

## 5.0 PHASE 1B/2 AS-BUILT DOCUMENTATION

As-Built documentation, as described below, includes the results of field measurements and inspections, photographs, surveys, and “as-built” drawings of the remediation features, signed and stamped by a professional engineer. A complete set of as-built drawings of the Remedial Action Construction are provided in Volume II of this report.

### 5.1 FIELD MEASUREMENTS/INSPECTIONS

#### 5.1.1 Overview

The horizontal limit of the caps in Areas 3, 7, 2, the 100’ by 100’ Area, and the West Bank cap were laid out with stakes and/or flagging, by a licensed surveyor or engineer, prior to construction activities. Grade stakes were also installed across the cap areas to provide the design subgrade elevations in the field. The stakes were maintained throughout construction.

The horizontal limit of the caps in the Canal (except along the West Bank Cap area) was defined by the cribbing walls along the east and west side of the Canal, and on the west and south side of the Turning Basin. The edge of the cap along the east and north sides of the Turning Basin was determined by the break in existing topography.

A summary of the areas of all the caps installed as part of the Remedial Action construction is provided in Table 6.

TABLE 6 SUMMARY OF CAPPED AREAS		
Location:	Capped Area	
	Square feet	Acres
Area 3/2	82,500	1.89
Area 7	59,500	1.37
Turning Basin	99,700	2.29
Canal	74,000	1.70
100 ft by 100 ft Area	10,000	0.23
West Bank Cap	14,900	0.34
<b>Total Capped Area:</b>	<b>340,600 ft<sup>2</sup></b>	<b>7.82 acres</b>

Field measurements and inspections concurrent with and following construction were conducted to ensure that the remediation construction was completed consistent with design plans and specifications, and to provide the basis for the preparation of as-built drawings. A series of cap thickness measurements were collected throughout active construction to verify cap

REMEDIAL ACTION  
CONSTRUCTION COMPLETION  
REPORT

VOLUME I  
REPORT & APPENDICES

Pine Street Canal Superfund Site  
Burlington, Vermont

Prepared for  
Performing Defendants

Submitted to  
U.S. Environmental Protection Agency  
Region I  
The State of Vermont

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PREPARED BY:

The Johnson Company, Inc.  
100 State Street, Suite 600  
Montpelier, Vermont 05602

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the canal and turning basin was constructed as an extension to Phase 1B while the canal was dewatered. This change was made because it was determined that placement of the geotextile and sand could be better controlled in the “dry”, construction in the winter months would take advantage of increased sediment strength due to freezing; and the schedule would be accelerated. Phase 1A was conducted first to allow for control of the canal water elevation during subsequent phases of construction.

#### **4.2.1 Phase 1A – Construction of the Weir**

Phase 1A consisted of the construction of a cast-in-place, broad-crested concrete weir at the canal outlet to Lake Champlain. Construction of the weir took place in October 2001 and received a final construction inspection by EPA on November 1, 2001. The weir is approximately 50 feet long and is located beneath the Burlington bike path bridge at the canal outlet. The weir was designed to provide a normal canal stage elevation between 96.0 and 96.5 feet NGVD. Removable stop logs and a six-foot wide sluice were incorporated into the design to allow variation in the canal stage elevation after completion of construction in order to improve wetlands hydrology and optimize wetlands functions at the Site, and to improve access conditions for cap maintenance activities. The Phase 1A Remedial Action Construction Completion Report was submitted to EPA in January 2002.

#### **4.2.2 Phase 1B/2 – Cap Construction**

Phase 1B, which consisted of the capping of Areas 3 and 7, construction of the Burlington Electric Department (BED) stormwater outfall and other stormwater management features, and capping and construction of the Area 2 waterway in the southern end of the canal, was implemented in the summer and fall of 2002. Phase 2 construction was implemented during the winter of 2002/2003 and as an extension of Phase 1B. **The cap consists of a geotextile material covered by sand in the canal and turning basin, and sand and topsoil in the upland areas.** In the wetland waterways, GeoWeb® was paced on sand and filled with crushed stone to provide erosion protection. Capping of a 100 x 100 foot area south of the turning basin and just east of the canal was done following the winter installation of the cap in the canal and turning basin. The cap in this area consisted of sand and topsoil.

In the spring of 2003, following a high seasonal lake water level, non-aqueous phase liquid (NAPL), both lighter and denser than water (LNAPL and DNAPL), was observed on a portion of the west bank of the canal outside of the cap footprint, and on top of the subaqueous canal cap adjacent to the west bank area. Sheens and globules of NAPL were also observed on the water surface in the canal. During the fall of 2003, a NAPL response strategy was developed which recommended additional capping over the affected portion of the west bank of the canal and removal of DNAPL that had accumulated on the surface of the cap in the canal. Additional investigations of the nature and extent of NAPL contamination on the canal cap and near sub-surface were performed by the Performing Defendants and, based on the results, the West Bank Cap Remedial Action Workplan and Supplemental West Bank Cap Remedial Action Workplan were prepared by Johnson Company, in the late fall of 2003. The west bank cap construction and DNAPL removal were implemented in the summer of 2004.

Wetlands restoration activities were performed in accordance with the Wetland Restoration Plan, contained in the Phase 1B Remedial Action Design Report, and the supplemental restoration plan for the west bank cap, with certain modifications. The initial seeding and planting within the wetland restoration

**Five-Year Review Report**  
**for**  
**Pine Street Barge Canal Superfund Site**  
**Burlington,**  
**Chittenden County, Vermont**

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**PREPARED BY:**

**United States Environmental Protection Agency  
Region 1  
Boston, Massachusetts**

**Date:**

Susan Studlien  
Susan Studlien, Director  
Office of Site Remediation and Restoration  
United States Environmental Protection Agency, Region 1

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