

**Documentation of Environmental Indicator Determination**  
Interim Final 2/5/99  
**RCRA Corrective Action**  
**Environmental Indicator (EI) RCRA Info code (CA725)**  
**Current Human Exposures Under Control**

**Facility Name:** Emporia Foundry, Inc.  
**Facility Address:** 620 Reese Street, Emporia, VA 23847-1423  
**Facility EPA ID #:** VAD023720105

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

- If yes - check here and continue with #2 below.  
 If no - re-evaluate existing data, or  
 If data are not available skip to #6 and enter "IN" (more information needed) status code.

**BACKGROUND**

**Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

**Definition of "Current Human Exposures Under Control" EI**

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

**Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

**Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRA Info as long as they remain true (i.e., in RCRA Info status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**"<sup>1</sup> above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

|                            | <u>Yes</u> | <u>No</u> | <u>?</u> | <u>Rationale / Key Contaminants</u> |
|----------------------------|------------|-----------|----------|-------------------------------------|
| Groundwater                | ✓          | —         | —        | <u>Metals</u>                       |
| Air (indoors) <sup>2</sup> | —          | ✓         | —        | _____                               |
| Surface Soil (<2 ft)       | ✓          | —         | —        | <u>Metals, VOC, SVOC</u>            |
| Surface Water              | —          | ✓         | —        | _____                               |
| Sediment                   | —          | ✓         | —        | _____                               |
| Subsurf. Soil (>2 ft)      | ✓          | —         | —        | <u>Metals, VOC, SVOC</u>            |
| Air (outdoors)             | —          | ✓         | —        | _____                               |

\_\_\_\_\_ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

✓\_\_\_\_\_ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

\_\_\_\_\_ If unknown (for any media) - skip to #6 and enter "IN" status code.

**Rationale and Reference(s):**

See attached page

("Unknowns" are carried through with "Yes" determinations to ascertain what information is needed or if risks are negligible.)

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**Footnotes:**

<sup>1</sup> "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

**Section 2 attachment – Rationale and References****Site Description**

Emporia Foundry Inc. (Emporia Foundry) is located in an industrial area in Emporia, Virginia. The facility consists of 20.16 acres and lies between multi-family residential areas to the North, and commercial/industrial areas to the South and East. The facility manufactures gray-iron, municipal castings by mold-casting methods for use by municipal governments and the construction industry. Manufactured castings include manhole covers, manhole cover receptacles, and drain grates.

The foundry site contains a closed hazardous waste landfill, approximately 3.13 acres; the landfill contains characteristic wastes under the RCRA. The landfill, a regulated unit, is bounded on the north and east by Little Metcalf Branch, on the south by CSX Railroad tracks, and on the west by a drainage ditch.

Between 1965 and 1975, foundry wastes consisting of cupola slag, spent casting sand, and spent steel shot were spread at the landfill. Between January 1975, and December 1981, cupola baghouse dust (a characteristic hazardous waste due to toxicity from lead and cadmium concentrations) was included with other wastes. Between January 1982, and the fall of 1982, foundry waste without cupola baghouse dust was disposed in the landfill. The facility stopped disposal of industrial wastes in the on-site landfill by December of 1982.

**Hazardous Waste Landfill**

Emporia Foundry was issued a Post-Closure Care Permit in 1994 for their closed hazardous waste landfill. The Permit included requirements for initiation of a Groundwater Compliance Monitoring Program because it was determined during detection monitoring (begun in 1985) that there had been a release of constituents from the landfill above background concentrations. However, the concentrations of detected constituents in groundwater at the closed landfill unit boundary do not exceed the GPS specified in the Permit (based on either MCLs or ACLs).

**Site-Wide Investigations**

A Phase I RFI was conducted at Emporia Foundry in March 2008 to assess potential site-wide groundwater, surface and subsurface soil, sediment, and surface water impacts from identified existing or former SWMUs. The RFI Report was submitted to the Department on July 31, 2008. Although the Department has not completed its review of the report or granted the Facility RFI approval, the results of the initial report review indicate there are some areas of groundwater contamination with inorganic constituents, primarily in the vicinity of the former (SWMU 1) and existing (SWMU 8) waste oil tanks. The concentrations of detected constituents in groundwater downgradient of each SWMU which exceeded MCLs during the RFI include arsenic, chromium, and lead. In addition, the results of the initial report review indicate that there are some areas of soil contamination with organic and inorganic constituents, primarily in the vicinity of the former waste oil tank, SWMU-1 and existing waste oil tank, SWMU-8. Out of the four (4) riparian soil samples collected barium and lead exceeded all screening levels with the exception of Industrial RBC's in RS-3 and RS-4. Verification sampling will be performed in these areas to determine the validity of the results. Based on the available information, SWMU-1 and SWMU-8 are recommended for further investigation. The attached site location map (Figure 1) provides the environmental setting for the facility and Figure 2 provides a detailed site plan for the facility.

**1. Groundwater – YES**

REFERENCE: 1) *Phase I RFI Work Plan, revised Final July 17, 2007*; 2) *Semiannual Groundwater Monitoring Report – April 2008*; 3) *Annual Groundwater Monitoring Report – January through December 2007*; 4) *Phase I RFI Report, dated July 2008*

RATIONALE: During the Phase I RCRA Facility Investigation (RFI), groundwater samples were collected at 8 Geoprobe boring or monitoring well locations. The Phase I RFI Report, dated July 2008 (RFI Report), was submitted to the Department of Environmental Quality (the Department) on July 31, 2008. Although the Department has not completed its review of the report or granted the facility RFI approval, the results of the initial report review indicate there are some areas of groundwater contamination with inorganic constituents, primarily in the vicinity of the former waste oil tank, Solid Waste Management Unit (SWMU) -1 and the existing waste oil tank, SWMU-8. The constituents with concentrations exceeding Maximum Contaminant Levels (MCLs) or Risk-based Concentrations (RBCs) during the RFI are lead, arsenic, and chromium for SMWU-1; and lead and chromium for SWMU-8. These areas are recommended for

**Section 2 attachment – Rationale and References**

further investigation.

**2. Air (indoors) – NO**

REFERENCE: 1) *Phase I RFI Work Plan, revised Final July 17, 2007*; 2) *Semiannual Groundwater Monitoring Report – April 2008*; 3) *Annual Groundwater Monitoring Report – January through December 2007*; 4) *Phase I RFI Report, dated July 2008*

RATIONALE: During the RFI, SWMU-1 and SWMU-8 had constituents in both soil and groundwater with concentrations exceeding the screening criteria set forth in the Phase I RFI Work Plan (RFI Work Plan). SWMU-1 is the site of a former waste oil tank (non-hazardous) and SWMU-8 is the location of the existing waste oil tanks (non-hazardous) and it is strongly believed that the elevated concentrations in the soil and groundwater are a direct result from the historic operations at these units. It does not appear that the activities in these areas had any type of significant impact on the air (indoors). In addition, the workers in the work environments are protected under the OSHA standards. Based on this information there is no evidence of air (indoors) to be "**contaminated**" above appropriately protective risk-based "levels" from releases subject to RCRA Corrective Action.

**3. Surface Soil – YES**

REFERENCE: 1) *Phase I RFI Work Plan, revised Final July 17, 2007*; 2) *Phase I RFI Report, dated July 2008*

RATIONALE: During the RFI five (5) soil sample locations were advanced to a minimum depth of four (4) feet below the ground surface (bgs) at the upgradient locations; UG-1, UG-2, UG-3, UG-4, and UG-5, and at SWMU-1, SWMU-2, SWMU-4, SWMU-7, and SWMU-8. Soil was continuously sampled to four (4) feet at six (6) inch intervals at each of the five (5) locations. Photoionization Detector's (PID) readings dictated whether additional soil sampling was required below four (4) feet. Results of the sampling were screened against a background screen, health-based screen, and migration-based screen.

Although the Department has not completed its review of the RFI Report, or granted the facility RFI approval, the results of the initial report review indicate that there are some areas of soil contamination with organic and inorganic constituents, primarily in the vicinity of the former waste oil tank, SWMU-1 and existing waste oil tank, SWMU-8. Out of the four (4) riparian soil samples collected barium and lead exceeded all screening levels with the exception of Industrial RBC's in RS-3 and RS-4. Verification sampling will be performed in these areas to determine the validity of the results. Based on the available information SWMU-1 and SWMU-8 are recommended for further investigation.

**4. Surface Water – NO**

REFERENCE: 1) *Phase I RFI Work Plan, revised Final July 17, 2007*; 2) *Semiannual Groundwater Monitoring Report – April 2008*; 3) *Annual Groundwater Monitoring Report – January through December 2007*; 4) *Phase I RFI Report, dated July 2008*

RATIONALE: The Little Metcalf Branch (LMB) receives shallow groundwater and storm water from the site. The storm water flows intermittently north-northeast between the manufacturing facility and the closed landfill toward LMB. The facility has a General Storm Water Discharge Permit which requires monitoring of five outfalls. Total suspended solids, aluminum, copper, iron, and zinc consistently exceeded their respective monitoring limits. Because of this the facility upgraded its storm water system by adding riprap with filter fabric at the storm water outfalls, constructing a storm water retention basin and adding diversion berms. Only aluminum has exceeded the monitoring limits since.

Additional surface water samples were collected from LMB during the RFI and were compared to the site-specific background concentrations and Ambient Water Quality Criteria (AWQC) for ingestion of water and organisms. According to the RFI Report, all the surface water samples collected were below their respective published AWQC. During the RFI, surface water sampling at the five (5) outfalls on site could not be performed due to various reasons, however based on the current information there is no evidence of surface water to be "**contaminated**" above appropriately protective risk-based "levels" from releases subject to RCRA Corrective Action. In addition, LMB is in the Meherrin River Basin, which is in the Chowan River and Dismal Swamp Basins. LMB is not a stream listed on the 305(b)/303(d) List of Impaired (Category 5) Waters in 2008.

**Section 2 attachment – Rationale and References**

**5. Sediment – NO**

REFERENCE: 1) *Phase I RFI Work Plan, revised Final July 17, 2007*; 4) *Phase I RFI Report, dated July 2008*

RATIONALE: Sediment samples were collected from LMB and were compared to the Ecological Risk Assessment Bulletins (ERAB), site-specific background concentrations, and USGS naturally occurring metal ranges for the eastern US. According to the RFI Report, all the sediment samples collected were below their respective USGS naturally occurring metals ranges. Based on these results there is no evidence of sediment to be "contaminated" above appropriately protective risk-based "levels" from releases subject to RCRA Corrective Action. In addition, LMB is in the Meherrin River Basin, which is in the Chowan River and Dismal Swamp Basins. LMB is not a stream listed on the 305(b)/303(d) List of Impaired (Category5) Waters in 2008.

**6. Subsurface Soil – YES**

REFERENCE: 1) *Phase I RFI Work Plan, revised Final July 17, 2007*; 2) *Semiannual Groundwater Monitoring Report – April 2008*; 3) *Annual Groundwater Monitoring Report – January through December 2007*; 4) *Phase I RFI Report, dated July 2008*

RATIONALE: During the RFI five (5) soil sample locations were advanced to a minimum depth of four (4) feet below the ground surface (bgs) at the upgradient locations; UG-1, UG-2, UG-3, UG-4, and UG-5, and at SWMU-1, SWMU-2, SWMU-4, SWMU-7, and SWMU-8. Soil was continuously sampled to four (4) feet at six (6) inch intervals at each of the five (5) locations. PID readings dictated whether additional soil sampling was required below four (4) feet. Results of the sampling were screened against a background screen, health-based screen, and migration-based screen.

Although the Department has not completed its review of the RFI Report or granted the facility RFI approval, the results of the initial report review indicate that there are some areas of soil contamination with inorganic and organic constituents, primarily in the vicinity of the former waste oil tank, SWMU-1 and existing waste oil tank, SWMU-8. Out of the four (4) riparian soil samples collected barium and lead exceeded all screening levels with the exception of Industrial RBC's in RS-3 and RS-4. Verification sampling will be performed in these areas to determine the validity of the results. Based on the available information SWMU-1 and SWMU-8 are recommended for further investigation.

**7. Air (outdoors) – NO**

REFERENCE: 1) *Phase I RFI Work Plan, revised Final July 17, 2007*; 2) *Semiannual Groundwater Monitoring Report – April 2008*; 3) *Annual Groundwater Monitoring Report – January through December 2007*

RATIONALE: The facility operates its baghouses under an air permit issued by the Department. According to the facility the operating conditions of the permit have never been exceeded since the issuance of the permit in June 1987. During the RFI, SWMU-1 and SWMU-8 had constituents in both soil and groundwater with concentrations exceeding the screening criteria set forth in the RFI Work Plan. SWMU-1 is the site of a former waste oil tank (non-hazardous) and SWMU-8 is the location of the existing waste oil tanks (non-hazardous) and it is strongly believed that the elevated concentrations in the soil and groundwater are a direct result from the historic operations at these units. It does not appear that the activities in these areas had any type of significant impact on the air (outdoors). In addition, there is an active permit regulating air emissions and the workers in the work environments are protected under the OSHA standards. Based on this information there is no evidence of air (outdoors) to be "contaminated" above appropriately protective risk-based "levels" from releases subject to RCRA Corrective Action.

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3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

**Summary Exposure Pathway Evaluation Table**

Potential **Human Receptors** (Under Current Conditions)

| <b><u>Contaminated Media</u></b> | Residents | Workers    | Day-Care  | Construction | Trespassers | Recreation | Food <sup>3</sup> |
|----------------------------------|-----------|------------|-----------|--------------|-------------|------------|-------------------|
| Groundwater                      | <u>NO</u> | <u>NO</u>  | <u>NO</u> | <u>YES</u>   | <u>NO</u>   | <u>NO</u>  | <u>NO</u>         |
| Air (indoors)                    | ---       | ---        | ---       | ---          | ---         | ---        | ---               |
| Soil (surface, e.g., <2 ft)      | <u>NO</u> | <u>YES</u> | <u>NO</u> | <u>YES</u>   | <u>NO</u>   | <u>NO</u>  | <u>NO</u>         |
| Surface Water                    | ---       | ---        | ---       | ---          | ---         | ---        | ---               |
| Sediment                         | ---       | ---        | ---       | ---          | ---         | ---        | ---               |
| Soil (subsurface e.g., >2 ft)    | <u>NO</u> | <u>NO</u>  | <u>NO</u> | <u>YES</u>   | <u>NO</u>   | <u>NO</u>  | <u>NO</u>         |
| Air (outdoors)                   | ---       | ---        | ---       | ---          | ---         | ---        | ---               |

Instructions for **Summary Exposure Pathway Evaluation Table**:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.
2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("\_\_\_"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- \_\_\_\_\_ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- ✓\_\_\_\_\_ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.
- \_\_\_\_\_ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

**Rationale and Reference(s):**

- Groundwater - see attached page, Item #1
- Soil (surface) - see attached page, Item #2
- Soil (subsurface) - see attached page, Item #3

<sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

**Section 3 attachment – Rationale and References**

**1. Groundwater**

REFERENCE: All available information within the Department files.

Residents

NO – There is no information indicating the presence of residents on the facility.

Workers

NO – The workers at the facility will not potentially be exposed to subsurface since workers do not get involved in excavation activities.

Day-Care

NO – There is no information indicating the presence of a day-care on the facility.

Construction

YES – The workers at the facility may potentially be exposed to groundwater if construction activities require them to excavate down to the groundwater table (approximately 10-15 bgs). Construction activities would be covered by the facility's health and safety plan. Currently, there are no planned construction activities at the facility therefore exposure to groundwater is considered to be under control.

Trespassers

NO – The facility is located in an industrial area with a fence surrounding the property thereby restricting access to trespassers.

Recreation

NO – There is no information indicating that any portion of the facility is for recreational use.

Food

NO – There is no information indicating that food is grown within the facility's boundary.

**2. Soil (surface)**

REFERENCE: All available information within the Department files.

Workers/Construction

YES – The workers at the facility may potentially be exposed to surface soils that may be high in contaminant concentrations and fugitive dust arising from the surface soils in the vicinity of SWMU-1 and SWMU-8. Construction activities would be covered by the facility's health and safety plan. Currently, there are no planned construction activities at the facility therefore exposure to groundwater is considered to be under control.

**3. Soil (subsurface)**

REFERENCE: All available information within the Department files.

RATIONALE:

Construction

YES – The workers at the facility may potentially be exposed to subsurface soils if construction activities require them to excavate down to the subsurface soils in the vicinity of SWMU-1 and SWMU-8. Construction activities would be covered by the facility's health and safety plan. Currently, there are no planned construction activities at the facility therefore exposure to subsurface soils is considered to be under control.







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6. Check the appropriate RCRA Info status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Emporia Foundry, Inc. facility, EPA ID # VAD023720105, located Emporia, Virginia, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

NO - "Current Human Exposures" are NOT "Under Control."

IN - More information is needed to make a determination.

Completed by Matthew M. Stepien Date 9-9-08  
(print) Matthew M. Stepien  
(title) Environmental Engineer Sr.

Supervisor Leslie A. Romanchik Date 9/11/08  
(print) Leslie A. Romanchik  
(title) Director, Office of Hazardous Waste  
(EPA Region or State) VA DEQ

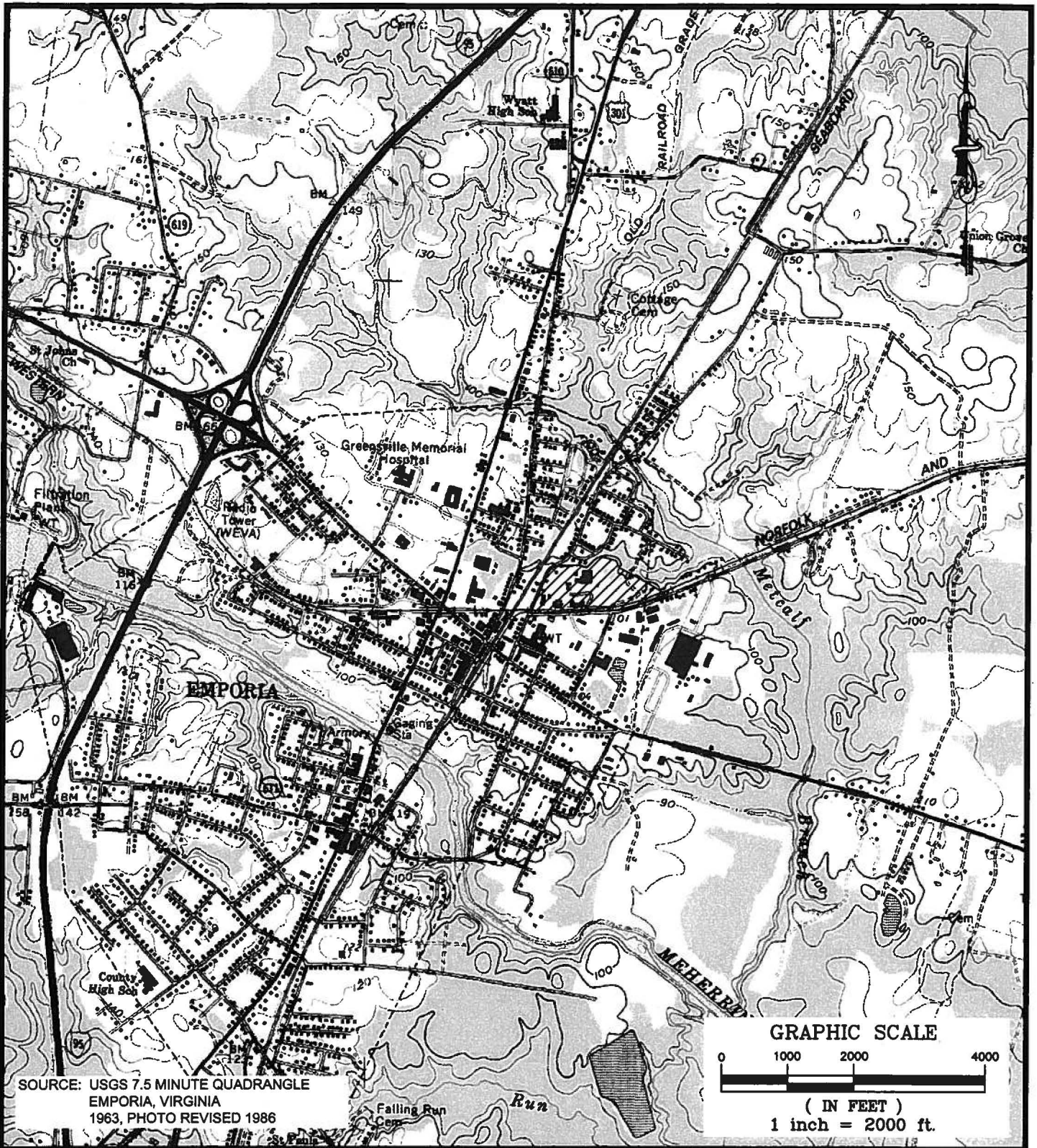
Locations where References may be found:

VA Department of Environmental Quality, Office of Hazardous Waste  
\_\_\_\_\_  
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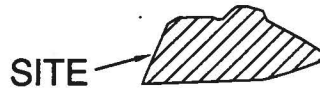
Contact telephone and e-mail numbers:

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**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**



GENERAL SITE LOCATION MAP, PHASE 1 RFI WORK PLAN  
 EMPORIA FOUNDRY, INC.  
 EMPORIA, VIRGINIA



SCALE: 1" = 2000'  
 PLAN NO. R02263-05J



**Draper Aden Associates**

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 Hampton Roads, VA

DESIGNED  
 DRAWN  
 CHECKED  
 DATE

SGW  
 DCJ  
 JWP  
 7/30/08

FIGURE

1