UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF: SR-6J

EPA Region 5 Records Ctr.
299864

MEMORANDUM

AUG 28 2008

Date:

Subject: ACTION MEMORANDUM - Request for Approval of a Non-Time Critical Removal Action at the Vulcan Louisville Smelting Company Site, North Chicago, Illinois (Site ID # A527)

From: Syed Quadri, Remedial Project Manager
Remedial Response Branch#2, Section #6

To: Richard Karl, Director
Superfund Division

Through: Jason El-Zein, Chief
Emergency Response Branch #1

I. PURPOSE

This memorandum is to request and document your approval to expend up to $2.5 million to mitigate threats to public health, welfare, and the environment at the Vulcan Louisville Smelting Site, hereafter referred to as the "Site", in North Chicago, Illinois. The Site includes a 6.4 acre vacant lot (Vacant Lot), and an adjacent 8 acre parcel, formerly owned and operated by Fansteel, Inc. (Fansteel). The buildings on the Fansteel parcel have been demolished by its current owner, the City of North Chicago (North Chicago).

The selected removal action is necessary to mitigate the threat to public health, welfare and the environment posed by the presence of elevated levels of trichloroethylene (TCE), tetrachloroethylene or perchloroethylene (PCE), vinyl chloride and lead in soils and elevated levels of TCE and other volatile organic compounds (VOCs) in groundwater at the Site. This non-time critical removal action will be protective of human health and the environment by removing contaminants from the Site, preventing exposure to on-site residual contamination and by minimizing the migration of contaminants from the Site.

Specifically, the selected removal action for the Site will include excavation of contaminated soil at the following designated areas located at the Site: (1) a hazardous waste management unit area (HWMU) on the north end of the former Fansteel parcel; (2) a "TCE hot spot" near Pettibone

Creek on the vacant lot area; (3) a former drum storage area east of the main Fansteel plant building; and (4) the mid-eastern edge of Fansteel Chemical Building A.

In addition, a physical barrier will be installed in the former Above-Ground Storage Tank area, area, the former drum storage area, and over any areas where existing building floor slabs will be removed as part of site redevelopment. Improvements to existing impermeable covers over contaminated soil will also be made as necessary. The former transformer courtyard was not within the scope of the original study, but if sufficient special account funds remain they will be used to dig up about 44 cubic yards (80 tons) of PCB-contaminated soil located there. This additional work is appropriate because it would be funded by payments Fansteel made to attempt to resolve all known environmental issues at the Site.

Some residual contamination will remain on-site following the completion of the removal action, such as lower levels of lead and volatile organic compounds. North Chicago has entered a settlement agreement with U.S. EPA agreeing to impose land use restrictions on the Site requiring long term maintenance of impermeable cover material over areas within the Site where soil contaminated with lower levels of lead or VOCs will remain in place. A Post Removal Site Control Plan will be established and its implementation will be periodically reviewed by U.S. EPA.

On May 22, 2008, U.S. EPA issued a fact sheet proposing to proceed with this removal action and soliciting public comment on the proposal. The comment period closed on June 20, 2008. Comments received by the U.S. EPA on the removal action proposal have been included, along with U.S EPA's response to the comments, in a responsiveness summary which is attached to this memorandum.

The selected removal action is based on the administrative record for this Site. This action has an estimated present worth value of approximately $2.5 million. This action does not obligate funds from the Superfund pipeline because it will utilize settlement funds held in a special account under Section 122(b)(3) of CERCLA. Even though the $2 million statutory limit on removal funding under CERCLA Section 104 does not specifically apply, this memorandum describes the conditions at the site that meet the criteria for exemption from the $ 2 million limit.

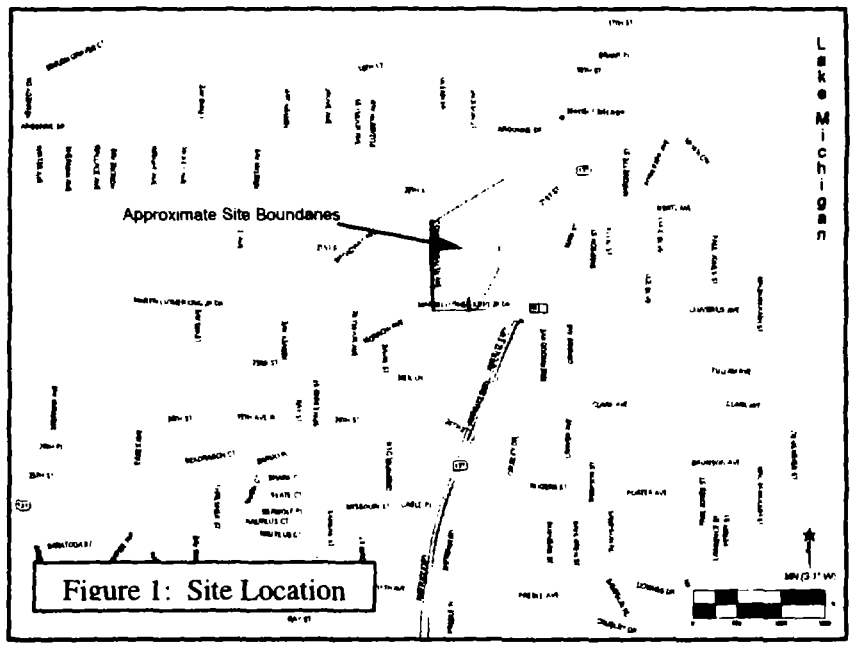


Figure 1: Site Location

The Site is not on the National Priorities List (NPL).

II. SITE CONDITION AND BACKGROUND

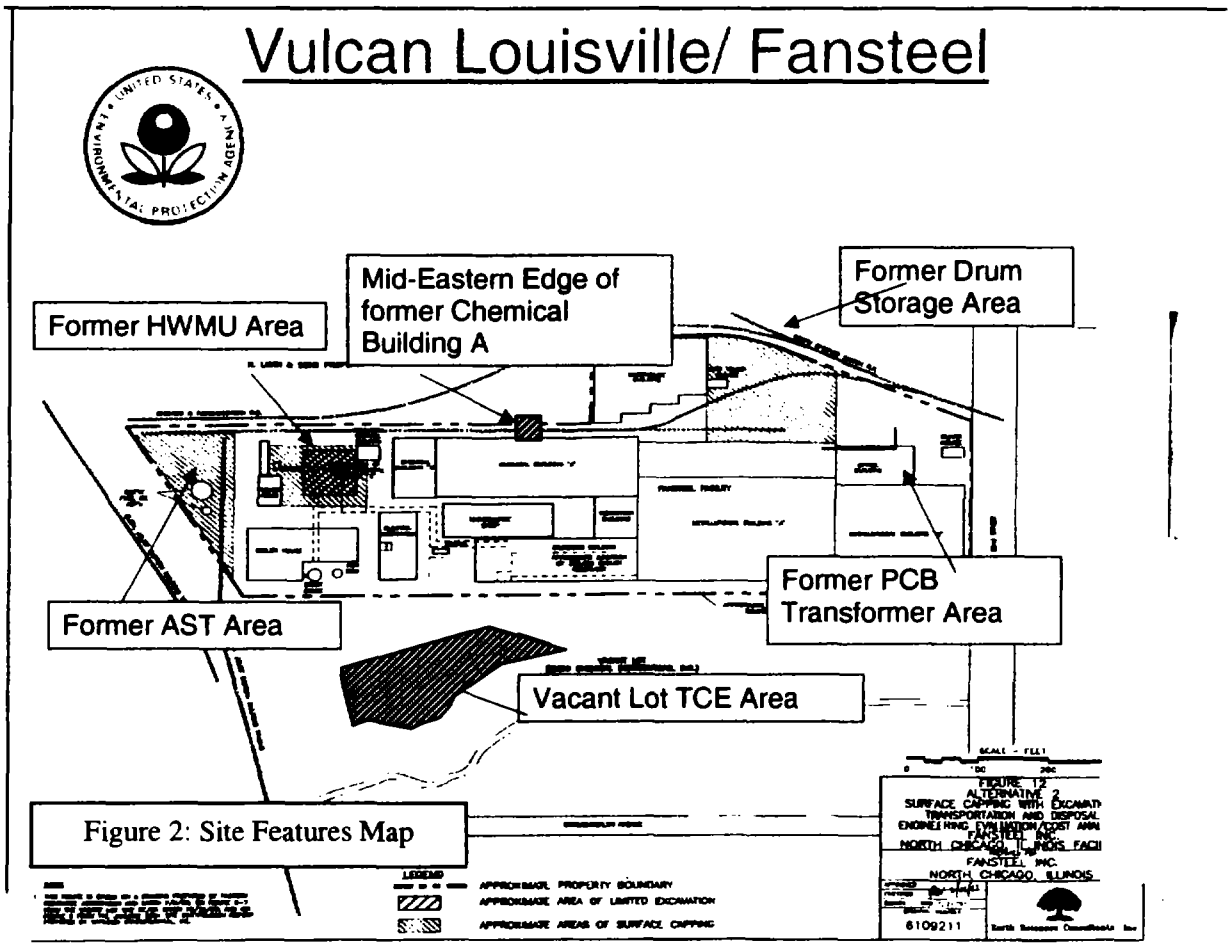
CERCLIS ID#: ILD097271563

A. Physical Location

The Site is located in North Chicago, Lake County, in northeast Illinois. The Site consists of two parcels. The former Fansteel property is located at Number One Tantalum Place, approximately 2 miles east of the intersection of Martin Luther King Jr. Street (22nd Street) and U.S. Highway 41. The Fansteel parcel is bounded by the R. Lavin & Sons facility to the east, 22nd Street (Martin Luther King Jr. Street) to the south, the Vacant Lot parcel to the west, and the Elgin, Joliet & Eastern Railroad to the north. Figure 1 is the Site location map.

The Vacant Lot parcel is a 6.4 acre parcel of land bordered by the Fansteel facility on the east, the Elgin, Joliet & Eastern Railroad to the north, Martin Luther King Jr. Street (22nd Street) to the south and Commonwealth Avenue on the west. The Vacant Lot is bisected by Pettibone Creek (Creek), an intermittent creek.

Figure 2 is a map of Fansteel and Vacant Lot parcel features.



According to the 2000 Census, the City of North Chicago has a population of 33,271, but this includes Naval personnel stationed at Great Lakes Naval Training Center. Subtracting base personnel shows North Chicago to be a community of approximately 16,000 people with over 75% of its residents from a racial or ethnic minority. Twelve percent of families are below the poverty level and the 24-month average for unemployment being 9.53% (which is 225% above national unemployment levels.

According to the Region 5 Superfund Environmental Justice (EJ) Analysis, in Illinois, the low income percentage is 27% and the minority percentage is 32%. To meet the EJ criteria, the area within one mile of the Site must have a population that is twice the state low income percentage and/or twice the state minority percentage. That is, the area must be at least 54% low income and/or 64% minority. As determined by ArcView 3.0, in the area of the Site, the low income percentage is 12% and the minority percentage is 75%. Therefore, this site meets the Region's EJ criteria based on demographics as identified in "Region 5 Interim Guidelines for Identifying and Addressing a Potential EJ Case, June 1998."

B. Site Description and Background

Beginning in approximately 1910, Vulcan Louisville Smelting Company (VLS) owned and operated the areas that currently comprise the Vacant Lot Site, the Fansteel facility, and the adjacent R. Lavin & Sons plant.

The federal government purchased an 8-acre portion of the VLS property in 1942 through its Defense Plant Corporation, and authorized and financed the construction of the Fansteel facility. A Fansteel subsidiary, the Tantalum Defense Corporation, was formed and leased the site from the federal government. The Tantalum Defense Corporation supplied the government with various materials needed during World War II. The federal government owned the facility from 1942 to 1947. The facility was subsequently sold by the federal government to Fansteel in 1947. The Fansteel Metals Division and Fansteel VR/Wesson Division operated at the site between 1954 and 1990. The main facility operations included the production of specialty metals and related products in addition to powder metallurgy operations. Production activities at the North Chicago Facility ceased in 1990, although Fansteel continued to maintain its offices there until 2005.

The site contained a variety of industrial buildings which have now all been razed to the ground. The Fansteel facility is enclosed by security fencing. Portions of the property that were not covered by buildings were generally paved with asphalt or concrete, and were used as parking areas or access ways. Two large empty aboveground storage tanks (AST) located at the northern end of the property were removed, as was a railroad spur situated in proximity to the eastern edge of the site. Some vegetation, consisting of grass and bushes, exists between the former office building area and 22nd Street.

In 1936, VLS transferred the Vacant Lot property to the Chicago North Shore and Milwaukee Railroad Company. By 1954, the current Vacant Lot property was sold to an individual who developed the western portion of the property as a parking lot. The owner reportedly solicited fill

materials to be placed at the Site. The source, quantity and nature of the materials is not well documented. However, reports of foundry sand and tailings deposition at the Site is consistent with descriptions of materials observed on the Site.

The owner later transferred title to an Illinois land trust. In 2000, the Vacant Lot property was acquired by BREMS Realty, L.L.C. (BREMS), which leased it to EMCO Chemical Distributors, Inc. (EMCO). Before purchasing the Vacant Lot, BREMS entered into a Prospective Purchaser Agreement with the U.S. EPA and the prior owners entered a de minimis settlement with the U.S. EPA. Under those agreements, the sales proceeds of $35,000 were paid to the U.S. EPA to reimburse a portion of its response costs. Currently EMCO uses the west side of the Vacant Lot (west of the Creek) for employee parking, while the area east of the Creek is unused.

The Vacant Lot parcel is vegetated with bushes, grasses and weeds. The southern two-thirds of the parcel has a weathered concrete/gravel layer, under approximately 6 inches of top soil. Pettibone Creek, which runs diagonally across the property, is in a relatively steep-sided ravine and flows to the south on Site, and then flows east to Lake Michigan (approximately 1.5 miles from the Site). The Creek receives water through the North Chicago stormwater discharge and a ditch. The Creek is also fed by rain water and outfalls from EMCO (to the west) and the Fansteel facility.

General topography across the Site is uniformly flat, with the exception of the Creek and a relatively steep rise to the railroad bed along the northern border.

C. Previous Studies

The presence of contamination at the Site first came to the attention of the U.S EPA due to an underground fire at the Vacant Lot on June 12, 1988. Firefighters responding to the fire noticed that the ground was unusually hot and the water they were applying was causing the ground to bubble, as if the water was boiling. The firefighters allowed the ground fire to burn itself out because of the unknown nature of the fire and the possible hazards of applying more water. Samples collected at the time of the fire revealed 43.5 milligrams per liter (mg/L) leachable lead, exceeding the RCRA regulatory limit of 5 mg/L; therefore, characterizing the soil as a RCRA hazardous waste when it is excavated.

Additional sampling conducted between September 1988 and February 1989, revealed heavy metal contamination in both soil and groundwater. VOCs and polychlorinated biphenyls (PCBs) were also detected in several of the soil samples. Overall, barium, cadmium, chromium, lead, and mercury were the most elevated contaminants detected in the soils. Cadmium, chromium, mercury, and lead were the most elevated contaminants detected in the groundwater.

Between February and June of 1991, Envirodyne Engineers, Inc., of Chicago, Illinois, conducted a two-phase environmental assessment of several properties along Commonwealth Avenue, including the Site. The purpose of the assessment was to evaluate the condition of the properties for the proposed installation of a public bike path. Soil borings at the Site along the proposed bike path detected lead levels as high as 1,250 milligrams per kilogram (mg/kg). Further sampling in June of 1992, by Aires Environmental Services, Limited, of Batavia, Illinois,

collected several soil samples along Commonwealth Avenue corresponding to the proposed bike path, including borings at the northwest and southwest corners of the Vacant Lot. Several polynuclear aromatic hydrocarbons (PAHs) and chloroform were detected at low levels in the samples.

The Illinois Environmental Protection Agency (IEPA) performed a CERCLA integrated site assessment at the Vacant Lot beginning in September of 1992. Chlorinated solvents including 1,1-dichloroethene (DCE), 1,2-DCE, TCE, and vinyl chloride, were detected in groundwater monitoring wells, as were cadmium, chromium, lead, mercury, manganese and zinc. A trace amount of PCBs was also detected in one of the monitoring wells. Elevated levels of heavy metals, chlorinated solvents, PAHs, pesticides, and PCBs were detected in on-site soil samples collected during the assessment; specifically, arsenic, beryllium, lead, zinc, TCE, benzo(a)pyrene, and PCBs were the most prevalent contaminants. Elevated levels of heavy metals, chlorinated solvents, PAHs, pesticides, and PCBs were detected in on-site sediment samples collected during the assessment; specifically, beryllium, lead, benzo(a)pyrene, and PCBs were the most prevalent.

Geraghty & Miller, Inc., of Chicago, Illinois, performed a groundwater investigation at the Site in November of 1993 on behalf of Northern Illinois Trust Company, who represented the owners of the Site. The study was conducted in order to evaluate the condition of shallow groundwater, groundwater flow direction, and potential off-site impacts to groundwater quality. Groundwater was observed at 7 to 14 feet below ground surface (bgs). The groundwater quality was impacted by chlorinated solvents, including 1,1-DCE, 1,2-DCE, TCE, and vinyl chloride, and by manganese and arsenic levels.

In August and September of 1994, the City of North Chicago collected several sediment samples from the Creek. Low levels of pesticides and PCBs were detected in several samples. Toxicity characteristic leaching procedure (TCLP) lead was also detected, but at levels below the federally-regulated hazardous characteristics concentration criteria of 5 mg/L. Zinc and chromium TCLP concentrations, and TCE and PCB concentrations, were detected at low levels in a composite sample.

In September of 1994, the U.S. EPA conducted a site assessment at the Vacant Lot at the request of the IEPA. Several soil and sediment samples were collected, including samples from the location of the previous fire incident. Generally, elevated levels of heavy metals (including arsenic, beryllium, and lead), TCE, and PCBs were detected at the Site.

D. Response Actions

Based on the Site Assessment results, the U.S. EPA began a non-time critical removal action at the Vacant Lot in 1996 and completed its Engineering Evaluation/Cost Analysis (EE/CA) on October 30, 1997. The EE/CA investigation concluded that all soil at the Vacant Lot, excluding two small areas, was generally contaminated up to a 2-foot depth with elevated concentrations of lead; the source/fill area on the northeast portion of the Vacant Lot was contaminated with TCE to a 4-foot depth, and with lead to a 9-foot depth; a small area was contaminated with PCBs to a 9-foot depth; the eastern perimeter of the Site contained TCE contamination; the creekbed was

contaminated with lead and with benzo(a)pyrene to depths of 3-6 feet; and within the northern one-third of the Site area, groundwater contamination of DCE, vinyl chloride, and other volatile organic compounds could potentially be attributed to the source/fill area. The remainder of the northern one-third of the Site area had TCE contamination likely attributed to a plume originating at the Fansteel property.

An action memorandum for funding a $ 2.7 million non-time critical removal action funding was approved by the U.S EPA on May 6, 1998. On September 15, 1998, U.S. EPA amended the scope of the previously approved May 6, 1998 Action Memorandum to include the removal of the contaminated Pettibone Creek sediments for an additional cost of $ 150,000. Based on this action, the U.S. EPA excavated, treated and disposed of approximately 24,245 cubic yards of lead-contaminated soils requiring stabilization; 1000 cubic yards of PCB-contaminated soils; 20,000 cubic yards of other contaminated soils; and 4,500 cubic yards of contaminated sediments. These removal actions cost approximately $3.1 million.

The information provided by the on- and off-site environmental investigations identified that the eastern edge of the Vacant Lot had TCE and manganese contamination in groundwater that appeared to be caused by a source area located on the Fansteel property. As a result, the U.S. EPA issued an order on September 21, 2000, requiring Fansteel to perform an EE/CA on its property.

Field work associated with EE/CA Work Plan was completed on June 11, 2001. Fansteel filed a bankruptcy petition on January 15, 2002. By that time, Fansteel had completed a draft EE/CA report. U.S. EPA subsequently provided extensive comments and after significant revisions the final EE/CA Report was approved by the U.S. EPA on October 12, 2005.

As part of a bankruptcy settlement agreement the City of North Chicago purchased the Fansteel property for $1,400,000 using its eminent domain powers. Fansteel and North Chicago agreed to place those proceeds in a special account that the U.S. EPA would use to pay for Site cleanup. Fansteel also paid an additional $700,000 and the DOD paid $425,000 to resolve its potential liability at the Site. Thus, approximately $2.5 million is available in the special account.

The City of North Chicago has acquired the majority of the Site in order to foster redevelopment of the Fansteel parcel and the portion of the Vacant Lot parcel east of Pettibone Creek.

E. Current Conditions – Results of EE/CA

The EE/CA investigation identified elevated levels of TCE, PCE, vinyl chloride and lead in soils and elevated levels of TCE and other VOCs in groundwater on the Fansteel property.

That EE/CA Report provides the primary basis for the U.S. EPA's Action Memorandum selecting the final response actions for the Site. The report identified contamination of concern in several areas: 1) a former hazardous waste management (HWMU) unit at the northern end of the parcel contains DCE, TCE and lead contamination in soil, and DCE, TCE, vinyl chloride, methylene chloride, lead and cadmium in groundwater. (the soil contamination levels are high enough to present an ongoing source of contamination to a TCE groundwater plume, also known

as the northern plume, which exists beneath the former HWMU area); 2) a former drum storage area east of the main plant building contains benzo(a)pyrene, PCE and TCE in soil, and DCE, PCE, TCE, vinyl chloride and lead in groundwater (the soil contamination levels are high enough to present an ongoing source of contamination to a relatively smaller TCE plume, also known as the southeastern plume. The southern plume is smaller in both aerial extent and intensity and is also present beneath the Former Drum Storage area); 3) elevated levels of TCE and vinyl chloride are present in soil and groundwater in a hot spot area on the vacant lot parcel near Pettibone Creek (a separate and distinct TCE plume was also noted beneath this area of soil contamination, near Pettibone Creek); 4) elevated levels of lead are present in the surface soil at the mid-eastern edge of the Former Chemical Building A; and 5) elevated levels of lead are present in the surface and subsurface soils in the former Above-Ground Storage Tank area.

In addition, although it is not related to the releases prompting U.S. EPA's response, the EE/CA identified a former transformer courtyard area with elevated levels of PCB contamination at the northeast portion of the Metallurgical Building A footprint. The former transformer courtyard was not within the scope of the original study, but if sufficient special account funds remain they will be used to dig up about 44 cubic yards (80 tons) of PCB-contaminated soil there. This additional work is appropriate because it would be funded by payments Fansteel made to resolve all known environmental issues.

1. Site Geology and Hydrogeology:

The depth to ground water ranged from 7.22 to 13.81 feet bgs. The Creek flows in a southerly direction across the Vacant Lot. The shallow groundwater flow direction ranged from southwest to southeast, and flowed toward the Creek ravine. Groundwater at Fansteel ranged in depths from 3.0 feet to 13.6 feet bgs. The elevations indicate that groundwater within the shallow aquifer generally mimics the local topography and flows in a westerly direction toward Creek. The calculated average hydraulic gradient across the Fansteel facility is 0.010 foot/foot and the calculated average linear groundwater velocity is 0.00173 feet/day (or 0.63 feet per year).

2. Sensitive Ecosystems

No sensitive ecosystems are known to be present in the immediate vicinity of the Site.
The relative health of the aquatic environment in the Creek downstream of the Site is not known. The Creek drains into Lake Michigan and but does not appear to serve as a migration pathway for any of the site contaminants. The modeling scenarios created during the EE/CA indicate that the northern on-Site plume may not reach Pettibone Creek for as long as 100 years. Note that the EE/CA selected a deliberately conservative range of degradation rates for modeling purposes. The values used in modeling ranged from 1.4 percent (50 year half life) to 3.5 percent per year (20 year half life). The modeling scenarios provide reasonable predictions of plume dissipation over time. Only the scenario with the greater hydraulic conductivity and slowest biodegradation rate ever reaches Pettibone Creek. In fact, the other three scenarios with the slower hydraulic conductivity indicate that the extent of the plume is not anticipated to be much greater than what is depicted for existing conditions.

3. Soil Sampling Results:

Drilling and continuous soil screening was performed at 37 Geoprobe® locations (24 on the

Fansteel parcel and 13 on the Vacant Lot). Continuous soil samples were collected from 10 Geoprobe® borings and submitted for laboratory analysis of constituents of potential concern (COPC). Figure 2 is a map of soil and Geoprobe locations. Three samples of the slag/fly ash material were obtained and submitted for laboratory analysis of COPCs. Soil samples were collected from 7 Geoprobe® borings and analyzed for parameters related to modeling and removal alternative evaluation.

HWMU and AST Area

Lead concentration at and near the surface (0 to 4 feet deep) was detected at a concentration of 2,850 milligrams per kilogram at boring TB-14. At TB-14, at a depth of 0.0 to 4.0 feet, a lead concentration of 1760 milligrams per kilograms was detected. TCE was identified in soil samples collected from Boring TB-14 at concentrations of as high as 80.6 milligrams per kilogram (0.0 foot to 4.0 feet)

Former Drum Storage Area

TCE was detected at a concentration of 413 milligram per kilogram at TB-7 (0.0 foot to 4.0 feet). PCE was detected at a concentration of 116 milligram per kilogram at GP-3.

Mid-Eastern Edge of Chemical Building A

Within this area Lead was identified in a soil sample collected from Boring GP-8 at a concentration of 19,300 milligrams per kilogram (0.0 foot to 4.0 feet).

Vacant Lot-Pettibone Creek

U.S. EPA's contractor installed 3 soil borings on the Vacant Lot and collected soil samples. TCE concentrations ranged from 7.1 to 1,100 mg/Kg in site soils. The maximum concentration of TCE was found in soil boring SB-2-2, collected adjacent to TB-24 soil boring where EE/CA investigations indicated 96.2 mg/L TCE in the groundwater sample.

Transformer PCB Courtyard

Fansteel informed U.S. EPA that PCB transformers were removed in 1982 from an inner transformer courtyard at the Site for offsite disposal in accordance with TSCA requirements. These transformers were replaced with PCB-free transformers. Wipe samples collected indicate high concentration of PCBs ranging from 230 ug/kg to 98000 ug/kg. PCB was detected at concentrations ranging from 3.1 ug/kg to 9500 ug/kg in surface soil samples. PCB was not detected in any of the soil boring samples. Removing all of the potential PCB contamination identified in the transformer courtyard would encompass approximately 100 square feet of soil to a depth of 2 feet (this is more than half of the total surface areas of exposed soil/gravel in the courtyard).

Former AST Area (A.K.A Slag/Fly Ash Area)

The proceeding list provides a summary and concentration range for COPCs identified in the

slag/fly ash material collected from Test Borings TB-13, TB-14, and TB-16: Lead was detected in each of the slag/fly ash material samples and ranged in concentration from 1,760 milligrams per kilogram (TB-14; 0.0 foot to 4.0 feet) to 13,100 milligrams per kilogram (TB-16; 0.0 foot to 4.0 feet). Lead concentrations exceeded screening levels for each sample. TCE was identified in samples of the slag/fly ash material collected from Borings TB-13 (3.0 feet to 4.0 feet) and TB-14 (1.0 foot to 2.0 feet) at concentrations of 716 and 63,100 micrograms per kilogram respectively. The TCE concentration of 63,100 micrograms per kilogram exceeded screening levels. In one of the samples, the concentration of benzo (a) pyrene at 288 micrograms per kilogram approached screening levels.

4. Groundwater Sampling Results

The analytical data represented groundwater samples taken from 9 existing monitoring wells and 36 geoprobe samples. Aquifer characterization testing was also performed in 5 monitoring wells to assist in quantifying hydraulic parameters for the shallow aquifer beneath Fansteel property. The COPCs in groundwater that were most frequently detected were: total cadmium, total lead, dissolved lead, TCE, cis-1,2-DCE and vinyl chloride.

Based on the analytical data a northern TCE groundwater plume exists beneath the former HWMU and AST area. This supports the conclusion stated above that a source area may be present in that area. A relatively smaller (in both aerial extent and intensity) southern TCE groundwater plume is present beneath the Former Drum Storage area. A TCE groundwater plume was noted along the eastern boundary of the Vacant Lot parcel near Pettibone Creek.

Groundwater samples from some facility monitoring points have contained metals concentrations including lead. Trace amounts of total cadmium and dissolved cadmium were identified in 17 and 6 samples, respectively, out of a total of 36 groundwater samples. Total lead was detected in 19 out of 36 wells, ranging from 0.0105 milligram per liter to 9.85 milligrams per liter.

TCE was detected in 21 Borings with a range of concentration from 2.82 ug/L to 1,190,000 ug/L (TB-18). Vinyl chloride was identified in 10 Borings with a concentration ranging from 2.32 ug/L (TB-36) to 59,900 ug/L (TB-18).

Groundwater Analytical Results, Facility Monitoring Wells

Analytical results for metals and VOCs detected in groundwater samples collected from facility Monitoring Wells MW-1 through MW-9 (June 10, 2001 event) identified the following elevated levels of contamination: TCE – Concentrations of TCE were detected in Monitoring Wells MW-2 (2.97 ug/L), MW-4 (2,290 ug/L), and MW-8 (825 ug/L). Vinyl chloride – Vinyl chloride was identified in the groundwater sample collected from Well MW-4 (43.4 ug/L).

Eight groundwater borings were taken within the Vacant Lot hydraulically down gradient of the HWMU/AST source area (Borings TB-20 through 25, TB-35, and TB-36). Five borings were installed within the Vacant Lot hydraulically down gradient of the Metallurgical A and B buildings (Borings TB-26 through TB-30). The highest concentration of TCE in groundwater was detected in TB-24 (96,200 ug/l). TCE in groundwater was detected in TB-22 and TB-25 at a

concentration of 1830 ug/l and 368 ug/l, respectively. Cis-1,2-DCE in groundwater was detected at a concentration of 33,300 ug/l in TB-24.

F. Human Health Risk Assessment

A baseline risk assessment was performed to provide a quantitative analyses, in a conservative and health-protective manner, of the likelihood that adverse health effects may be associated with potential exposures to constituents in environmental media at the Site. In providing health-related information on potential contact with site-associated constituents, the risk assessment was designed to provide a sound basis for risk management decisions.

The COPCs identified at the site included TCE, PCE, benzo(a)pyrene, vinyl chloride, cis-1,2-DCE, chloroform, and trans-1,2-DCE. The potential receptors at the site included Construction Worker, On-site Trespasser, Outdoor Worker, and Indoor Worker. Risk based remediation goals (RBRGs) were developed for carcinogenic and noncarcinogenic constituents for soil and groundwater. The media of exposure was through ambient air and indoor air from groundwater and from direct contact with soil and from indoor air from soil. The human health risk assessment identified the following complete exposure pathways and receptors:

- Inhalation of indoor vapors and outdoor vapors from groundwater and soil
- Incidental ingestion and dermal contact from surface soils for an outdoor worker and construction worker
- Incidental ingestion, dermal contact, and inhalation of outdoor vapors and particulates from surface soils for an on-site trespasser
- Inhalation of outdoor vapors from groundwater and subsurface soils for an on-site trespasser

The areas that were identified for a potential response action are noted in the table below. Furthermore, this table identifies the range of contamination, the selected remedy and the remedial goals for each of the areas of concern:

Remediation Goals at the Areas of Concern

Area of Concern	Range	Remedy	Goal
Former HWMU area	1-1,310 mg/Kg TCE	Soil Removal plus Institutional Controls	58 mg/Kg TCE in soil
Former Drum Storage area	1 – 413 mg/Kg TCE 1-116 mg/Kg PCE	Soil Removal, Containment[1] plus Institutional Controls	58 mg/Kg TCE in soil 61.1 mg/Kg PCE in soil
Mid-Eastern edge of Chemical Building A	1 – 40 mg/Kg TCE	Soil Removal, Containment[1] plus Institutional Controls	58 mg/Kg TCE in soil
Vacant Lot TCE area	7.1 – 1,100 mg/Kg TCE 0.38 – 150 mg/Kg PCE	Soil Removal	58 mg/Kg TCE in soil 61.1 mg/Kg PCE in soil
Former AST area	3,100 – 28,200 mg/Kg Lead	Containment[1] plus Institutional Controls	1,079 mg/Kg Lead Abate direct contact - physical barrier (asphalt, etc)
Former PCB Transformer area	<1 – 9,500 mg/Kg PCBs	Soil Removal	10 mg/Kg PCBs in soil

Notes:
[1]Containment is one of the presumptive remedies recommended by EPA for metals in soil. Containment includes vertical or horizontal barriers like capping, etc.

G. State and Local Authorities' Roles

The State has been consulted throughout the EE/CA process. The State is the lead agency for the RCRA closure of the adjacent R. Lavin & Sons property, and the agencies have coordinated to assure the approaches are compatible. To the extent practicable, all State Applicable or Relevant and Appropriate Requirements ("ARARs") identified in this process will be followed. North Chicago will, through its commitments under its settlement with the U.S. EPA be a central part of the institutional controls and post removal site controls that are a central portion of the selected response action. .

H. Potential for continued State/local response

Because the preferred final response actions would include and rely on long-term maintenance of impermeable cover material over residual contamination, the U.S. EPA has entered into an

enforceable agreement with North Chicago to provide the necessary long-term protections after implementing the selected cleanup approach.

Under the Windfall Lien Settlement Agreement with the U.S EPA, North Chicago has agreed to: (1) secure the Site against unauthorized access; (2) assure through appropriate institutional controls that the Site would not be used for residential purposes; (3) assure that any protective cover constructed or left in place as part of the U.S. EPA's selected response action would be maintained through an enforceable operation and maintenance plan and deed restrictions until the U.S. EPA determines that the cover is no longer necessary to prevent unacceptable risks to human health or the environment; (4) assure installation and maintenance of appropriate vapor intrusion controls for all buildings constructed at the Site; and (5) provide the U.S. EPA with a permanent right to Site access. In addition, to the extent the U.S. EPA's selected response action requires construction or installation of a protective cover where such a cover is not currently present, North Chicago will construct and/or install such protective cover within 6 months after the completion of the U.S. EPA's on-Site construction and excavation activities under the selected response action; North Chicago may ask the U.S. EPA to leave the excavation in the northeastern portion of the vacant lot parcel open so that North Chicago may use the excavated area to convert it into a stormwater detention pond, for the benefit of surrounding development. If so, the U.S. EPA will not backfill the excavated area and North Chicago will secure the area. Any redevelopment construction plans must be provided to the U.S. EPA for review and comment at least 45 days prior to construction. All construction-related work must be consistent with the requirements of the Action Memorandum and all applicable federal and state laws and regulations North Chicago will implement and comply with any land use restrictions and institutional controls on the Site in connection with the response actions selected by the U.S. EPA. North Chicago will take steps outlined in the agreement to assure that an Environmental Easement and Environmental Restrictive Covenant will be established that runs with the land. In return, the U.S. EPA would agree not to pursue a windfall lien for the Site.

III. THREAT TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, ND STATUTORY AND REGULATORY AUTHORITIES

As stated initially in the September 21, 2000 Order issued to Fansteel for the North Chicago facility, and as further characterized through the EE/CA, the conditions at the site constitute a potential threat to public health, welfare, or the environment based upon the following factors (as set forth in Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Act):

- **Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants**; This factor is present at the site due to the presence of lead in soils and via its exposure pathways of direct contact, ingestion and inhalation. This factor is also present at the site due to the presence VOCs in soils and via the exposure pathways of direct contact, ingestion and inhalation. The proposed action will reduce this potential risk by isolating and removing soils within the exposed areas.

- **Actual or potential contamination of drinking water supplies or sensitive**

ecosystems; This factor is present at the Site due to high levels of VOCs such as TCE, in subsurface soils in the HWMU and AST area. Residential drinking water supply wells in the immediate vicinity of the site have not been affected by this groundwater but the potential exists for future impacts. This area has been determined to serve as a potential source of contamination to the Northwestern Plume in the immediate vicinity underneath the HWMU and AST area. The proposed excavation will isolate and remove VOC contaminants within the associated source area (HWWU and AST) and the contaminated plume beneath the site is expected to be reduced by natural attenuation and natural dissipation processes. It was assumed that this excavation would reduce groundwater VOC concentrations in the source area to about 10 mg/l consistent

- **High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.** This factor is present at the Site due to high levels of VOCs such as TCE and PCE, in surface and subsurface soils in the HWMU, drum storage area, area near the Mid-Eastern edge of Former Chemical Building A, the Vacant Lot TCE area, and AST area.

IV. ENDANGERMENT DETERMINATION

The actual or threatened release of hazardous substances from the Site, if not addressed by implementing the response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to the public health, or welfare, or the environment within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

V. EXEMPTION FROM STATUTORY LIMITS

This action does not obligate funds from the Superfund pipeline because it will utilize settlement funds held in a special account under Section 122(b)(3) of CERCLA. Even though the $2 million statutory limit on removal funding under CERCLA Section 104 does not specifically apply, conditions at the Site meet the criteria for exemption from the $2 million limit. CERCLA Section 104 (c) states that removal actions can exceed the 12-month and the 2 million dollar statutory limit if conditions meet either the "emergency exemption" criteria or the consistency criteria. Conditions at the Site warrant the exemption from the 2 million dollar statutory limit based on the following factors:

EMERGENCY WAIVER

1. "There is an immediate risk to public health or welfare or the environment;"
High levels of VOCs such as TCE and PCE, are present in surface and subsurface soils in the HWMU, drum storage area, area near the Mid-Eastern edge of Former Chemical Building A, the Vacant Lot TCE area, and AST area. High levels of lead are also present at and near the surface in the AST area. Exposure pathways exist through direct contact, ingestion and inhalation. These areas are accessible to the public and are planned for commercial redevelopment by the City of North Chicago.

2. "Continued response actions are immediately required to prevent, limit, or mitigate an emergency;"
For reasons stated above, this criterion applies. Excavation and disposal of the contaminated soil is necessary to eliminate ongoing releases and to limit the exposures and the contaminant migration described above.

3. "Assistance will not otherwise be provided on a timely basis;"
Neither state nor local agencies have any resources to conduct and complete the removal actions at this Site.

VI. PROPOSED ACTION AND ESTIMATED COSTS

In accordance with the NCP, the EE/CA Report and supplemental materials, U.S. EPA identified a number of different options for addressing contamination at the Site.

After evaluating the EE/CA Report, on May 19, 2008, U.S. EPA issued a notice identifying its proposed cleanup measures for the Site and requesting public comment on the proposal. The public comments received and the Agency's responses are summarized in the attached responsiveness summary.

As a result of this process, U.S. EPA has determined that the following response actions are appropriate to mitigate the potential and actual threats to human health and the environment posed by the hazardous substances present at the Site:

(1) excavation of contaminated soils at the former HWMU area on the north end of the Fansteel parcel; (2) excavation of contaminated soils at the hot spot area near Pettibone Creek on the vacant lot parcel; (3) excavation of contaminated soils at the former drum Storage area east of the main Fansteel plant building; (4) excavation of contaminated soils at the mid-eastern edge of the Fansteel Chemical Building A; (5) installation of a physical barrier to abate direct contact with lead contamination over contaminated soils in the former AST area, former HWMU, Former Drum Storage Area, and over any areas where existing building floor slabs are removed as part of Site redevelopment; (6) securing the Site against unauthorized access; (7) assure that an Environmental Easement and Environmental Restrictive Covenant is established that runs with the land, prohibiting residential land use and prohibiting use of groundwater; (8) assuring that the impermeable cover is maintained through an enforceable operation and maintenance plan and deed restrictions until the U.S. EPA determines that the cover is no longer necessary to prevent unacceptable risks to human health or the environment; (9) installation and maintenance of appropriate vapor intrusion controls for any buildings to be constructed at the Site; (10) groundwater monitoring to verify that source removal activities have contributed to natural dissipation of the groundwater plumes over time to acceptable levels. In addition, although it was not within the scope of the original EE/CA, to the extent special account funds remain, they will be used to excavate approximately 44 cubic yards (80 tons) of PCB-contaminated soil at the former transformer courtyard. This additional contingent work is appropriate because it would be funded by payments Fansteel made to resolve all known environmental issues at the Fansteel parcel.

The selection of this response action relies in part, and is based on, on the enforceable commitment provided by City of North Chicago in a Windfall Lien Agreement with the U.S. EPA. Under that agreement, the City of North Chicago will: (1) construct and/or install all impermeable covers required for this response action within 6 months after the completion of the U.S. EPA's on-Site construction and excavation activities; (2) assess and control all potential vapor intrusion pathways for volatile organic compounds in soil and groundwater at the Site for all buildings to be constructed at the Site by the City or North Chicago and its successors (this will include installation of appropriate barriers or technologies to limit vapor intrusion into buildings at the Site using methods and materials approved by the U.S. EPA); (3) assure that an Environmental Easement and Environmental Restrictive Covenant is established that runs with the land, prohibiting residential land use, prohibiting use of groundwater, and requiring maintenance of impermeable cover material under an operation and maintenance plan approved by U.S. EPA; assure that all future construction and redevelopment plans for the Site are consistent with the requirements of the Action Memorandum and all applicable federal and state laws and regulations. The settlement between the U.S EPA and North Chicago helps assure the long-term effectiveness and enforceability of the necessary controls and allows selection of a response action that relies in part on maintenance of impermeable covers and on post-removal site controls.

North Chicago may ask the U.S. EPA to leave the excavation in the northeastern portion of the vacant lot parcel near Pettibone Creek open so that North Chicago may use the excavated area to convert it into a stormwater detention pond, for the benefit of surrounding development. If so, the U.S. EPA will not backfill the excavated area and North Chicago will secure the area. Any redevelopment construction plans must be provided to the U.S. EPA for review and comment at least 45 days prior to construction.

A Post Removal Site Control Plan will be established and a review of the Site situation shall occur every 5 years by U.S. EPA. Excavation and removal of contaminated soils within the potential source areas will assist in the natural dissipation of the groundwater plume over time so that contaminants are reduced to acceptable levels.

The estimated quantity of contaminated soil to be excavated in the source areas to eliminate direct contact threats and facilitate groundwater plume control is approximately 100,000 cubic yards or approximately 14,700 tons. This estimate is based on the following assumptions

derived from the EE/CA:

Response Actions at the Areas of Concern

Area	Response Action	Excavation Dimensions
Former HWMU area (centered near GP-14 and TB-18)	Soil excavation and off-site disposal - 5,600 tons Plus Institutional Controls (ICs)	75X50X15 feet
Former Drum Storage area	Soil excavation and off-site disposal – 2 tons Plus ICs	7X7X2 feet
Mid-Eastern edge of Chemical Building A	Soil excavation and off-site disposal, containment & Institutional controls	5X5X2 feet
Former PCB Transformer area	Soil excavation and off-site disposal – 80 tons	60X10X2 feet
Former AST area	Containment plus Institutional controls	None-Physical barrier (asphalt, etc)
Vacant Lot TCE area	Soil Excavation and off-site disposal – 9,000 tons	75X400X8 feet

The anticipated aerial extent of the above excavation areas are illustrated in Figure 2. It is assumed that these excavations would reduce groundwater VOC concentrations in the source area to about 10 mg/l.

Additional pre-excavation sampling will be performed to further identify the extent of the contamination and to characterize the soil for disposal.

Groundwater monitoring will be performed for a period of up to 30 years to monitor the condition of groundwater in the area. Specifics regarding the implementation of the selected response actions will be developed as part of the Removal Action Work Plan.

U.S. EPA estimates that this removal action will cost in the range of approximately $2.5 million and take approximately 2-3 months to implement. The response action selected is readily available, administratively feasible, and have been performed effectively at other sites.

The response actions described in this Action Memorandum directly address actual or threatened releases of hazardous substances, pollutants, or contaminants at the Site that may pose an imminent and substantial endangerment to public health, welfare, or and the environment. These response actions do not impose a burden on affected property disproportionate to the extent to which that property contributes to the conditions being addressed.

All federal, and state ARARs, including those specifically identified in the EE/CA Report, will be complied with to the extent practicable. The removal actions will also include planning for the provision of post-removal site control, consistent with the provisions of Section 300.415(l) of the NCP. All hazardous substances, pollutants or contaminants removed off-Site pursuant to this removal action for treatment, storage or disposal shall be treated, stored or disposed of at a facility in compliance with the U.S. EPA Off-Site Rule, 40 C.F.R. § 300.440.

The other removal alternatives considered for the Site are described in detail in the EE/CA Report. They included:

- No Action
- Surface Capping with Enhanced In-Situ Bioremediation
- *Surface Capping with Permeable Reactive Barrier*

As described in the EE/CA and the response action proposal, the selected removal action represents the best combination of effectiveness, implementability and cost to address the contaminated soils and contaminated groundwater at the Site. The EE/CA Report provides a more detailed comparison of the alternatives that supports the selection of this removal action.

VII. ACTION LEVEL STANDARDS

U.S. EPA selected a response action level of 58 mg/kg in soil for TCE for Ingestion based on the site specific risk assessment. Similarly, U.S EPA selected a response action level of 61 mg/kg for PCE in soil for Ingestion. Based on these exceedances, EPA has selected the following remediation goals for the noted areas of concern:

Summary of Carcinogenic Risks at the Fansteel Site

Areas Considered	1. Former HWMU area. 2. Mid-eastern edge of Former Chemical Building A. 3. Former Drum Storage Area 4. Former AST area			
Receptors	Outdoor Worker	Indoor Worker	Construction Worker	On-Site Trespasser
Pathway	Ingestion/inhalation	Ingestion/Inhalation	Ingestion /Inhalation	Ingestion/Inhalatio n
Constituents of Potential Concern (COPCs)	Trichloroethene (TCE), Tetrachloroethene (PCE)	TCE, PCE	TCE, PCE	TCE, PCE
Estimated Lifetime Carcinogenic Risk (ELCR)1	4.0E-06	4.3E-01	5.3E-07 (ELCR is acceptable)	6.7E-07 (ELCR is acceptable)
Risk Based Remediation Goals (RBRGs)2 (mg/Kg)	PCE – 61.12	PCE – 0.04142 TCE – 0.002	None	None

Notes:
[1] The acceptable risk for ELCR is 1.0E-06.
[2] EPA's proposed removal action will remove the highest PCE and TCE concentrations in soil which are also contributing to indoor worker risk. After the removal, the indoor worker risk can be re-evaluated to determine if any vapor intrusion controls are necessary.

VIII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delay or inaction at the Site may result in an increased likelihood of direct human contact with hazardous substances. Because the Site is not fully secured, the various threats to human health and/or the environment pose a serious threat to the local population. Additionally, any delay or inaction will also increase the likelihood of contaminant migration.

IX. OUTSTANDING POLICY ISSUES

There is no outstanding policy issue associated with this Site.

X. ENFORCEMENT

The PRPs at this Site have been identified, and U.S. EPA entered settlements with those parties maximizing the amount of private party funds that would be available for Site cleanup. Those funds have been placed in a special account that the U.S. EPA will use to perform the selected response actions. In addition, under the Windfall Lien Agreement, North Chicago has agreed, at its expense, to provide long-term operation and maintenance activities and to implement necessary use restrictions. Those commitments from the City further assure the protectiveness of the selected response actions

XI. RECOMMENDATION

This decision document represents the selected non-time critical removal action for the Vulcan Louisville Smelting Site located in North Chicago, Illinois, developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based upon the Administrative Record for this Site. Conditions at the Site meet the NCP Section 300.415 (b) (2) criteria for a removal action. You may indicate your decision by signing below.

APPROVE: Richard K. DATE: 8-27-08
Director
Superfund Division

DISAPPROVE: _____ DATE:
Director
Superfund Division

Attachments: (A) Administrative Record
(B) Responsiveness Summary

cc: D. Chung, U.S. EPA HQ, 5202G
D. Chezik, U.S. Department of Interior
E. Runkel, Illinois EPA
S. Davis, Illinois DNR
SFD Record Center

Responsiveness Summary

Vulcan Louisville Smelting/Fansteel Site
North Chicago, Illinois

EPA held a public meeting to discuss its proposed cleanup plan for the Vulcan Louisville Smelting/Fansteel Superfund site on Thursday, May 29, 2008 in North Chicago, IL. The public comment period ran May 22 - June 20, 2008. As part of the public comment period, U.S EPA accepted written, e-mailed, or faxed comments. U.S EPA received written (by 2 letters) comments concerning the proposed plan during the comment period. The comments received during the public comment period and our responses to these comments are included in this Responsiveness Summary, which is a part of the Non-Time Critical Action Memorandum for the Vulcan Louisville Smelting/Fansteel Site.

1) *EPA's engineering estimate did not account for backfill soil costs as noted by the City of North Chicago. The excavated areas will have to be restored to grade by USEPA's contractor. USEPA's cost estimate appears conservatively high and contains contingency costs that can be used to place backfill. The city has a stockpile of backfill due south of the site at Commonwealth Ave. and MLK Dr. If the stockpile is still available at the time of the project, it can be made available to USEPA.*

Response – USEPA's engineering estimate did not include costs for capping the site (lead contamination remedy) because under its settlement agreement with USEPA, the City of North Chicago is responsible to address this as part of their redevelopment actions. Furthermore, the City of North Chicago has suggested that it may use the larger excavated area, near the former *Hazardous* Waste Management Area, to convert it into a stormwater detention pond, for the benefit of surrounding development.

It is considered a good project management practice to add a contingency on all cost estimates. The primary reason for contingency in the USEPA cost estimate is to account for unknowns, unforeseen circumstances, and unanticipated conditions such as changes in project scope, adverse weather conditions and unexpected labor and equipment costs. If North Chicago would prefer not to convert the excavated area into a storm water detention pond, then USEPA would need to place clean backfill soil into the excavated area. This is the very type of change in scope that the budgeting contingency is intended for. USEPA appreciates the offer of clean backfill from the City of North Chicago, which is consistent with its commitment to cooperate with the remedy under the settlement agreement. USEPA will evaluate the feasibility of using clean soil from the City of North Chicago for backfilling. Before this soil could be used it would have to be sampled to verify that it is acceptable. A decision about the feasibility of using the city's soil stockpile will be made at a later time.

2) *The City of North Chicago is proposing that we excavate lead-contaminated soil from the former AST area instead of capping. They also are proposing that we backfill the hot-spot excavated area with the lead-contaminated soil removed from the former AST area and bring it to grade with 3 feet of clean backfill.*

USEPA has identified an area of the site "Former AST Area" that will not be subject to excavation, but requires surface capping due to elevated levels of lead in soil. The City suggests that this lead-impacted soil in the Former AST Area be excavated and consolidated within the USEPA removal areas in lieu of using clean backfill. Placement

of lead-impacted soil in the lower depths of the excavation would reduce the cost requirements, while also equally reducing risk of surface exposure. The upper 3-feet of the excavation should then be backfilled by USEPA with clean soil or aggregate

Response: The risk factors at the site driving the need to excavate certain soil contamination are from potential exposures to the volatile organic compounds (VOCs) TCE and PERC in "hot spot" areas. These exposures could occur via ingestion, inhalation of vapors and direct contact with VOC contaminated soils.

The EE/CA proposed response actions to abate VOC risks from soil contamination "hot spots" at and near the surface mainly by excavation. VOC risk from deeper contaminated soil are to be abated by engineering and management controls such as soil vapor recovery controls to be included as part of any future buildings in those areas.

Lead contamination, on the other hand, is prevalent throughout the site at various depths and poses potential threats only through direct contact and ingestion. The EE/CA proposed response action for abating the areas with elevated lead risks is to cap the contaminated soil to remove the direct contact and ingestion threat. Lead contaminated soil at greater depths, such as at the AST area, does not provide any risk of contact and ingestion. Further risk abatement is provided by ensuring that the site is being redeveloped for industrial/commercial purposes instead of residential use and by the City's commitment to assure maintenance of the cap. Thus there is no risk-related reason to single out the deep lead contamination in AST area for different treatment; such an approach is not cost-effective.

The City of City North Chicago has also proposed in its comments that USEPA should backfill the excavated TCE-hot spot areas with lead-contaminated soil excavated from the Former AST areas. U.S. EPA has determined that moving the lead-contaminated soil to another area of the site for disposal has potential regulatory implications. Resolution of those issues could lead to significant delays to the schedule of the entire project.

3) *The City of North Chicago received contaminated soil disposal and transport bids that are much less than the engineers estimate*

EPA Response: During all USEPA cleanup actions, competitive bids will be procured irrespective of initial quotes received from the bidders at the time of engineering estimates. As described above, USEPA's cost estimates are intended to be conservative; USEPA hopes that actual costs may be lower. If the City of North Chicago can share their vendor information, USEPA will try to seek bids from those vendors to help ensure that the government gets the best value.

4) *A detection of TCE was found at 2240 Commonwealth Ave and whether this detection was due to the migration of TCE contamination from the Fansteel Site, which is located approximately "750 feet North East of 2240 Commonwealth Ave"?*

EPA Response: It is difficult to determine the source of this detection, since no details were provided; whether this detection was found in soil or groundwater samples. However, based on its investigation of groundwater flow and its evaluation of the results of its groundwater sampling, USEPA does not believe that the groundwater contamination at the Former Fansteel Facility has migrated off site.