

Example: Corrective Action Framework for a New RFI

Corrective Action Framework

Facility Name
Address
City, State
EPA ID: XXXXXXXX

The CAF is a tool intended to summarize the goals and expectations of the U.S.EPA and the facility that will facilitate performance of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the captioned site. The CAF is not a legally binding document and is not a substitute for a permit or order. The CAF is not expected to address every technical or administrative aspect or detail of the RFI. Rather, the CAF summarizes the discussions that took place during the CAF meeting conducted at the facility on August 7, 2014. It is noted that the CAF is a “living document” and is subject to change in light of new information or data.

I. CAF Meeting Participants

The CAF meeting was attended by:

- *[participant names have been removed from this example]*

II. Site Characterization

a. Overview of facility/surrounding properties

The facility is a secondary iron casting foundry situated on approximately 10 acres of land in Lincoln, Nebraska. The site has been in operation as a foundry since 1964. The facility is surrounded primarily by commercial/industrial properties to the north, east, southeast, south, and southwest and open fields or agricultural property to the northeast, west, and northwest with industrial property beyond. Adjacent to the western boundary of the site is a soccer field. This soccer field is on property owned by the neighboring industrial facility and is used infrequently (i.e., less than two months of the year) as a practice field for a local team. The field is not open to the public for general recreational use. A site layout is included as Figure 1.

b. Environmental characteristics

Key environmental characteristics of the facility and surrounding properties that are relevant to the RFI and evaluation of exposure pathways were identified in an investigation report. No drinking water wells are present on the facility property. Additionally, no drinking water wells were identified within a 1-mile radius of the facility. Public water supply wells for the City of Lincoln are located along the Platte River near Ashland, Nebraska,

approximately 15 miles to the northeast of the city. Groundwater flow beneath the facility is generally from south to north/northwest at a depth of more than 25 feet.

c. Areas of Concern (AOCs)/Solid Waste Management Units (SWMUs)

A summary of AOCs and SWMUs identified in the 2002 Draft RCRA Facility Assessment (RFA) is presented as Table 1.

d. Previous releases

A site investigation conducted in 2011 by the consultant (on behalf of U.S. EPA Region 7) evaluated SWMUs and AOCs identified in the Draft RFA. The intent of the investigation was to determine whether historical or current facility practices have resulted in environmental contamination. The results of this investigation are detailed in a sampling investigation report. The report recommended the following:

- Supplemental surface soil sampling beyond the western boundary of the site (analysis for volatile organic compounds (VOCs) and metals);
- Supplemental sampling to define the lateral and vertical extents of groundwater impact at the facility (analysis for VOCs and metals);
- Establishment of a monitoring well network to evaluate the extent of groundwater impact;
- Based on the presence of VOCs in groundwater, an evaluation to determine the potential for vapor intrusion;
- Establishment of long-term preventive measures to protect the health and safety of visitors, facility workers, drillers, and construction workers in areas where elevated concentrations of metals are documented and to ensure the ongoing integrity of the surface cover if it is employed as a means to prevent exposure to identified areas of contamination.

The report also included some recommendations related to the Stormwater Management Plan for the site, but it was agreed during the CAF meeting that the facility would address potential stormwater related issues with the Nebraska Department of Environmental Quality (NDEQ) under the existing permit and not as part of the RFI.

e. RCRA regulatory history

A summary of the RCRA regulatory history was presented in a sampling investigation report. A brief overview of the facility's regulatory history is as follows:

Year	Regulatory History Milestone
June 1987	Nebraska Department of Environmental Control (NDEC) conducted an inspection of the facility and noted water and fines were discharged from the cupola furnace scrubber to an unlined, on-site surface impoundment.
February 1991–April 1991	A former employee complained to the Lincoln-Lancaster County Health Department of a valve leak on a toluene tank. The facility indicated it had replaced the leaking valve.
June 1991	NDEC conducted a RCRA compliance inspection and issued a Letter of Warning indicating the facility had failed to determine if a solid waste was a hazardous waste.
October 1991	The facility submitted waste determination information for most waste streams.
November 1991	NDEC issued a Letter of Warning identifying a hazardous waste release, and requiring a Step 6 site assessment, a closure plan for the surface impoundment, and financial assurance information.
December 1991	A Step 6 groundwater investigation of the facility was completed under Nebraska Title 118.
February 1992	EPA issued a 3008(a) Complaint, Compliance Order, and Notice of Opportunity for Hearing with financial penalty for failing to make hazardous waste determinations, disposing of hazardous waste onsite without notification, failing to have a closure plan, failing to implement a groundwater monitoring program, failing to obtain financial assurance, and operating a hazardous waste land disposal facility without a permit.
November 1992	The facility submitted a Step 7 Groundwater Investigation Report to Nebraska Department of Environmental Quality (NDEQ) (formerly NDEC).
June 1993	EPA conducted a RCRA compliance inspection and issued a Notice of Violation.
September 1994 –August 1995	NDEQ conducted a Comprehensive Groundwater Monitoring Evaluation of the facility, and issued a Letter of Warning specifying issues relating to the monitoring wells on the property.
July 1995–August 1995	The facility submitted the Final Closure Plan for the RCRA surface impoundment. NDEQ approved the plan and a modification.
April 1996	NDEQ conducted a RCRA compliance inspection and issued a Notice of Violation regarding failure to keep groundwater monitoring wells secured, failure to mark the manifest document number on the land disposal restriction notification, and failure to maintain a copy of a manifest that had been signed by the receiving facility.
May 1996	The facility submitted the Final Closure Report and closure certification for the RCRA surface impoundment.
August 1996	The facility submitted a request to NDEQ to discontinue groundwater detection monitoring and abandon groundwater monitoring wells associated with surface impoundment closure.
December 1996	NDEQ issued a Notice of Violation regarding improper facility surface impoundment closure activities.

Year	Regulatory History Milestone
June 1997	NDEQ issued a Consent Decree with financial penalty for issues regarding hazardous waste treatment. NDEQ acknowledged receipt of closure certification for the surface impoundment but required an EPA RCRA Facility Assessment (RFA) prior to formal termination of interim status. NDEQ authorized termination of the Irrevocable Standby Letter of Credit for the facility. NDEQ reviewed and approved the RCRA Closure Report for the surface impoundment. NDEQ authorized abandonment of the surface impoundment detection monitoring wells. NDEQ approved the waste pile characterization Sampling Plan and requested a closure/contingent post-closure plan for the foundry sand waste piles.
August 1997	EPA conducted a Preliminary Assessment, Preliminary Review, and Visual Site Inspection of the facility.
September 1997	EPA directed Olsson Environmental Services to collect two samples of surficial sediment upgradient of two stormwater outfalls (outfalls #1 and #3).
December 1997	EPA requested additional information from the facility to complete the final RFA report. The facility's consultant responded. EPA representatives conducted a Compliance Evaluation Inspection at the facility and documented no RCRA violations.
September 1999	NDEQ requested a closure plan for all areas where hazardous wastes had been stored for greater than 90 days.
June 2000	NDEQ granted the facility approval to proceed with implementation of closure activities.
October 2000	NDEQ acknowledged receipt of closure certification for the hazardous waste storage areas and determined the site clean closed. NDEQ released the facility from the requirements of 40 Code of Federal Regulations (CFR) 264.142, 264.143, and 264.147 in accordance with 40 CFR 264.143(h) and 264.147(e).

f. Other permitted activities

The site currently operates under a Class II Synthetic Minor Air Operating Permit and a general NPDES stormwater permit. As agreed during the CAF meeting, stormwater-related issues will not be addressed as part of the RFI, but will be managed, as necessary, by NDEQ under the general stormwater permit.

g. Access or physical constraints

Site access may be obtained through coordination with the facility manager. Work within the facility building will be limited to third shift and the presence of equipment and infrastructure may limit accessibility to some areas. Based on initial review of proposed sampling locations, these access limitations do not appear to pose a significant obstacle to site characterization.

h. Other potential areas of investigation based on facility history

None.

i. Other

There does not appear to be any other information, reports, or agreements (e.g., CERCLA or state cleanup actions) related to the characteristics and history of the site that are not covered under the above headings. This section may be amended in the future if additional information, reports, or agreements become available.

III. Conceptual Site Model (CSM)

A graphical CSM is presented as Figures 2 and 3. These figures compile relevant site characteristics and will be subject to further development as additional data is available. The CSM illustrates the following:

- Site stratigraphy and general hydrogeology:
 - Variable thickness of fill material consisting of silty clay and some residual foundry materials (e.g., slag, foundry sand, scrap iron, etc.)
 - Silty clay underlying the fill to a depth of approximately 15 feet below grade
 - Sand and silty sand underlying the silty clay unit to a depth of approximately 60 feet below grade. Groundwater occurs within this sand and silty sand unit under unconfined conditions. Groundwater flow direction is estimated to be to the northwest
 - Silty clay underlying the sand and silty sand aquifer
- Current and future site land use (Industrial)
- Current and future surrounding property land use (industrial and limited recreational)
- Areas of materials handling

a. Sources and extent of known contamination

The known extent of soil and groundwater impact was summarized in the sampling investigation report and is presented graphically in Figure 4.

SWMUs and AOCs are summarized in Table 1. In previous documents, the presence of VOCs in groundwater was attributed to SWMU 14 (small scale parts washing operation). Sufficient data is not currently available to conclusively link the groundwater impacts to SWMU 14. Therefore, it was agreed during the CAF meeting to handle site groundwater as a separate AOC (AOC 2). The separation from SWMU 14 can be revisited in the future if site data identifies a connection.

b. Contamination transport/migration pathways

Migration pathways identified during the CAF meeting included:

- Migration to groundwater (soil leaching)
- Groundwater flow
- Potential vapor intrusion (it was agreed during the CAF that the necessity for evaluating potential vapor intrusion will be addressed based on the results of groundwater investigation to be conducted during the RFI)

c. Tentative exposure pathways

i. *Exposure Receptors*

Tentative exposure receptors agreed to during the CAF meeting included:

- On site: Industrial site workers
- Off site: Industrial site workers and limited recreational receptors
- It was agreed during the CAF Meeting that on-site and off-site ecological receptors were not currently a concern.

ii. *Exposure point and exposure medium*

Tentative exposure point agreed to during the CAF meeting included:

- Soil direct contact

iii. *Exposure routes*

Tentative exposure routes agreed to during the CAF meeting included:

- Dermal contact
- Inhalation of fugitive dust
- Accidental ingestion

It is noted that institutional or engineering controls may be employed to prevent exposure by any of these potential exposure routes.

d. Discussion of unknowns and uncertainty

The delineation of constituents of potential concern (COPCs) is currently ongoing, so Section 3 of the CAF may be amended. Phase 2 of the RFI will delineate the horizontal and vertical extent of COPCs on site. Phase 3 will delineate the horizontal and vertical extent of COPCs offsite and fill data gaps from the Phase 2 investigation.

IV. RFI Workplan

a. Scope and objectives of the investigation

Scope and objectives of the investigation include characterization of the nature and extent of COPCs to fill CSM data gaps. Characterization will include horizontal and vertical delineation of COPC-impacted soil and groundwater.

No vapor intrusion investigation of VOCs is currently planned, but may be re-visited based on results of future investigations

b. Screening levels

Site investigations will include sampling sufficient to define the vertical and horizontal extent of COPC-impacted soil and groundwater to EPA Regional Screening Levels (RSLs). COPC impacts will be delineated to residential land use criteria, but any corrective actions will consider actual land use (i.e., industrial, on site) and may incorporate institutional/engineering controls.

c. Adaptive approach

Site characterization will include the following three phase approach:

- i. Phase 1 – Tetra Tech 2011 investigation
- ii. Phase 2 – On-site investigation with limited investigation immediately adjacent to west. Proposed sampling locations are depicted on Figure 4 (A through K) with a sampling rationale included in Table 2. In general, the sampling rationale includes the following:
 - Horizontal and vertical delineation of metals above RSLs
 - Screening data for VOCs in groundwater
 - Sampling at specific SWMUs
- iii. Phase 3 – Off-site investigation and on-site data gap filling to be defined by results of Phase 1 and 2
 - Installation and sampling of permanent monitoring wells

d. Quality Assurance Project Plan (QAPP)

i. *Data Quality Objectives (DQO)*

EPA guidance documents describing data quality objectives will assist in understanding the basic structure of EPA's Quality System. DQO will be included in the QAPP accompanying the RFI workplan.

ii. *Standard Operating Procedures*

Any Standard Operating Procedures to be used will be included with the RFI workplan for review and comment.

e. Modeling

It is not anticipated that any modeling will be required. However, if the facility chooses to use modeling, the type of modeling, assumptions used, and the proposed use of the output will be discussed with the EPA prior to conducting the modeling.

f. Sampling approach/design

Site characterization for COPCs will include the following sample approach:

i. *Soil Characterization for metals to include sampling of:*

- Fill—not aggregate (if present)
- First native soil (upper 0.5 feet)
- Subsurface soil (highest photoionization detector reading or directly above capillary fringe, if all PID readings are zero)

g. Sampling analysis

Site characterization will include analysis for the following COPCs:

- Soil: Pb, Cd, As, VOCs (specifically chlorinated solvents)
- Groundwater: Pb, Cd, As, VOCs (specifically chlorinated solvents)
- Grab groundwater samples will include both filtered and unfiltered metals to evaluate potential contribution from suspended solids in the samples.

h. Use of historical data

As agreed during the CAF meeting, existing data from the “Sampling Investigation Report” is of sufficient quality to be used as part of the site characterization.

i. Background

No background study of arsenic is expected. Arsenic remains a COPC and will be evaluated against other site sampling and literature values for background.

j. Health and Safety Plan

During the CAF meeting, no special circumstances pertaining to the Health and Safety Plan that could affect the investigation were observed, other than the overhead power lines. Any other hazards or special circumstances, such as high hazard processes within the facility, will be discussed in the Health and Safety Plan accompanying the RFI workplan.

k. Community involvement and environmental justice

Community involvement is expected to be limited and will be addressed at the time of the Statement of Basis. This issue may be re-visited if conditions change or there is significant public inquiry.

l. Workplan

Schedule

- CAF due September 22, 2014 (45 days after the CAF meeting on August 7, 2014)
- EPA response 15 days from receipt of CAF
- RFI Phase 2 workplan due December 1, 2014 (115 days after the CAF meeting on August 7, 2014)
 - RFI workplan will include a schedule based on EPA approval

Implementation

- RFI Report Process:
 - RFI Phase 2 with data package reporting results
 - Agree to scope for Phase 3 investigation
 - Brief addendum to RFI workplan
 - RFI Phase 3 with data package reporting results
 - Agree to proceed to RFI
- RFI to include:
 - Characterization of nature and extent of soil and groundwater
 - Interim action results (if applicable)
 - Use default EPA threshold requirements and balancing criteria to provide sufficient detail regarding corrective measures strategy to justify proposed remedy
 - Other materials necessary to proceed to statement of basis
 - CMS only if needed to address more complex remedial issues (i.e., on-site chlorinated solvent source)

V. Interim Measures

- a. Identified Interim Measures
No interim measures are identified at this time, but may be implemented with EPA consent if deemed necessary.
- b. Future Potential Interim Measures
Any future potential interim measures will be discussed with EPA based on the data collected during the Phase 2 and 3 of the RFI.

VI. Goals and Expectations

Prior to and during the CAF meeting, the U.S. EPA Region 7 and the facility identified the following goals and expectations.

- a. Land use/reasonably-expected future use in relation to characterization and remediation
Future land use expected to be limited to Industrial.
- b. Existing background conditions and consideration in RFI process background
No background study of arsenic is expected. Arsenic remains a COPC and will be evaluated against other site sampling and literature values for background.
- c. Use of historical data

Existing data from the “Sampling Investigation Report” was agreed during the CAF meeting to be of sufficient quality for use as part of site characterization.

d. Groundwater use/process for addressing groundwater contamination, including state, federal, and local requirements

No drinking water wells are present on the facility property. Additionally, no drinking water wells were identified within a 1-mile radius of the facility. The RFI and any corrective measures will consider actual and potential future groundwater use in the area including, but not limited to, off-site sources of contamination and local use restrictions.

e. Coordination with other programs

Stormwater will be managed on a separate track with the state and not as part of the RFI.

f. Risk range issues (target cancer risk and non-cancer hazard index)

Based on the CAF meeting, off-site sample screening will be based on a target cancer risk of 10^{-6} and a non-cancer hazard index of 1.0. On-site sample screening will be based on a target cancer risk between 10^{-4} and 10^{-5} .

g. Expected process for addressing remediation

- Unknown sources (if source cannot be found) may potentially exist for observed chlorinated solvents and may not be related to the site. RFI will include investigation to sufficiently characterize residual chlorinated solvents to determine presence or absence of an on-site source.
- Source removal versus source control will depend on locations of impacts
 - On-site COPCs in soil will likely involve source control (metals)
 - Off-site COPCs in soil will likely involve source removal (metals)
 - Insufficient data to make determination regarding chlorinated solvents
- Pathway elimination approach is likely to be employed to address on-site metals impacts.
- Use of institutional and/or engineering controls is expected to prevent exposure. Institutional controls may include soil management plan—plan only applies to areas above industrial criteria.