



**PERMIT APPLICATION
REVIEW SUMMARY**

New Hampshire Department of Environmental Services
Air Resources Division
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Facility:	Former Pease AFB Remediation Project	Engineer:	Barbara Dorfschmidt			
Location:	Portsmouth					
AFS #:	3301590780	Application #:	FY04-0453	Date:	4/9/07	Page 1 of 3

APPLICATION & OTHER COMMUNICATION:

Date	Description
5/14/04	Letter received requesting Air Resources Division (ARD) review remediation solutions for demonstration of compliance with Env-A 1400 (note that a copy of this letter is not located in the source file).
5/21/04	Comments on the remediation alternatives report submitted to Waste Management Division (WMD) via internal memo. The memo stated that emissions from either proposed alternative would need to show compliance with the Air Toxics regulation (Env-A 1400) and that since emission rates were not supplied, ARD was unable to make any conclusions.
6/3/04	Letter from WMD sent to Air Force with comments on the "Initial Screening of Alternatives Report." This letter included a statement that air emissions needed to be evaluated for compliance with air toxics and that a Temporary Permit may be required for the project.
1/11/05	Letter from WMD sent to Air Force with comments on the "Final Alternatives Analysis Report."
3/6/07	Email received from URS Corp, contractor overseeing the remediation project - preliminary design of the oxidizer being proposed to control emissions from the remediation project was submitted along with test results from a pilot study conducted for the project. ARD was asked to evaluate the information to determine the need for a Temporary Permit.

PROJECT DESCRIPTION

URS Corporation has been contracted by the United States Air Force Real Property Agency to conduct a groundwater remediation project at the former Pease Air Force Base (Pease AFB) located in Portsmouth, NH. Engineering data concerning the expected emissions from the project were submitted to the Air Resources Division for a permit applicability determination.

FACILITY/PROCESS DESCRIPTION

The major contaminates at the site are from JP-4, which had been delivered to the runway apron via an underground fueling system. This system had developed leaks, releasing fuel into the surrounding groundwater and soil. This system associated with Hydrant lateral 9 was taken off-line, drained and abandoned in place in 1990. The leakages from this system prior to its shutdown are know as Plumes 13 and 14. The remediation project will consist of an air sparge and soil vapor extraction system. Vapors from the system will be piped to a catalytic oxidizer.

POLLUTION CONTROL EQUIPMENT

As stated above, vapors from the remediation system will be piped to a catalytic oxidizer. The catalytic oxidizer is considered a pollution control device for air emissions. The expected destruction efficiency of the oxidizer is 95%. The air toxics review was conducted assuming the emissions would exhaust out of the oxidizer stack uncontrolled.

EMISSION CALCULATIONS/AIR TOXICS REVIEW

A pilot study was done for the remediation system during which time samples of soil gas were measured with a photo ionization detector (PID). The PID measured the concentration of hydrocarbons in the gas in terms of benzene. The average concentration measured during the study was 138 ppm with a maximum of 380 ppm. These numbers were used to estimate the potential emissions from the system. All organic emissions were calculated as jet fuel.

The flow rate through the oxidizer will be 3896 acfm at 400 °F. Note that the original submittal stated that the flow rate would be equal to 1000 scfm. At this flow rate, the source was not able to show compliance with the AALs. URS stated that the oxidizer could be designed with a higher flow rate and modeling was redone using this new rate. The following calculations also use this updated flow rate to calculate the emission rates.

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The following numbers are used in the calculation:

Molecular weight of benzene = 78 g/gmole (lb/lbmole)

Molecular weight of jet fuel is estimated to be 165 g/gmole (lb/lbmole)

Benzene has 6 carbon atoms and jet fuel has approximately 12 carbon atoms; therefore 2 moles of benzene would equivalent to one mole of jet fuel

For an ideal gas there are 22.06 liters per mole.

Potential emissions are calculated using the average measured concentration of 138 ppm because this is a more realistic measurement of actual operations. The maximum concentration would not be expected during the lifetime of the project.

$$\frac{(138 / 1,000,000) * 78 \text{ g/gmol} * 1000 \text{ l/m}^3}{22.06 \text{ l/gmole}} = 0.49 \text{ g/m}^3$$

$$(0.49 \text{ g/m}^3) * (0.02832 \text{ m}^3/\text{ft}^3) * (3865 \text{ ft}^3/\text{min}) * (60 \text{ min/hr}) / (453.6 \text{ g/lb}) = 7.06 \text{ lb/hr benzene}$$

$$\frac{7.06 \text{ lb/hr benzene}}{78 \text{ lb/lbmole benzene}} * \frac{1 \text{ lbmole jet fuel}}{2 \text{ lbmole benzene}} * 165 \text{ lb/lbmole jet fuel} = 7.47 \text{ lb/hr jet fuel}$$

The potential, uncontrolled emissions from the site are estimated to be

$$(7.47 \text{ lb VOC/hr}) * (8760 \text{ hr/yr}) / (2000 \text{ lb/ton}) = 32.7 \text{ tpy}$$

The potential controlled emissions are estimated to be 32.7 tpy * (1-0.95) = 1.64 tpy

For the air toxics review, the maximum concentration of 380 ppm was used as a more conservative approach because there is a 24-hour standard. Using the same calculations as above gives the maximum, uncontrolled emission rate of 20.6 lb/hr. Modeling was done to show that the source could meet the AALs for jet fuel without the use of controls.

STACK INFORMATION

Modeling was conducted based on the exhaust parameters listed in the following table. If the final as-built conditions are different than those listed, updated modeling may need to be conducted.

Device	Exit Diameter (ft)	Height (ft)	Exhaust Flow (acfm)	Exhaust Temperature (°F)	Stack Configuration
Oxidizer	1.0	13.5	3865	400	vertical and unobstructed

MODELING

Modeling was conducted to assure that the emissions of jet fuel would be in compliance with Env-A 1400. Details of the modeling are contained in a memo dated 4/3/07.

EMISSION TESTING

No emissions testing will be required at this time.

SITE VISITS/INSPECTIONS

There was no site visit conducted as part of this review.

ANNUAL EMISSION REPORTS/FEES

Not applicable.

CHANGES FROM PREVIOUS PERMIT

Not applicable.

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REVIEW OF REGULATIONS

State Regulations

Env-A 600 – Permitting

- 607.01(a) – Not Applicable – Burner capacity of the oxidizer is less than 10 MMBtu/hr
- 607.01(f) – Not Applicable – The oxidizer will burn a Type 5 waste at a capacity less than 200 lb/hr
- 607.01(g) – Not Applicable – Actual VOC emissions are expected to be less than 10 tpy
- 607.01(n) – Not Applicable – Source does not need to restrict potential to emit – True Minor Source
- 607.01(v) – Not Applicable – Source is able to show compliance without the use of controls

Env-A 1200 – Prevention, Abatement, and Control of Stationary Source Air Pollution

- Not applicable – potential VOCs < 50 tpy

Env-A 1400 – Regulated Toxic Air Pollutants

- Source is able to show compliance without the use of controls.

Federal Regulations

None applicable

SUMMARY AND CONCLUSIONS

In summary, the remediation system is able to show compliance with Env-A 1400 without the use of controls, and a Temporary Permit is not required for the system.