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REPORT OZONE SPARGE/SVE TREATMENT SYSTEM

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FINAL

Osmose, Inc.

Buffalo, New York

As-Built Report
Ozone Sparge/SVE Treatment System

Prepared for
Osmose, Inc.
980 Ellicott Street
Buffalo, New York 14209

January 6, 2000

Prepared by
IT Engineering of New York, P.C.
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FINAL
AS-BUILT REPORT
OZONE SPARGE/SVE TREATMENT SYSTEM
OSMOSE, INC.
BUFFALO, NEW YORK

NYSDEC Site No.: 915143

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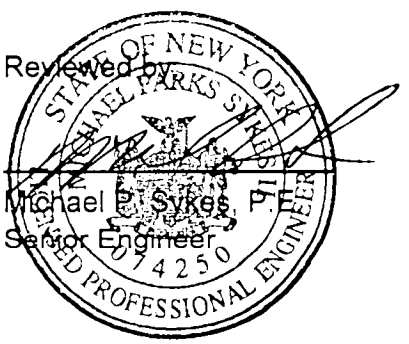
Signature/Certification Page

This document was prepared in accordance with the requirements of the Order on Consent (Index # B9-0314-90-01) for the Osmose, Inc. site located at 980 Ellicott Street, Buffalo, New York, and certifies that the installation of the remedial design was completed in accordance with the *Final Remedial Design, Ozone Sparge System* dated January 19, 1999. Any deviations from the design plan are listed within this document.

Prepared by:

Bruce W. Ahrens, CHMM
Senior Project Manager

Reviewed by:



Michael P. Sykes, P.E.
Senior Engineer

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Drawings

1.0 INTRODUCTION

On March 30, 1999, Osmose, Inc. (Osmose) entered into a remedial design/remedial action Order on Consent (Index # B-9-0314-90-01) with the New York State Department of Environmental Conservation (NYSDEC). Section 1, Paragraph D of the Order requires that Osmose prepare and submit "as-built" drawings and a final engineering report (including all changes made to the remedial design during construction); a certification that the remedial design was implemented and that all construction activities were completed in accordance with the Department-approved *Final Remedial Design*; and a post-remedial operation and maintenance plan (O&M Plan). The Order further requires that these documents be submitted to the Department within 90 days after completion of the remedial activities identified in the *Final Remedial Design*. Substantial completion of the ozone sparge/SVE treatment system was achieved on August 27, 1999.

1.1 Objectives

This *As-Built Report* was prepared to satisfy the requirements of the Order for the submittal of a final engineering report which:

- includes a certification that the remedial design was implemented, and that all construction activities were completed, in accordance with the Department-approved *Final Remedial Design* (dated January 19, 1999)
- identifies all changes made to the remedial design during construction
- includes as-built drawings

The statement of certification is included as page ii. The design modifications are presented and discussed in **Section 2.0**. As-built drawings are included in the **Figures** appendix.

As discussed with the NYSDEC, a post-remedial O&M Plan will be submitted to the NYSDEC under separate cover.

2.0 DESIGN MODIFICATIONS

The following sections detail significant modifications to the Department-approved design. Included with each modification is the associated rational for the change. Modifications are grouped according to the portion of the treatment system they are associated with.

2.1 Soil Vapor Extraction System

2.1.1 SVE Manifold

One modification was made during construction of the SVE manifold:

Flexible, 2-inch diameter translucent, reinforced PVC hose was used to construct the SVE manifold rather than the specified 2-inch diameter PVC inflexible piping. The reason for the change was the limited available space for the installation. When the 23 SVE wells were piped into the existing treatment compound, they had to be grouped closely together to fit around existing equipment. This placement made a traditional hard piped manifold impractical and extremely difficult to construct. The reinforced, flexible PVC hose was chosen because:

- it has the same chemical compatibility as the PVC pipe
- it's design is consistent with it's application in the SVE manifold
- it is flexible enough to be used in the limited space available

2.1.2 SVE Blower Accoutrements

Two modifications were made which are associated with monitoring the SVE blower output.

The temperature gauges to monitor the blower temperature (shown on design **Drawing P-2**) were not included by the manufacturer with the blower package. The manufacturer indicated that temperature is not a major concern on regenerative blower systems, as they customarily run much cooler than their rotary vane or positive displacement counterparts. The absence of inline temperature gauges will not hinder operation, maintenance or monitoring of the system.

An inline flow meter, as shown on design **Drawing P-2**, was not installed. Instead, a combination sample port and air flow monitoring port was installed. This combination port will allow for air flow to be measured with a hand held thermal anemometer. The thermal anemometer is a more accurate flow-monitoring device, and can be calibrated easier than the

inline flow meter. Additionally, the combination sample port can be used to collect air samples for analysis.

2.1.3 SVE Effluent

One clarification/modification was made on the effluent site of the SVE system.

An inline ozone-monitoring device was erroneously shown on the design P&ID prior to discharge on the effluent side of the SVE system. The inline meter, however; was not specified within the engineering design report. It was the intent of the design to use Dragger (or equal) tubes to monitor the SVE effluent for compliance. Monitoring requirements will be detailed in the O&M Manual.

2.1.4 Control Panel

One upgrade/modification was made which is associated with the SVE control panel.

The transfer pump "Hand/Off/Auto" switch controls the SVE moisture knockout transfer pump and controls the solenoid valve on the groundwater wells' air supply line instead of just the knockout transfer pump. This change was made to ensure that the system "high-high" alarm float in the equalization tank shuts down the two largest influent water sources (the moisture in the knockout and the recovery wells).

2.2 Groundwater Treatment System

2.2.1 Water Manifold

One change in the materials of construction was made in the water manifold.

The design drawing indicated that the water manifold to be installed in the existing treatment compound would be FRE (fiberglass reinforced epoxy) pipe. It was determined that FRE is difficult to obtain, difficult to install in the close quarters present in the existing treatment compound, and potentially brittle in its proposed application. The existing manifold, which operated for 3-4 years without incident, was constructed of carbon steel. This manifold was dissected at several locations to determine the effects that the small amounts of fuel oil and creosote had on the materials. The carbon steel, bronze, and PVC materials that were used to construct the original manifold were all inspected. All these materials were found to be competent and not show signs of deterioration. Because of this site-specific review and the

anticipation of lower concentrations of dissolved chemicals of concern (COCs) than detected during the LNAPL IRM, the manifold materials of construction were changed to be carbon steel and reinforced PVC hose. Additionally, groundwater from the full-scale system is expected to contain less COCs than during the IRM because the IRM concentrated on the most highly impacted areas of the site.

All this piping is above grade and plainly visible from within the treatment compound. Material compatibility may easily be verified during site visits.

2.2.2 Recovery Well Air Supply Manifold

Three upgrades/modifications were made to the recovery well air supply manifold.

A pressure regulator was used in place of the needle valve specified on the drawings on the influent air supply line. The pressure regulator allows for more accurate control of the air supply, and can handle any influent pressure fluctuations that may occur.

A ball valve was added to the air supply manifold to provide a quick emergency shut-off and a lock out point. This change makes troubleshooting, operation, and maintenance safer and easier.

An additional solenoid valve was added, immediately following the emergency shut-off solenoid, to vent any residual air pressure in the air supply line when the "high-high" alarm level is reached in the 500 gallon equalization tank. This change was implemented to vent pressurized air still in the manifold piping and hoses and allow the submersible pumps to shut off quickly (instead of running for a few more minutes on the volume of air left in the lines).

2.3 Ozone Injection System

2.3.1 Injection Manifold

Two modifications were made to the ozone injection manifold that is located in the new treatment compound (TC-2).

Teflon tubing was used to construct a portion of the injection point manifold instead of the specified stainless steel tubing. Both materials are compatible with ozone and suitable for use in this application. Teflon tubing was chosen for its ease of installation.

Instead of a programmable logic controller (PLC) based control system, each solenoid valve is controlled with a dedicated electronic timer. This timer is fully programmable, and provides the same functionality of a PLC but with an interface that is easier to use and understand.

2.4 General

2.4.1 National Fuel Gas Pipeline

The engineering design called for replacing the rubber-gasketed cast iron and/or polyethylene natural gas supply lines that were in the vicinity of the treatment area with Halar pipe. Instead of replacing the existing pipe, National Fuel Gas relocated the lines away from the treatment area.

2.4.2 Telephone Line

The engineering design called for sheathing to be placed around the telephone line that exists in front of the Osmose facility. Conversations with Bell Atlantic indicated that:

- due to the age and condition of the telephone lines, and the clay tile pipe they were installed in, Bell Atlantic felt that disturbances during application of sheathing might damage the lines
- the telephone lines and the clay tile pipe were bedded in clay

During remedial construction, the presence of the clay bedding was verified at several locations. Given the shallow depth of the telephone lines (2.0 – 2.5 feet below grade), the clay layer that exists across the site which separates the treatment area from the telephone lines, the placement of the SVE points to ensure ozone will not come into contact with the lines, and Bell Atlantic's concerns regarding disturbances to the clay tile pipe, a determination was made not to sheath the line.

2.4.3 Water Line

The engineering plan indicated that the water supply line that exists beneath the sidewalk in front of the Osmose facility would be sheathed or replaced. Conversation with Mr. Paul Gareis of the City of Buffalo Water Department indicated that the water line is constructed of cast iron with leaded joints. Available chemical compatibility data indicates that these materials are compatible with ozone. The water department indicated that they would not require either sheathing or replacement of the water line. The reasons for not sheathing the line was because three levels of protection are believed to exist. These protections include:

- chemical compatibility of the materials of construction of the water line to ozone
- collection of unreacted ozone vapors beneath the clay layer

- the impermeable clay layer

In addition the water line is old and constructed with bell-type joints that could not be easily sheathed.

3.0 AS-BUILT DRAWINGS

The engineering drawings have been edited to reflect the as-built configuration of the treatment system. These "As-Built" drawings are included in the Figures appendix.