

**U.S. ENVIRONMENTAL PROTECTION AGENCY – REGION I**

**CAI, INC. REMOVAL ACTION  
DANVERS, MA**



**AMBIENT AIR SAMPLING AND MONITORING PLAN**

**DECEMBER 5, 2006**

Version 1.0



U.S. Environmental Protection Agency – Region I

CAI, Inc Site Removal Action  
Danvers, MA  
Ambient Air Sampling and Monitoring Plan

SIGNATURE PAGE

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## **1.0 INTRODUCTION**

The United States Environmental Protection Agency, Region I (EPA), at the request of the United States Coast Guard (USCG), Massachusetts Department of Environmental Protection (DEP) and the Town of Danvers (the Town), has commenced a removal action at the site of CAI, Inc (the Site). EPA responded to an explosion and ensuing fire at the Site on November 22, 2006, to provide support to State and local responders. While the cause of the explosion is still to be determined, potential contaminants at the Site have been identified as Toluene, 1-propyl alcohol, ethyl alcohol, isopropyl alcohol, nitrocellulose and polyamide resin. Samples collected during the emergency response phase indicated 2-butanone (MEK), toluene and acetone in some water samples and volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) in air and water samples.

## **2.0 OBJECTIVE**

Hazardous substances present at the Site present a threat of contamination to the air, water and soil. The purpose of this report is to provide the air sampling and monitoring plan as EPA activities transition from the emergency response phase to the time-critical removal action phase. Air sampling and monitoring activities conducted during the emergency response phase and reviewed by the Agency for Toxic Substances and Disease Register (ATSDR) and the Massachusetts Department of Public Health (MDPH) did not identify levels of contaminants which would present a public health threat to residents living close to the Site.

The scope of the air sampling and monitoring plan provided herein is to support removal activities conducted within the exclusion zone at the Site, which is considered to be the area of the explosion and fire at the CAI, Inc and Arnel Co properties. The Site has been defined in the EPA Removal Action Memorandum, dated November 29, 2006, as including the property where the CAI, Inc and Arnel Company were located, as well as all surrounding areas impacted by the explosion and fire. Removal activities are anticipated to include the removal of drums, debris and contaminated soils within the exclusion zone.



### **3.0 FIELD OPERATIONS**

#### **3.1 SITE SCHEDULE**

Removal activities are anticipated to commence on December 4, 2006. Air sampling and monitoring support at the Site is expected to continue for approximately thirty days.

#### **3.2 HEALTH AND SAFETY**

All sampling and monitoring activities will be carried out in accordance with the EPA CAI, Inc Site-specific health and safety plan.

#### **3.3 DOCUMENTATION**

In addition to standard operating procedures for sample documentation, the following information must be recorded to ensure accurate assessment of sampling and monitoring data:

- Continuous monitoring of wind speed and direction
- Potential interferences to instrument readings, including mobile sources from automobiles and construction vehicles, humidity, etc.
- Any potential equipment functional issues

#### **3.4 AIR SAMPLING**

Air sampling will be performed at the Site to monitor potential off-site migration of contaminants throughout the removal action. Air sampling involves the collection of ambient air for analysis at a lab which can identify and quantify specific contaminants. EPA will continue to sample ambient air at several locations for analysis of the following contaminants:

##### **3.4.1 VOLATILE ORGANIC COMPOUNDS**

Air sampling for analysis of VOC's will be conducted using six-liter Summa passivated stainless steel canisters. Three samples will be collected along the perimeter of the exclusion zone and five samples will be collected within residential areas located near the exclusion zone. Samples will be collected at a flow rate of approximately 9 ml/min for a period of 8 hours. The sampling schedule will be based upon the specific operations occurring within the exclusion zone. Sampling will be conducted on days when activities within the exclusion have the potential to impact public health.



Instantaneous (grab) sampling using the 400ml Summa canisters will be conducted only as necessary when perimeter monitoring exceeds the action levels determined for the Site or at the discretion of the Environmental Unit Leader (EUL). (see section 3.7.2.)

#### **3.4.2 AMINES (aromatic and aliphatic)**

Samples were taken on November 30, 2006 for analysis of amines, both aromatic and aliphatic. Samples were taken using the GilAir 5 air sampling pump with 150mg/75 mg silica tubes. No additional sampling is anticipated but will be conducted if necessary based on the results of the analysis.

#### **3.4.3 KETONES (I and II)**

Samples were taken on November 30, 2006 for analysis of Ketones, both I and II. Samples were taken using the GilAir 5 air sampling pump with 100mg/50 mg coconut shell charcoal tubes. No additional sampling is anticipated but will be conducted if necessary based on the results of the analysis.

#### **3.4.4 FORMALDEHYDE**

Samples were taken on November 30, 2006 for analysis of formaldehyde. Samples were taken using the GilAir 5 air sampling pump with cartridge containing silica gel with 2,4-dinitrophenylhydrazine. No additional sampling is anticipated but will be conducted if necessary based on the results of the analysis.

#### **3.4.5 ASBESTOS**

Air sampling for analysis of asbestos will be conducted during the week of December 4, 2006. The samples will be collected using the GilAir 5 air sampling pump and a filter cartridge.

#### **3.4.6 PARTICULATES**

Air sampling for analysis of particulates will be conducted as necessary and at the discretion of the EUL to monitor potential off-site migration during operations within the exclusion zone.



### **3.5 AIR SAMPLING LOCATIONS**

Sample locations are determined based on residential density and proximity to the exclusion zone. Air sample locations are as follows but may change based on analytical results:

- Summa 1 – Northeast perimeter of the exclusion zone
- Summa 2 – Northwest perimeter of the exclusion zone
- Summa 3 – Southwest perimeter of the exclusion zone
- Summa 4 – Water Street Northwest of the exclusion zone
- Summa 5 – Water Street West of the exclusion zone
- Summa 6 – Bates Street Northeast of the exclusion zone
- Summa 7 – Riverside Street North of the exclusion zone
- Summa 8 – Marina property Southeast of the exclusion zone

### **3.6 AIR SAMPLE ANALYSIS**

Summa canisters will be analyzed for VOC's at the EPA New England Regional Lab (NERL) located in Chelmsford, MA. Analysis will be done using Gas Chromatography/Mass Spectrometry (GC/MS) and is anticipated to take approximately two days from the date of receipt at the lab. Asbestos samples will be analyzed at a non-EPA lab and will be determined when samples are ready to be collected. EPA will contract services at a lab certified for asbestos analysis.

Results of each sampling event will be submitted to the EUL, the Incident Commander, ATSDR and MDPH for further analysis and in support of Site operations.

### **3.7 AIR MONITORING PLAN**

Air monitoring will be conducted continuously as operations persist within the exclusion zone in order to assess and mitigate threats to public health or the environment due to potential off-site migration of contaminants. Air monitoring instruments draw in ambient air to determine the presence of a non-specific contaminant and its concentration. If an air monitoring device records the presence of a contaminant which exceeds the perimeter action levels identified for the Site, procedures will be taken for further assessment and potential sampling for specific contaminant identification. Air monitoring procedures will be conducted as follows:



### 3.7.1 EXCLUSION ZONE

An AreaRAE will be deployed in the area of the exclusion zone where responders will be conducting removal activities. The AreaRAE is a wireless multi-gas monitor which delivers real-time readings on a continuous basis to a computer located on the Site. A hand-held PID and combustible gas indicator (CGI) will also be utilized during removal activities within the exclusion zone. In accordance with the Site Health and Safety Plan (HASp), removal activities will require either level B or Level C personal protective equipment (PPE). Following are the action levels for responders within the exclusion zone:

Monitor	Action Level	Required Action
AreaRAE - Level B PPE	500 ppm	Evacuate the exclusion zone and reassess activities
AreaRAE - Level C PPE	25 ppm	Evacuate the exclusion zone and assess possible upgrade to Level B PPE
CGI	LEL 10%	Evacuate the exclusion zone and reassess activities
PID (breathing zone reading) Level B PPE	500 ppm	Evacuate the exclusion zone and reassess activities
PID (breathing zone reading) Level C PPE	25 ppm	Evacuate the exclusion zone and assess possible upgrade to Level B PPE

### 3.7.2 PERIMETER MONITORING

Four AreaRAE multi-gas monitors will be deployed along the Northeast, Northwest, Southeast and Southwest perimeter of the exclusion zone. The purpose of air monitoring along the perimeter is to detect potential off-site migration of contaminants during removal activities within the exclusion zone. An action level of 5ppm above background for an instantaneous reading or an average reading of 1ppm above background over a 15 minute time period has been determined for the perimeter monitoring. Additional AreaRAE's will be deployed outside of the perimeter as determined by specific operations within the exclusion zone and at the discretion of the EUL.

Prior to the start of removal activities, exhaust from mobile sources within the exclusion zone should be assessed and measures taken to prevent interferences of readings on the AreaRAE. If an AreaRAE produces an instantaneous reading of 5ppm above background or an average reading of 1ppm above background over a 15 minute time period at the perimeter at any time during removal activities within the exclusion zone, the following actions must be taken:



- ⇒ Quickly assess the possibility of interferences within the exclusion zone;
- ⇒ If no interferences can be identified, immediately conduct air monitoring in residential or other public areas downwind of the specific AreaRAE producing the elevated reading using a hand held PhotoIonization Detector (PID);
- ⇒ If the PID produces an instantaneous reading of 1ppm or greater above background, quickly conduct an evaluation of potential interferences. If no interferences can be identified, collect an air grab sample using the 400 ml Summa canister for analysis at EPA NERL;
- ⇒ Report the incident immediately to the EUL, the Site Safety Officer, the Operations Section Chief and the IC for consideration of additional safety measures for responders and the public;
- ⇒ Notify the EPA NERL that a sample will be delivered for analysis;
- ⇒ Immediately deliver the sample to the EPA NERL for analysis;
- ⇒ Notify ATSDR that the sample data is expected and request an evaluation;
- ⇒ Provide the sample results to ATSDR as soon as they are received from NERL.

#### **4.0 ANALYTICAL RESULTS AND EVALUATION**

Air sample results will be sent from NERL to the EUL, ATSDR/MDPH, the Planning Section Chief (PLANS) and the Situation Unit for processing. ATSDR will provide an assessment of the data based on health comparison values and make recommendations, if necessary, to the EUL, IC and PLANS within 24-hours of receiving the sample results. ATSDR will notify EPA if the assessment cannot be completed within 24-hours.

#### **5.0 RESPONDING TO RESIDENTIAL REPORTS OF ODORS**

In ensuring the safety of the residents located near the Site, EPA will respond to residential reports of odors by providing air monitoring at the location of the complaint using the following procedures:

- ⇒ A hand held PID will be taken to the location of the complaint of an odor;
- ⇒ If the PID records a result of 1ppm or greater above background, EPA will quickly conduct an evaluation of potential interferences;
- ⇒ If no interferences can be identified, a grab sample will be taken immediately using a 400 ml Summa canister for analysis at EPA NERL;
- ⇒ The incident will be reported to the EUL, the Site Safety Officer, the Operations Section Chief and the IC for consideration of additional safety measures;
- ⇒ EPA NERL will be notified that a sample will be delivered for analysis;
- ⇒ The sample will be immediately delivered to the EPA NERL for analysis;
- ⇒ EPA will notify ATSDR that the sample data is expected and request an evaluation;
- ⇒ EPA will provide the sample results to ATSDR as soon as they are received from NERL.



EPA recognizes that most odor thresholds are below the health assessment thresholds and will work with the residents to address any concerns.

## **6.0 REVISIONS TO THE PLAN**

Revisions to the Ambient Air Sampling and Monitoring Plan will be added as separate pages to this section. A new version of the plan will be issued at the discretion of the Environmental Unit Leader, as necessary.

SUMMA AIR SAMPLING LOCATIONS  
CAI, INC. EMERGENCY RESPONSE  
DANVERS, MASSACHUSETTS



AREARAE AIR MONITORING LOCATIONS  
CAI, INC. EMERGENCY RESPONSE  
DANVERS, MASSACHUSETTS

