition of the site specified that the building be demolished to one foot below existing grade and that all machine foundations and pits were to be removed to 12 inches below the floor. No documentation of demolition activities was available.

- Adjacent Historical Dry Cleaning Operations

  A Sanborn Map from 1969 indicated that adjacent property to the southwest was used for dry cleaning.

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR), and the site was not listed in any of the databases searched by EDR.

Current Environmental Issues and Future Remedial Actions

CRA completed Phase II Environmental Site Assessment. CRA was contacted to discuss the Phase II activities and results. Four sampling events were completed in December 2006, February 2007, September 2007, and November 2008. A total of 104 soil borings were advanced. Fifty borings were advanced to a depth of 2 feet below ground surface (ft bgs), seven borings were advanced to a depth of 4 ft bgs, 43 borings were advanced to a depth of 5 ft bgs, and 7 borings were advanced to a depth of 10 ft bgs. In addition to grid

sampling across the site, soil borings were advanced in the area of each of the RECs, at the three doorways, one in the loading area, and three in the vicinity of tanks.

A review of boring logs provided by CRA indicated that the lithology generally consists of sand from the ground surface down to depths ranging from approximately 2 to 5 feet. The sand is underlain by clay that extends down to at least 10 feet. CRA indicated that no groundwater was encountered during drilling operations; therefore, no groundwater samples were collected. CRA also indicated that they did not expect groundwater to be affected from site operations.

CRA reported that the Residential Drinking Water Protection Criteria for soil was exceeded for arsenic, total chromium, lead, and trichloroethene. CRA indicated that the Residential Drinking Water Protection criteria is not applicable because groundwater was not encountered in the area of impacts and the impacted surface soils are underlain by a continuous extensive clay layer beginning at a depth of approximately 5 ft bgs separating the impacted soils from the groundwater table. Further, groundwater in the city is not used for drinking water and shallow groundwater wells are prohibited.

The Residential Direct Contact Criteria for soil was exceeded for arsenic, lead, and benzo(a)pyrene. Arsenic concentrations in soil at the Site were within statewide background concentrations; therefore, CRA indicated that no further investigation with respect to arsenic was necessary. Soil samples exceeded Residential Direct Contact criteria for lead (400 milligrams/kilogram [mg/kg]) at five locations located in a small isolated area ranging in concentration from 431 mg/kg to 5,450 mg/kg. CRA indicated that lead has been characterized horizontally and vertically, except for one soil sample location (BH13W) with a concentration of 823 mg/kg, which required further delineation to the south. Soil samples exceeded Residential Direct Contact criteria for benzo(a)pyrene (2 mg/kg) at five locations ranging in concentration from 3.7 mg/kg to 14 mg/kg. CRA indicated that benzo(a)pyrene has been characterized horizontally and vertically at BH18 which was marginally above screening criteria. CRA also indicated that the remaining four locations that exceeded Residential Direct Contact criteria for benzo(a)pyrene were marginally above criteria, were located near roads along the perimeter of the property, and were not believed to be site-related. CRA recommended no additional sampling for benzo(a)pyrene.

The end-use of the site will dictate whether additional work is required. If the site were to be used under a residential/park scenario, further delineation is anticipated for lead as well as some soil removal. Surficial soil removal would also likely be required for exceedances of benzo(a)pyrene under a residential use scenario. If the Site were to be used under an industrial/commercial use scenario, a fence is likely required to limit access to the Site as well as further delineation of lead and some soil removal.

Due to the isolated areas of affected soil, it will most likely be more cost effective to remediate the site assuming a residential/park scenario. This will eliminate any deed restrictions and associated operations and maintenance activities. Based on this scenario,

it is recommended to delineate and excavate the affected soil.

Remediation Cost Estimate

The remedial cost estimate is provided below:

- Remedial Activities

  Complete the delineation of affected soil. Based on known and anticipated conditions, approximately 370 cubic yards of lead-affected soil and approximately 185 cubic yards of benzo(a)pyrene-affected soil is excavated from the site and transported off-site for proper off-site disposal.

- Regulatory Drivers

  There are no current drivers. The remediation cost estimate assumes that the site will have unrestricted land use.

- Key Assumptions

  The remediation cost estimate is based on the following key assumptions:

  1. MDEQ agrees with the results of the Phase II environmental site assessment, approves the report and agrees with the proposed remedial approach.

  2. MDEQ believes that the benzo(a)pyrene exceedances at the four locations along the boundary of the site are due to site activities and require remediation.

  3. Additional assessment activities indicate that soil affected with lead above screening criteria due to site activities is located in an area of approximately 5,000 square feet and extends vertically to 2 feet bgs.

  4. Additional assessment activities indicate that soil affected with benzo(a)pyrene above screening criteria due to site activities is located in 5 separate areas of approximately 500 square feet each and extends vertically to 2 feet bgs.

  5. Affected soil excavated from the site in non-hazardous.

  6. Groundwater is not affected by site activities.

The remediation cost estimate for this site in current dollars (2009) is $187,688. Refer to the Remediation Budget Summary Spreadsheet below for more details on these costs.

Year	No.	Remediation Budget Summary: Site Assessment and Reporting	Contingency	Soil Excavation and Reporting	Contingency	Agency Oversight
2009	1	$ 37,500	10%	$ -	10%	$ 2,063
2010	2	$ -	10%	$ 125,000	10%	$ 6,875
2011	3	$ -	10%	$ -	10%	$ -
2012	4	$ -	10%	$ -	10%	$ -
2013	5	$ -	10%	$ -	10%	$ -
2014	6	$ -	10%	$ -	10%	$ -
2015	7	$ -	10%	$ -	10%	$ -
2016	8	$ -	10%	$ -	10%	$ -
2017	9	$ -	10%	$ -	10%	$ -
2018	10	$ -	10%	$ -	10%	$ -
2019	11	$ -	10%	$ -	10%	$ -
2020	12	$ -	10%	$ -	10%	$ -
2021	13	$ -	10%	$ -	10%	$ -
2022	14	$ -	10%	$ -	10%	$ -
2023	15	$ -	10%	$ -	10%	$ -
2024	16	$ -	10%	$ -	10%	$ -
2025	17	$ -	10%	$ -	10%	$ -
2026	18	$ -	10%	$ -	10%	$ -
2027	19	$ -	10%	$ -	10%	$ -
2028	20	$ -	10%	$ -	10%	$ -
2029	21	$ -	10%	$ -	10%	$ -
2030	22	$ -	10%	$ -	10%	$ -
2031	23	$ -	10%	$ -	10%	$ -
2032	24	$ -	10%	$ -	10%	$ -
2033	25	$ -	10%	$ -	10%	$ -
2034	26	$ -	10%	$ -	10%	$ -
2035	27	$ -	10%	$ -	10%	$ -
2036	28	$ -	10%	$ -	10%	$ -
2037	29	$ -	10%	$ -	10%	$ -
2038	30	$ -	10%	$ -	10%	$ -

Brownfield and Redevelopment Considerations

The site has minor surface contamination that will be remediated to achieve unrestricted land uses. Once this work is complete, there will be no significant environmental constraints to redevelopment.