UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

IN THE MATTER OF:	)	
	)	
Chamberlain Manufacturing Corporation	)	
Former Facility at:	)	
550 Esther Street	)	
Waterloo, Iowa	)	
	)	
	)	Docket No. RCRA-07-2010-002
	)	and
Respondent	)	Docket No. CERCLA-07-2010-0005
	)	
Proceedings under Section 7003 of the	)	UNILATERAL
Resource Conservation and Recovery	)	ADMINISTRATIVE ORDER
Act as amended, 42 U.S.C. Section 6973	)	
and	)	
Section 106(a) of the Comprehensive	)	
Environmental Response, Compensation and	)	
Liability Act, as amended, 42 U.S.C. § 9606	)	

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I. JURISDICTION AND PRELIMINARY STATEMENT

1. This Unilateral Administrative Order ("Order") is issued to Chamberlain Manufacturing Corporation, Waterloo, Iowa (hereinafter referred to as "Chamberlain" or "Respondent"). Chamberlain is an Iowa corporation and is a subsidiary of Duchossois Industries Inc., Elmhurst, Illinois. This Order is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency ("EPA") by Section 7003(a) of the Solid Waste Disposal Act of 1976, commonly referred to as the Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984 (hereinafter referred to as "RCRA"), 42 U.S.C. § 6973(a). The authorities vested in the Administrator pursuant to RCRA have been further delegated to the EPA Regional Administrators and further delegated to the Director of the Air and Waste Management Division by EPA Delegation Nos. R7-8-022-A and R7-8-022-B dated January 1, 1995, both revised September 16, 2007. This Order is also issued pursuant to the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9606(a), as amended ("CERCLA"), and delegated to the Administrator of EPA by Executive Order No. 12580, January 23, 1987, 52 Federal Register 2933, and further delegated to the Regional Administrators and further to the Director of the Superfund Division, by EPA Delegation Nos. R7-14-014-A and R7-14-014-B, dated April 24, 2002.

II. STATEMENT OF PURPOSE

2. This Order concerns Chamberlain's former facility located at 550 Esther Street, Waterloo, Iowa (hereinafter referred to as the "Facility"). This Order requires Respondent to (i) conduct interim measures to mitigate vapor intrusion to residences, near the Facility, that are over a volatile organic compound contaminant plume, (ii) formulate a plan for proper clean up of releases, investigate to determine off-facility migration of waste, and clean-up the Facility property and surrounding area, and, (iii) assist the City of Waterloo to restrict access to areas where there has been a release of hazardous material within the Facility.

III. PARTIES BOUND

3. This Order applies to and is binding upon Respondent and its successors and assigns. Any change in ownership or corporate status of Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter Respondent's responsibilities under this Order.

4. Respondent shall ensure that its contractors, subcontractors, and representatives receive a copy of this Order and comply with this Order. Respondent shall be responsible for any noncompliance with this Order.

IV. DEFINITIONS

5. Unless otherwise expressly provided herein, terms used in this Order and the SOW that are defined in the RCRA statute shall have the meaning assigned to them in that

statute. Whenever the terms listed below are used in this Order and the SOW the following definitions apply:

a. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, et seq.

b. "Data Quality Objectives" shall mean those qualitative and quantitative statements derived from the outputs of a scientific and legally defensible data collection planning process.

c. "Day" shall mean a calendar day unless expressly stated otherwise.

d. "Effective Date" shall be the date on which EPA signs this Order

e. "Facility" shall mean shall mean the former Chamberlain Manufacturing Corporation Facility, encompassing approximately 22.8 acres, located at 550 Esther Street, Waterloo, Black Hawk County, Iowa, now owned by the City of Waterloo, Iowa. Attachment C to this Order is the legal description of the Facility.

f. "Order" shall mean this Unilateral Administrative Order, any amendments thereto, and any documents incorporated by reference into this Order.

g. "RCRA" shall mean the Resource Conservation and Recovery Act (also known as the Solid Waste Disposal Act), as amended, 42 U.S.C. § 6901, et seq.

h. "Respondent" shall mean Chamberlain Manufacturing Corporation, an Iowa corporation.

i. "Site" shall mean the Chamberlain Manufacturing Facility, encompassing approximately 22.8 acres, located at 550 Esther Street, City of Waterloo, Black Hawk County, Iowa, and areas where contamination from the Facility has migrated. Attachments B and C to this Order, respectively, are a map of the Site and the legal description of the Facility.

j. "SOW" shall mean the Statement of Work marked as Attachment A to this Order.

k. "Work" shall mean all the activities and requirements specified in this Order and to the SOW.

V. FINDINGS OF FACT

Site Background

6. The Facility is irregular in shape and approximately 22.8 acres in size. The Facility is located at 550 Esther Street, Waterloo, Iowa. The City of Waterloo (City) acquired the Facility in 2005 from Atlas Warehouse L.C. pursuant to EPA's Brownfield Program in an effort to begin redevelopment of the Facility. The City has performed a Brownfield Assessment to study the contamination at the Facility.

7. Currently the Facility is unoccupied and contains several single-story and two-story buildings. The structures on the Facility were constructed between 1919 and the early 1990s. The City has demolished certain buildings to diminish the hazards presented by the abandoned buildings to persons at the Facility.

8. The Facility is zoned Heavy Industrial (M-2) by the city of Waterloo, but is surrounded by park land and single family residential housing. To the east of the Facility is a golf course and Virden Creek. The creek is within approximately 100 feet of the Facility at its closest point. Gates Park adjoins the Facility to the north across Louise Street, to the east across Virden Creek, and to the south across from the railroad tracks. Single family residences are located across East 4th Street to the west of the Facility. Single family residences are also located along the east side of East 4th between Anita and Louise Streets. The Cedar River is approximately one mile from the Facility.

9. The Facility is fenced, but trespassers have repeatedly cut holes in the fence to gain access to the Facility.

10. Respondent owned the Facility from 1953 to March 15, 1996, and its business operations included the generation and handling of hazardous wastes.

11. Respondent had manufacturing operations at the Facility. Respondent manufactured metal washer wringers, projectile metal parts, aluminum awnings, and refrigerator shelves.

12. Respondent generated hazardous wastes at the Facility. Respondent submitted an Iowa Hazardous Waste survey questionnaire stating that it generated 100 pounds per year of paint residue classified as F017.

13. Respondent submitted a notification of hazardous waste activity dated January 26, 1984.

14. Respondent submitted a Biennial Hazardous Waste Report for 1985, stating it was a generator of D002 and K062 hazardous wastes, which were generated at the Facility.

15. EPA sent an Information Request to Respondent on May 3, 1990. In its response to the Information Request dated July 13, 1990, Respondent identified the following areas where solid wastes were handled at the Facility and included a map showing the solid waste handling areas (the map is attached to this Order and marked as Attachment D):

Type of Unit	Attachment D to order- Map Reference Number	Operation period identified in 1990 response	General Waste Description
process wastewater treatment system	1	1985 - to date of response	metal finishing process waste waters from: phosphating steel. Sulfuric acid anodizing, chromating aluminum, electroplating, chemical cleaning of non-ferrous metals
metal preparation lines	2	various - to date of response	metal finishing rinse waters and stearate soap
rinse tank	3	1988 - to date of response	caustic paint stripper and paint sludge
Sanborn unit	4	1987 - to date of response	waste coolants, lubricants and hydraulic oils
hard coat line and associated containment area, sump and treatment tanks	5	Early 1970's - to date of response	anodizing and chromating rinse water
passivating system	6	1979 - to date of response	acid rinse waters
solvent reclamation area	7	1989 - to date of response	1,1,1-trichloroethane, toluene, acetone, solvent blends
paint drying area	8	Mid 1970's	solvent based paint wastes

hazardous waste accumulation areas	9	1989 - to date of response	sealed and labeled drums awaiting shipment
drum crushing area	10	1985 - to date of response	repacking, inspection and marking for "F" and "D" hazardous wastes
satellite drum accumulation areas	11	1985 - to date of response	waste acetone, mixed paint related wastes, spent 1,1,1-trichloroethane, mixed garage solvents
production paint line system	12	about 1940 - to date of response	metal finishing rinse waters
waste accumulation drums associated with emission control devices	13	1989 - to date of response	air emission control sludge containing metals such as copper, chromium, cadmium and lead
drum closure area	14	1988	solvent waste
separation unit and associated evaporation tank	15	1987 - to date of response	soluble oils, lubricants, plastic solids and water
sludge mixing and drying area	16	1987 - to date of response	metal finishing wastewater treatment sludges
metal preparation line	17	1975 - to date of response	metal finishing rinse waters
zinc paint line and associated waste water treatment equipment	18	1988, 1989 to date of response	zinc electroplating waste waters, metal finishing waste waters
hard coat line and associated containment area, sump and treatment tanks	19	1979 - to date of response	anodizing and chromating rinse waters
production paint line system	20	1988 - to date of response	paint wastes
used oil tank	21	1988 - to date of response	used oil burned in industrial furnaces
waste accumulation drums associated with emission control devices	22	various - to date of response	air emissions control sludges containing metals
forge press pits	23	various - to date of response	forging lubricants, hydraulic oils and equipment cleaning materials

trash compactor	24	1982 - to date of response	trash, contaminated scrap metal turnings, plastic, paper, packaging and office wastes
metal scrap hoppers and rolloffs	25	various - to date of response	ferrous and non-ferrous scrap and turnings
metal scrap hoppers and rolloffs	26	various - to date of response	ferrous and non-ferrous scrap and turnings
used oil tanks	27	1989	coolant oily waste

Site Area Geology

16. The Site lies in the dissected till plains of the central lowlands province. The dissected till plains include all the glaciated areas of the state of Iowa and the loess-covered till and bedrock adjoining the Cedar River Valley.

17. The soils below the Site are sparta loamy fine sand. The sparta series consists of nearly level to moderately steep, excessively drained soils on alluvial terrace and uplands. These soils formed in sand deposited mainly by wind. The sparta soils have a rapid permeability and low water capability. Approximately 60 to 65 feet of sand and gravel deposits lie below the sparta soils and above the limestone bedrock.

18. The Site is underlain to a depth of about 1,300 feet by Ordovician, Silurian, Devonian, and Quaternary-age deposits. Ordovician rock units are about 1,000 feet thick and are penetrated by a former City municipal water supply well field located approximately 1.5 miles southwest of the Facility and a current municipal supply well, used primarily as a peaker during periods of high demand (called Gates Well No. 22), which is approximately 600 feet north of the Facility.

19. The Silurian-age deposits are about 100 feet thick and also are penetrated by the former municipal supply well.

20. The Devonian-age deposits are about 125 feet thick and are composed of the Wapsipinicon and Cedar Valley formations.

Site Area Hydrology

21. Groundwater is found in unconsolidated and consolidated aquifers below the Site. The water table is approximately 30 feet below the ground surface. Local groundwaters in both the unconsolidated deposits and the Silurian and Devonian rock units are likely to flow to the southwest toward the Cedar River. No continuous confining layer separates the sands, gravels, and limestones of the water-bearing formation from the bedrock, so these units are believed to be hydrologically connected.

22. Based on field observations, the upper groundwater unit, which underlies a large portion of the Facility, is a perched aquifer created by fill material overlying native soils. Depth to groundwater on the Facility ranges from less than 10 feet below ground surface (bgs) in the area of the perched aquifer to 20 feet bgs. Depth to groundwater off the Facility ranges from approximately 10 feet bgs to greater than 20 feet.

Environmental Investigations

23. A RCRA Facility Assessment was performed for EPA in 1997. The Visual Site Inspection identified 41 SWMUs and 58 Areas of Concern. The report recommended soil testing in areas where there may have been releases of solids wastes, including volatile organic

compounds (VOCs), semi-volatile organic compounds (SVOCs), oils, heavy metals and cyanides.

24. In 2004 to 2005 the City conducted a Brownfields Environmental Site Assessment (ESA). The Phase I was conducted in 2004. The Phase I, Phase II ESA and a Supplemental Phase II ESAs included assessments of those SWMU and AOCs identified in the RFA. The Baseline Groundwater Monitoring Report was issued in March 2006. The ESAs and 2006 Report identified the following contaminants of potential concern (COPC):

Contaminants of Potential Concern (COPC)	Samples Above Soil Screening Level*	Samples above Water Screening Level**
Arsenic	17 of 34	0
Trichloroethylene (TCE)	5 of 43	18 of 30
Polynuclear aromatic hydrocarbons (PAH)	1 of 39	0
Cadmium	3 of 17	0
Chromium	3 of 17	0
Mercury	0	3 of 17
1,1 dichloroethane	0	1 of 30
Cis-1,2 dichloroethane	0	6 of 30
Perchloroethylene	0	4 of 30

* EPA's Median Specific Soil Screening Levels for Industrial Property (MSSL)

** EPA's Drinking Water Maximum Contaminant Levels (MCL)

25. In 2006, Respondent collected 20 additional soil samples to obtain data in areas that were not previously sampled or where data gaps existed. Results were presented to EPA in the Soil and Groundwater Assessment Report dated April 30, 2007. In the upper two feet of soil, arsenic and trichloroethene (TCE) exceeded EPA's Media-Specific Soil Screening.

26. Levels (MSSLs) for an industrial property. Mercury was found in Monitoring Well Number 3 (MW3) at 0.042 mg/l, which exceeds EPA's drinking water Maximum Contaminant Level (MCL) of 0.002 mg/l.

27. From October 2006 through June 2008, geoprobe groundwater samples were collected and groundwater monitoring wells were installed and sampled off the Facility property. VOCs were found in the shallow groundwater under the residential neighborhood and parkland to the west and south west of the Facility. The groundwater plume down gradient (west-southwest) from the Facility was found to have VOCs (primarily TCE and tetrachloroethene (PCE)) in off-Facility groundwater at levels as high as 3650 ug/l TCE and 22.7 ug/l PCE.

28. Other VOCs consistently detected in the off-Facility groundwater plume from 2005 to the present include 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane, cis-1,2-dichloroethene, 1,1-dichloroethane, and 1,2-dichloroethane.

29. A January 2008 Vapor Intrusion Assessment prepared by EPA concluded that there was the potential for the vapor intrusion pathway to be complete in inhabited Site areas over the groundwater plume. The model used in the study predicted that the vapor intrusion pathway may lead to contaminant concentrations in indoor air that present an excess lifetime cancer risk of 1E-04 (1 in 10,000) and Hazard Index greater than 1. Based on the results of the assessment, vapor intrusion sampling was recommended.

30. Vapor intrusion sampling was performed by EPA in November 2008 and April 2009 at 10 residential homes near the Facility. Nine of the tested homes are over the Site VOC

plume to the southwest of the Facility. One home was selected to the north - upgradient with respect to groundwater flow from the Facility - to represent a "background" sample for area residential homes. Sampling ports (2 per home) were installed through basement floors to obtain sub-slab soil vapor samples. The sampling was conducted in two rounds to examine seasonal variation: (i) the first round of sampling results revealed levels as high as 66.7 micrograms/cubic meter (ug/m3) for TCE and 10.4 ug/m3 for PCE; (ii) the second round of fixed laboratory sampling results revealed vapor levels as high as 3,250 ug/m3 for TCE and 84.6 ug/m3 for PCE. Other VOCs detected include cis-1,2-dichloroethene (23.9 ug/m3), 1,1,2-trichlorotrifluoroethane (67.1 ug/m3) and 1,1,1-TCA (15.6 ug/m3).

Contaminants of Concern

31. Respondent generated and handled waste steams containing 1,1,1-TCA, TCE and PCE in its manufacturing operations. From the sampling conducted at the Facility, there were releases to the soils at the Facility. Mercury has also been found in the groundwater at the Facility in one sampling event at a concentration above the MCL.

32. VOCs released at the Facility have contaminated the groundwater and the VOC contaminated groundwater has migrated off the Facility. **Attachment E** is a map showing the approximate location of the Site VOC plume in the groundwater beneath the Facility and adjacent properties.

33. Chronic (long term) exposure to TCE and PCE may adversely affect the neurological system, liver and kidneys. Chronic exposure to TCE has also been associated with

impaired immune system function and reproductive and developmental toxicity. TCE and PCE are classified as probably carcinogenic to humans (2A) by the International Agency for Research on Cancer (IARC). Human and animal studies support that TCE is a potential kidney carcinogen and may increase liver cancer risks and non-Hodgkin's lymphoma. Epidemiologic evidence has associated PCE exposure with excess risks for a number of cancers, including cancer of the lymphoid system, esophagus, and cervix, bladder, kidney, and lung. TCE and PCE are currently being re-assessed under EPA's Integrated Risk Information System (IRIS) program.

34. The central nervous system (CNS) is the most sensitive target for 1,1,1-trichloroethane (TCA) following inhalation exposure. Deficits in neurobehavioral performance tests have been widely reported in humans and animals with acute exposure. Neurodevelopmental effects have been reported in inhalation animal studies of longer duration. Animal studies have also shown 1,1,1-TCA to be a weak hepatotoxicant, producing mild effects on the liver at relatively high levels. According to EPA's Integrated Risk Information System (IRIS), the toxicological database for 1,1,1-TCA provides "inadequate information to assess carcinogenic potential." Epidemiologic studies of humans chronically exposed to 1,1,1-tricholoroethane are inconclusive.

35. Mercury exists in three general chemical forms, elemental (metallic) mercury, methylmercury, and other mercury compounds (organic and inorganic). Each form has specific effects on human health. Chronic inhalation exposure to elemental mercury vapor has been associated with CNS toxicity, including, but not limited to tremors, memory disturbance, and

autonomic dysfunction. Exposure to metallic mercury has also been associated with renal dysfunction and at higher levels of exposure, respiratory, cardiovascular, and gastrointestinal effects also occur. Chronic ingestion of methylmercury has been shown to be associated with a number of adverse health effects, mainly neurotoxicity. The most sensitive adverse effect for methylmercury exposure is developmental neuropsychological impairment. In addition, exposure to methylmercury has been associated with delayed and persistent neurotoxicity in aging populations and cardiovascular toxicity. Oral exposure to mercury compounds (e.g., mercuric chloride) has been associated with toxicity to the kidneys with autoimmune glomerulonephritis being the most sensitive adverse effect from exposure to mercuric chloride in experimental animals. Symptoms of high exposures to inorganic mercury include: skin rashes and dermatitis; mood swings; memory loss; mental disturbances; and muscle weakness.

Potential Receptors

36. Groundwater: Site groundwater is contaminated by VOCs and mercury. Any water wells installed into the contaminated aquifer could result in unacceptable exposures to contaminated water through consumption or dermal contact exposure.

37. Surface water: Persons at the Facility could be exposed to surface water from a precipitation event contaminated by contact with soil contamination at the Facility and/or runoff precipitation could carry such contamination off-Facility and expose area residents to contaminated runoff waters.

38. Air contamination: Sub-slab soil vapor sampling at residential homes at the Site over the VOC plume have shown the potential for indoor air to be contaminated by VOCs. The vapor intrusion pathway of exposure has been shown to be potentially complete.

39. Soil contamination: Persons at the Facility could be exposed to contaminated surface and subsurface (during excavation activities) soils. Although fencing has been constructed at the Facility, trespassers have been entering the Facility and could be exposed to contaminated soils. Future site workers, including utility workers, may be exposed to unacceptable levels of contaminated surface and subsurface soils.

VI. CONCLUSIONS OF LAW AND DETERMINATIONS

40. Respondent is a "person" as defined in Section 1004(15) of RCRA, 42 U.S.C. § 6903(15) and also as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

41. The property located at 550 Esther Street, Waterloo, Iowa, is a "facility" within the meaning of Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

42. The wastes that were stored and handled at Respondent's facility are "solid wastes" and/or "hazardous wastes," as defined in Sections 1004(27) of RCRA, 42 U.S.C. § 6903(27), and 1004(5) of RCRA, 42 U.S.C. § 6903(5), respectively.

43. The wastes that were stored and handled at Respondent's facility are "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

44. The presence of solid wastes, hazardous wastes, and/or hazardous constituents in the soil and ground water resulted from the past or present handling, storage, treatment, transportation, and/or disposal of solid wastes, hazardous wastes, and/or hazardous constituents.

45. Present conditions at the facility and where contamination has migrated may present an imminent and substantial endangerment to health or the environment, within the meaning of Section 7003 of RCRA, 42 U.S.C. § 6973.

46. The conditions at the Site described in the Findings of Fact above constitute an actual or threatened release of hazardous substances from the facility as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9602(22).

47. Respondent has contributed to such handling, storage, treatment, transportation and/or disposal of solid wastes, hazardous wastes and/or hazardous constituents at the facility within the meaning of RCRA and its implementing regulations.

48. The actual or threatened release of hazardous substances from the Site may present an imminent and substantial endangerment to the public health, welfare, or the environment within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

49. The removal actions required by this Order are necessary to protect the public health, welfare, or the environment and are not inconsistent with the National Contingency Plan (NCP), 40 C.F.R. Part 300, and CERCLA.

50. Respondent is the "owner" of a facility within the meaning of Sections 107(a)(1) and107(a)(2) of CERCLA, 42 U.S.C. §§ 9607(a)(1) and 9607(a)(2).

VII. NOTICE TO STATE AND LOCAL AUTHORITIES

51. The State of Iowa and appropriate local authorities have been notified of the issuance of this Order pursuant to Section 7003(c) of RCRA, 42 U.S.C. § 6973(c) and Section 106(a) of CERCLA, 24 U.S.C. § 9606(a).

VIII. ORDER

52. Based on the foregoing, Respondent is hereby ordered to perform the activities described in Section IX of this Order and the SOW and all other activities required by this Order.

IX. WORK TO BE PERFORMED

53. Posting: Respondent shall immediately post a sign at the facility which provides notice of the hazardous conditions present at the site in accordance with the requirements of Section 7003(c) of RCRA, 42 U.S.C. § 6973(c). The sign to be posted shall be at least twenty-four (24) by thirty-six (36) inches, and shall be made of weatherproof material in white or a brightly-colored background with large, clearly contrasting lettering. The sign shall be posted in a prominent place at or near the public entrance to the facility, and shall state: "Warning: Conditions at this site may present an imminent and substantial endangerment to human health or the environment." Failure to post the sign as directed in this paragraph will constitute a violation of this Order.

54. Notice of Intent to Comply: Within five days of the effective date of this Order, Respondent shall notify EPA of its intent to comply with this Order in accordance with Section XVI below.

55. Selection of contractor: Within seven days of the effective date of this Order, Respondent shall select a contractor, subject to EPA approval, to carry out all activities set forth herein. EPA retains the right to disapprove of the selected contractors and/or subcontractors retained by the Respondent.

a. Respondent shall also notify EPA of the name and qualifications of its selected Project Manager within seven days of the effective date of this Order. All work performed pursuant to this Section (Work to be Performed) shall be under the direction and supervision of a professional engineer or geologist with expertise in hazardous waste clean-up. Respondent's Project Manager shall be responsible for administration of all the Respondent's actions required by the Order. To the greatest extent possible, Respondent's Project Manager shall be readily available during all work to be performed hereunder.

b. Respondent shall also notify EPA of the name and qualifications of any other contractors or subcontractors retained to perform work under this Section (Work to be Performed) at least seven days prior to commencement of such work. If EPA disapproves of a selected Project Manager or contractor, Respondent shall retain a different Project Manager or contractor within five business days

following EPA's disapproval and shall notify EPA of the new Project Manager's or contractor's name and qualifications within seven business days of EPA's disapproval. If EPA still disapproves of the selected contractor or Respondent fails to select a new contractor, then EPA reserves the right to perform any or all of the work required by this Order and to seek reimbursement of its costs from Respondent pursuant to applicable statutory authorities.

56. Project Coordinator. On or before five days after the Effective Date of this Order, Respondent shall designate its Project Coordinator and notify EPA in writing of the name, address, phone number, electronic mail address and qualifications of its Project Coordinator. The EPA Project Coordinator will be Mr. Bruce Morrison: address - U.S. EPA, Region 7, AWMD/RCAP, 901 North 5th Street, Kansas City, Kansas 66101; telephone 913-551-7755; e-mail, morrison.bruce@epa,gov. EPA may also designate an Alternate Project Coordinator. Each Project Coordinator shall be responsible for overseeing the implementation of this Order. EPA and Respondent have the right to change their respective Project Coordinators. Respondent must notify EPA in writing at least 10 days prior to the change.

57. EPA will approve/disapprove of Respondent's Project Coordinator (original or replacement) based upon the person's qualifications and ability to effectively perform this role. The qualifications of the persons undertaking the Work for Respondent shall be subject to EPA's review for verification that such persons meet minimum technical background and experience requirements of the EPA. All persons under the direction and supervision of Respondent's

Project Coordinator must possess all necessary professional licenses required by federal and state law.

58. The EPA Project Coordinator shall be EPA's designated representative for the Site. Unless otherwise provided in this Order, all reports, correspondence, notices, or other submittals relating to or required under this Order shall be in writing and shall be sent to the EPA Project Coordinator at the address specified in Paragraph 74, unless notice is given in writing by EPA to Respondent of a change in address. Reports, correspondence, notices or other submittals shall be delivered by U.S. Postal Service, private courier service or electronic mail. All correspondence shall include a reference to the case caption EPA Docket No. RCRA-07-2010-0002.

59. Respondent shall undertake and complete all of the Work to the satisfaction of EPA, pursuant to RCRA § 7003, 42 U.S.C. § 6973. All of the Work performed under this Order shall be under the direction and supervision of Respondent's Project Coordinator and shall be in accordance with the terms of this order and the Statement of Work, Marked as Attachment A and which is incorporated herein by this reference.

60. SOW Task I - Vapor Intrusion Characterization: Within 30 days from the effective date of this Order, Respondent shall submit a Work Plan to complete the characterization of the potential for vapor intrusion to indoor air in accordance with the SOW. The Vapor Intrusion Characterization (VIC) Work Plan shall include a schedule of the Work to be performed. Following EPA's approval or modification of the VIC Work Plan pursuant to

Paragraph 74, Respondent shall implement the VIC Work Plan in accordance with the schedule and provisions approved by EPA.

61. In accordance with the EPA-approved schedule in the VIC Work Plan, Respondent shall submit a Vapor Intrusion Characterization (VIC) Report according to the SOW for EPA review and approval.

62. SOW Task IA - Vapor Intrusion Interim Measures: Within 30 days of the effective date of this Order, Respondent shall submit a Vapor Intrusion Interim Measures (VIIM) Work Plan for mitigating vapor intrusion at the Site in accordance with the terms of the SOW. The VIIM Work Plan shall include a schedule of the Work to be performed. The VIC Work Plan shall be submitted to EPA for approval. Following EPA's approval or modification of the VIIM Work Plan pursuant to Paragraph 74, Respondent shall implement the VIIM Work Plan in accordance with the schedule and provisions approved by EPA.

63. Beginning in accordance with the schedule in the EPA-approved VIIM Work Plan, Respondent shall submit to EPA a Quarterly VIIM Report as provided in the SOW. The Quarterly VIIM Report shall be due within 30 days of the end of the prior quarter-year.

64. SOW Task II - Aquifer Characterization: Within 30 days from the effective date of this Order, Respondent shall submit a Work Plan to complete the characterization of the Site aquifers in accordance with the terms of the SOW. The Aquifer Characterization (AC) Work Plan shall include a schedule of the Work to be performed. The AC Work Plan shall be submitted to EPA for review and approval. Following EPA's approval or modification of the

AC Work Plan pursuant to Paragraph 74, Respondent shall implement the AC Work Plan in accordance with the schedule and provisions approved by EPA.

65. In accordance with the EPA-approved schedule in the AC Work Plan, Respondent shall submit an Aquifer Characterization (AC) Report in accordance with the terms of the SOW for EPA review and approval.

66. SOW Task III - Corrective Measures Study: Within **60** days following EPA approval of the AC Report, Respondent shall submit for EPA approval a Corrective Measures Study (CMS) Work Plan for identifying cleanup alternatives for mitigation of contamination in all affected media and for all exposure pathways. The CMS Work Plan shall be developed in accordance with the SOW.

67. As provided in the approved CMS Work Plan, Respondent shall submit the CMS Report detailing the cleanup alternative(s) evaluation in accordance with threshold and balancing criteria listed in Task III of the SOW which summarizes EPA's Statement of Basis Guidance and relevant guidance including, but not limited to, the RCRA Corrective Action Plan: Final (EPA 520-R-94-004, OSWER Directive 9902.3-2a, May 1994), Interim Final RCRA Facility Investigation (RFI) Guidance (EPA 530/SW-89-031), RCRA Ground-water Monitoring: Draft Technical Guidance (November 1992), Test Methods for Evaluating Solid Waste (SW-846, most recent method), and Construction Quality assurance a for Hazardous Waste Land Disposal Facilities (EPA 530/SW-85-031, July 1986). The CMS Report shall provide estimated costs for each alternative evaluated and a schedule for implementation of the preferred alternative(s).

Respondent shall specify a preferred alternative. EPA will review and approve or modify the submittal in accordance with Paragraph 74 of this Order. EPA may approve the CMS Report without prejudice to EPA's rights and authority to select a final corrective action remedy different from the remedy(ies) preferred by Respondent.

68. EPA will provide Respondent and the public an opportunity to review and comment on a Statement of Basis describing EPA's proposed final corrective action remedy for the Site, including EPA's justification for proposing such corrective actions.

69. SOW Task IV - Corrective Measures Implementation: EPA will notify Respondent of the final corrective actions selected by EPA in a Final Decision Document with Response to Comments. Within 60 days of Respondent's receipt of notification of EPA's selection of the final corrective action(s) for the Site, Respondent shall submit to EPA for its review and approval a Corrective Measures Implementation (CMI) Work Plan, along with a cost estimate for the performance of the Work. The CMI Work Plan shall be developed in accordance with Task IV of the SOW. The CMI Work Plan shall specify the design, construction, operation, maintenance, monitoring and completion criteria for the corrective measures to be implemented. EPA will review and approve or modify the submittal in accordance with Paragraph 74 of this Order.

70. Concurrent with the submission of the CMI Work Plan, Respondent shall submit to EPA an Operation and Maintenance Plan (O&M Plan) that outlines procedures for performing operations, long-term maintenance, and monitoring of the final corrective actions required by

this Order. The O&M Plan shall be developed in accordance with Task IV of the SOW. EPA will review and approve or modify the O&M Plan submittal in accordance with Paragraph 74 of this Order.

71. Concurrent with the submission of the CMI Work Plan, Respondent shall submit to EPA an updated Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPP), and Health and Safety Plan (HSP). EPA will review and approve or modify the FSP and QAPP submittals in accordance with Paragraph 74 of this Order. The updated HSP is submitted to EPA for documentation purposes and is not approved by EPA.

72. Within 30 days after completing construction of the remedy as required in the approved CMI Work Plan, Respondent shall submit for EPA approval a Corrective Measures Implementation Report (CMI Report). The CMI Report shall document the construction of the remedy in accordance with Task IV of the SOW.

73. Task V - Corrective Measures Completion Report: When Respondent believes that it has satisfied the EPA-approved corrective measures completion criteria, or within 90 days of written notice from EPA requesting a Corrective Measures Complete Report, Respondent shall submit to EPA a Corrective Measures Completion Report as provided in the SOW for review and approval by EPA in accordance with Paragraph 74 of this Order.

74. Document Review: All documents submitted pursuant to this Order shall be reviewed in accordance with the procedures outlined in this paragraph. EPA will review the document and may approve the document, approve the document with modifications, or

disapprove the document and provide comments to Respondent. If the document is disapproved with comments, Respondent shall incorporate EPA's comments and resubmit the document within 14 days of receipt of EPA's comments. If Respondent fails to revise the document in accordance with EPA's comments, then EPA may unilaterally modify the work document and Respondent shall implement such work plan or report as necessary to complete the work pursuant to this Order. If the document is approved either upon initial submission or resubmission, Respondent shall commence implementation of the document immediately upon receipt of EPA's written approval of the document. Upon approval of the document by EPA, the document, including all activities and schedules for such activities, shall be incorporated into and made an enforceable part of this Order, and failure to implement any document in accordance with the scheduled contained therein shall be deemed a violation of this Order. The EPA Project Coordinator to whom all documents must be submitted is:

Mr. Bruce Morrison
Project Coordinator
AWMD/RCAP
U.S. EPA Region 7
901 North 5th Street
Kansas City, Kansas 66101

His telephone number is 913-551-7755 or he may be reached via e-mail at the following address: Morrison.bruce@epa.gov.

75. Additional Work: EPA may determine that certain additional tasks are necessary to achieve the purpose of this Order, including but not limited to: investigatory work, excavation and disposal of contaminated materials or other activities as necessary to protect human health or

the environment. In the event such a determination is made, EPA will notify Respondent in writing that Respondent must perform the additional work and will specify the basis and reasons for its determination that the additional work is necessary. Within 15 days of the receipt of such request, Respondent may request a meeting with EPA to discuss the additional work. Within 30 days of notification of the need for additional work, or according to an alternative schedule agreed to by the parties, Respondent shall submit a work plan for such additional work to EPA. The plan will be reviewed by EPA in accordance with the procedures set forth herein. Upon approval by EPA, Respondent shall perform the additional work according to the EPA-approved plan. The EPA-approved plan shall be incorporated into and become an enforceable part of this Order. All additional work performed by Respondent under this subparagraph shall be performed in a manner consistent with this Order.

76. Split samples: Upon request by EPA, Respondent shall allow EPA or its authorized representatives to take split and/or duplicate samples of any samples collected by Respondent while performing work under this Order. Respondent shall notify EPA not less than thirty (30) calendar days in advance of any sample collection activity. In addition, EPA shall have the right to take any additional samples that it deems necessary.

X. MODIFICATION OF WORK PLANS

77. If at any time during the implementation of the Work, Respondent identifies a need for a compliance date modification or revision of a Work Plan, Respondent shall submit a memorandum documenting the need for the modification or revision to the EPA Project

Coordinator. EPA in its discretion will determine if the modification or revision is warranted and may provide written approval or disapproval. Any approved modified compliance date or Work Plan modification is incorporated by reference into this Order.

78. Emergency Response. In the event of any action or occurrence arising from the performance of the Work that constitutes an emergency situation or may present an immediate threat to human health and the environment, Respondent shall immediately take all appropriate action to minimize such emergency or threat, and shall immediately notify the EPA's Project Coordinator. Respondent shall take such immediate and appropriate actions in consultation with EPA's Project Coordinator. Respondent shall then submit to EPA and the IDNR written notification of such emergency or threat at the Site within three calendar days of such discovery. Respondent shall thereafter submit to EPA for approval, within 20 days, a plan to mitigate this threat. EPA will approve or modify this plan, and Respondent shall implement this plan as approved or modified by EPA. In the case of an extreme emergency, Respondent may act as it deems appropriate, at its own risk, to protect human health or the environment.

79. Upon receipt of information that there is newly discovered hazardous waste at the Site which has presented an imminent and substantial endangerment to human health or the environment, Respondent shall immediately provide notice to EPA, the City and the IDNR. Respondent shall also immediately post a notice of the endangerment at the Site.

XI. QUALITY ASSURANCE

80. As provided in Section XI, Respondent shall submit an updated Quality Assurance Project Plan (QAPP), for EPA review and approval. The QAPP shall address quality assurance, quality control, and chain of custody procedures for all sampling, monitoring and analytical activities. Respondent shall follow "EPA Requirements for Quality Assurance Project Plans (QA/R5)" (EPA/240/B-01/003, March 2001), "Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/600/R-98/018, February 1998), and "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/b-01/002, March 2001) as well as other applicable documents identified by EPA. The QAPP shall be incorporated into this Order by reference.

81. Respondent shall include Data Quality Objectives for any data collection activity to ensure that data of known and appropriate quality are obtained and that data are sufficient to support their intended use as required by this Order.

82. Respondent shall ensure that laboratories used by Respondent for analysis perform such analysis according to the latest approved edition of "Test Methods for Evaluating Solid Waste (SW-846)" or other methods approved by EPA. If methods other than EPA methods are to be used, Respondent shall specify all such protocols in the applicable Work Plan. EPA may reject any data that does not meet the requirements of the approved Work Plan and EPA analytical methods and may require resampling and additional analysis.

83. Respondent shall ensure that all laboratories it uses for analyses participate in a quality assurance/quality control (QA/QC) program equivalent to the program that EPA follows.

Respondent shall, upon EPA's request, make arrangements for EPA to conduct a performance and QA/QC audit of the laboratories chosen by Respondent, whether before, during, or after sample analyses. Upon EPA's request, Respondent shall have its laboratories perform analyses of samples provided by EPA to demonstrate laboratory QA/QC and performance. If the audit reveals deficiencies in a laboratory's performance or QA/QC, Respondent shall submit a plan to address the deficiencies and EPA may require resampling and additional analysis.

84. EPA reserves the right to require a change in laboratories for reasons which may include, but shall not be limited to, QA/QC, performance, conflict of interest, or confidential agency audit information. In the event EPA requires a laboratory change, Respondent shall propose two alternative laboratories within 30 calendar days. Once EPA approves of the laboratory change, Respondent shall ensure that laboratory service shall be made available within 15 calendar days.

XII. RECORD RETENTION

85. Until 10 years after Respondent's receipt of EPA's notification pursuant to Section XIX of this Order, Respondent shall preserve and retain all non-identical copies of records and documents (including those in electronic form) which relate in any manner to the performance of the work required under this Order. Respondent shall also instruct its contractors and agents to preserve all such documents for a period of 10 years.

XIII. OPPORTUNITY TO CONFER

86. Respondent may, within 3 days after the effective date of this Order, request a conference with EPA to discuss this Order. The conference must be scheduled to occur on or before 14 days after the effective date of this Order.

87. The purpose and scope of the conference shall be limited to issues involving the implementation of the work required by this Order and the extent to which Respondent intends to comply with this Order. This conference shall not constitute an evidentiary hearing, and shall not constitute a proceeding to challenge this Order. Any such conference shall not give Respondent a right to seek review of this Order, or to seek resolution of potential liability, and no official stenographic record of the conference shall be made. Respondent may appear in person or by an attorney or other representative, at any conference held pursuant to Respondent's request hereunder. A request for a conference with EPA does not in any way delay or continue any of the deadlines or work to be performed by the Respondent.

88. Requests for a conference shall be made by telephone followed by written confirmation mailed by the following business day to the EPA contact identified in Paragraph 74.

XIV. COMPLIANCE WITH OTHER LAWS

89. Respondent shall perform all actions required pursuant to this Order in accordance with all applicable local, state, and federal laws and regulations except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 6921(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j).

In accordance with 40 C.F.R. § 300.415(j), all on-site actions required pursuant to this Order shall, to the extent practicable, as determined by EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements (ARARs) under federal environmental or state environmental or facility siting laws.

XV. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

90. In the event of any action or occurrence during performance of the work which causes or threatens a release of hazardous waste or hazardous substances from the site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action. Respondent shall take these actions in accordance with all applicable provisions of this Order, including but not limited to, any plans submitted pursuant to this Order, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondent shall also immediately notify the EPA representative identified in Paragraph 74 above, or, in the event of his unavailability, notify the Regional Spill Line number listed in the following Paragraph. In the event that Respondent fails to take appropriate response action as required by this paragraph, and EPA takes such action instead, EPA reserves the right to pursue cost recovery.

91. In addition, in the event of any release of a hazardous substance from the site, Respondent shall immediately notify the EPA Regional Spill Line at (913) 281-0991 and the National Response Center at (800) 424-8802. Respondent shall submit a written report to EPA

within seven days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9602(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, et seq.

XVI. NOTICE OF INTENT TO COMPLY

92. Respondent shall provide, within 5 days after the effective date of this Order, written notice to EPA stating whether Respondent will comply with the terms of this Order. The notice shall be sent to EPA's representative identified in Paragraph 74 above. If Respondent does not unequivocally commit to perform the work required by this Order, Respondent shall be deemed to have violated this Order and to have failed or refused to comply with this Order. The absence of a response by EPA to the notice required by this paragraph shall not be deemed to be acceptance of any of Respondent's assertions.

XVII. ENFORCEMENT AND RESERVATIONS

93. The United States reserves the right to bring an action against Respondent pursuant to the CERCLA, for recovery of any costs incurred by the United States related to this Order.

94. Notwithstanding any other provision of this Order, EPA reserves the right to perform its own studies, complete the work (or any portion of the work) required by this Order, and seek reimbursement from Respondent for its costs, or seek any other appropriate relief.

95. Nothing in this Order shall preclude EPA from taking any additional enforcement actions, including modification of this Order or issuance of additional Orders, and/or additional actions as EPA may deem necessary, or from requiring Respondent in the future to perform additional activities pursuant to RCRA, or CERCLA, or any other applicable law. Such additional enforcement actions may include, but are not necessarily limited to: actions taken pursuant to Section 3008(a) of RCRA, 42 U.S.C. § 6928(a), to assess civil penalties and/or seek injunctive relief; actions taken pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h), to compel corrective action at the facility; further actions under Section 7003 of RCRA to address conditions that may present an imminent and substantial endangerment to human health or the environment caused by any future releases of solid waste or hazardous waste from the facility. In addition, Respondent shall be subject to civil penalties of up to $7,500 per day for any violation of this Order under Section 7003(b) of RCRA, 42 U.S.C. § 6973.

96. Notwithstanding any provision of this Order, the United States hereby reserves all of its information gathering, inspection and all enforcement authorities and rights under RCRA, CERCLA, and any other applicable statutes or regulations. The United States expressly reserves all rights it has to issue additional orders or to take other action it deems necessary or appropriate

to address any other areas of the facility which the United States deems a threat to human health or the environment.

97. Respondent may be subject to civil penalties of up to $37,500 per day for any violation of this Order under Section 106(b)(1) of CERCLA, 42 U.S.C. § 9606(b)(1). Respondent may also be subject to punitive damages in an amount up to three times the amount of any costs incurred by the United States as a result of such violation, as provided in Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). In addition, EPA may carry out the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, and/or may seek judicial enforcement of this Order pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606. All penalties shall begin to accrue on the date that complete performance is due or a violation occurs and shall continue to accrue through the final day of correction of the noncompliance.

98. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action or demand at law or in equity against any person for any liability arising out of or relating in any way to the facility.

99. If a court issues an order that invalidates any provision of this Order or finds that Respondent has sufficient cause not to comply with one or more provisions of this Order, Respondent shall remain bound to comply with all provisions of this Order not invalidated by said court order.

100. Except as specifically provided in this Order, nothing herein shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect

public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the site. Further, nothing herein shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Order, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondent in the future to perform additional activities pursuant to CERCLA or any other applicable law. EPA reserves, and this Order is without prejudice to, all rights against Respondent with respect to all other matters, including, but not limited to:

a. claims based on a failure by Respondent to meet a requirement of this Order;
b. liability for costs incurred by EPA for the performance of the work required under this Order in the event that Respondent fails to perform the work, in addition to any past or future costs incurred by EPA associated with responding to a release or threatened release of hazardous substances at or from the facility/site;
c. liability for performance of response action(s) other than the work required by this Order;
d. criminal liability;
e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;
f. liability arising from the past, present, or future disposal, release or threat of release of hazardous waste or hazardous substances from the site; and

g. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry related to the site.

XVIII. SAMPLING AND ACCESS

101. EPA and/or its authorized representatives shall have access to the facility at all reasonable times for the purpose of reviewing the progress of Respondent in carrying out the provisions of this Order and for purposes including, but not limited to, inspecting and copying records, collecting samples, and verifying data. Nothing in this Order shall restrict EPA's rights under Section 3007 of RCRA, 42 U.S.C. § 6927, and CERCLA or other statutory authority.

XIX. EFFECTIVE DATE AND COMPUTATION OF TIME

102. This Order shall become effective immediately upon signature. All times for performance of ordered activities shall be calculated from this effective date.

XX. ADMINISTRATIVE RECORD

103. EPA has established an Administrative Record which contains the documents that form the basis for the issuance of this Order. It is available for review by appointment on weekdays between the hours of 8:30 a.m. and 4:00 p.m. at the offices of EPA Region 7, located at 901 North 5th Street, Kansas City, Kansas, 66101. To review the Administrative Record, please contact EPA's representative identified in Paragraph 74 above.

XXI. MODIFICATION AND TERMINATION

104. EPA may modify or revoke this Order based upon information discovered during the course of implementation of the Order. Any modification shall be incorporated into a revised

Order and issued to the Respondent in the form of a modified Unilateral Administrative Order. The provisions of this Order shall remain in full force and effect until all actions required by this Order have been completed and EPA has notified the Respondent, in writing, that the actions required by this Order have been completed. Respondent shall notify EPA in writing at such time as it believes that all such actions have been completed. EPA shall have sole discretion in determining whether or not all such actions have in fact been completed. Failure to complete all activities required hereunder as directed by EPA shall be deemed a violation of this Order. EPA's provision of written notice to Respondent pursuant to this paragraph shall not be construed as a waiver of any of EPA's rights to take further enforcement action under RCRA or any other laws.

IT IS SO ORDERED:

Becky Weber
Director
Air and Waste Management Division

Cecilia Tapia
Director
Superfund Division

James D. Stevens
Assistant Regional Counsel

4/20/10
Effective Date of Signatures

ATTACHMENT A
UNILATERAL ADMINISTRATIVE ORDER
CHAMBERLAIN MANUFATURING SITE
DOCKET NO. RCRA-07-2010-0002
DOCKET NO. CERCLA-07-2010-0005

ATTACHMENT A

INTRODUCTION

1. The purpose of this Statement of Work (SOW) for the former Chamberlain Manufacturing Site in Waterloo, Iowa, is to define the requirements, standards and guidelines that shall be followed by the Respondent to accomplish the following tasks:

Task I: Prepare and implement a work plan for the characterization of the nature and extent of the potential for vapor intrusion of Volatile Organic Compounds (VOCs) into structures, over the Site groundwater contaminant plume, in excess of human health risk-based levels of concern. Prepare and submit a report summarizing vapor intrusion data collection activities and outcomes.

Task IA: Prepare and implement a Vapor Intrusion Interim Measures Work Plan to mitigate VOC contamination exceeding human health risk-based levels of concern over the Site groundwater contaminant plume. Prepare a quarterly report of mitigation systems installed.

Task II: Prepare and implement a work plan to characterize the shallow aquifer and unconsolidated and Devonian (deep bedrock) aquifer system. The purpose of this work plan is to gain a better understanding of three dimensional flow components and head relationships in the groundwater system in the vicinity of the Site and the relationships and variations due to pumping of area water wells. The characterization of the shallow and deep aquifers is necessary to ensure that off-site pumping wells do not alter the direction and rate of the flow of the groundwater contaminant plume toward potential receptors (under homes to the west-northwest of the Site and Logan Middle School) and interfere with the effectiveness of the selected groundwater remedy.

Task III: Prepare a Corrective Measures Study (CMS) that identifies, compares and recommends alternatives to address the contamination at, and/or originating from, the Facility in accordance with the provisions specified below.

Task IV: Perform the Corrective Measures Implementation (CMI) that implements the remedy selected by EPA to prevent, mitigate, and/or remediate any migration or release of solid and/or hazardous wastes and/or hazardous constituents at, and/or from, the Site in accordance with the provisions specified below.

The remedial action objectives are to implement a remedy that reduces risk to human health and the environment to a cumulative cancer risk in the range of 10E-4 to 10E-6 and a cumulative non-cancer hazard index of less than 1 for all media and all pathways for exposure to chemicals of potential concern at the Site; and to place institutional and engineering controls on the Facility which make it protective for people based on the current anticipated future use.

Task V: Submit a Corrective Measures Completion Report (CMCR) upon achieving the corrective action objectives and meeting corrective measure completion criteria.

In accomplishing the above tasks, the Respondent shall comply with the provisions of the Unilateral Administrative Order (Order), Docket Number RCRA-07-2010-0002, this SOW, and applicable EPA guidance. Applicable guidance may include, but is not limited to:

- *"RCRA Corrective Action Plan: Final"* (EPA 520-R-94-004, OSWER Directive 9902.3-2A, May 1994). ("Corrective Action Guidance")
- *"Interim Final RCRA Facility Investigation (RFI) Guidance"* (EPA 530/SW-89-031).
- *"RCRA Ground-water Monitoring: Draft Technical Guidance"* (November 1992).
- *"Test Methods for Evaluating Solid Waste"* (SW-846, most recent method).
- *"Construction Quality Assurance for Hazardous Waste Land Disposal Facilities"* (EPA 530/SW-85-031, July 1986).

In performing the work required by the Order and this SOW, Respondent may rely upon and use any and all information contained in the "Reports" listed in this SOW, Exhibit 1.

TASK I: VAPOR INTRUSION CHARACTERIZATION INVESTIGATION

Vapor Intrusion Characterization Work Plan. Within **30** days from the effective date of the Order, Respondent shall submit a "Vapor Intrusion Characterization" (VIC) Work Plan to complete the characterization of the potential for vapor intrusion of VOCs to indoor air at theSite. Specifically, the VIC Work Plan shall define the nature and extent of subslab soil gas contamination beginning with homes indentified in SOW, Exhibit 2 If the lateral limits of subslab soil gas contamination have not been adequately characterized for the Residences following completion of sampling in the SOW, Exhibit 2 defined area, Respondent will develop a supplement to the VIC Work Plan to conduct selective sampling of Residences immediately adjoining the SOW, Exhibit 2 defined area to determine the outer boundary of Residences with subslab soil gas or indoor air concentrations in excess of the Interim Measures Action Levels (as set forth in Table 1A1, below). Upon EPA's approval of the supplement to the VIC Work Plan, and Respondent's implementation thereof, additional supplemental VIC Work Plans prepared by

Respondent may be required if EPA determines the outer boundary of the affected Residences has not been defined.

The Work shall be performed in accordance with EPA guidance, including but not limited to, the following:

- CalEPA (California Environmental Protection Agency). 2004. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*. Interim Final. Department of Toxic Substances Control. Sacramento, CA. (Revised February 7, 2005)

- ITRC (The Interstate Technology & Regulatory Council). 2007. *Vapor Intrusion Pathway: A Practical Guideline.* Vapor Intrusion Team. Washington, DC.

- U.S. EPA. 2002. *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway From Groundwater and Soils (Subsurface Vapor Intrusion Guidance).* Office of Solid Waste and Emergency Response, Washington, DC.

- U.S. EPA. 2008. *U.S. EPA's Vapor Intrusion Database: Preliminary Evaluation of Attenuation Factors*. Draft. Office of Solid Waste, Washington, DC.

- U.S. EPA "Development of a Sub-Slab Gas Sampling Protocol to Support Assessment of Vapor Intrusion." (http://www.epa.gov/ahaazvuc/research/waste/research_40.pdf.)

The following information shall be collected in support of the sampling efforts:

- Indoor air surveys documenting the presence/absence and use of household products containing volatile organic compounds (VOCs), including completion of the Occupied Dwelling Questionaire;
- Ambient outdoor levels of VOCs during sampling;
- Meteorological conditions during sampling; and
- Documentation of physical characteristics of the home being sampled including, but not limited to the type of foundation and its integrity.

The risk-based criteria for residential indoor air exposure shall be based on the most recently published values in EPA's Integrated Risk Information System database (http://cfpub.epa.gov/ncea/iris/index.cfm) and/or other recognized sources of toxicity values consistent with OSWER Directive 9285.7-53 (the"Risk Screening Levels").

The VIC Work Plan shall include a schedule of the work to be performed. Following EPA's approval or modification of the Work Plan pursuant to the Order, Respondent shall implement the VIC Work Plan in accordance with the schedule(s) and provisions approved by EPA.

Vapor Intrusion Characterization Report. In accordance with the schedule in the EPA-

approved VIC Work Plan, Respondent shall submit a VIC Report that provides the sample locations, sampling information, figures depicting sampling locations, and analysis of data resulting from the characterization of the potential for vapor intrusion. The VIC Report shall define the nature and extent of subslab soil vapor contamination greater than the Screening Levels for the VOCs. The VIC Report shall be reviewed and approved by EPA in accordance with approval and/or modification procedures in the Order.

TASK IA: VAPOR INTRUSION INTERIM MEASURES

Vapor Intrusion Interim Measures Work Plan. Within **30** days following the effective date of the Order, Respondent shall submit a work plan for mitigating Site vapor intrusion into residential homes that exceed, or have subslab soil gas levels having the potential to cause intrusion to exceed, the human health risk-based screening levels listed in the Table 1A1 below.

Table 1A1 - Interim Measures Action Levels ($\mu g/m^3$)

	Residential Indoor Air Screening Level[1]	Subslab Vapor Screening Level[2]
Cis-1,2-DCE[3]	63 nc	630
1,1,1-TCA	5,200 nc	52,000
TCE	1.2 c	12
1,1,2-TCA	0.15 c	1.5
PCE	0.41 c	4.1

[1] – Residential Indoor Air Screening Levels obtained from Regional Screening Table (USEPA 2009)
[2] – Subslab vapor screening level = (indoor air screening level)/α
[3] – trans – 1,2-Dichloroethene is used as the surrogate compound for cis-1,2-dichloroethene

Table 1A2 – Vapor Intrusion Decision Matrix

Subslab Vapor Concentration	Indoor Air Concentration	Action
> Screening Level	**> or < Screening Level**	**Install vapor mitigation system**
< Screening Level	**> Screening Level**	**Install vapor mitigation system**
< Screening Level	**< Screening Level**	**No action**

The Vapor Intrusion Interim Measures (VIIM) Work Plan shall provide a description of the design for the ventilation system to mitigate VOCs and a schedule to implement the proposed

interim measures. Following EPA's approval or modification of the VIIM Work Plan pursuant to the Order, Respondent shall implement the VIIM Work Plan in accordance with the schedule and provisions approved by EPA.

Quarterly Vapor Intrusion Interim Measures Report. Beginning with EPA's approval of the VIIM Work Plan, Respondent shall submit to EPA a Quarterly VIIM Report that details thedesign and construction of the vapor intrusion mitigation system(s) installed at the Site during the quarterly reporting period. The report shall provide documentation of the system(s) design "as-built," information on the expected operational life of the system, a recommendation for the frequency for monitoring and maintaining the system, criteria for determining its effectiveness, a schedule for system replacement in whole or in part (as appropriate), the frequency of system inspection by the Respondent, and any deviations from the approved VIIM Work Plan. The quarterly VIIM Report shall be due within **30** days of the end of the prior quarter-year.

TASK II: AQUIFER CHARACTERIZATION

Aquifer Characterization Work Plan. Within **30** days of the effective date of this Order, Respondent shall prepare and submit to EPA a work plan with schedule for the characterization of the shallow aquifer and unconsolidated Devonian (deep bedrock) aquifer in the vicinity of the Site. The Devonian aquifer in the area is intensely fractured, has karst development, and the sub-regional flow under large withdrawal and injection conditions, such as the conditions created by the public water supply well #22 directly north and the geothermal wells installed at Logan Middle School and Allen Hospital to the northwest of the Site, is not well defined. Additional data are needed to determine the influence of large withdrawl and injection conditions from off-site pumping wells that may alter the direction and flow rate of groundwater contaminant plumes toward potential receptors (under homes to the west-northwest of the Site and Logan Middle School) and/or interfere with the actual effectiveness of a groundwater remedy proposed and selected in Task IV below.

The Aquifer Characterization (AC) Work Plan shall include a schedule for a planned and coordinated pumping test to obtain relevant background information of local and regional stresses on the shallow aquifer and Devonian (deep) aquifer. At a minimum, water levels should be continuously monitored in all production wells in/near the groundwater contaminant plume (e.g.,the public water supply well #22, Logan Middle School, Allen Hospital, and the deep production well on-Site) and a select number of shallow monitoring wells screened in the unconsolidated geologic materials (both on- and off-Site) during the aquifer (pumping) test. The pumping test should be of sufficient duration to evaluate 24-hours of water use and groundwater movement (vertical and horizontal) in the area of interest.

The AC Work Plan shall include a procedure to measure for the presence of non-aqueous phase liquids in on-Site monitoring, observation or production wells that will serve as an indication that there is a source area at the Site.

The information obtained from implementation of the AC Work Plan shall be submitted to EPA in an Aquifer Characterization Report (AC Report) in accordance with the schedule in the approved AC Work Plan. The AC Report shall be reviewed and approved by EPA in accordance with approval and/or modification procedures in the Order.

The EPA-approved AC Report results shall be incorporated into the evaluation and proposal of groundwater cleanup alternatives in Task III, below.

TASK III. CORRECTIVE MEASURES STUDY

1. Respondent shall conduct a Corrective Measures Study (CMS) that shall identify, screen and develop the alternative or alternatives for removal, containment, treatment and/or other remediation of the contamination at the Site based on the overall protection of human health and the environment.

2. The CMS shall identify/develop how alternatives provide human health and environmental protection, specify media cleanup standards (MCS) and evaluate alternatives based on the ability of each to achieve them. Respondent shall identify/develop how measures control the sources of releases by describing how alternatives reduce or eliminate to the maximum extent possible further releases. Respondent shall identify/develop methods to comply with standards for the management of wastes generated during corrective measures.

3. **CMS Work Plan**. Within **60** days following EPA approval of the AC Report, Respondent shall submit to EPA for approval a draft CMS Work Plan. The CMS Work Plan shall identify cleanup alternatives to be evaluated and ranked in the CMS Report. The CMS Work Plan shall address contamination in all affected media and for all exposure pathways, both current and future, for which the EPA's Final Risk Assessment for the Chamberlain Manufacturing Site predicts an unacceptable human health or ecological risk. The Federal Remediation Technologies Roundtable, Remediation Technologies Screening Matrix at http://www.frtr.gov/matrix2/top_page.html should be consulted for guidance in selecting the appropriate cleanup technologies to be evaluated.

The CMS Work Plan shall include a table that summarizes the available technologies to be considered. The CMS Work Plan shall also include the proposed MCS for cleanup in all effected media. The MCS may take into account naturally occurring background concentrations for metals. The CMS Work Plan shall contain the schedule for evaluation of cleanup alternatives for all effected media and any pilot or bench-scale testing of cleanup alternatives, if necessary. The work plan shall be reviewed and approved by EPA in accordance with approval and/or modification procedures in the Order

4. **CMS Report.** In accordance with the schedule in the EPA-approved CMS Work Plan, Respondent shall submit to EPA for approval a draft CMS Report. The CMS Report shall describe a detailed evaluation of corrective measure alternatives and a recommendation as to the alternative (or combination of alternatives) which should be selected to address contamination in

all affected Site media and for all exposure pathways, both current and future, for which there is an unacceptable human health or ecological risk. The CMS Report shall address, without limitation, all items set forth in this task, below:

a. Statement of Purpose: The CMS Report shall describe the purpose of the document and provide a summary description of the project;

b. Description of Current Conditions: The CMS Report shall summarize the soil, groundwater and vapor intrusion investigations conducted since the Baseline Groundwater Monitoring report dated March 2006, prepared by Howard R. Green Company on behalf of the city of Waterloo which concluded the Brownfields investigation at the site and any new information that has been developed since the effective date of this Order. This discussion shall concentrate on those issues which could significantly affect the evaluation and selection of the corrective measure alternative(s);

c. Corrective Action Objectives

The CMS Report shall describe and propose Respondent's corrective action objectives. Specifically, Respondent shall propose applicable MCS for all affected media and for all exposure pathways, both current and future, for which the EPA's Final Risk Assessment for the Chamberlain Manufacturing Site predicts an unacceptable human health or ecological risk. The corrective action objectives shall be based on promulgated federal or state standards, risk-derived standards, institutional controls, and all data and information gathered during the Brownfields investigation phases and corrective action process (e.g., Phase I, Phase II and Supplemental Phase II Environmental Assessments, RCRA Facility Assessment, etc.), and/or other applicable guidance documents. The residential indoor air and subslab screening levels for VOCs listed in Task IA above shall be re-evaluated to determine whether they remain protective for the mitigation of potential long-term indoor air exposure. If no specific standards exist for a given contaminant and media, the Respondent shall propose and justify a MCS for such contaminant and/or media. EPA has final approval of all MCSs. Final MCSs will be determined at the time of the preparation of the CMS, and will take into account the current and reasonably anticipated future use of the Facility property.

d. Identification, Screening, and Development of Corrective Measure Alternatives

(1) Identification of Technologies:

(a) The CMS Report shall list and describe potentially applicable technologies from the EPA-approved CMS Work Plan for each affected media that may be used to achieve the corrective action objectives proposed by Respondent;

(b) The CMS Report may consider innovative treatment technologies, especially in situations where existing corrective measure technologies are limited. Innovative technologies are defined as those technologies utilized for source control other than incineration, solidification/stabilization, and pumping with conventional treatment for contaminated groundwater. The EPA may require treatability studies and/or on-site pilot scale studies to evaluate the effectiveness of any proposed innovative treatment technologies;

(c) Respondent may conduct, and include in the draft CMS Report, laboratory and/or bench scale studies to determine the applicability of a corrective measure technology or technologies to Site conditions. The methodology of these studies is subject to EPA review and approval;

(d) If Respondent proposes laboratory and/or bench scale studies, Respondent shall develop and submit a testing plan to the EPA for review and approval that identifies the type(s) and goal(s) of the study or studies, the level of effort needed, and the procedures to be used for data management and interpretation. Upon completion of the testing, the Respondent shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan; and

(e) The CMS Report shall summarize the testing program and its results (if studies are performed), both positive and negative.

(2) Screening of Technologies:

(a) The CMS Report shall present a screening of corrective measures technologies to demonstrate why certain corrective measures technologies may not prove feasible to implement given the existing set of waste and site-specific conditions; and

(b) In addition to the "no action" alternative, Respondent shall present all corrective measures technologies considered in tabular form.

(3) Corrective Measure Development:

(a) The CMS Report shall assemble the technologies that pass the screening step into specific alternatives that have the potential to meet the corrective action objectives for each media: and

(b) Each alternative proposed in the CMS Report shall consist of an individual technology or a combination of technologies used in sequence (i.e., a treatment train). Different alternatives may be considered for separate areas of the Site contamination. The developed alternatives shall be carried forward for evaluation using the EPA's four General Standards for Remedies and Remedy Selection Decision Factors below.

5. General Standards for Remedies

For each remedy which warrants a more detailed evaluation, the CMS Report shall provide detailed documentation of how the potential remedy will comply with each of the General Standards for Remedies listed below. These standards reflect the major technical components of remedies including cleanup of releases, source control and management of wastes that are generated by remedial activities in accordance with the RCRA Corrective Action Plan (OSWER Directive 9902.3-2A, May 1994). Specifically these standards are:

a. Be protective of human health and the environment;

b. Attain media cleanup standards set by the EPA;

c. Control the source(s) of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment;

d. Comply with any applicable standards for management of wastes; and

e. Other Factors (5 General Factors).

6. Any Proposed Remedy must Satisfy the Four General Standards

Any corrective measure alternative proposed by the Respondent in the CMS Report must satisfy the four General Standards for Remedies in order to be carried forward for evaluation using the Remedy Selection Decision Factors. In evaluating the selected corrective measure alternative or alternatives, the Respondent shall prepare and submit information documenting that the specific remedy will meet the standards listed above. A detailed explanation of the General Standards for Remedies is set forth below.

7. **Any proposed Remedy must be Protective of Human Health and the Environment**

Corrective action remedies must be protective of human health and the environment. Remedies may include those measures that are needed to be protective, but are not directly related to media cleanup, source control, or management of wastes. An example would be providing an alternative drinking water supply in order to prevent exposure to a contaminated aquifer used as a drinking water source. This information must be provided in addition to a discussion of how the other corrective measure alternatives meet this standard.

8. **Any proposed remedy must attain Media Cleanup Standards Set by the EPA**

Remedies will be required to attain media cleanup standards which are set by EPA (based on state or federal regulations (e.g., groundwater standards) or other standards which are set by the EPA). The CMS Report shall address whether the potential remedy will achieve the preliminary remediation objective as identified by the EPA as well as other alternative corrective action objectives that may be proposed by the Respondent. Respondent shall also include an estimate of the time frame necessary for each alternative to meet these standards.

9. **Any proposed remedy must Control the Sources of Releases**

A critical objective of any remedy proposed by Respondent must be to prevent further releases from source areas and prevent migration of the groundwater plume by controlling or eliminating further releases that may pose a threat to human health and the environment. An effective source control program is essential to ensure the long-term effectiveness and protectiveness of the corrective action program. As part of the CMS Report, the Respondent shall address the issue of whether source control measures are necessary, and if so, the type of source control actions that would be appropriate. Any source control measure proposed shall include a discussion on how well the method is anticipated to work given the particular situation at the Site and the known track record of the specific technology.

10. **Any Proposed Remedy must comply with Any Applicable Standards for Management of Wastes.**

The CMS Report shall include a discussion of how the specific waste management activities will be conducted in compliance with all applicable state or federal regulations (e.g., the land disposal restrictions).

11. **Remedy Selection Decision Factors**

Any remedy proposed by Respondent shall be evaluated according to EPA's Remedy Selection Decision Factors. The Remedy Selection Decision Factors are five factors that the EPA considers in selecting/approving a remedy that meets the four General Standards listed above. These factors represent a combination of technical measures and management controls for addressing the environmental problems at the Site. The five factors are:

a. Long-term reliability and effectiveness;

b. Reduction in the toxicity, mobility or volume of wastes;

c. Short-term effectiveness;

d. Implementability; and

e. Cost.

The CMS Report shall discuss and provide information in support of Respondent's application of these factors in the evaluation of corrective action alternatives. Examples of the types of information required are provided below:

12. **Long-term Reliability and Effectiveness**

Demonstrated and expected reliability is a way of assessing the risk and effect of failure. The CMS Report shall consider whether the technology or a combination of technologies have been used effectively under analogous site conditions, whether failure of any one technology in the alternative would have an immediate impact on receptors, and whether the alternative would have the flexibility to deal with uncontrollable changes at the site (e.g., heavy rain storms, earthquakes, etc.). The CMS Report shall evaluate each corrective measure alternative in terms of the projected useful life of the overall alternative and of its component technologies. Useful life is defined as the length of time the level of effectiveness can be maintained.

13. **Reduction in the Toxicity, Mobility or Volume of Wastes**

The CMS Report shall discuss how the alternatives employ techniques, such as treatment technologies, to eliminate or substantially reduce the inherent potential for the wastes in SWMUs (and/or contaminated media at the Site) to cause future environmental releases or other risks to human health and the environment. Considerations include the amount of contaminants destroyed or treated, the degree of expected reduction in toxicity, mobility, and volume, the degree to which the treatment is irreversible, and the type and quantity of residuals remaining after treatment.

14. **Short-term Effectiveness**

The CMS Report shall evaluate the short-term effectiveness of each of the alternatives as proposed. Short-term effectiveness considers the protection of the community and on-site work force (both Facility and remedial) during the performance of the corrective action, along with any short-term environmental impacts. An important aspect of the short-term effectiveness factor is the consideration of the time a remedy requires to attain the media cleanup standards.

15. **Implementability**

The CMS Report shall evaluate Respondent's ability to construct and operate each corrective measure alternative proposed. Key elements include the reliability of the technology, the ease of undertaking additional corrective action (if necessary), and the ability of the Respondent to monitor the effectiveness of the corrective action. Examples of information the CMS Report shall consider when assessing implementability include:

a. The administrative activities needed to implement the corrective measure alternative (e.g., permits, rights of way, offsite approvals, etc.) and the length of time these activities will take;

b. The constructability, time for implementation, and time for beneficial results;

c. The availability of adequate offsite treatment, storage capacity, disposal services, needed technical services and materials; and

d. The availability of prospective technologies for each corrective measure alternative.

16. **Cost**

The relative cost of a remedy may be considered, particularly when several different technical alternatives to remediation offer equivalent protection of human health and the environment, but vary widely in cost. When presenting cost estimates, the CMS Report shall include third-party costs for engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, training, operation and maintenance, etc., and shall be presented in tabular form. The cost estimates for the alternatives shall be categorized as capital costs and operation and maintenance costs, and the Respondent shall present the cost of each alternative, or combinations of alternatives, separating the short-term and construction capital costs from the long-term operation and maintenance (O & M) costs. Respondent shall use net present worth for the long-term cost(s) of each alternative using a discount rate of five (5) percent before taxes and after inflation.

17. **Recommended Alternative(s)**

Respondent may recommend a preferred corrective measure alternative, or combination of alternatives, for consideration by the EPA. Such a recommendation should include a description and supporting rationale for the proposed remedy, consistent with the General Standards for Remedies and the Remedy Selection Decision Factors that appear above. EPA will review and/or approve and/or modify this submittal in accordance with the Order. EPA's approval of the CMS Report shall not bind EPA to select Respondent's recommended remedy as the final remedy selected for the Site.

1. Following public review and comment on the proposed remedy decision, EPA will select the corrective measures to be implemented at the Site. Respondent shall develop the work plan for designing and constructing the selected corrective measures, prepare a report documenting the construction of the remedy in accordance with the approved work plan, submit a plan to conduct any and all on-going monitoring and maintenance required to ensure that the constructed remedy remains protective of human health and the environment, and continue operation and maintenance (O & M) of the selected remedy until cleanup objectives have been achieved, documented and approved by EPA.

2. **Corrective Measures Implementation (CMI) Work Plan** - Within **60** calendar days of receipt of notification from EPA that the public comment period for the proposed remedy has been completed and EPA has selected a final corrective action for the Site, Respondent shall submit the CMI Work Plan to EPA. The required CMI Work Plan shall specify the work required for the design, construction, implementation, and continued performance monitoring of EPA's selected final corrective action(s) at the Site. EPA will review and/or approve and/or modify this submittal in accordance with the Order.

3. The CMI Work Plan shall include, at a minimum, the following elements:

a. Introduction/Purpose: The CMI Work Plan shall contain a description of the purpose of the document and a summary description of the project;

b. Summary of corrective action objectives;

c. Description of the final corrective measure(s) selected by EPA and the rationale for the remedy selection;

d. Performance expectations;

e. Preliminary design criteria and rationale;

f. General O & M requirements;

g. Startup Procedures, including all applicable system startup procedures, including operational testing;

h. Long-term monitoring requirements;

i. Design and implementation considerations to implement the selected remedy, to include, but not be limited to:

(1) Anticipated technical problems;
(2) Additional engineering data that may be required;

(3) A description of any permits and regulatory requirements; and
(4) Access, easements and right-of-way.

j. Cost estimates, including the capital and O & M costs for implementing the corrective action.

k. The CMI Work Plan shall specify a project schedule for key elements of the bidding and construction process, and for the initiation of all major corrective action construction tasks.

l. The CMI Work Plan shall propose the process and criteria for determining when the implemented corrective measures have achieved the corrective action objectives. The CMI Work Plan shall also describe the process and criteria for determining when maintenance and monitoring may cease.

4. Operation and Maintenance (O & M) Plan – Concurrently with the submittal of the CMI Work Plan, Respondent shall also submit to EPA for approval an O & M Plan that outlines procedures for performing operations, long-term maintenance and monitoring of the final corrective action required by this Statement of Work. The O & M Plan shall address all elements set forth below, including but not limited to, Project Management, Data Collection, Waste Management Procedures and Contingency Procedures.

EPA will review and/or approve and/or modify this submittal in accordance with the Order. The O & M Plan shall, at a minimum, include the following elements:

a. Project Management - The O & M Plan shall describe the management approach including levels of personnel authority and responsibility (including an organizational chart), lines of communication and the qualifications of key personnel who will operate and maintain the corrective action (including contractor personnel);

b. System description - The O & M Plan shall describe the corrective action components and identify significant equipment, as applicable to each selected corrective action alternative. Provide schematics or process diagrams to illustrate system design and operation;

c. Personnel Training - The O & M Plan shall describe the training process for O & M personnel, as applicable. Respondent shall prepare, and include the technical specifications governing the operation and on-going maintenance of contaminant mitigation systems (e.g., indoor air migration systems), and the support requirements for the following:

i. Appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up and operation of contaminant mitigation systems; and

ii. Training covering appropriate operational procedures once the start-up has been successfully accomplished.

d. Start-Up Procedures - The O & M Plan shall describe all applicable system start-up procedures including any operational testing;

e. O & M Procedures - The O & M Plan shall describe all normal operation and maintenance procedures including:

(1) A description of tasks for operation;

(2) A description of tasks for maintenance;

(3) A description of prescribed treatment or operation conditions; and

(4) A schedule showing the frequency of each O & M task.

f. Data Management and Documentation Requirements - The O & M Plan shall specify that Respondent shall collect and maintain the following information:

(1) Progress Report Information;

(2) Monitoring and Laboratory data;

(3) Records of operating costs; and

(4) Personnel, maintenance and inspection.

g. Application of QAPP/FSP:

The O & M Plan shall reference the approved updates to the QAPP/FSP and describe actions necessary to apply the QAPP/FSP to ensure that all information, data and resulting decisions are technically sound, statistically valid and properly documented.

h. The O & M Plan shall specify a replacement schedule for equipment and installed components;

i. Waste Management Practices - The O & M Plan shall describe any solid wastes/hazardous wastes/LNAPL which may be generated by the operation of the remedy and describe how they will be managed;

j. Contingency Procedures - The O & M Plan shall describe, as applicable, the following types of contingency procedures necessary to ensure system operation in a manner protective of human health and the environment:

(1) Procedures to address system breakdowns and operational problems including a list of redundant and emergency back-up equipment and procedures;

(2) Alternative procedures to be implemented if the mitigation systems suffer complete failure. The alternative procedures must be able to achieve the performance standards for the remedy until system operations are restored;

(3) The O & M Plan shall specify that, in the event of a major breakdown and/or the failure of the remedy, Respondent shall notify EPA and IDNR within 24 hours of the event; and

(4) The O & M Plan shall specify the procedures to be implemented in the event that the remedy is experiencing major operational problems, is not performing to design specifications, and/or will not achieve the Interim Measure performance standards.

k. Comprehensive 5-year reviews that the remedy remains protective of human health and the environment.

5. **Updated Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPP), and Health and Safety Plans (HSP)** – Concurrent with the submittal of the CMI Work Plan, the Respondent shall also update the QAPP approved by EPA on September 22, 2006, and submit an updated HSP combining and updating the previous HSPs for groundwater sampling and subsurface soil drilling and sampling dated September 27 and 29, 2006, respectively. The updated plans shall be revised as appropriate to address the requirements of implementing the final corrective action for the Site. The EPA will review and/or approve and/or modify all updates to the QAPP and FSP in accordance with the Order. The updated HSP shall be submitted to EPA for documentation; however, EPA will not review and approve this submittal.

6. **Corrective Measures Implementation Report** - Within **30** days after completing construction of the remedy as required by the approved CMI Work Plan, Respondent shall submit a Corrective Measures Implementation Report, which shall include at a minimum, the following elements:

a. A statement of the purpose of the Report;

b. A synopsis of the corrective measure, design criteria, and a certification that the corrective measure was constructed and implemented in accordance with the approved CMI Work Plan;

c. An explanation and description of any modifications to the approved CMI Work Plan and design specifications, and why such modifications were necessary and appropriate. EPA approval is required for modifications to the approved CMI Work Plan and design specifications;

d. Copies of any sampling/test results for operational testing and/or monitoring that documents how initial operation of the corrective measure compares to design criteria;

e. A summary of significant activities that occurred during the implementation/construction, including a discussion of any problems encountered and how such problems were addressed;

f. A summary of all inspection findings (including copies of inspection reports, documents and appendices); and

g. Copies of as-built drawings and photographs.

TASK V. CORRECTIVE MEASURES COMPLETION REPORT

When Respondent believes it has implemented the remedy and satisfied the EPA-approved completion criteria, or within **90** days of a request from EPA, Respondent shall submit to EPA a Corrective Measures Completion Report (CMCR) for review and approval by EPA in accordance with the Order. The CMCR shall fully document how the corrective action objectives and corrective measures completion criteria have been satisfied, and shall justify why the corrective measures and/or monitoring may cease. The CMCR shall, at a minimum, include the following elements:

a. A synopsis of the corrective measures;

b. Corrective Measures Completion Criteria - the CMCR shall include the process and criteria used to determine, and recommend, that the corrective measure, maintenance and monitoring may cease;

c. A demonstration that the corrective action objectives and corrective measure completion criteria have been met. The CMCR shall include results of tests and/or monitoring that documents how operation of the corrective measure compares to, and satisfies, the corrective action objectives and completion criteria;

d. A summary of work accomplishments (e.g. performance levels achieved, total hours of operation, total volume treated and/or excavated volumes of media, nature and volume of wastes generated, etc.);

e. A summary of significant activities that occurred during operation of the corrective measure, including a discussion of any problems encountered and how such problems were addressed;

f. A summary of inspection findings (including copies of key inspection documents in appendices); and

g. A summary of total O&M costs.

REPORTS

HR Green Reports

- Phase I Environmental Site Assessment, Former Chamberlain Manufacturing Property, 550 Esther Street, Parcel ID 8913-13-176-002, Waterloo, Iowa. Howard R. Green Company, May 2004.
- Phase II Environmental Site Assessment, Former Chamberlain Manufacturing Property, 550 Esther Street, Parcel ID 8913-13-176-002, Waterloo, Iowa. Howard R. Green Company, January 2005.
- Supplemental Phase II Environmental Site Assessment, Former Chamberlain Manufacturing Facility, Parcel ID 8913-13-176-002, 550 Esther Street, Waterloo, Iowa. Howard R. Green Company, September 2005.
- Property-Specific Sampling and Analysis Checklist, Former Chamberlain Manufacturing Facility, Baseline Groundwater Monitoring, Chamberlain Manufacturing Redevelopment Project, Waterloo, Iowa. Howard R. Green Company, December 2005.
- Baseline Groundwater Monitoring, Former Chamberlain Manufacturing Facility, Parcel ID 8913-13-176-002, 550 Esther Street, Waterloo, Iowa. Howard R. Green Company, March 2006.

Terracon Reports

- Quality Assurance Project Plan, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, June 19, 2006
- Quality Assurance Project Plan, Revision 1, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, August 18, 2006
- Soil Assessment Summary, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, August 24, 2006
- Groundwater Field Sampling Plan, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, September 27, 2006
- Soil Field Sampling Plan, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, September 29, 2006
- Soil Assessment Summary, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, August 24, 2006

- Soil and Groundwater Assessment Report, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, April 30, 2007

- Quarterly Groundwater Monitoring Report, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, August 27, 2007

- Quarterly Groundwater Monitoring Report, October 2007 Sampling, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, February 11, 2008

- Quarterly Groundwater Monitoring Report, June 2008 Sampling, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, November 6, 2008

- Quarterly Groundwater Monitoring Report, November 2008 Sampling, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, January 5, 2009

- Quarterly Groundwater Monitoring Report, June 2009 Sampling, Former Industrial Property, 550 Esther Street, Waterloo, IA, Terracon Project No. 07067011, July 22, 2009

- Memorandum from John F. Brimeyer to Stephanie Doolan (EPA), Mike Gannon (IDNR), Deb Tinker (IDNR) and James P. Caldwell (USGS) regarding Logan School Pump Test, January 16, 2009

USEPA Reports

- RCRA Facility Assessment, Chamberlain Manufacturing Corporation, Waterloo, Iowa, February 6, 1996

- Memorandum, Vapor Intrusion Assessment, Former Chamberlain Manufacturing Property, Waterloo, IA, United States Environmental Protection Agency

- Memorandum, November 2008 Subslab Vapor Sampling, Former Chamberlain Manufacturing Site – Residential Properties, Waterloo, IA, United States Environmental Protection Agency, January 5, 2009

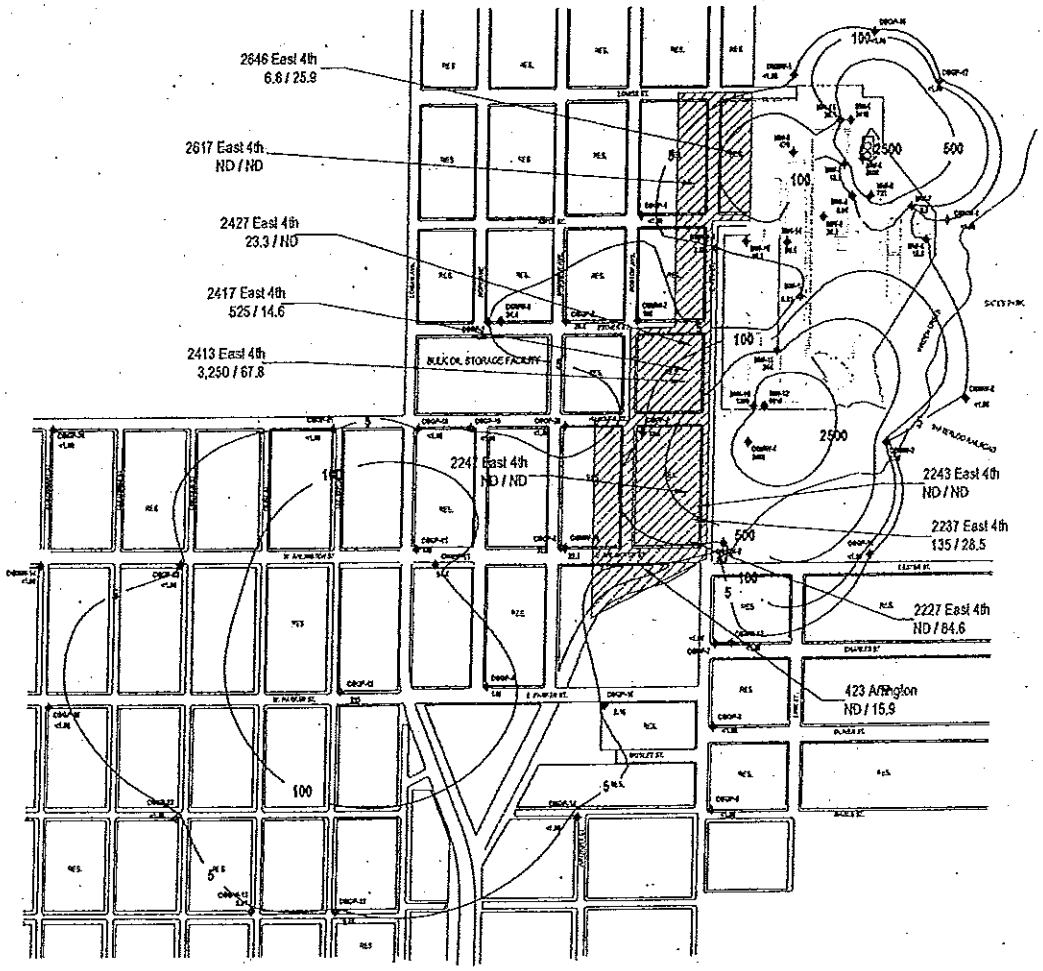
- Memorandum, April 2009 Subslab Vapor Sampling, Former Chamberlain Manufacturing Site – Residential Properties, Waterloo, IA, United States Environmental Protection Agency, June 23, 2009

Iowa Department of Natural Resources Report

- Memorandum, Logan School – Geothermal Pump/Injection Model Results Review from Terracon – Discussion, March 25, 2009

- November 2, 2001 letter from Brett Meyers, Blackhawk County Health Department to Stephanie Doolan, EPA, Regarding Existing and Proposed Wells

Exhibit 2



N

0 500

Approximate Scale (Feet)

LEGEND

- PROPERTY LINE
- RAILROAD
- MONITORING WELL
- RES. RESIDENTIAL
- FORMER GEOPROBE SAMPLES
- 135 / 28.5 TCE/PCE CONCENTRATION (µg/m3)
- PROPSED VAPOR SAMPLING LIMITS

REV	DATE	BY	DESCRIPTION

Terracon
Consulting Engineers and Scientists
170 40th Avenue, Suite 5270
(563) 556-0702 (563) 355-4788

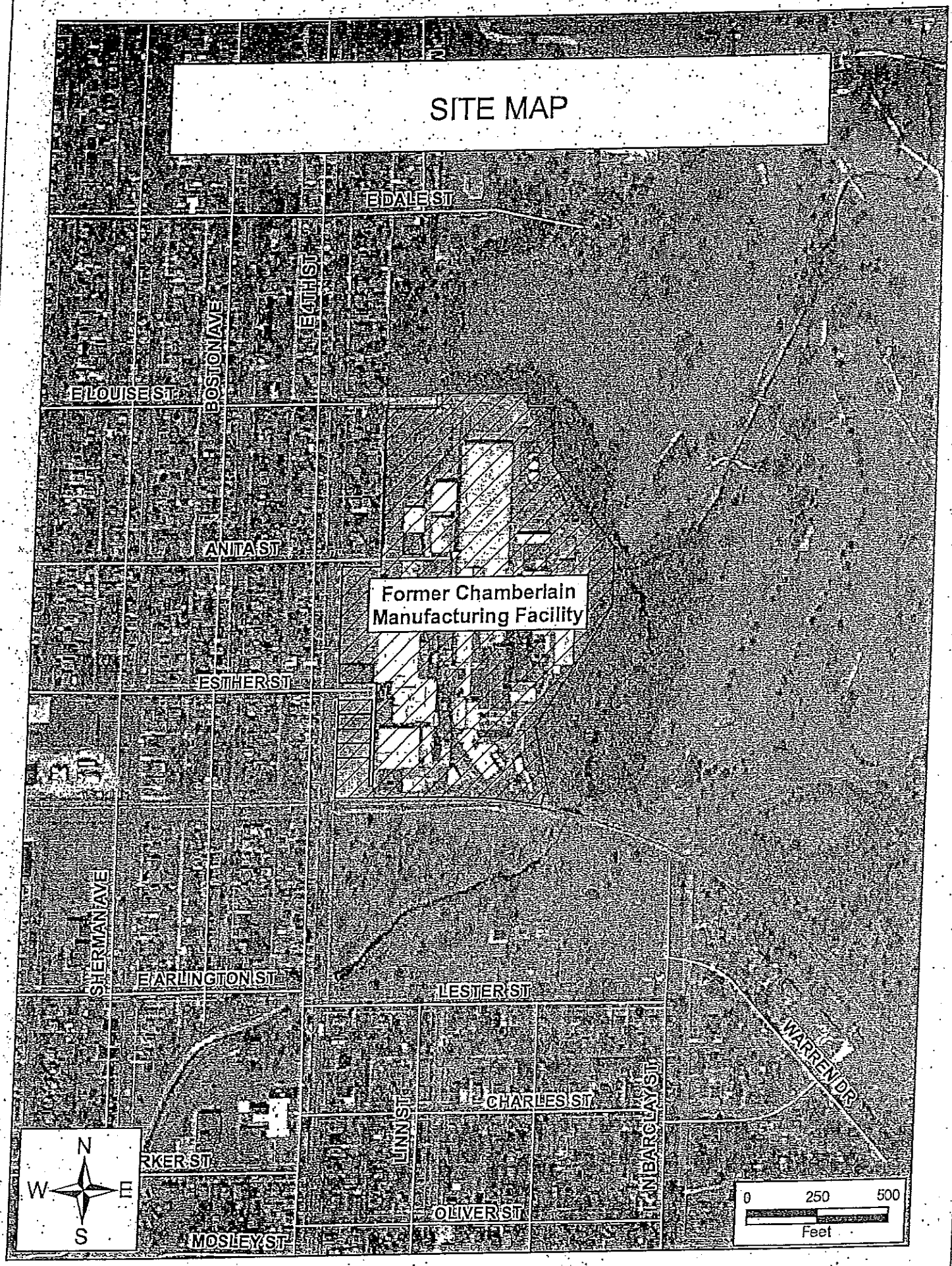
SOIL GAS SAMPLING

PROPOSED VAPOR SAMPLING AREA
FORMER INDUSTRIAL PROPERTY
550 ESTHER STREET
WATERLOO IOWA

FIGURE 1

PROJECT MGR.	JFS
DRAWN BY:	MKS
APPVD. BY:	JFS
SCALE:	AS SHOWN
DATE:	February 18, 2015
PROJECT NO.	57363015
FILE NAME:	Vapor
SHEET NO.:	1 OF 1

ATTACHMENT B
UNILATERAL ADMINISTRATIVE ORDER
CHAMBERLAIN MANUFATURING SITE
DOCKET NO. RCRA-07-2010-0002
DOCKET NO. CERCLA-07-2010-0005


SITE MAP
E DALE ST
E LOUISE ST
BOSTON AVE
E 14TH ST
ANITA ST
Former Chamberlain
Manufacturing Facility
ESTHER ST
SHERMAN AVE
E ARLINGTON ST
LESTER ST
WARREN DR
CHARLES ST
LINN ST
BARCLAY ST
OLIVER ST
MOSLEY ST
N
W
E
S
0
250
500
Feet

ATTACHMENT C
UNILATERAL ADMINISTRATIVE ORDER
CHAMBERLAIN MANUFATURING SITE
DOCKET NO. RCRA-07-2010-0002
DOCKET NO. CERCLA-07-2010-0005

EXHIBIT A

Legal Description

A parcel of land located in parts of Blocks Nos. 1, 10 and 11, "Logan Dale Heights" in the City of Waterloo, Iowa, Blocks Nos. 10, 11, 15 and 16, Enterprise Place in the City of Waterloo, Iowa, Block No. 6, North Waterloo Place, an addition to the City of Waterloo, Iowa, the Southwest Quarter of Section No. 13, Township No. 89 North, Range No. 13 West of the Fifth Principal Meridian in the City of Waterloo, Black Hawk County, Iowa, and vacated streets and alleys all located in Waterloo, Black Hawk County, Iowa, described as follows:

Beginning at the Northwest corner of Lot No. 16, Block No. 10 of said "Logan Dale Heights"; thence South 89 degrees 44 minutes 58 seconds East along the Southerly line of Anita Street a distance of 138.00 feet; thence North 00 degrees 10 minutes 04 seconds East a distance of 544.40 feet to the Northwest corner of Lot No. 1, Block No. 1 of said "Logan Dale Heights"; thence North 90 degrees 00 minutes 00 seconds East a distance of 170.05 feet to the Northwest corner of Block No. 10 of said Enterprise Place; thence North 00 degrees 44 minutes 37 seconds East a distance of 50.00 feet to the Southwest corner of Block No. 9 of said Enterprise Place; thence North 90 degrees 00 minutes 00 seconds East along the Northerly line of vacated Louise Street a distance of 324.00 feet to the Southwest corner of Block No. 8 of said Enterprise Place; thence South 00 degrees 29 minutes 17 seconds West a distance of 50.00 feet to the Northwest corner of Block No. 11 of said Enterprise Place; thence North 89 degrees 55 minutes 12 seconds East along the Southerly line of Louise Street a distance of 99.88 feet; thence South 00 degrees 44 minutes 44 seconds West a distance of 191.30 feet; thence South 71 degrees 43 minutes 53 seconds East a distance of 300.80 feet to the Southwest corner of Block No. 12 of said Enterprise Place; thence South 00 degrees 44 minutes 44 seconds West a distance of 204.00 feet to the Northerly line of Block No. 16 of said Enterprise Place; thence South 32 degrees 39 minutes 07 seconds West a distance of 492.37 feet; thence South 14 degrees 45 minutes 05 seconds West a distance of 239.29 feet; thence North 76 degrees 47 minutes 05 seconds East a distance of 14.81 feet; thence South 10 degrees 43 minutes 42 seconds West a distance of 40.00 feet to the Northerly R-O-W line of the Waterloo Railroad Company; thence Westerly along a curve concave Southerly and having a radius of 1450.02 feet and a long chord bearing North 84 degrees 36 minutes 30 seconds West a distance of 342.55 feet; thence North 89 degrees 56 minutes 40 seconds West along said Northerly R-O-W line a distance of 99.21 feet to the Easterly line of East Fourth Street; thence North 00 degrees 13 minutes 53 seconds West along the Easterly line of East Fourth Street a distance of 188.92 feet to the Northwest corner of Lot No. 9, Block No. 11 of said "Logan Dale Heights"; thence South 89 degrees 45 minutes 29 seconds East a distance of 119.54 feet to the Northeast corner of Lot No. 9, Block No. 11 of said "Logan Dale Heights"; thence South 00 degrees 13 minutes 20 seconds West a distance of 149.89 feet to the Southeast corner of Lot No. 17, Block No. 11 of said "Logan Dale Heights"; thence South 89 degrees 47 minutes 47 seconds East a distance of 14.00 feet to the Southwest corner of Lot No. 6, Block No. 11 of said "Logan Dale Heights"; thence North 00 degrees 13 minutes 20 seconds East a distance of 159.80 feet to the Southwest corner of Lot No. 8, Block No. 10 of said "Logan Dale Heights"; thence North 89 degrees 47 minutes 57 seconds West a distance of 14.00 feet to the Southeast corner of Lot No. 9, Block No. 10 of said "Logan Dale Heights"; thence North 00 degrees 06 minutes 04 seconds West along the Easterly line of Lot Nos. 9 and 10, Block No. 10 of said "Logan Dale Heights" a distance of 65.03 feet; thence North 89 degrees 47 minutes 57 seconds West a distance of 124.40 feet to the Easterly line of East Fourth Street; thence North 00 degrees 14 minutes 32 seconds West along the Easterly line of East Fourth Street a distance of 335.28 feet to the point of beginning.

And also,

Lot No. 12, Block No. 11 of said "Logan Dale Heights."

And also,

Lots Nos. 13, 14, 17 and 18, Block No. 6, North Waterloo Place, an addition to the city of Waterloo, Iowa.

NOTE: The North line of Louise Street is assumed to bear North 90 degrees 00 minutes 00 seconds East.

AND

The South 10 feet of Anita Street from the East line of East Fourth Street to a point 138.02 feet East, vacated and adjoining Blot No. 10 in "Logan Dale Heights" in the city of Waterloo, Iowa.

AND

Lot No. 9 and the South 15 feet of Lot No. 10 in Block No. 10, and Lots Nos. 10 and 11 in Block No. 11 in "Logan Dale Heights" in the city of Waterloo, Iowa

ATTACHMENT D
UNILATERAL ADMINISTRATIVE ORDER
CHAMBERLAIN MANUFATURING SITE
DOCKET NO. RCRA-07-2010-0002
DOCKET NO. CERCLA-07-2010-0005

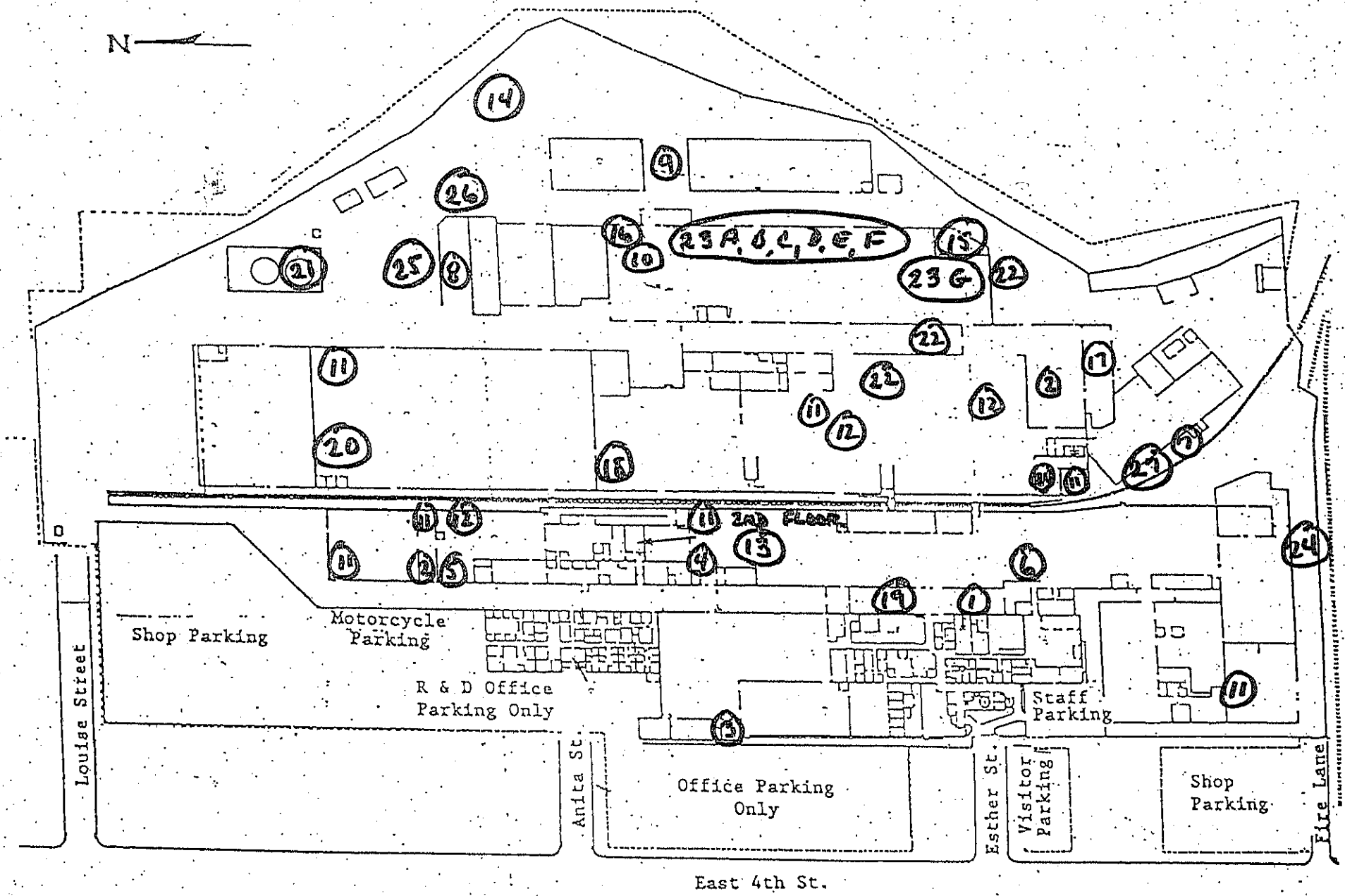
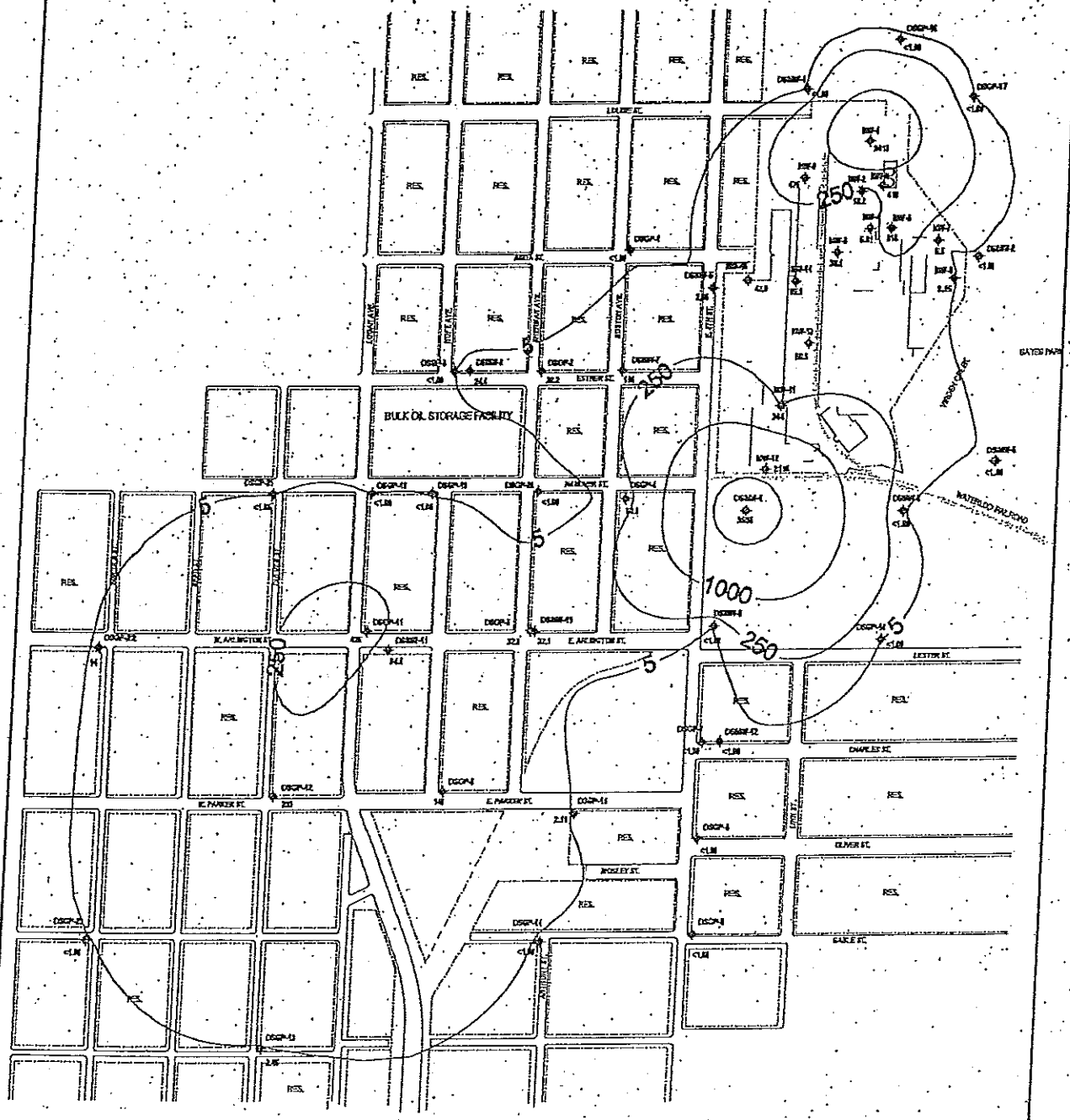

N
Louise Street
Shop Parking
Motorcycle Parking
R & D Office Parking Only
Anita St.
Office Parking Only
Esther St.
Visitor Parking
Staff Parking
Shop Parking
Fire Lane
East 4th St.
2nd FLOOR

EXHIBIT 2

ATTACHMENT E
UNILATERAL ADMINISTRATIVE ORDER
CHAMBERLAIN MANUFATURING SITE
DOCKET NO. RCRA-07-2010-0002
DOCKET NO. CERCLA-07-2010-0005



REV	DATE	BY	DESCRIPTION

Terracon
Consulting Engineers and Scientists

GROUNDWATER ASSESSMENT RESULTS

FORMER INDUSTRIAL PROPERTY
550 ESTHER STREET
WATERLOO IOWA

FIGURE 6

PROJECT MGR.	JFB
DRAWN BY:	MHF
APPVD. BY:	JFB
SCALE:	AS SHOWN
DATE:	JAN 2018
PROJECT NO.	07807019
FILE NAME:	07807019-EPA-6
SHEET NO.:	6 OF 6

IN THE MATTER OF Chamberlain Manufacturing Corporation, Respondent
Docket Nos. RCRA-07-2010-002 and CERCLA-07-2010-0005

CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing Unilateral Administrative Order was sent this day in the following manner to the addressees:

Copy hand delivered to
Attorney for Complainant:

James D. Stevens
Assistant Regional Counsel
Region VII
United States Environmental Protection Agency
901 N. 5th Street
Kansas City, Kansas 66101

Copy by Certified Mail Return Receipt to:

Michael F. Dolan
77 W. Wacker Drive
Chicago, IL 60601-1692

Dated: 4/20/10

Kathy Robinson
Hearing Clerk, Region 7