UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
BOSTON, MA 02109-3912

CERTIFIED MAIL RETURN RECEIPT REQUESTED

NOV 14 2014

Ken Drolette
Superintendent
Windover Construction
66 Cherry Hill Drive
Beverly, MA 01915

Re: Authorization to discharge under the Remediation General Permit (RGP) – MAG910000. Beauport Hotel site located at 47-61 Commercial Street, Gloucester, MA 01930, Essex County; Authorization # MAG910648

Dear Mr. Drolette:

Based on the review of a Notice of Intent (NOI) submitted by Elizabeth J. Christmas from Haley & Aldrich, Inc., on behalf of client Windover Construction, Inc., for the site referenced above, the U.S. Environmental Protection Agency (EPA) hereby authorizes you, as the named Operator, to discharge in accordance with the provisions of the RGP at that site. Your authorization number is listed above.

The checklist enclosed with this RGP authorization indicates the pollutants which you are required to monitor. Also indicated on the checklist are the effluent limits, test methods and minimum levels (MLs) for each pollutant. Please note that the checklist does not represent the complete requirements of the RGP. Operators must comply with all of the applicable requirements of this permit, including influent and effluent monitoring, narrative water quality standards, record keeping, and reporting requirements, found in Parts I and II, and Appendices I – VIII of the RGP. See EPA's website for the complete RGP and other information at: http://www.epa.gov/region1/npdes/mass.html#dgp.

Please note the enclosed checklist includes parameters that your consultant marked "Believed Present." The checklist also includes trichloroethylene (TCE) and lead. These parameters were detected in recent soil samples at the site. They are being monitored as part of the permit in the event of potential detection during site excavation.

Also, please note that the metals included on the checklist are dilution dependent pollutants and subject to limitations based on selected dilution ranges and technology-based ceiling limitations. With the absence of dilution of freshwater into tidal water, EPA determined that the Dilution Factor Range (DFR) for each parameter for this site is in the one and five (1-5) range. (See the RGP Appendix IV for Massachusetts facilities).

Therefore, the limits for antimony of 5.6 ug/L, copper of 3.7 ug/L, lead of 8.5 ug/L, and iron of 1,000 ug/L, are required to achieve permit compliance at your site.

Finally, please note the checklist of pollutants attached to this authorization is subject to a recertification if the operations at the site result in a discharge lasting longer than six months. A recertification can be submitted to EPA within six (6) to twelve (12) months of operations in accordance with the 2010 RGP regulations.

This general permit and authorization to discharge will expire on September 9, 2015. You have reported that this project will terminate on September 1, 2015. You are required to submit a Notice of Termination (NOT) to the attention of the contact person indicated below within 30 days of project completion.

Thank you in advance for your cooperation in this matter. Please contact Victor Alvarez at 617-918-1572 or Alvarez.Victor@epa.gov, if you have any questions.

Sincerely,

Thelma Murphy

Thelma Murphy, Chief
Storm Water and Construction
Permits Section

Enclosure

cc: Robert Kubit, MassDEP
Michael Hale, Gloucester PWD
Elizabeth J. Christmas, Haley & Aldrich

	Parameter	Effluent Limit/Method#/ML (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
	9. Total Benzene, Toluene, Ethyl Benzene, and Xylenes (BTEX) [4]	100 ug/L/ Me#8260C/ ML 2ug/L
	10. Ethylene Dibromide (EDB) (1,2- Dibromoethane)	0.05 ug/l/ Me#8260C/ ML 10ug/L
	11. Methyl-tert-Butyl Ether (MtBE)	70.0 ug/l/Me#8260C/ML 10ug/L
	12.tert-Butyl Alcohol (TBA) (TertiaryButanol)	Monitor Only(ug/L)/Me#8260C/ML 10ug/L
	13. tert-Amyl Methyl Ether (TAME)	Monitor Only(ug/L)/Me#8260C/ML 10ug/L
	14. Naphthalene [5]	20 ug/L /Me#8260C/ML 2ug/L
	15. Carbon Tetrachloride	4.4 ug/L /Me#8260C/ ML 5ug/L
	16. 1,2 Dichlorobenzene (o-DCB)	600 ug/L /Me#8260C/ ML 5ug/L
	17. 1,3 Dichlorobenzene (m-DCB)	320 ug/L /Me#8260C/ ML 5ug/L
	18. 1,4 Dichlorobenzene (p-DCB)	5.0 ug/L /Me#8260C/ ML 5ug/L
	18a. Total dichlorobenzene	763 ug/L - NH only /Me#8260C/ ML 5ug/L
	19. 1,1 Dichloroethane (DCA)	70 ug/L /Me#8260C/ ML 5ug/L
	20. 1,2 Dichloroethane (DCA)	5.0 ug/L /Me#8260C/ ML 5ug/L
	21. 1,1 Dichloroethene (DCE)	3.2 ug/L/Me#8260C/ ML 5ug/L
	22. cis-1,2 Dichloroethene (DCE)	70 ug/L/Me#8260C/ ML 5ug/L
	23. Methylene Chloride	4.6 ug/L/Me#8260C/ ML 5ug/L
	24. Tetrachloroethene (PCE)	5.0 ug/L/Me#8260C/ ML 5ug/L
	25. 1,1,1 Trichloro-ethane (TCA)	200 ug/L/Me#8260C/ ML 5ug/L
	26. 1,1,2 Trichloro-ethane (TCA)	5.0 ug/L /Me#8260C/ ML 5ug/L
√	27. Trichloroethene (TCE)	5.0 ug/L /Me#8260C/ ML 5ug/L
	28. Vinyl Chloride (Chloroethene)	2.0 ug/L /Me#8260C/ ML 5ug/L
	29. Acetone	Monitor Only(ug/L)/Me#8260C/ML 50ug/L
	30. 1,4 Dioxane	Monitor Only /Me#1624C/ML 50ug/L
	31. Total Phenols	300 ug/L Me#420.1&420.2/ML 2 ug/L/ Me# 420.4 /ML 50ug/L
	32. Pentachlorophenol (PCP)	1.0 ug/L /Me#8270D/ML 5ug/L,Me#604 &625/ML 10ug/L
	33. Total Phthalates (Phthalate esters) [6]	3.0 ug/L ** /Me#8270D/ML 5ug/L, Me#606/ML 10ug/L& Me#625/ML 5ug/L
	34. Bis (2-Ethylhexyl) Phthalate [Di- (ethylhexyl) Phthalate]	6.0 ug/L /Me#8270D/ML 5ug/L,Me#606/ML 10ug/L & Me#625/ML 5ug/L

2010 Remediation General Permit
Summary of Monitoring Parameters[1]

NPDES Authorization Number:	**MAG910648**
Authorization Issued:	November, 2014
Facility/Site Name:	Beauport Hotel
Facility/Site Address:	47-61 Commercial Street, Gloucester, MA 01930
	Email address of owner: ken@windover.com
Legal Name of Operator:	Windover Construction
Operator contact name, title, and Address:	66 Cherry Hill Drive, Beverly, MA 01915
	Email: Same as the Owner
Estimated date of the site's Completion:	September 1, 2015
Category and Sub-Category:	
RGP Termination Date:	September 9, 2015
Receiving Water:	Outer Gloucester Harbor

Monitoring & Limits are applicable if checked. All samples are to be collected as grab samples

	Parameter	**Effluent Limit/Method#/ML** (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
√	1. Total Suspended Solids (TSS)	30 milligrams/liter (mg/L) **, 50 mg/L for hydrostatic testing ** Me#160.2/ML5ug/L
	2. Total Residual Chlorine (TRC) [1]	Freshwater = 11 ug/L ** Saltwater = 7.5 ug/L **/ Me#330.5/ML 20ug/L
√	3. Total Petroleum Hydrocarbons (TPH)	5.0 mg/L/ Me# 1664A/ML 5.0mg/L
	4. Cyanide (CN) [2, 3]	Freshwater = 5.2 ug/l ** Saltwater = 1.0 ug/L **/ Me#335.4/ML 10ug/L
	5. Benzene (B)	5ug/L /50.0 ug/L for hydrostatic testing only/ Me#8260C/ML 2 ug/L
	6. Toluene (T)	(limited as ug/L total BTEX)/ Me#8260C/ ML 2ug/L
	7. Ethylbenzene (E)	(limited as ug/L total BTEX) Me#8260C/ ML 2ug/L
	8. (m,p,o) Xylenes (X)	(limited as ug/L total BTEX) Me#8260C/ ML 2ug/L

	Parameter	Effluent Limit/Method#/ML (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
	35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)	10.0 ug/L
	a. Benzo(a) Anthracene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	b. Benzo(a) Pyrene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	c. Benzo(b)Fluoranthene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	d. Benzo(k)Fluoranthene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	e. Chrysene [7]	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	f. Dibenzo(a,h)anthracene [7]	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	g. Indeno(1,2,3-cd) Pyrene [7]	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML5ug/L
	36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)	100 ug/L
	h. Acenaphthene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	i. Acenaphthylene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	j. Anthracene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	k. Benzo(ghi) Perylene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	l. Fluoranthene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	m. Fluorene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	n. Naphthalene [5]	20 ug/l / Me#8270/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
	o. Phenanthrene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	p. Pyrene	X/Me#8270D/ML5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	37. Total Polychlorinated Biphenyls (PCBs) [8, 9]	0.000064 ug/L/Me# 608/ ML 0.5 ug/L
√	38. Chloride	Monitor only/Me# 300.0/ ML 100 ug/L

	Metal Parameters	Total Recoverable MA/Metal Limit H [10] = 50 mg/l CaCO3, Units = ug/l [(11/12)] Saltwater Limits	Minimum level=ML	
√	39. Antimony	5.6	ML	10
	40. Arsenic **	36	ML	20
	41. Cadmium **	8.9	ML	10
	42. Chromium III (trivalent) **	100	ML	15
	43. Chromium VI (hexavalent) **	50.3	ML	10
√	44. Copper **	3.7	ML	15
	45. Lead **	8.5	ML	20
	46. Mercury **	1.1	ML	02
	47. Nickel **	8.2	ML	20
	48. Selenium **	71	ML	20
	49. Silver	2.2	ML	10
	50. Zinc **	85.6	ML	15
√	51. Iron	1,000	ML	20

	Other Parameters	Limit
√	52. Instantaneous Flow	Site specific in CFS
√	53. Total Flow	Site specific in CFS
	54. pH Range for Class A & Class B Waters in MA	6.5-8.3; 1/Month/Grab[13]
√	55. pH Range for Class SA & Class SB Waters in MA	6.5-8.3; 1/Month/Grab[13]
	56. pH Range for Class B Waters in NH	6.5-8; 1/Month/Grab[13]
	57. Daily maximum temperature - Warm water fisheries	83°F; 1/Month/Grab[14]
	58. Daily maximum temperature - Cold water fisheries	68°F; 1/Month/Grab[14]
	59. Maximum Change in Temperature in MA - Any Class A water body	1.5°F; 1/Month/Grab[14]
	60. Maximum Change in Temperature in MA - Any Class B water body- Warm Water	5°F; 1/Month/Grab[14]
	61. Maximum Change in Temperature in MA – Any Class B water body - Cold water and Lakes/Ponds	3°F; 1/Month/Grab[14]
	62. Maximum Change in Temperature in MA – Any Class SA water body - Coastal	1.5°F; 1/Month/Grab[14]
	63. Maximum Change in Temperature in MA – Any Class SB water body - July to September	1.5°F; 1/Month/Grab[14]
	64. Maximum Change in Temperature in MA –Any Class SB water body - October to June	4°F; 1/Month/Grab[14]

Footnotes:

[1] Although the maximum values for TRC are 11ug/l and 7.5 ug/l for freshwater, and saltwater respectively, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI (i.e., Method 330.5, 20 ug/l).
[2] Limits for cyanide are based on EPA's water quality criteria expressed as micrograms per liter. There is currently no EPA approved test method for free cyanide. Therefore, total cyanide must be reported.
[3] Although the maximum values for cyanide are 5.2 ug/l and 1.0 ug/l for freshwater and saltwater, respectively, the compliance limits are equal to the minimum level (ML) of the Method 335.4 as listed in Appendix VI (i.e., 10 ug/l).
[4] BTEX = sum of Benzene, Toluene, Ethylbenzene, and total Xylenes.
[5] Naphthalene can be reported as both a purgeable (VOC) and extractable (SVOC) organic compound. If both VOC and SVOC are analyzed, the highest value must be used unless the QC criteria for one of the analyses is not met. In such cases, the value from the analysis meeting the QC criteria must be used.
[6] The sum of individual phthalate compounds(not including the #34, Bis (2-Ethylhexyl) Phthalate . The compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI.
Total values calculated for reporting on NOIs and discharge monitoring reports shall be calculated by adding the measured concentration of each constituent. If the measurement of a constituent is less than the ML, the permittee shall use a value of zero for that constituent. For each test, the permittee shall also attach the raw data for each constituent to the discharge monitoring report, including the minimum level and minimum detection level for the analysis.
[7] Although the maximum value for the individual PAH compounds is 0.0038 ug/l, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI.
[8] In the November 2002 WQC, EPA has revised the definition of Total PCBs for aquatic life as total PCBs is the sum of all homologue, all isomer, all congener, or all "Oroclor analyses."Total values calculated for reporting on NOIs and discharge monitoring reports shall be calculated by adding the measured concentration of each constituent. If the measure of a constituent is less than the ML, the permittee shall use a value of zero for that constituent. For each test, the permittee shall also attach the raw data for each constituent to the discharge monitoring report, including the minimum level and minimum detection level for the analysis.
[9]Although the maximum value for total PCBs is 0.000064 ug/l, the compliance limit is equal to the minimum level (ML) of the test method used as listed in Appendix VI (i.e., 0.5 ug/l for Method 608 or 0.00005 ug/l when Method 1668a is approved).
[10] Hardness. Cadmium, Chromium III, Copper, Lead, Nickel, Silver, and Zinc are Hardness Dependent.
[11] For a Dilution Factor (DF) from 1 to 5, metals limits are calculated using DF times the base limit for the metal. See Appendix IV. For example, iron limits are calculated using DF x 1,000ug/L (the iron base limit). Therefore DF is 1.5, the iron limit will be 1,500 ug/L; DF 2, then iron limit =1,000 x 2 =2,000 ug/L., etc. not to exceed the DF=5.
[12] Minimum Level (ML) is the lowest level at which the analytical system gives a recognizable signal and acceptable calibration point for the analyte. The ML represents the lowest concentration at which an analyte can be measured with a known level of confidence. The ML is calculated by multiplying the laboratory-determined method detection limit by 3.18 (see 40 CFR Part 136, Appendix B).
[13] pH sampling for compliance with permit limits may be performed using field methods as provided for in EPA test Method 150.1.
[14] Temperature sampling per Method 170.1

Haley & Aldrich, Inc.
465 Medford St.
Suite 2200
Boston, MA 02129

Tel: 617.886.7400
Fax: 617.886.7600
HaleyAldrich.com

30 October 2014
File No. 38605-052

US Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code OEP06-4
Boston, Massachusetts 02109-3912
RTNs 3-30901

Attention: Remediation General Permit NOI Processing

Subject: Notice of Intent (NOI)
Temporary Construction Dewatering
Beauport Gloucester Hotel
47-61 Commercial Street
Gloucester, Massachusetts

Ladies and Gentlemen:

On behalf of our client, Windover Construction, Inc. and in accordance with the National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) in Massachusetts, MAG910000, this letter submits a Notice of Intent (NOI) and the applicable documentation as required by the US Environmental Protection Agency (EPA) for temporary construction site dewatering under the RGP for the subject site ("Site") located at 41-67 Commercial Street in Gloucester, Massachusetts (see Figure 1).

CURRENT SITE CONDITIONS

The Site is located at 47-61 Commercial Street in Gloucester, Massachusetts as shown in the Site Locus (see Figure 1). The Site is comprised of an approximately 1.7 acre parcel developed with a former unoccupied two-story warehouse-style building (currently undergoing abatement and demolition) with an adjacent paved parking lot, indicated as shown on Figure 2 – Site and Subsurface Exploration Location Plan. The Site is bordered to the north by Commercial Street; to the east by Fort Square; to the south by Pavilion Beach/Western Harbor; and to the west by 33 Commercial Street. Site grades are relatively level at approximately 15 feet above mean sea level, gently sloping south towards Western Harbor, located adjacent to the south of the Site.

SITE HISTORY

In 1903, the majority of the Site was occupied by the Gloucester Mackerel Co. The northern portion of the Site was bisected by Commercial Court, a dead end street extending from Commercial Street to the west and ending at Pavilion Beach. Residences and a cooperage were located on Commercial Court. The remainder of the Site was occupied by fish drying racks, a smoke house, and fish packing houses. A portion of the current Site building was constructed in 1916 for fish salting and drying. The building

was separated from an iron-clad building used for fish skinning and packing by a narrow alley. In 1917, the Site was occupied by residential and commercial buildings along Commercial Court.

In 1949, the Site building was refurbished into a fish-freezing plant. Residences were located on the south side of the Site where the fish packing building had formerly been located, and residences and shops continued to be located along Commercial Court. By 1972 the land along Commercial Court had been turned into a parking area; the Site building was a fish packing and freezing plant, and the residences had been razed for construction of the western portion of the Site building for cold storage. The Site and building were utilized for seafood processing and cold storage until approximately 1996. The Site was vacated in approximately 1999 and has remained vacant since that time.

PROPOSED CONSTRUCTION

Windover Construction is redeveloping the Site. Site redevelopment will involve demolition of the current building (completed) as well as construction of a seawall and hotel building. The hotel building will include three to four levels with parking level at grade. Construction of the building will be supported on concrete footings and piles. No below grade space is planned for the project.

MASSACHUSETTS MCP REGULATORY BACKGROUND

There are three Release Tracking Numbers (RTNs) associated with the subject property, as described below. The subject property achieved regulatory closure for one of the RTNs, 3-23398, in June 2004 with the filing of a Class B-1 Response Action Outcome (RAO) Statement. The 2004 RAO indicated that residual petroleum contamination remained in Site soil.

Response actions and management of remediation waste at the property are being conducted under our recent Release Abatement Measure (RAM) Plan and Modified RAM Plan for Site and submitted to MassDEP vie eDEP on 7 August 2014 and 23 August 2014, respectively. The release and compliance history associated with RTN 3-32005, RTN 3-30901 and RTN 3-23398 are summarized below.

Release Tracking Number 3-32005

Haley & Aldrich conducted a soil sampling program at the Site in July 2014 to supplement the historical sampling data. In summary, trichloroethylene (TCE) was detected in one soil sample at a concentration (0.55 mg/kg) exceeding the RCS-1 criteria. The finding triggered a new 120-day reporting condition. On 8 September 2014, Transmittal Form BWSC103 Release Notification Form (RNF) was submitted by Beauport Gloucester, LLC to the MassDEP for the TCE in soil RCS-1 exceedance via eDEP. MassDEP subsequently assigned RTN 3-32005 to the release.

Release Tracking Number 3-30901

ATC Associates, Inc. (ATC) conducted a subsurface exploration program at the Site in June 2011 as part of pre-acquisition due diligence work. In summary, Transmittal Form BWSC103 Release Notification Form (RNF) was submitted by Beauport Gloucester, LLC to the MassDEP for a lead in soil RCS-1 exceedance via eDEP on 22 June 2012 (within 120 days of acquisition of the Site).

MassDEP subsequently assigned RTN 3-30901 to the release. An MCP Phase I Initial Site Investigation Report, Tier II Classification Submittal and Phase II Conceptual Scope of Work was submitted to MassDEP via eDEP on 19 December 2013.

Release Tracking Number (3-23398)

Soil samples collected from beneath an abandoned approximately 3,000-gallon fuel oil underground storage tank (UST) located within the boiler room of the Site building indicated concentrations of extractable petroleum hydrocarbon (EPH) constituents exceeding applicable MCP RCS-1 criteria in June 2003. RTN 3-23398 was assigned to the release. Remediation of the residual petroleum contamination in soil at that time was considered categorically infeasible because the impacted material was located beneath an occupied building. The UST was closed in-place with concrete slurry because it could not be removed without potentially impacting Site improvements. A Class B-1 RAO and Method 3 Risk Characterization were submitted to MassDEP in June 2004 indicating remedial actions were not conducted because a level of No Significant Risk had been achieved. The 2004 RAO indicated that residual petroleum contamination remained in site soil.

WATER QUALITY INFORMATION

In support of the NOI, Haley & Aldrich collected groundwater samples from observation well HA14-04(OW) (see Figure 2) at the site on 19 August 2014. The collected groundwater samples were submitted to Alpha Analytical, Inc. of Westborough, Massachusetts (Alpha Analytical), a DEP certified laboratory for analysis for NPDES permit parameters including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total and dissolved metals, polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH), Total Suspended Solids (TSS), chloride, total cyanide, total phenolics, and total residual chlorine.

The results of the analysis indicated total antimony, copper, iron, and dissolved iron were above the RGP effluent discharge criteria. The results of water quality testing conducted for this NOI are summarized in Table I. The location of the observation well is shown on Figure 2. Copies of the Laboratory Data Reports for the analyses of groundwater samples collected at the site are included in Appendix E. Although TPH has not been detected in groundwater at the Site during recent sampling, the NOI has been filled out such that TPH is “believed present”. As there was a known release at the Site associated with a former underground storage tank, RTN 3-23398, there is the potential for petroleum impacted material to be encountered during excavation and dewatering activities.

PLANNED DEWATERING AND TREATMENT

During construction, it will be necessary to perform temporary dewatering to control surface water runoff from precipitation, groundwater seepage, and construction-generated waster to enable construction in-the-dry. Construction and construction dewatering activities are currently anticipated to begin as early as October 2014 and continue until September 2015. Temporary dewatering will be conducted from sumps located in excavations.

On Going Work Dewatering

On-Site recharge of groundwater during construction is currently being conducted to the maximum extent feasible provided it does not impact on-going construction. On-site recharge will be performed in accordance with the MCP at 310 CMR 40.0045. If on-site recharge is not feasible, temporary construction dewatering will be managed under an EPA National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) and in accordance with the best management practices in the Stormwater Pollution Prevention Plan (SWPPP) as previously provided under the General Construction Permit (MAR12AX47) field electronically on 17 July 2014. The SWPPP addresses erosion prevention, runoff control, and discharges associated with Site.

Planned Future Dewatering

As part of future dewatering, an effluent treatment system will be designed by the Contractor to meet NPDES RGP discharge criteria. Prior to discharge, collected water will be routed through a sedimentation tank and a bag filter, at a minimum, to remove suspended solids and undissolved chemical constituents. Supplemental pretreatment may be required to meet discharge criteria as shown in the Proposed Treatment System Schematic included in Figure 3.

Construction dewatering under this RGP NOI will included piping and discharging to catch basins along Commercial Street located north of the site. The catch basins travel easterly along Commercial Street, turn southerly down Fort Square, and discharge into Outer Gloucester Harbor at the southwest corner of Pavilion Beach. The proposed discharge catch basins that drain to this outfall are shown in Figure 2.

DILUTION FACTOR APPLICABLE FOR METALS

Based on email correspondence with the EPA on 24 October 2014, a dilution rate concentration between 1 and 5 is applicable to tidal water or salt (ocean discharges).

Testing of groundwater at the site indicated that metals were either not detected above the laboratory detection limit and/or were below NPDES RGP effluent discharge criteria with the exception of total antimony, copper, and iron. The Outer Gloucester Harbor is the receiving water body, and it is a tidally influenced channel.

Using a DF equal to 2.5, according to Appendix IV of the Remediation General Permit, the ceiling limitation for the calculated dilution factor of 2.5 for antimony is 14 ug/L, copper is 13 ug/L, and iron is 2,500 ug/L. If testing of the dewatering effluent indicates that the antimony, copper, or iron concentrations are greater than 14, 13 or 2,500 ug/L, respectively, than pretreatment of the dewatering effluent will include an ion exchange unit or other technology to remove dissolved metals as shown on Figure 3.

RGP NOTICE OF INTENT FORM

The completed "Suggested Notice of Intent" (NOI) form as provided in the RGP is enclosed in Appendix A. Windover Construction (Windover) is the owner and construction manager and will hire a subcontractor to conduct Site work, including dewatering and treatment activities. Haley & Aldrich, Inc. (Haley & Aldrich) will monitor the subcontractor's dewatering activities and conduct water quality sampling to evaluate compliance with RGP discharge criteria on behalf of Windover Construction. In accordance with the requirements for this NOI submission, Ken Drolette of Windover Construction, Inc., is listed as the "Owner and Sole Permittee" for this NPDES RGP and has signed the NOI form.

SUPPORTING INFORMATION

A Best Management Practices Plan (BMPP), which outlines the proposed discharge operations covered under the RGP, is included in Appendix B.

In response to NOI Section 6 regarding information on Historic Places and Endangered Species, available public documentation on the National Register of Historic Places and Endangered Species Act are provided in Appendix C and D, respectively. The building formerly located at the Site was identified on the Massachusetts Cultural Resource Information System (MCRIS) under historic name, O'Donnell – Usen Fisheries, located at 47 Commercial Street. A Project Notification Form (PNF) was filed by Beal Associates, Inc. on 14 February 2014. The Massachusetts Historical Commission (MHC) responded in mid-March requesting the completion of a Form B be completed for the property. This was completed in early June. When the project team went through the Massachusetts Environmental Policy Act (MEPA) process, MHC also commented that they were going to submit the project to a Section 106 Federal Review since they indicated the project required an Army Corps permit. However, Army Corps did not take jurisdiction on the building, so no historic resources were part of that federal permit, and Section 106 did not apply. MHC has a 30 day statutory requirement to respond to all applications. Since there was no further response, the application is presumed approved.

In addition, the small whorled pogonia and piping plover were identified as endangered species present in the Town of Gloucester. Haley & Aldrich, Inc. consulted with the Maria Tur of the US Department of Fish and Wildlife and Lauren Gloriosi of Natural Heritage & Endangered Species Program (NHESP). Based on our review of the Information, Planning, and Conservation (IPaC) decision support system as provided by Maria Tur (US Department of Fish and Wildlife) and the fact that these species were not mapped as a habitat based on their review of available on-line resource tools and maps, we concluded that the Site is not located within an area mapped as a Priority Habitat for either species. IPaC is a conservation planning tool for streamlining the environmental review process.

Alpha Analytical laboratory reports for collected water samples are provided in Appendix E.

CLOSURE

Thank you for your consideration of this NOI. Please contact the undersigned at 617-886-7341 should you wish to discuss the information contained herein or need additional information.

Sincerely yours,
HALEY & ALDRICH, INC.

Elizabeth J. Christmas
Staff Engineer

Cole E. Worthy, LSP
Vice President

Attachments:

- Table I – Summary of Water Quality Data
- Figure 1 – Project Locus
- Figure 2 – Subsurface Exploration and Discharge Location Plan
- Figure 3 – Proposed Dewatering System Route
- Appendix A – Notice of Intent (NOI) for Remediation General Permit (RGP)
- Appendix B – Best Management Practices Plan (BMPP)
- Appendix C – National Register of Historic Places and Massachusetts Historical Commission Documentation
- Appendix D – Endangered Species Act Documentation
- Appendix E – Laboratory Data Reports

c: Windover Construction; Attn: Ken Drolette
City of Gloucester Department of Public Works; Attn: Michael Hale

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TABLE I
SUMMARY OF GROUNDWATER QUALITY DATA
BEAUPORT HOTEL
GLOUCESTER, MASSACHUSETTS
FILE NO.: 38605-050

LOCATION SAMPLING DATE LAB SAMPLE ID	RCGW-2 Reportable Concentration (ug/l)	NPDES RGP Effluent Discharge Criteria (at zero dilution) (ug/l)	HA14-04(OW) 8/19/2014 L1418843-01 L1418843-01 R1 L1419545-01
Volatile Organics by GC/MS (ug/l)			
Chloroform	50	NA	1.2
Dichlorodifluoromethane	100000	NA	5.4
Total BTEX	NA	100	ND
Total VOCs	NA	NA	6.6
Volatile Organics by GC/MS-SIM (ug/l)			
1,4-Dioxane	6000	Monitor only	ND(1.5)
Semivolatile Organics by GC/MS (ug/l)			
Total SVOCs	NA	10	ND
Semivolatile Organics by GC/MS-SIM (ug/l)			
Total SVOCs	NA	10	ND
Total Metals (ug/l)			
Antimony, Total	8000	5.6	**7.54**
Arsenic, Total	900	10	ND(1.25)
Cadmium, Total	4	0.2	ND(0.5)
Chromium, Total	300	48.8	ND(0.5)
Copper, Total	100000	5.2	**7.87**
Iron, Total	NA	1000	**2200**
Lead, Total	10	1.32	ND(1.25)
Mercury, Total	20	0.9	ND(0.1)
Nickel, Total	200	29	5.01
Selenium, Total	100	5	ND(12.5)
Silver, Total	7	1.2	ND(1)
Zinc, Total	900	66.6	47.78
Dissolved Metals (ug/l)			
Antimony, Dissolved	NA	5.6	ND(10)
Copper, Dissolved	NA	5.2	ND(5)
Iron, Dissolved	NA	1000	**2100**
PCBs by GC (ug/l)			
Aroclor 1016	5	NA	ND(0.125)
Aroclor 1221	5	NA	ND(0.125)
Aroclor 1232	5	NA	ND(0.125)
Aroclor 1242	5	NA	ND(0.125)
Aroclor 1248	5	NA	ND(0.125)
Aroclor 1254	5	NA	ND(0.125)
Aroclor 1260	5	NA	ND(0.1)
Total PCBs	NA	0.000064	ND
Anions by Ion Chromatography (ug/l)			
Chloride	NA	monitor only	11600000
Microextractables by GC (ug/l)			
1,2-Dibromoethane	2	0.05	ND(0.005)
Waste Characteristics			
Solids, Total Suspended (ug/l)	NA	30000	14000
Cyanide, Total (ug/l)	30	5.2	ND(2.5)
Chlorine, Total Residual (ug/l)	NA	11	ND(10)
pH	NA	NA	7.4
TPH (ug/l)	5000	5000	ND(2000)
Phenolics, Total (ug/l)	NA	300	ND(15)
Chromium, Hexavalent (ug/l)	300	11.4	ND(5)

Notes and Abbreviations:
ND(15): Not detected; number in parentheses is one-half the laboratory detection limit.
NA: Not Applicable
1. Bold values indicate an exceedance of NPDES RGP Effluent Discharge Criteria at zero dilution.
(Note that the concentrations of dissolved antimony and dissolved lead are below the NPDES RGP Effluent Discharge Criteria).

SITE COORDINATES: 42°36'34"N,70°39'55"W

U.S.G.S. QUADRANGLE: GLOUCESTER OE S, MA

HALEY & ALDRICH

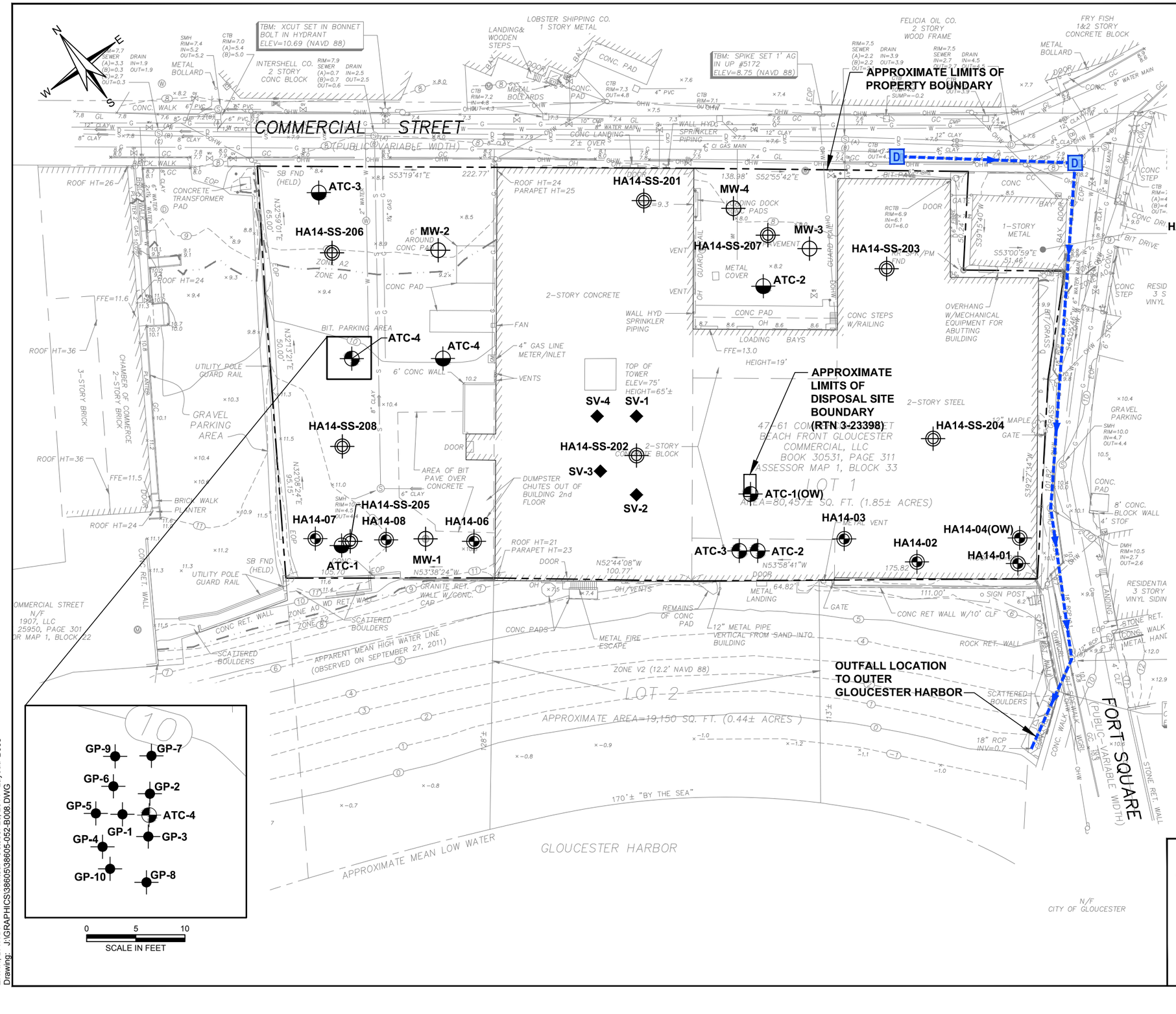
BEAUPORT GLOUCESTER HOTEL
47-61 COMMERCIAL STREET
GLOUCESTER, MASSACHUSETTS

PROJECT LOCUS

SCALE: 1:24,000
OCTOBER 2014

FIGURE 1

38605-040 1.PDF



LEGEND:

- SV-1 ◆ — DESIGNATION AND APPROXIMATE LOCATION OF SOIL VAPOR SAMPLE COLECTED BY HALEY & ALDRICH, INC. ON 22 AUGUST 2014
- HA14-01 ⊕ — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY GEOLOGIC EARTH EXPLORATIONS, INC. AND MONITORED BY HALEY & ALDRICH, INC. BETWEEN 1 JULY AND 29 JULY 2014
- HA14-SS-201 ⊕ — DESIGNATION AND APPROXIMATE LOCATION OF HAND EXCAVATED AUGER EXCAVATIONS COMPLETED BY WINDOVER CONSTRUCTION AND HALEY & ALDRICH, INC. BETWEEN 7 AND 25 JULY 2014
- GP-1 ⊕ — DESIGNATION AND APPROXIMATE LOCATION OF GEOPROBE BOREHOLE DRILLED BY TECHNICAL DRILLING SERVICES AND MONITORED BY ATC ASSOCIATES, INC. ON 20 MARCH 2012
- ATC-1 ⊕ — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY NEW HAMPSHIRE BORING AND MONITORED BY ATC ASSOCIATES, INC. BETWEEN 4 AND 7 OCTOBER 2011.
- ATC-1 ⊕ — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY NEW HAMPSHIRE BORING, INC. AND MONITORED BY ATC ASSOCIATES, INC. BETWEEN 9 AND 13 JUNE 2011
- MW-1 ⊕ — EXISTING MONITORING WELL
- (OW) □ — INDICATES OBSERVATION WELL INSTALLED IN COMPLETED BOREHOLE
- D — APPROXIMATE LOCATION OF PROPOSED DISCHARGE
- APPROXIMATE ROUTE OF DISCHARGE TO OUTFALL

NOTE:

1. BASE PLAN PREPARED FROM AN ELECTRONIC PLAN TITLED "26-19250 EC_Transmittal_11-10-2011.dwg" PREPARED BY COLER & COLANTONIO, INC., DATED 24 OCTOBER 2011 FOR BEACH FRONT GLOUCESTER COMMERCIAL, LLC.

HALEY & ALDRICH

BEAUPORT GLOUCESTER HOTEL
41-67 COMMERCIAL STREET
GLOUCESTER, MASSACHUSETTS

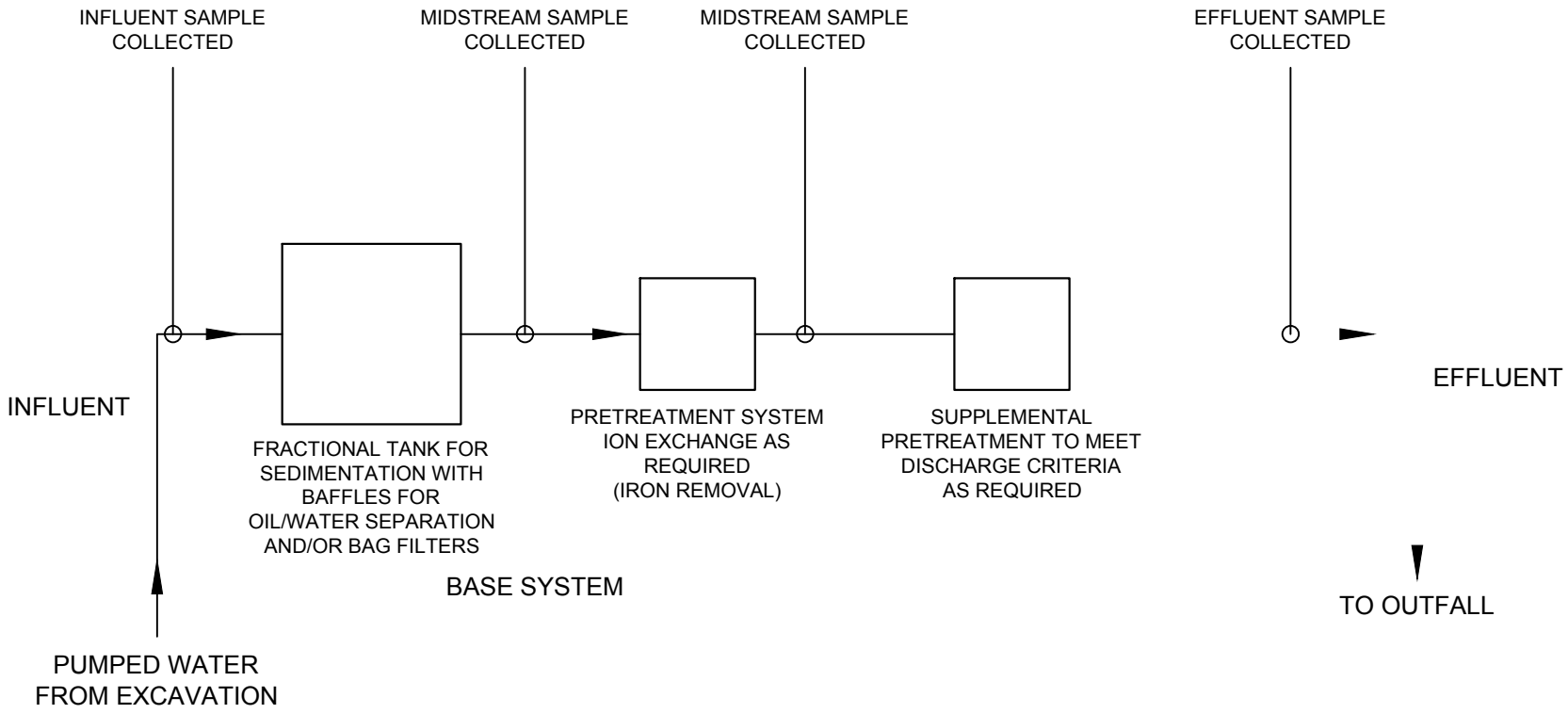
SUBSURFACE EXPLORATION AND DISCHARGE LOCATION PLAN

SCALE: AS SHOWN
OCTOBER 2014

FIGURE 2

ERVIN, DAYNA Printed: October 28, 2014 Layout: B008
Drawing: J:\GRAPHICS\38605\38605-052-B008.DWG

ERVIN, DAYNA Printed: October 28, 2014 Layout: A009
Drawing: J:\GRAPHICS\38605\38605-052-A009.DWG



LEGEND:

→ DIRECTION OF FLOW

NOTE:

1. DETAILS OF TREATMENT SYSTEM MAY VARY FROM SYSTEM INDICATED ABOVE. SPECIFIC MEANS AND METHODS OF TREATMENT TO BE SELECTED BY CONTRACTOR. WATER WILL BE TREATED TO MEET REQUIRED EFFLUENT STANDARDS.

HALEY & ALDRICH

BEAUPORT GLOUCESTER HOTEL
41-67 COMMERCIAL STREET
GLOUCESTER, MASSACHUSETTS

PROPOSED TREATMENT SYSTEM SCHEMATIC

SCALE: AS SHOWN
OCTOBER 2014

FIGURE 3

APPENDIX A

Notice of Intent (NOI) for Remediation General Permit (RGP)

B. Suggested Form for Notice of Intent (NOI) for the Remediation General Permit

1. General facility/site information. Please provide the following information about the site:

a) Name of **facility/site**: Beauport Hotel		**Facility/site** mailing address:		
Location of **facility/site**: longitude: 70°39'56.2" latitude: 42°36'35.3"	Facility SIC code(s):	Street: 47-61 Commercial Street		
b) Name of **facility/site owner:** Windover Construction		Town: Gloucester		
Email address of facility/site owner:		State: MA	Zip: 01930	County: Essex
Telephone no. of facility/site **owner**: 978-526-9410				
Fax no. of facility/site **owner**: 978-526-9409		**Owner** is (check one): 1. Federal ○ 2. State/Tribal ○ 3. Private ◉ 4. Other ○ if so, describe:		
Address of **owner** (if different from site):				
Street: 66 Cherry Hill Drive				
Town: Beverly	State: MA	Zip: 01915	County: Essex	
c) Legal name of **operator**:		**Operator** telephone no: 978-526-9410		
Windover Construction		**Operator** fax no.: 978-526-9409	**Operator** email: ken@windover.com	
Operator contact name and title: Ken Drolette				
Address of **operator** (if different from owner):		Street: 66 Cherry Hill Drive		
Town: Beverly	State: MA	Zip: 01915	County: Essex	

d) Check Y for "yes" or N for "no" for the following:
1. Has a prior NPDES permit exclusion been granted for the discharge? Y__ N__X__, if Y, number:
2. Has a prior NPDES application (Form 1 & 2C) ever been filed for the discharge?
Y__ N__X__, if Y, date and tracking #:
3. Is the discharge a "new discharge" as defined by 40 CFR 122.2? Y__X__ N__
4. For sites in Massachusetts, is the discharge covered under the Massachusetts Contingency Plan (MCP) and exempt from state permitting? Y__X__N__

e) Is site/facility subject to any State permitting, license, or other action which is causing the generation of discharge? Y__ N__X__
If Y, please list:
1. site identification # assigned by the state of NH or MA:
2. permit or license # assigned:
3. state agency contact information: name, location, and telephone number:

f) Is the site/facility covered by any other EPA permit, including:
1. Multi-Sector General Permit? Y__ N__X__,
if Y, number:
2. Final Dewatering General Permit? Y__ N__X__,
if Y, number:
3. EPA Construction General Permit? Y__X__N__,
if Y, number: MAR12AX47
4. Individual NPDES permit? Y__ N__X__,
if Y, number:
5. any other water quality related individual or general permit? Y__
N__X__, if Y, number:

g) Is the site/facility located within or does it discharge to an Area of Critical Environmental Concern (ACEC)? Y__ N__X__

h) Based on the facility/site information and any historical sampling data, identify the sub-category into which the potential discharge falls.

Activity Category	**Activity Sub-Category**
I - Petroleum Related Site Remediation	A. Gasoline Only Sites ☐ B. Fuel Oils and Other Oil Sites (including Residential Non-Business Remediation Discharges) ☐ C. Petroleum Sites with Additional Contamination ☐
II - Non Petroleum Site Remediation	A. Volatile Organic Compound (VOC) Only Sites ☐ B. VOC Sites with Additional Contamination ☐ C. Primarily Heavy Metal Sites ☐
III - Contaminated Construction Dewatering	A. General Urban Fill Sites ☒ B. Known Contaminated Sites ☒

IV - Miscellaneous Related Discharges	A. Aquifer Pump Testing to Evaluate Formerly Contaminated Sites ☐ B. Well Development/Rehabilitation at Contaminated/Formerly Contaminated Sites ☐ C. Hydrostatic Testing of Pipelines and Tanks ☐ D. Long-Term Remediation of Contaminated Sumps and Dikes ☐ E. Short-term Contaminated Dredging Drain Back Waters (if not covered by 401/404 permit) ☐

2. Discharge information. Please provide information about the discharge, (attaching additional sheets as necessary) including:

a) Describe the discharge activities for which the owner/applicant is seeking coverage:

Temporary construction dewatering.

b) Provide the following information about each discharge:

1) Number of discharge points: 2

2) What is the **maximum** and **average flow rate** of discharge (in cubic feet per second, ft^3/s)?
Max. flow: 0.223 Is maximum flow a **design value**? Y ○ N ◉
Average flow (include units) 0.1 cfs Is average flow a design value or estimate? estimate

3) Latitude and longitude of each discharge within 100 feet:
pt.1: lat. 42°36'34.24"N long. 70°39'53.18"W pt.2: lat. 42°36'33.74"N long. 70°39'52.20"W;
pt.3: lat. long. pt.4: lat. long. ;
pt.5: lat. long. pt.6: lat. long. ;
pt.7: lat. long. pt.8: lat. long. ; etc.

4) If hydrostatic testing, total volume of the discharge (gals): N/A

5) Is the discharge intermittent ◉ or seasonal ○ ?
Is discharge ongoing? Y ○ N ◉

c) Expected dates of discharge (mm/dd/yy): start 12/1/2014 end 09/01/2015

d) Please attach a line drawing or flow schematic showing water flow through the facility including:
1. sources of intake water, 2. contributing flow from the operation, 3. treatment units, and 4. discharge points and receiving waters(s). See Figures 2 and 3

3. Contaminant information.

a) Based on the sub-category selected (see Appendix III), indicate whether each listed chemical is **believed present** or **believed absent** in the potential discharge. Attach additional sheets as needed.

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
1. Total Suspended Solids (TSS)		☐	☒	1	grab	30,2540D	5000	14000		14000	
2. Total Residual Chlorine (TRC)		☒	☐	1	grab	30,4500CL-D	20	ND		ND	
3. Total Petroleum Hydrocarbons (TPH)		☐	☒	1	grab	74,1664A	4000	ND		ND	
4. Cyanide (CN)	57125	☒	☐	1	grab	30,4500CN-CE	5	ND		ND	
5. Benzene (B)	71432	☒	☐	1	grab	1,8260C	0.5	ND		ND	
6. Toluene (T)	108883	☒	☐	1	grab	1,8260C	0.75	ND		ND	
7. Ethylbenzene (E)	100414	☒	☐	1	grab	1,8260C	0.5	ND		ND	
8. (m,p,o) Xylenes (X)	108883; 106423; 95476; 1330207	☒	☐	1	grab	1,8260C	1	ND		ND	
9. Total BTEX [2]	n/a	☒	☐	1	grab	1,8260C	NA	ND		ND	
10. Ethylene Dibromide (EDB) (1,2-Dibromoethane) [3]	106934	☒	☐	1	grab	1,8260C	2	ND		ND	
11. Methyl-tert-Butyl Ether (MtBE)	1634044	☒	☐	1	grab	1,8260C	1	ND		ND	
12. tert-Butyl Alcohol (TBA) (Tertiary-Butanol)	75650	☒	☐	1	grab	1,8260C	10	ND		ND	

***** Numbering system is provided to allow cross-referencing to Effluent Limits and Monitoring Requirements by Sub-Category included in Appendix III, as well as the Test Methods and Minimum Levels associated with each parameter provided in Appendix VI.

[2] BTEX = Sum of Benzene, Toluene, Ethylbenzene, total Xylenes.

[3] EDB is a groundwater contaminant at fuel spill and pesticide application sites in New England.

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
13. tert-Amyl Methyl Ether (TAME)	9940508	☒	☐	1	grab	1,8260C	2	ND		ND	
14. Naphthalene	91203	☒	☐	1	grab	1,8260C	2.5	ND		ND	
15. Carbon Tetrachloride	56235	☒	☐	1	grab	1,8260C	0.5	ND		ND	
16. 1,2 Dichlorobenzene (o-DCB)	95501	☒	☐	1	grab	1,8260C	2.5	ND		ND	
17. 1,3 Dichlorobenzene (m-DCB)	541731	☒	☐	1	grab	1,8260C	2.5	ND		ND	
18. 1,4 Dichlorobenzene (p-DCB)	106467	☒	☐	1	grab	1,8260C	2.5	ND		ND	
18a. Total dichlorobenzene		☒	☐	1	grab	1,8260C	NA	ND		ND	
19. 1,1 Dichloroethane (DCA)	75343	☒	☐	1	grab	1,8260C	0.75	ND		ND	
20. 1,2 Dichloroethane (DCA)	107062	☒	☐	1	grab	1,8260C	0.5	ND		ND	
21. 1,1 Dichloroethene (DCE)	75354	☒	☐	1	grab	1,8260C	0.5	ND		ND	
22. cis-1,2 Dichloroethene (DCE)	156592	☒	☐	1	grab	1,8260C	0.5	ND		ND	
23. Methylene Chloride	75092	☒	☐	1	grab	1,8260C	3	ND		ND	
24. Tetrachloroethene (PCE)	127184	☒	☐	1	grab	1,8260C	0.5	ND		ND	
25. 1,1,1 Trichloro-ethane (TCA)	71556	☒	☐	1	grab	1,8260C	0.5	ND		ND	
26. 1,1,2 Trichloro-ethane (TCA)	79005	☒	☐	1	grab	1,8260C	0.75	ND		ND	
27. Trichloroethene (TCE)	79016	☒	☐	1	grab	1,8260C	0.5	ND		ND	

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
28. Vinyl Chloride (Chloroethene)	75014	☒	☐	1	grab	1,8260C	1	ND		ND	
29. Acetone	67641	☒	☐	1	grab	1,8260C	5	ND		ND	
30. 1,4 Dioxane	123911	☒	☐	1	grab	1,8260C-SIM(M)	3	ND		ND	
31. Total Phenols	108952	☒	☐	1	grab	1,8270D	5	ND		ND	
32. Pentachlorophenol (PCP)	87865	☒	☐	1	grab	1,8270D-SIM	0.8	ND		ND	
33. Total Phthalates (Phthalate esters) [4]		☒	☐	1	grab	1,8270D	NA	ND		ND	
34. Bis (2-Ethylhexyl) Phthalate [Di-(ethylhexyl) Phthalate]	117817	☒	☐	1	grab	1,8270D	3	ND		ND	
35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)		☐	☐	1	grab	NA	NA	ND		ND	
a. Benzo(a) Anthracene	56553	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
b. Benzo(a) Pyrene	50328	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
c. Benzo(b)Fluoranthene	205992	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
d. Benzo(k)Fluoranthene	207089	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
e. Chrysene	21801	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
f. Dibenzo(a,h)anthracene	53703	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
g. Indeno(1,2,3-cd) Pyrene	193395	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)		☐	☐	1	grab	NA	NA	ND		ND	

[4] The sum of individual phthalate compounds.

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
h. Acenaphthene	83329	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
i. Acenaphthylene	208968	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
j. Anthracene	120127	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
k. Benzo(ghi) Perylene	191242	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
l. Fluoranthene	206440	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
m. Fluorene	86737	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
n. Naphthalene	91203	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
o. Phenanthrene	85018	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
p. Pyrene	129000	☒	☐	1	grab	1,8270D-SIM	0.2	ND		ND	
37. Total Polychlorinated Biphenyls (PCBs)	85687; 84742; 117840; 84662; 131113; 117817.	☒	☐	1	grab	5,608	0.250	ND		ND	
38. Chloride	16887006	☐	☒	1	grab	44,300.0	250000	11600000		11600000	
39. Antimony	7440360	☐	☒	1	grab	1,6020A	3	7.54		7.54	
40. Arsenic	7440382	☒	☐	1	grab	1,6020A	2.5	ND		ND	
41. Cadmium	7440439	☒	☐	1	grab	1,6020A	1	ND		ND	
42. Chromium III (trivalent)	16065831	☐	☐	1	grab	1,6020A	1	ND		ND	
43. Chromium VI (hexavalent)	18540299	☒	☐	1	grab	30,3500CR-D	10	ND		ND	
44. Copper	7440508	☒	☐	1	grab	1,6020A	1	7.87		7.87	
45. Lead	7439921	☒	☐	1	grab	1,6020A	2.5	ND		ND	
46. Mercury	7439976	☒	☐	1	grab	3,245.1	0.2	ND		ND	
47. Nickel	7440020	☒	☐	1	grab	1,6020A	0.5	5.01		5.01	
48. Selenium	7782492	☒	☐	1	grab	1,6020A	25	ND		ND	
49. Silver	7440224	☒	☐	1	grab	1,6020A	2.0	ND		ND	
50. Zinc	7440666	☒	☐	1	grab	1,6020A	10	47.8		47.8	
51. Iron	7439896	☒	☐	1	grab	19,200.7	50	2200		2200	
Other (describe):		☐	☐								

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
Chloroform	67-66-3	☐	☒	1	grab	1,8260C	0.75	1.2		1.2	
Dichlorodifluoromethane	75-71-8	☐	☒	1	grab	1,8260C	5	5.4		5.4	

b) For discharges where **metals** are believed present, please fill out the following (attach results of any calculations):

Step 1: Do any of the metals in the influent exceed the effluent limits in Appendix III (i.e., the limits set at zero dilution)? Y◉ N○	If yes, which metals? Antimony, Copper, Iron
Step 2: For any metals which exceed the **Appendix III** limits, calculate the **dilution factor (DF)** using the formula in Part I.A.3.c (step 2) of the NOI instructions or as determined by the State prior to the submission of this NOI. What is the dilution factor for applicable metals? Metal: Antimony DF: 2.5 Metal: Copper DF: 2.5 Metal: Iron DF: 2.5 Metal: DF: Etc.	Look up the limit calculated at the corresponding dilution factor in **Appendix IV.** Do any of the metals in the **influent** have the potential to exceed the corresponding **effluent** limits in Appendix IV (i.e., is the influent concentration above the limit set at the calculated dilution factor)? Y○ N◉ If Y, list which metals:

4. Treatment system information. Please describe the treatment system using separate sheets as necessary, including:

a) A description of the treatment system, including a schematic of the proposed or existing treatment system:

See attached Figure 3.

b) Identify each applicable treatment unit (check all that apply):	Frac. tank ☒	Air stripper ☐	Oil/water separator ☒	Equalization tanks ☐	Bag filter ☒	GAC filter ☒
	Chlorination ☐	De-chlorination ☐	Other (please describe):	Additional pretreatment as necessary to meet NPDES RGP Discharge Criteria.		

c) Proposed **average** and **maximum flow rates** (gallons per minute) for the discharge and the **design flow rate**(s) (gallons per minute) of the treatment system:
Average flow rate of discharge 50 gpm Maximum flow rate of treatment system 100 gpm
Design flow rate of treatment system 100 gpm

d) A description of chemical additives being used or planned to be used (attach MSDS sheets):

N/A

5. Receiving surface water(s). Please provide information about the receiving water(s), using separate sheets as necessary:

a) Identify the discharge pathway:	Direct to receiving water ☐	Within facility (sewer) ☐	Storm drain ☒	Wetlands ☐	Other (describe):

b) Provide a narrative description of the discharge pathway, including the name(s) of the receiving waters:

Effluent will be discharged to storm drains in Commercial Street which discharge to Outer Gloucester Harbor.

c) Attach a detailed map(s) indicating the site location and location of the outfall to the receiving water:
1. For multiple discharges, number the discharges sequentially.
2. For indirect dischargers, indicate the location of the discharge to the indirect conveyance and the discharge to surface water
The map should also include the location and distance to the nearest sanitary sewer as well as the locus of nearby sensitive receptors (based on USGS topographical mapping), such as surface waters, drinking water supplies, and wetland areas.

d) Provide the state water quality classification of the receiving water SB

e) Provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water N/A cfs
Please attach any calculation sheets used to support stream flow and dilution calculations.

f) Is the receiving water a listed 303(d) water quality impaired or limited water? Y ◉ N ○ If yes, for which pollutant(s)?

Is there a final TMDL? Y ◉ N ○ If yes, for which pollutant(s)? Pathogens (Fecal Coliform)

6. ESA and NHPA Eligibility.

Please provide the following information according to requirements of Permit Parts I.A.4 and I.A.5 Appendices II and VII.

a) Using the instructions in Appendix VII and information on Appendix II, under which criterion listed in Part I.C are you eligible for coverage under this general permit?

A ○ B ◉ C ○ D ○ E ○ F ○

b) If you selected Criterion D or F, has consultation with the federal services been completed? Y ○ N ○ Underway ○

c) If consultation with U.S. Fish and Wildlife Service and/or NOAA Fisheries Service was completed, was a written concurrence finding that the discharge is "not likely to adversely affect" listed species or critical habitat received? Y ○ N ◉

d) Attach documentation of ESA eligibility as described in the NOI instructions and required by Appendix VII, Part I.C, Step 4.

e) Using the instructions in Appendix VII, under which criterion listed in Part II.C are you eligible for coverage under this general permit?

1 ○ 2 ○ 3 ◉

f) If Criterion 3 was selected, attach all written correspondence with the State or Tribal historic preservation officers, including any terms and conditions that outline measures the applicant must follow to mitigate or prevent adverse effects due to activities regulated by the RGP.

7. Supplemental information.

Please provide any supplemental information. Attach any analytical data used to support the application. Attach any certification(s) required by the general permit.

Laboratory Data is provided in Appendix E.

8. Signature Requirements: The Notice of Intent must be signed by the operator in accordance with the signatory requirements of 40 CFR Section 122.22, including the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Facility/Site Name:	Beauport Gloucester Hotel
Operator signature:	
Printed Name &Title:	Ken Drolette, Superintendent, Windover Construction
Date:	

8. Signature Requirements: The Notice of Intent must be signed by the operator in accordance with the signatory requirements of 40 CFR Section 122.22, including the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Facility/Site Name:	Beauport Gloucester Hotel
Operator signature:	Kenneth J Drolette
Printed Name &Title:	Ken Drolette, Superintendent, Windover Construction
Date:	10/29/14

APPENDIX B

Best Management Practices Plan (BMPP)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
REMEDIATION GENERAL PERMIT
TEMPORARY CONSTRUCTION DEWATERING
BEAUPORT GLOUCESTER HOTEL
41-67 COMMERCIAL STREET
GLOUCESTER, MASSACHUSETTS

Best Management Practices Plan

A Notice of Intent for a Remediation General Permit (RGP) under the National Pollutant Discharge Elimination System (NPDES) has been submitted to the US Environmental Protection Agency (EPA) in anticipation of temporary construction dewatering planned to occur during the construction of the proposed Beauport Hotel located at 47 to 61 Commercial Street in Gloucester, Massachusetts. This Best Management Practices Plan (BMPP) has been prepared as an Appendix to the RGP and will be posted at the site during the time period that temporary construction dewatering is occurring at the site.

Water Treatment and Management

Construction dewatering will be conducted using a combination of drainage ditches and sumps located inside the excavation. The treatment system will be designed by the Contractor. Prior to discharge, collected water will likely be routed through a sedimentation tank with baffles for oil/water separation, bag filters, and granular activated carbon (GAC), as required, to remove suspended solids and undissolved chemical constituents. Supplemental pretreatment may be required to meet discharge criteria as shown on the Proposed Treatment System Schematic included in Figure 3. Construction dewatering under this RGP NOI will include piping and discharging to storm drains located in Commercial Street adjacent to the site. The storm drains travel east along Commercial Street, then south along Fort Square before discharging from outfalls to Outer Gloucester Harbor.

Discharge Monitoring and Compliance

Regular sampling and testing will be conducted by the Contractor at the treated effluent as required by the RGP. This includes chemical testing required within the first month of discharging, and the monthly testing to be conducted through the end of the scheduled discharge.

Monitoring will include checking the condition of the treatment system, assessing the need for treatment system adjustments based on monitoring data, observing and recording daily flow rates and discharge quantities, and verifying the flow path of the discharged effluent.

The total monthly flow will be monitored by checking and documenting the flow through the flow meter to be installed on the system. Flow will be maintained below the "system design flow" by regularly monitoring flow and adjusting the amount of construction dewatering as needed.

Monthly monitoring reports will be compiled and maintained at the site.

System Maintenance

A number of methods will be used to minimize the potential for violations for the term of this permit. Scheduled regular maintenance of the treatment system will be conducted to verify proper operation. Regular maintenance will include checking the condition of the treatment system equipment such as the fractionization tanks, filters, hoses, pumps, and flow meters. Equipment will be monitored daily for potential issues or unscheduled maintenance requirements.

Employees who have direct or indirect responsibility for ensuring compliance with the RGP will be trained by the Operator.

Miscellaneous Items

It is anticipated that the excavation support system, erosion control measures, and the nature of the site and surrounding infrastructure will minimize potential runoff to or from the site. The project specifications also include requirements for erosion control.

Site security for the treatment system will be covered within the overall site security plan.

No adverse affects of designated water uses of surrounding surface water bodies is anticipated. Gloucester Harbor is the nearest surface water body to the site located adjacent to the construction activities on site. Dewatering effluent will be pumped to a sedimentation tank with baffles for oil/water separation, bag filters, and GAC, as required, prior to discharge to the storm drains.

Management of Treatment System Materials

Groundwater analytical data for the site is below the applicable MCP RCGW-2 criteria but above the NPDES RGP criteria for total antimony, total copper, and total and dissolved iron. Dewatering effluent will be pumped directly to the treatment system from the excavation with use of hoses and sumps to minimize handling. The contractor will establish staging areas on the site for any equipment or materials storage which may be possible sources of pollution away from any dewatering activities.

Sediment from the fractionalization tank used in the treatment system will be characterized and disposed of as soil at an appropriate receiving facility in accordance with applicable laws and regulations. GAC will be recycled and/or removed from the site to an appropriate receiving facility. Bag filters will be placed in drums and manifested for off-site disposal.

APPENDIX C

National Register of Historic Places and
Massachusetts Historical Commission Documentation

Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No:	GLO.19
Historic Name:	O'Donnell - Usen Fisheries
Common Name:	
Address:	47 Commercial St
City/Town:	Gloucester
Village/Neighborhood:	Gloucester
Local No:	9
Year Constructed:	
Architect(s):	
Architectural Style(s):	Spanish Eclectic
Use(s):	Food Processing and Packaging; Industrial Complex or District
Significance:	Architecture; Industry
Area(s):	GLO.AH: Harbor Village GLO.AU: Gloucester Harbor Area
Designation(s):	
Building Materials(s):	Roof: Tar, Built-up Wall: Stucco; Concrete Unspecified

The Massachusetts Historical Commission (MHC) has converted this paper record to digital format as part of ongoing projects to scan records of the Inventory of Historic Assets of the Commonwealth and National Register of Historic Places nominations for Massachusetts. Efforts are ongoing and not all inventory or National Register records related to this resource may be available in digital format at this time.

The MACRIS database and scanned files are highly dynamic; new information is added daily and both database records and related scanned files may be updated as new information is incorporated into MHC files. Users should note that there may be a considerable lag time between the receipt of new or updated records by MHC and the appearance of related information in MACRIS. Users should also note that not all source materials for the MACRIS database are made available as scanned images. Users may consult the records, files and maps available in MHC's public research area at its offices at the State Archives Building, 220 Morrissey Boulevard, Boston, open M-F, 9-5.

Users of this digital material acknowledge that they have read and understood the MACRIS Information and Disclaimer (http://mhc-macris.net/macrisdisclaimer.htm)

Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

This file was accessed on:

Friday, September 05, 2014 at 3:54: PM

GLO.19
Pl-Gloucs

FORM B - BUILDING

MASSACHUSETTS HISTORICAL COMMISSION

In Area no.	Form no.
AJ ~~A~~ AH	~~9~~ 19

Town Gloucester

Address 47 Commercial Street

Name O'Donnell-Usen Fisheries

Present use industrial

Present owner O'Donnell-Usen Fisheries Corp.

Description:

Date c. 1925

Source J. Garland's Eastern Point

Style Italianate/Spanish Colonial

Architect unknown

Exterior wall fabric stucco

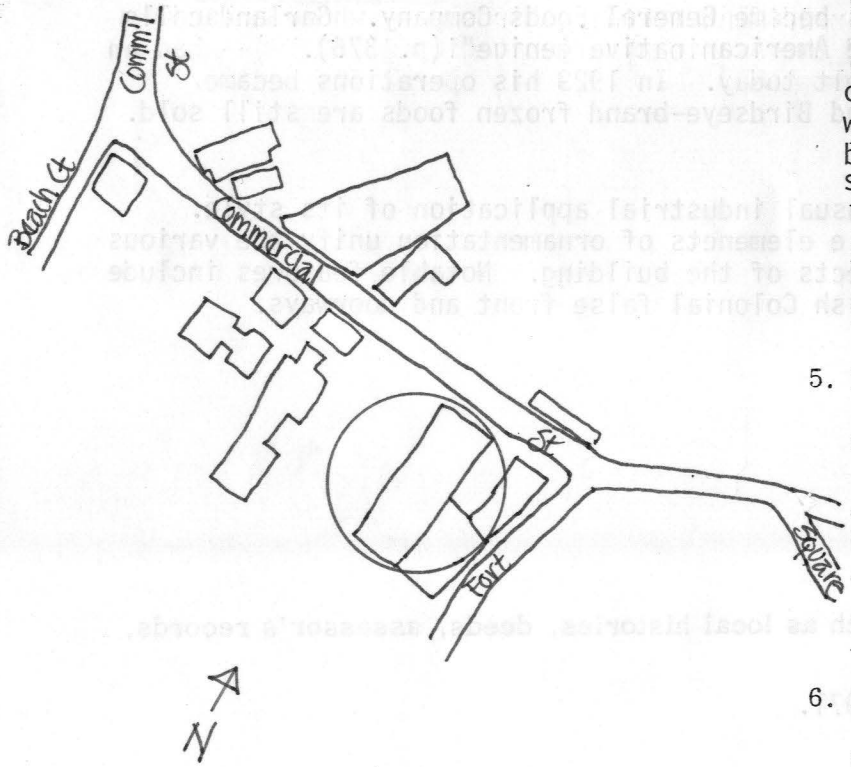
Outbuildings (describe) attached indus'l bldgs.

Other features facade has false front w/ crenellated parapet; symmetrical entrances w/ pilasters, entablature, & console brackets; bays separated by piers; square tower at rear

Altered filling in of windows & doorway Date mid-20t c

Moved no Date ---

4. Map. Draw sketch of building location in relation to nearest cross streets and other buildings. Indicate north.



5. Lot size:

One acre or less ___ Over one acre X

Approximate frontage

Approximate distance of building from street

6. Recorded by wendy frontiero

Organization Gloucester Development Team

Date 23 oct 78

(over)

G10.19

7. Original owner (if known) General Seafoods Corp. (?)

   Original use industrial

   Subsequent uses (if any) and dates same

8. Themes (check as many as applicable)

Aboriginal		Conservation		Recreation	
Agricultural		Education		Religion	
Architectural	X	Exploration/		Science/	
The Arts		settlement		invention	X
Commerce		Industry	X	Social/	
Communication		Military		humanitarian	
Community development		Political		Transportation	

9. Historical significance (include explanation of themes checked above)

A plaque on this building states, "At this site Clarence Birdseye pioneered the frozen food industry." Clarence Birdseye (1886-1956) moved to Gloucester in 1924, forming General Seafoods Corporation in 1925 at Fort Point for the purpose of mass-producing quick-frozen fish and other foods. Garland reports that "in 1927 he moved into a new plant up Commercial Street designed around the belt freezer, his best known mechanical contribution to the industry" (p. 376). A sign on an annex building reads,"In this building Clarence Birdseye constructed the first commercial production facility"for his frozen foods research lab & experimental line. Birdseye-- whom Garland describes as an "archetype of the American native genius" (p. 376)-- had an impact that is still being felt today. In 1929 his operations became the General Foods Company, and Birdseye-brand frozen foods are still sold nationwide.

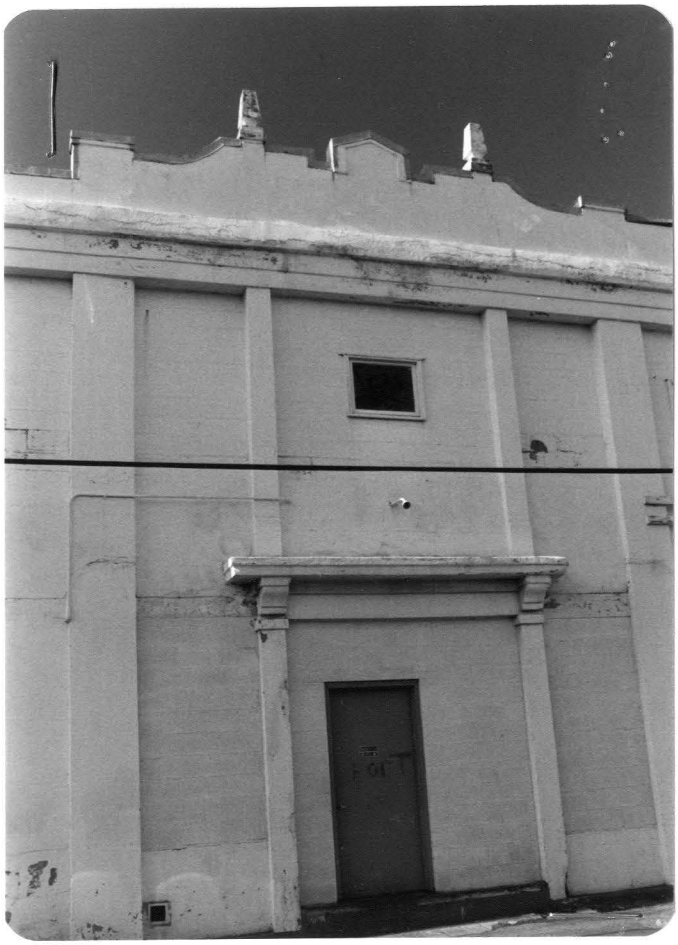
The building displays an unusual industrial application of its style. Broad flat surfaces and simple elements of ornamentation unify the various aesthetic and functional aspects of the building. Notable features include an Italianate tower and Spanish Colonial false front and doorways.

10. Bibliography and/or references (such as local histories, deeds, assessor's records, early maps, etc.)

J. Garland, Eastern Point, 1971.
atlases (1884, 99)

MHC INVENTORY FORM CONTINUATION SHEET **MACRIS No.** 610.19

MHC Inventory scanning project, 2008-2012



Original yellow form: Eligibility file ____
copies: Inventory form ____
Town file(w/corresp.) ____
Macris ____
NR director ____

GLO.19

493

Community: Gloucester

MHC OPINION: ELIGIBILITY FOR NATIONAL REGISTER

Date Received: Date Due: Date Reviewed: 9/15/93

Type: Individual District (Attach map indicating boundaries)

Name: Gloucester multiproperty submission. Inventory Form:

Address: various Maritime Context 19.

Requested by:

Action: (Honor) ITC (Grant) R & C Other:

Agency: Staff in charge of Review: BF

INDIVIDUAL PROPERTIES

__ Eligible
__ Eligible, also in district
__ Eligible only in district
__ Ineligible
__ More information needed

DISTRICTS

__ Eligible
__ Ineligible
__ More information needed

CRITERIA: A B C D

LEVEL: Local State National

STATEMENT OF SIGNIFICANCE by BF

The list of properties to be included in the maritime context was drawn from the recommendations of the 1989 Preservation Plan. All districts & buildings included in this phase of the project will be nominated strictly for their association with the maritime context. In later phases, as more contexts are developed, additional properties associated with the maritime context as well as other ~~properties~~ contexts will be nominated. District bounds will be determined in the field & in discussion 10/86 w/ consultants.

Eligible properties include:

See ind. forms for specific inf.
GLO.19

East Gloucester Sq. HD
@ 250 properties, A+C [AW]

Gloucester Harbor HD [AV]
@ 50 properties, A, C, possibly D

Gloucester Net + Twine Co. [1343]
A+C

Babson-Allnig House, 245 Wash St. - A+C [1022]
304 Main St. - A+C

include
Empire Fish [1342]
Gorton's Complex [1324]
[312] H. Blackburn Bldg, Main St.
[71] 15 Western Ave.
[19] - O'Donnell - Usen
[939] Glouc. Marine Railways
Blynman Canal, A, C+D [940]

? all ind. eligible but could be incorp. into Harbor HD

BEALS · ASSOCIATES INC.

2 THIRTEENTH STREET CHARLESTOWN, MA 02129
PHONE: 617-242-1120 FAX: 617-242-1190

February 14, 2014

Brona Simon, Executive Director
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, Mass. 02125

Dear Ms. Simon:

Enclosed is a Project Notification Form for the proposed Beauport Gloucester Hotel in Gloucester, Mass. The project site is currently occupied by an early 20th century reinforced concrete building, which was historically used for fish processing, and a large, late 20th century, windowless metal addition that was used for storage.

The waterfront site is located on the neck of "the Fort", a small peninsula separating the Inner and Outer Harbors that contains a mix of residential, commercial, and industrial uses. The proposed hotel will provide year-round accommodations for both business and pleasure travelers, in the tradition of Gloucester's long history of seaside hotels, several of which were located close by.

The character of the early 20th century building derives primarily from its imposing massing, its iconic tower, and its historical associations with Clarence Birdseye, who in the 1920s established an innovative plant for quick-freezing fish and other foods here. Architecturally, the original detailing is interesting but quite modest in both concept and execution; virtually all original fenestration has been reconfigured; and the building envelope and structural elements are seriously deteriorated after years of disuse. Adaptive re-use is not feasible due to the incompatible programmatic requirements of a major hotel and because of the many code requirements that would be triggered for upgrading structural systems, fire protection, and seismic and wind loading.

The proposed project will replace the existing buildings on the site with a new structure consisting of grade-level covered parking and three floors of hotel space above. It will incorporate a new tower in the general vicinity of and similar in overall height to the existing tower. The developer plans a significant interpretive display within one of the public spaces of the hotel, to convey the history and significance of the property.

Please feel free to contact me or our preservation consultant, Wendy Frontiero, if you have any questions or need additional information.

Sincerely,
Beals Associates, Inc.

Matthew A. Webber, E.I.T

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Beauport Gloucester Hotel

Location / Address: 47-61 Commercial Street

City / Town: Gloucester, Mass.

Project Proponent

Name: Beauport Gloucester, LLC

Address: 6 Rowe Square

City/Town/Zip/Telephone: Gloucester, Mass. 01930; 978 . 282 . 9700

Agency license or funding for the project (list all licenses, permits, approvals, grants, or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or Funding (specify)
Massachusetts DEP	Chapter 91 Letter Approval
Massachusetts EOEEA	MEPA ENF Certificate
Massachusetts Office of Coastal Zone Management	CZM Review
US Army Corps of Engineers	Category 2 Permit

Project Description (narrative):
The project consists of a 96-room hotel with a restaurant, function rooms, and parking. The three-story hotel structure will surmount ground-level covered parking, with hotel reception and function space at the first floor above grade, and guest rooms on the second and third floors. The project also involves the construction of a new sea wall, public access walkway, and ramps to Pavilion Beach. Located in the Fort neighborhood of downtown Gloucester, the property is adjacent to the waterfront and within walking distance of the Inner Harbor and downtown commercial district. Aerial views of the site are attached.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.
The proposed project includes demolition of the existing complex, which contains a total of approximately 49,800 square feet. It is composed of two main parts: (1) a large two-story, reinforced concrete structure built in 1916 (containing approximately 25,800 square feet) with a 1 ½ story brick and concrete-block boiler room on its southeast side and a tall reinforced concrete tower rising from the interior of the parcel; and (2) a large steel frame, metal clad addition (two stories high and approx. 24,000 square feet) that was constructed in 1967 on the east side of the original building and used for storage.

APPENDIX A (continued)

Studies of alternatives to demolition and new construction found that programmatic, structural, and site constraints prohibit a financially viable re-use of the existing industrial building on the site. Unoccupied for more than five years, the existing building's envelope and structural system are in very poor condition. Furthermore, re-use of the existing building would require significant replacement of structural systems to meet building codes for a change of use. Expert engineers have determined that

> "The buildings are in serious need of repair and/or replacement of structural and non-structural elements and will worsen with continued exposure to the environment. We expect that the combined need for code upgrades, a new lateral force resisting system, and structural repairs and replace[ment] throughout make any re-use practically and financially unviable."

A copy of McNamara/Salvia's analysis of structural conditions is attached.

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.
No existing buildings are proposed for rehabilitation.

Does the project include new construction? If so, describe (attach plans and elevations if necessary).
The project will construct a new three-story hotel building over enclosed at-grade parking; a new seawall to the south of the building at the edge of Pavilion Beach; and a new public access walkway and new surface parking to the west of the building. The proposed building will be set back from Commercial Street to accommmodate commercial business traffic as well as zoning requirements. The hotel will be constructed above flood level. Its roof ridge will be approximately 61 feet above grade and the peak of the new tower will rise approximately 20 feet above the main ridgeline. The form and style of the new building will echo traditional seaside hotels, with an H-shaped volume articulated with sloped roofs, gambrel pavilions, shed dormers, and traditional building materials. Copies of current plans and elevations are attached.

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.
The project site is included in the Inventory of Historic and Archaeological Resources of the Commonwealth as the O'Donnell-Usen Fisheries building (GLO.19). The property was determined eligible for listing in the National Register by the MHC as part of the Historic and Archaeological Resources of Gloucester, Massachusetts – Development of the Maritime Industry in Gloucester, 1624-1946, Multiple Property Nomination Form, in an area that was proposed as a potential Boundary Increase to the existing Central Gloucester National Register District.

Photographs of major building elevations and existing building conditions are attached.

No known archaeological resources are located within the project site.

APPENDIX A (continued)

What is the total acreage of the project area?

Woodland	0	acres	Productive Resources:		
Wetland	0	acres	Agriculture	0	acres
Floodplain	1.85	acres	Forestry	0	acres
Open space	0	acres	Mining/Extraction	0	acres
Developed	1.85	acres	Total Project Acreage	1.85	acres

What is the acreage of the proposed new construction? 1.85 acres

What is the present land use of the project area?
The existing building is presently vacant, with paved surface parking occupying the western part of the parcel. Unused for more than five years, the property was most recently used for industrial purposes. The site is zoned as part of an Hotel Overlay District within a Marine Industrial District.

Please attached a copy of the section of the USGS quadrangle map which clearly marks the project location.
Copies of the USGS quadrangle map and the City's GIS map are attached.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of Person submitting this form: _____ Date: 2.14.2014

Name: Matthew A. Webber (Beals Associates, Inc.)

Address: 2 Thirteenth Street

City/Town/Zip: Charlestown, MA 02129

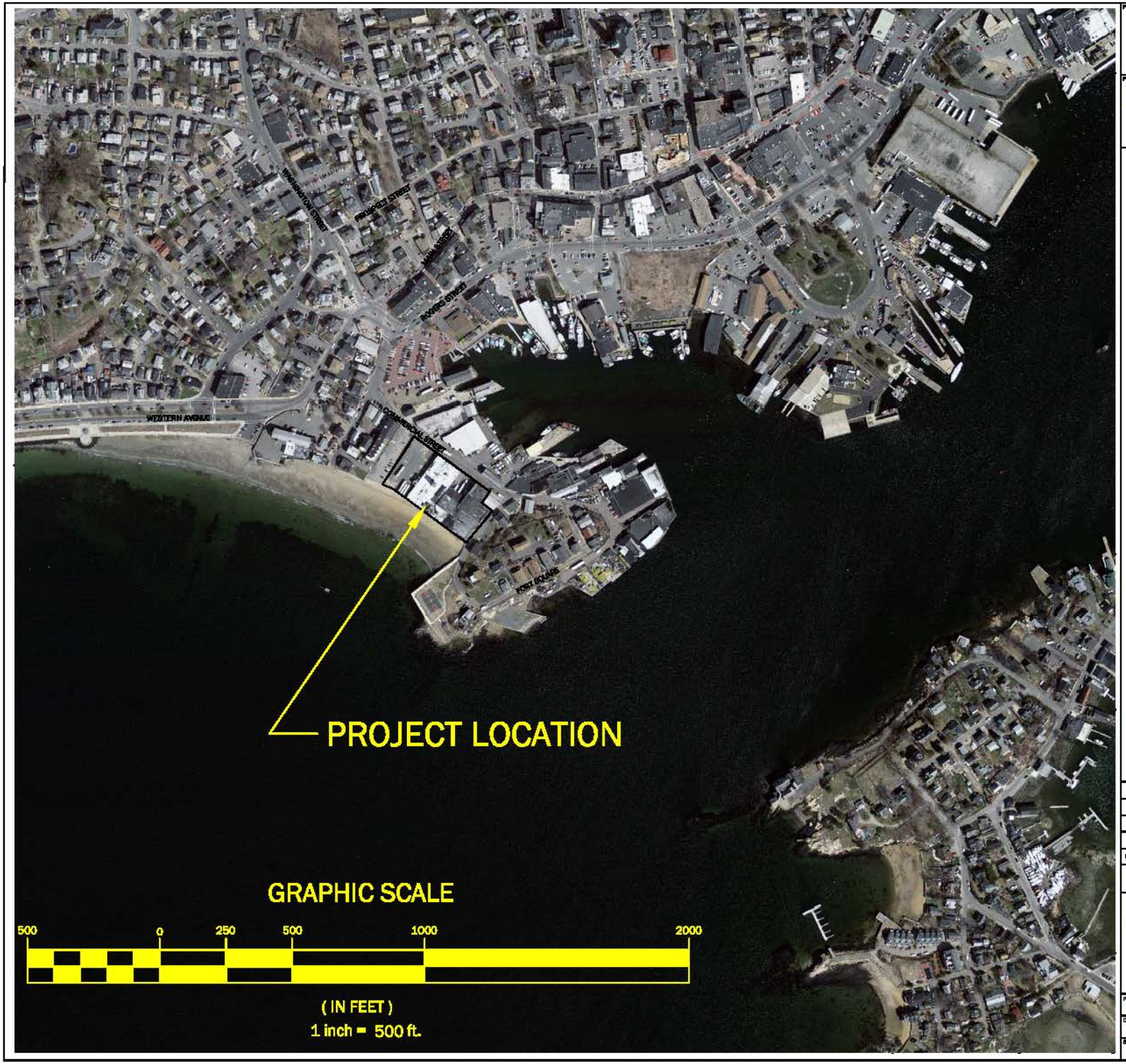
Telephone: 617.242.1120

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, sec. 26-27C as amended by St. 1988, c. 254

Attachment A

Aerial Views



PREPARED FOR

BEAUPORT GLOUCESTER, LLC
6 ROWE SQUARE
GLOUCESTER, MA

PREPARED BY

BEALS · ASSOCIATES INC.
2 THIRTEENTH STREET CHARLESTOWN, MA 02129
PHONE: 617-242-1120 FAX: 617-242-1190

NO.	REVISION/ISSUE	DATE

MHC PNF PROJECT LOCATION

BEAUPORT GLOUCESTER HOTEL
COMMERCIAL STREET
GLOUCESTER, MA

PROJECT	DESIGN	SHEET
D-734	TPM	1 OF 1
DATE: JUNE 21, 2013	CHECKED TPM	
SCALE: AS NOTED	REVIEWED TPM	

0 50' 100' 200'

Scale: 1" = 100'

BEALS · ASSOCIATES INC.	BEAUPORT GLOUCESTER HOTEL 47-61 COMMERCIAL STREET GLOUCESTER, MASSACHUSETTS 01930	AERIAL PLAN	DATE PREPARED FEBRUARY 7, 2014	SHEET 1 OF 1

Attachment B

Structural Report and Existing Conditions Plan

McNamara/Salvia, Inc.
Consulting Engineers

FOUNDING PRINCIPALS

Robert J. McNamara, P.E., S.E.
Joseph A. Salvia, P.E.

MANAGING PRINCIPALS

Mark F. Aho, P.E.
Neil A. Atkinson
John S. Matuszewski, P.E.
Adam C. McCarthy, P.E.
Andrew P. Sullivan, P.E., S.E.
Benjamin B. Wild, P.E.

BOSTON

160 Federal Street
5th Floor
Boston, MA 02110
617-737-0040
617-737-0042 (Fax)

MIAMI

One Biscayne Tower
Suite 3795
2 South Biscayne Boulevard
Miami, FL 33131
305-579-5765
FL CA #26616

www.mcsal.com

July 16, 2012

Via E-Mail: bhowe@nbguest.com

Mr. Brian Howe
N B Guest Street Associates
180 Guest Street
Brighton, MA 02135

RE: 47 Commercial Street – Gloucester, MA
Bird's Eye Due Diligence
Mc/Sal Project N^{0} 12001.00

Dear Brian,

On June 6, 2012, we visited the site at 47 Commercial Street, Gloucester, MA and the former home of the Bird's Eye factory. The original factory is a two-story concrete building which we understand to have been built around the turn of the century. The structural system consists of a formed concrete one-way slab with supporting beams in one direction and concrete columns. Several areas have been reinforced with steel beams and girders presumably for special high load conditions or hung gantries as needs changed. The beams and columns extend to the face of the exterior with terra cotta and CMU in-fill making up the balance of the wall panels. The foundation system is unknown, but generally expected to be deep foundations of some kind given its proximity to the water and lack of notable settlement. Over the years, the building has been added to for increased capacity and cold storage. The dates of these additions are unknown, but all additions are steel framed with metal deck roof and corrugated metal siding. The roof framing is wide flange girders with joists running in the opposite direction.

Each of the structures suffers from many years of neglect and a compromised building envelope. Damage from moisture and multiple freeze-thaw cycles is evident throughout. Excessive spalling and cracking of the concrete structure is easily noted from the exterior with the majority of those exposed columns and perhaps 40% of the beams requiring structural repair. Because the repairs have been neglected for such a lengthy period, the reinforcing steel that has been exposed below these cracks and spalls has lost substantial area due to the rusting and corrosion. In many cases replacement will be required and a process by which to neutralize the continued corrosive chemical reaction within the concrete would be necessary throughout. At the roof line, the concrete overhang has deteriorated substantially, and continues to spall and crumble as evidenced by pieces of concrete observed on the ground below the overhang. With the exception of the tower, which requires extensive repair, the interior of the concrete building has fared somewhat better with less damage to the structural elements. Still, where damage does exist, the exposure to elements, temperature cycles, and years of neglect complicate the possibility of repair.

The steel framed buildings are in reasonable condition, except again where the building envelope has been compromised and constant exposure to moisture has led to corrosion and deterioration that would be difficult to repair and likely requires replacement. Vegetation on the roof is visible from the ground, and water can be heard dripping throughout the cold storage area. While lighting and visibility were poor from the interior, we suspect that the metal roof deck has been seriously compromised in several areas and is likely unsafe to walk on.

Any possibility of re-use of these buildings will require conformance to the Massachusetts State Building Code, 8th Edition. Under virtually any conceived renovation, the building would be required to meet the provisions of Change of Use and a Level 3 Alteration (i.e. a renovation effecting more than 50% of the building area). As a

factory, the building would be classified with the lowest possible Hazard Index, and unless re-opened as a factory or used as storage, would be classified with a higher Hazard Index; meaning that it would pose a greater risk to life and property if the building were compromised. There are a number of code issues and requirements dealing with fire protection, egress, accessibility, etc. that are triggered as a result of this Change of Use and Level 3 Alteration that go beyond the scope of this report. With regard to structure, the implication is that the buildings would need to be analyzed and retrofitted for a percentage of the current code seismic loading and the full current code wind loading. Codes have evolved significantly since these buildings were constructed. While the buildings pre-date seismic code, Gloucester is of the highest seismicity in the state with the largest recorded earthquake occurring off Cape Ann in 1755. The lateral force resisting system of the concrete building consists of partial restraint between column and beam, and is not a permitted system under the current code. Most of the notable damage to the concrete columns occurs at these joints further compromising the building to extreme wind and seismic events. In the steel buildings some bracing was observed in the tall cold storage areas, but at the lower buildings a similar partially restrained system was observed in the direction of the girders with no definable system in the direction of the joists.

Upgrading the lateral force resisting system of the buildings would involve constructing new concrete shear walls in the concrete building and erecting braced frames throughout steel building. Pile supported foundations would likely need to be added for these new systems. Expansion joints would also likely need to be introduced between the steel and concrete buildings involving demolition of a portion of the steel building and addition of new steel columns.

Some areas of the buildings are in reasonable condition, particularly given their age and duration in which they have been unoccupied. However, where deterioration and damage is observed, it is in many cases significant and will be impractical, if not infeasible, to repair. Replacement, re-build, or removal is likely required for much of the observed damage. While the building is not safe for occupancy in its current state, there are three areas of immediate concern that present a possible risk to people and property despite its vacant status:

1. With evidence of pieces of concrete falling from the building, we would recommend cutting back the failing concrete overhang and epoxy patching some of the more extreme concrete spalls at the columns and beams. We observed quite a bit of activity around the building with the beach frontage. We would recommend erecting a temporary fence around the building to keep the perimeter clear of people and away from potential harm's way until such work could be done.
2. With the roof deck compromised, continued water infiltration, and vegetation build-up there is risk of localized roof collapse. A more detailed review of the roof from within the building should be performed immediately to identify areas of danger and potential collapse. People should remain off the roof and out of the cold storage areas until such a review can be completed. At a minimum replacement of sections of the roof deck will be required, but likely sections of the roof framing will also need to be replaced to mitigate immediate safety concerns.
3. Deterioration of the concrete beams and compromised floor deck within the tower is significant. Because of its exposure to wind and the lack of redundancy, this element is perhaps more susceptible to an extreme weather event than the building as a whole. Failure of the tower could lead to progressive failure of other building elements. At a minimum we would suggest shoring the deteriorated beams and deck and bracing the tower either with internal diagonal braces or external scaffolding.

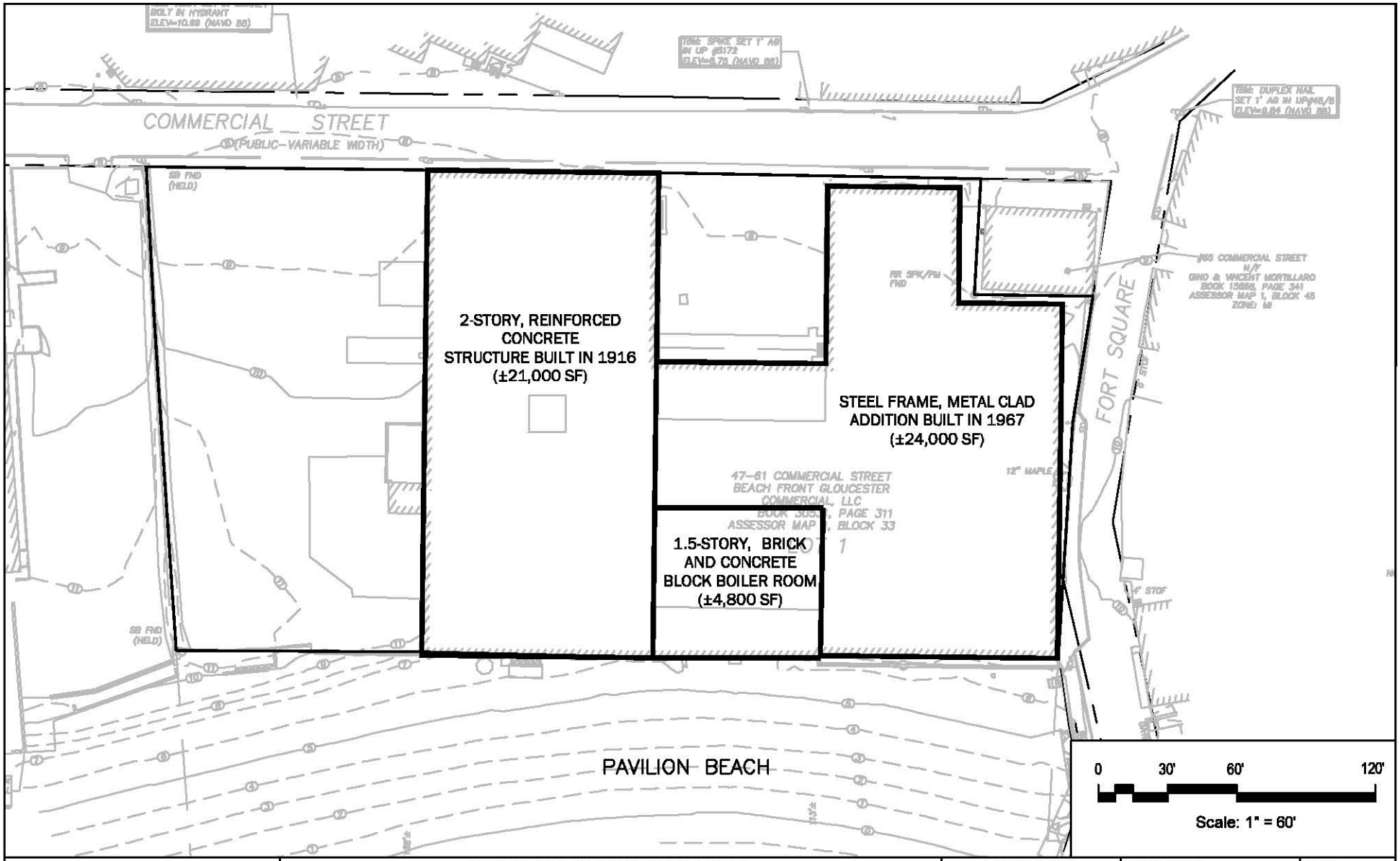
It should be emphasized that these recommendations are minimum needs in the interest of public protection and protection of property. The buildings are in serious need of repair and/or replacement of structural and non-structural elements and will worsen with continued exposure to the environment. We expect that the combined need for code upgrades, a new lateral force resisting system, and structural repairs and replace

throughout make any re-use, practically and financially unviable. Regardless of the future intent, immediate action is required, and a longer term plan of action should be implemented or initiated in the near future.

Very truly yours,
McNamara/Salvia, Inc.

Benjamin B. Wild, P.E.
Benjamin B. Wild, P.E.
Principal

Cc: Sandra Smith – Perkins & Will
Sandra.Smith@perkinswill.com



BEALS · ASSOCIATES INC.
2 Thirteenth Street Charlestown, MA 02129
Phone: 617-242-1120 Fax: 617-242-1190

BEAUPORT GLOUCESTER HOTEL
47-61 COMMERCIAL STREET
GLOUCESTER, MASSACHUSETTS 01930

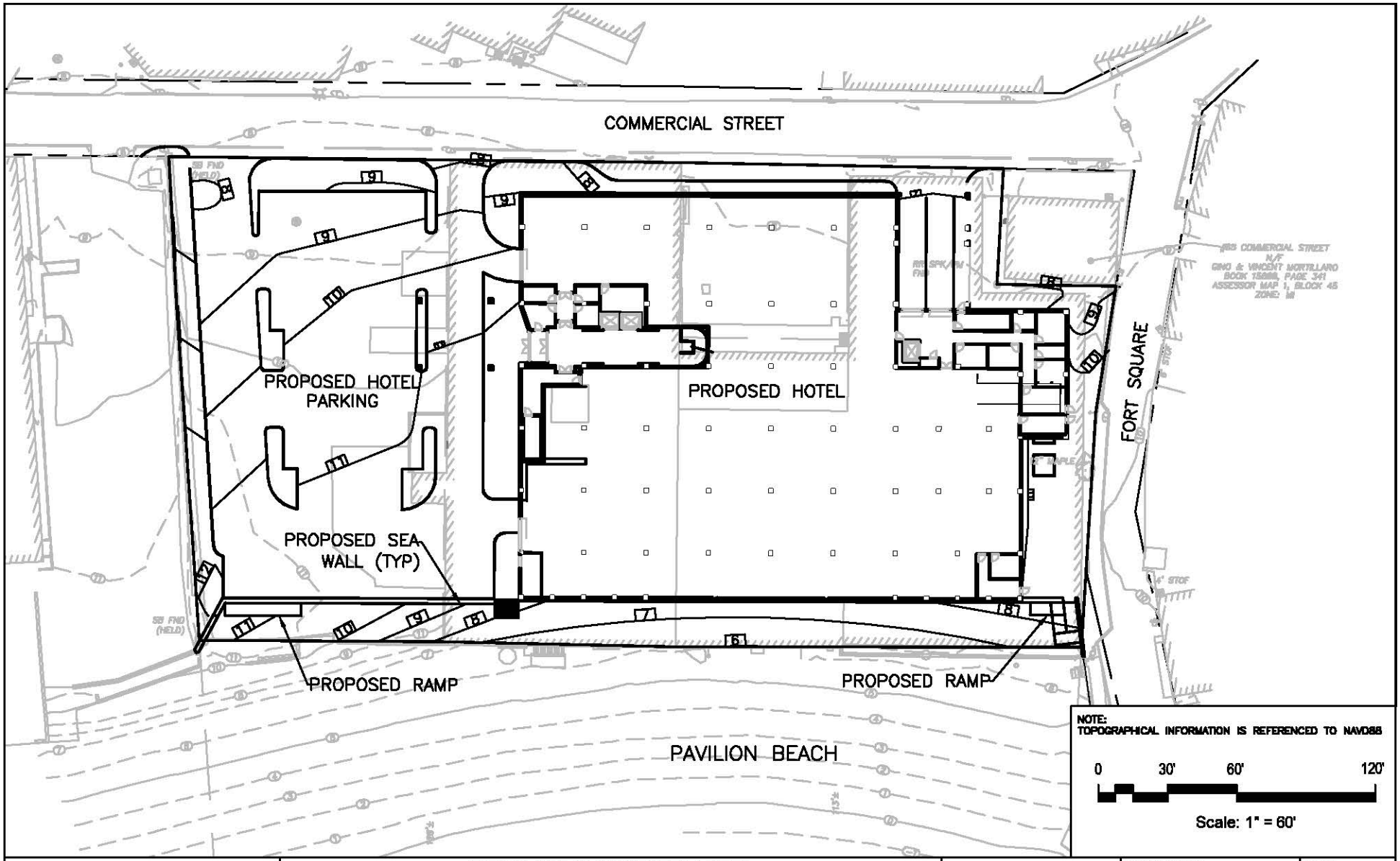
EXISTING CONDITIONS PLAN

DATE PREPARED
FEBRUARY 7, 2014

SHEET
1 OF 2

Attachment C

Current Plans and Elevations



BEALS · ASSOCIATES INC.
2 Thirteenth Street Charlestown, MA 02129
Phone: 617-242-1120 Fax: 617-242-1190

BEAUPORT GLOUCESTER HOTEL
47-61 COMMERCIAL STREET
GLOUCESTER, MASSACHUSETTS 01930

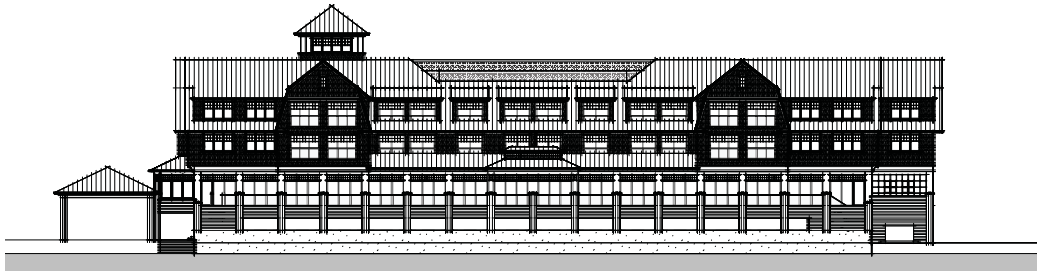
SITE PLAN

DATE PREPARED
FEBRUARY 7, 2014

SHEET
2 OF 2

WEST ELEVATION

EAST ELEVATION



SOUTH ELEVATION

Attachment D

Site Photographs

Photo 1: 1916 Building Looking West

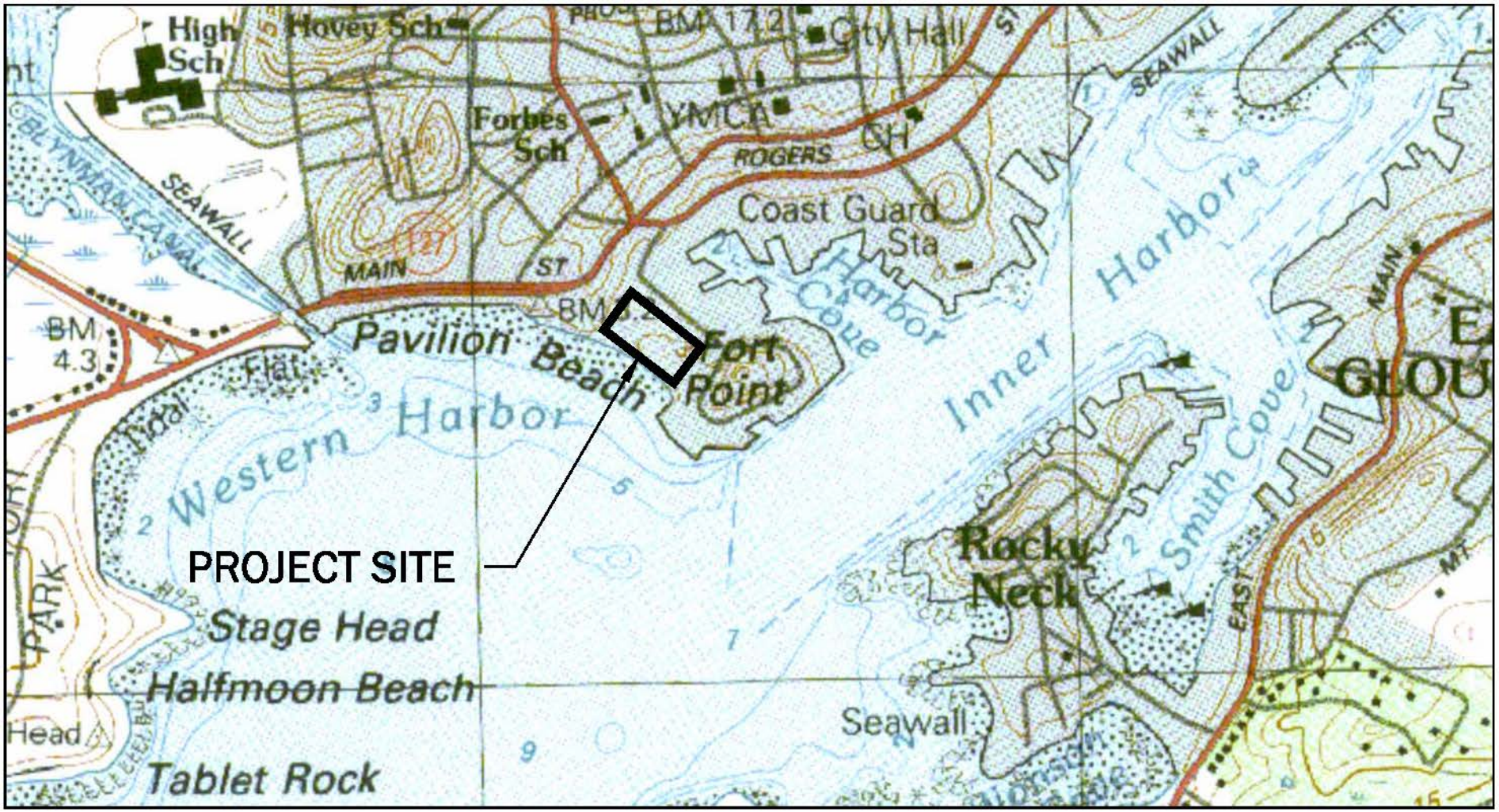
Photo 2: 1916 Building Looking East

Photo 3: 1916 Building Exterior Detail

Photo 4: 1916 Building Exterior Detail

Attachment E

Vicinity Plan and City GIS

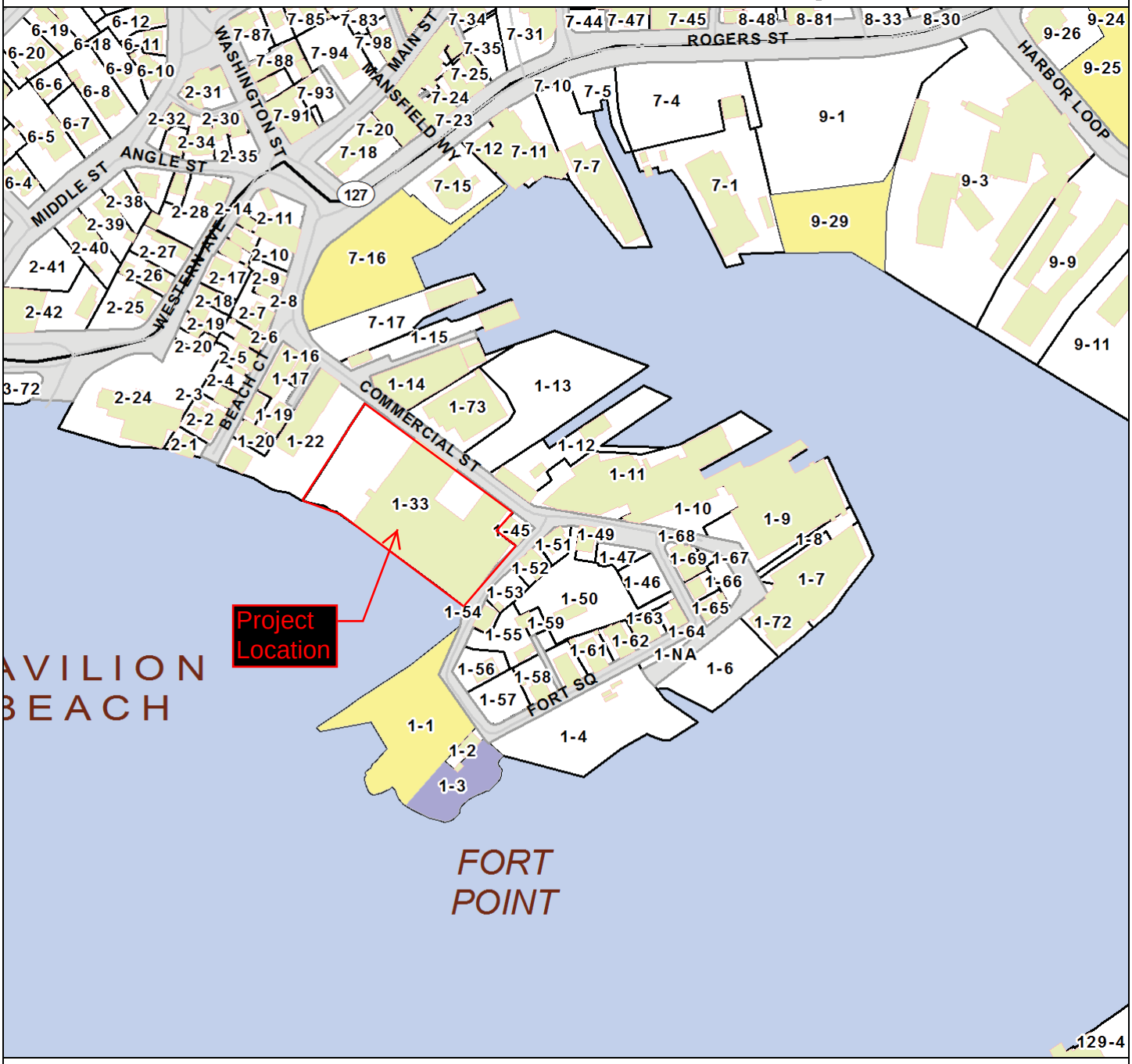


0 400' 800' 1600'

Scale: 1" = 800'

BEALS · ASSOCIATES INC. 2 Thirteenth Street Charlestown, MA 02129 Phone: 617-242-1120 Fax: 617-242-1190	BEAUPORT GLOUCESTER HOTEL 47-61 COMMERCIAL STREET GLOUCESTER, MASSACHUSETTS 01930	VICINITY MAP	DATE PREPARED FEBRUARY 7, 2014	SHEET 1 OF 5

Gloucester Assessor's Map



Building Footprint

Transportation

StreetCenterlines

Openspace

Cemetery
Conservation
Landing
Marina/Landing
Other
Recreation
Recreation and Conservati
Undesignated
Watershed

Display Parcels

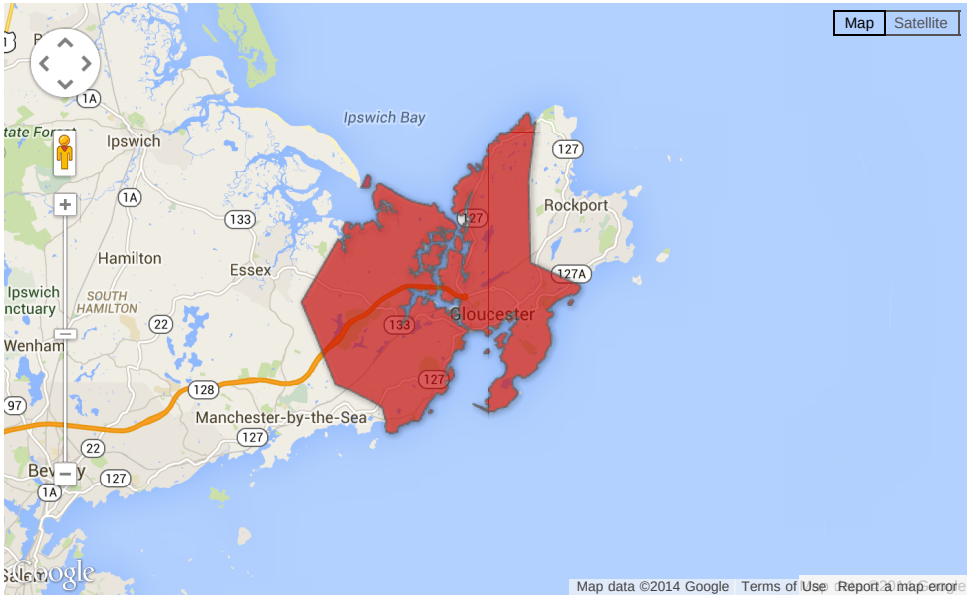
APPENDIX D

Endangered Species Act Documentation

The Natural Heritage & Endangered Species Program maintains a list of all documented MESA-listed species observations in the Commonwealth. Please select a town if you would like to see a table showing which listed species have been observed in that town. The selected town will also be highlighted on the map. Alternatively you can specify either the Common Name or Scientific Name of a species to see it's distribution on the map and table showing the towns it has been observed in. Clicking on a column header in the table will sort the column. Clicking again on the same column heading will reverse the sort order.

The Town List and Species Viewer will be updated at regular intervals as new data is accepted and entered into the NHESP database.

Town: or Species (Common Name): or Species (Scientific Name):



Showing 1 to 20 of 20 entries

First Previous 1 Next Last

Search:

Town	Taxonomic Group	Scientific Name	Common Name	MESA Status	Most Recent Obs
GLOUCESTER	Amphibian	Ambystoma laterale	Blue-spotted Salamander	SC	1997
GLOUCESTER	Vascular Plant	Carex lenticularis	Shore Sedge	T	1917
GLOUCESTER	Bird	Charadrius melodus	Piping Plover	T	2002
GLOUCESTER	Beetle	Cicindela rufiventris hentzii	Eastern Red-bellied Tiger Beetle	T	2011
GLOUCESTER	Reptile	Emydoidea blandingii	Blanding's Turtle	T	1992
GLOUCESTER	Dragonfly/Damselfly	Enallagma pictum	Scarlet Bluet	T	1972
GLOUCESTER	Vascular Plant	Goodyera repens	Dwarf Rattlesnake-plantain	E	1966
GLOUCESTER	Vascular Plant	Leymus mollis ssp. mollis	Sea Lyme-grass	E	2007
GLOUCESTER	Vascular Plant	Liatris scariosa var. novae-angliae	New England Blazing Star	SC	1928
GLOUCESTER	Vascular Plant	Listera cordata	Heartleaf Twayblade	E	1905
GLOUCESTER	Butterfly/Moth	Lithophane viridipallens	Pale Green Pinion Moth	SC	2013
GLOUCESTER	Vascular Plant	Magnolia virginiana	Sweetbay Magnolia	E	2011
GLOUCESTER	Vascular Plant	Malaxis bayardii	Bayard's Green Adder's-mouth	E	1877
GLOUCESTER	Vascular Plant	Ophioglossum pusillum	Adder's-tongue Fern	T	1880
GLOUCESTER	Butterfly/Moth	Papaipema stenocelis	Chain Fern Borer Moth	T	2013
GLOUCESTER	Vascular Plant	Rumex pallidus	Seabeach Dock	T	1993
GLOUCESTER	Bird	Sterna hirundo	Common Tern	SC	1993
GLOUCESTER	Vascular Plant	Suaeda calceoliformis	American Sea-blite	SC	1982

GLOUCESTER	Butterfly/Moth	Sympistis riparia	Dune Noctuid Moth	SC	2013
GLOUCESTER	Vascular Plant	Vaccinium vitis-idaea ssp. minus	Mountain Cranberry	E	1988

Show 10 entries

Hide Additional Info

Status

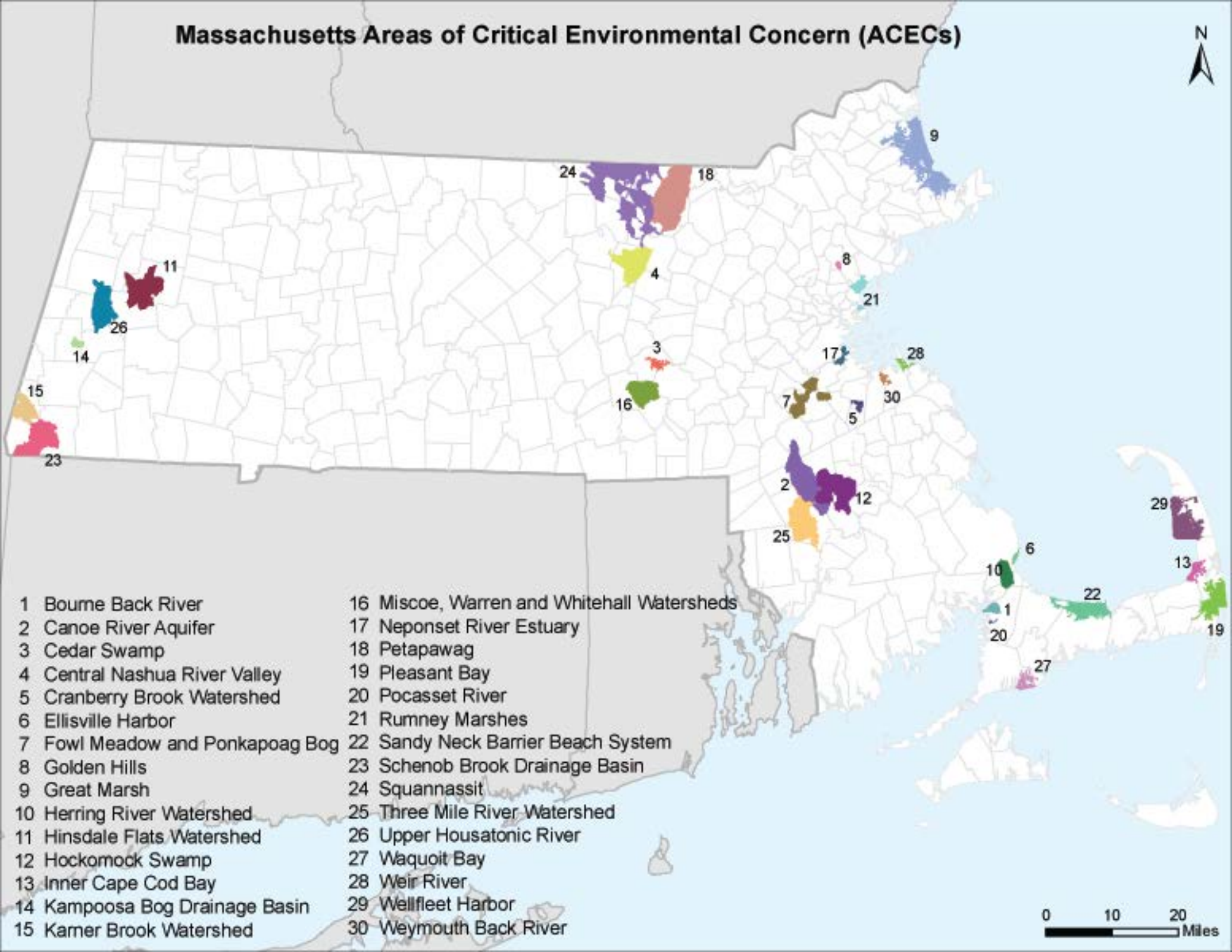
E = Endangered T = Threatened SC = Special Concern

Most Recent Observation

This field represents the most recent observation of that species in a town. However, because they are rare, many MESA-listed species are difficult to detect even when they are present. Natural Heritage does not have the resources to be able to conduct methodical species surveys in each town on a regular basis. Therefore, the fact that the 'Most Recent Observation' recorded for a species may be several years old should not be interpreted as meaning that the species no longer occurs in a town. However, Natural Heritage regards records older than twenty-five years historic.

For more information about a particular species, view the list of Natural Heritage Fact Sheets.

Massachusetts Areas of Critical Environmental Concern (ACECs)



1 Bourne Back River
2 Canoe River Aquifer
3 Cedar Swamp
4 Central Nashua River Valley
5 Cranberry Brook Watershed
6 Ellisville Harbor
7 Fowl Meadow and Ponkapoag Bog
8 Golden Hills
9 Great Marsh
10 Herring River Watershed
11 Hinsdale Flats Watershed
12 Hockomock Swamp
13 Inner Cape Cod Bay
14 Kampoosa Bog Drainage Basin
15 Karner Brook Watershed
16 Miscoe, Warren and Whitehall Watersheds
17 Neponset River Estuary
18 Petapawag
19 Pleasant Bay
20 Pocasset River
21 Rumney Marshes
22 Sandy Neck Barrier Beach System
23 Schenob Brook Drainage Basin
24 Squannassit
25 Three Mile River Watershed
26 Upper Housatonic River
27 Waquoit Bay
28 Weir River
29 Wellfleet Harbor
30 Weymouth Back River

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Barnstable	Piping Plover	Threatened	Coastal Beaches	All Towns
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Chatham
	Sandplain gerardia	Endangered	Open areas with sandy soils.	Sandwich and Falmouth.
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Bourne (north of the Cape Cod Canal)
Berkshire	Bog Turtle	Threatened	Wetlands	Egremont and Sheffield
Bristol	Piping Plover	Threatened	Coastal Beaches	Fairhaven, Dartmouth, Westport
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Fairhaven, New Bedford, Dartmouth, Westport
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Taunton
Dukes	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Piping Plover	Threatened	Coastal Beaches	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Aquinnah and Chilmark
	Sandplain gerardia	Endangered	Open areas with sandy soils.	West Tisbury
Essex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Gloucester, Essex and Manchester
	Piping Plover	Threatened	Coastal Beaches	Gloucester, Essex, Ipswich, Rowley, Revere, Newbury, Newburyport and Salisbury
Franklin	Northeastern bulrush	Endangered	Wetlands	Montague, Warwick
	Dwarf wedgemussel	Endangered	Mill River	Whately
Hampshire	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Hadley
	Puritan tiger beetle	Threatened	Sandy beaches along the Connecticut River	Northampton and Hadley
	Dwarf wedgemussel	Endangered	Rivers and Streams.	Hatfield, Amherst and Northampton
Hampden	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Southwick
Middlesex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Groton
Nantucket	Piping Plover	Threatened	Coastal Beaches	Nantucket
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Nantucket
	American burying beetle	Endangered	Upland grassy meadows	Nantucket
Plymouth	Piping Plover	Threatened	Coastal Beaches	Scituate, Marshfield, Duxbury, Plymouth, Wareham and Mattapoisett
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Kingston, Middleborough, Carver, Plymouth, Bourne, Wareham, Halifax, and Pembroke
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Plymouth, Marion, Wareham, and Mattapoisett.
Suffolk	Piping Plover	Threatened	Coastal Beaches	Winthrop
Worcester	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Leominster

-Eastern cougar and gray wolf are considered extirpated in Massachusetts.
-Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.
-Critical habitat for the Northern Red-bellied Cooter is present in Plymouth County.

Revised 10/7/2011

MASSACHUSETTS AREAS OF CRITICAL ENVIRONMENTAL CONCERN
November 2010

Total Approximate Acreage: 268,000 acres
Approximate acreage and designation date follow ACEC names below.

Bourne Back River
(1,850 acres, 1989) Bourne

Canoe River Aquifer and Associated Areas (17,200 acres, 1991) Easton, Foxborough, Mansfield, Norton, Sharon, and Taunton

Cedar Swamp
(1,650 acres, 1975) Hopkinton and Westborough

Central Nashua River Valley
(12,900 acres, 1996) Bolton, Harvard, Lancaster, and Leominster

Cranberry Brook Watershed
(1,050 acres, 1983) Braintree and Holbrook

Ellisville Harbor
(600 acres, 1980) Plymouth

Fowl Meadow and Ponkapoag Bog
(8,350 acres, 1992) Boston, Canton, Dedham, Milton, Norwood, Randolph, Sharon, and Westwood

Golden Hills
(500 acres, 1987) Melrose, Saugus, and Wakefield

Great Marsh (originally designated as Parker River/Essex Bay)
(25,500 acres, 1979) Essex, Gloucester, Ipswich, Newbury, and Rowley

Herring River Watershed
(4,450 acres, 1991) Bourne and Plymouth

Hinsdale Flats Watershed
(14,500 acres, 1992) Dalton, Hinsdale, Peru, and Washington

Hockomock Swamp
(16,950 acres, 1990) Bridgewater, Easton, Norton, Raynham, Taunton, and West Bridgewater

Inner Cape Cod Bay
(2,600 acres, 1985) Brewster, Eastham, and Orleans

Kampoosa Bog Drainage Basin
(1,350 acres, 1995) Lee and Stockbridge

Karner Brook Watershed
(7,000 acres, 1992) Egremont and Mount Washington

Miscoe, Warren, and Whitehall Watersheds
(8,700 acres, 2000) Grafton, Hopkinton, and Upton

Neponset River Estuary
(1,300 acres, 1995) Boston, Milton, and Quincy

Petapawag
(25,680 acres, 2002) Ayer, Dunstable, Groton, Pepperell, and Tyngsborough

Pleasant Bay
(9,240 acres, 1987) Brewster, Chatham, Harwich, and Orleans

Pocasset River
(160 acres, 1980) Bourne

Rumney Marshes
(2,800 acres, 1988) Boston, Lynn, Revere, Saugus, and Winthrop

Sandy Neck Barrier Beach System
(9,130 acres, 1978) Barnstable and Sandwich

Schenob Brook Drainage Basin
(13,750 acres, 1990) Mount Washington and Sheffield

Squannassit
(37,420 acres, 2002) Ashby, Ayer, Groton, Harvard, Lancaster, Lunenburg, Pepperell, Shirley, and Townsend

Three Mile River Watershed
(14,280 acres, 2008) Dighton, Norton, Taunton

Upper Housatonic River
(12,280 acres, 2009) Lee, Lenox, Pittsfield, Washington

Waquoit Bay
(2,580 acres, 1979) Falmouth and Mashpee

Weir River
(950 acres, 1986) Cohasset, Hingham, and Hull

Wellfleet Harbor
(12,480 acres, 1989) Eastham, Truro, and Wellfleet

Weymouth Back River
(800 acres, 1982) Hingham and Weymouth

ACEC acreages above are based on MassGIS calculations and may differ from numbers originally presented in designation documents and other ACEC publications due to improvements in accuracy of GIS data and boundary clarifications. Listed acreages have been rounded to the nearest 50 or 10 depending on whether boundary clarification has occurred. For more information please see, http://www.mass.gov/dcr/stewardship/acec/aboutMaps.htm.

Towns with ACECs within their Boundaries — November 2010

TOWN	ACEC
Ashby	Squannassit
Ayer	Petapawag
	Squannassit
Barnstable	Sandy Neck Barrier Beach System
Bolton	Central Nashua River Valley
Boston	Rumney Marshes
	Fowl Meadow and Ponkapoag Bog
	Neponset River Estuary
Bourne	Pocasset River
	Bourne Back River
	Herring River Watershed
Braintree	Cranberry Brook Watershed
Brewster	Pleasant Bay
	Inner Cape Cod Bay
Bridgewater	Hockomock Swamp
Canton	Fowl Meadow and Ponkapoag Bog
Chatham	Pleasant Bay
Cohasset	Weir River
Dalton	Hinsdale Flats Watershed
Dedham	Fowl Meadow and Ponkapoag Bog
Dighton	Three Mile River Watershed
Dunstable	Petapawag
Eastham	Inner Cape Cod Bay
	Wellfleet Harbor
Easton	Canoe River Aquifer
	Hockomock Swamp
Egremont	Karner Brook Watershed
Essex	Great Marsh
Falmouth	Waquoit Bay
Foxborough	Canoe River Aquifer
Gloucester	Great Marsh
Grafton	Miscoe-Warren-Whitehall Watersheds
Groton	Petapawag
	Squannassit
Harvard	Central Nashua River Valley
	Squannassit
Harwich	Pleasant Bay
Hingham	Weir River
	Weymouth Back River
Hinsdale	Hinsdale Flats Watershed
Holbrook	Cranberry Brook Watershed
Hopkinton	Miscoe-Warren-Whitehall Watersheds
	Cedar Swamp
Hull	Weir River
Ipswich	Great Marsh
Lancaster	Central Nashua River Valley
	Squannassit
Lee	Kampoosa Bog Drainage Basin
	Upper Housatonic River
Lenox	Upper Housatonic River
Leominster	Central Nashua River Valley
Lunenburg	Squannassit
Lynn	Rumney Marshes
Mansfield	Canoe River Aquifer
Mashpee	Waquoit Bay
Melrose	Golden Hills
Milton	Fowl Meadow and Ponkapoag Bog
	Neponset River Estuary
Mt. Washington	Karner Brook Watershed
	Schenob Brook
Newbury	Great Marsh
Norton	Hockomock Swamp
	Canoe River Aquifer
	Three Mile River Watershed
Norwood	Fowl Meadow and Ponkapoag Bog
Orleans	Inner Cape Cod Bay
	Pleasant Bay
Pepperell	Petapawag
	Squannassit
Peru	Hinsdale Flats Watershed
Pittsfield	Upper Housatonic River
Plymouth	Herring River Watershed
	Ellisville Harbor
Quincy	Neponset River Estuary
Randolph	Fowl Meadow and Ponkapoag Bog
Raynham	Hockomock Swamp
Revere	Rumney Marshes
Rowley	Great Marsh
Sandwich	Sandy Neck Barrier Beach System
Saugus	Rumney Marshes
	Golden Hills
Sharon	Canoe River Aquifer
	Fowl Meadow and Ponkapoag Bog
Sheffield	Schenob Brook
Shirley	Squannassit
Stockbridge	Kampoosa Bog Drainage Basin
Taunton	Hockomock Swamp
	Canoe River Aquifer
	Three Mile River Watershed
Truro	Wellfleet Harbor
Townsend	Squannassit
Tyngsborough	Petapawag
Upton	Miscoe-Warren-Whitehall Watersheds
Wakefield	Golden Hills
Washington	Hinsdale Flats Watershed
	Upper Housatonic River
Wellfleet	Wellfleet Harbor
W Bridgewater	Hockomock Swamp
Westborough	Cedar Swamp
Westwood	Fowl Meadow and Ponkapoag Bog
Weymouth	Weymouth Back River
Winthrop	Rumney Marshes

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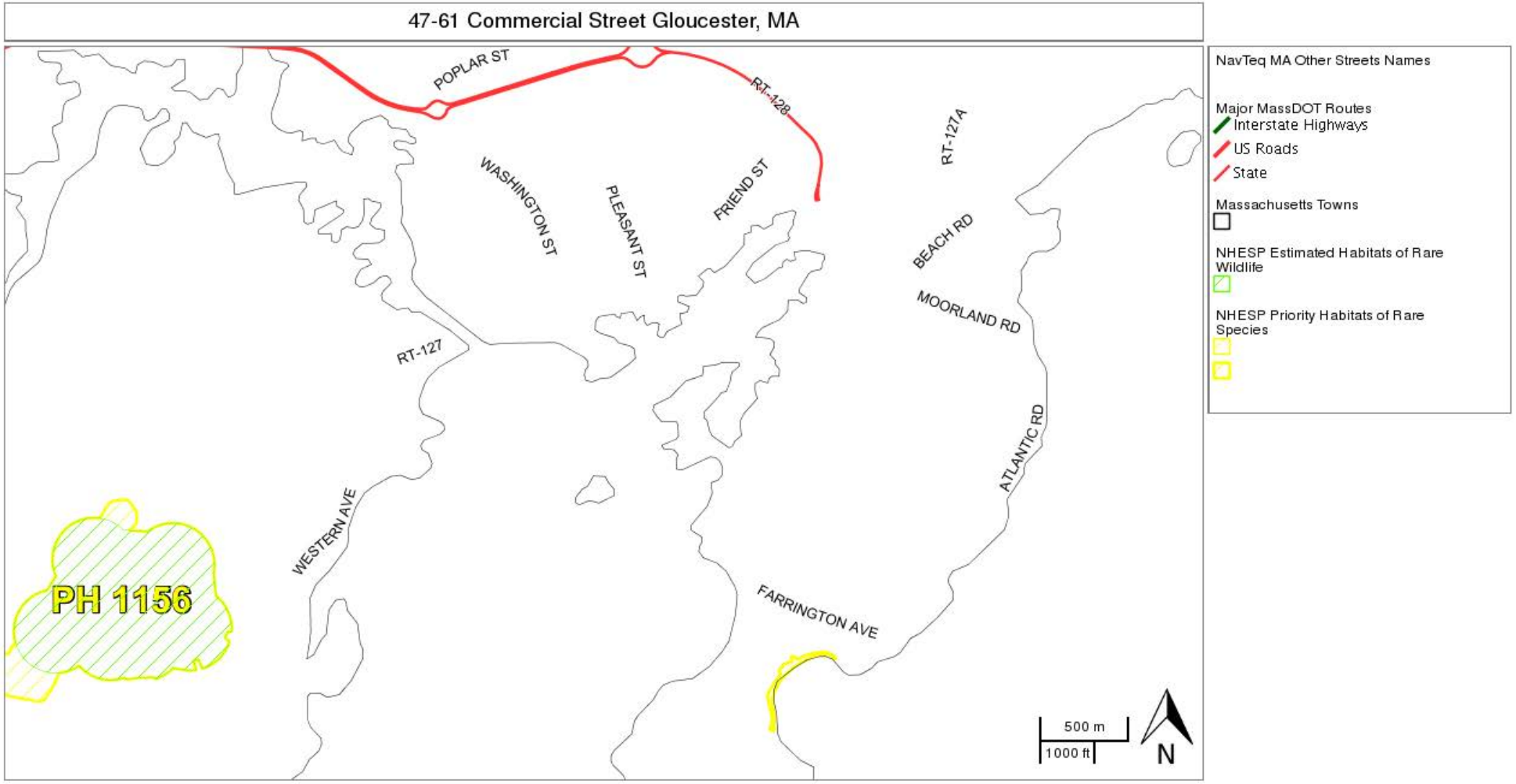

47-61 Commercial Street Gloucester, MA
POPLAR ST
RT-128
WASHINGTON ST
PLEASANT ST
FRIEND ST
RT-127A
BEACH RD
MOORLAND RD
RT-127
ATLANTIC RD
WESTERN AVE
FARRINGTON AVE
PH 1156
500 m
1000 ft
N
NavTeq MA Other Streets Names
Major MassDOT Routes
Interstate Highways
US Roads
State
Massachusetts Towns
NHESP Estimated Habitats of Rare Wildlife
NHESP Priority Habitats of Rare Species

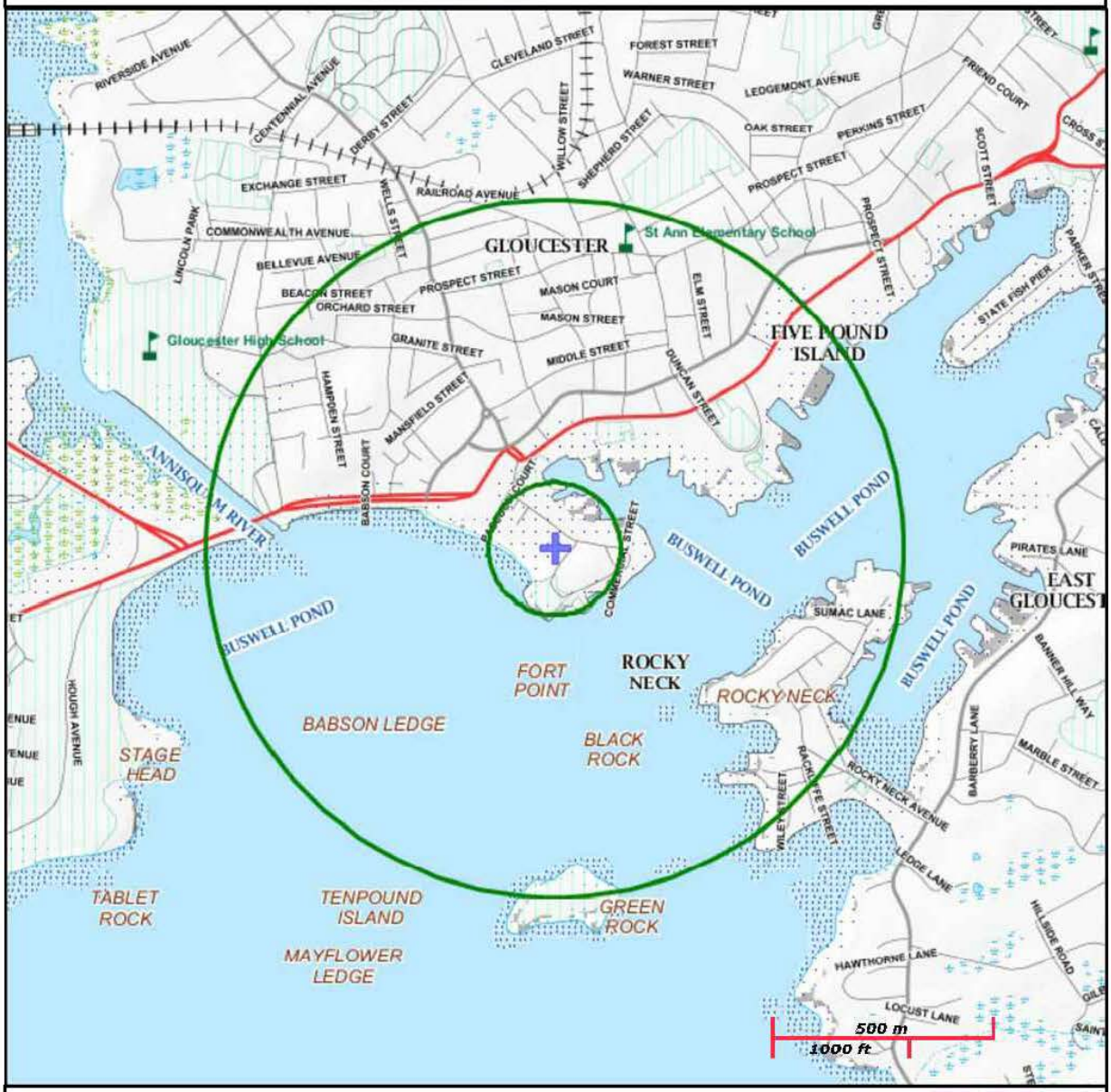
MassDEP - Bureau of Waste Site Cleanup

Site Information: MCP Numerical Ranking System Map: 500 feet & 0.5 Mile Radii

47-61 COMMERCIAL STREET GLOUCESTER, MA
3-000030901
NAD83 UTM Meters:
4718771mN , 363430mE (Zone: 19)
November 25, 2013

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: http://www.mass.gov/mgis/.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



HALEY & ALDRICH

COMMERCIAL STREET PROPERTY
47-61 COMMERCIAL STREET
GLOUCESTER, MASSACHUSETTS

Ma□□DEP SITE SCORING MAP

SCALE: AS SHOWN
DECEMBER 2013

FIGURE 3

J:\GRAPHICS\38605\38605-040-A002.DWG

Species Summary Table for the New England Field Office Field Review

Your name: Cole Worthy

Project name used in IPaC: 47-61 Commercial Street, Gloucester, MA

Date: 9/11/2014

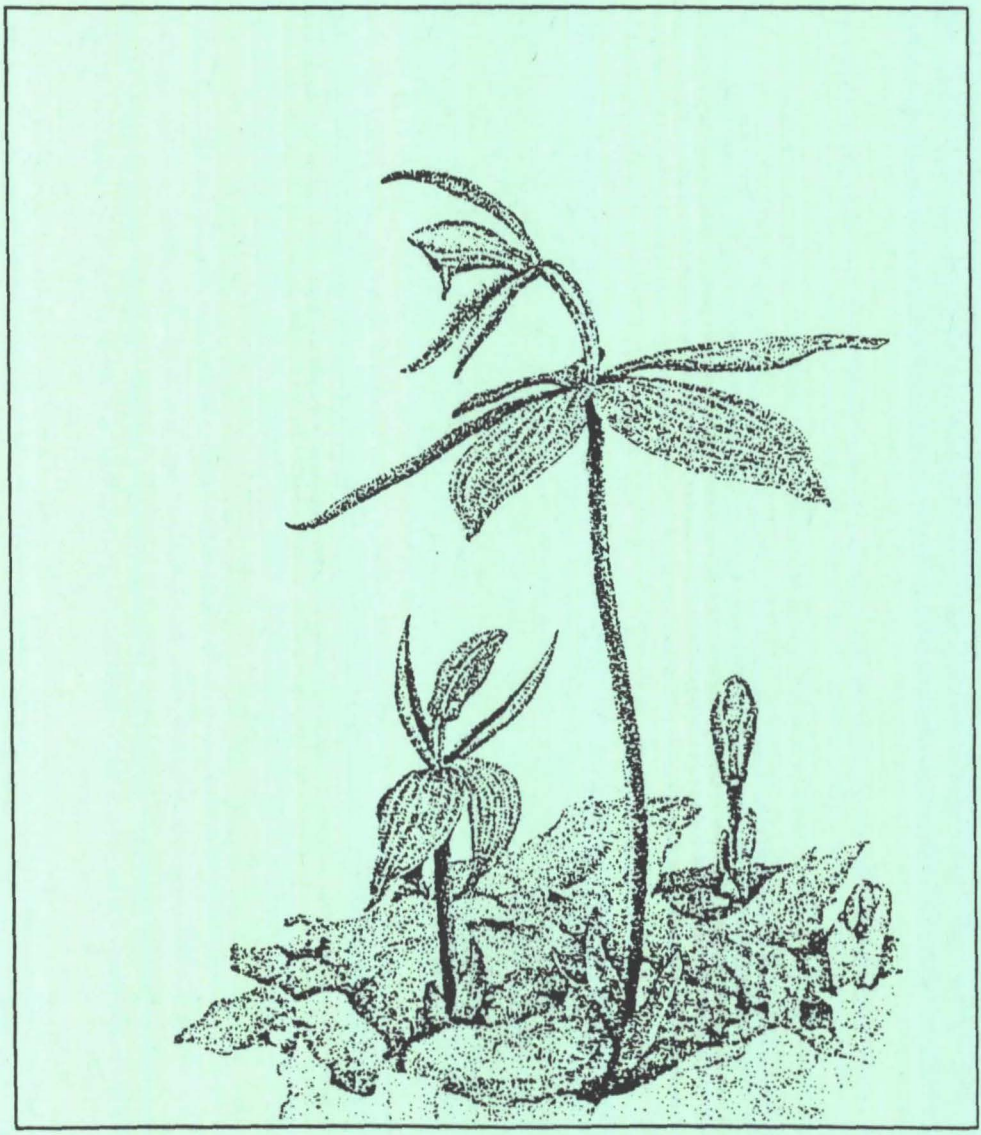
Step 1 – Review project on IPAC

Step 2 Listed or candidate species that are likely present according to the Official Species List from IPaC? "No Species" or IPaC species list	Step 2 Is your action area in critical habitat (only for Plymouth red-bellied cooter)? Yes or No	Step 3A Is suitable habitat for listed or candidate species present in your action area? "suitable habitat present" "suitable habitat not present" "Don't know"	Step 3B Does the species occur in your action area? "Species present" "Species not present" "Don't know"	Step 4 Determinations for the Endangered Species Act – **only Federal agencies complete this column** "No effect" "May effect"	Notes and Documentation (provide additional information if needed)
Small Whorled Pagonia	No	Not Present	Species Not Present		According to Lauren Gloriosi of Natural Heritage and Endangered Species Program, the area of the Site is not mapped within a Priority Habitat or Rare Species mapped area.

Notes: Piping Plover which is listed in Appendix II of the RGP, was not identified in IPAC website

Small Whorled Pogonia
(*Isotria medeoloides*)
Recovery Plan

FIRST REVISION



U.S. Fish and Wildlife Service

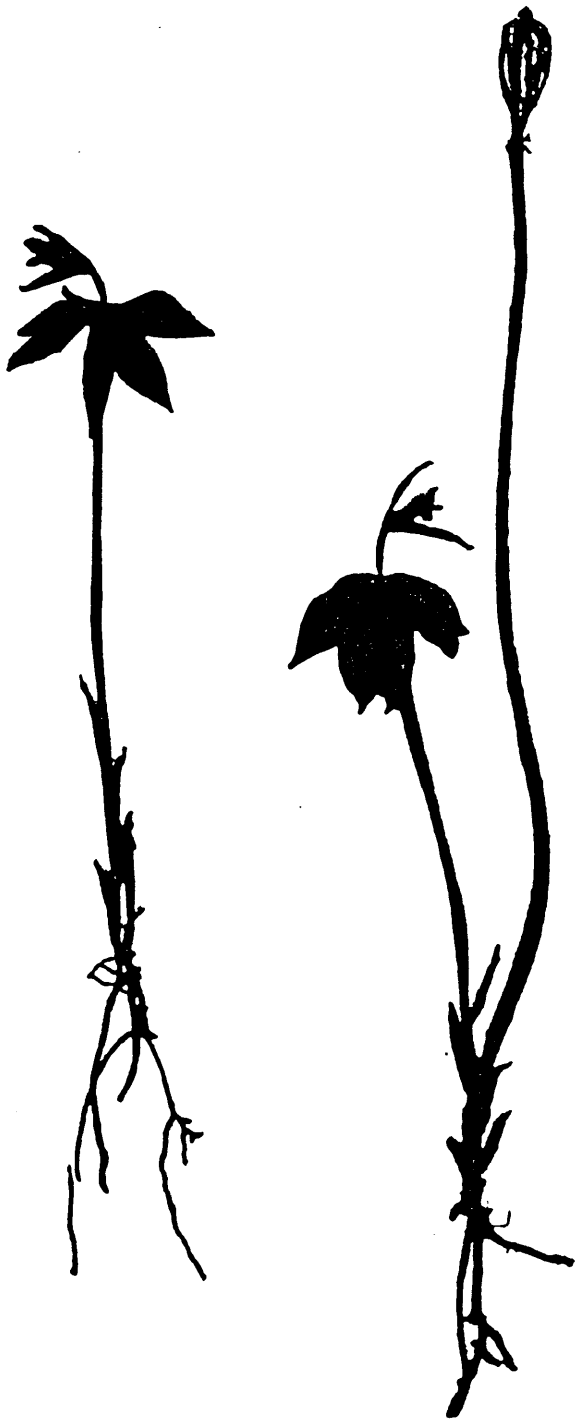
Region Five, Newton Corner, Massachusetts

SMALL WHORLED POGONIA

(*Isotria medeoloides*)

RECOVERY PLAN

FIRST REVISION



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ACTING
Regional Director, Region Five
U.S. Fish and Wildlife Service

Date: 11/13/92

The title page illustration is a xerox of a National Arboretum herbarium specimen collected by O.M. Freeman in May of 1941. The specimen is an historical record for James City County, Virginia, and is currently housed at the herbarium of the College of William and Mary, Williamsburg, Virginia.

EXECUTIVE SUMMARY

Small Whorled Pogonia Revised Recovery Plan

Current Status: This rare but widely distributed species is currently known from 86 sites in 15 states and Canada, with a total of approximately 2,600 stems (1991 data). This population level exceeds the number of occurrences known at the time of listing (17 extant sites); however, 13 to 15 sites are known to be extirpated, while as many as 41 sites are considered to be historical. Populations continue to be lost as habitat is degraded, developed, and otherwise threatened. *Isotria medeoloides* was listed as endangered on October 12, 1982, and the initial recovery plan was completed in 1985. Recovery activity to date has generated new site, life history, and population information. In addition, some level of habitat protection has been achieved for 47 percent of the known sites.

Habitat Requirements: The small whorled pogonia occurs on upland sites in mixed-deciduous or mixed-deciduous/coniferous forests that are generally in second- or third-growth successional stages. Characteristics common to most *I. medeoloides* sites include sparse to moderate ground cover in the species' microhabitat, a relatively open understory canopy, and proximity to features that create long-persisting breaks in the forest canopy. Soils at most sites are highly acidic and nutrient poor, with moderately high soil moisture values. Light availability could be a limiting factor for this species.

Recovery Objectives: The immediate objective of the recovery program is to reclassify the small whorled pogonia from endangered to threatened status. The ultimate objective of the program is to delist the small whorled pogonia by ensuring long-term viability of the species.

Recovery Criteria: *Isotria medeoloides* will be considered for reclassification when: (1) at least 25% of the known viable sites, distributed proportionately throughout the species' range, are permanently protected, (2) sites or colonies are shown to be viable using a geometric mean of 20 emergent stems over a 3-year period, and (3) site protection includes a sufficient buffer zone around the population. Delisting will be considered when: (1) at least 61 sites distributed proportionately throughout the species' current range are permanently protected; (2) these sites represent at least 75% of the known self-sustaining populations, using an average of 20 emergent stems, with 25% flowering stems, over a 10-year period; and (3) appropriate management programs are established, or sufficient habitat adjacent to existing colonies is protected, to allow for natural colonization.

Actions Needed:

1. Protect known *Isotria medeoloides* populations and essential habitat.
2. Manage protected habitats for *I. medeoloides*.
3. Monitor existing populations.
4. Survey for new populations.
5. Investigate population dynamics.
6. Investigate species biology.
7. Provide public information and education.

Estimated Costs ($000):

	Need 1	Need 2	Need 3	Need 4	Need 5	Need 6	Need 7	Total
FY1	22.5		5	22.5	7.5	5		62.5
FY2	20	5	7	25	7.5	10	10	84.5
FY3	20	25	5	20	20.5	10	13	113.5
FY4	9.5	17	5	22	5	10		68.5
FY5	9.5	12	5	22	5	5		58.5
FY6	9.5	10	5	15				39.5
FY7-10	9.5		20	15				44.5
Total	100.5	69	52	141.5	45.5	40	23	471.5

Estimated Time Frame: Reclassification should be initiated in 1993. Delisting may be initiated by the year 2003, if recovery actions are implemented on schedule.

* * *

Based on additional information generated by past recovery activities, this revised recovery plan updates the recovery objectives and tasks of the initial Small Whorled Pogonia Recovery Plan (U.S. Fish and Wildlife Service 1985), carrying forward a course of action for protecting and recovering this endangered species.

The plan does not necessarily represent the views of any individuals or agencies other than the U.S. Fish and Wildlife Service. It is subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks. Recovery objectives will be attained and funds expended contingent on budgetary constraints affecting the parties involved, as well as the need to address other priorities.

Literature citations should read as follows:

U.S. Fish and Wildlife Service. 1992. Small Whorled Pogonia (Isotria medeoloides) Recovery Plan, First Revision. Newton Corner, Massachusetts. 75 pp.

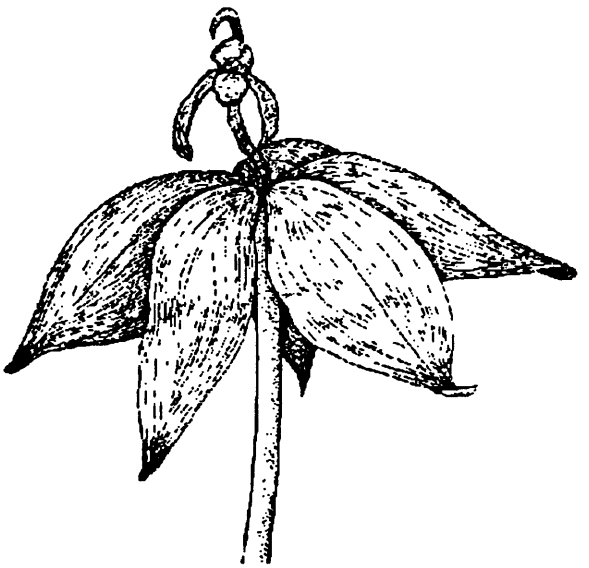
Additional copies of this plan can be purchased from:

Fish and Wildlife Reference Service
5430 Grosvenor Lane, Suite 110
Bethesda, Maryland 20814
301-492-6403
or
1-800-582-3421

Fees vary according to number of pages.

ACKNOWLEDGMENTS

Portions of this revised recovery plan were written under contract by Dr. Donna M.E. Ware, College of William and Mary. Her hard work and astute insights into the biology and status of Isotria medeoloides are much appreciated. Recognition is also extended to the cadre of State botanists and others who provided population and site-specific information to help further our understanding of this species.



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PART I: INTRODUCTION

Isotria medeoloides (Pursh) Raf., a member of the orchid family (Orchidaceae) (Figure 1), has long been considered a rare and intriguing species (Ames 1922). This perception was epitomized by one small whorled pogonia colony near Williamsburg, Virginia (Grimes 1921, Baldwin 1967), which inspired botanists to travel hundreds of miles to observe and photograph it (Morris and Eames 1929, Luer 1975, Ware 1988a). Although sparse, the species is widely distributed, with a primary range extending from southern Maine and New Hampshire through the Atlantic Seaboard states to northern Georgia and southeastern Tennessee. Outlying colonies have been found in the western half of Pennsylvania, Ohio, Michigan, Illinois, and Ontario, Canada.

Isotria medeoloides was listed as endangered on October 12, 1982 (U.S. Fish and Wildlife Service 1982). At the time of listing, records for the species were known from 48 counties in 16 states and Canada. However, only 17 sites (in ten states and Ontario, Canada) were known to be extant, and these sites contained a total of fewer than 500 plants. Subsequent searches have resulted in the discovery of several new sites: the 1991 census totaled approximately 2,600 stems at 86 sites in 15 states and Canada.

The initial Small Whorled Pogonia Recovery Plan was completed in 1985 (U.S. Fish and Wildlife Service 1985). Implementation of recovery activities specified in that plan generated additional site, life history, and population information. In addition, habitat protection efforts successfully resulted in some level of protection for approximately 50 percent of the known sites. This revision reflects these accomplishments and incorporates the latest information in updating recovery objectives and activities.

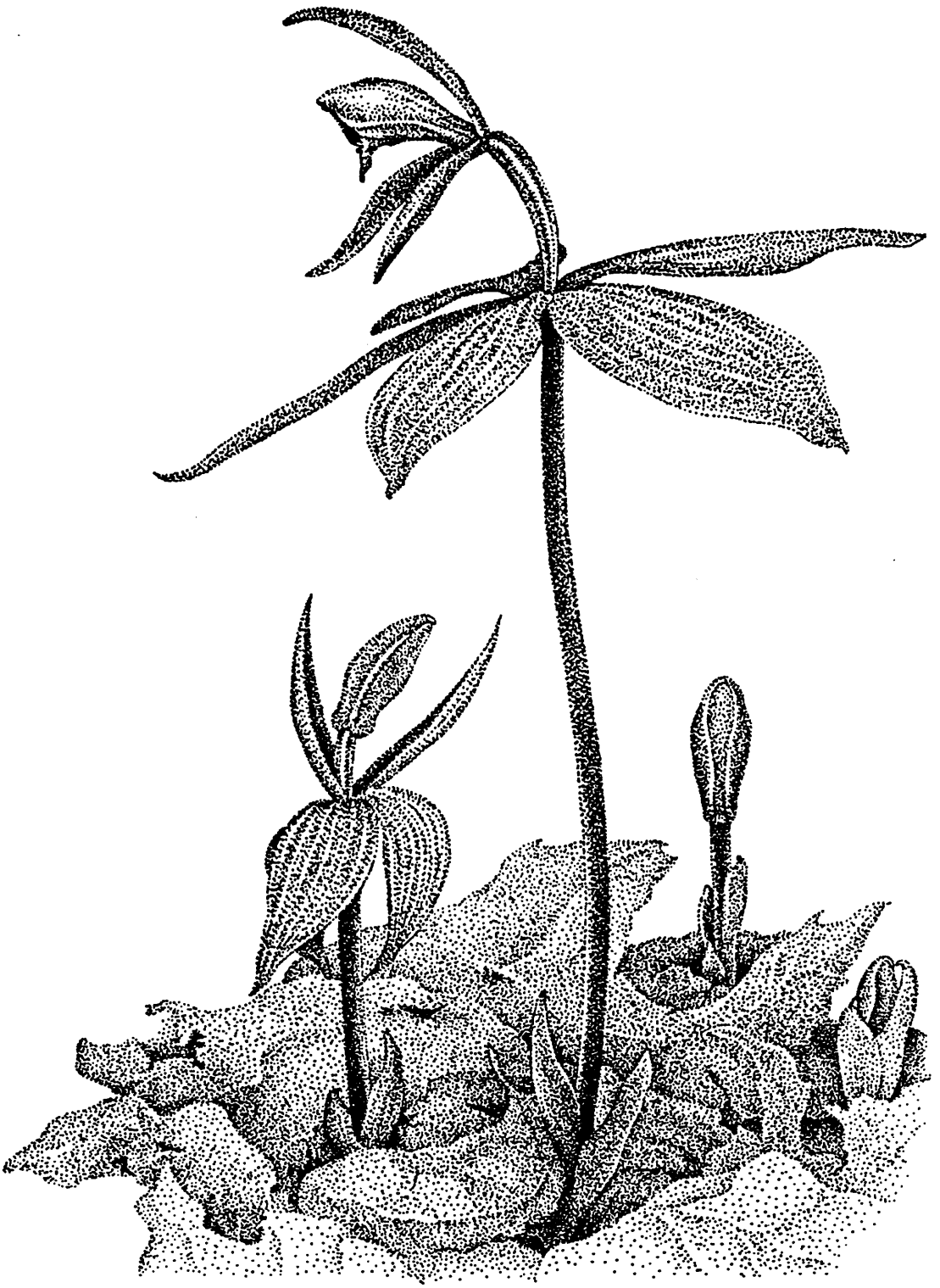


Figure 1. *Isotria medeoloides*

DESCRIPTION AND TAXONOMY

The small whorled pogonia was first described by Frederick Pursh in 1814 under the name Arethusa medeoloides. Pursh based this new species on a specimen from the Kittatinny Mountains, a mountainous region along the border of New York, New Jersey, and Pennsylvania (Fernald 1947). By 1838, the plant was recognized to be in a separate genus and was named Isotria medeoloides, although it later became known as Pogonia affinis and Isotria affinis. M.L. Fernald finally clarified the nomenclature in 1947, making the latter names synonyms of I. medeoloides.

Isotria is a genus with only two species: I. medeoloides and I. verticillata, the large whorled pogonia. Both species are herbaceous perennials with slender, hairy, fibrous roots that radiate from a crown or rootstock. In the genus Isotria, overwintering buds for the next year's shoot form on the rootstock at ground level in robust plants and beneath the soil surface on most smaller plants. The five or six leaves of Isotria plants (or four leaves in some vegetative plants) display themselves in a circular arrangement (false whorl) at the apex of a robust, smooth, hollow stem. A single flower, or flower pair, stands in the center of the whorl of leaves. The sepals are outwardly spreading, and the overall shape of the Isotria flower superficially resembles a typical Easter corsage orchid; however, in the Isotria species two lateral petals point forward above the lip, and the petals and sepals are narrower than the typical orchid. The three sepals of the flower are more or less equal in length, the attribute for which the genus received its name (isos, equal; treis, three) (Fernald 1950).

Isotria medeoloides has a number of key characteristics that differentiate it from I. verticillata. Particularly important are the color of the stem and flower, the relative lengths of the sepals and petals, and the length of the stem (peduncle) of the fruit capsule in relation to the length of the capsule itself. An

individual small whorled pogonia is usually single-stemmed, although occasionally a plant produces two or more stems in a cluster. The stem ranges from 6 to 35 centimeters tall in a flowering plant and is similar in color, with the same degree of glaucousness, as white seedless grapes; the elliptic to elliptic-obovate leaves are also a pale milky-green or grayish-green. The flower is yellowish-green with a greenish-white lip. The sepals vary from linear-oblanceolate to narrowly spatula-like in shape, and spread outward when in full flower (Figure 2). The lateral petals are oblanceolate to oblong-elliptic and point forward above the lip. The sepals are approximately 1.5-2.5 cm long and either equal in length to the lateral petals or up to 1.5 times as long.

Figure 2. *I. medeoloides* flower

During the flowering stage, the ovary appears to be attached directly to the center of the whorl or on a very short stalk. As the erect fruit capsule develops, this stalk elongates, but it does not exceed the length of the body of the capsule (Figure 3). When the capsule dries, it splits and releases thousands of minute seeds (Figure 4).

Figure 3. *I. medeoloides* maturing capsule

Figure 4. *I. medeoloides* dehiscent capsule

Colonies of the large whorled pogonia often occur near colonies of the small whorled pogonia in the extensive region in which they occur together (Morris and Eames 1929; Ware 1988a; A. Belden, Virginia Division of Natural Heritage, in litt. 1991; N. Murdock, USFWS, pers. comm. 1991; E. Johnson, New Jersey Natural Heritage, pers. comm. 1991; K. Clancy, Delaware Natural Heritage, pers. comm. 1991; J. Cavanaugh, pers. comm. 1991). The

two species have also been reported to grow mixed together (Dixon and Cook 1988).

The combination of the overlap in ranges and the eye-catching generic characteristics that the two species share results in frequent misidentifications of Isotria verticillata as Isotria medeoloides. Similarities aside, there are striking differences between the two in both vegetative and reproductive parts that can be used in the field to tell them apart (Table 1).

Table 1. Contrasting characteristics of *Isotria medeoloides* and *Isotria verticillata*.

Morphological Characteristic	*Isotria medeoloides*	*Isotria verticillata*
Stem	stem greenish-white	stem reddish-purple (at least in lower portion)
Sepal length	sepals equal to or up to 1.5 times as long as petals	sepals 2 to 3 times as long as petals
Flower	flower is yellow-green with a greenish-white lip	sepals grade form greenish-white at the base to reddish-purple toward tip
Leaves	leaves are glaucous	leaves are not glaucous
Leaf development	leaves are well developed when flowering begins	leaves are very small when flowering begins
Leaf whorl development	leaf whorl of flowering plants reflexes	leaf whorl does not reflex
Peduncle length	length of peduncle does not exceed length of capsule	length of peduncle is longer than length of capsule

Indian cucumberoot, Medeola virginiana (lily family), often grows with Isotria, and when in its vegetative stage is frequently confused with it. This confusion is reflected in the specific name of the small whorled pogonia, medeoloides (like "Medeola"). Medeola can be distinguished from Isotria by its wiry, solid stem clothed with cobwebby hair near the base.

POPULATION STATUS AND DYNAMICS

The distribution and dynamics of small whorled pogonia populations are discussed here in terms of sites and colonies. For the purposes of this document, the following definitions are applied to these two terms: A **site** is considered to be the proximal area where one isolated small whorled pogonia colony or a cluster of colonies occurs. All the colonies comprising a site are usually within the same watershed and are usually separated from one another by no more than a quarter of a mile to one half of a mile. A **colony** is a single natural grouping of plants in a particular locality. There may be gaps between clusters of stems within the colony, but there should be no large disjunctions and no major habitat discontinuities. The terms group, subgroup, population, and subpopulation are frequently found in the literature and are approximate synonyms for colony.

The small whorled pogonia has a broad but sparse primary distribution in the Atlantic seaboard states from Maine to Georgia with outlying occurrences in the midwest United States and Canada. The States of Delaware, Tennessee, and Ohio have been added to the species' range in recent years, each on the basis of the discovery of a single colony.

Historical records exist for localities within Vermont, Maryland, Missouri, Ohio, eastern Pennsylvania, and the District of Columbia. The habitat of many of these known historical sites has been destroyed; for example, sites in Maryland, the District of

Columbia, and New Jersey have been lost to habitat destruction, primarily from development. Recent efforts to relocate historical sites in New York, Vermont, and Missouri have been unsuccessful (Dixon and Cook 1988; T. Smith, Missouri Natural Heritage Program, pers. comm. 1992).

There are three main population centers of the small whorled pogonia today (Figure 5). The northernmost is centered in the Appalachian Mountains foothills in New England and northern coastal Massachusetts, with one outlying site in Rhode Island. A second grouping is located at the southern extreme of the Appalachian chain in the Blue Ridge Mountains where North Carolina, South Carolina, Georgia, and Tennessee join. The third center is concentrated in the coastal plain and piedmont provinces of Virginia, with outliers in Delaware and New Jersey. Six sites scattered in four outlying states (west-central Pennsylvania, Ohio, Michigan, and Illinois), and one in Ontario, are considered disjunct populations.

The largest by far of the population centers in terms of sites, colonies, and stems is the New England concentration. In 1991, this center comprised 53 sites (with 92 colonies) that produced a total of approximately 2,200 stems. The southern Blue Ridge concentration consisted of 15 sites (23 colonies) that produced 172 stems in 1991. The Virginia center had 12 sites (21 colonies) and produced over 250 stems, while the midwestern outliers produced a total of nine stems in 1991. Because colony sizes and stem counts fluctuate widely on an annual basis, population dynamics must be factored into both the decline and the recovery of the species. This consideration is discussed below.

Population dynamics

Individual colonies of small whorled pogonia have wide population fluctuations from year to year, making assessment of their presence and viability difficult at best. Monitoring is

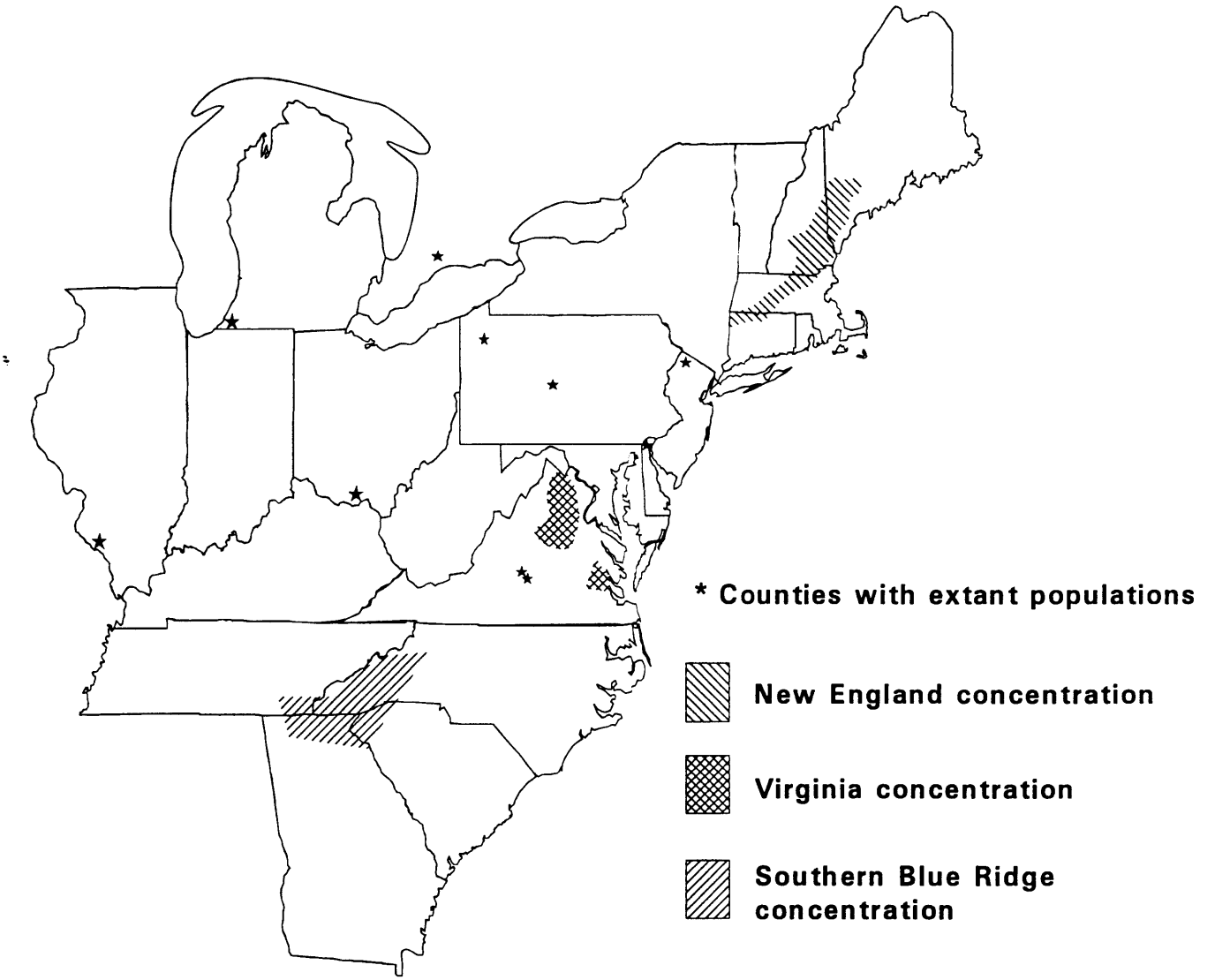


Figure 5. Population concentrations of *Isotria medeoloides*

being conducted throughout the range of this species in an effort to interpret the age and stage of colonies being studied and their fate through time. The percent of stems emerging has declined in many of the colonies being monitored, sometimes in the absence of any obvious cause (Brumback and Fyler 1988, Vitt 1991a, Ware 1991).

Possible causes for the decline of a population include one or a combination of the following: changes in habitat that lead to the death of adult plants, changes that prevent seed germination, or changes that prevent seedling establishment (Mehrhoff 1989b). Thus, a colony with an extremely high percentage of vegetative plants may be an established colony that has been repressed (Brackley 1985). On the other hand, such a colony may be one that is young and just getting established. At this time, it is virtually impossible to determine whether such a colony is young or in decline.

A different scenario for a non-viable colony would be of a colony that consisted mostly or solely of flowering plants. This type of population structure may indicate a temporary lapse in reproduction, or that it is a "dead end" colony. The latter would be a situation in which the habitat is still amenable to mature plants, but is no longer amenable to the germination and/or establishment of seedlings. Some of the smaller colonies (10 stems or less) are made up solely of plants known to have flowered, often with successful fruiting (D. Ware, College of William and Mary, pers. comm. 1992). Further investigation into the population structure and reproductivity is needed to determine the viability of such skewed colonies.

Five colonies have been closely monitored for seven to nine years in Virginia. Of these, one is stable, three are showing gradual decline in numbers, and one declined radically in 1989 (Ware 1990). As an example, one colony had 143 stems in 1986, the highest number known for a single colony south of New England (Ware 1987a); however, its size had gradually declined to 62 stems by 1991, apparently as a result of increased grazing by deer. At

another Virginia site, the population in each of four colonies plummeted in one year from 34, 25, 14 and 8 stems to six, seven, six, and 0 stems (Ware 1991).

In North Carolina, one site (two colonies) located in the Nantahala National Forest (Macon County) has steadily declined over a 15-year period. Only one plant was present in 1991 at what had been the larger of the two colonies. There has been no apparent change in the habitat except for some reduction in shading due to oak wilt.

In some cases, populations that had shown a decline in numbers have since demonstrated a reversal. In Maine, subsets of monitored plants in each of four of the five large colonies declined in 1989 and 1990 (Vitt 1991b), but three of them increased in numbers the following year (Vitt in litt. 1991). A colony in Massachusetts that had diminished from 130 to 62 stems over an eight-year period rebounded to 100 stems in one year (P. Dunwiddie, Massachusetts Audubon Society, pers. comm. 1991). No obvious environmental changes were observed. Further monitoring data are needed to determine whether certain colonies are in a true decline or whether natural cycles, perhaps related to weather patterns, are taking place.

Throughout this plan, numbers designating colony size (stem counts) refer to the total number of stems emerged in a given year, not to the total number of different plants that have been known to emerge in that colony over a period of years. For instance, in the large colony in Virginia, the greatest number of stems known to have emerged in a given year is 144; however, over nine years of monitoring, stems have emerged at 261 different loci in that colony. Those not emerging in a given year are considered to be either dead or dormant (D. Ware pers. comm. 1992). Dormant plants usually return as vegetative plants, but may return in the flowering state (Brumback and Fyler 1988). Vitt (1991a) observed a 40-45 percent likelihood that a re-emergent individual would be vegetative.

State-by-state distribution and status

On a per state basis, the largest number of colonies are in New Hampshire (65), Maine (17), and Virginia (17). In addition, these three states, and Massachusetts, are the only states where large colonies (100 or more stems) have been documented. Historical and current distribution and the current level of protection of extant sites are described below for each state.

Maine

There are 16 extant sites (17 colonies) and three historical sites in Maine. Of Maine's five largest colonies (on five sites), three have some form of protection. One site occurs on property owned by The Nature Conservancy; TNC holds a conservation easement on another site. The Maine Department of Inland Fisheries and Wildlife owns most of a third site. The remaining two large colonies, and all the smaller colonies, are on private land.

New Hampshire

New Hampshire appears to be the major "hot spot" for this species. Thirteen extant sites were known at the time of the original recovery plan (USFWS 1985); as of 1991 there were 30 sites (65 colonies). Two sites accounted for approximately 60 percent of the total stem count in 1991. One Belknap County "megasite" is composed of 23 colonies in which a total of over 800 stems emerged in 1991. One of these colonies alone produced 326 stems in 1985 (W. Brumback, New England Wild Flower Society, in litt. 1992), the record for the species throughout its range. The second largest site, on municipal and private property in Strafford County, had five colonies (285 stems) in 1991. Only two sites are found west of the Merrimack River, the second of which was recently discovered (S. von Oettingen, USFWS, pers. obs. 1991). In 1991 approximately 100 stems were counted at this location.

Nine New Hampshire sites are under some form of protection: the majority of populations of the Belknap County megasite are now

on town conservation land and/or have conservation easements, two populations are on property owned by The Nature Conservancy, two others are registered by TNC (voluntary protection only), one population is on property owned by a watershed association with a conservation easement held by TNC, one population is owned by a land trust organization, one population is partially municipally owned, and one has voluntary landowner protection.

Vermont

Vermont has one historical site and no known extant sites. Searches undertaken in 1989 at the historical site and other potential habitat in Chittenden County were not successful (B. Popp, Vermont Natural Heritage Program, pers. comm. 1991).

Massachusetts

There are three sites with extant colonies in northeastern Massachusetts, and two sites in the central portion of the state. The largest site, in Essex County, supported one large and four small colonies in 1991 (P. Swain, Massachusetts Natural Heritage Program, pers. comm. 1991). A colony discovered in Hampden County in 1986 (with 30 stems) had only three stems in 1991 (J. Cavanaugh pers. comm. 1991).

Two of the Massachusetts sites have some degree of protection. One site is on municipal land, while the other site is owned by a conservation land trust (T. Simmons, TNC, pers. comm. 1992).

Rhode Island

The species has been reported from two sites in Rhode Island (R. Enser, Rhode Island Natural Heritage Program, pers. comm. 1991). One colony in Providence County was discovered in the 1930s, relocated in 1979, and last monitored in 1990, when only a few stems were present. A 1957 report recorded 23 stems from the second Rhode Island site; however, no stems have been reported since the early 1970s (Church and Champlin 1978). This site is on privately owned land with no habitat protection.

Connecticut

The one extant site (one colony) in Connecticut is on state forest land. Four stems were present when it was first recorded in 1983 (USFWS 1985); the same number was reported in 1991. In the intervening years the count fluctuated from one to eight stems (N. Murray, Connecticut Natural Diversity Data Base, in litt. 1991). There are eight historical sites in the state.

New York

All six historical sites in New York have been extirpated (S. Clemants, Brooklyn Botanic Garden, in litt. 1989). The most recent report for the state was of a single plant seen in Onondaga County in 1980 (USFWS 1985). Four of the six historical sites fell victim either to reservoir construction or housing development.

Pennsylvania

There are three extant sites (four colonies) in Pennsylvania. The largest colony is in Centre County where 14 stems were discovered in 1987, although only five emerged in 1991. This site is in a special management area owned by Pennsylvania Department of Fish and Game (P. Wiegman, TNC, pers. comm. 1991). The second Centre County site, on privately owned land, was discovered in 1979 and has two very small colonies (E. Dix, Bureau of Forestry, pers. comm. 1992). The third site, also privately owned, had only one plant in 1991. Five of the historical sites in eastern Pennsylvania have been intensively searched at least twice, with no success (J.Kunsman, Eastern Pennsylvania Natural Heritage Program, in litt. 1991). A sixth historical site is based on one herbarium specimen dating from the 1920s.

New Jersey

There are two and possibly three extant sites in New Jersey. The Nature Conservancy has a cooperative agreement with the private landowner for one site in Sussex County, where the number of plants has fluctuated from 21 stems in 1981 to six in 1987. A second site in the county has two small colonies and is located on a preserve

owned by TNC. Three small whorled pogonias were found on a previously unconfirmed historical site in May of 1991, but had been grazed early in the season, presumably by deer (R. Radis pers. comm. 1992). There are eight historical sites in the state.

Delaware

The small whorled pogonia was reported from Delaware (New Castle County) for the first time in 1985 (eleven stems in the one colony). In 1991 five stems were reported. The private landowner has shown interest in protecting the site (K. Clancy, Delaware Natural Heritage Program, pers. comm. 1991).

Maryland

There have been no sightings of the species in Maryland since 1928-1930 when it was found at three, and perhaps as many as five, sites in Montgomery County. All these sites were located within an area of less than two square miles that has since been developed (G. Cooley, Maryland Natural Heritage Program, pers. comm. 1992).

Washington, D.C.

Recent checks have verified that two historical sites in the District of Columbia have been destroyed by land development, one as recently as 1991 (K. Minnichello pers. comm. 1992).

Virginia

The small whorled pogonia is known from nine sites in Virginia (18 colonies), a number of which are protected or semi-protected. Sites located on military reservations are afforded some level of protection; at the military reservation in Caroline County, no disturbance to Isotria medeoloides has been observed over the past ten years, although training occurs nearby. In 1991, searches on another military base yielded three new sites. One site (four colonies) is located on National Park Service property (D. Ware pers. comm. 1992). Despite being on Federal property, these colonies are susceptible to disturbance from adjacent housing developments.

Records based on the sighting of a single stem are known from Buckingham County (Harvill 1969) and Appomattox County (C. Stevens pers. comm. 1988). Recent attempts to relocate the species in these central piedmont counties and in New Kent County (last seen in 1929) have not been successful (Ware 1988b).

North Carolina

There are five extant sites (seven colonies) in North Carolina (N. Murdock pers. comm. 1991). Most are located on Federal or municipal land and are afforded some protection. The Haywood County site (one colony) -- found at 3600 feet, the highest known elevation of any of the small whorled pogonia occurrences -- is located on National Park Service land. It produced only one stem in 1991 (D. Pittillo, West Carolina University, pers. comm. 1992). Another site (one colony), located in Nantahala National Forest, has steadily declined over a 15-year period. A third site (two colonies), located on municipal land, is semi-protected. The two remaining sites (one colony each) are on privately owned land; one of these had 25 stems when last recorded in 1986.

South Carolina

Three extant sites (seven colonies) of small whorled pogonia are found in South Carolina, located within a five-mile radius of one another in the Sumter National Forest (Gaddy 1985). Three of these colonies were known in 1980, three more were found in 1985, and one in 1991. Six of the colonies produced an average of six or fewer stems per year. One has had no plants since 1982; another has had none since 1987. In a seventh colony, 12 to 14 stems emerged over each of the last six years.

Georgia

As of 1985, Georgia had no confirmed occurrences of Isotria medeoloides. By 1991, six different sites with seven colonies had been found on the Chattahoochee National Forest (T. Patrick, Georgia Natural Heritage Program, pers. comm. 1991). A seventh site (one colony) was found on private land adjacent to the

National Forest. The colony on private land has not been checked since 1987, when it had eight stems (T. Patrick pers. comm. 1991). Two other sites in Georgia are now considered extirpated (T. Patrick pers. comm. 1991).

Tennessee

Isotria medeoloides is known from one site (one colony) in Tennessee on privately-owned farmland (B. Wilkey, Tennessee Department of Conservation, pers. comm. 1991). When the site was discovered in 1986, there were 19 stems, but the number of emerging stems had dwindled to seven in 1991 (P. Somers, Tennessee Department of Conservation, pers. comm. 1992).

Ohio

The only report of small whorled pogonia from Ohio was a single plant found in 1985 on state forest land. None were found on two later visits to the site (F. Case pers. comm. 1992).

Michigan

The single known site in Michigan was discovered in 1968 (Case and Schwab 1971). Two plants were last seen at this location in 1984, although there had been as many as 20 stems counted previously (W. Schwaub pers. comm. 1992). This site was made a preserve expressly for the protection of this species.

Illinois

The single Illinois site (one colony) was discovered in 1973. In 1991, only one plant was observed. This site is located on land owned by The Nature Conservancy and is protected.

Missouri

Despite repeated searches, no small whorled pogonias have been located in the vicinity of the "limestone hill" in Bollinger County where the species was first collected in 1897 (T. Smith, Missouri Natural Heritage Program, pers. comm. 1991).

Canada

The only records for small whorled pogonia in Canada are from an Elgin County, Ontario site discovered in 1977 (Stewart 1977). Only one plant emerged in 1989, 1990, and 1991. The site is on a preserve purchased by The Conservation Authority specifically to protect this species (W. Stewart pers. comm. 1992). Table 2 summarizes the 1985 and 1991 distribution and status of Isotria medeoloides throughout its range.

Table 2. Distribution and status of *Isotria medeoloides*.

STATE	COUNTY	No. SITES 1985	No. SITES 1991
Maine	Cumberland	1(E) 1(H)	3(E) 1(H)
	Kennebec	1(E)	1(E)
	Oxford	1(H)	3(E)
	York		2(H) 9(E)
Total Extant		**2**	**16**
New Hampshire	Belknap	2(E) 2(H)	6(E) 2(H)
	Carroll	3(E) 2(H)	7(E) 2(H)
	Grafton	1(H)	1(H)
	Hillsborough		1(E)
	Merrimack	2(E)	3(E)
	Rockingham	1(E)	1(E)
	Strafford	8(E) 2(H)	12(E) 2(H)
Total Extant		**16**	**30**
Vermont	Chittenden	1(H)	1(H)
Total Extant		**0**	**0**
Massachusetts	Essex	1(E)	2(E)
	Hampden		1(E)
	Hampshire	1(H)	1(H)
	Middlesex		1(E) 1(H)
	Worcester		1(E)
Total Extant		**1**	**5**

Table 2. Continued.

STATE	COUNTY	No. SITES 1985	No. SITES 1991
Rhode Island	Kent	1(H)	1(H)
	Providence	1(E)	1(E)
Total	**Extant**	**1**	**1**
Connecticut	Fairfield	2(H)	1(H)
	Hartford	1(H)	1(H)
	Litchfield	1(E)	1(E)
	New Haven	1(H)	1(H)
	New London	2(H)	2(H)
	Tolland	1(H)	1(H)
	Windham	1(H)	1(H)
Total	**Extant**	**1**	**1**
New York	Nassau	1(H)	1(H)
	Onondaga	1(H)	1(H)
	Rockland	1(H)	1(H)
	Suffolk	1(H)	1(H)
	Ulster	1(H)	1(H)
	Washington	1(H)	1(H)
Total	**Extant**	**0**	**0**
Pennsylvania	Berks	1(H)	1(H)
	Centre	1(E)	2(E)
	Chester	1(H)	1(H)
	Greene	1(H)	1(H)
	Monroe	1(H)	1(H)
	Montgomery	1(H)	1(H)
	Philadelphia	1(H)	1(H)
	Venango	1(H)	1(E)
Total	**Extant**	**1**	**3**
New Jersey	Bergen	3(H)	3(H)
	Hunterdon	1(H)	1(H)
	Monmouth	1(H)	1(H)
	Passaic	2(H)	1(U)
			1(H)
	Sussex	2(E)	2(E)
		1(H)	2(H)
Total	**Extant**	**2**	**2 to 3**
Delaware	New Castle		1(E)
Total	**Extant**	**0**	**1**
Maryland	Montgomery	2(H)	3 to 5(H)
Total	**Extant**	**0**	**0**

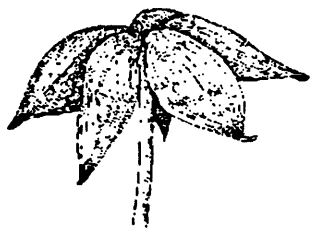
Table 2. Continued.

STATE	COUNTY	No. SITES 1985	No. SITES 1991
Washington D.C.		2(H)	2(H)
Total	**Extant**	**0**	**0**
Virginia	Appomattox	1(U)	
	Buckingham	1(H)	1(H)
	Caroline	1(E)	2(E)
	Gloucester	1(H)	1(E)
	James City	1(E)	2(E)
		1(H)	1(H)
	New Kent		1(H)
	Prince William		3(E)
	Stafford		1(E)
Total	**Extant**	**2 to 3**	**9**
Georgia	Habersham	1(H)	1(H)
	Gilmer		2(E)
	Rabun	1(E)	2(E)
			1(H)
	Towns		1(E)
	Union		1(E)
Total Extant		**1**	**6**
Tennessee	Hamilton		1(E)
Total Extant		**0**	**1**
Ohio	Scioto		1(U)
Total Extant		**0**	**0 or 1**
Michigan	Berrien	1(E)	1(E)
Total Extant		**1**	**1**
Illinois	Randolph	1(E)	1(E)
Total Extant		**1**	**1**
Missouri	Bollinger	1(H)	1(H)
Total Extant		**0**	**0**
Canada	Elgin	1(E)	1(E)
Total Extant		**1**	**1**
Range Total		30(E) 50(H)	86(E) 53(H)

E = Extant H = Historical U = Status Unknown

LIFE HISTORY

Populations of Isotria medeoloides consist of plants that may be in any of four different states: vegetative, with an abortive flower bud, flowering, or dormant (Mehrhoff 1989a). On the average, a flowering plant is taller and has a wider whorl diameter than one with an abortive bud; likewise, the latter is bigger than a vegetative plant (Mehrhoff 1980, 1989a).



Reproduction

Mehrhoff (1989a) determined that the leaf whorl diameter in a given year is a good predictor of the reproductive state of that plant for the following year. Plants that are large one year are more likely to bloom the next year, while plants that are small are more likely to be vegetative, go dormant, or die (Mehrhoff 1989a, Vitt 1991a). However, an event that prevents a large plant from storing adequate energy (the loss of the whorl early in the season, for instance) may interrupt this sequence. A previously large plant may then reappear the next year as a small vegetative plant or may fail altogether to emerge (Mehrhoff 1989a). At present, short of examining the rootstock or doing annual monitoring, one cannot tell whether a small vegetative plant is a seedling, a young plant, or an older plant that may have flowered in the past.

The small whorled pogonia appears to have a staggered system of emergence, depending upon the reproductive status of the individual plant. On the average, those stems that form an abortive flower bud emerge later than flowering plants, while vegetative plants emerge latest of all (Brumback and Fyler 1988). In the northern part of its range, plants with flowering buds emerge from the leaf litter in May and flower in June (Brumback and Fyler 1988). Farther south (e.g., in Virginia), such plants

typically emerge in April, with flowering beginning in very late April to mid-May (Ware 1987a). An individual plant may stay in flower from four days to nearly two weeks (Mehrhoff 1983).

Isotria medeoloides is scentless, apparently lacks nectar, and is primarily self-pollinating (Mehrhoff 1983, 1989a; Vitt 1991a). The effects of inbreeding, if any, on the long-term viability of this species are not known (L. Mehrhoff in litt. 1992). Insect pollination may take place on occasion; however, this has not been documented. The small whorled pogonia only occasionally reproduces vegetatively, as indicated by rare occurrences of two or more stems originating from a single root stock (Ames 1922, Brumback and Fyler 1983, D. Ware pers. comm. 1992).

As soon as pollination occurs, the ovary begins to plumpen. The fruit capsule does not fully ripen until fall, and may not dehisce until late fall. Many plants form a visible over-wintering vegetative bud at the base of the stem in August or September (Mehrhoff 1983).

Dormancy

Dormancy for I. medeoloides continues to be a matter of speculation and debate. Early comments suggested that dormancy for this species could extend from 10 to 20 years (Correll 1950, USFWS 1985). To date, this length of dormancy has not been substantiated. However, shorter periods of dormancy are being documented. Mehrhoff (1989b) conducted a six-year study and observed that no plants emerged after three or more consecutive years of dormancy. Brumback and Fyler (1988) also followed a number of colonies through time. Their data show periods of dormancy for up to four years. During a study of four sites in Maine, Vitt (1991a) determined that dormancy varied by year and site. The majority of plants in this study experienced dormancy for only a single year before re-emerging, while a very small

percent were dormant for three consecutive years, re-emerging in the fourth. In Virginia, among five colonies monitored from four to seven years, 14 stems reappeared after one year of dormancy and two stems after two years (Ware 1990). Continued annual tracking of dormant plants will be necessary to determine the maximum length of dormancy.

Mycorrhizal relationships

Orchid seeds, unlike seeds of other angiosperms, contain either very small quantities of food reserves or none at all. They will not germinate and/or establish seedlings unless they fall on a substrate containing a suitable mycorrhizal fungus (Jackson and Mason 1984). These fungi are often ones that can use cellulose as an energy source (Mallock et al. 1980). The strands of the fungus penetrate the cells of the orchid and form a symbiotic root/fungus association known as a mycorrhiza.

Mycorrhizae serve as conduits through which the young, non-photosynthetic orchid seedling receives water and nutrients (Mallock et al. 1980). In return, the orchid provides the fungus with carbohydrates at a later stage of its life cycle (Sanders et al. 1975).

Mycorrhizal fungi have been seen in the tissues of mature Isotria medeoloides (Ames 1922), although, to date, no specific mycorrhizal fungus has been identified. However, a member of the genus Rhizoctonia, a commonly encountered mycorrhizal fungus, was isolated from Isotria verticillata (L. Mehrhoff, Connecticut Natural Diversity Data Base, in litt. 1983). In addition, a species known to be a fungal symbiont of other orchids, Armillariella mellea, the honey mushroom (C. Ovrebo, Central State University at Edmond, Oklahoma, pers. comm. 1985), was identified from decaying wood in a large Virginia colony (Ware 1987b).

HABITAT REQUIREMENTS

Vegetation characteristics

Although varying in composition, the mixed-deciduous or mixed-deciduous/coniferous forests in which the small whorled pogonia grows are generally in second- or third-growth successional stages. The small whorled pogonia occurs both in fairly young forests and in maturing stands. The ages of the older trees forming the canopy at some of the sites have been estimated at 45-50 and 60-80 years old in Virginia (Ware 1987b), at least 75 years old in New Hampshire (Brumback and Fyler 1983), and as little as 30 years old in white pine stands in South Carolina (Gaddy 1985).

Historical agricultural use of small whorled pogonia habitat may not be uncommon. At some sites, vestiges of rows and furrows from past cultivation are still visible (F. Brackley pers. comm. 1991, D. Ware pers. comm. 1992). For example, some of the habitat at the megasite in Belknap County, New Hampshire was known to be open pasture 80 years ago (Brumback and Fyler 1983), and a site in Union County, Georgia was stony old pasture about 50 years ago (B. Sanders, U.S. Forest Service, pers. comm. 1992). There is also circumstantial evidence that the site of the large colony in James City County, Virginia, was once a hog lot (B. Apperson, Virginia Division of Forestry, pers. comm. 1986).

The majority of Isotria medeoloides sites share several common characteristics. These include: sparse to moderate ground cover in the microhabitat of the orchids (except when among ferns); a relatively open understory canopy; and proximity to logging roads, streams, or other features that create long persisting breaks in the forest canopy (Mehrhoff 1989a). Beyond this "common ground" of habitat characteristics, there are myriad exceptions and variations that may occur regionally and/or locally. As one example, the

single Illinois site is on a steep, thinly forested slope atop a vertical sandstone bluff. Wilted and withered plants have been observed there (Homoya 1977), and it has been described as perhaps the driest of all known sites (USFWS 1985).

Various second-growth forest types in which Isotria medeoloides occurs in its primary range include: mixed deciduous/white pine or hemlock forests in New England, mixed deciduous forests in Virginia, and white pine/mixed deciduous or white pine/oak/hickory forests in Georgia. In Michigan, the habitat of the single known extant colony is dominated by red maples (Case and Schwab 1971). The Illinois plants inhabit an oak/hickory forest (Homoya 1977). The Ohio site is in the region along the Ohio River that supports an Appalachian-type forest association and several species of Appalachian affinities (A. Cusick, Ohio Department of Natural Resources, pers. comm. 1992). Species associated with each forest type are identified by range section in Table 3.

Understory trees and shrubs in the northern part of the range include witch-hazel (Hamamelis virginiana), striped maple (Acer pensylvanica), American hazelnut (Corylus americana), and serviceberry (Amelanchier arborea) (Mehrhoff 1980). In the southern part of the range flowering dogwood (Cornus florida), sourwood (oxydendron arboreum), mountain laurel (Kalmia latifolia), American chestnut (Castanea dentata), witch-hazel, and, in the mountains, flame azalea (Rhododendron calendulaceum) are the more common understory tree and shrub associates (Mehrhoff 1980).

A few ground-layer taxa that are associated with the small whorled pogonia in the northeastern part of its range also occur with it in at least a portion of its southern range. This is particularly true for partridge berry, Indian cucumber root, New York fern, and sweet lowbush blueberry. In general, however, herbaceous associates vary greatly from region to region, and none can be considered true indicator species because of their

Table 3. Typical canopy species associated with *Isotria medeoloides*.

RANGE SECTION	SCIENTIFIC NAME	COMMON NAME
New England	*Acer rubrum*	Red maple
	Tsuga canadensis	Eastern hemlock (Canada hemlock)
	Betula papyrifera	Paper birch
	Quercus rubra	Northern red oak
	Pinus strobus	White pine
	Fagus grandifolia	American beech
Virginia	*Quercus alba*	White oak
	Q. velutina	Black oak
	Q. coccinea	Scarlet oak
	Liquidambar styraciflua	Sweet-gum
	Liriodendron tulipifera	Tulip poplar
	F. grandifolia	American beech
South Carolina and Georgia	*P. strobus*	White pine
	A. rubrum	Red maple
	L. tulipifera	Tulip poplar
	Quercus prinus	Chestnut oak
	Q. alba	White oak
Michigan	*A. rubrum*	Red maple
Illinois	*Q. alba*	White oak
	Q. rubrum	Red oak
	Carya ovata	Shagbark hickory

widespread distribution in sites where I. medeoloides does not occur. Rawinski (1986a) pointed out that a site where several of these species occur in eye-catching abundance is worth perusing for the small whorled pogonia. Table 4 lists those ground layer species most often found in association with the small whorled pogonia.

Decaying vegetable material may be important to the small whorled pogonia; Grimes (1921) found several plants rooted in decaying wood litter. Various types of decaying vegetation are almost always found in small whorled pogonia habitat, including fallen trunks and limbs (Brumback and Fyler 1983), leaf and frond litter, bark, stumps, and roots of dead trees (Ware 1987b).

Table 4. Typical ground layer species associated with *Isotria medeoloides*.

RANGE SECTION	SCIENTIFIC NAME	COMMON NAME
Throughout Range	*Mitchella repens*	Partridge berry
	Medeola virginiana	Indian cucumber root
	Thelypteris noveboracensis	New York fern
	Vaccinium pallidum (vacillans)	Sweet lowbush blueberry
	Goodyera pubescens	Rattlesnake plantain
	Acer rubrum (seedlings)	Red maple
	Quercus spp. (seedlings)	Oak species
Northern Part of Range	*Maianthemum canadense*	Canada mayflower
	Gaultheria procumbens	Wintergreen
	Trientalis borealis	Star-flower
	Lycopodium digitatum	Running cedar
Southern Part of Range	*Parthenocissus quinquefolia*	Virginia creeper
	Desmodium nudiflorum	
	Smilax glauca	Cat-brier
	Polystichum acrostichoides	Christmas fern

Shade/light factors

It appears that too much shading could be a limiting factor for this species. Sites where colonies of small whorled pogonia had once occurred but no longer could be found were more shaded by vegetation than were the extant sites (Mehrhoff 1989a). There is anecdotal evidence of burgeoning numbers and vigor in Isotria following major events that caused an increase in the amount of light reaching the forest floor. In New Hampshire, gypsy moth outbreaks preceded the discovery of the orchid at several sites in the 1980s (Brackley 1991). In North Carolina, it was newly discovered at the annual camp site of a wildflower photographer the year after a major ice storm created canopy gaps (N. Murdock pers. comm. 1991).

Existing colonies are generally near some habitat feature that effects a semi-permanent break in the canopy, such as a stream bed or a logging road (Mehrhoff 1989a). Colonies may form in more ephemeral types of canopy breaks, such as those caused by wind-throws and dead standing trees, but may go dormant or die out much more quickly than colonies in more stable habitats. In his study of seven North Carolina sites, Gaddy (1985) noted that circumstantial evidence indicated that the plant germinates on bare soil or disturbed leaf litter (old logging roads) at sites where light intensities are greater than under normal canopy cover.

Topography

Slope exposure and degree, and the position of the plants on the slope vary throughout the range of I. medeoloides. Mehrhoff (1989a) found that most of his study sites were on level terrain or at the base of slopes facing south or southeasterly. In New England, easterly slopes are the most frequently identified exposures (Rawinski 1986a), yet the highly prolific site in East Alton, New Hampshire faces northwest (Brumback and Fyler 1983). In Virginia, most colonies are on north- or northeast-facing slopes, but some have southerly exposure (Ware 1991). Six sites checked in South Carolina faced south, west, or southwest (Gaddy 1985).

Slopes varied from 0 to 30 percent among the sites studied by Mehrhoff (1989a). He also observed that colonies, although found at a variety of slope positions, are most often found at the base of a slopes or at mid-slope positions.

In Maine and New Hampshire, botanists have had great success locating colonies by searching along the braided channels of vernal streams and in gullies up slope from where the streams arise (Rawinski 1986a). The plants tend to occur in the water-sorted leaf litter along these streams. Small whorled pogonia has also been found in this type of habitat in Massachusetts (P. Dunwiddie

pers. comm. 1991), although this is not the case outside of New England (Homoya 1977, Gaddy 1985, Ware 1987b, Dixon and Cook 1988). Most of the historical sites in New York were not in vernal streambeds (Dixon and Cook 1988), and in Virginia, I. medeoloides has been found on the floor of ravines that have no stream channel (Ware 1987b; Crouch 1990).

Soils

The soil in which the shallowly-rooted small whorled pogonia grows is usually covered with leaf litter (Homoya 1977). The substrate in which it is rooted may be a variety of different textures, from extremely stony glacial till (Brumback and Fyler 1983), to stone-free sandy loams (Ware 1987b), to sterile duff (Rawinski 1986a). At one site in Massachusetts, the plants are rooted in a thin, easily punctured layer of humus that overlies boulders (T. Smith pers. comm. 1991). One site west of the Merrimack River in New Hampshire is on rockier terrain than typical and appears to be on a different soil type than that of those New Hampshire east of the river (S. von Oettingen pers. comm.).

The common soil factor at most sites is the highly-acidic, nutrient-poor quality of the soil in which this orchid grows (Mehrhoff 1989a, Rawinski 1986a). Soil analyses in New Hampshire, Rhode Island, and Virginia showed a combined overall range in pH values from 4.0 to 5.0, and low to extremely low nutrient values (Brumback and Fyler 1983, Stuckey 1967, and Ware 1987b). There are, however, several reports of the small whorled pogonia from calcareous soils (Correll 1950, Steyermark 1963, Dixon and Cook 1988) or from sites at which the presence of certain associated species indicate that the soil is very likely nutrient-rich (N. Murdock pers. comm. 1991). Historical sites in New York were found on acidic soil types (Dixon and Cook 1988), and the Haywood County site in North Carolina occurs in habitat with associated species indicative of a basic soil type (N. Murdock pers. comm. 1991).

At sites in New England, there is an impermeable soil layer (fragipan) beneath the highly acidic soils supporting Isotria medeoloides (Rawinski 1986a). Downward percolation of water is blocked by this layer; therefore, on sloping terrain there is a significant increase in the lateral flow of water. Botanists searching for new small whorled pogonia sites in Maine and New Hampshire were successful in locating additional populations by concentrating their searches on fragipan soils identified in county soil surveys. At the Tennessee site, an impervious sandstone lies beneath the topsoil, and cracks in the soil allow rapid drainage and leaching (B. Wilkey pers. comm. 1991). Fragipans may also account for the low nutrient soils in other parts of the species' range; however, this has not yet been substantiated.

In the past, the habitat of the small whorled pogonia was described as "dry woodland" (Fernald 1950) and "moist to dry leaf mold in rather dry . . . woods" (Correll 1950). The plant is now known to occur on much moister sites than indicated by these descriptions. Soil moisture measurements carried out in a colony in the coastal plain of Virginia showed more or less consistently high soil moisture values, even through a summer drought (Ware 1989a). However, when under sufficient and sustained drought stress, the plant will be affected as the whorl droops, wilts and withers (Homoya 1977, Ware 1989a).

THREATS

The 1985 Small Whorled Pogonia Recovery Plan identified habitat destruction and collection as the two main threats to the continued existence of this species. Although collecting can still be regarded as a factor in the partial or complete destruction of individual small whorled pogonia colonies, actual and potential habitat destruction is now considered to be the primary threat to the species. Other threats such as recreational use of the

habitat, herbivory, and inadvertent damage from research activities have also been identified as harming small whorled pogonia populations, albeit to a lesser extent.

Residential or commercial development, both directly and indirectly, is a primary factor in the destruction of small whorled pogonia habitat. In several cases, house lots are adjacent to or very near colonies of the orchid. At one site in Virginia, two colonies are on house lots in a rapidly developing subdivision, one colony is on land slated for development, and a fourth colony is in a highway corridor. In 1986 in New Hampshire, the habitat of a large colony of plants was destroyed during the construction of summer housing (Brumback pers. comm. 1992). In an attempt to mitigate this loss, the developer financed the transplanting of small whorled pogonias to a protected site where the species already occurred. However, the transplanted population has since undergone a steep decline; only one-third of those plants emerged five years later (W. Brumback pers. comm. 1992). In addition to the loss of plants, what had been productive habitat is now a residential area.

Development in areas surrounding Isotria medeoloides habitat could indirectly be responsible for habitat destruction as roads, power lines and sewer mains are designed to connect settled areas. Because I. medeoloides occurs in uplands, there are few state or Federal regulatory means of protecting this species on private lands. For example, the second largest site for the species, located in New Hampshire on municipal and private property, is in a precarious situation. Publicity surrounding its discovery could potentially prompt collecting, vandalism, or cause inadvertent disturbance by visitors; further, there is recreational use of the property with no consideration taken to managing for the population at this time. This site is also in a potential new highway corridor (Brackley 1991).

The concentration of white-tail deer onto smaller and smaller parcels of woodland is an indirect effect of development pressure that may pose an increasing threat to the small whorled pogonia. The decline of a large Virginia colony appears to be primarily due to grazing of whorls early in the season (Ware 1991), and circumstantial evidence indicates that the grazers are deer.

Another indirect effect of development is the formation of barriers to seed dispersal, in that it is vital that populations have adequate space in which to "move around" (Brackley 1991). Further, depending upon the methods used, selective timbering may not necessarily be harmful to a population, but heavy timbering and clear-cutting are real threats. Potential habitat and colonies not yet known could be destroyed before being discovered. In New Hampshire, except for sites located within state forests, most of the sites chosen for de novo searches were found to have been logged (Brackley 1991). One privately owned site (one colony) of Isotria medeoloides in Tennessee has been logged, burned, and otherwise disturbed for the last 150 years (B. Wilkey pers. comm. 1991). There were 19 stems on the site when it was discovered in 1986, but the number of emergent stems decreased to seven in 1991.

One site (four colonies) on National Park Service property in Virginia is threatened by "people pressure" from adjacent housing developments (D. Ware pers. comm. 1992). In Georgia one site on National Forest lands is considered historical since it was unwittingly destroyed when a culvert was installed for a Forest Service road (B. Sanders pers. comm. 1992).

Events causing drastic changes in the amount of light reaching the forest floor, such as severe and repeated defoliation of the canopy by gypsy moths, might cause the herbaceous layer to flourish. This would result in more interspecific competition and increased shading (Brackley 1991), thus reducing the functional suitability of the habitat.

Additional threats cited by those involved in small whorled pogonia monitoring include trampling or uprooting by wild pigs, and crushing by off-road vehicles, and, to a lesser extent, by researchers and recreational users of the sites which support the small whorled pogonia. Although disturbance to the plants by researchers is inadvertent, techniques must be developed that will minimize such impacts on frequently visited sites. Encroachment of certain ground-covering plant species such as hog-peanut, running cedar, and blueberry may also adversely affect this species. The possibility of fire caused by military training is another concern (A. Belden in litt. 1991).

Herbivory by deer is a known threat; however, other types of herbivory have recently come to light. In New England, slugs are considered by some to be a serious pest to the orchid (Brumback and Fyler 1988). It has been suggested that touching the plants may leave salts on the leaves that are, in turn, attractive to slugs (Brackley 1991). In Virginia, camel crickets were identified (by night-time surveillance) as at least one of the agents causing progressive herbivory of the whorls throughout the season (Ware 1989b).

Although few cases of vandalism or collections have been reported, such activities do still occur. The release of specific locational information on small whorled pogonia sites increases the potential for the plant's removal. All eight stems comprising a colony in Strafford County, New Hampshire, were dug up in 1986 (Rawinski 1986b). Within days after a newspaper article was published revealing the location of one site in Connecticut, the plants had been dug up and removed (L. Mehrhoff pers. comm. 1991).

A few states have no laws preventing the destruction or removal of Isotria medeoloides plants. Federally endangered plant species are protected from "taking" if they occur on Federal land or if the destruction and/or removal is in knowing violation of a state endangered species law. None of the populations in Maine or

Rhode Island occurs on Federal land. Rhode Island law does not provide any protection beyond that provided by the Federal Endangered Species Act; state law only prohibits collection of the state listed species for sale. There is also no Maine State law protecting endangered plant species. In lieu of state legal protection of the plants, botanical collecting and/or vandalism could constitute threats to the species.

CONSERVATION MEASURES

The data referred to in Table 2 show a substantial increase in the number of known sites of small whorled pogonia in all three of the species' centers of distribution since the species was listed in 1982. This increase is due to intensive field work throughout the species' range as a result of listing as well as the implementation of the 1985 Recovery Plan. These search efforts in turn have played a vital role in pinpointing sites where conservation efforts are needed. Indeed, in many instances conservation of the small whorled pogonia through habitat protection has been initiated; Table 5 identifies the number of protected sites to date. In this case, protection is defined as habitat protection afforded at a level that prevents immediate development such as that which could occur on privately owned land. This definition does not distinguish habitats that are protected only from those that are both protected and managed.

Botanists in the New England states have actively, and successfully, searched both historical and de novo locations for the small whorled pogonia. In some cases, botanists have used soil maps to identify new, potential sites; additional populations have been found by greatly expanding the search radius of known populations, while still others have been discovered by pure chance. Since 1985, 14 additional extant sites in Maine have been

located, along with 14 sites in New Hampshire and four in Massachusetts.

A number of small whorled pogonia sites have been discovered on lands under state and Federal jurisdiction, and are thus afforded at least some protection (primarily from development). Sixteen sites are located on property under the jurisdiction of Federal agencies including the U.S. Forest Service, the National Park Service, and the Department of Defense. Approximately six sites are located on state-owned lands (Table 5).

Federal agencies have intensified their protection efforts on behalf of the small whorled pogonia. In Virginia, the National Park Service has provided funding for monitoring and is seeking ways to prevent disturbance to sites under their jurisdiction. Six colonies (five populations) on two different military installations in Virginia are protected; personnel at both bases have facilitated searches and monitoring, and have limited the activities that can occur in the vicinity of the colonies. At one base, the tract of land on which a colony was located was withdrawn from sale. At another military base, consultations were held to determine adequate buffer zones between small whorled pogonia colonies and land to be timber harvested (J. Wolflin, USFWS, in litt. 1991).

Many states are actively pursuing conservation easements or agreements with private landowners. Since the species was listed in 1982, a number of sites have been protected through conservation easements, deed restrictions, acquisition, or voluntary, non-binding agreements with private landowners. Seven sites are on lands owned by various private conservation agencies (refer to Table 5). Some state agencies pursue voluntary registration of small whorled pogonia sites. While such registration does not guarantee habitat protection, it does seek to recognize the importance of the site in the hopes of voluntary protection on the part of the landowners.

Table 5. Protection status of extant sites

STATE	# Sites 1991	OWNERSHIP/ PROTECTION [1]	% PROTECTED
Maine	16	1 - State, partial site 1 - TNC 1 - TNC easement	New England Center 28%
New Hampshire	30	2 - TNC 2 - TNC registered (voluntary protection) 1 - Conservation easement in progress with TNC 1 - Voluntary landowner protection 1 - Municipal, partial site 1 - Conservation trust 1 - Municipal, w/ easement	
Massachusetts	5	1 - Municipal 1 - Conservation land trust	
Rhode Island	1		
Connecticut	1	1 - State	
New Jersey	2	1 - TNC 1 - Landowner agreement	Coastal Mid-Atlantic Center 83%
Delaware	1	1 - Conservation easement in progress	
Virginia	9	5 - Department of Defense 1 - National Park Service 1 - State	
North Carolina	5	1 - U.S. Forest Service 2 - Municipal 1 - National Park Service	Southern Blue Ridge Center 80%
South Carolina	3	3 - U.S. Forest Service	
Georgia	6	5 - U.S. Forest Service	
Tennessee	1		
Pennsylvania	3	1 - State	Outliers 66 %
Ohio	1	1 - State	
Michigan	1	1 - Private conservation organization	
Illinois	1	1 - TNC	

[1] All other sites not counted are owned by private individuals, no protection.

In some instances, protective efforts have involved habitat manipulation or physical protection of I. medeoloides plants. U.S. Fish and Wildlife Service personnel have successfully used tomato cages to protect some of the larger plants from grazing by deer and/or rabbits at one of the sites in North Carolina. Several trees were also girdled in 1988 to open the canopy; however, no response has yet been seen in that colony. In New England, biologists from the University of Maine are currently investigating the potential use of habitat manipulation as a tool for enhancing population viability.

Some protection through Federal and State legislation is provided to the species. All states with current and historical populations have cooperative plant agreements with the Fish and Wildlife Service as specified under Section 6(c)(2) of the Endangered Species Act. The 1988 amendments to the Act increased protection to plant species not on Federal land by making it illegal to destroy or remove an endangered plant if it is in knowing violation of a state endangered species law. A number of states have enacted such laws, providing various levels of additional protection to the small whorled pogonia (Appendix 1).

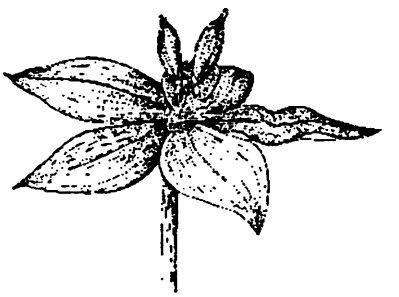
Consultations with Federal, state, and local agencies, as well as private developers have resulted in the avoidance of adverse impacts to the small whorled pogonia. For example, a road and a sewer main in a private subdivision near Williamsburg, Virginia, were re-routed to avoid direct destruction of small whorled pogonia colonies. In Connecticut, a trail was re-routed to avoid a colony in a state forest. Consultations required under Section 7 of the Endangered Species Act resulted in the re-routing of a highway in Virginia and the avoidance of adverse impacts to a colony.

Recent intensive search efforts by Federal and state agencies and other conservation organizations have been particularly fruitful. The U.S. Forest Service in Georgia hired eight botanists to spend the summer of 1991 searching more than 10,000 acres of

Forest Service land for 100 rare plant species. As a result, four colonies of small whorled pogonia (B. Sanders pers. comm. 1992) were discovered. In Virginia, Heritage Program surveys in 1991 at a Marine Corps base added three new colonies to the growing list for that state (N. van Alstine, Virginia Division of Natural Heritage, pers. comm. 1991). Also in 1991, one new site was discovered in New Hampshire and one in Massachusetts.

Recovery efforts have also been directed toward research and environmental education relating to the small whorled pogonia. Educational materials in the form of posters (The Maine Critical Areas Program, in conjunction with voluntary contributions from four industries, produced a poster of rare Maine plants, centered on the small whorled pogonia), U.S. Fish and Wildlife brochures, and fact sheets (Massachusetts Natural Heritage Program) have been made available to the general public. Other educational efforts have been, and continue to be, directed towards information dissemination to the general public through the publication of articles in newspapers and other periodicals.

RECOVERY STRATEGY



Recovery of Isotria medeoloides is based on a multi-faceted strategy of habitat protection and management (on a case-by-case basis), threat reduction, and environmental education to ensure the continued existence of this species. Although many more sites are now known for this species than were known when it was first listed, the habitat continues to face unrelenting pressure from development, logging, and recreational activities.

Of utmost importance is the conservation of both occupied and potential small whorled pogonia habitat. In this respect, potential habitat is considered to be habitat adjacent to extant colonies, or historical sites that appear to be good habitat. Habitat conservation will require significant time and funding to prevent loss or alteration caused by development or disturbance. Because this is an upland species -- often located on prime, developable land -- there may be few regulatory opportunities for protection. Direct acquisition of habitat or conservation easements and deed restrictions will be considered the primary methods of protecting viable populations of the species. Although New England has the greatest concentration of populations, the region has the lowest percentage of protected populations. A significant conservation effort will thus be needed in New England to achieve the recovery objectives.

In considering priorities for habitat conservation, the maintenance of the population distribution of the three geographic centers, as well as the outlying sites, will be emphasized. Widespread distribution of the species is a vital component for the preservation of the genetic diversity of this species and ultimately its recovery. The genetic make-up of the outlying populations may differ greatly from the more centrally located, eastern populations, or the coastal sites may differ from the populations in more mountainous regions. Research will be necessary to determine if genetic variability influences population viability.

Recent monitoring results indicate a decline in viability of many of the populations that have been followed over a number of years; indeed, many extant colonies may not be viable. This in turn may impede recovery in significant portions of the species' range. In those areas, a second priority is not only to protect the habitat of known sites, but to develop management plans that will augment the colonies with the goal of bringing them at least

to minimum viability. This will be done to a level that will meet the recovery objectives.

To date, no causes for the decline of many of the monitored colonies have been determined; however, the loss of functionally suitable habitat may be a factor. Research on manipulation of the habitat, particularly with regard to light intensity, will need to be performed to determine whether habitat management will promote small whorled pogonia growth. Other research needs include the impacts of deer management (or lack thereof) on small whorled pogonia habitat, and investigations into techniques to alleviate impacts by researchers and other visitors on the species' habitat.

During the recovery period, all Isotria medeoloides sites will be protected through enforcement of the Endangered Species Act. In order to ensure long-term protection for all viable populations of the species and enable its eventual delisting, efforts will be made to strengthen regulations protecting endangered plants at the state and local levels.

Public awareness of the species and its recovery needs has been a major factor in the protection and recovery efforts. Educational efforts will continue to promote the conservation this species and its habitat. Information will be distributed to the general public and to schools. The addition to school curricula of endangered species activities and information, including the small whorled pogonia, will be supported.

PART II: RECOVERY

The original objective outlined in the 1985 Small Whorled Pogonia Recovery Plan, based on the best available information at that time, was to locate and protect 30 populations (sites) of at least 20 individuals each, with at least 15 of the sites to be located in New England. This recovery objective is no longer considered appropriate, due to new information regarding the small whorled pogonia's life history and site viability, as well as the dramatic increase in known sites. Consequently, the objective has been revised. Its two components, reclassification and delisting, emphasize site viability and levels of protection.

RECOVERY OBJECTIVES

The immediate objective of the recovery program is to **reclassify** the small whorled pogonia from endangered to threatened by meeting the following conditions:

1. A minimum of 25 percent of the known viable sites as of 1992 must be permanently protected. These sites should be distributed proportionately throughout the species' current range, and a given site should include the majority of the colonies.

2. Sites or colonies must be shown to be viable as indicated by a geometric mean of 20 emergent stems, of which at least 25 percent are flowering stems, over a three-year period. The geometric mean is considered a better indicator of the stability of a population that exhibits wide year-to-year

fluctuations than is the arithmetic average (Sokal and Rohlf 1969).

Data used to determine site viability over time will be retroactive for those sites where the information is available. For sites lacking complete quantitative flowering data but showing persistence of the population with no significant change in habitat conditions, evidence of successful reproduction will be extrapolated from records showing stable or increasing stem counts; this will apply only as a reclassification criterion.

3. Site protection must include a buffer zone around the colony or colonies (if there is more than one colony at a site) sufficient to allow some natural colonization of habitat that becomes functionally suitable over time, and to provide protection from outside disturbance, including human-generated disturbance. The buffer will be determined on a site-by-site basis, as sites differ in number of colonies, topography, number of landowners, and abutting land uses.

   Protection will be accomplished through: (1) ownership by government agency or a private organization that considers maintenance of the I. medeoloides population to be the predominant management objective for the site, or (2) a deeded easement or covenant that effectively commits present and future landowners to protecting the population and allowing the implementation of management activities when appropriate. This high level of landowner commitment to site protection will be even more critical if it is determined that the species requires habitat management to offset countervailing decreases in the amount of unoccupied, suitable habitat.

The ultimate objective of the recovery program is to **delist** the small whorled pogonia by ensuring its long-term viability. This will be accomplished by meeting the following conditions:

1. A minimum of 61 sites (75 percent of the number of sites known in 1992) must be permanently protected. These sites should be distributed proportionately among the three geographic centers and the outliers. The level of protection considered to be sufficient for the purpose of reaching this objective is defined in condition 3 for reclassification.

2. These sites must represent at least 75 percent of the known viable (self-sustaining) populations as determined at the time of reclassification, including a total of 20 sites having 80 stems or more. Self-sustaining populations are indicated as those sites showing a geometric mean of 20 emergent stems, of which at least 25 percent are flowering stems, over a 10-year period. This length of time should account for naturally induced dormancy of individual plants and their potential re-emergence. Quantitative data regarding reproductive success will be required to meet this condition.

3. Appropriate habitat management programs must be established for occupied I. medeoloides habitat as necessary to ensure the continuation of certain self-sustaining populations. Historically, there was additional habitat adjacent to I. medeoloides colonies that naturally became available for recolonization. This habitat allowed for the replacement of those colonies that either died out or went into extended dormancy as a result of changing habitat parameters, particularly light conditions. In certain colonies, management strategies will need to replace the historical availability of this additional habitat.

- OR -

A sufficient amount of unoccupied habitat adjacent to existing colonies must be protected to allow for natural colonization and maintenance of a self-sustaining population. This will be determined on a site-by-site basis.

RECOVERY TASKS

1. Protect known Isotria medeoloides populations and essential habitat.

The overriding recovery necessity for I. medeoloides is habitat protection, particularly for those sites with viable populations. I. medeoloides habitat and populations are threatened directly and indirectly by development and recreational activities. Many sites have already been provided some level of protection, although in several cases it is insufficient to guarantee the long-term conservation of the species. Measures such as land acquisition, conservation easements, or landowner agreements will be pursued as a means of habitat protection.

1.1 Identify ownership of all known populations. Ownership information for many of the small whorled pogonia sites is still incomplete. Such information is often scattered among different agencies, not yet collected, or difficult to ascertain (the latter can be particularly problematic for those sites with more than one landowner).

1.2 Determine those areas in need of protection. When land ownership has been determined (Task 1.1), those sites most in need of protection will be identified. Priorities for pursuing habitat protection should be based on criteria such as: (1) significance of the site with respect to population viability (e.g., those sites having greater than minimally viable populations should be given higher priority), (2) potential for recoverability (for those sites not currently viable), and (3) distribution. Along with these criteria, the opportunity for protection, e.g., willingness of sellers, needs to be considered.

1.21 Identify gaps in protected habitat throughout the range of the species. Many states are beginning to develop GAP analyses for wildlife habitat and other parameters. This type of analysis will be used to identify unprotected small whorled pogonia sites.

1.22 Determine overall priorities for land protection. On a state-by-state and site-by-site basis, priorities for protection will be determined according to the significance of the population (e.g., size and distribution among geographical centers of concentration), potential for recoverability, and magnitude/immediacy of threats.

1.3 Develop and implement habitat protection strategies. As sites in need of protection are identified and prioritized (Tasks 1.1 and 1.2), appropriate habitat protection strategies will be determined and implemented on a site-by-site basis.

1.31 Coordinate among Federal and state agencies and conservation organizations in providing permanent protection. Permanent protection may be provided for sites either through land acquisition or conservation easements. Maintenance of I. medeoloides populations should be the predominant management objective for these sites.

1.32 Seek cooperation and active support of private landowners in protecting known sites through the development of voluntary agreements. Cooperation from landowners is an extremely important facet of protection for sites located on private lands, especially since the laws of most states within its range do not prohibit taking of Isotria medeoloides from private property with the landowner's

permission. A deeded easement or covenant that effectively commits present and future landowners to protecting the population and allowing the implementation of management activities (as needed) is vital for those areas where conservation easements or land acquisition are not applicable.

1.4 Use existing regulatory mechanisms to protect I. medeoloides habitat. Section 7 Endangered Species Act responsibilities will continue to be carried out to avoid direct and secondary impacts to populations or their habitat. Section 7(a)(1) of the Act, which directs Federal agencies to use their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation and recovery of listed species, will be emphasized. In addition, active consultation with state agencies needs to be pursued for those states with endangered species laws regulating state funded, authorized, or carried out activities that might threaten the continued existence of the species.

1.5 Encourage the development of comprehensive State plant protection legislation. A number of state acts could provide better protection of I. medeoloides habitat if stronger amendments were added. In addition, a few states do not have comprehensive plant protection laws. A coordinated effort among public agencies and private conservation groups should be undertaken to develop and pass legislation that will provide legal State protection and enhanced Federal protection for threatened and endangered plants, including the small whorled pogonia.

2. Manage protected habitats for Isotria medeoloides. Site-specific conservation plans or management strategies will be developed for protected sites, when necessary. Plans for

sites on Federal and other public lands will be developed in cooperation with the administering agency, on an as needed basis. Plan products will be brief and will include statements regarding protection agreements, management activities as defined in Task 2.1, and/or actions for long-term preservation.

2.1 Determine appropriate habitat management strategies. Currently, there is a lack of information regarding specific habitat requirements of the small whorled pogonias. Anecdotal evidence indicates that I. medeoloides may require certain levels of disturbance in its habitat, allowing openings in the forest canopy. Evidence also indicates that herbivory, incidental trampling from visitors, and other forms of physical disturbance may adversely affect the orchids. Habitat manipulation and protection from physical disturbance must be investigated, with results being incorporated into management plans. Management strategies will be applied on a site-specific basis -- not all sites will need active management.

2.11 Investigate effects of manipulation of light levels on I. medeoloides. There has been increased interest in determining how light levels affect the growth, and possibly the dormancy, of Isotria medeoloides. It appears that I. medeoloides populations are often found near some habitat feature that causes a semi-permanent break in the canopy, such as a stream bed or a logging road (Mehrhoff 1989a), and that light levels are an important component in small whorled pogonia habitat. Further research is needed to determine whether the opening of understory and/or overstory canopies will positively affect I. medeoloides growth by altering light levels. These

quantitative studies should determine what level of light is necessary to maintain viable populations or enhance marginally viable colonies.

2.12 Determine researcher/visitor impacts on populations. I. medeoloides does not appear to be tolerant of physical disturbance, such as trampling. In addition, it is speculated that handling of plants might attract herbivores such as slugs. To prevent the decline of easily accessible, often visited populations, impacts from researchers or visitors, and concomitant management recommendations, must be determined.

2.13 Identify herbivore impacts. In areas of large deer concentrations, the effects of herbivory on the populations will be determined. In addition, other animals are known to feed on the small whorled pogonia. As part of a management strategy, it may be necessary to identify and alleviate these impacts.

2.2 Develop and maintain conservation plans for each site protected under Task 1. Mehrhoff (1989a) stated that conservation programs for the small whorled pogonia cannot consist exclusively of habitat acquisition and preservation; some type of management will be necessary to maintain mid-successional conditions. However, not all sites are in mid-successional forests, since some of the largest sites (in New England) are found in stable forests and would not need active management if the populations are viable. Conservation plans will be developed on a site-by-site basis and should incorporate management strategies, when necessary, and monitoring programs to ensure the long-term viability of the

populations. Research results from Tasks 5 and 6 will be incorporated into these plans as appropriate.

3. Monitor existing populations.
All known sites will continue to be monitored. Meeting the recovery objectives is contingent upon the stabilization of viable populations over time. Consistent monitoring will provide population data necessary to reach the objectives.

3.1 Develop rangewide consistency in monitoring strategies.
A uniform method of estimating colony or population extent and viability should be incorporated throughout the species' range. The definitions for colony and site stated on page 6 of this plan should either be used in all monitoring efforts or refined. Observations regarding the reproductive status of the plants, such as the number of flowering versus non-flowering stems, must be incorporated into monitoring parameters.

3.2 Monitor known sites and new sites as they are found.
All sites will continue to be monitored using a consistent scheme (Task 3.1) throughout the range of the species. Monitoring will be conducted, at a minimum, on a biennial basis.

3.3 Determine when a population is to be considered historical. Because I. medeoloides may go dormant, it is difficult to determine whether or not a site, particularly one with very few stems, is extant. For those sites not physically destroyed (i.e., habitat no longer exists), a standard formula will be used to determine whether a site is historical.

4. Survey for new populations.
Past survey efforts undertaken by state agencies and other conservation organizations resulted in a dramatic increase in

known populations. It is imperative that this effort continue, especially in those portions of the range where most of the sites are considered to be historical.

4.1 Continue statewide surveys. Searches of suitable habitat will be continued until a comprehensive database of occupied sites is completed.

4.2 Develop a predictive model based on Geographical Information System (GIS) methods to identify new search areas for I. medeoloides. I. medeoloides habitat does not appear to have unique characteristics that make it easily identifiable. Predictive models will be developed to enable the identification of potential habitat and facilitate survey efforts of de novo sites. The use of a GIS will be emphasized since much of the information on these habitat parameters is available in digitized format.

4.21 Assess known habitat characteristics. In order to develop a predictive model, small whorled pogonia habitat characteristics need to be identified.

4.22 Determine those parameters most representative of preferred habitat. Once Task 4.21 is completed, those environmental factors that are most critical to small whorled pogonia populations need to be quantified.

4.23 Develop predictive models for all three centers of geographical distribution. Because there appear to be three distinct geographical concentrations of I. medeoloides, it is possible there may be different regional habitat parameters. The development of more than one predictive model may be necessary, dependent upon the results of Tasks 4.21 and 4.22.

4.3 Survey areas identified by predictive models for I. medeoloides. When Task 4.2 has been completed, the predictive model will be tested. Areas identified as potential small whorled pogonia habitat by the predictive model will need to be ground-truthed.

5. Investigate population dynamics.

5.1 Conduct detailed, demographic studies of selected sites. Populations of I. medeoloides are composed of four stages of plants: dormant, vegetative, with an abortive bud, and flowering (Mehrhoff 1989a). It appears that the distribution of plants in these stages may determine whether a colony is increasing, decreasing, or stable. Mortality, dormancy, recruitment, and sequence in appearance in vegetative, flowering, and arrested plants will be followed throughout a number of populations. Previously initiated studies of this type (for which data is already available for a series of years) will be continued and the data analyzed.

5.2 Determine population colonization of unoccupied habitat in order to identify appropriate buffers. The upland habitat of the small whorled pogonia often appears to be uniform; however, the orchid generally is found in clusters. Appropriate buffers to allow dispersal and colonization need to be determined and incorporated into habitat protection strategies.

5.3 Determine minimum viability of a colony. Incorporating data on the reproductive status of the small whorled pogonia plants, i.e., percent flowering versus non-reproductive, minimum viability of a population will be determined. When this figure has been established, those colonies below minimum viability may need special

management considerations (Task 2.1) to bring them up to minimum viability or higher.

6. Investigate species biology.

The 1985 Recovery Plan for the small whorled pogonia identified the investigation of species biology as a recovery task. To date, some new life history information has been discovered as a result of research. However, much is still unknown about the mechanisms that control growth and reproduction of this species. Limiting factors, management needs, and recovery efforts cannot be addressed without data on species biology.

6.1 Investigate dormancy. A clear understanding of dormancy and how to differentiate it from the death of the plant needs to be in place to determine the health of colonies. Basic questions such as the maximum and minimum lengths of dormancy and potential causes will be investigated. A long-term effort to precisely monitor marked plants will assist in assessing the species' dormancy in different parts of its range. The possibility of an extended subterranean juvenile stage before seedlings become photosynthetic should also be examined (USFWS 1985).

6.2 Investigate reproductive strategies. Reproductive strategies of I. medeoloides are still relatively unknown. Seed banking, flower and seed development, pollination, seed production, seed germination strategies, and vegetative reproduction are all components of the small whorled pogonia's reproduction that should be studied in order to develop the most suitable habitat management plans for individual sites.

6.3 Determine mycorrhizal interaction and function. It is not known whether this could be a limiting factor in the

small whorled pogonia's habitat. Studies are needed to determine the association of mycorrhizal fungi with I. medeoloides, its degree of specificity, and role in the species life cycle.

6.4 Investigate genetic variability of populations within the three geographic centers and the outlying sites. Historically, the distribution of I. medeoloides may have been more uniform, with the exception of the western outliers. Electrophoretic analyses to determine whether there are genetic distinctions between the three geographic centers of concentration and the outliers may be warranted. Differences in the genetic composition of populations may influence site protection priorities (Task 1.22).

7. Provide public information and education.
Public support of recovery efforts for I. medeoloides plays a significant role in encouraging landowner assistance and raising awareness of activities on behalf of the species. Outreach opportunities for educating the general public about the species will be identified, and appropriate informational materials will be developed. Outreach and education efforts will take care to avoid identifying specific locations of populations in order to protect sites from vandalism.

7.1 Update and reprint brochure on I. medeoloides. The current small whorled pogonia brochure will be updated to include new life history and distribution information. Many schools, conservation organizations, and private individuals request general information on this orchid; to date, there are no more available brochures or fact sheets.

7.2 Develop educational materials for distribution in schools. Increasingly, school curricula include

sections on endangered species. Information and activities focusing on rare plants, including the small whorled pogonia, should be developed and distributed to accompany these curricula.

7.3 Contact and provide information to conservation commissions or other pertinent municipal agencies in areas of known I. medeoloides populations. The general caution in publicizing I. medeoloides sites often means that municipal agencies are unaware of the presence of the orchid in their towns. It is important that appropriate municipal agencies are informed about the small whorled pogonia so that they (1) take the small whorled pogonia and its habitat into consideration in town management or zoning plans, and (2) become interested and supportive in protecting occupied habitat.

7.4 Create displays for use at information centers of National Parks, National Forests, and military bases in those areas with I. medeoloides populations. Many of the populations are on Federal lands, providing an ideal opportunity for exposing the general public to the species and its history (i.e., decline, management, and recovery efforts). The purpose for this aspect of outreach is to inform the public about the rarity of this plant and its needs, not necessarily to encourage seeking it out. Furthermore, through efforts to inform the public about this one species, the importance of the need to protect endangered species, in particular, plants, may be more braodly emphasized.

8. Review recovery progress and update or revise plan as necessary.

Progress towards recovery will be reviewed on an annual basis, and this plan will be updated and revised as needed.

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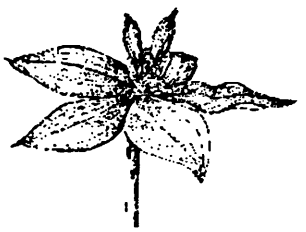
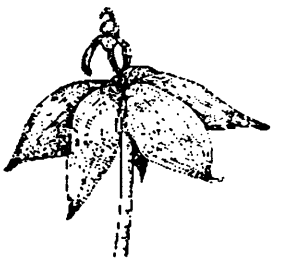
Ware, D.M.E. 1991. Small whorled pogonia (pp. 95-97). In: Karen Terwilliger, coord. Virginia's endangered species. Nongame and Endangered Species Program, Virginia Department of Game and Inland Fisheries. The McDonald and Woodward Publishing Company, Blacksburg, VA. 672 pp.



PART III: IMPLEMENTATION



The Implementation Schedule lists and ranks tasks that should be undertaken within the next three years in order to implement recovery of the small whorled pogonia. This schedule will be reviewed annually until the recovery objective is met, and priorities and tasks will be subject to revision. Tasks are presented in order of priority.

Key to Implementation Schedule Column 1

Task priorities are set according to the following standards:

Priority 1: Those actions that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.

Priority 2: Those actions that must be taken to prevent a significant decline in species population, or some other significant impact short of extinction.

Priority 3: All other actions necessary to provide for full recovery of the species.

Key to Agency Designations in Column 5

USFWS = U.S. Fish and Wildlife Service
R5 FWE = Region 5, Division of Fish and Wildlife Enhancement, U.S. Fish and Wildlife Service
R4, R3 = Regions 4 and 3, U.S. Fish and Wildlife Service
FA = Other Federal agencies
SA = State agencies
CO = Conservation organizations
PI = Private research or academic institutions

IMPLEMENTATION SCHEDULE
Small Whorled Pogonia

Revised Plan, October 1992

Priority	Task Description	Task Number	Duration	Responsible Agency		Cost Estimates, $000			Comments
				USFWS	Other	FY1	FY2	FY3	
1	Identify ownership of all known populations.	1.1	3 years	R5 FWE R4	SA, CO	10	5	5	R3 landowner information known.
1	Identify gaps of protected habitat throughout the species' range.	1.21	3 years	R5 FWE	SA, CO	3	3	3	
1	Determine overall priorities for land protection.	1.22	2 years	R5 FWE	SA, CO		2.5	2.5	
1	Coordinate among governmental agencies and conservation organizations in providing permanent protection.	1.31	7 years	R5 FWE R4 FWE	FA, SA, CO, PI	7	7	7	+ 7,000/yr for at least 4 more years = $49,000 total
1	Develop and maintain conservation plans for each protected site.	2.2	4 years	R5, R4, R3	SA, CO			20	+ FY 4-6 at 10,000/yr = $30,000 total
1	Continue statewide surveys.	4.1	7 years		SA, CO	15	15	15	+ 15,000/yr for at least 4 more years = $95,000 total
1	Determine minimum viability of a colony.	5.3	1 year		SA, CO			3	
2	Seek support of private landowners in protecting habitat through voluntary agreements.	1.32	7 years		SA, CO, PI	2.5	2.5	2.5	+ 2,500/yr for at least 4 more years = $17,500 total
2	Use existing regulatory mechanisms to protect *I. medeoloides* habitat.	1.4	Ongoing	R5 FWE, R4 FWE, R3 FWE	FA, SA				No funding
2	Investigate effects of manipulation of light levels on *I. medeoloides*.	2.11	3 years		SA, PI		5	5	+5,000 for FY 4 = $15,000 total
2	Develop rangewide consistency in monitoring strategies.	3.1	1 year	R5	SA, CO		2		

Small Whorled Pogonia Implementation Schedule, continued, October 1992

Priority	Task Description	Task Number	Duration	Responsible Agency		Cost Estimates, $000			Comments
				USFWS	Other	FY1	FY2	FY3	
2	Create displays for use at visitor information centers.	7.4	2 years	R5, R4	FA, SA		3	3	
3	Encourage the development of comprehensive State plant protection legislation.	1.5	Ongoing		SA, PI				No funding
3	Determine researcher/visitor impacts on populations.	2.12	2 years		SA, CO				FY 4-5 at 2,000/yr = $4,000 total
3	Identify herbivore impacts.	2.13	2 years		SA, CO				
3	Investigate reproductive strategies.	6.2	3 years		SA, PI		5	5	+ 5,000 in FY 4 = $15,000 total
3	Determine mycorrhizal interaction and function.	6.3	2 years		PI				
3	Investigate genetic variability of populations within the three geographic centers and the outlying sites.	6.4	2 years		PI				
3	Develop educational materials for distribution in schools.	7.2	1 year	R5, R4	SA, CO			10	
3	Review recovery progress and update plan as necessary.	8	Ongoing	R5					

Samll Whorled Pogonia Implementation, continued, October 1992

Priority	Task Description	Task Number	Duration	Responsible Agency		Cost Estimates, $000			Comments
				USFWS	Other	FY1	FY2	FY3	
2	Monitor known sites and new sites as they are found.	3.2	10 years	R5, R4, R3	SA, CO	5	5	5	+ 5,000 for FY 4-10 = $50,000 total
2	Determine when a population is to be considered historical.	3.3	1 year		SA, CO				
2	Assess known habitat characteristics.	4.21	2 years	R5	SA, PI	5	5		
2	Determine those parameters most representative of preferred habitat.	4.22	2 years	R5	SA, PI	2.5	2.5		
2	Develop predictive models for all three centers of geographical distribution.	4.23	2 years	R5, R4	SA, PI		2.5	5	
2	Survey areas identified by predictive models.	4.3	2 years	R5, R4	SA, CO, PI				FY 4-5 at 7,000/yr = $14,000 total
2	Continue detailed demographic studies of selected sites.	5.1	3 years	R5, R4	SA, CO, PI	7.5	7.5	7.5	
2	Determine colonization of unoccupied habitat in order to identify appropriate buffers.	5.2	3 years	R5, R4	SA, CO, PI			10	+ FY 4-5 at 5,000/yr = $20,000 total
2	Investigate dormancy.	6.1	5 years		SA, CO, PI	5	5	5	Continuation of ongoing studies. $25,000 total
2	Update brochure on *I. medeoloides*.	7.1	1 year	R5, R4			7		
2	Provide information to pertinent municipal agencies in areas of *I. medeoloides* populations.	7.3	Ongoing	R5, R4, R3	SA, CO				

APPENDIX 1.

AVAILABLE REGULATORY AUTHORITIES

FEDERAL AUTHORITIES

Endangered Species Act of 1973
(87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.)

Prohibits import and export; removal, damage and possession of listed species from lands under Federal jurisdiction; removal, damage, etc. in violation of any state law or regulation; transport in course of commercial activity; or sale of the species. Requires Federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or result in adverse modification of critical habitat. Requires consultation with the U.S. Fish and Wildlife Service when an activity may affect listed species or critical habitat. Directs Federal agencies to utilize their authorities in furtherance of the purposes of the Act by carrying out conservation and recovery activities for listed species.

Regulations Protecting Proposed, Listed Endangered or Threatened Species on National Forests

Isotria medeoloides is protected under FSM 2670.44 R-8 supp 37. Since this species is Federally listed endangered, it qualifies as a Forest Service PET species, and as such should receive a level of protection that will lead to identification of possible recovery opportunities and ensure that no adverse effects occur.

STATE AUTHORITIES

Connecticut
(Chapter 495 Sec. 26-303 through 26-314)

Protects State listed species from take on state-owned land. In addition, activities that are state funded, authorized, or performed may not threaten the continued existence of State or Federally listed plants. Allows for acquisition of essential habitat.

Georgia Wildflower Preservation Act of 1973
(43:43-1801 to 43-1806)

Prohibits taking of State listed plants from public lands without permit from the Georgia Department of Natural Resources. Prohibits sale and transport of listed species without landowner's written permission.

Illinois Endangered Species Protection Act
(Section 331-341 of Illinois Revised Statutes)

Protects State listed species from take on private lands without landowner permission.

Maryland Nongame and Endangered Species Conservation Act
(Natural Resources Article §10-2A-01 through 10-2A-09)

Prohibits taking from private land without written landowner permission, taking without a permit from State land, and prohibits trade and possession of listed species. Provides for development of programs for the conservation of listed species.

Massachusetts Endangered Species Act
(Chapter 131A)

Although regulations have not been promulgated at this time, this Act protects listed species from take, unless a permit has been issued by the Director of the Division of Fisheries and Wildlife. Additional protection may be afforded if significant habitat is designated. Under State law, there may be no alteration of significant habitat.

Michigan Endangered Species Act of 1974
(Public Act 203 as amended, Section 6)

This act protects State endangered and threatened taxa on both private and public lands. In addition, other State laws indirectly protect State listed species. For example, species within or near wetlands are indirectly regulated through the wetland permitting process, and in fact the permitting process for wetlands does consider the proximity of natural features and potential detriment. Thus, if Isotria medeoloides occurs within or near a State-regulated wetland, it may receive protection through other than the State endangered species act.

New Hampshire Plant Protection Act
(SB 152-FN, Chapter 217-A)

Prohibits the taking of listed species from private and State property without permission of the landowner.

New Jersey Endangered Plant Species List Act
(N.J.S.A. 13:1B-15.151 to 13:1B-15.158)

Establishes a list of endangered plant species to be utilized by the State's regulatory agencies.

New York State Environmental Conservation Law
(Section 9-1503, Reg 6NY CRR Part 193.3)

New York State law protects State and Federally listed plants. Listed plant species are protected from take or destruction without the permission of the landowner.

North Carolina Plant Protection and Conservation Act
(General Statute 19B (202.12-202.19)

Protects listed species by prohibiting taking without written landowner permission, intrastate trade (without a permit), and provides management and monitoring activities.

Ohio Endangered Plant Law
(Ohio Revised Code Chapter 1518:18)

Take of Ohio State listed plants for commercial purposes is prohibited. Take, possession, or transport for botanical, educational, or scientific purposes, or for propagation in captivity to preserve the species is prohibited without first obtaining a State permit, unless a Federal permit has already been issued for Federally listed species. Nothing prohibits take on private lands by the landowner or with landowner permission.

Pennsylvania Wild Resources Conservation Act
(25 Pa. Code, Chapter 82).

Permits are required to collect, remove, or transplant wild plants classified as threatened or endangered, though landowners are exempt from these requirements. Also provides for the establishment of native wild plant sanctuaries on private lands where there is a management agreement between the landowner and the State Department of Environmental Resources.

Rhode Island General Laws, 1956 for the Preservation and Conservation of Wild Plants
(Title 20 -37-3)

Prohibits commercial traffic in State or Federally listed plants.

South Carolina legal protection

All plants on South Carolina heritage preserves have legal protection.

Tennessee Rare Plant Protection and Conservation Act of 1985
(Chapter 242, Section 1)

Prohibits sale and taking (include destruction and removal) of State listed plants. Take on private lands with landowner permission is allowed. Nurserymen can purchase up to ten plants for commercial propagation purposes from landowners.

Vermont Endangered Species Law
(10 V.S.A. Chapter 123)

Affords protection to listed species from taking, possession or transport by any person, unless exempted, or authorized by certificate or permit. Permits could be granted for scientific purposes, enhancement of survival of the species, economic hardship, educational purposes or special purposes consistent with the purposes of the Federal Endangered Species Act. However, take is allowed for agricultural or silvicultural activities since no permit is required.

Endangered Plant And Insect Species Act of Virginia
(1979, c. 372).

Prohibits taking without permits, except by private landowners. Also gives the Department of Agriculture and Consumer Services the authority to regulate the sale and movement of listed plants and to establish programs for the management of listed plants.

APPENDIX 2.

LIST OF REVIEWERS AND SUMMARY OF COMMENTS

Comments and suggestions received during the recovery planning process were reviewed and incorporated to the extent appropriate into this document. Agencies, organizations, and individuals who participated in the review of the draft revised recovery plan are listed below.

Keith Clancy
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Department of Natural Resources
James Hall
University of New Hampshire
Durham, New Hampshire 03824

Frankie Brackley Tolman
RFD
Marleborough, New Hampshire
03455

Harry R. Tyler, Jr.
Maine Critical Areas Program
SPO, State House Station 38
Augusta, Maine 04333

Donna M. E. Ware
Department of Biology
College of William and Mary
Williamsburg, Virginia 23185

SUMMARY OF COMMENTS

Most of the comments received were specific corrections that were incorporated into the document. In addition, three substantial comments were made during review of the draft recovery plan. Following are summaries of these comments with the Service's responses.

COMMENT 1. Two reviewers questioned the number of stems that define the minimum viable population of small whorled pogonia (page , Part II). Both reviewers felt that in New England, the minimum viable population should be greater than an average of 20 stems.

RESPONSE The Service chooses to retain the geometric mean over three years of 20 stems, with an average 25 percent flowering as the definition of a minimum viable population for **reclassification to threatened** for the small whorled pogonia. Currently, there are no available data indicating that minimum viability will change throughout the range of the small whorled pogonia. That is to say, that populations of an average of 20 stems with 25 percent flowering in Virginia are viable, while populations of the same size and reproductive status would not be considered viable in New Hampshire.

One reviewer provided data for a single New Hampshire population that fluctuated in stem counts from one to 34 over a 27 year period; however, the reproductive status of this population was not documented. A population with a three-year geometric mean of 20 stems that did not have a minimum average of 25 percent flowering stems over that same time period would not be considered viable. Since the data provided was from only one of thirty populations in New Hampshire, more populations counts indicating severe fluctuations **with** the accompanying reproductive status of these populations will be necessary before the Service can reconsider the definition of minimum viability. The Service believes that the two-pronged definition of average stems and reproductive status (or persistence) should sufficiently identify those populations considered to be minimally viable for purposes of reclassification.

The recovery objectives are subject to modification based on information gathered during the completion of the recovery tasks. As more populations are followed through time, and the reproductive status is documented, the minimum viable population may be reconsidered if information indicates that it is necessary to do so.

In addition, one reviewer felt that habitat protection of those populations with greater than an average of 20 stems should be emphasized, and that efforts to protect populations barely meeting the current definition might be misguided. The condition for habitat protection of 25 percent of known viable sites is further clarified under Task 1.2. Those areas in need of protection will be identified and prioritized if possible. Priority will be determined based on the significance of the site with respect to its population size (with a higher priority given to those populations of greater viability), the potential for recoverability, and its distribution.

COMMENT 2. One reviewer disagreed with the recovery objective of a minimum of 25 percent of known viable sites (based on 1992 population counts) needing protection to satisfy this goal. The reviewer felt that the 25 percent should refer to a total number of known populations at any given time to account for new populations as they are discovered.

RESPONSE The Service believes that the recovery objective stated for reclassification will be sufficient to protect the species from imminent extinction. A finite point (1992 data) was purposely chosen for this species because of the five-fold increase of known populations since listing; 17 extant sites in 1985, 86 extant sites in 1991. The additional population information that has been acquired since 1985 includes historical site verification and the discovery of many new sites.

Without a finite overall population figure, the reclassification recovery objective of 25 percent (a minimum of 22 sites distributed proportionately throughout the range) and the delisting recovery objective of 75 percent (a minimum of 61 sites), could become impossible to attain. As more populations are found, the number of protected sites needed to meet the criteria for recovery would increase, potentially to the point where recovery could not realistically be met. Indeed, as additional populations are discovered, a time lag will occur due to the need to determine minimum viability of these populations.

Furthermore, since the criteria states that protection of sites must occur proportionally throughout the range of the species, discoveries of additional populations that are skewed to one center of concentration might decrease the feasibility of reaching the recovery goal. For example, New England has the majority of populations to date. Should many more populations be discovered only in this region, the potential of reaching the goal of the protection of 25 percent of known viable

populations will either decrease, or be delayed as studies are undertaken to determine the viability of the populations.

COMMENT 3. A number of reviewers corrected the approximate stem count given in the draft recovery plan (duly corrected). In fact, one reviewer felt that more quantitative information about the sizes of the population was necessary, perhaps presented in a graphic format.

RESPONSE A quantitative count of **all** of the known populations has not been possible to date. The approximate stem count given in the recovery plan is based on the best available information submitted by State resource agencies in 1991. A number of populations were not visited, and therefore, the 1991 total stem count may be incomplete. Colony sizes and stem counts fluctuate widely (and wildly) from year to year. To make a quantitative graphic of stem counts for one given year might give an incorrect impression of the status of the species.

The cover illustration is a computer scan of an original drawing by D.D. Tyler, copyright 1992.

APPENDIX E

Laboratory Data Reports

ANALYTICAL REPORT

Lab Number:	L1418843
Client:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Charlestown, MA 02129-1400
ATTN:	Cole Worthy
Phone:	(617) 886-7341
Project Name:	BEAUPORT HOTEL
Project Number:	38605-050
Report Date:	08/25/14

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1418843-01	HA14-04(OW)	WATER	GLOUCESTER, MA	08/19/14 10:10	08/19/14
L1418843-02	TB-20140819	WATER	GLOUCESTER, MA	08/19/14 00:00	08/19/14

Project Name: BEAUPORT HOTEL **Lab Number:** L1418843
Project Number: 38605-050 **Report Date:** 08/25/14

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	BEAUPORT HOTEL	**Lab Number:**	L1418843
Project Number:	38605-050	**Report Date:**	08/25/14

Case Narrative (continued)

Volatile Organics

WG715518: An LCS/LCSD was performed in lieu of a Matrix Spike due to insufficient sample volume available for analysis.

Metals

L1418843-01 (HA14-04(OW)) has elevated detection limits for all elements, with the exception of mercury, due to the dilution required by matrix interferences encountered during analysis.

The WG715322-2 LCS recovery, associated with L1418843-01 (HA14-04(OW)), are above the acceptance criteria for cadmium (121%); however, the associated sample is non-detect for this target compound. The results of the original analysis are reported.

The WG715794-4 MS recovery, performed on L1418843-01 (HA14-04(OW)), is outside the acceptance criteria for mercury (59%). A post digestion spike was performed and was within acceptance criteria.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 08/25/14

ORGANICS

VOLATILES

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1418843
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01
Client ID: HA14-04(OW)
Sample Location: GLOUCESTER, MA
Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 08/24/14 22:43
Analyst: PK

Date Collected: 08/19/14 10:10
Date Received: 08/19/14
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	3.0	--	1
1,1-Dichloroethane	ND		ug/l	0.75	--	1
Chloroform	1.2		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,2-Dichloropropane	ND		ug/l	1.8	--	1
Dibromochloromethane	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.75	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
Trichlorofluoromethane	ND		ug/l	2.5	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
Bromodichloromethane	ND		ug/l	0.50	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	2.5	--	1
Bromoform	ND		ug/l	2.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	0.75	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
Chloromethane	ND		ug/l	2.5	--	1
Bromomethane	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	--	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1

Project Name: BEAUPORT HOTEL **Lab Number:** L1418843

Project Number: 38605-050 **Report Date:** 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01 Date Collected: 08/19/14 10:10

Client ID: HA14-04(OW) Date Received: 08/19/14

Sample Location: GLOUCESTER, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2-Dichlorobenzene	ND		ug/l	2.5	--	1
1,3-Dichlorobenzene	ND		ug/l	2.5	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
Methyl tert butyl ether	ND		ug/l	1.0	--	1
p/m-Xylene	ND		ug/l	1.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Dibromomethane	ND		ug/l	5.0	--	1
1,4-Dichlorobutane	ND		ug/l	5.0	--	1
1,2,3-Trichloropropane	ND		ug/l	5.0	--	1
Styrene	ND		ug/l	1.0	--	1
Dichlorodifluoromethane	5.4		ug/l	5.0	--	1
Acetone	ND		ug/l	5.0	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	5.0	--	1
Vinyl acetate	ND		ug/l	5.0	--	1
4-Methyl-2-pentanone	ND		ug/l	5.0	--	1
2-Hexanone	ND		ug/l	5.0	--	1
Ethyl methacrylate	ND		ug/l	5.0	--	1
Acrylonitrile	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	2.5	--	1
Tetrahydrofuran	ND		ug/l	5.0	--	1
2,2-Dichloropropane	ND		ug/l	2.5	--	1
1,2-Dibromoethane	ND		ug/l	2.0	--	1
1,3-Dichloropropane	ND		ug/l	2.5	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	2.5	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	2.5	--	1
o-Chlorotoluene	ND		ug/l	2.5	--	1
p-Chlorotoluene	ND		ug/l	2.5	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Isopropylbenzene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	2.5	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1

Project Name: BEAUPORT HOTEL **Lab Number:** L1418843

Project Number: 38605-050 **Report Date:** 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01 Date Collected: 08/19/14 10:10

Client ID: HA14-04(OW) Date Received: 08/19/14

Sample Location: GLOUCESTER, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/l	2.5	--	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	--	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	--	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	--	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	--	1
Ethyl ether	ND		ug/l	2.5	--	1
Tert-Butyl Alcohol	ND		ug/l	10	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	93		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	117		70-130

Project Name: BEAUPORT HOTEL
Lab Number: L1418843
Project Number: 38605-050
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01
Client ID: HA14-04(OW)
Sample Location: GLOUCESTER, MA
Matrix: Water
Analytical Method: 1,8260C-SIM(M)
Analytical Date: 08/24/14 22:43
Analyst: PK

Date Collected: 08/19/14 10:10
Date Received: 08/19/14
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	--	1

Project Name: BEAUPORT HOTEL
Lab Number: L1418843
Project Number: 38605-050
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01
Client ID: HA14-04(OW)
Sample Location: GLOUCESTER, MA
Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 08/20/14 22:40
Analyst: GP

Date Collected: 08/19/14 10:10
Date Received: 08/19/14
Field Prep: Not Specified
Extraction Date: 08/20/14 15:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Microextractables by GC - Westborough Lab							
1,2-Dibromoethane	ND		ug/l	0.010	--	1	A

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1418843
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-02
Client ID: TB-20140819
Sample Location: GLOUCESTER, MA
Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 08/24/14 20:34
Analyst: PK

Date Collected: 08/19/14 00:00
Date Received: 08/19/14
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	3.0	--	1
1,1-Dichloroethane	ND		ug/l	0.75	--	1
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,2-Dichloropropane	ND		ug/l	1.8	--	1
Dibromochloromethane	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.75	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
Trichlorofluoromethane	ND		ug/l	2.5	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
Bromodichloromethane	ND		ug/l	0.50	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	2.5	--	1
Bromoform	ND		ug/l	2.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	0.75	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
Chloromethane	ND		ug/l	2.5	--	1
Bromomethane	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	--	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1

Project Name: BEAUPORT HOTEL **Lab Number:** L1418843

Project Number: 38605-050 **Report Date:** 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-02 Date Collected: 08/19/14 00:00

Client ID: TB-20140819 Date Received: 08/19/14

Sample Location: GLOUCESTER, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2-Dichlorobenzene	ND		ug/l	2.5	--	1
1,3-Dichlorobenzene	ND		ug/l	2.5	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
Methyl tert butyl ether	ND		ug/l	1.0	--	1
p/m-Xylene	ND		ug/l	1.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Dibromomethane	ND		ug/l	5.0	--	1
1,4-Dichlorobutane	ND		ug/l	5.0	--	1
1,2,3-Trichloropropane	ND		ug/l	5.0	--	1
Styrene	ND		ug/l	1.0	--	1
Dichlorodifluoromethane	ND		ug/l	5.0	--	1
Acetone	ND		ug/l	5.0	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	5.0	--	1
Vinyl acetate	ND		ug/l	5.0	--	1
4-Methyl-2-pentanone	ND		ug/l	5.0	--	1
2-Hexanone	ND		ug/l	5.0	--	1
Ethyl methacrylate	ND		ug/l	5.0	--	1
Acrylonitrile	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	2.5	--	1
Tetrahydrofuran	ND		ug/l	5.0	--	1
2,2-Dichloropropane	ND		ug/l	2.5	--	1
1,2-Dibromoethane	ND		ug/l	2.0	--	1
1,3-Dichloropropane	ND		ug/l	2.5	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	2.5	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	2.5	--	1
o-Chlorotoluene	ND		ug/l	2.5	--	1
p-Chlorotoluene	ND		ug/l	2.5	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Isopropylbenzene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	2.5	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1

Project Name: BEAUPORT HOTEL **Lab Number:** L1418843

Project Number: 38605-050 **Report Date:** 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-02 Date Collected: 08/19/14 00:00

Client ID: TB-20140819 Date Received: 08/19/14

Sample Location: GLOUCESTER, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/l	2.5	--	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	--	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	--	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	--	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	--	1
Ethyl ether	ND		ug/l	2.5	--	1
Tert-Butyl Alcohol	ND		ug/l	10	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	92		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	118		70-130

Project Name: BEAUPORT HOTEL
Lab Number: L1418843
Project Number: 38605-050
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-02
Client ID: TB-20140819
Sample Location: GLOUCESTER, MA
Matrix: Water
Analytical Method: 1,8260C-SIM(M)
Analytical Date: 08/24/14 20:34
Analyst: PK

Date Collected: 08/19/14 00:00
Date Received: 08/19/14
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	--	1

Project Name: BEAUPORT HOTEL
Lab Number: L1418843
Project Number: 38605-050
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-02
Client ID: TB-20140819
Sample Location: GLOUCESTER, MA
Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 08/20/14 23:14
Analyst: GP

Date Collected: 08/19/14 00:00
Date Received: 08/19/14
Field Prep: Not Specified
Extraction Date: 08/20/14 15:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Microextractables by GC - Westborough Lab							
1,2-Dibromoethane	ND		ug/l	0.010	--	1	A

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 08/20/14 21:49
Analyst: GP

Extraction Date: 08/20/14 15:00

Parameter	Result	Qualifier	Units	RL	MDL	
Microextractables by GC - Westborough Lab for sample(s): 01-02 Batch: WG715518-1						
1,2-Dibromoethane	ND		ug/l	0.010	--	A
1,2-Dibromo-3-chloropropane	ND		ug/l	0.010	--	A

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 08/24/14 19:29
Analyst: PK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG716653-3					
Methylene chloride	ND		ug/l	3.0	--
1,1-Dichloroethane	ND		ug/l	0.75	--
Chloroform	ND		ug/l	0.75	--
Carbon tetrachloride	ND		ug/l	0.50	--
1,2-Dichloropropane	ND		ug/l	1.8	--
Dibromochloromethane	ND		ug/l	0.50	--
1,1,2-Trichloroethane	ND		ug/l	0.75	--
Tetrachloroethene	ND		ug/l	0.50	--
Chlorobenzene	ND		ug/l	0.50	--
Trichlorofluoromethane	ND		ug/l	2.5	--
1,2-Dichloroethane	ND		ug/l	0.50	--
1,1,1-Trichloroethane	ND		ug/l	0.50	--
Bromodichloromethane	ND		ug/l	0.50	--
trans-1,3-Dichloropropene	ND		ug/l	0.50	--
cis-1,3-Dichloropropene	ND		ug/l	0.50	--
1,3-Dichloropropene, Total	ND		ug/l	0.50	--
1,1-Dichloropropene	ND		ug/l	2.5	--
Bromoform	ND		ug/l	2.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--
Benzene	ND		ug/l	0.50	--
Toluene	ND		ug/l	0.75	--
Ethylbenzene	ND		ug/l	0.50	--
Chloromethane	ND		ug/l	2.5	--
Bromomethane	ND		ug/l	1.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	0.50	--
trans-1,2-Dichloroethene	ND		ug/l	0.75	--
1,2-Dichloroethene, Total	ND		ug/l	0.50	--

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 08/24/14 19:29
Analyst: PK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG716653-3					
Trichloroethene	ND		ug/l	0.50	--
1,2-Dichlorobenzene	ND		ug/l	2.5	--
1,3-Dichlorobenzene	ND		ug/l	2.5	--
1,4-Dichlorobenzene	ND		ug/l	2.5	--
Methyl tert butyl ether	ND		ug/l	1.0	--
p/m-Xylene	ND		ug/l	1.0	--
o-Xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	0.50	--
Dibromomethane	ND		ug/l	5.0	--
1,4-Dichlorobutane	ND		ug/l	5.0	--
1,2,3-Trichloropropane	ND		ug/l	5.0	--
Styrene	ND		ug/l	1.0	--
Dichlorodifluoromethane	ND		ug/l	5.0	--
Acetone	ND		ug/l	5.0	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	5.0	--
Vinyl acetate	ND		ug/l	5.0	--
4-Methyl-2-pentanone	ND		ug/l	5.0	--
2-Hexanone	ND		ug/l	5.0	--
Ethyl methacrylate	ND		ug/l	5.0	--
Acrylonitrile	ND		ug/l	5.0	--
Bromochloromethane	ND		ug/l	2.5	--
Tetrahydrofuran	ND		ug/l	5.0	--
2,2-Dichloropropane	ND		ug/l	2.5	--
1,2-Dibromoethane	ND		ug/l	2.0	--
1,3-Dichloropropane	ND		ug/l	2.5	--
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--
Bromobenzene	ND		ug/l	2.5	--

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 08/24/14 19:29
Analyst: PK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG716653-3					
n-Butylbenzene	ND		ug/l	0.50	--
sec-Butylbenzene	ND		ug/l	0.50	--
tert-Butylbenzene	ND		ug/l	2.5	--
o-Chlorotoluene	ND		ug/l	2.5	--
p-Chlorotoluene	ND		ug/l	2.5	--
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	--
Hexachlorobutadiene	ND		ug/l	0.50	--
Isopropylbenzene	ND		ug/l	0.50	--
p-Isopropyltoluene	ND		ug/l	0.50	--
Naphthalene	ND		ug/l	2.5	--
n-Propylbenzene	ND		ug/l	0.50	--
1,2,3-Trichlorobenzene	ND		ug/l	2.5	--
1,2,4-Trichlorobenzene	ND		ug/l	2.5	--
1,3,5-Trimethylbenzene	ND		ug/l	2.5	--
1,2,4-Trimethylbenzene	ND		ug/l	2.5	--
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	--
Ethyl ether	ND		ug/l	2.5	--
Tert-Butyl Alcohol	ND		ug/l	10	--
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	92		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	115		70-130

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C-SIM(M)
Analytical Date: 08/24/14 19:29
Analyst: PK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02 Batch: WG716654-3					
1,4-Dioxane	ND		ug/l	3.0	--

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab	Associated sample(s): 01-02		Batch: WG715518-2		WG715518-3				
1,2-Dibromoethane	98		98		70-130	0		20	A
1,2-Dibromo-3-chloropropane	113		114		70-130	1		20	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG716653-1 WG716653-2								
Methylene chloride	110		111		70-130	1		20
1,1-Dichloroethane	115		111		70-130	4		20
Chloroform	112		110		70-130	2		20
Carbon tetrachloride	108		104		63-132	4		20
1,2-Dichloropropane	107		92		70-130	15		20
Dibromochloromethane	88		86		63-130	2		20
1,1,2-Trichloroethane	98		93		70-130	5		20
Tetrachloroethene	96		92		70-130	4		20
Chlorobenzene	101		97		75-130	4		25
Trichlorofluoromethane	119		115		62-150	3		20
1,2-Dichloroethane	112		111		70-130	1		20
1,1,1-Trichloroethane	114		108		67-130	5		20
Bromodichloromethane	108		106		67-130	2		20
trans-1,3-Dichloropropene	94		91		70-130	3		20
cis-1,3-Dichloropropene	105		105		70-130	0		20
1,1-Dichloropropene	110		105		70-130	5		20
Bromoform	74		82		54-136	10		20
1,1,2,2-Tetrachloroethane	96		99		67-130	3		20
Benzene	109		104		70-130	5		25
Toluene	100		96		70-130	4		25
Ethylbenzene	102		98		70-130	4		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG716653-1 WG716653-2								
Chloromethane	104		100		64-130	4		20
Bromomethane	87		83		39-139	5		20
Vinyl chloride	113		105		55-140	7		20
Chloroethane	116		113		55-138	3		20
1,1-Dichloroethene	116		116		61-145	0		25
trans-1,2-Dichloroethene	118		110		70-130	7		20
Trichloroethene	112		108		70-130	4		25
1,2-Dichlorobenzene	94		94		70-130	0		20
1,3-Dichlorobenzene	96		97		70-130	1		20
1,4-Dichlorobenzene	94		95		70-130	1		20
Methyl tert butyl ether	109		109		63-130	0		20
p/m-Xylene	104		98		70-130	6		20
o-Xylene	103		98		70-130	5		20
cis-1,2-Dichloroethene	116		111		70-130	4		20
Dibromomethane	106		107		70-130	1		20
1,4-Dichlorobutane	98		99		70-130	1		20
1,2,3-Trichloropropane	94		96		64-130	2		20
Styrene	103		98		70-130	5		20
Dichlorodifluoromethane	105		100		36-147	5		20
Acetone	116		101		58-148	14		20
Carbon disulfide	108		105		51-130	3		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG716653-1 WG716653-2								
2-Butanone	115		119		63-138	3		20
Vinyl acetate	111		112		70-130	1		20
4-Methyl-2-pentanone	111		112		59-130	1		20
2-Hexanone	109		103		57-130	6		20
Ethyl methacrylate	104		102		70-130	2		20
Acrylonitrile	128		121		70-130	6		20
Bromochloromethane	113		106		70-130	6		20
Tetrahydrofuran	102		107		58-130	5		20
2,2-Dichloropropane	115		108		63-133	6		20
1,2-Dibromoethane	94		92		70-130	2		20
1,3-Dichloropropane	96		94		70-130	2		20
1,1,1,2-Tetrachloroethane	91		87		64-130	4		20
Bromobenzene	92		93		70-130	1		20
n-Butylbenzene	96		96		53-136	0		20
sec-Butylbenzene	96		95		70-130	1		20
tert-Butylbenzene	93		94		70-130	1		20
o-Chlorotoluene	98		97		70-130	1		20
p-Chlorotoluene	97		97		70-130	0		20
1,2-Dibromo-3-chloropropane	88		90		41-144	2		20
Hexachlorobutadiene	98		97		63-130	1		20
Isopropylbenzene	106		104		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG716653-1 WG716653-2								
p-Isopropyltoluene	96		95		70-130	1		20
Naphthalene	83		88		70-130	6		20
n-Propylbenzene	97		96		69-130	1		20
1,2,3-Trichlorobenzene	90		90		70-130	0		20
1,2,4-Trichlorobenzene	88		92		70-130	4		20
1,3,5-Trimethylbenzene	95		94		64-130	1		20
1,2,4-Trimethylbenzene	94		96		70-130	2		20
trans-1,4-Dichloro-2-butene	90		96		70-130	6		20
Ethyl ether	117		114		59-134	3		20
Tert-Butyl Alcohol	115		113		70-130	2		20
Tertiary-Amyl Methyl Ether	105		104		66-130	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	99		98		70-130
Toluene-d8	95		95		70-130
4-Bromofluorobenzene	100		102		70-130
Dibromofluoromethane	106		105		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG716654-1 WG716654-2								
1,4-Dioxane	120		118		70-130	2		25

SEMIVOLATILES

Project Name: BEAUPORT HOTEL
Lab Number: L1418843
Project Number: 38605-050
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01
Client ID: HA14-04(OW)
Sample Location: GLOUCESTER, MA
Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 08/23/14 12:58
Analyst: JB

Date Collected: 08/19/14 10:10
Date Received: 08/19/14
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 08/20/14 01:08

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzidine	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorocyclopentadiene	ND		ug/l	20	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA	ND		ug/l	2.0	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1
2-Nitroaniline	ND		ug/l	5.0	--	1
3-Nitroaniline	ND		ug/l	5.0	--	1
4-Nitroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1

Project Name: BEAUPORT HOTEL **Lab Number:** L1418843

Project Number: 38605-050 **Report Date:** 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01 Date Collected: 08/19/14 10:10

Client ID: HA14-04(OW) Date Received: 08/19/14

Sample Location: GLOUCESTER, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
n-Nitrosodimethylamine	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
4,6-Dinitro-o-cresol	ND		ug/l	10	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1
Benzoic Acid	ND		ug/l	50	--	1
Benzyl Alcohol	ND		ug/l	2.0	--	1
Carbazole	ND		ug/l	2.0	--	1
Pyridine	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	35		21-120
Phenol-d6	23		10-120
Nitrobenzene-d5	57		23-120
2-Fluorobiphenyl	76		15-120
2,4,6-Tribromophenol	112		10-120
4-Terphenyl-d14	104		41-149

Project Name: BEAUPORT HOTEL **Lab Number:** L1418843

Project Number: 38605-050 **Report Date:** 08/25/14

SAMPLE RESULTS

Lab ID:	L1418843-01	Date Collected:	08/19/14 10:10
Client ID:	HA14-04(OW)	Date Received:	08/19/14
Sample Location:	GLOUCESTER, MA	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8270D-SIM	Extraction Date:	08/20/14 01:09
Analytical Date:	08/20/14 17:26		
Analyst:	MW		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.20	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	ND		ug/l	0.20	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	0.20	--	1
Benzo(a)anthracene	ND		ug/l	0.20	--	1
Benzo(a)pyrene	ND		ug/l	0.20	--	1
Benzo(b)fluoranthene	ND		ug/l	0.20	--	1
Benzo(k)fluoranthene	ND		ug/l	0.20	--	1
Chrysene	ND		ug/l	0.20	--	1
Acenaphthylene	ND		ug/l	0.20	--	1
Anthracene	ND		ug/l	0.20	--	1
Benzo(ghi)perylene	ND		ug/l	0.20	--	1
Fluorene	ND		ug/l	0.20	--	1
Phenanthrene	ND		ug/l	0.20	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.20	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.20	--	1
Pyrene	ND		ug/l	0.20	--	1
1-Methylnaphthalene	ND		ug/l	0.20	--	1
2-Methylnaphthalene	ND		ug/l	0.20	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name: BEAUPORT HOTEL **Lab Number:** L1418843

Project Number: 38605-050 **Report Date:** 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01 Date Collected: 08/19/14 10:10

Client ID: HA14-04(OW) Date Received: 08/19/14

Sample Location: GLOUCESTER, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS-SIM - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	29		21-120
Phenol-d6	21		10-120
Nitrobenzene-d5	58		23-120
2-Fluorobiphenyl	57		15-120
2,4,6-Tribromophenol	78		10-120
4-Terphenyl-d14	78		41-149

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 08/23/14 10:26
Analyst: JB

Extraction Method: EPA 3510C
Extraction Date: 08/20/14 01:08

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG715276-1					
Benzidine	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
1,2-Dichlorobenzene	ND		ug/l	2.0	--
1,3-Dichlorobenzene	ND		ug/l	2.0	--
1,4-Dichlorobenzene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene	ND		ug/l	2.0	--
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorocyclopentadiene	ND		ug/l	20	--
Isophorone	ND		ug/l	5.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA	ND		ug/l	2.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--
Aniline	ND		ug/l	2.0	--
4-Chloroaniline	ND		ug/l	5.0	--
2-Nitroaniline	ND		ug/l	5.0	--
3-Nitroaniline	ND		ug/l	5.0	--
4-Nitroaniline	ND		ug/l	5.0	--

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 08/23/14 10:26
Analyst: JB

Extraction Method: EPA 3510C
Extraction Date: 08/20/14 01:08

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG715276-1					
Dibenzofuran	ND		ug/l	2.0	--
n-Nitrosodimethylamine	ND		ug/l	2.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	10	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
4,6-Dinitro-o-cresol	ND		ug/l	10	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol	ND		ug/l	5.0	--
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--
2,4,5-Trichlorophenol	ND		ug/l	5.0	--
Benzoic Acid	ND		ug/l	50	--
Benzyl Alcohol	ND		ug/l	2.0	--
Carbazole	ND		ug/l	2.0	--
Pyridine	ND		ug/l	5.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	27		21-120
Phenol-d6	15		10-120
Nitrobenzene-d5	51		23-120
2-Fluorobiphenyl	67		15-120
2,4,6-Tribromophenol	80		10-120
4-Terphenyl-d14	92		41-149

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 08/20/14 12:38
Analyst: MW

Extraction Method: EPA 3510C
Extraction Date: 08/20/14 01:09

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG715277-1					
Acenaphthene	ND		ug/l	0.20	--
2-Chloronaphthalene	ND		ug/l	0.20	--
Fluoranthene	ND		ug/l	0.20	--
Hexachlorobutadiene	ND		ug/l	0.50	--
Naphthalene	ND		ug/l	0.20	--
Benzo(a)anthracene	ND		ug/l	0.20	--
Benzo(a)pyrene	ND		ug/l	0.20	--
Benzo(b)fluoranthene	ND		ug/l	0.20	--
Benzo(k)fluoranthene	ND		ug/l	0.20	--
Chrysene	ND		ug/l	0.20	--
Acenaphthylene	ND		ug/l	0.20	--
Anthracene	ND		ug/l	0.20	--
Benzo(ghi)perylene	ND		ug/l	0.20	--
Fluorene	ND		ug/l	0.20	--
Phenanthrene	ND		ug/l	0.20	--
Dibenzo(a,h)anthracene	ND		ug/l	0.20	--
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.20	--
Pyrene	ND		ug/l	0.20	--
1-Methylnaphthalene	ND		ug/l	0.20	--
2-Methylnaphthalene	ND		ug/l	0.20	--
Pentachlorophenol	ND		ug/l	0.80	--
Hexachlorobenzene	ND		ug/l	0.80	--
Hexachloroethane	ND		ug/l	0.80	--

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 08/20/14 12:38
Analyst: MW

Extraction Method: EPA 3510C
Extraction Date: 08/20/14 01:09

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG715277-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	32		21-120
Phenol-d6	20		10-120
Nitrobenzene-d5	69		23-120
2-Fluorobiphenyl	63		15-120
2,4,6-Tribromophenol	73		10-120
4-Terphenyl-d14	83		41-149

Lab Control Sample Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG715276-2 WG715276-3								
Benzidine	11		18		10-75	**48**	Q	30
1,2,4-Trichlorobenzene	67		70		39-98	4		30
Bis(2-chloroethyl)ether	61		64		40-140	5		30
1,2-Dichlorobenzene	60		64		40-140	6		30
1,3-Dichlorobenzene	58		61		40-140	5		30
1,4-Dichlorobenzene	59		63		36-97	7		30
3,3'-Dichlorobenzidine	91		88		40-140	3		30
2,4-Dinitrotoluene	**98**	Q	**98**	Q	24-96	0		30
2,6-Dinitrotoluene	100		100		40-140	0		30
Azobenzene	73		74		40-140	1		30
4-Chlorophenyl phenyl ether	98		103		40-140	5		30
4-Bromophenyl phenyl ether	112		115		40-140	3		30
Bis(2-chloroisopropyl)ether	44		46		40-140	4		30
Bis(2-chloroethoxy)methane	61		61		40-140	0		30
Hexachlorocyclopentadiene	**30**	Q	**32**	Q	40-140	6		30
Isophorone	67		70		40-140	4		30
Nitrobenzene	66		69		40-140	4		30
NDPA/DPA	91		92		40-140	1		30
Bis(2-ethylhexyl)phthalate	89		86		40-140	3		30
Butyl benzyl phthalate	97		99		40-140	2		30
Di-n-butylphthalate	94		92		40-140	2		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG715276-2 WG715276-3								
Di-n-octylphthalate	94		93		40-140	1		30
Diethyl phthalate	95		95		40-140	0		30
Dimethyl phthalate	94		96		40-140	2		30
Aniline	**28**	Q	**30**	Q	40-140	7		30
4-Chloroaniline	55		53		40-140	4		30
2-Nitroaniline	94		93		52-143	1		30
3-Nitroaniline	65		68		25-145	5		30
4-Nitroaniline	84		82		51-143	2		30
Dibenzofuran	87		88		40-140	1		30
n-Nitrosodimethylamine	27		28		22-74	4		30
2,4,6-Trichlorophenol	92		90		30-130	2		30
p-Chloro-m-cresol	74		72		23-97	3		30
2-Chlorophenol	58		61		27-123	5		30
2,4-Dichlorophenol	74		77		30-130	4		30
2,4-Dimethylphenol	62		62		30-130	0		30
2-Nitrophenol	70		74		30-130	6		30
4-Nitrophenol	34		38		10-80	11		30
2,4-Dinitrophenol	89		93		20-130	4		30
4,6-Dinitro-o-cresol	99		105		20-164	6		30
Phenol	20		22		12-110	10		30
2-Methylphenol	47		47		30-130	0		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG715276-2 WG715276-3								
3-Methylphenol/4-Methylphenol	48		49		30-130	2		30
2,4,5-Trichlorophenol	97		96		30-130	1		30
Benzoic Acid	34		34		10-164	0		30
Benzyl Alcohol	44		46		26-116	4		30
Carbazole	91		96		55-144	5		30
Pyridine	16		22		10-66	**32**	Q	30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	37		37		21-120
Phenol-d6	23		24		10-120
Nitrobenzene-d5	67		67		23-120
2-Fluorobiphenyl	94		90		15-120
2,4,6-Tribromophenol	**127**	Q	**128**	Q	10-120
4-Terphenyl-d14	117		113		41-149

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG715277-2 WG715277-3								
Acenaphthene	74		67		37-111	10		40
2-Chloronaphthalene	72		66		40-140	9		40
Fluoranthene	96		84		40-140	13		40
Hexachlorobutadiene	64		58		40-140	10		40
Naphthalene	69		62		40-140	11		40
Benzo(a)anthracene	95		84		40-140	12		40
Benzo(a)pyrene	91		79		40-140	14		40
Benzo(b)fluoranthene	96		84		40-140	13		40
Benzo(k)fluoranthene	92		80		40-140	14		40
Chrysene	91		80		40-140	13		40
Acenaphthylene	77		70		40-140	10		40
Anthracene	90		80		40-140	12		40
Benzo(ghi)perylene	89		76		40-140	16		40
Fluorene	85		76		40-140	11		40
Phenanthrene	85		76		40-140	11		40
Dibenzo(a,h)anthracene	94		81		40-140	15		40
Indeno(1,2,3-cd)Pyrene	92		79		40-140	15		40
Pyrene	95		84		26-127	12		40
1-Methylnaphthalene	72		65		40-140	10		40
2-Methylnaphthalene	75		68		40-140	10		40
Pentachlorophenol	94		82		9-103	14		40

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG715277-2 WG715277-3								
Hexachlorobenzene	90		80		40-140	12		40
Hexachloroethane	69		62		40-140	11		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	37		33		21-120
Phenol-d6	25		22		10-120
Nitrobenzene-d5	75		67		23-120
2-Fluorobiphenyl	71		64		15-120
2,4,6-Tribromophenol	98		88		10-120
4-Terphenyl-d14	91		80		41-149

PCBS

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1418843
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID:	L1418843-01	Date Collected:	08/19/14 10:10
Client ID:	HA14-04(OW)	Date Received:	08/19/14
Sample Location:	GLOUCESTER, MA	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 608
Analytical Method:	5,608	Extraction Date:	08/21/14 01:06
Analytical Date:	08/23/14 20:28	Cleanup Method:	EPA 3665A
Analyst:	TQ	Cleanup Date:	08/22/14
		Cleanup Method:	EPA 3660B
		Cleanup Date:	08/22/14

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.250	--	1	B
Aroclor 1221	ND		ug/l	0.250	--	1	B
Aroclor 1232	ND		ug/l	0.250	--	1	B
Aroclor 1242	ND		ug/l	0.250	--	1	B
Aroclor 1248	ND		ug/l	0.250	--	1	B
Aroclor 1254	ND		ug/l	0.250	--	1	B
Aroclor 1260	ND		ug/l	0.200	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	66		30-150	B
Decachlorobiphenyl	47		30-150	B

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Analytical Method: 5,608
Analytical Date: 08/23/14 21:05
Analyst: TQ

Extraction Method: EPA 608
Extraction Date: 08/21/14 01:06
Cleanup Method: EPA 3665A
Cleanup Date: 08/22/14
Cleanup Method: EPA 3660B
Cleanup Date: 08/22/14

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG715639-1						
Aroclor 1016	ND		ug/l	0.250	--	B
Aroclor 1221	ND		ug/l	0.250	--	B
Aroclor 1232	ND		ug/l	0.250	--	B
Aroclor 1242	ND		ug/l	0.250	--	B
Aroclor 1248	ND		ug/l	0.250	--	B
Aroclor 1254	ND		ug/l	0.250	--	B
Aroclor 1260	ND		ug/l	0.200	--	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	76		30-150	B
Decachlorobiphenyl	66		30-150	B

Matrix Spike Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715639-3 QC Sample: L1418843-01 Client ID: HA14-04(OW)													
Aroclor 1016	ND	2	1.29	64		-	-		40-140	-		50	B
Aroclor 1260	ND	2	1.32	66		-	-		40-140	-		50	B

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	73				30-150	B
Decachlorobiphenyl	47				30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 Batch: WG715639-2									
Aroclor 1016	66		-		40-140	-		50	B
Aroclor 1260	63		-		40-140	-		50	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74				30-150	B
Decachlorobiphenyl	62				30-150	B

Lab Duplicate Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits	
Polychlorinated Biphenyls by GC - Westborough Lab 04(OW)	Associated sample(s): 01	QC Batch ID: WG715639-4		QC Sample: L1418843-01		Client ID: HA14-	
Aroclor 1016	ND	ND	ug/l	NC		50	B
Aroclor 1221	ND	ND	ug/l	NC		50	B
Aroclor 1232	ND	ND	ug/l	NC		50	B
Aroclor 1242	ND	ND	ug/l	NC		50	B
Aroclor 1248	ND	ND	ug/l	NC		50	B
Aroclor 1254	ND	ND	ug/l	NC		50	B
Aroclor 1260	ND	ND	ug/l	NC		50	B

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	66		82		30-150	B
Decachlorobiphenyl	47		56		30-150	B

METALS

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1418843
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01
Client ID: HA14-04(OW)
Sample Location: GLOUCESTER, MA
Matrix: Water
Date Collected: 08/19/14 10:10
Date Received: 08/19/14
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab											
Antimony, Total	0.00754		mg/l	0.00300	--	1	08/20/14 08:07	08/20/14 17:25	EPA 3005A	1,6020A	KL
Arsenic, Total	ND		mg/l	0.00250	--	5	08/20/14 08:07	08/21/14 10:33	EPA 3005A	1,6020A	KL
Cadmium, Total	ND		mg/l	0.00100	--	5	08/20/14 08:07	08/21/14 10:33	EPA 3005A	1,6020A	KL
Chromium, Total	ND		mg/l	0.00100	--	1	08/20/14 08:07	08/20/14 17:25	EPA 3005A	1,6020A	KL
Copper, Total	0.00787		mg/l	0.00100	--	1	08/20/14 08:07	08/20/14 17:25	EPA 3005A	1,6020A	KL
Iron, Total	2.2		mg/l	0.05	--	1	08/20/14 08:07	08/20/14 14:03	EPA 3005A	19,200.7	JH
Lead, Total	ND		mg/l	0.00250	--	5	08/20/14 08:07	08/21/14 10:33	EPA 3005A	1,6020A	KL
Mercury, Total	ND		mg/l	0.0002	--	1	08/21/14 12:14	08/21/14 15:47	EPA 245.1	3,245.1	AK
Nickel, Total	0.00501		mg/l	0.00050	--	1	08/20/14 08:07	08/20/14 17:25	EPA 3005A	1,6020A	KL
Selenium, Total	ND		mg/l	0.0250	--	5	08/20/14 08:07	08/21/14 10:33	EPA 3005A	1,6020A	KL
Silver, Total	ND		mg/l	0.00200	--	5	08/20/14 08:07	08/21/14 10:33	EPA 3005A	1,6020A	KL
Zinc, Total	0.04778		mg/l	0.01000	--	1	08/20/14 08:07	08/20/14 17:25	EPA 3005A	1,6020A	KL

Project Name: BEAUPORT HOTEL **Lab Number:** L1418843

Project Number: 38605-050 **Report Date:** 08/25/14

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Westborough Lab for sample(s): 01 Batch: WG715322-1										
Antimony, Total	ND		mg/l	0.00300	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL
Arsenic, Total	ND		mg/l	0.00050	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL
Cadmium, Total	ND		mg/l	0.00020	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL
Chromium, Total	ND		mg/l	0.00100	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL
Copper, Total	ND		mg/l	0.00100	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL
Lead, Total	ND		mg/l	0.00050	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL
Nickel, Total	ND		mg/l	0.00050	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL
Selenium, Total	ND		mg/l	0.00500	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL
Silver, Total	ND		mg/l	0.00040	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL
Zinc, Total	ND		mg/l	0.01000	--	1	08/20/14 08:07	08/20/14 14:19	1,6020A	KL

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Westborough Lab for sample(s): 01 Batch: WG715323-1										
Iron, Total	ND		mg/l	0.05	--	1	08/20/14 08:07	08/20/14 13:14	19,200.7	JH

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Westborough Lab for sample(s): 01 Batch: WG715794-1										
Mercury, Total	ND		mg/l	0.0002	--	1	08/21/14 12:14	08/21/14 15:40	3,245.1	AK

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1418843

Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Westborough Lab Associated sample(s): 01 Batch: WG715322-2								
Antimony, Total	92		-		80-120	-		
Arsenic, Total	106		-		80-120	-		
Cadmium, Total	**121**	Q	-		80-120	-		
Chromium, Total	106		-		80-120	-		
Copper, Total	106		-		80-120	-		
Lead, Total	105		-		80-120	-		
Nickel, Total	109		-		80-120	-		
Selenium, Total	114		-		80-120	-		
Silver, Total	109		-		80-120	-		
Zinc, Total	113		-		80-120	-		
Total Metals - Westborough Lab Associated sample(s): 01 Batch: WG715323-2								
Iron, Total	93		-		85-115	-		
Total Metals - Westborough Lab Associated sample(s): 01 Batch: WG715794-2								
Mercury, Total	86		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715322-4 QC Sample: L1418834-02 Client ID: MS Sample												
Antimony, Total	0.0031	0.5	0.5474	109		-	-		75-125	-		20
Arsenic, Total	0.00686	0.12	0.1325	105		-	-		75-125	-		20
Cadmium, Total	ND	0.051	0.05623	110		-	-		75-125	-		20
Chromium, Total	0.00607	0.2	0.2066	100		-	-		75-125	-		20
Copper, Total	0.0043	0.25	0.2679	105		-	-		75-125	-		20
Lead, Total	0.0009	0.51	0.5304	104		-	-		75-125	-		20
Nickel, Total	0.00319	0.5	0.5064	101		-	-		75-125	-		20
Selenium, Total	ND	0.12	0.131	109		-	-		75-125	-		20
Silver, Total	ND	0.05	0.05309	106		-	-		75-125	-		20
Zinc, Total	0.0226	0.5	0.5550	106		-	-		75-125	-		20
Total Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715323-4 QC Sample: L1418834-02 Client ID: MS Sample												
Iron, Total	0.10	1	1.1	100		-	-		75-125	-		20
Total Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715794-4 QC Sample: L1418843-01 Client ID: HA14-04(OW)												
Mercury, Total	ND	0.005	0.0029	**59**	Q	-	-		70-130	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715322-3 QC Sample: L1418834-02 Client ID: DUP Sample						
Arsenic, Total	0.00686	0.00695	mg/l	1		20
Chromium, Total	0.00607	0.00607	mg/l	0		20
Nickel, Total	0.00319	0.00298	mg/l	7		20
Total Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715323-3 QC Sample: L1418834-02 Client ID: DUP Sample						
Iron, Total	0.10	0.11	mg/l	10		20
Total Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715794-3 QC Sample: L1418843-01 Client ID: HA14-04(OW)						
Mercury, Total	ND	ND	mg/l	NC		20

INORGANICS
&
MISCELLANEOUS

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

SAMPLE RESULTS

Lab ID: L1418843-01
Client ID: HA14-04(OW)
Sample Location: GLOUCESTER, MA
Matrix: Water

Date Collected: 08/19/14 10:10
Date Received: 08/19/14
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	14.		mg/l	5.0	NA	1	-	08/21/14 21:00	30,2540D	JT
Cyanide, Total	ND		mg/l	0.005	--	1	08/20/14 16:33	08/21/14 14:49	30,4500CN-CE	JO
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/19/14 22:30	30,4500CL-D	MR
pH (H)	7.4		SU	-	NA	1	-	08/20/14 00:23	30,4500H+-B	MR
TPH	ND		mg/l	4.00	--	1	08/20/14 07:30	08/20/14 10:30	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	08/21/14 11:00	08/21/14 13:39	4,420.1	MP
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/19/14 22:50	08/19/14 23:13	30,3500CR-D	MR
Anions by Ion Chromatography - Westborough Lab										
Chloride	11600		mg/l	250	--	500	-	08/20/14 20:19	44,300.0	AU

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1418843
Report Date: 08/25/14

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG715252-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/19/14 22:30	30,4500CL-D	MR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG715257-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/19/14 22:50	08/19/14 23:11	30,3500CR-D	MR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG715330-1										
TPH	ND		mg/l	4.00	--	1	08/20/14 07:30	08/20/14 10:30	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG715473-1										
Cyanide, Total	ND		mg/l	0.005	--	1	08/20/14 16:33	08/21/14 14:21	30,4500CN-CE	JO
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG715630-1										
Chloride	ND		mg/l	0.500	--	1	-	08/20/14 17:19	44,300.0	AU
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG715745-1										
Phenolics, Total	ND		mg/l	0.030	--	1	08/21/14 11:00	08/21/14 13:36	4,420.1	MP
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG715946-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	08/21/14 21:00	30,2540D	JT

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG715252-2								
Chlorine, Total Residual	109		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG715257-2								
Chromium, Hexavalent	101		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG715268-1								
pH	100		-		99-101	-		5
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG715330-2								
TPH	85		-		64-132	-		34
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG715473-2								
Cyanide, Total	101		-		90-110	-		
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 Batch: WG715630-2								
Chloride	99		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG715745-2								
Phenolics, Total	98		-		70-130	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715257-4 QC Sample: L1418843-01 Client ID: HA14-04(OW)												
Chromium, Hexavalent	ND	0.1	0.095	95		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715330-4 QC Sample: L1418834-02 Client ID: MS Sample												
TPH	ND	20.4	18.4	90		-	-		64-132	-		34
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715473-3 QC Sample: L1418578-01 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.192	96		-	-		90-110	-		30
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715630-3 QC Sample: L1418798-08 Client ID: MS Sample												
Chloride	37.8	4	40.3	62		-	-		40-151	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715745-4 QC Sample: L1418843-01 Client ID: HA14-04(OW)												
Phenolics, Total	ND	0.4	0.40	101		-	-		70-130	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715252-3 QC Sample: L1418843-01 Client ID: HA14-04(OW)						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715257-3 QC Sample: L1418843-01 Client ID: HA14-04(OW)						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715268-2 QC Sample: L1418834-01 Client ID: DUP Sample						
pH	9.6	9.6	SU	0		5
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715330-3 QC Sample: L1418834-01 Client ID: DUP Sample						
TPH	ND	ND	mg/l	NC		34
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715473-4 QC Sample: L1418578-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715630-4 QC Sample: L1418798-08 Client ID: DUP Sample						
Chloride	37.8	37.7	mg/l	0		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715745-3 QC Sample: L1418843-01 Client ID: HA14-04(OW)						
Phenolics, Total	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG715946-2 QC Sample: L1418465-01 Client ID: DUP Sample						
Solids, Total Suspended	85	91	mg/l	7		29

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1418843
Report Date: 08/25/14

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1418843-01A	Vial HCl preserved	A	N/A	2.9	Y	Absent	8260-SIM(14),8260(14)
L1418843-01B	Vial HCl preserved	A	N/A	2.9	Y	Absent	8260-SIM(14),8260(14)
L1418843-01C	Vial HCl preserved	A	N/A	2.9	Y	Absent	8260-SIM(14),8260(14)
L1418843-01D	Vial Na2S2O3 preserved	A	N/A	2.9	Y	Absent	504(14)
L1418843-01E	Vial Na2S2O3 preserved	A	N/A	2.9	Y	Absent	504(14)
L1418843-01F	Plastic 250ml NaOH preserved	A	>12	2.9	Y	Absent	TCN-4500(14)
L1418843-01G	Plastic 250ml HNO3 preserved	A	<2	2.9	Y	Absent	SE-6020T(180),CR-6020T(180),NI-6020T(180),CU-6020T(180),ZN-6020T(180),FE-UI(180),PB-6020T(180),HG-U(28),AS-6020T(180),SB-6020T(180),AG-6020T(180),CD-6020T(180)
L1418843-01H	Amber 1000ml Na2S2O3	A	7	2.9	Y	Absent	PCB-608(7)
L1418843-01I	Amber 1000ml Na2S2O3	A	7	2.9	Y	Absent	PCB-608(7)
L1418843-01J	Amber 1000ml unpreserved	A	7	2.9	Y	Absent	8270TCL(7),8270TCL-SIM(7)
L1418843-01K	Amber 1000ml unpreserved	A	7	2.9	Y	Absent	8270TCL(7),8270TCL-SIM(7)
L1418843-01L	Amber 1000ml HCl preserved	A	N/A	2.9	Y	Absent	TPH-1664(28)
L1418843-01M	Amber 1000ml HCl preserved	A	N/A	2.9	Y	Absent	TPH-1664(28)
L1418843-01N	Amber 500ml H2SO4 preserved	A	<2	2.9	Y	Absent	TPHENOL-420(28)
L1418843-01O	Plastic 1000ml unpreserved	A	7	2.9	Y	Absent	TSS-2540(7)
L1418843-01P	Plastic 500ml unpreserved	A	7	2.9	Y	Absent	HEXCR-3500(1)
L1418843-01Q	Plastic 500ml unpreserved	A	7	2.9	Y	Absent	CL-300(28),TRC-4500(1),PH-4500(.01)
L1418843-01R	Vial Na2S2O3 preserved	A	N/A	2.9	Y	Absent	504(14)
L1418843-01S	Amber 1000ml unpreserved	A	7	2.9	Y	Absent	8270TCL(7),8270TCL-SIM(7)
L1418843-01T	Amber 1000ml unpreserved	A	7	2.9	Y	Absent	8270TCL(7),8270TCL-SIM(7)
L1418843-01W	Plastic 250ml unpreserved	A	7	2.9	Y	Absent	HOLD-METAL(180)
L1418843-02A	Vial HCl preserved	A	N/A	2.9	Y	Absent	8260-SIM(14),8260(14)
L1418843-02B	Vial Na2S2O3 preserved	A	N/A	2.9	Y	Absent	504(14)

*Values in parentheses indicate holding time in days

Project Name:	BEAUPORT HOTEL	**Lab Number:**	L1418843
Project Number:	38605-050	**Report Date:**	08/25/14

GLOSSARY

Acronyms

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NI - Not Ignitable.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

Report Format: Data Usability Report

Project Name:	BEAUPORT HOTEL	**Lab Number:**	L1418843
Project Number:	38605-050	**Report Date:**	08/25/14

Data Qualifiers

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	BEAUPORT HOTEL	**Lab Number:**	L1418843
Project Number:	38605-050	**Report Date:**	08/25/14

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.

4 Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Revised March 1983.

5 Methods for the Organic Chemical Analysis of Municipal and Industrial Wastewater. Appendix A, Part 136, 40 CFR (Code of Federal Regulations).

14 Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water. EPA/600/4-88/039, Revised July 1991.

19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

74 Method 1664,Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

Last revised April 15, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8330A/B: PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 8/19/14

ALPHA Job #: L1418843

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Haley & Aldrich
Address: 465 Medford St
Charlestown MA 02129
Phone: (617) 886-7400
Fax:
Email: CMcKenzie@HaleyAldrich.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Behuport Hotel
Project Location: Gloucester MA
Project #: 38605-050
Project Manager: Cole Worthy
ALPHA Quote #:

Turn-Around Time

☐ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 8/25/14 Time:

Report Information - Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All *CAM* methods for inorganic analyses require MS every 20 soil samples)

8260 also include SIM (GH 8/19/14)

SAMPLE HANDLING
Filtration
☑ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	8260	EDB-504	PCBs-608	TSS	pH, Cl, TRC	Hex Cr	TCN	Total Phenol	8270	8270-SIM	TPH-1664	Total RCP Metals	Sample Specific Comments	TOTAL # BOTTLES
1884 3.1	HA14-04(ow)	8/19/14	1010	GW	CAS	X	X	X	X	X	X	X	X	X	X	X	X	Hold Dissolved RCP Metals pending total results	20
2	TB_20140819					X	X												3

Container Type	V	V	A	P	P	P	P	A	A	A	A	A
Preservative	B	H	H	A	A	A	E	D	A	A	B	C

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
	8/19/2014 13:30		8/19/14 16:30
	8/19/14 1923		8/19/14 1620
	8/19/14 1815		8/19/14 18:15

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 8/19/14

ALPHA Job #: L1418843

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Haley & Aldrich
Address: 465 Medford St
Charlestown MA 02129
Phone: (617) 886-7400
Fax:
Email: CMcKenzie@HaleyAldrich.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Behuport Hotel
Project Location: Gloucester MA
Project #: 38605-050
Project Manager: Cole Worthy
ALPHA Quote #:

Turn-Around Time

☐ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 8/25/14 Time:

Report Information - Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All *CAM* methods for inorganic analyses require MS every 20 soil samples)

SAMPLE HANDLING

Filtration
☑ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	8260	EDB-504	PCBs-608	TSS	pH, Cl, TRC	Hex Cr	TCN	Total Phenol	8270	8270-SIM	TPH-1664	Total RGP Metals	Sample Specific Comments	TOTAL # BOTTLES
1884 3.1	HA14-04(ow)	8/19/14	1010	GW	CAS	X	X	X	X	X	X	X	X	X	X	X	X	Hold Dissolved RGP Metals pending total results	20
2	TB_20140819					X	X												3

Container Type	V	V	A	P	P	P	P	A	A	A	A	A
Preservative	B	H	H	A	A	A	E	D	A	A	B	C

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
Chris Sullivan	8/19/2014 13:30	M.Curtin	8/19/14 16:30
M.Curtin	8/19/14 1923	Richard Scott	8/19/14 1815

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

ANALYTICAL REPORT

Lab Number:	L1419545
Client:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Charlestown, MA 02129-1400
ATTN:	Cole Worthy
Phone:	(617) 886-7341
Project Name:	BEAUPORT HOTEL
Project Number:	38605-050
Report Date:	09/03/14

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1419545
Report Date: 09/03/14

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1419545-01	HA14-04(OW)	WATER	GLOUCESTER, MA	08/19/14 10:10	08/19/14

Project Name: BEAUPORT HOTEL **Lab Number:** L1419545
Project Number: 38605-050 **Report Date:** 09/03/14

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: BEAUPORT HOTEL **Lab Number:** L1419545
Project Number: 38605-050 **Report Date:** 09/03/14

Case Narrative (continued)

Dissolved Metals

L1419545-01 has elevated detection limits for antimony and copper due to the dilution required by matrix interferences encountered during analysis.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 09/03/14

METALS

Project Name: BEAUPORT HOTEL
Lab Number: L1419545
Project Number: 38605-050
Report Date: 09/03/14

SAMPLE RESULTS

Lab ID: L1419545-01
Client ID: HA14-04(OW)
Sample Location: GLOUCESTER, MA
Matrix: Water

Date Collected: 08/19/14 10:10
Date Received: 08/19/14
Field Prep: Field Filtered

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Dissolved Metals - Westborough Lab											
Antimony, Dissolved	ND		mg/l	0.02000	--	10	08/28/14 09:55	08/30/14 12:53	EPA 3005A	1,6020A	KL
Copper, Dissolved	ND		mg/l	0.01000	--	10	08/28/14 09:55	08/30/14 12:53	EPA 3005A	1,6020A	KL
Iron, Dissolved	2.1		mg/l	0.05	--	1	08/28/14 09:55	08/29/14 11:03	EPA 3005A	19,200.7	TT

Project Name: BEAUPORT HOTEL
Project Number: 38605-050
Lab Number: L1419545
Report Date: 09/03/14

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Westborough Lab for sample(s): 01 Batch: WG717566-1										
Antimony, Dissolved	ND		mg/l	0.00200	--	1	08/28/14 09:55	08/29/14 17:40	1,6020A	KL
Copper, Dissolved	ND		mg/l	0.00100	--	1	08/28/14 09:55	08/29/14 17:40	1,6020A	KL

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Westborough Lab for sample(s): 01 Batch: WG717573-1										
Iron, Dissolved	ND		mg/l	0.05	--	1	08/28/14 09:55	08/29/14 10:55	19,200.7	TT

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BEAUPORT HOTEL

Project Number: 38605-050

Lab Number: L1419545

Report Date: 09/03/14

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Westborough Lab Associated sample(s): 01 Batch: WG717566-2								
Antimony, Dissolved	101		-		80-120	-		
Copper, Dissolved	102		-		80-120	-		
Dissolved Metals - Westborough Lab Associated sample(s): 01 Batch: WG717573-2								
Iron, Dissolved	110		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1419545
Report Date: 09/03/14

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG717566-4 QC Sample: L1419545-01 Client ID: HA14-04(OW)												
Antimony, Dissolved	ND	0.5	0.5431	109		-	-		75-125	-		20
Copper, Dissolved	ND	0.25	0.2566	103		-	-		75-125	-		20
Dissolved Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG717573-4 QC Sample: L1419545-01 Client ID: HA14-04(OW)												
Iron, Dissolved	2.1	1	3.0	90		-	-		75-125	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1419545
Report Date: 09/03/14

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dissolved Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG717566-3 QC Sample: L1419545-01 Client ID: HA14-04(OW)						
Antimony, Dissolved	ND	ND	mg/l	NC		20
Copper, Dissolved	ND	ND	mg/l	NC		20
Dissolved Metals - Westborough Lab Associated sample(s): 01 QC Batch ID: WG717573-3 QC Sample: L1419545-01 Client ID: HA14-04(OW)						
Iron, Dissolved	2.1	2.1	mg/l	0		20

Project Name: BEAUPORT HOTEL
Project Number: 38605-050

Lab Number: L1419545
Report Date: 09/03/14

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information **Custody Seal**

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1419545-01A	Plastic 250ml HNO3 preserved	A	<2	2.9	Y	Absent	CU-6020S(180),FE-RI(180),SB-6020S(180)

*Values in parentheses indicate holding time in days

Project Name:	BEAUPORT HOTEL	**Lab Number:**	L1419545
Project Number:	38605-050	**Report Date:**	09/03/14

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NI	- Not Ignitable.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.
C	- Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
D	- Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
E	- Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
G	- The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

Report Format: Data Usability Report

Project Name:	BEAUPORT HOTEL	**Lab Number:**	L1419545
Project Number:	38605-050	**Report Date:**	09/03/14

Data Qualifiers

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	BEAUPORT HOTEL	**Lab Number:**	L1419545
Project Number:	38605-050	**Report Date:**	09/03/14

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

Last revised April 15, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8330A/B: PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Serial No:08321413:42

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 8/19/14

L1419545 ER
ALPHA Job #: L1418643

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Haley & Aldrich
Address: 465 Medford St
Charlestown MA 02129
Phone: (617) 886-7400
Fax:
Email: CMcKenzie@HaleyAldrich.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Behuport Hotel
Project Location: Gloucester MA
Project #: 38605-050
Project Manager: Cole Worthy
ALPHA Quote #:

Turn-Around Time

☐ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 8/25/14 Time: 9/3/14

Report Information - Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☐ Yes ☐ No CU-6020S,FE-RI, SB-6020S s Required?
☐ Yes ☐ No ed on this SDG? (If yes see note in Comments)
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required , indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All *CAM* methods for inorganic analyses require MS every 20 soil samples)

8260 also include SIM (GH 8/19/14)

ANALYSIS: 8260 | EDB-504 | PAHs-608 | TSS | PH, Cl, TRC | Hex Cr | TCN | Total Phenol | 1,4-D | 8270-SIM | TPH-HLHT | TOTAL RCP Metals

SAMPLE HANDLING
Filtration
☑ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	8260	EDB-504	PAHs-608	TSS	PH, Cl, TRC	Hex Cr	TCN	Total Phenol	1,4-D	8270-SIM	TPH-HLHT	TOTAL RCP Metals	Sample Specific Comments	TOTAL # BOTTLES
1418643.1	HA14-04(ow)	8/19/14	1010	GW	CAS	X	X	X	X	X	X	X	X	X	X	X	X	~~Hold Dissolved RCP METALS~~ PENDING TOTAL RESULTS	20
19545 -2	TB_20140819					X	X												3

Container Type	V	V	A	P	P	P	P	A	A	A	A	A
Preservative	B	H	H	A	A	A	E	D	A	A	B	C

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
Chris Sullivan	8/19/2014 13:30	M.Curtis	8/19/14 16:30
M.Curtis	8/19/14 1923	Richard Scott	8/19/14 18:15
	8/19/14 1815		

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 8/19/14

ALPHA Job #: L1418843

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Haley & Aldrich
Address: 465 Medford St
Charlestown MA 02129
Phone: (617) 886-7400
Fax:
Email: CMcKenzie@HaleyAldrich.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Behuport Hotel
Project Location: Gloucester MA
Project #: 38605-050
Project Manager: Cole Worthy
ALPHA Quote #:

Turn-Around Time

☐ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 8/25/14 Time:

Report Information - Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All *CAM* methods for inorganic analyses require MS every 20 soil samples)

SAMPLE HANDLING

Filtration
☑ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	8260	EDB-504	PCBs-608	TSS	pH, Cl, TRC	Hex Cr	TCN	Total Phenol	8270	8270-SIM	TPH-1664	Total RGP Metals	Sample Specific Comments	TOTAL # BOTTLES
1884 3.1	HA14-04(ow)	8/19/14	1010	GW	CAS	X	X	X	X	X	X	X	X	X	X	X	X	Hold Dissolved RGP Metals pending total results	20
2	TB_20140819					X	X												3

Container Type	V	V	A	P	P	P	P	A	A	A	A	A
Preservative	B	H	H	A	A	A	E	D	A	A	B	C

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
	8/19/2014 13:30		8/19/14 16:30
	8/19/14 1923		8/19/14 1620
	8/19/14 1815		8/19/14 18:15

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)