SEBAGO TECHNICS

CIVIL ENGINEERING ▪ SURVEYING ▪ LANDSCAPE ARCHITECTURE

# Solid Waste Transfer Station
# Permit Application

To:

## Department of Environmental Protection

## Great Diamond Island
## Diamond Cove Associates

on behalf of

City of Portland
Department of Public Services
55 Portland Street
Portland, ME 04101

and

Diamond Cove Homeowners Association
8 McKinley Ct.
Great Diamond Island, ME 04109

September 2014

SEBAGO
TECHNICS

September 5, 2014
09405

Ms. Vicky Bryant
Maine Department of Environmental Protection
Central Maine Regional Office
17 State House Station
Augusta, Maine 04333-0017

**Solid Waste Program Application for a Solid Waste Transfer Station:**
**Great Diamond Island Transfer Station, Portland, ME**

Dear Vicky:

On behalf of the City of Portland, we are pleased to submit a Solid Waste Program application for a new solid waste transfer station to be located on Great Diamond Island in Portland, ME. The City of Portland does not have a formal solid waste transfer facility on Great Diamond Island. Solid waste and recycled material is currently collected and stored using packer trucks before it is transported off the island by transport barge. This process has created challenges both operationally and logistically to collect, store and transport solid waste and recycled material. A lease agreement from the Diamond Cove Homeowners Association (DCHA) to the City of Portland was initiated for the subject lease area, which was identified by both parties as a suitable location for this type of project.

The site is located within the Diamond Cove Homeowners Association area of the Island near the former "laundry facility." This location is accessed from an existing gravel road and is currently used for storing miscellaneous landscaping materials. The existing site contains approximately 8,924 square feet of disturbed surface area, including existing dirt/gravel drives, and material storage piles. Proposed work will include construction of a paved access drive around the facility, concrete dumpster pads, a compacter installation, and stormwater management BMP's. With the site developed as proposed, approximately 28,516 sf of developed area will be created, which includes 9,876 of new impervious surface area. Maine DEP Chapter 500 stormwater standards and Site Location of Development do not apply to this project because the amount of impervious and developed area are below the associated regulatory thresholds.

Less than 4,300 square feet of wetland disturbance is anticipated for the proposed improvements so a NRPA permit application is not required. A Notice of Intent to File for the project was published in the Portland Press Herald on August 9, 2014 and the DCHA membership discussed the project at their annual meeting on July 26, 2014. We believe that we have prepared a complete permit application that appropriately addresses the Solid Waste Program application submitted requirements. Upon your review of the application, please call me with any questions or if you require additional information.

Sincerely,

SEBAGO TECHNICS, INC.

Craig Burgess

Craig Burgess, P.E.
Project Engineer

CAB: llg

# Table of Contents:

**Application**

**Sheet Title**

DEPARTMENT OF ENVIRONMENTAL PROTECTION
**Solid Waste Program, Attn: Vicky Bryant**
**17 State House Station**
**Augusta, Maine 04333-0017**
**Telephone: (207) 287-2651**

| **FOR DEP USE ONLY** | |
|---|---|
| ATS ID: Seq: DEP ID: | Received by DEP: |
| Bureau: S Type of Application: WH Activity: E | Fees Paid: |
| Project Analyst: | Check No.: |

# APPLICATION FOR A SOLID WASTE TRANSFER STATION OR STORAGE SITE REDUCED PROCEDURES

This form shall be used to request approval for the establishment of a new solid waste transfer station or storage site, pursuant to 38 MRSA, Section 1301 et seq., and Maine's Solid Waste Management Regulations.

PLEASE TYPE OR PRINT

**Company Name:** City of Portland, Maine **Telephone: 207-874-8467**

Applicant's Last Name: Moon First Name: Troy

Contact Person: Troy Moon Telephone: 207-874-8467

## *Address Information*

**Applicant Name:** City of Portland, Maine

Telephone: 207-874-8467

Mailing Address: 55 Portland Street

Street Address:

Town: Portland State: ME Zip: 04101

**Agent/Consultant Name: Sebago Technics, Inc.**

Telephone: 207-200-2100

Mailing Address: 75 John Roberts Road, Suite 1A

Street Address:

Town: South Portland State: ME Zip: 04106

**Address: Billing**
Name: City of Portland

Mailing Address: 55 Portland Street

Street Address:

Town: Portland State: ME Zip: 04101

## *Site/Activity Information*

Project Description: Transfer station or Storage site (circle one) Reduced Procedures

Location: Great Diamond Island Directions: See attached location map

**PLEASE SEE PAGE 2 - SIGNATURE REQUIRED**

# SIGNATURE OF APPLICANT

By signing this application, the applicant certifies that he or she has: (1) published the public notice form once in a newspaper circulated in the area where the project is located, (2) sent a copy of the public notice form to the owners of property abutting the land upon which the project is located, (3) sent a copy of the public notice form to the chief municipal officer and chair of the municipal planning board of the municipality in which the project is located (4) filed a complete copy of this application in the municipal office of the municipality in which the project is located, (5) reviewed the instructions contained in this application form, and (6) reviewed the appropriate state laws that relate to the proposed project.

I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I, the property owner or lessee, authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

DATE: 9-15-14

NAME: _____ (Applicant)/Agent

TITLE: V.P. Engineering

(If other than applicant, attach letter of agent authorization.)

PLEASE SEE ATTACHED FEE SCHEDULE TO DETERMINE THE APPLICATION FEE FOR FOR A TRANSFER STATION OR STORAGE SITE

Portland, Maine — Yes. Life's good here.

Michael J. Bobinsky
Director of Public Services

September 4, 2014
09405

Maine Department of Environmental Protection
312 Canco Road
Portland, ME 04103

**Letter of Agent Authorization – MDEP Permit Applications, Great Diamond Island**

Sebago Technics, Inc. has been retained by the City of Portland to assemble permit applications and represent the City during the Maine Department of Environmental Protection permitting process for several related permit applications to include:

1. Permit application for a new solid waste transfer facility;
2. Minor amendment permit application; and
3. Permit-by-Rule application for improvements to an existing marine ramp.

These permit applications are associated with infrastructure improvements on Great Diamond island. We look forward to working with the Maine Department Environmental on these important community projects. If you have any questions please feel free to contact me.

Sincerely

City of Portland
Troy Moon
Environmental Programs and Open Space Manager

# INSTRUCTIONS

1. **Please refer to Chapters 400 and 402 of the "Maine Solid Waste Management Regulations" to understand the standards and requirements for the design and operation of a solid waste transfer station or storage site.** If you have any questions that arise at any point during the application or review process, please contact the DEP Solid Waste Program staff.

2. Pre-Application meeting. Applicants proposing to establish a new transfer station or storage site are encouraged to meet with DEP staff to discuss the proposed project. The meetings can help avoid unnecessary expense and processing delays.

3. Fill out the application completely. INCOMPLETE APPLICATIONS WILL BE RETURNED, CAUSING UNNECESSARY DELAYS IN THE REVIEW PROCESS. All work to support the investigation, design, and construction of a solid waste facility must be undertaken by individuals whose training, experience and professional certification is appropriate to accomplish the specific tasks with accuracy and technical proficiency. Reports, plans or other materials submitted in support of the application must bear the signature and, if appropriate, the seal of the individual who drafted or supervised the drafting of each document.

4. Publish a "Notice of Intent to File" this application once in a newspaper circulated in the area where the project is located. (A form for this notice is attached to this application.) The notice should appear in the newspaper within 30 days prior to filing the application with the DEP.

5. Send by certified mail, a copy of the "Notice of Intent to File" to all the owners of property abutting the project. Their names and addresses can be obtained from town tax maps or local public officials. Abutters must receive notice within 30 days prior to filing the application with the DEP. If your project abuts a road or other public or private right-of-way, the person on the opposite side of the right-of-way must be notified.

6. Send by certified mail, a copy of the "Notice of Intent to File" to the chief municipal officer and to the chairperson of the planning board in the municipality where the project is to be located. If the project is located in an unorganized area, send the notice and application to the appropriate Office of the County Commissioners and the Maine Land Use Regulation Commission, 22 State House Station, Augusta, Maine 04333-0022. The notice must be filed in the appropriate office within 30 days prior to filing with the DEP.

7. Submit to the Department the application along with all attachments, a copy of the "Notice of Intent to File", and a check for the appropriate application fee made payable to "Treasurer, State of Maine". Please consult with DEP staff to determine how many copies of the completed application form and supporting reports must be submitted to the Department. In general, three copies of site plans, drawings, soil maps, or other data on sheets larger than 8½" x 14" copies must be submitted unless the staff determines that fewer copies are needed. ALL PLANS SHOULD BE FOLDED TO SIZE 8½" x 11" unless otherwise indicated by DEP staff. Any part of the application which has been prepared by a P.E., C.G. or C.S.S. must be stamped and signed by that person. If the applicant is a corporation, a certificate of good-standing from the Secretary of State must be included.

8. Send one complete copy of the application and any amendments that are subsequently submitted to the Municipal Office of the town within which the project is located. If the project is located in an unorganized area, send the application to the appropriate Office of the County Commissioners and the Maine Land Use Regulation Commission, 22 State House Station, Augusta, Maine 04333-0022. The application must be filed in the municipal office or at the County Commissioners Office and LURC at the time of filing with the DEP.

9. Keep a copy of the completed application for your files. This copy will be helpful in speeding up communications with the DEP staff if any questions arise during the review of the project.

10. Upon the approval by the Department of Environmental Protection, a permit will be issued and sent to the applicant. The applicant should read the permit carefully in order to become familiar with any conditions. Failure to comply with conditions of approval may lead to enforcement action or the revocation of a permit.

THIS FORM IS FOR USE IN NOTIFYING ABUTTING PROPERTY OWNERS, THE MUNICIPALITY, AND PUBLISHING THE NOTICE IN THE NEWSPAPER.

**PUBLIC NOTICE OF INTENT TO FILE**

Please take notice that The City of Portland, Maine located at 55 Portland Street, Portland, Maine 04106, Tel. 207-874-8467

(name, address and telephone number of applicant)

is intending to file an application with the Maine Department of Environmental Protection (DEP) on or about August 15, 2014 *(estimated submittal date)* pursuant to the provisions of 38 M.R.S.A., Section 1301 et seq. and 06-096 CMR Chapter 400 et seq.

The application is for construction of a solid waste transfer and recycling facility.

(summary of project)

at Great Diamond Island, Portland, Maine
(project location)

owned by Diamond Cove Homeowners Association and operated by City of Portland, Maine
(landowner) (site operator if different)

According to Department regulations, interested parties must be publicly notified, written comments invited, and if justified, an opportunity for public hearing given. A request for a public hearing, or that the Board of Environmental Protection assume jurisdiction of the application, must be received by the Department, in writing, no later than 20 days after the application is accepted by the Department as complete for processing.

The application and supporting documentation are available for review at the Bureau of Remediation and Waste Management (BRWM) at the appropriate DEP regional office, during normal working hours. A copy of the application and supporting documentation may also be seen at the municipal office in Portland, Maine.
(town)

Send all correspondence to: Maine Department of Environmental Protection, Bureau of Remediation and Waste Management, 17 State House Station, Augusta, Maine 04333-0017 (207-287-2651 or 1-800-452-1942), or to the appropriate regional office, if known.

## REQUIRED INFORMATION FOR APPLICATION FOR A SOLID WASTE TRANSFER STATION OR STORAGE FACILITY

1. **Description**. Provide a brief description of the nature and purpose of the project. Include information on any other types of solid waste handling to be incorporated, such as recycling and/or collection of household hazardous wastes.

**See enclosed Sections 1-21 for more detailed narratives.**

2. **Schedule**.

   a. Proposed date of start of construction:

   b. Proposed date of start of operation:

   c. Anticipated lifetime of facility use:

3. **Topographic Map**. Submit the most recent full size U.S.G.S. topographic map (7.5 minute series if available) showing the waste facility boundary and the property boundary.

4. **Title, Right, or Interest.** State the number of acres included in the facility site (see Chapter 400 for the definition of "facility site") . Attach copies of deeds, leases, contracts or agreements that establish the applicant's title, right or interest for the proposed site.

5. **Abutters**. Attach a copy of the municipal tax map with the proposed site and names of abutting property owners clearly marked. Also, include a list of the names and addresses of all the owners of property abutting the proposed facility site:

6. **Notice of intent to file.** Provide a copy of the completed "Notice of Intent to File" and evidence of compliance with the public notice requirements delineated in items 4, 5, and 6 of the instructions.

7. **Financial ability**. Submit evidence that affirmatively demonstrates the financial ability of the applicant to develop the project in a manner consistent with the State environmental standards and laws. Refer to Chapter 400, section 4.B for standards and submission requirements.

8. **Technical ability**. Include evidence that affirmatively demonstrates that the applicant has the technical ability to design, construct, operate, maintain, close, and (if applicable) accomplish post-closure care of the facility. If the proposed project will be managed by other than the applicant, state the persons or businesses that will be responsible for management and operation of the facility. This information should include the applicant's or operator's prior experience and/or appropriate training related to the nature of the proposed facility, and a description of the personnel who will be employed to design, construct, operate, maintain, close, and (if applicable) accomplish post-closure care of the facility.

9. **Disclosure statement**. This should include information on the criminal or civil record of the owner, operator, or anyone having a legal interest in the applicant or the facility, as described in Chapter 400, Section 12(A) of the Maine Solid Waste Management Regulations.

10. **Other authorizations**. Identify all environmental or land use licenses, permits, or authorizations which are or may be required by any governmental agency. Indicate those now held with an asterisk(*); indicate when the remaining licenses and permits will be obtained.

| | |
|---|---|
| Building permit: | Waste discharge license: |
| Plumbing permit: | Highway entrance license: |
| Air emissions license: | Other (describe): |

11. **Waste handling area setbacks.** Submit the following information:

(a) The land uses of all abutting properties located within 250 feet of the proposed waste handling area;

(b) The location and distances to the proposed waste handling area from all permanent structures on these properties, and

(c) If municipal solid waste will be handled and, if necessary to obtain approval for proposed setbacks, written statements, using the template provided as Appendix 402.A, from all property owners having any boundary that is within 250 feet of the proposed waste handling area granting permission to locate the waste handling area within that distance. If a statement from a property owner having a boundary within 250 feet is not available, an applicant shall provide documentation of its efforts to obtain written statements.

**12. Siting and Design Information.** Please submit the following:

(a) Plan View Drawing of the Facility Site. A detailed drawing, at a scale of 1 inch = 100 feet or a larger engineering scale and prepared by a qualified professional, clearly showing any buildings proposed as part of the facility site (including foundations), roadways, the compactor unit(s), transfer trailer(s), storage pads for wastes, water lines, sewer lines, uncovered storage pads, fire breaks, and any other types of solid waste management functions to be incorporated at the transfer station or storage site. It must also clearly delineate the waste handling boundary, the facility boundary, and the property boundary; all existing buildings, structures, roads, parking lots, wells, etcetera; all surface water bodies within and to 500 feet beyond the property boundary; residences within and to 500 feet beyond the property boundary; and the 100- year floodplain, where applicable, within and to 500 feet beyond the property boundary.

(b) Subsurface Investigation Information. Whenever the proposed transfer station or storage site includes the use of in-situ soils as any part of a soil base pad for stored solid wastes, structures requiring foundations, or subsurface wastewater holding or disposal systems, the application must include information from a subsurface investigation. The subsurface investigation must provide soil test data in the proposed handling areas from a certified professional describing the surficial geology and/or the subsurface soils. This information must demonstrate that the facility design is compatible with the site's soil characteristics, as determined by applicable engineering standards of practice.

(c) Storage Pad Design.

(i) if any uncovered storage pads for white goods, tires, or construction and demolition debris are proposed to be greater than 2,500 square feet in size, you must submit information to demonstrate that the proposed size is necessary. The demonstration must include information on volumes of the wastes to be delivered to the proposed facility, hauling schedules for removal of the wastes, and a maintenance plan for handling the larger volume of wastes which provides for flow-through of wastes and periodic clean-up and maintenance of the storage areas.

(ii) if an uncovered storage area for wood waste, and/or wood from construction or demolition debris, greater than 1 acre in size is proposed, you must submit information to demonstrate that the proposed size is necessary. The demonstration must include information on volumes of the waste to be delivered to the proposed facility, a hauling schedule for removal of the waste, and a maintenance plan for handling the larger volume of waste which provides for flow-through of the wastes and periodic clean-up and maintenance of the storage areas.

(iii) if non-containerized uncovered storage areas for solid wastes that are not putrescible wastes is proposed, information to demonstrate that this storage is designed to meet the appropriate criteria in Chapter 400, section 2.B(5) or 2.B(6).

(iv) if wood waste and/or wood from construction or demolition debris is to be burned, information that demonstrates that the burn area is designed to meet the criteria of Chapter 400, section 2.B(5).

13. **Traffic Movement**. Submit information in compliance with the submission requirements of Chapter 400, section 4.D(2) to demonstrate that the facility will meet the standards of Chapter 400, Section 4.D(1).

14. **Existing Uses and Scenic Character.** Describe the existing use of the site. Also, provide information sufficient to meet the standards and submission requirements of Chapter 400, section 4.F, except that transfer stations and storage sites which do not grind or chip wood waste more than 4 times per year are assumed to meet the noise standards of Chapter 400, section 4.F.

15. **Air Quality.** Provide informationsufficient to meet the standards and submission requirements of Chapter 400, section 4.G.

16. **Other Natural Resources.** Provide information sufficient to demonstrate the facility meets the siting requirements of Chapter 402, section 2.A(4).

17. **Adequate Provisions for Utilities.** Provide the following information to demonstrate compliance with the standards of Chapter 400, section 4.L.

(a) Information sufficient to demonstrate the transfer station or storage site meets the design requirements of Chapter 402, section 2.B(9). A schedule for pumping and signed contracts for disposal of any stored washdown water and leachate must also be submitted.

(b) In cases where a water supply is or will be established for the transfer station or storage site, a description of the source and its location must be provided.

18. **Flooding.** The following information must be provided to demonstrate compliance with the standards of Chapter 400, section 4.M.

(a) Floodplain map. Provide the most recent Federal Emergency Management Agency's flood insurance rate map of the area, if applicable, to demonstrate that the proposed transfer station or storage site will not be located in a 100 year floodplain, restrict the flow of a 100-year flood, or reduce the storage capacity of a floodplain.

(b) Storm Water Control Plan. Provide either a stormwater management plan that meets the submission requirements of Chapter 400, section 4.M, or a certification by a qualified professional that the siting and/or design of the proposed facility will not result in post-construction runoff that is greater than pre-construction runoff.

19. **Operations manual**. Submit an operations manual, suitable for use by the facility, which includes at a minimum all information that would enable supervisory and operating personnel and persons evaluating the operation of the facility to determine what sequence of operation, plans, diagrams, policies, procedures, and legal requirements are to be followed for orderly and successful operation on a daily and yearly basis. The operations manual must address all the applicable requirements specified in Chapter 402, section 4. Variances from operational requirements may be requested pursuant to Chapter 400, Section 13 of the Solid Waste Management Regulations.

20. **Provisons for Solid Waste Removal.** Submit a signed contract for the removal and/or disposal of all putrescible wastes handled at the transfer station or storage site. Also submit volume estimates and schedules for removal of all waste streams to be handled at the facility.

21. **If a variance or variances are being requested as part of this application, specify the nature of the variance and the justification for why it should be granted.** Refer to Chapter 400, Section 13 of the Solid Waste Management Rules for the standards and submissions required in this variance application.

**END**

# Section 1

## Description

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**Section 1**

## Project Description

The City of Portland currently has no formal solid waste transfer facility on Great Diamond Island and relies on the use of packer trucks for collection and temporary storage of MSW (Municipal Solid Waste). This has created challenges both operationally and logistically to collect and store the solid waste/recycling materials until being transported off the Island by transport barge. The City in cooperation with Diamond Cove Homeowners Association (DCHA) has identified a suitable location within the Diamond Cove area of the Island as shown on the enclosed plans.

The selected location is accessed from an existing gravel road and is currently undeveloped with moderate to steep topography to the northeast. The site provides an opportunity to take advantage of the topography for the upper/lower levels inherent of transfer stations. The agreed upon location that is easily accessed and conveniently located near the barge landing site.


**Location Map - Great Diamond Island Project Site**

The proposed facility is not intended to be open to the general public as the City provides curbside pickup of MSW and Recycling materials. These material will be collected by Public Services personnel for the Public Side of the Island and by DCHA staff on the private side of the Island. Materials will be transported from the transfer station to EcoMaine or the Riverside Street Recycling Facility. Materials to be handled at the facility will include:

A. Collection and waste reduction of MSW through the use of a compaction unit.

B. Collection and transfer of construction and demolition debris, scrap metal, bulky waste, shingles, and similar type materials.

C. Collection and waste reduction of "zero-sort" recycling materials through use of a dedicated compaction unit and storage container.

As depicted on the enclosed plans, the facility will include access from the existing Island roadway network and include an operations area of approximately one acre. The project site will be leased to the City (see enclosed lease agreement) from DCHA. Operations will be provided by the City of Portland Public Services personnel and DCHA staff. The general public will not be given access to the transfer station. A gated access will be installed to prevent unauthorized use of the transfer facility to the container and compactor drop-off areas.

This project offers a long-term solution to the historic need for better solid waste management on the Island. This facility to establish a dedicated and controlled location for collecting and transferring solid waste on Great Diamond Island.

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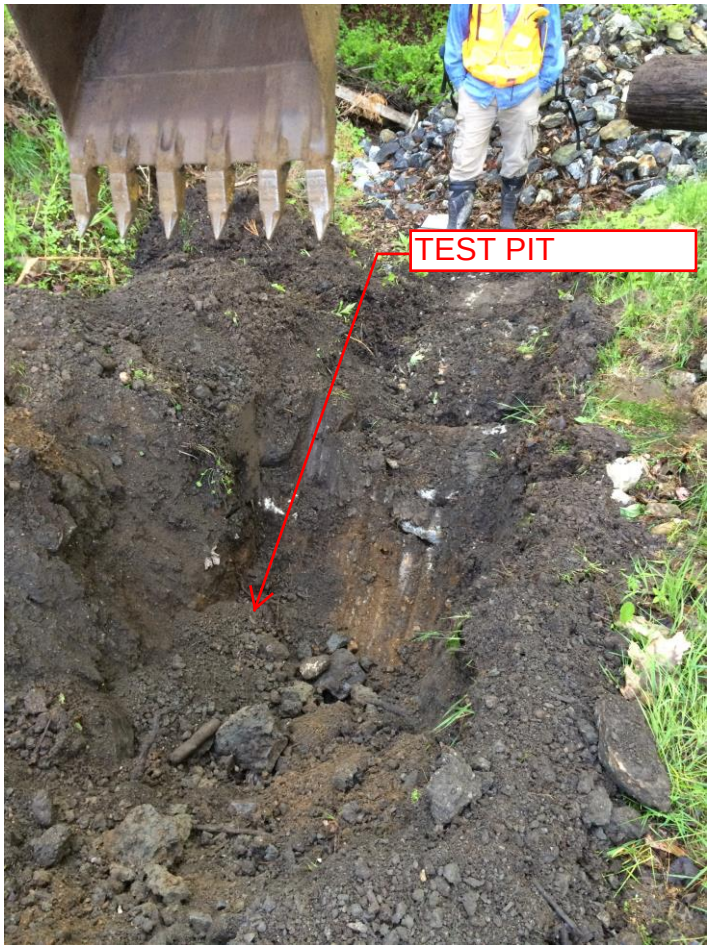

# Section 2

## Schedule

## Project Schedule

Depending on the final permitting, competitive construction bidding, and approval the actual project schedule may vary. Presently, the City of Portland is anticipating the following project schedule:

| Description | Anticipated Schedule |
|---|---|
| Prepare and submit Maine DEP permit application | August 2014 |
| Complete Maine DEP project permitting | November 2014 |
| Prepare construction bid documents and obtain competitive bids for project | November – December 2014 |
| Begin construction of the facility | March – April 2015 |
| Complete Facility Construction | July – August 2015 |

It is expected that this facility will operate 30+ years and possibly an indefinite period of time depending on economic conditions, future solid waste management needs and governing regulations.

# Section 3

## Topographic Map

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**Section 3**

## Topographical Map

As part of this process, a comprehensive boundary and topographical survey was completed by the City of Portland and is included in this application with the design plans. In addition, we have included a USGS topographical map.


**USGS Location Map - GDI Transfer Facility 1**

# Section 4

## Title, Right, or Interest

**LEASE AGREEMENT**
**FOR TRANSFER STATION**
**BY AND BETWEEN**
**CITY OF PORTLAND AND**
**DIAMOND COVE HOMEOWNERS ASSOCIATION**

**THIS LEASE AGREEMENT** (hereinafter this "**Agreement**") is made as of this 17th day of ~~February~~ April, 2014, by and between the **CITY OF PORTLAND**, a municipal corporation located in Cumberland County, State of Maine (hereinafter the "**CITY**") and **DIAMOND COVE HOMEOWNERS ASSOCIATION**, a Maine not-for-profit corporation doing business on Great Diamond Island, Maine (hereinafter "**LESSOR**").

**WITNESSETH:**

That **LESSOR**, for and in consideration of the rent hereinafter to be paid by **CITY**, and other consideration, and the covenants and agreements hereinafter contained, to be kept and performed by **CITY**, does hereby demise, lease and let unto **CITY**, the property located at or near the 'laundry building' on Great Diamond Island in Portland, Maine and more particularly described in Exhibit A (hereinafter the "**PREMISES**"), to have and to hold unto said **CITY** on the following terms and conditions:

1. **Term and Renewal; Commencement Date**

A. The initial term of this Agreement shall begin on the Commencement Date (as hereinafter defined), and shall continue until midnight on the last day of the calendar month containing the twentieth ($20^{th}$) anniversary of the Commencement Date, unless sooner terminated by either party as provided herein. This Agreement shall renew automatically for four (4) additional 20-year terms, unless either party gives the other notice of non-renewal at least 30 days before such end of the 20-year term. The grounds for non-renewal shall be the same as the grounds for termination, set out in Section 18 of this Agreement; but in addition, however, if the **CITY** fails to substantially complete the construction of a transfer station facility on the **PREMISES** in accordance with the Final Site Plan and the Final Construction Plans, each as hereinafter defined, by ***February 28, 2015***, or said transfer station facility is not operational by

*May 30, 2015*, this Agreement shall then be automatically and immediately terminated as of that date.

B. As used herein, the "**Commencement Date**" shall mean the date on which the last of the following events shall have occurred: (i) the date on which **CITY** shall obtain site plan approval by the Portland Planning Board of the Final Site Plan (the "**Planning Board Approval**"); (ii) the date on which **CITY** shall obtain an a Portland City Council order amending the 1985 Amendment Re: Conditional Rezoning of Ft. McKinley, to allow for the proposed transfer station facility as depicted on the Final Site Plan (the "**City Council Order**"); and (iii) the date on which **CITY** shall obtain the 2014 DEP Site Location Order, as hereinafter defined in Section 7(A) below. In the event the Commencement Date shall not occur by ***October 1, 2014***, this Agreement shall then be automatically and immediately terminated as of that date.

## 2. Rent

From and after the Commencement Date, **CITY** agrees to pay to **LESSOR** as rent for such use and occupancy of the **PREMISES** the sum of One Dollar ($1.00) per year, payable in advance. This is a 'net lease', that is, the costs of constructing and operating the transfer station facility shall be borne solely by **CITY**. **CITY** will pay any fees related to the improvements which are the transfer station facility, including but not limited to permit fees, and all costs of utility services necessary for the operation of the transfer station facility. **CITY** will not pay any real estate taxes on the **PREMISES**, but shall be responsible for any taxes or assessments on the building or improvements constructed by **CITY** at the **PREMISES**.

## 3. Purposes

(A) **CITY** shall use the **PREMISES** solely for the development, construction (including landscaping) and maintenance of a transfer station facility to provide trash compaction, recycling services, and short term storage of trash and materials to be recycled, within the screened improvements to be built on the **PREMISES**. Only trash and materials to be recycled that have been generated on Great Diamond Island or Little Diamond Island will be so processed at said transfer station facility. **CITY** will not knowingly or intentionally store or process hazardous waste on the **PREMISES**. **CITY** will not be permitted to build any improvements on the **PREMISES** other than those shown on the Final Site Plan and Final Construction Plans for this transfer station facility .

(B) There shall be no parking on the **PREMISES** unless related or incident to the trash processing and recycling, and then not overnight. There shall be no staging or storage of equipment on the **PREMISES** unless related or incident to the trash processing and recycling, and then only very short term.

(C) Subject to (i) the construction of the transfer station facility in accordance with the Final Site Plan and the Final Construction Plans and the conduct of the operation of said transfer station facility in accordance with this Agreement, and (ii) **CITY**'s obtaining the 2014 DEP Site Location Order, **LESSOR** represents to **CITY** that such purposes are permitted under the private regulation of the **PREMISES** set forth in the Amended and Restated General

Declaration of Covenants and Restrictions dated December 17, 1993 and recorded at the Cumberland County Registry of Deeds in Book 11277, Page 322; as modified and amended (hereinafter the **"DCIIA Declaration"**).

4. Access

Appurtenant to the **CITY**'s leasehold of the **PREMISES**, **CITY** shall have a nonexclusive right to access the **PREMISES** from the "Lower Gate" and from the existing Diamond Cove Barge Landing, over the most direct, existing roadways, subject to the rules attached hereto as Exhibit C. **CITY** will repair any damage it causes to such defined access ways; and in addition, will provide limited annual general maintenance to such ways, such by as spreading several loads of gravel on said (gravel) ways, annually.

5. Site Plan and Facility Operation

**CITY** covenants and agrees:

A. that a plan of the Premises, as well as a preliminary site plan of the transfer station facility, not-yet approved by the Portland Planning Board or Planning Board staff, are attached to this Agreement as Exhibit B (hereinafter collectively, the **"Preliminary Site Plan"**);

B. that the transfer station facility will be constructed in accord with the Final Site Plan and the Final Construction Plans, including, but not limited to, the landscaping elements of such Plans, and the visual screening and any fencing elements of said Plans;

C. that in the event the **CITY** proposes to revise the Preliminary Site Plan, the **CITY** will provide **LESSOR** with a preliminary draft of the proposed revision; and in the event the proposed revision is material (as determined by City Corporation Counsel in its reasonable discretion), the **CITY** will incorporate any suggestions received by the **CITY** from **LESSOR** that are determined by **LESSOR** to be necessary for its representation in Section 3.C above and are received by **CITY** within 30 days of mailing such revision to **LESSOR**, provided that in the event such suggested changes cannot be made by the **CITY** reasonably cost effectively, or are in conflict with any requirements for the Planning Board Approval, the City Council Order, the 2014 DEP Site Location Order, or other required approvals for the transfer station facility, the parties will work in good faith to revise the Preliminary Site Plan to meet both of their respective needs; the Preliminary Site Plan (with any modifications not deemed material as determined by City Corporation Counsel in its reasonable discretion) or a revised version of it that is approved by the parties pursuant to this Section shall constitute the **"Final Site Plan"**, and the Final Site Plan is hereby incorporated by reference herein and Exhibit B shall be deemed revised accordingly;

D. that **CITY** will prepare and submit to **LESSOR** proposed construction plans for the transfer station facility and **CITY** will incorporate any suggestions made by **LESSOR** that are determined by **LESSOR** to be necessary for its representation in Section 3.C above and are received by **CITY** within 30 days of mailing of said proposed construction plans to **LESSOR**, provided that in the event such suggested changes cannot be made by **CITY** reasonably cost effectively, or are in conflict with any requirements for the Planning Board Approval, the City

Council Order, the 2014 DEP Site Location Order, or other required approvals for the transfer station facility, the parties will work in good faith to revise such proposed construction plans to meet both of their respective needs; the proposed construction plans or a revised version of them that are approved by the parties pursuant to this Section shall constitute the **"Final Construction Plans"**; and the Final Construction Plans are hereby incorporated by reference herein.

E. that the transfer station facility will be operated in accord with any operational elements of the Final Site Plan;

F. that the **CITY** will operate the transfer station facility in accord with any conditions required by the DCHA Declaration (including, without limitation, DCHA Declaration Section 4.18), the Planning Board Approval, the City Council Order, the 2014 DEP Site Location Order, and any other required approvals for the transfer station facility;

G. that under the normal course of operation, there will be no more than four to six (4-6) deliveries of waste/recycling per week by the **CITY** to the transfer station facility and, during summer months, at least one transfer of waste/recycling per week from the two transfer station hopper/compactor units off the island, and the two separate transfer station roll-off containers will be removed when full and then emptied and returned, all by appropriately sized vehicles; and

H. to operate the transfer station facility in a responsible, clean and orderly manner, and in addition to the regular removal of waste/recycling described above, to make reasonable best efforts to minimize odors emitted from the **PREMISES**.

6. **Costs of Development and Maintenance of the Premises**

The **CITY** shall provide all clearing, grading and construction of the transfer station facility and other development set forth in the Final Site Plan and Final Construction Plans, and otherwise all as deemed necessary by the **CITY** for its proposed use. **LESSOR** hereby consents to the crossing of the other portions of **LESSOR**'s real property as reasonably necessary for such purposes. The **CITY** shall provide all services deemed necessary to maintain the **PREMISES** in a safe condition all as deemed necessary by **CITY**.

7. **Location of Structures and Use; 2013 Forest Management Plan/Manual**

A All structures, site improvements and/or changes in the **PREMISES** shall be located or done in accordance with the laws, rules and regulations of all applicable federal, state and local jurisdictions. The parties acknowledge the following:

(i) the **PREMISES** are located in the vicinity of "Compartment B" as defined in (i) a report dated March 31, 1989 and titled "Forest Management Plan for the Old Growth Softwood Stand on Diamond Cove Associates Property on Great Diamond Island, Casco Bay, City of Portland, Maine" prepared by Eco-Analysts, Inc. (the "**1989 Forest Management Plan**") and (ii) a report dated January 19, 1989 and titled "Operations Manual for Activities Adjacent To and Within The Old Growth Stand of Trees Within The Diamond Cove Development On Great

Diamond Island" prepared by Eco-Analysts, Inc. (the "**1989 Stand Operations Manual**");

(ii) by Maine Department of Environmental Protection ("**DEP**") Condition Compliance Order dated July 5, 1989 and recorded at the Cumberland County Registry of Deeds in Book 8833, Page 12 and re-recorded in Book 8902, Page 118 (the "**1989 DEP Site Location Order**"), the DEP expressly referenced both the 1989 Forest Management Plan and the 1989 Stand Operations Manual in connection with its approval of Diamond Cove Phase I; and

(iii) for several reasons, including an infestation of hemlock woolly adelgid and concerns about dangerous fire conditions identified by Maine Licensed Foresters, **LESSOR** has engaged a Maine Licensed Forester to update and amend the 1989 Forest Management Plan and the 1989 Stand Operations Manual, and the updated and amended forest management plan and stand operations manual is attached hereto as Exhibit D (collectively, the "**2013 Forest Management Plan/Manual**").

**CITY** agrees to submit such 2013 Forest Management Plan/Manual to the DEP, in connection with **CITY**'s application for approval by the DEP of the transfer station facility. This Agreement is subject to **CITY**'s obtaining a DEP Site Location modification order satisfactory to **LESSOR** (the "**2014 DEP Site Location Order**") that (a) modifies the 1989 DEP Site Location Order by expressly replacing references to the 1989 Forest Management Plan and the 1989 Stand Operations Manual with the 2013 Forest Management Plan/Manual, and (b) confirms that the transfer station facility at the **PREMISES**, as approved by the DEP, is permitted by such 2013 Forest Management Plan/Manual. In the event the DEP shall propose revisions to the 2013 Forest Management Plan/Manual before issuing such a 2014 DEP Site Location Order, the parties will work in good faith to revise the 2013 Forest Management Plan/Manual to meet both of their respective needs and the requirements of the DEP; provided, however, that if the parties shall fail to agree on a final 2013 Forest Management Plan/Manual that is expressly incorporated into a 2014 DEP Site Location Order by ***October 1, 2014***, this Agreement shall then be automatically and immediately terminated as of that date.

B. Work done on the **PREMISES** will either be conducted by a Contractor or by the **CITY**'s Department of Public Services. If the work is performed by a Contractor, the Contractor shall provide a performance bond for work performed on the **PREMISES. LESSOR** shall be named as co-obligee on the bond. The Contractor performing the work for **CITY** shall also procure general liability insurance in the minimum amounts of $1,000,000 for each occurrence, and $2,000,000 in the 'general aggregate' for bodily injury, death and property damage, naming **CITY** and **LESSOR** as additional insureds thereon.

C. The general public shall not be allowed by the **CITY** to have access to the transfer station facility to be built on the **PREMISES**; however, the **LESSOR** and its property management company, or the person or entity with property management responsibilities or trash pick-up responsibilities as agent for the **LESSOR**, shall be allowed access to the PREMISES, including the transfer station facility, for the disposal of trash and recyclables, provided that all such trash (except large items) shall be bagged as required from time to time by the **CITY**, such

as, inside the colored trash bags sold in support of its waste disposal system; and all such recyclables shall also be bagged or packaged as required by the **CITY**, from time to time.

8. **Maintenance and Repairs, and Surrender Upon Termination**

**CITY** represents that it has inspected and examined the **PREMISES** and accepts them in their present condition, and agrees that **LESSOR** shall not be required to make any improvements or repairs or provide any services whatsoever in or upon the **PREMISES** or any part thereof; **CITY** agrees to keep said **PREMISES** and the transfer station facility safe and in good order and condition at all times during the term hereof, and upon expiration of this Agreement or any sooner termination thereof, the **CITY** will quit and surrender the possession of the **PREMISES** quietly and peaceably and leave it in as good order and condition as they were at the commencement hereof. Upon such surrender of possession, the **CITY** may leave the screened improvements on the **PREMISES** provided that they then are in good order and condition (with **CITY** having performed required maintenance to date), reasonable wear and tear excepted, and shall remove any equipment and any fixtures (except as otherwise agreed by **LESSOR**), and will offer for sale to the **LESSOR** the trash compactors located within said screened improvements, at their then fair market value, given their age and condition, as determined by agreement of the parties, and if no such agreement is reached within 45 days, as determined by a valuation made by an independent third party chosen by the **CITY** and **LESSOR**. The obligations of **CITY** pursuant to this Section shall survive the expiration or termination of this Agreement.

9. **Various City Commitments**

A. **CITY** covenants and agrees , subject to the availability of funds, any required City Council approval, and any other required governmental approvals:

(i) When a term lease between the **LESSOR** and the **CITY** has been executed for the existing Diamond Cove Barge Landing, to make repairs to that facility or re-build that facility (in addition to the 'stop-gap' repairs already made by **CITY** prior to the date hereof), as soon as required by that facility;

(ii) to monitor animal or 'varmint' access to the waste stored on the **PREMISES**, and respond to any such access accordingly; and

B. **CITY** covenants and agrees to observe the conditions imposed by its proposed settlement in the litigation involving **LESSOR** and the Diamond Cove Barge Landing, including the conditions listed on the attached Exhibit C; in addition, **CITY** covenants and agrees not to park any vehicles overnight on the Diamond Cove ('Fort') one-half of Great Diamond Island, except in emergency circumstances. **CITY** further covenants and agrees to observe any conditions imposed by the DEP with respect to use of the Diamond Cove Barge Landing and adjacent roadways.

## 10. Liability

**LESSOR** shall not be liable for damage to or loss of property of any kind which may be lost or stolen, damaged or destroyed by fire, water or otherwise, while on the **PREMISES**. Up to the limits of, and subject to the terms and provisions of the Maine Tort Claims Act, **CITY** agrees to indemnify and save **LESSOR** harmless from all liability, loss or damage arising from any nuisance made or suffered on the **PREMISES** by **CITY**, the **CITY**'s guests, invitees, agents or servants due to any carelessness, neglect or improper conduct of any such persons; however, and by way of limitation of this indemnity and holding harmless, nothing herein is intended to, nor shall it be deemed to, waive, amend or otherwise modify any claim of immunity, any defense or any limitation of liability available to **CITY** under the Maine Tort Claims Act, 14 M.R.S.A. § 8101 et seq.

## 11. Default

In the event that **CITY** shall be in default in the performance of any of the terms, covenants, agreements or conditions herein agreed to be kept and performed by **CITY**, then in that event, **LESSOR** may terminate this Agreement as provided in Section 18 of this Agreement.

## 12. Hold Over

In the event that **CITY** shall hold over and remain in possession of the **PREMISES** with the consent of **LESSOR**, such holding over shall be deemed to be from month to month only, and upon all the same rents, terms, covenants and conditions as contained herein.

## 13. Notices

Any notices which are required hereunder, or which either **CITY** or **LESSOR** may desire to serve upon the other shall be in writing and shall be deemed served when delivered personally, or when deposited in the United States mail, postage pre-paid, return receipt requested, addressed to **LESSOR,** Diamond Cove Homeowners Association, c/o Phoenix Management, P.O. Box 759, Saco, ME 04072 and **LESSOR,** Diamond Cove Homeowners Association Board, Great Diamond Island, Portland, ME; or addressed to **CITY**, Mark H. Rees, City Manager, 389 Congress Street, Portland, ME 04101.

## 14. Subletting or Assignment

The **CITY** shall not sublet the **PREMISES** or assign its rights hereunder without the express written consent of **LESSOR**.

## 15. Inspections and Access

The **CITY** shall allow **LESSOR** to inspect the **PREMISES**, including the transfer station facility, at all reasonable times to insure compliance with the terms and conditions herein, including but not limited to compatible uses, maintenance, safety of operations and access on common rights of way.

16. **Sale of the Premises**

**LESSOR** agrees that if, during the term of this Agreement and extension, it sells the **PREMISES**, it shall assign its obligations under this Agreement to the buyer of the **PREMISES.**

17. **Recordation in Registry of Deeds**

The parties agree to execute and record in the Cumberland County Registry of Deeds a Memorandum of Lease outlining the principal terms of this Agreement.

18. **Termination**

A. **CITY** may terminate this Agreement upon one (1) year written notice to **LESSOR.**

B. **LESSOR** may terminate this Agreement upon a one (1) year written notice for failure of the **CITY** to observe and perform any of its terms, covenants, agreements or conditions hereunder, and such failure shall not have been cured within any time period specified herein or within 90 days of written notice to do so.

19. **Waiver**

Waiver by either party of any default in performance by the other of any of the terms, covenants, agreements or conditions contained herein, shall not be deemed a continuing waiver of the same or any subsequent default herein.

**IN WITNESS WHEREOF**, the said **CITY OF PORTLAND** has caused this Lease Agreement to be signed in its corporate name and sealed with its corporate seal by Mark H. Rees, its City Manager, thereunto duly authorized, and **DIAMOND COVE HOMEOWNERS ASSOCIATION** has caused this Lease Agreement to be signed by Matthew Hoffner, its Director and Operations Officer thereunto duly authorized, as of the day and date first set forth above.

**WITNESS:**

Sonia Bean

**CITY OF PORTLAND**

By: Mark H. Rees
Mark H. Rees
Its City Manager

STATE OF MAINE
CUMBERLAND, ss.

~~February~~ March 19, 2014

Personally appeared before me the above-named Mark H. Rees, City Manager of the City of Portland, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of the City of Portland.

Before me,

Sonia T. Bean
Notary Public~~/Attorney-at-Law~~

SONIA T. BEAN
Notary Public, Maine
My Commission Expires January 10, 2017

WITNESS:

**DIAMOND COVE HOMEOWNERS ASSOCIATION**

By: _____
Matthew Hoffner
Its Director and Operations Officer

STATE OF MAINE
CUMBERLAND, ss.

February 14, 2014

Personally appeared before me the above-named Matthew Hoffner, Director and Operations Officer of Diamond Cove Homeowners Association, and made oath that the foregoing is his free act and deed and the free act and deed of Diamond Cove Homeowners Association.

Before me,

_____
Notary Public/Attorney-at-Law

JUDE A. CLUFF
NOTARY PUBLIC, MAINE
MY COMMISSION EXPIRES OCTOBER 27, 2020

Exhibit A

Leased Land for Proposed Transfer Station on Land
of Diamond Cove Homeowners Association

A certain lot or parcel of land located on Great Diamond Island, City of Portland, Cumberland County, State of Maine, being more particularly described as follows:

**Commencing** at the southeasterly corner of land now or formerly of Jesse S. and Evelyn C. K. Harriott (Book 25439 Page 248; City of Portland Tax Map Lot 83E-B-7).

Thence N 45° 05' 04" E two hundred seventy-two and ninety-nine hundredths feet (272.99') along the southeasterly boundary line of said land of Harriott to the northeasterly corner of said Harriott land and the southwesterly street line of Wood Side Drive.

Thence S 44° 54' 56" E one hundred seventy-nine and twenty-seven hundredths feet (179.27') along said southwesterly street line of Wood Side Drive to an angle point in said street line.

Thence S 40° 52' 40" W two hundred nineteen and forty-nine hundredths feet (219.49') through land now or formerly of Diamond Cove Homeowners Association (Book 24560 Page 106; City of Portland Tax Map Lot 83E-B-1) to a point in a gravel driveway or roadway and the **Point of Beginning**. Said Point of Beginning also being located S 60° 23' 34" E two hundred two and seventy-three hundredths feet (202.73') from said southeasterly corner of said land now or formerly of Harriott.

Thence continuing through said land now or formerly of said Diamond Cove Homeowners Association by the following courses and distances:

S 6° 20' 18" E two hundred twenty-nine and zero hundredths feet (229.00') to a point;

S 43° 24' 45" W one hundred eight and zero hundredths feet (108.00') to a point;

S 84° 09' 35" W one hundred sixty-six and zero hundredths feet (166.00') to a point;

N 4° 24' 42" W one hundred sixty-one and fifty hundredths feet (161.50') to a point;

N 30° 03' 59" E one hundred forty and fifty hundredths feet (140.50') to a point in a gravel driveway or roadway, said point being located S 8° 09' 38" E one hundred forty-one and ninety-two hundredths feet (141.92') from said southeasterly corner of said land now or formerly of Harriott;

S 31° 26' 26" E forty-six and fifty hundredths feet (46.50') to a point in a gravel driveway or roadway;

S 74° 03' 49" E thirty-two and zero hundredths feet (32.00') to a point in a gravel driveway or roadway;

N 81° 25' 21" E thirty-two and zero hundredths feet (32.00') to a point in a gravel driveway or roadway;

N 39° 34' 33" E one hundred nine and zero hundredths feet (109.00') to the Point of Beginning.

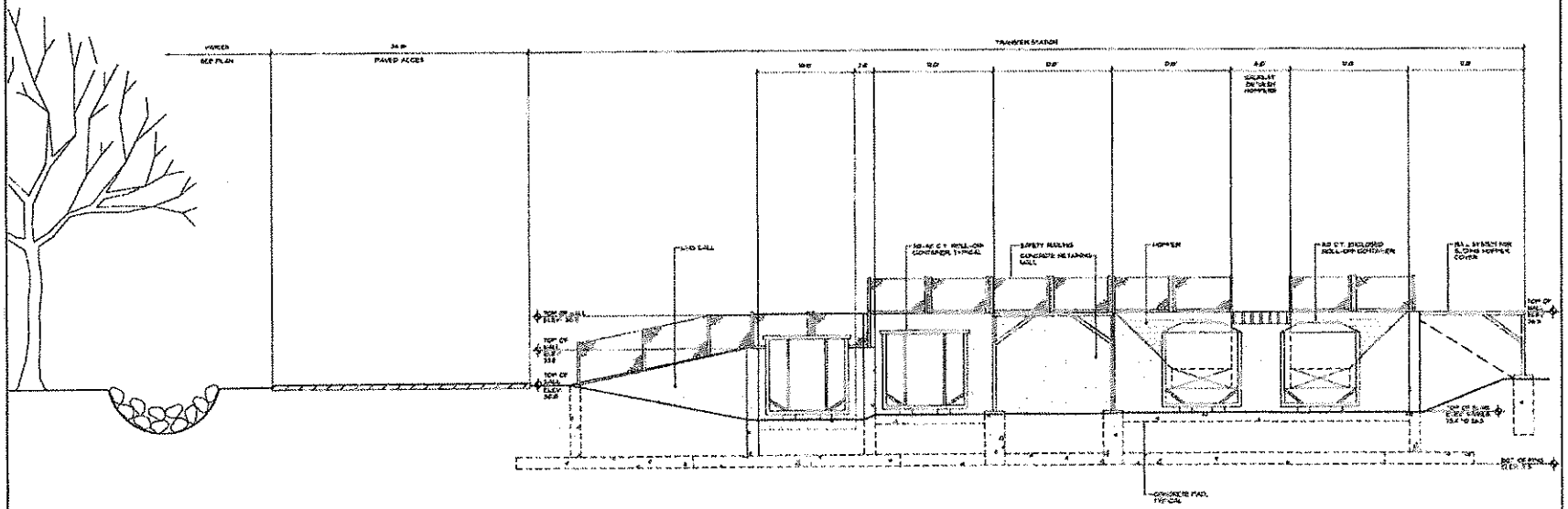
Said lot of land containing 55,050 square feet (1.3 acres), more or less.

Bearings herein are referenced to Grid North. All deed book numbers refer to the Cumberland County Registry of Deeds.

Reference is made to a plan entitled "Proposed Transfer Station Site – Lease Limit Boundary Plan, Woodside Drive, Diamond Cove, Great Diamond Island, Portland, Maine", dated September 4, 2013, on file in the City Engineer's Archives, Department of Public Services, 55 Portland Street, Portland, Maine.

(Description by City of Portland, William G. Scott, P.L.S. 2239, September 4, 2013)

SITE PLAN
GREAT DIAMOND ISLAND TRANSFER AND RECYCLING FACILITY
CITY OF PORTLAND
SHEET 3 OF 8
SEBAGO
TECHNICS
NOT FOR CONSTRUCTION
PROGRESS PRINT
LEGEND
GRAPHIC SCALE




ELEVATION

GRAPHIC SCALE

( IN FEET )

NOT FOR CONSTRUCTION

PROGRESS PRINT

SEBAGO TECHNICS

FRONT ELEVATION

GREAT DIAMOND ISLAND TRANSFER AND RECYCLING FACILITY

CITY OF PORTLAND

| DATE | SCALE |
|---|---|
| 6/29/18 | 1" = 5' |

SHEET 6 OF 8

Exhibit C

**SPECIAL RULES REGARDING PARKING AND ANTI-IDLING POLICIES FOR USE OF THE BARGE LANDING OWNED BY DIAMOND COVE HOMEOWNERS ASSOCIATION**

**Note: Exceptions to the following rules will be made for emergency vehicles and/or emergency situations. These rules do not supersede other DCHA policies pertaining to the barge landing that are now in effect or that may be implemented in the future by the DCHA.**

**Parking and Loading/Off-loading of Vehicles:**

Vehicles may be parked temporarily only in the following permitted parking area prior to and following a scheduled barge delivery:

On the cement pad located to the east of the barge landing on Wood Side Drive, between the hours of **9:00 a.m. to 5:00 p.m. only**.

All vehicle operators shall comply with the vehicle anti-idling policy that is used by the City of Portland for its own vehicles.

**Days/Hours of Operation:**

- Days of operation for City vehicles will be **Monday through Saturday** only.
- Days of operation for other non-DCHA vehicles (i.e., vehicles servicing the public side of the Island) will be **Monday through Friday** only.
- Hours of operation for City vehicles and other non-DCHA vehicles will be from **7:00 a.m. to 8:00 p.m. Monday-Friday and 7:00 a.m. to 6:00 p.m. on Saturday.**
- DCHA vehicles (i.e., vehicles servicing DCHA property or property of DCHA members) are not subject to these hours and days of operations restrictions.

**Reports of Non-Compliance:**

Any reports of non-compliance of these rules shall be reported to the City of Portland's Island and Neighborhood Liaison, who shall provide notice of any or all said reports to the DCHA.

The DCHA reserves the right to revoke permission to use the barge landing from non-DCHA vehicles or any operator thereof deemed to be in violation of any of these rules.

Exhibit D

[2013 Forest Management Plan/Manual]

# FOREST MANAGEMENT PLAN FOR THE OLD GROWTH SOFTWOOD STAND ON DIAMOND COVE ASSOCIATES PROPERTY ON GREAT DIAMOND ISLAND CASCO BAY CITY OF PORTLAND MAINE

Submitted by:

ECO-ANALYSTS, INC.
P.O. Box 224
Bath, ME 04530

Revised
March 31, 1989

ECO-ANALYSTS INC.
Environmental Consultants

## 1.1.0 INTRODUCTION

In compliance with Condition 8 of the Board of Environmental Protection (BEP) order of December 10, 1986, a management plan to protect the "Unique Stand of Old Growth Trees" has been developed. The plan involves seven aspects:

1. Delineation of the four (4) "Compartments" which compose the stand.
2. A description of the trees within the Stand.
3. A description of the physical features within the Stand.
4. A summary of activities proposed within and adjacent to the Stand as part of Phase I of the project.
5. Management techniques to protect the integrity of the Stand under Phase I of the project.
6. A summary of activities which will be a part of Phase II of the project as currently proposed.
7. Management techniques to protect the integrity of the Stand under Phase II of the project.

The two major goals of this report are to protect the individual large trees and to insure the integrity of the Stand so it can perpetuate itself in the future. Guidelines have been developed and included in this report which will accomplish those goals.

The report by Mott (1986) suggests that the Stand encompasses over 22.7 acres and is composed entirely of very large old growth trees such as one sees at the Bowdoin Pines (Bowdoin College,

Brunswick, Maine) with a buffer of edge vegetation necessary for protection from windthrow for a total of 29.9 acres. Our survey was conducted to accurately define the Stand based on an inventory on the ground.

ECO-ANALYSTS, INC. (EA) intensively mapped and made forest stand measurements of Compartment A of the Stand on the northwestern side of Great Diamond Island (GDI) on Diamond Cove Associates (DCA) property. This area was reported to be within a larger area supporting an "exemplary old growth hemlock-white pine stand" (Mott 1986). The remainder of the Stand, Compartments B and C, was mapped to include a 35 foot buffer (except in areas abutted by roads, existing buildings, or currently existing property boundaries). Obviously, in those cases, the Stand was mapped to the abutting edges. Only limited measurements were made in Compartments B and C for reasons explained below. Trees in Compartment D were measured as in Compartment A and mapped by survey.

As noted, we divided the Stand into four Compartments for the purpose of this report (See, attached plan). As previously described, all the acreages INCLUDE the 35 foot buffer which is ENTIRELY outside the large trees unless the Stand abuts a road, the existing buildings, or the existing property boundary. Compartment A encompasses 5.95 acres. This is an area where we took the total tree inventory. Compartment B is 7.81 acres. This includes the area with the tennis courts and the cemetery. Compartment C covers 2.87 acres. This is the area west of the parade ground which provides

the visual screen from Casco Bay. Compartment D is the small grove of trees on Lot 14 and Lot 15. It includes an area of 0.80 acres. This is a total of 17.43 acres. The variance between this figure and Mott's 29.9 acres is explained below.

The methods used to map the Stand and collect data are described and results are discussed as they relate to stand parameters, the Critical Areas Program, the windfirmness of the Stand, and construction impacts on Stand preservation.

## 2.1.0 METHODS

### 2.1.1 STAND INVENTORY

A total tree inventory was performed in the portion of the mature softwood Stand that is located within the boundaries of proposed Phase II house lots on the western side of the DCA property (Figure 1). This is Compartment A. The Stand in this Compartment is discussed in terms of proposed house lots since the original application included house lots. Phase II house lot boundaries and conservation easements are delineated adjacent to Compartment A. Compartments B and C were not intensively inventoried because major portions of them fall within open space or protective zones, defined by DCA in the Landscape Plan, in which no construction or other activities disruptive to a forest stand will be allowed (See, Landscape Plan). Data from Compartments B and C were gathered from prism plots (See Section 2.1.3). Compartment D was inventoried in the same manner as Compartment A.

In Compartment A, a hand compass was used to run parallel transects at 50 foot intervals. These were marked every 50 feet, thus forming a gridwork of 50 foot by 50 foot cells. Within each cell all trees with diameters greater than 6.0 inches at 4.5 feet above the ground (DBH) were tallied and their positions within the cell were mapped. The grid was extended to all areas within the lots[1] that contained softwoods which appeared to be a part of the contiguous Stand based on size and proximity to other softwoods.

No individual large softwoods and only 4 hardwoods of the dominant Stand species were observed north, south or west of the Stand as delineated in the attached plan (see 2.1.2).

In Compartments B and C, the Stand was delineated by sketching in the perimeter of the Stand one-half (1/2) tree height outside the drip-edge of the outermost individual trees of the dominant tree species. In Compartment D, the trees were located by survey.

2.1.2 STAND BOUNDARY

In Compartment A, the Stand perimeter in the area of proposed house lots in Phase II was mapped using the data collected from the total tree inventory. DBH and mean tree height were used as limiting factors. This is referred to as the 'Biological Edge' on the attached Plan.

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[1] The term "lots' is used to refer to the single family house lots marked on maps and exhibits in the original application. They are not part of the approved project (Phase I) and may or may not be approved in Phase II as proposed. Thus, they are used herein as reference points, and contain within them certain conservation easements.

All 12 inch DBH or larger softwoods and all 24 inch DBH or larger hardwoods were placed within the Stand boundary. However, if a qualifying individual at the edge of the Stand was clearly separated from any other qualifying trees by 50 feet or more, it was still noted and marked on the map. It simply was not included within the Stand. These trees were four (4) individuals in Lot 11 which will not be developed for a house lot in any event.

Once the initial boundary was established, it was then moved 35 feet out from the large trees forming the Stand edge. This was done to establish a windfirmness buffer area and was based on one-half the mean Stand height of 70 feet. This is referred to as the 'Buffer Edge' on the attached Plan. Compartment A as mapped on the attached plan includes the Stand and the buffer zone as an integral unit. The value of this buffer is discussed in section 3.2.5.

To facilitate management of the Stand, the Stand boundaries in Compartment A and D were further extended by placing metes and bounds descriptions for this edge along proposed easements, proposed lot lines, and/or straight lines between the two. These descriptions, along with bearings and distance, are shown on the attached Plan for Compartments A and D.

The perimeter of the rest of the Stand, i.e., Compartments B and C, was mapped using the criteria in the last paragraph of section 2.1.1.

### 2.1.3 STAND AREA

In Compartment A, the species and DBH data were used to develop basal area (BA) and size class information for the Stand as a whole and within lots. Basal area is the cross-sectional area of a tree stem and is used to determine relative utilization of a site.

Five Diameter classes were established:

1) 6.0-11.9 inches
2) 12.0-17.9 inches
3) 18.0-23.9 inches
4) 24.0-29.9 inches
5) 30.0 inches or greater

These were used to quantify Stand structure.

Data were summarized for hardwoods, softwoods, and cumulatively by lot and for the Stand as a whole. The number of trees per acre, mean DBH, total basal area, basal area per acre (BAA), and frequency distribution by size class were calculated and compared. Prism plots were taken in Compartments B and C to determine their composition (Husch et.al, 1972). Nine points were sampled in Compartment B and six in Compartment C.

The Stand was described using the categories defined for Inventory Procedures in Natural Old-Growth Forest Stands in Maine (Maine State Planning Office, 1983).

2.1.4 BUILDING WINDOWS

Recognizing that construction of houses adjacent to the Stand, especially near Compartment A, could potentially have some impact on the windfirmness buffer, DCA has removed three lots (Lots 10, 11, and 12) near the Stand from consideration for development. This change has been reflected in the Phase II application. To further protect these, or any other, large trees, building windows have been established for house lots adjacent to the four Compartments of the Stand. As shown in the Design Review Guidelines in the original submission for Phase I, construction activities can only take place on twenty percent (20%) of the area on a lot, except on Lots 10, 11, 14, and 17. On those lots, all construction activities will occur only within the building widows as shown on the accompanying plan. Driveways and on-site sewage disposal systems will be as shown on the plan. This 20 percent will be the building window designated on each lot. No large trees and no part of the windfirmness buffer will be encroached upon during development within these windows.

Conservation easements will be placed on developed Lots 8, 10, 11, 14, 16, 17, 36, and 37 as designated in the Phase II application and are shown on the attached Plan for Compartments A and D. These conservation easements will preclude development and/or disturbance within these lots where they either include or are adjacent to portions of the Stand in Compartments A and D. A description of the proposed conservation easements will be submitted to the D.E.P. for their approval.

## 2.1.5 LOT DESIGNATIONS

Original submissions to DEP refer to various lot numbers. This report refers to the original lot numbers, not to lot numbers as they now exist in the Phase II development application, unless otherwise noted. Lot numbers have changed with the elimination of lots in Compartment A. The following listing gives these changes. The report will continue to utilize the old designations for ease of comparison with previous submissions.

| Original Submission | Phase II Application |
|---|---|
| Lot 9 | Lot 8 |
| Lot 10 | Eliminated |
| Lot 11 | Eliminated |
| Lot 12 | Eliminated |
| Lot 13 | Lot 11 |
| Lot 14 | Lot 10 |
| Lot 15 | Lot 9 |
| Lot 17 | Lot 13 |
| Lot 18 | Lot 14 |
| Lot 19 | Lot 15 |
| Lot 20 | Lot 16 |
| Lot 21 | Lot 17 |
| Lot 40 | Lot 36 |
| Lot 41 | Lot 37 |

## 3.1.0 DISCUSSION

### 3.1.1 COMPOSITION

A series of photographs in the accompanying album (Tour 1 - Tour 28) progresses northward from the southern edge of the DCA property through Compartment B, then northward through Compartment C, then northward from the southern edge of Compartment A, and then across the old firing range to the westward of Compartment A to the 0.8 acres described in Section 2.1.4. The following narrative references the photographs to give the reader a general overview of the composition of the Stand. All photographs were submitted to D.E.P. with the original management plan and are on file.

The southern edge of Compartment B is an old fire break in which pioneer species and some regeneration have grown (Tour 1). Looking from the west, one can see the edge of Compartment B (Tour 2). The interior of Compartment B has several areas of large old growth white pine and hemlock (Tsuga canadensis) with a very sparse understory (Tour 3, Tour 4, Tour 5, and Tour 6).

The area between Compartment B and Compartment C has been overgrown with white birch (Betula papyrifera) and aspen (Populus sp.) since the fort was abandoned (Tour 7, Tour 8, Tour 9, Tour 10, and Tour 11). This area has existing viewsheds and is also the site where the sewer line will connect the Phase I development to the septic tanks.

Compartment C is dedicated to open space. Some development already exists in this Compartment (Tour 12). For example, there are two old sheds and sewage collection lines which are within or

pass adjacent to the Compartment. This Compartment is mixed wood and has a much denser understory than Compartment B (Tour 14 and Tour 15).

Compartment A has a combination of characteristics of Compartment B and Compartment C, having both sections of very large trees with mixed growth and thick understory. South of the Stand, a large area of open growth shrubs and hardwoods exist (Tour 15). This changes to mixed growth with some large trees in Lot 9 (Tour 16). Lot 10 has large trees scattered throughout with a thick understory in many places (Tour 17 an Tour 18). Lot 11 has extensive areas of regeneration with very few large trees (Tour 19, Tour 20, and Tour 21). There is a transition into Lot 12 (Tour 22) where the hardwood regeneration ends and the large trees in the lot begin (Tour 23). Lots 12, 41, and 40 have areas of large trees (Tour 24) with regeneration again becoming predominant in sections of Lot 41 and Lot 40. The view from the west into Lot 21 shows the mixed character of that lot (Tour 25).

Looking to the westward from Compartment A to the shoreline, one can see the very open character of the old firing range (Tour 26). The open character of the 0.8 acres of white pine in Compartment D along with the white birch which has grown into the open areas since the abandonment of the fort is apparent in the two final photographs (Tour 27 and Tour 28). The following sections will quantitatively describe the composition of the four Compartments of the Stand.

### 3.1.1.1 COMPARTMENT A

The predominant overstory species in this Compartment are hemlock and white pine. Hemlock composes 39.9 percent of the BA and 38.5 percent of the stems tallied. White pine composes 37.2 percent of the BA and 23.6 percent of the stems tallied. Overall, these two species account for 76.5 percent of the BA and 62.1 percent of the trees tallied. Hardwoods are scattered throughout the dominant and co-dominant levels of the Stand but the majority are intermediate. American beech (Fagus grandifolia) is most common, comprising 11.4 percent of the basal area, followed by sugar maple (Acer saccharum) and red oak (Quercus rubra) with 3.9 percent and 3.1 percent of the BA and 3.5 percent and 6.9 percent of the stems tallied, respectively.

Table 1 shows various Stand parameters by lot and as a whole. Discussion of these data as they relate to individual lots and construction activities is presented in Sections 3.3.0 through 3.3.9 of this report.

### 3.1.1.2 COMPARTMENT B

This Compartment also has a hemlock and white pine overstory. Hemlock represents 75.3 percent of the BA and 54.6 percent of the stems tallied. White pine is 14.3 percent of the BA and 16.0 percent of the stems tallied. Overall, these two species represent 89.6 percent of the BA and 70.6 percent of the stems tallied. The predominant hardwood species are yellow birch (Betula alleghaniensis), white birch, and American beech. Overall, they

represent 9.0 percent of the BA and 21.9 percent of the stems tallied within this Compartment. Table 2 contains a summary of Stand parameters for this Compartment.

#### 3.1.1.3 COMPARTMENT C

This Compartment has a greater hardwood component than the rest of the Stand. Hemlock and white pine respectively have 23.4 and 37.5 percent of the BA and 23.3 and 26.7 percent of the stems. Overall, they represent 60.9 percent of the BA and 50.0 percent of the stems tallied. American beech and sugar maple comprise a total of 35.2 percent of the BA and 31.7 percent of the stems tallied. Table 3 contains a summary of Stand parameters for this Compartment.

#### 3.1.1.4 COMPARTMENT D

This compartment is primarily white pine. 89.4 percent of the BA and 86.9 percent of the stems are pine. Five red oak and three white birch are the only other trees tallied of the total of 61 within this small (0.8 acres) compartment.

### 3.1.2 AGE STRUCTURE

Based on the total tree inventory, the Stand, as a whole, is uneven aged as is shown by the diameter frequency distribution for all trees in Figure 2 (Husch et. al, 1972). In most cases, as diameter class increased, frequency decreased. However, when the Stand is separated into softwood and hardwood components, it

becomes clear that the softwoods are even aged, roughly exhibiting a normal distribution around the mean softwood DBH of 19.4 inches. The hardwoods show a characteristic diameter distribution for an uneven aged stand which is roughly an inverted J-shaped curve.

The oldest measured age in the Stand was 125 years from a 21.9 inch DBH white pine. The true age is greater when allowance is made for years of growth up to 4.5 feet. This tree is probably representative of the average age of softwoods in the Stand since it is near the mean diameter. It is possible that larger or smaller individuals would show greater age. However a boring from 25.3 inch DBH hemlock had a lower age count than the above pine. It should be noted that the highest age counted by Mr. Mott was 158 years from a white pine (Mott 1986).

### 3.1.3 CONDITION

The mean height of the dominant trees in all compartments is approximately 70 feet with some taller individuals. The live crowns typically cover 50 percent of the tree height. Boles of hemlock and white pine are well pruned up to 20 feet in most cases with variations above and below that level. The crowns, as viewed from the adjacent mainland, are irregularly shaped with open portions. This probably results from exposure to wind causing some loss of branches.

### 3.1.4 LANDFORM AND TOPOGRAPHY

All Compartments studied are located on the northwest side of Great Diamond Island on gradual west facing slopes that range from 5 to 25 percent in grade.

### 3.1.5 FOREST FLOOR

Litter in the Compartment is composed mostly of hardwood leaves except under small dense clusters of white pine or hemlock where a greater percentage of needles are found. Little slash from fallen branches or downed trees is evident. Occasional small patches of exposed bedrock are seen on the upper portion of the slope that the Stand occupies. Rocks are infrequently seen. Most have been exposed as a result of various excavations on the site.

### 3.1.6 INSECT AND DISEASE

Few signs of insect and disease damage are evident in any of the four Compartments. Most pine and hemlock appear to be very healthy. The first five large beech trees that were bored for age data had extensive heartrot. No further ages of large hardwoods were collected. The trunks of most beech show little sign of the fungus disease caused by the genus Nectria. However, scale insects (Cryptococcus fagisuga and/or Xylolocculus betulae), the disease vectors, were seen on several trees indicating that the disease is in the early stages of establishment and will probably become well established over time. This could reduce the beech component of the

hardwood-hemlock stand that is likely to succeed the current hemlock-white pine stand.

### 3.1.7 SOILS

The predominant soil classification for all Compartments is Lyman very rocky fine sandy loam (LyC), based on Soil Conservation Service (SCS) medium intensity mapping. The Lyman series is described as consisting of shallow, somewhat excessively drained, gently sloped to steep, moderately coarse textured soils that have few to many outcroppings (Appendix L of the original application).

The LyC classification is suitable for pasture and as woodland. Depth to bedrock is 14 inches. White pine and white spruce (Picea glauca) are suitable for planting.

Windthrow hazard is rated as moderate because of shallowness to bedrock. However, nine test pits dug within the stand show soil depths considerably greater than 14 inches to bedrock with a minimum depth 24 inches and a maximum depth of 48 inches. Test pit number 86 in Lot 21 revealed roots as deep as 30 inches. The test pits may not be representative of all areas. However, they do show that many areas within the Stand have deep soils which promote windfirmness.

### 3.1.8 STAND ORIGIN

The former name of Great Diamond Island was Great Hog Island. This is because it was used as a naturally fenced rangeland for pigs and cattle during the 18th and 19th centuries. Lancaster and

Leak (1978) state that many pure white pine stands are the result of grazing livestock that remove grasses, weeds, and hardwoods which normally would hinder white pine development. Eyre (1980) states that the white pine-hemlock forest type is occasionally the result of long continuous grazing of farm woods containing scattered pine and hemlock in mixture with hardwoods.

Based on the long association of white men with the Casco Bay Islands and the known agricultural past of Great Diamond Island, it is very likely that these Compartments are part of a second growth stand which originated as a direct result of man's influence and should not be defined as one of natural origin. Because of many disturbances which will be discussed later in this report, it is likely that considerable cutting of a non-commercial nature occurred within the Stand during the period from the turn of the century to the early 1950's when the fort was abandoned.

### 3.1.9 STAND NATURALNESS AND DISTURBANCE

As stated above in Section 3.1.8, the history of the island strongly suggests that all Compartments in the Stand are second growth in nature resulting from the influence of past agricultural practices. The area today does not exhibit evidence of recent cutting but does show multiple disturbances from the past presence of man. The absence of stumps would be expected since the fort has been abandoned for over 30 years and the cutting of trees in the original Stand was probably done during the construction of the infrastructure 80 years ago. The trees would have been 70 to 80

years old at that time and probably had already achieved large size.

Most of the disturbances are products of the interaction of the one thousand or more military personnel who occupied the northern end of the island between 1900 and 1950 and the infrastructure necessary to support their activities. After completion of the total tree inventory in Compartment A, we used the grid system to accurately enumerate and map the various disturbances. We also photographed the disturbances and developed an overlay to more fully document the development which has already occurred in the Compartment. Similar disruptions are found in Compartments B and C, including tennis courts, an abandoned cemetery, and roads in Compartment B, but because they are "open space". we did not describe them.

Within the 5.95 acres of Compartment A intensively mapped by EA, we photographed and mapped 23 different artifacts of man's presence including five old roadbeds, several barbed wire enclosures, and a stone altar and chapel area. These items and others are described below. Other disturbances were present as well. The following paragraphs describe the mapped disturbances and refer to the accompanying photographs which document each one. The disturbances are referenced on the overlay by the Disturbance number and can be used to discern just where they are in relationship to the large trees. The photographs are also useful to view the character of Compartment A at each disturbance since the direction of the view is indicated by the arrow at each number.

An elevated road bed passes through Lot 9 from the perimeter road to the old dirigible hangar foundation which straddles the boundary on Lot 9 and 15 (DISTURBANCE 1). This roadbed was raised above the contour by a stone rip-rap base (DISTURBANCE 2). A glass power-line insulator was also found on one tree indicating the former presence of a phone or power line (DISTURBANCE 3). Moving north in Lot 9 one finds a rock and tile drain which passes westerly from the culvert (DISTURBANCES 4 and 5). It appears the islanders have been cutting firewood in this area as evidenced by several ash dumps and 4 foot sections of ash lying about.

Lot 10 has a series of steel poles and cabling attached to four trees (DISTURBANCE 6). Their purpose is unknown but it may have supported an antenna. We also found a stone altar with a cleared pathway approaching from the paved road which forms the eastern lot boundary (DISTURBANCES 7 and 8). It is obvious that this area was maintained during occupation of the fort. The flat terrain east of the altar is probably where the audience sat during services.

Lot 11 has many remnants from the military presence. The very open character of this lot indicates that it probably was either grass or shrub covered before maintenance was discontinued. The first disturbance is the ditch from the culvert to the french drain (DISTURBANCES 9 and 10). This ditch does not follow the natural drainage, instead it is dug in a relatively straight line. The drainageway does follow the natural contours downslope of the french drain. The second disturbance is one of two roadways which

pass through the lot. The first roadway is elevated and very straight, suggesting that it may have been a railway (DISTURBANCES 11 and 12). The roadway runs from the northern edge of Lot 12, through the northwestern corner of Lot 11, and then into Lot 13. We speculate that ammunition may have been taken to the firing range along this roadway. Several carved trees are scattered throughout this Compartment. DISTURBANCE 13 shows one of them. They appear to be quite old. Barbed wire enclosures and trees with scars on their trunks are found throughout this Compartment as well. Two from Lot 11 are shown in DISTURBANCES 14 and 15. The second roadway passes from the southeastern corner of Lot 11 where it abuts the perimeter road, diagonally through Lot 13 and into the southwestern corner of Lot 12 to its intersection with the roadbed in Lot 12 (DISTURBANCE 16). This road is not elevated and no speculation on its purpose can be made.

Lot 12 has the largest concentration of large trees in Compartment A. It also has some of the most significant disturbances. These disturbances had to have been constructed when the Stand was 70 to 80 years old. The existence of the many large trees indicate that the development activities did not have a catastrophic impact on the Stand. The first disturbance is the sewer line which passes directly through Lot 12 and Lot 21 and into Seal Cove. One of the manholes is shown in DISTURBANCE 17. There is also an existing water main in Lot 12 which also passes through Lot 41 (DISTURBANCE 18). There is a road passing through Lot 12 and Lot 21 to Seal Cove which can still be driven easily (DISTURBANCES

19 and 20). The narrowest passage between trees in Lot 12 is 18 feet.

Besides the road described in Lot 12, there is a large pile of rock spoils in Lot 21 at the edge of the Compartment (DISTURBANCE 21). These piles of spoils occur at other sites outside the Stand and appear to have been blasted from the ledge during construction of the bunkers.

Lot 41 also has a considerable amount of disturbance throughout the site. The southern section of the lot has many large trees in good condition. There are two disruptions which are still evident, a stone foundation and iron grate of unknown purpose (DISTURBANCE 22) and a fallen wood structure which may have been a guardhouse (DISTURBANCE 23). The barbed wire and log enclosure shown in DISTURBANCES 24 and 25 appears to have been used to hold livestock of some sort. The borrowing pit has stone foundations and metal bars in it (DISTURBANCE 26). The series of stone foundations and steel posts appears to have been some sort of fence of unknown purpose (DISTURBANCE 27).

Lot 40 is only on the edge of the Compartment. The insulator on the large white pine appears to be part of a utility line (DISTURBANCE 28). The drivable road shown in DISTURBANCES 29 and 30 goes from the paved road to the bunkers northwest of the Lot.

In summary, this series of disturbances (and others exist but were not documented) very clearly shows that the Stand of trees in Compartment A is not natural in origin but instead is the remnants of a Stand which was about 80 years old when the Army built Fort

McKinley and was altered to construct roads, sewer lines, water mains, storm drains, power lines, an outdoor chapel, a firing range, and probably other facilities which have disappeared since the fort was abandoned. More accurately, it is akin to a suburban park that has been left unattended for 30 or 40 years. There is no question that some beautiful specimens of white pine and hemlock exist on this site and should be preserved. However, we do not believe it meets the criteria for classification as a natural old growth forest stand.

### 3.1.10 STAND REPLACEMENT

Although regeneration was not quantified, it appears that the Stand will shift from a predominantly softwood stand to a long lived hardwood stand composed of sugar maple, red oak, and beech with some hemlock. This thesis is supported by the fact that the majority of the smallest diameter classes are these hardwood species. Eyre (1980) states that the hardwood-hemlock stand type is considered a probable climax type following the white pine-hemlock type.

### 3.2.0 WINDFIRMNESS

The windfirmness of the Stand was evaluated to assess possible impacts from construction activities on the DCA property. Factors relating to windfirmness are discussed below and construction activities are further discussed in Sections 3.3.0 through 3.3.9. An important factor to consider is that the Stand was open directly

to the wind during the period that the fort was occupied without any buffer vegetation.

### 3.2.1 CURRENT STAND CONDITION AS IT RELATES TO WINDFIRMNESS

The current condition of the Stand indicates that it is very windfirm. The Stand shows little evidence of wind damage. Very few blown down individuals or trees with broken tops were observed. The fallen individuals are primarily old beech trees whose hollow-hearted condition was noted previously. No Stand openings appear to be the result of past wind damage.

### 3.2.2 SPECIES RESISTANCE TO WINDTHROW

White pine is generally considered very resistant to windthrow because of its strong lateral root system which forms a supportive root plate. Conkling (1978), when discussing the ability of white pine to reproduce on ridge tops below 2,500 feet, states: "The support of its lateral root system gives white pine an advantage over other conifers which are highly susceptible to windthrow on such sites."

Windthrow in hemlock Stands occurs most frequently on wet sites and on shallow or slow draining soils that become waterlogged during heavy rains (Fowells 1968). As discussed in Sections 3.1.7 and 3.2.3, the soils are neither shallow nor wet within the Stand.

### 3.2.3 SOIL RELATIONSHIP TO WINDFIRMNESS

Falk (1980) in a literature review of wind damage to forest Stands, states that windfirmness of the site is related to the shear strength of the soil. Soil shear strength is a function of soil texture and moisture content. Dry soils are strongest overall but weaken when wet, while sandy soils gain strength when wet. The Soil Conservation Service uses 10 inches of soil depth to bedrock, perched water table, or fragipan as the dividing point between severe to moderate windthrow sites.

The area mapped on Great Diamond Island is on Lyman soil type described earlier in this report. This soil is moderately coarse textured, expected to be well drained, and 14 inches deep. Test pits in the Stand confirm that the soil is much deeper than 14 inches at many points throughout the Stand.

### 3.2.4 WIND DIRECTION AND FORCE

The prevailing winds in the Portland area come out of the northwest to southwest quadrants (Falk 1980). This is also the direction from which most of the monthly highest wind speeds are recorded. However, for the period between 1940 through 1979, the first, second, and third highest wind speeds were recorded from the northeast, east and southeast, respectively. Therefore, although most heavy winds will be from the northwest, over long periods of time the threat of high winds should be expected from all compass points.

### 3.2.5 THE 35 FOOT WINDFIRMNESS BUFFER

A 35 foot zone of vegetation beyond the 12 inch DBH or greater softwoods forms the Stand buffer. This is primarily hardwood regeneration which is outside the actual Stand of softwood trees. These are the trees and shrubs which have grown into the cleared areas during the past 30 to 35 years since the fort was abandoned.

When clearcutting near spruce-fir forest Stands, a buffer of 1 chain (66 feet), which is typically the height of such stands, is usually recommended (Mr. Robert Frank, USFS, pers. comm.), spruce and fir being less windfirm than white pine and hemlock. However, since no cutting will occur within the Stand or the buffer area and only 25 to 30 percent of the area of individual lots outside the buffer will be cleared for buildings, lawns, and underground disposal systems, a tree height buffer is not warranted. All openings will be relatively small and be partially filled by dwellings which will also act as buffering devices outside the Stand by reducing downward air flow on the lee side of these openings.

In some cases we have expanded the windfirmness buffer, not for biological reasons, but to facilitate administration of the Management Plan. For example, the entire eastern edge of Compartment A along Wood Side Drive has been included in the Stand although biologically there are small areas outside the windfirmness buffer.

Likewise, on the western edge of Compartment A adjacent to Lots 10 and 11, we have provided straight edges to the Stand

boundary. These are beyond the biological buffer and give readily defined boundaries which will be located by survey (See attached Plan). This edge, which will be marked by placards on the Lots adjacent to the Stand, will define the area beyond which a lot owner may not encroach towards the windfirmness buffer of the Stand.

### 3.2.6 RATING OF WINDFIRMNESS FOR HEMLOCK-WHITE PINE STAND ON GDI

Based on observations of the current condition of the Stand (all Compartments), the species involved, soil conditions, and exposure, we rate the wind damage risk to this Stand as moderate to low. No significant current wind damage or definable patterns of past damage are present. White pine is known to be very resistant to windthrow and hemlock is on a site which is not considered a high risk wind damage site.

In addition, the open character of the Stand provides little protection to the dominant crowns both along the Stand edge and inside the Stand. This promotes windfirmness throughout the Stand by requiring most individuals to develop strong root plates and stems in reaction to this exposure. Exceptions to the open character are the area in Lot 12 which also borders Lots 41 and 21 and the section of Compartment C northwest of the tennis courts. Because this area is relatively dense, some individuals near its center may be less resistant to wind than those in the rest of the Stand.

The fact that the Stand has a west facing aspect may also contribute to windfirmness because of frequent exposure to storms and accompanying high winds. By default, open grown and Stand edge individuals in this area must be windfirm to survive.

## 4.1.0 MANAGEMENT OF STAND

The majority of the following practices will deal with both the Phase I development and proposed Phase II on GDI.

## 4.2.0 PHASE I

The Board Order of December 10, 1986 deals only with reconstruction of existing facilities and buildings along with associated new infrastructure. As a consequence, there is very little potential impact upon any of the Compartments of the Stand. What impacts there will be are discussed below.

Currently, the Compartments of the Stand fall within either Landscape Zone A or Open Space Zone (See, "Landscape Plan" and "Design Review Process and Design Guidelines" pp. 26 and 28).

### 4.2.1 SEWER LINE TO SEPTIC TANKS

The sewer line which will run from the existing system to the septic tanks will pass through the Open Space Zone between Compartment B and Compartment C. As can be seen on the recording plat and in photographs (PLAN 1, PLAN 2, and PLAN 3), the existing manhole is between the two Compartments and the proposed line to the septic tanks will pass between two isolated trees. Snow fencing

will be placed between the path of the new sewer line and Compartment B to the south and Compartment C to the north to prevent intrusion of bulldozers, backhoes, or trucks into either Compartment during construction. These activities will not be disruptive to the Stand.

### 4.2.2 RESTORATION OF TENNIS COURTS

The tennis courts in Compartment B will be reconstructed during the Phase I segment of the Diamond Cove project. The existing road will be restored with a gravel surface. The courts themselves will have their surfaces replaced and the old fencing will be removed and replaced. During these activities, snow fencing will be placed between work areas and the large trees to prevent impact from bulldozers, backhoes and trucks. Brush will be removed or trimmed but no large trees will be cut during this restoration work.

### 4.2.3 ROAD RIGHT OF WAY MAINTENANCE

Small trees less than 6 inches DBH and brush will be cut periodically along existing roadways to prevent encroachment into those roads. Since hand implements only are necessary for this type of activity, no special precautions will be required to protect the Stand. No large trees will be cut during these activities.

### 4.2.4 ACCESS TO INFRASTRUCTURE

Various segments of the infrastructure of the Phase I development pass through parts of Compartments A, B, and C. These include existing roadways, drainageways, sewer lines, and water mains. It will be necessary to access these components, both for reconstruction where necessary and for periodic maintenance or replacement in the future. Various activities can be expected, including the cutting of brush and small trees less then 6.0 inches DBH, excavation of buried lines, and placement of new or replacement materials. No large trees will be cut during any of these activities. When this type of work is required, a corridor of snow fencing will be placed to prevent impacts to the large trees by bulldozers, backhoes, and trucks.

### 4.2.5 REMOVAL OF DEAD, DISEASED, OR DYING TREES

Dead, diseased, and dying trees are likely to present a safety hazard from time to time, especially within the perimeters of the Compartments, along roadways within the Compartments and adjacent to the tennis courts. Removal of these trees will be necessary for safety and liability considerations. Tree removal will be accomplished by a licensed arborist when required.

### 4.2.6 MAINTENANCE OF EXISTING VIEWSHEDS

No cutting or trimming of trees within the defined boundaries of the Compartments of the Stand will be undertaken to maintain existing viewsheds. Cutting and trimming of trees that will take

place within the Open Space zone is discussed in the "Landscape Plan".

## 4.3.0 PHASE II DEVELOPMENT

The Phase II application of this project includes 70 proposed single family house lots. Phase II would have no impact upon Compartments B and C which are part of the "Open Space" zone and are within the boundaries of Phase I. Compartment A is within the boundaries of the proposed Phase II development. Specifics of the management of the Compartment in the event that Phase II is undertaken have been addressed with the application. In the interim, no activities other than those listed in Sections 4.2.3, 4.2.4, and 4.2.5 will be carried out in Compartment A. The following descriptions are proposals for activities in Compartment A which will have impacts adjacent to the Stand in the case of house lot location and within the Stand with regard to infrastructure reconstruction and maintenance. In no case is the removal of any large trees anticipated nor is disruption of the 35 foot buffer planned.

There are nine potential building lots associated with the 5.95 acre Stand defined as Compartment A in this report. They are Lots 9, 10, 11, 12, 14, 21, 40, and 41. Each lot and its relationship to the Stand is discussed below in terms of the proportion of lot area within the Stand which includes the 35 foot buffer and its relationship to usable construction area for houses outside the Stand but within each lot.

Construction limitations defined in the Diamond Cove Design Review Process and Design Guidelines (Exhibit G) require that the area of construction shall not exceed 20 percent of the lot area, not including driveways and subsurface disposal systems. An additional 5 to 10 percent of lot area would be required for subsurface disposal systems which are expected to be 50 feet by 75 feet, including fill extensions. In the case of Lots 10, 11, 14, and 17 reduced building windows and specifically placed sewage disposal systems and driveways will further reduce the percentage of land area impacted.

4.3.1 LOT 9 (NOW LISTED AS LOT 8 PHASE II)

Table 1 shows that the basal area/acre in Lot 9 is lower than the Stand average. The large trees are clustered in the northeast third of the lot. This is a highly disturbed section of the Compartment and the building of a house south of the existing road should have no impact on the Stand.

The conservation easement shown on the attached plan protects 37.8% (0.42 acres) of the Lot from development. The building window will be outside the easement and will be approved by the Homeowner's Association prior to site preparation. The only activity within the easement will be maintenance of the utility easement along the boundary of Lot 8 and the Homeowner's Association property. Any work will be under the guidelines presented in Section 4.2.4.

### 4.3.2 LOT 10 (NOW INCLUDED WITHIN COMPARTMENT A, PHASE II)

The BAA of softwood in Lot 10 is 131 square feet which is close to the Stand average of 135. Lot 10, although fairly open, has large trees scattered throughout its area. The majority are clustered along its eastern boundary, but individuals and clusters of two to three trees are close enough together in the rest of the lot to be included as part of a contiguous stand. Because of the large amount of the lot encompassed by the Stand (99% of the area), no house construction will be undertaken in this lot. Trimming of small trees and brush near the stone altar is desirable to restore this remnant of the fort to its former condition. Large (over 12.0 inches DBH) trees will not be cut and will be protected by snow fencing if anything but hand equipment is used during trimming. In addition, the utility easement between Lot 8 and the Homeowner's Association property will be maintained as in Lot 8.

### 4.3.3 LOT 11 (NOW INCLUDED WITHIN COMPARTMENT A, PHASE II)

The 0.90 acres of stand located on Lot 11 has a BAA of 104 square feet which is the seventh lowest BAA value for softwoods when compared to all nine mapped lots (Table 1). This value was also considerably lower than the Stand BAA of 135 square feet. This is because of the very open character of the Stand in this lot. The mean DBH was relatively high, 23.3 inches versus a Stand mean of 19.5 inches, and the number of softwood stems per acre is low, 32 in Lot 11 versus 59 for the Stand as a whole. Most of the lot

including areas outside the Stand consists of hardwood trees with DBH's less than 12 inches.

The utility easement which passes through Compartment A from Wood Side Drive to West Shore Drive will be maintained as described in Section 4.2.4. As shown in the attached plan, the utility easement passes through a short (less than 50 feet) section of the buffer.

4.3.4 LOT 12 (NOW INCLUDED WITHIN COMPARTMENT A, PHASE II)

Lot 12 has a BAA value of 199 square feet for softwood which is the highest value for any lot mapped (Table 1). It is considerably higher than the Stand BAA of 135 square feet for the Stand as a whole. This area is densely stocked with large hemlock and white pine. It had the third greatest number of stems per acre but the second largest mean DBH for softwoods. It does not resemble the open character of Lot 11, and if both areas were larger, they would probably be classified as different Compartments.

The Stand occupies 95.8 percent of Lot 12 with large trees evenly distributed throughout the area. No house construction is proposed for this lot in order to protect the large trees.

The upgrading of Seal Cove Lane is the only activity to be undertaken in this area of the Stand. Management activities are described in Section 4.3.13.

4.3.5 LOT 13 (NOW LISTED AS LOT 11, PHASE II)

A small portion of the western edge of the Stand crosses the northern quarter of Lot 13. Most of this Stand area consists of buffer zone. A string of softwood having a mean DBH of 19.3 runs along the northern lot line. The BAA for this lot is 105.49 square feet which is the sixth lowest value for all the lots measured. The majority of the Stand area consists of small hardwoods in the buffer zone.

The two conservation easements shown on the attached plan encompass 0.27 acres (24.5 percent) of the Lot. The building window, sewage disposal system, and driveway location are shown on the accompanying plan. No activities will take place outside of those designated areas.

4.3.6 LOT 14 (NOW LISTED AS LOT 10, PHASE II)

Lot 14 has 98.27 square feet of softwood BAA. This is the lowest value of any lot mapped (Table 1). The reason for this low value is because this area of the Stand has relatively small hemlock and white pine that are widely scattered. The majority of trees in this segment of the Stand are hardwoods of small diameter.

The conservation easement takes up 0.48 acres (41.7 percent) of the Lot. The only activity within the easement will be maintenance of the utility easement shown on the attached plan. The building window and driveway location are shown on the accompanying plan. Sewage disposal will be accomplished by the common sewage treatment facility.

4.3.7 LOT 18 (NOW LISTED AS LOT 14, PHASE II)

A portion of Compartment D is included in this lot. A conservation easement will protect 28.7 percent (0.41 acres) of this lot. As shown on the attached plan, the building window has been reduced to keep all building outside of the easement. The driveway will use the existing roadbed as shown on the accompanying 2plan.

A septic easement and utility easement have been developed into the conservation easement to utilize the available soils for wastewater treatment. As shown, no trees will be impacted (see attached plan for Compartment D).

The attached letter from Land Use Consultants (Exhibit 5) describes the methodology required to install the system. Because of the sensitive nature of the area, NO machinery will be used to install the system. Hand implements will be used and will be mandated in the language of the conservation easement.

No other activities will be permitted within the conservation easement. The addition of additional moisture and nutrients will be a positive input for the trees adjacent to the septic easement.

4.3.8 LOT 19 (NOW LISTED AS LOT 15, PHASE II)

Lot 15 (Phase II) will be removed from the development plan and will be deeded to the Homeowner's Association as shown in the attached Plan for Compartments A and D. This lot will be available

to the Homeowner's Association members for recreation and access to the beach on the shore of Casco Bay.

4.3.9 LOT 20 (NOW LISTED AS LOT 16, PHASE II)

A very small (0.045 acre) portion of this lot is protected by a conservation easement. As shown in the attached plan, it encompasses only 3 percent of the lot and is not contiguous to the building window. No development activity will be permitted in the easement.

4.3.10 LOT 21 (NOW LISTED AS LOT 17, PHASE II)

Lot 21 has 118.57 square feet of BAA (Table 1). However, the mean softwood DBH of 15.6 inches is the smallest of any mapped lot. Hemlock composes 74 percent of the stems tallied in this section of the Stand. They form a relatively dense overstory. It is possible that this section may be younger than other parts of the Stand based on its smaller mean DBH. No age data was collected from this area. However, age is irrelevant because the larger trees in this lot have been included to enhance buffering of the portion of the Stand in Lots 12 and 41 which consist of very large densely stocked trees which may be less windfirm than other parts of the Stand, as mentioned in Section 3.2.6.

A conservation easement will protect 34.5 percent (0.48 acres) of the lot. No development will occur within the easement. A portion of Seal Cove Lane and West Shore Drive will abut this lot.

The driveway will utilize the existing roadbed of Seal Cove Lane. Conditions for road activities are described in Section 4.3.13.

4.3.11 LOT 40 (NOW LISTED AS LOT 36, PHASE II)

Lot 40 is located at the northern end of the hemlock-white pine Stand. It has a softwood BAA value of 37.13 which is the lowest of any lot. This section of the Stand has a very open character. It is composed mostly of small diameter big tooth aspen (Populus grandidentata) and red oak with scattered hemlock and pine in the overstory. It has the fewest number of stems per acre measured in any lot. This composition and the uneven aged structure of this section of the Stand point towards past disturbances which eliminated most of the old growth softwood and hardwood at this end of the Stand. The Stand boundary has been extended around the few remaining softwood at the southern end of the lot.

The conservation easement on this lot will protect 31.2 percent (0.44 acres) of the lot from development. The only activity permitted within the easement will be maintenance of the utility easement and the access route along the existing roadway. Standards for these activities are described in Section 4.3.13.

4.3.12 LOT 41 (NOW LISTED AS LOT 37, PHASE II)

Lot 41 has a softwood BAA value of 167.26 square feet. This is the second highest value for all lots and is higher than the mean Stand BAA of 135.38 square feet. There are dense clusters of softwoods at the southern end of this lot. Elsewhere, the Stand has

an open character with scattered large softwoods. A wide very open wedge shaped area with no softwoods and some hardwoods exists in the central and eastern portions of the lot. Part of this area is drawn within the Stand as a buffer zone. The diameter distribution for softwood in this more closely resembled an uneven-aged structure than an even-aged structure. This, as in Lot 40, may be the result of selective clearing within the older Stand during the military occupation of the island.

A large portion of this lot (1.09 acres) is protected by a conservation easement. The building window takes advantage of the open area outside the Stand boundaries (see attached plan).

4.3.13 INFRASTRUCTURE ACTIVITIES

Four infrastructure activities will be conducted in Compartment A if Phase II is undertaken.

1. Upgrading the condition of the existing road (Seal Cove Lane) by the addition of top fill (PLAN 4), maintaining a 20 foot road way as required by City of Portland Island Standards.
2. The 20 foot travel way within the 35 foot right of way reserved for West Shore Drive will be constructed in such a fashion that it preserves the edge vegetation in Compartment D (in Lots 14 and 15) and causes least disturbance to the edge vegetation west of Compartment A. This travel lane will traverse the west boundary of the edge vegetation in and near Compartment A between

Lots 11 and 16 on a course designated on the ground by the placement of striped blue and white flagging on tree stems that are to be protected from cutting. No soil material now in place will be graded.

3. Running of utility lines in a trench down the center of West Shore Drive.

4. Spring Cove Way will follow the existing road through Lots 36 and 37 to the bunkers as shown on the attached plan. It will be to Island Standards of a 35 foot right of way and a 20 foot travel way.

Snow fencing will be used to protect the trees from physical damage during construction. It is worth noting that the roads will be gravel; no paving will be done.

4.3.11 GENERAL: CONSTRUCTION ADJACENT TO STAND

These recommendations are based on those of Falk (1980) for spruce (*Picea sp.*) and balsam fir (*Abies balsamea*), two species common in Maine which are less windfirm than white pine and hemlock.

1. The 35 foot buffer and/or the conservation easements will be strictly observed on all sides of the Compartments, except in the cases where the Compartments abut roadways or other parts of the infrastructure as described above.
2. Stand edges generated by roads and lots will not be perpendicular to the slope, i.e., they will not run directly east or west but diagonally downslope or

parallel to it. Therefore, any roads or driveways passing through the Stand will not run directly downslope. This will prevent any opening of the buffer vegetation to prevailing winds.

3. Landowners will leave all vegetation outside the building windows and will replant cleared areas opened during construction adjacent to the Stand. In all cases, 80 percent of building lots will remain undisturbed as prescribed within the Covenants and Restrictions of the DCA.
4. The long axis of cleared areas within 50 feet of the Stand boundaries will be 70 feet or less. Falk (1980) states that research on clearcut strips in stands 75 to 100 feet tall with widths less than tree height cause little or no subsequent wind damage.
5. Placards marking the boundaries of conservation easements on individual lots will be installed at 50 foot intervals to provide reference points for Lot owners.

4.3.12 PUBLIC AWARENESS

All future residents of the Diamond Cove development will be provided with informational pamphlets which describe the three Compartments of the Stand and detail the protection afforded to it. This will include a prohibition on the collection of any flora within the Stand and will encourage residents and visitors to stay on existing travel ways.

Owners of lots adjacent to the Stand in any future Phase II development will have Covenants and Restrictions which prohibit cutting or trimming within the Stand except for the diseased, dying, or dead trees which must be removed for safety. Penalties will be included in the Diamond Cove Review Process and Design Guidelines.

Informational placards will be placed at logical points of entry into the Stand. These will be especially useful to inform non-residents of the special nature of the Stand.

## 5.0.0 CONCLUSIONS

The old growth trees described in this report are an enhancement to the Diamond Cove development and will be protected to preserve their value to the project. These trees probably are second growth resulting from agricultural activities before Fort McKinley was developed. The four Compartments of the Stand were all heavily developed during the construction and occupation of the fort. From the old photographs in the record and the results of our survey, it appears that the large trees were grown without buffer vegetation and the windfirm Stand was developed.

Sections of four of the originally proposed house sites, Lots 10, 11, 12 and 19, have a very high percentage of large trees and therefore have been removed from Phase II. These lots have been made part of the Homeowner's Association property. Conservation easements with metes and bounds have been placed on eight (8) lots

to protect edges of the stands which are included within Lot descriptions.

Compartment C will have no development activities and therefore will not be impacted. This Compartment actually has very few large trees but it will be protected because of its "open space" status. Compartment B will be preserved also. The only activities will be the restoration of the tennis courts and access road in the locations where they already exist and the placement of the sewer line to the new septic tanks for the sand filter system. As with all the other activities, barriers will be placed to prevent physical damage to the large trees. House lots adjacent to other large trees not in the Stand will have building windows sited to protect the large trees.

The activities and guidelines presented within this report have been developed to insure that the large trees in the white pine-hemlock Stand are not only protected as they exist, but also that the integrity of the Stand will be preserved to perpetuate the Stand into the future. Given the level of development which already exists within the Stand, the long history of disruptions in the Stand and the continued presence of the large trees with no indication that the Stand is deteriorating; we are confident that the Stand's future is secure.

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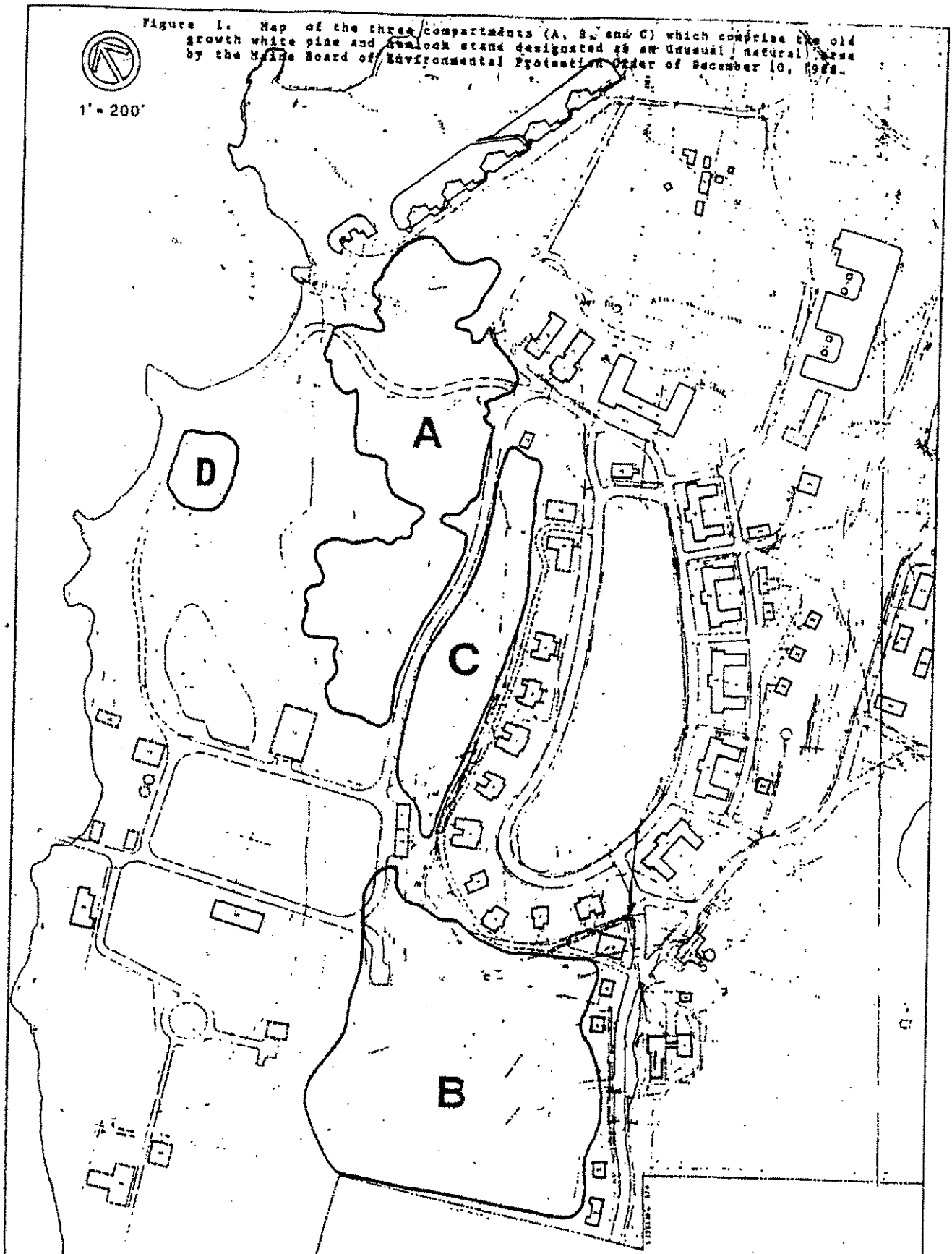
Figure 1. Map of the three compartments (A, B, and C) which comprise the old growth white pine and hemlock stand designated as an Unusual / natural Area by the Maine Board of Environmental Protection Order of December 10, 1986.




**DIAMOND COVE**

GREAT DIAMOND ISLAND, PORTLAND, MAINE

**FOREST MANAGEMENT PLAN**

PHASE I DEVELOPMENT

By

ECO ANALYSTS, INC.
P.O. Box 224 Bath, Maine 04530

Table 1. Total tree inventory of all trees six (6.0) inches or greater in Diameter at Breast Height (DBH) in Compartment A of the Old Growth Softwood Stand on Diamond Cove Associates' property on Great Diamond Island, Maine.

| LOT NUMBER | TYPE | N | ACRES | STEMS/AC | MEAN DBH | TOTAL BA | BA/ACRE |
|---|---|---|---|---|---|---|---|
| LOT 09 | HARDWOOD | 13 | 0.4 | 33 | 15.2 | 18.80 | 48.41 |
| LOT 09 | SOFTWOOD | 18 | 0.4 | 46 | 20.1 | 42.78 | 110.13 |
| LOT 09 | TOTAL | 31 | 0.4 | 80 | 18.0 | 61.58 | 158.53 |
| LOT 10 | HARDWOOD | 31 | 1.2 | 26 | 15.8 | 52.75 | 43.95 |
| LOT 10 | SOFTWOOD | 65 | 1.2 | 54 | 20.1 | 158.57 | 132.14 |
| LOT 10 | TOTAL | 96 | 1.2 | 80 | 18.7 | 211.31 | 176.09 |
| LOT 11 | HARDWOOD | 44 | 0.9 | 49 | 11.9 | 46.13 | 51.26 |
| LOT 11 | SOFTWOOD | 29 | 0.9 | 32 | 23.3 | 93.80 | 104.22 |
| LOT 11 | TOTAL | 73 | 0.9 | 81 | 16.4 | 139.93 | 155.48 |
| LOT 12 | HARDWOOD | 35 | 1.1 | 32 | 10.9 | 32.17 | 29.51 |
| LOT 12 | SOFTWOOD | 82 | 1.1 | 75 | 21.4 | 216.86 | 198.95 |
| LOT 12 | TOTAL | 117 | 1.1 | 107 | 18.3 | 249.03 | 228.46 |
| LOT 13 | HARDWOOD | 2 | 0.2 | 10 | 7.5 | 0.61 | 3.09 |
| LOT 13 | SOFTWOOD | 10 | 0.2 | 50 | 19.3 | 20.95 | 105.49 |
| LOT 13 | TOTAL | 12 | 0.2 | 60 | 15.6 | 22.92 | 115.38 |
| LOT 14 | HARDWOOD | 25 | 0.4 | 62 | 9.7 | 14.65 | 36.37 |
| LOT 14 | SOFTWOOD | 21 | 0.4 | 52 | 17.2 | 39.60 | 98.27 |
| LOT 14 | TOTAL | 46 | 0.4 | 114 | 13.1 | 54.25 | 134.63 |
| LOT 21 | HARDWOOD | 7 | 0.4 | 16 | 12.4 | 8.42 | 19.13 |
| LOT 21 | SOFTWOOD | 37 | 0.4 | 84 | 15.6 | 52.17 | 118.57 |
| LOT 21 | TOTAL | 44 | 0.4 | 100 | 15.1 | 60.59 | 137.70 |
| LOT 40 | HARDWOOD | 11 | 0.3 | 34 | 10.5 | 7.06 | 22.05 |
| LOT 40 | SOFTWOOD | 7 | 0.3 | 22 | 17.0 | 11.88 | 37.13 |
| LOT 40 | TOTAL | 18 | 0.3 | 56 | 13.1 | 18.94 | 59.19 |
| LOT 41 | HARDWOOD | 47 | 1.0 | 47 | 13.5 | 66.40 | 65.74 |
| LOT 41 | SOFTWOOD | 85 | 1.0 | 84 | 18.3 | 168.93 | 167.26 |
| LOT 41 | TOTAL | 132 | 1.0 | 131 | 16.6 | 235.33 | 233.00 |
| STAND TOTAL | HARDWOOD | 215 | 6.0 | 36 | 12.5 | 246.99 | 41.51 |
| | SOFTWOOD | 354 | 6.0 | 59 | 19.5 | 805.53 | 135.38 |
| | TOTAL | 569 | 6.0 | 96 | 16.9 | 1052.52 | 176.89 |

DEFINITIONS: DBH - DIAMETER AT BREAST HEIGHT (4.5 FEET)
BA - BASAL AREA (CROSS-SECTIONAL AREA AT DBH WHICH IS DIRECTLY RELATED TO STAND DENSITY AND VOLUME)

ECO-ANALYSTS INC.
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Table 2. Tree inventory of Compartment B of the Old Growth Softwood Stand on Diamond Cove Associates' property on Great Diamond Island Maine.

| PLOT NUMBER | TYPE | N | ACRES | STEMS/AC | MEAN DBH | TOTAL BA | BA/ACRE |
|---|---|---|---|---|---|---|---|
| PLOT 1 | HARDWOOD | 12 | n/a | 120 | 9.5 | 7.50 | 75.00 |
| PLOT 1 | SOFTWOOD | 2 | n/a | 20 | 24.5 | 6.52 | 65.20 |
| PLOT 1 | TOTAL | 14 | n/a | 140 | 11.6 | 14.02 | 140.20 |
| PLOT 2 | HARDWOOD | 8 | n/a | 80 | 1.3 | 6.95 | 69.50 |
| PLOT 2 | SOFTWOOD | 5 | n/a | 50 | 22.3 | 16.65 | 166.50 |
| PLOT 2 | TOTAL | 13 | n/a | 130 | 14.9 | 23.60 | 236.00 |
| PLOT 3 | HARDWOOD | 2 | n/a | 20 | 5.0 | 0.29 | 2.90 |
| PLOT 3 | SOFTWOOD | 5 | n/a | 50 | 25.0 | 17.48 | 174.80 |
| PLOT 3 | TOTAL | 7 | n/a | 70 | 19.3 | 17.77 | 177.70 |
| PLOT 4 | HARDWOOD | 7 | n/a | 70 | 5.4 | 1.58 | 15.80 |
| PLOT 4 | SOFTWOOD | 0 | n/a | 0 | 0.0 | 0.00 | 0.00 |
| PLOT 4 | TOTAL | 7 | n/a | 70 | 5.4 | 1.58 | 15.80 |
| PLOT 5 | HARDWOOD | 3 | n/a | 30 | 11.0 | 2.63 | 26.30 |
| PLOT 5 | SOFTWOOD | 4 | n/a | 40 | 32.6 | 23.64 | 236.40 |
| PLOT 5 | TOTAL | 7 | n/a | 70 | 23.3 | 26.27 | 262.70 |
| PLOT 6 | HARDWOOD | 2 | n/a | 20 | 6.7 | 0.64 | 6.40 |
| PLOT 6 | SOFTWOOD | 15 | n/a | 150 | 8.0 | 10.21 | 102.10 |
| PLOT 6 | TOTAL | 17 | n/a | 170 | 7.8 | 10.84 | 108.40 |
| PLOT 7 | HARDWOOD | 0 | n/a | 0 | 0.0 | 0.00 | 0.00 |
| PLOT 7 | SOFTWOOD | 19 | n/a | 190 | 17.3 | 33.84 | 338.40 |
| PLOT 7 | TOTAL | 19 | n/a | 190 | 17.3 | 33.84 | 338.40 |
| PLOT 8 | HARDWOOD | 1 | n/a | 10 | 24.1 | 3.17 | 31.70 |
| PLOT 8 | SOFTWOOD | 24 | n/a | 240 | 21.9 | 67.20 | 672.00 |
| PLOT 8 | TOTAL | 25 | n/a | 250 | 22.0 | 70.37 | 703.70 |
| PLOT 9 | HARDWOOD | 0 | n/a | 0 | 0.0 | 0.00 | 0.00 |
| PLOT 9 | SOFTWOOD | 1 | n/a | 10 | 19.2 | 21.26 | 212.60 |
| PLOT 9 | TOTAL | 10 | n/a | 100 | 19.2 | 21.26 | 212.60 |
| STAND TOTAL (ESTIMATES) | HARDWOOD | 35 | 7.81 | 39 | 7.1 | 197.51 | 25.29 |
| | SOFTWOOD | 75 | 7.81 | 83 | 19.0 | 1707.79 | 218.67 |
| | TOTAL | 119 | 7.81 | 132 | 15.6 | 1905.21 | 243.94 |

DEFINITIONS: DBH - DIAMETER AT BREAST HEIGHT (4.5 FEET)
BA - BASAL AREA (CROSS-SECTIONAL AREA AT DBH WHICH IS DIRECTLY RELATED TO STAND DENSITY AND VOLUME)

ECO-ANALYSTS INC.
Environmental Consultants

Table 3. Tree inventory of Compartment C of the Old Growth Softwood Stand on Diamond Cove Associates' property on Great Diamond Island Maine.

| PLOT NUMBER | TYPE | N | ACRES | STEMS/AC | MEAN DBH | TOTAL BA | BA/ACRE |
|---|---|---|---|---|---|---|---|
| PLOT 1 | HARDWOOD | 2 | n/a | 20 | 7.1 | 0.57 | 5.70 |
| PLOT 1 | SOFTWOOD | 3 | n/a | 30 | 27.2 | 13.16 | 131.60 |
| PLOT 1 | TOTAL | 5 | n/a | 50 | 19.1 | 13.73 | 137.30 |
| PLOT 2 | HARDWOOD | 6 | n/a | 60 | 18.6 | 18.73 | 187.30 |
| PLOT 2 | SOFTWOOD | 5 | n/a | 50 | 18.7 | 12.53 | 125.30 |
| PLOT 2 | TOTAL | 11 | n/a | 110 | 18.7 | 31.27 | 312.70 |
| PLOT 3 | HARDWOOD | 5 | n/a | 50 | 20.9 | 13.31 | 133.10 |
| PLOT 3 | SOFTWOOD | 4 | n/a | 40 | 28.8 | 18.12 | 181.20 |
| PLOT 3 | TOTAL | 9 | n/a | 90 | 24.4 | 31.43 | 314.30 |
| PLOT 4 | HARDWOOD | 6 | n/a | 60 | 17.0 | 13.19 | 131.90 |
| PLOT 4 | SOFTWOOD | 6 | n/a | 60 | 21.6 | 16.14 | 161.40 |
| PLOT 4 | TOTAL | 12 | n/a | 120 | 19.3 | 29.33 | 293.30 |
| PLOT 5 | HARDWOOD | 4 | n/a | 40 | 13.9 | 5.71 | 57.10 |
| PLOT 5 | SOFTWOOD | 10 | n/a | 100 | 21.0 | 24.91 | 249.10 |
| PLOT 5 | TOTAL | 14 | n/a | 140 | 19.0 | 30.62 | 306.20 |
| PLOT 6 | HARDWOOD | 7 | n/a | 70 | 10.3 | 5.86 | 58.60 |
| PLOT 6 | SOFTWOOD | 2 | n/a | 20 | 20.1 | 4.39 | 43.90 |
| PLOT 6 | TOTAL | 9 | n/a | 90 | 12.4 | 10.25 | 102.50 |
| STAND TOTAL (ESTIMATES) | HARDWOOD | 30 | 2.87 | 50 | 14.6 | 274.42 | 95.62 |
| | SOFTWOOD | 30 | 2.87 | 50 | 22.9 | 426.91 | 148.75 |
| | TOTAL | 60 | 2.87 | 100 | 18.8 | 701.38 | 244.38 |

DEFINITIONS: DBH - DIAMETER AT BREAST HEIGHT (4.5 FEET)
BA - BASAL AREA (CROSS-SECTIONAL AREA AT DBH WHICH IS DIRECTLY RELATED TO STAND DENSITY AND VOLUME)

ECO-ANALYSTS INC.
Environmental Consultants

# OPERATIONS MANUAL FOR ACTIVITIES ADJACENT TO AND WITHIN THE OLD GROWTH STAND OF TREES WITHIN THE DIAMOND COVE DEVELOPMENT ON GREAT DIAMOND ISLAND

Submitted by:

ECO-ANALYSTS, INC.
P.O. Box 224
Bath, ME 04530

Revised
January 19, 1989

ECO-ANALYSTS INC.
*Environmental Consultants*

## 1.0 INTRODUCTION

This manual contains a description of methods and restrictions which apply to construction and maintenance activities within and adjacent to the old growth stand of trees on Great Diamond Island (Stand). A complete description and detailed report on the Stand is contained in FOREST MANAGEMENT PLAN FOR DIAMOND COVE ASSOCIATES PROPERTY ON GREAT DIAMOND ISLAND (Report). Copies of the report are on file with the Design Review Board (DRB) of the Diamond Cove Homeowners Association and with the Land Bureau of the Maine Department of Environmental Protection (DEP). The guidelines within the report and this manual are also incorporated into the Landscape Management Plan and Practices. That document is also on file with the DRB and DEP.

## 2.0 BASIS

The Stand was determined to be an unusual natural area by the Maine Board of Environmental Protection (BEP) in its order of December 10, 1986. The Stand is delineated by the Report and is defined within the Declaration of Covenants and Restrictions. This manual will fulfill the requirements of the Board Order to manage activities within and adjacent to the Stand to maintain the windfirmness buffer zone and to protect individual trees within the stand during right of way maintenance, restoration of existing infrastructure, and the upgrading and construction of necessary roadways. This manual will become part of the Declaration of

Covenants and Restrictions and will regulate all activities with the Unique Natural Area.

## 3.0 DEFINITION OF STAND

The Stand is comprised of four Compartments (A, B, C, and D) which total 17.43 acres in extent. They include buffer areas outside the actual trees themselves which afford protection from windthrow and conservation easements on individual lots which facilitate management of the Stand.. The locations of the four Compartments are shown within the accompanying map (Figure 1).

The perimeters of the Compartments of the Stand will be delineated by placards at 150 foot intervals, except where adjacent to the building windows in Lots 10, 11, and 14 where they will be at 50 foot intervals. These placards will identify the Stand as an unusual natural area and will advise readers that cutting and other disturbances are prohibited in the Stand.

## 4.0 ACTIVITIES WITHIN AND ADJACENT TO THE STAND

Before any activities are undertaken within or adjacent to the Stand, a plan detailing the work must be submitted to and approved by the DRB. The DRB is required by the Declaration of Covenants and Restrictions to adhere to the guidelines contained within the Report and the Landscape Management Plan and Practices.

## 4.1 COMPARTMENT A

This Compartment in the IR1 zone is located between Wood Side Drive and West Shore Drive. Six activities are permitted within this Compartment: One is part of Phase I. The other five will be part of Phase II. No other cutting of underbrush, trimming of limbs from trees or removal of vegetation, or any other unapproved disruption within the old growth stand is permitted.

Phase I

1. Trimming of roadside brush along the 20 foot travel way along Wood Side Drive.

Phase II

1. Trimming of roadside brush within the 35 foot right of way along Seal Cove Lane and West Shore Drive.
2. Removal of brush and any excavation necessary to restore and maintain existing utilities and drainageways.
3. Upgrading of Seal Cove Lane by the addition of topfill.
4. Construction of West Shore Drive as shown in the accompanying plan which will access house lots.
5. Rehabilitation of the stone altar and the surrounding area in Lot 11.

Several precautions and practices must be employed during any of the allowable activities within the Stand during either phase of the development.

These include:

1. No trees greater than 6.0 inches in DBH can be cut during right of way maintenance or road upgrading or construction except for designated trees within the 20 foot travel way on West Shore Drive.
2. Snow fencing will be placed between trees greater than 6.0 inches DBH and rights of way to form buffer corridors for equipment.
3. Tree boles (trunks) will be wrapped in burlap along the corridors to prevent damage in the cases of accidental impacts.
4. Roads adjacent to large (greater than 12.0 inches DBH) trees will have topfill only to protect root system.

## 4.2 COMPARTMENT B

This section is in the IR3 zone and is part of Phase 1 Development of Diamond Cove Associates. Located south of the parade ground, this compartment contains the tennis courts and the abandoned cemetery. Four activities are planned within and adjacent to this compartment which will entail cutting of small caliper (less than 6.0 inches DBH) trees and brush. These are:

1. Rehabilitation of the tennis courts and access road in their present locations.
2. The trimming of roadside vegetation for the maintenance of existing rights of way.

3. The removal of understory growth and vegetation only as necessary to access and maintain existing infrastructure.
4. The construction of a sanitary sewer line from the existing manhole west of Buildings 4 and 5 to the filter beds.

When construction equipment is employed, the same precautions applied in Compartment A (e.g. - snow fencing and burlap) will be utilized. The sewer line will run between two trees as described and shown in photographs in the Report. Brush and small caliper trees will be cut only as necessary to install the line. No other cutting or disturbance is permitted in this part of the Stand.

## 4.3 COMPARTMENT C

This section of the Stand west of the parade ground will have only two activities involving disturbance of vegetation, trimming of roadside brush and accessing infrastructure. Management practices will be the same in this Compartment as in the preceding two.

## 4.4 COMPARTMENT D

The only activity permitted will be the installation of the one sewage disposal system. No powered equipment will be allowed. All components will be placed by hand. Fill materials will be transported by wheel barrow and all work will be accomplished by hand tools.

## 4.4 OTHER ACTIVITIES

Dead or dying trees which represent a threat to safety because of their proximity to roadways, buildings, tennis courts or other structures or facilities may be removed from any Compartment on the recommendation and under the supervision of a licensed arborist. Unforeseen events such as fire, disease, or insect infestations may require activities such as firebreaks or pesticide treatments to protect the Stand. These activities will be conducted in the fashion commonly accepted by the forestry community at the time of the event.

Phone: 207-892-6562

SOUTHERN MAINE FORESTERY SERVICES, INC.

P.O. Box 910 • North Windham, Maine 04062

Addendum to Forest Management Plan

for

Old Growth Stand

Diamond Cove Home Owners Association

Great Diamond Island

Portland, Maine

Prepared by:

Rene D. Noel, Jr. ACF
Maine Licensed Forester
December 12, 2013

**Purpose**

I have been engaged to:

1. More accurately locate the bounds of the old growth stand and mark edge of this stand.
2. Assess the impact of the hemlock woolly adelgid (*Adelges tsugae*) on the Hemlocks with the stand.
3. Identify those trees which pose potential hazards to life or property should they fail.
4. Identify those hemlocks in suitable condition so that treatment with an insecticide will extend their lives.
5. Estimate scope of work needed to mitigate fire danger and aesthetic impact of the loss of hemlock from the stands.
6. Address the proposed trash transfer station impact on the old growth stand.

**Field Work**

Using a handheld GPS receiver (Delorme Earthmate PN-60) data was collected to map the edge of the old growth stand. To do this the stand was perambulated and pink plastic ribbon was hung to mark the edge of the stand. I recommend that boundary be marked permanently. Painting boundary trees, signs or posts and signs are various options. Also gathered was GPS locations of trees that were judged to be potential hazards. These were marked with orange plastic flagging should last a couple of years but they should be marked with paint if they are not to be felled soon. Finally hemlocks that were in locations that were significant to the aesthetics of the area and judged to be in suitable condition that insecticide treatment would allow them to retain vigor were identified. Separate individual stems were located by GPS and marked with blue flagging. Small groves of trees around the tennis courts and along Diamond Avenue are identified solely on the included map.

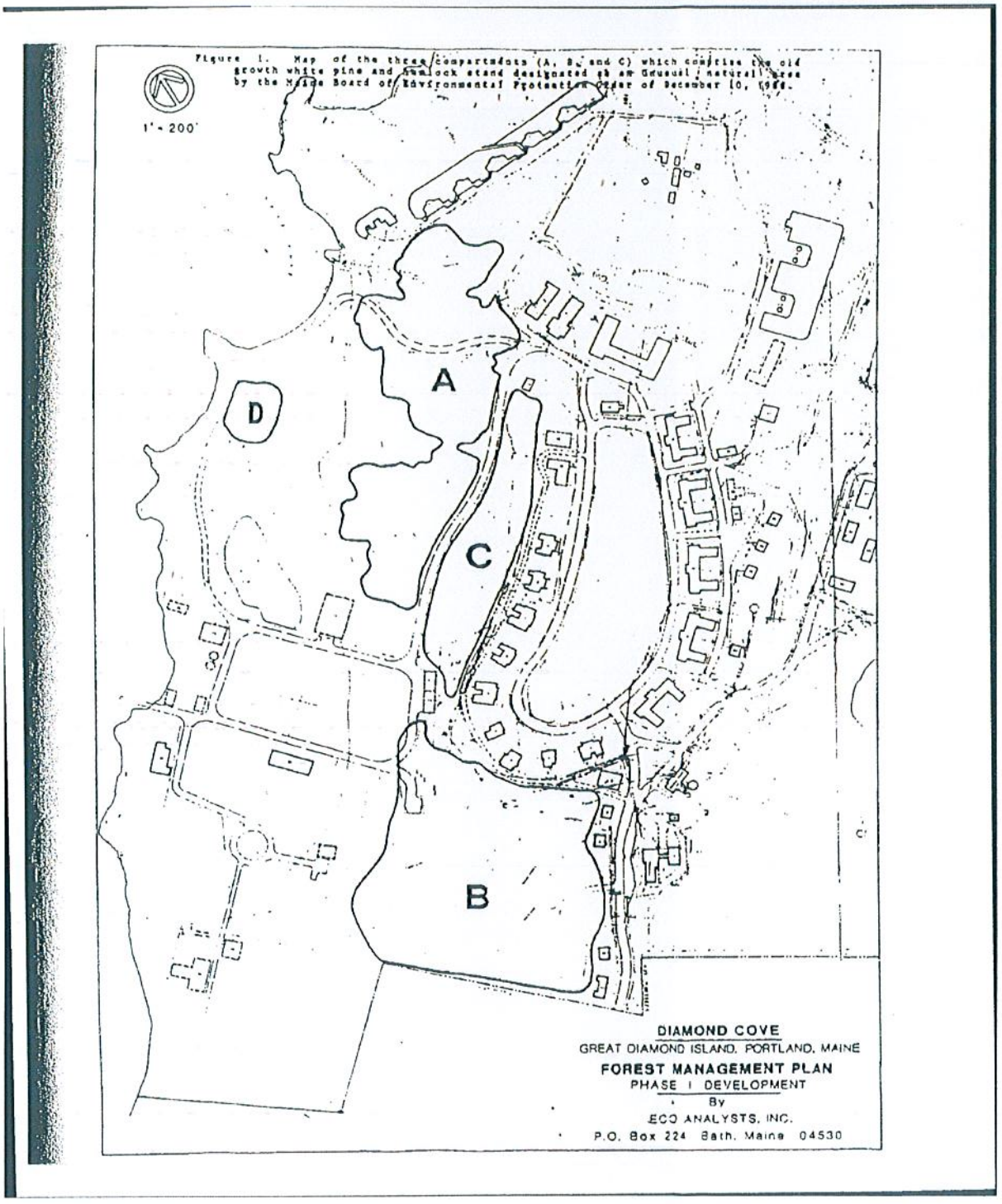
**Report**

The forest management plan prepared in 1989 gives an excellent description of the stand, soils, terrain, and other physical features. That work has not been recreated in this report. There has been little change in the forest other than a small amount of wind damage and other natural mortality. The hemlock wooly adelgid infestation and its effect is the primary change in forest conditions.


DELORME
XMap® 7
Diamond Cove Home Owner Assoc.
Common Area Shown in Red
Portland Parcel Map Shown in Purple
Proposed Transfer Station
drawn by:
Rene D. Noel, Jr. ACF
Maine Licensed Forester # 325
November 20, 2013
Not a legal survey
Data use subject to license.
© DeLorme. XMap® 7.
www.delorme.com
MN (15.5° W)
0 120 240 360 480 600 ft
Data Zoom 15-1


This area totals 15.58 acres and is a mapping of my judgement of the old growth stands boundary to the drip edge of the crowns of the trees identifying the edge of the stand. This is the accepted definintion of a stand boundary. The old growth was determined by me based on size, branching, stem and bark characteristics which indicate old age for the various species. It contains some area in gravel roads which is consistant with the 1989 map. The acreage stated in 1989 was 17.43 acres and this includes a 35 foot buffer where the old growth is bordered by younger forest.

Compartment Map from 1989 Plan




DeLORME
XMap® 7
Diamond Cove Home Owner Assoc.
Old Growth Compartments
Yellow line approximate 1989 mapping
Green line 2013 GPS mapping
A
B
C
D
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MN (15.5° W)
0 100 200 300 400 500 ft
Data Zoom 16-0


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Diamond Cove Home Owner Assoc.
Common Area Shown in Red
Portland Parcel Map Shown in Purple
GPS Bounds of Old Forest Coarse Pattern Green
Other Commonly Owned Forest Fine Pattern Green
Proposed Transfer Station
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MN (15.5° W)
0 140 280 420 560 700 ft
Data Zoom 15-4

**Damage by Hemlock Wooly Adelgid**

All of the hemlock are showing signs of damage from adelgid feeding. I would estimate that on the average, the hemlock have about 50% of normal foliage density. Hemlock is a significant component of Compartment A, (39.9%), Compartment B, (75.3%) and Compartment C, (23.4%) Compartment D (0%). There are also some understory sapling and small pole size hemlock that were not inventoried and are not included in these numbers.

With out insecticide treatment it can be anticipated that mortality of the hemlock will approach 100%. Based on 1989 inventory and my observations there would be about 300 tons of biomass contained in these trees. That would be about 10 tractor trailer loads of material. About a third or 100 tons would be in fine to medium size fuel which is of concern in a wildfire situation.

There is the option of harvesting all the hemlock and removing them from the island.

Hemlock is not particularly valuable as timber. Considering the cost of utilizing this material by shipping it to the mainland and the impact of heavy equipment needed to remove it I do not recommend this option.

The second option is to fell the stems as they die and treat the fine and medium size fuel to make it less flamable. Within 100 feet of any structure I recommend chipping branches and tops with a portable chipper. In areas over 100 feet from buildings branches and tops should be cut up so they lie within a foot or two of the ground. This treatment will hasten their decay and the close proximaty to the ground will keep the moisture content up in the fuel making it less flamable.

Current Hazards

Fourteen stems, 3 hardwoods and 13 hemlock were judge as currently being hazardous and located where they could damage people or property should they fail. They are marked with orange flagging. I did not get an estimate from arborists on the cost of dropping and treating these stems.

The three hardwoods are the most difficult to remove. A white birch, a red maple and a large sugar maple located at the eastern edge of Compartment C are all fairly close to residential buildings and are not easy to remove. The large sugar maple is located between two buildings and contains a considerable amount of rot. It will be somewhat of a challenge to remove. The weight of the large limbs indicate they are likely to fall towards the building to the trees north.

The hemlocks are located that they can likely be felled away from improvements.

I did not get estimates from arborists on the cost of removing these stems but I would estimate a mainland cost in the $5,000 to $10,000 range. My experience with transporting men and equipment is it adds significantly to the cost.

Future Mortality

Based on the inventory in the 1989 plan it appears there are 250 large hemlock in the three compartments. I have identified approximately 99 that can be treated and their lives extended for as long as the association is willing to continue treatment. These were either marked with blue flagging (individual stems ) or are located in small groves shown on included map. That leaves approximately 150 trees that are likely to die in the next 5 to 10 years if adelgid feeding damage remains at current levels. Or in other words there will be about 20 trees per year that will need to be dropped, limbed and limbs cut up or chipped.

Trees that are not near buildings or other improvements can be dropped by a proffessional logger limbed and slash treated less expensively than by a licensed arborist. I would estimate the cost for this sort of work to be about $100 per tree plus transport cost.

Trees near buildings and improvements should be taken down by a licensed arborist who is skilled and insured for in this work. A two man arborist crew with truck and chipper is being billed in the $300 per hour range. I would estimate they can fell and chip branches from two to four trees per day.

I recommend the Association budget an amount annually to do a certain amount of this work. Arborists' slow season is usually winter and this is the most suitable time to do this sort of work in this community. It may be possible to negotiate some discount from regular fees with a long term contract.

Replanting

Where the hemlock is in decline more light is reaching the forest floor. Seedlings and saplings are already responding to this increase light. In many areas this natural reseeding will replace the forest. In those areas that this does not occur or where it is destroyed during felling and fuel reduction activities of dying hemlock I recommend planting white pine and red oak. Both are native to the island, grow well in that environment and are trees that are well rooted and wind firm in windy conditions. There are numerous young stems, seedlings and saplings already established. Where and how many replacement trees will be needed will depend on how many are destroyed in the felling process. Where sizable areas (600 sq. ft or more of open ground is my recommendation) of regeneration are destroyed I recommend planting at the spacing described. There is no ratio between trees cut and trees planted.

I recommend seedlings be planted spaced about twelve feet apart. The oak should be protected with a five or six foot tree shelter to assure they grow above a height that will be browsed by deer. Large seedlings or transplants are recommended as these will more quickly grow out of reach of deer. Four or five year old pine transplants and oak seedlings a minimum of 24" tall are recommended. Depending on quantity, this size stock is available for $3.00 to $10.00 per seedling.

Invasive Plants

The plant community on the island includes a large number of invasive species. Honysuckle, bittersweet, barberry and Japanese knotweed are those noted which are likely invade disturbed forested areas. These species are very aggressive and have the potential to dominate a site preventing native vegetation from reestablishing itself. Controlling these species is difficult. It is possible to control small infestations by uprooting the plants. However, such mechanical control is labor intensive and needs to be repeated annually to remove sprouts from broken roots and new seedlings. Herbicides are much more efficient. Glyphosate the active chemical in Roundup brand yard products will control all of these. The woody species can be controlled with either a foliar application later in the growing season or by treating the surface of cut stumps within a day or two of the stems being cut. Japanese knotweed is easiest to treat with a foliar application. Ideally this should be done at the time of flowering. Stems are hollow and stems can be cut and treated by pouring herbicide into the hollow stem but this is very time consuming on all but smallest infestations.

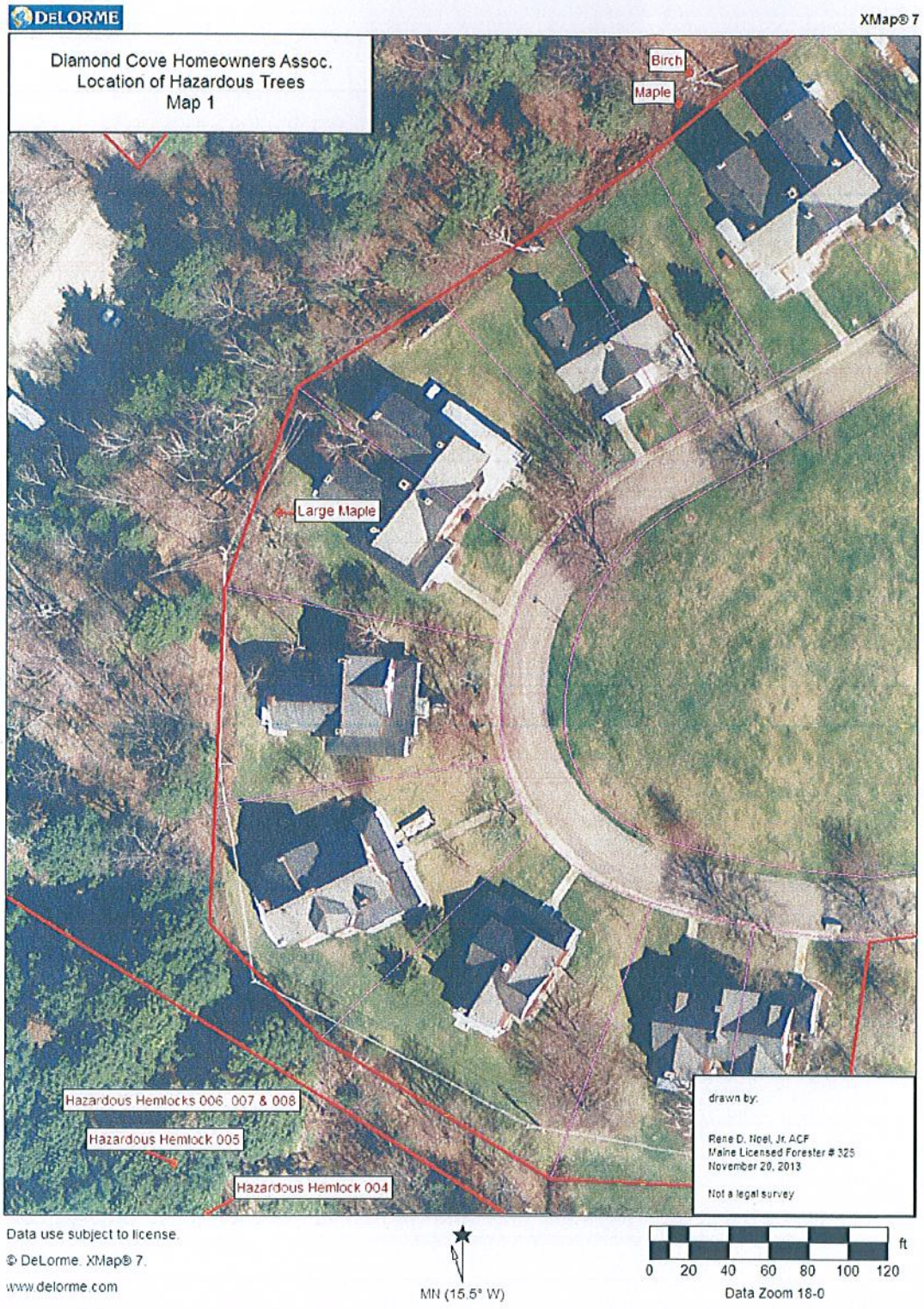
Managing Fire Risk

Risk of wild fire is best controlled by controlling fuel. To begin any flamable materials that collect around buildings should be removed. Porches, decks and other attached objects as well as gutters, roof valleys and other places were debris collects should have leaves and other fine fuels removed. Ideally the areas where this material collects should be screened to prevent these build ups.

Away from the building concentric rings of treatment should be applied. Nearest the building should have plant material and landscaping which is fire resistant such as green lawn, gravel or pavement. Shrubs should not be planted so they contact the building and species which are less likely to burn (hardwoods species in general) should be considered. Continuous stands of vegetation that could carry a fire should be avoided. This ring is typically the area immediately around the house lawn and other landscaped features. The next ring is more natural vegetation but in which fine fuel is not allowed to accumulate. Nor should dense stands of young stems be allowed to grow. Park like comes to mind with well space trees and understory plants and little brush or other fine flamable fuels. Typically 75 feet is recommended for this ring. The outer ring is the natural forest. Large trees do not easily burn. It takes a ladder of fuel from the ground to the crowns of large trees to ignite them. Controlling fire danger means controlling this fuel. The litter and duff layer of organic material is flamable but being on the ground maintains a fairly high moisture content and slower burning. Dead limbs and branches and small seedlings and saplings particularly softwoods are the most common fast fuels in a forest. Chipping or lopping dead material so it lays within a foot or so of the ground will hasten its decay and place it so it maintains a high moisture content. Seedlings and saplings should be spaced so there is not a continuous stand. Individual stems and small groups seperated from each other are ideal. As these grow lower limbs can be pruned until the stem is free of limbs for 6 or 8 feet.

My fire training occurred in a much drier climate than Maine but I believe the guidelines would be applicable to an island situation. In that climate it was recommended that a fire resistant forest be maintain out at least two tree lengths out from any structures or improvements. In this case that means about 150 feet back from anything that should be protected from fire.

Following these recommendations does not remove all fire danger. It should, however, slow the advance of a wildfire giving time for the arrival of men and equipment that will suppress the fire.


DeLORME
XMap® 7
Diamond Cove Homeowners Assoc.
Location of Hazardous Trees
Map 1
Birch
Maple
Large Maple
Hazardous Hemlocks 006, 007 & 008
Hazardous Hemlock 005
Hazardous Hemlock 004
drawn by:
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MN (15.5° W)
0 20 40 60 80 100 120 ft
Data Zoom 18-0


DeLORME
XMap® 7
Diamond Cove Home Owner Assoc.
Location of Hazardous Trees
Map 2
Hazardous Hemlocks 006, 007, 008
Hazardous Hemlock 005
Hazardous Hemlock 004
Hazardous Hemlock 001, 002
Hazardous Hemlock 009
Hazardous Hemlock 010
Hazardous Hemlock 003
Hazardous Hemlock 011
Hazardous Hemlock 013
Hazardous Hemlock 012
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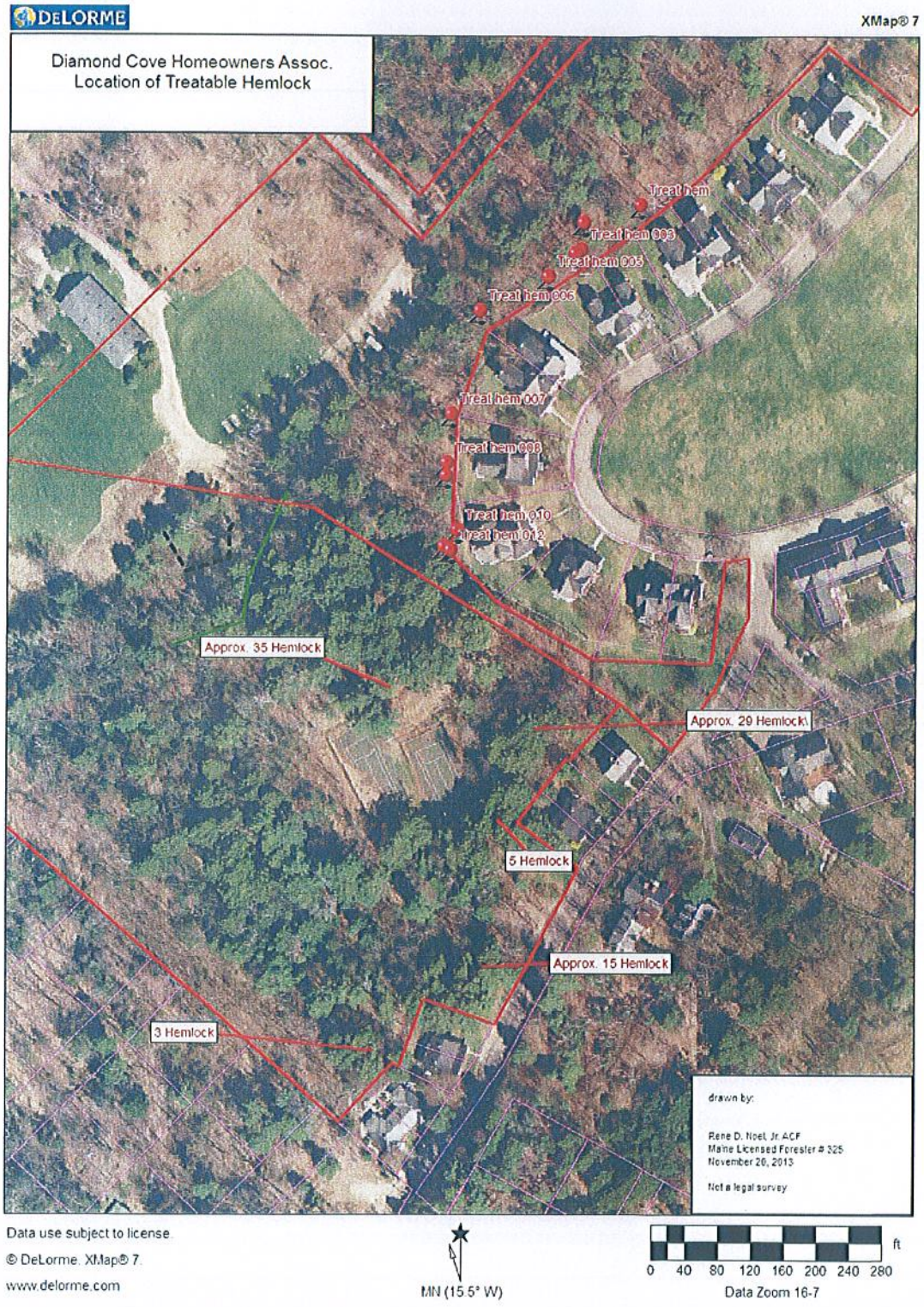
MN (15.5° W)
0 20 40 60 80 100 120 ft
Data Zoom 18-0

**Insecticide Treatment**

The forest between McKinley Court and West Side Drive and west of Diamond Avenue and around the tennis court have 99 hemlocks that contribute greatly to the forest of that residential area. Systemic insecticides containing the active ingrediant imidacloprid are effective in controlling the insect for a number of years following application. Some research has shown treatments every three or four years may be effective. Other products are in development/label phases and current product recommendations should be checked when treatments are planned.

This sort of treatment is fairly low tech. Backpack sprayers are used to either apply the chemicals to the ground or stem or granules are spread on the ground. It is necessary for the tree to absorb the chemical and translocate it to the needles. I estimate it would take a two man crew a full day to do the treatment. Depending on the cost of chemical at the time I estimate the cost of treatment to be in the $2,000 range.


DeLORME
XMap® 7
Diamond Cove Homeowners Assoc.
Location of Treatable Hemlock
Treat hem
Treat hem 003
Treat hem 005
Treat hem 006
Treat hem 007
Treat hem 008
Treat hem 010
Treat hem 012
Approx. 35 Hemlock
Approx. 20 Hemlock\
5 Hemlock
Approx. 15 Hemlock
3 Hemlock
drawn by:
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MN (15.5° W)
0 40 80 120 160 200 240 280 ft
Data Zoom 16-7

**Trash Transfer Station**

Most of the proposed site is in an area which appears to have not been forested 24-27 years ago when the original work for the forest management plan was undertaken. However, one corner will encroach on the old growth stand and will require the removal of one large hemlock tree. This tree is not in good condition because of adelgid feeding. As I envision the propose construction work less than 500 square feet within the old growth stand will need to be disturbed. The effect on the stand will not be noticeable. I suggest as a mitigation that buffer area to the west be expanded by a similar area. There are some large hardwood stems in this area that are 40 or 50 years younger than the oldest trees. With the anticipated loss of the hemlock due to adelgid damage these will be a natural expansion of a stand with old growth characteristics.

## Summary of Recommendations/Findings:

- Use of new technology (GPS mapping) has enabled a more precise delineation of the Old Growth Forests first identified in 1989 plan (page 2)
- trees identified and marked- establish tree drip line as the exact edge on all Old Growth trees along the border of each compartment (page 4)
- Woolly adelgid damage to Old Growth hemlocks evaluated
    - Certain trees that pose a hazard to life or property marked for removal (page 8)
    - Certain trees with enough vitality remaining to benefit from insecticide application marked (page 14)
- Recommendation for DCHA to create an ongoing yearly budget to deal with the eventual death and removal of infected hemlocks (page 9)
- Replanting recommendations made for certain areas of the Old Growth stand using native species (page 9)
- Recommendations made for the proper cutting/removal/chipping of damaged/dead trees within the stand to mitigate forest fire risk (pages 8-9)
- Recommendation on limb trimming and removal of small saplings as part of good management practices (page 10)
- Recommendations on insecticide application to save viable hemlocks (page 14)
- Minimal impact to Old Growth Stand (Compartment B) due to proposed construction of trash transfer station
    - 1 infested hemlock should be removed (page 16)
    - Add 500 square feet of area to the west of Compartment B to offset any disturbance and harmonize existing Old Growth area with large hardwoods within this new area (page 16)

# Section 5

## Abutters

09405

**Section 5**

## Abutters List

| Current Owner/Mailing Address | MAP | LOT |
|---|---|---|
| Diamond Cove Homeowners Association<br>C/O Phoenix Management<br>PO Box 759<br>Saco, ME 04072 | N/A | N/A |

# Section 6

## Notice of Intent to File

09405

**Section 6**

## Notice of Intent to File

A public notice has been published in the Portland Press Herald on August 9, 2014. An annual meeting was held. A copy of the Public Notice, newspaper publication certified is enclosed. Also, DCHA membership discussed the project at their annual meeting on July 26, 2014. Since the only abutters are members of the DCHA, who is a party to the lease agreement, certified mailings were not sent.

**PUBLIC NOTICE PUBLIC NOTICE OF INTENT TO FILE**

PUBLIC NOTICE PUBLIC NOTICE OF INTENT TO FILE Please take notice that The City of Portland, Maine located at 55 Portland Street, Portland, Maine 04106,Tel. 207-874-8467 is intending to file an application with the Maine Department of Environmental Protection (DEP) on or about August 15,2014 pursuant to the provisions of 38 M.R.S.A., Section 1301 et seq. and 06-096 CMR Chapter 400 et seq. The application is for construction of a solid waste transfer and recycling facility. at Great Diamond Island, Portland, Maine owned by Diamond Cove Homeowners Association and operated by City of Portland, Maine According to Department regulations, interested parties must be publicly notified, written comments invited, and if justified, an opportunity for public hearing given. A request for a public hearing, or that the Board of Environmental Protection assume jurisdiction of the application, must be received by the Department, in writing, no later than 20 days after the application is accepted by the Department as complete for processing. The application and supporting documentation are available for review at the Bureau of Remediation and Waste Management (BRWM) at the appropriate DEP regional office, during normal working hours. A copy of the application and supporting documentation may also be seen at the municipal office in Portland, Maine. Send all correspondence to: Maine Department of Environmental Protection, Bureau of Remediation and Waste Management, 17 State House Station, Augusta, Maine 04333-0017 (207-287-2651 or 1-800-452-1942), or to the appropriate regional office, if known. #5118217

Appeared in: ***Portland Press Herald/Maine Sunday Telegram*** on Saturday, 08/09/2014

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# Section 7

## Financial Ability

## Financial Ability

The City of Portland has funded this project through the Capital Improvement Program (CIP). The following letter from the Michael Bobinsky, Director of Public Services identifies the funding amount and sources. We have also included an engineer's cost estimate which confirms the funding is expected to adequately address expected construction costs.

# Section 8

## Technical Ability

## Technical Ability

The City of Portland currently operates and maintains its own solid waste management program including Island services. Full and part-time Public Services staff are trained in the management of solid waste programs and will be assigned to the facility. Troy Moon is the City of Portland's Environmental and Open Space manager and will oversee the facility operations, staffing and overall management. Troy has managed the solid waste program for the City of Portland since 2003.

The City of Portland has retained Sebago Technics, Inc., an engineering and design firm familiar with the operations of solid waste facilities. Sebago Technics has completed the design and permitting for several other Maine facilities to include the Towns of Waterboro, Acton, Winterport, Naples, Fryeburg, Ogunquit and the City of Portland (see attached information).

# Section 9

# Disclosure Statement

09405

**Section 9**

## Disclosure Statement

As required stipulated in Chapter 400, Section 12(A) of the Maine Solid Waste Management Regulations, the following disclosure statement and information is provided.

Applicant: City of Portland, Maine

Managerial Authority over Facility:

Michael J. Bobinsky, Director of Public Services
E-mail: mbobinsky@portlandmaine.gov
Tel. 207-874-8823

Troy Moon, Environmental and Open Space Manager
E-mail: THM@portlandmaine.gov
Tel. 207-874-8823

Applicant Information:

City of Portland
Department of Public Services
55 Portland Street
Portland, Maine 04101

The City of Portland is not aware of any pending or current solid waste management criminal convictions, civil violations, consent decrees, administrative orders or other enforcement proceeding related to solid waste management.

# Section 10

# Other Authorizations

## Other Authorizations

The Great Diamond Island project is expected to require the following land use and environmental permits.

1. MaineDEP Minor Site Location of Development Act permit modification for inclusion of an updated Forest Management Plan as part of the Diamond Cove Associates SLODA Permit. This permit will be filed simultaneously with the Solid Waste Transfer Station Permit application.

2. Maine DEP Solid Waste Transfer Station or Storage Site Reduces Procedures Application under Chapter 402 of the Maine Solid Waste Management Regulations.

3. City of Portland Planning Department/Board Site Plan approval. In conjunction with the MDEP permitting, the City will be filing for local permit approvals.

4. City of Portland Building Permit. This permit will be required for the actual construction of the facility and will be obtained once all other permits are granted.

5. City Council approval.

# Section 11

## Waste Handling Area Setbacks

09405

**Section 11**

**Waste Handling Area Setbacks**

The project will be located on Great Diamond Island and not connected to the mainland by a road. The Maine Department of Environmental Protection, Solid Waste Management Rules stipulate the following for Island Transfer Stations:

(2) Located on an island not connected to the mainland by a road. All transfer stations or storage sites regulated by this section and located on an island not connected to the mainland by a road shall meet site-specific setback distances from residences, property boundaries, and public roads as established by the Department on a case-by-case basis, based upon information submitted to the Department. The setbacks will be sufficient to minimize unreasonable adverse impact on residents, and the compatibility of the transfer station or storage site with abutting property uses will be considered. If all abutting landowners give written approval to the location of the proposed transfer station or storage site's handling site, the Department shall find that the proposed setbacks are reasonable and compatible.

The City of Portland has worked with the Land Owner, Diamond Cove Homeowners Association (DCHA) to identify and agree on a location for the Solid Waste Transfer Station. The location is internal to the property held entirely under control by the DCHA. As a result, all residential abutters to the solid waste handling boundary are part of the DCHA property. A letter of authorization and lease agreement are enclosed between the DCHA and City of Portland. We therefore, respectfully request that the Department find the location of the transfer station and setbacks are reasonable and compatible with the intended use.

# Section 12

## Siting and Design Information

## Siting and Design Information

As described in Section 1 of this permit application, the City of Portland has undertaken an extensive search in cooperation with DCHA to locate a parcel of land suitable for construction of a new solid waste transfer facility to continue servicing the residents and businesses of Great Diamond Island.

As part of the Cities effort in selecting this location for a new solid waste transfer facility, a site evaluation was completed to include review of soils information, site reconnaissance, topographical survey and identification of a suitable construction window for a solid waste transfer facility.

Sebago Technics, Inc. has prepared the detailed site drawings for application to the Maine DEP and construction of the facility. Enclosed with this application are several site design plans drawn to suitable scale depicting the design data and information for permitting and construction of the facility. In general, these plans include the following:

1. Complete boundary and topographical survey prepared by the City of Portland.

2. Overall site layout and design plan.

3. Site design plan depicting geometric layout of the access roadway, site operations area, buildings, retaining wall systems, and circulation patterns.

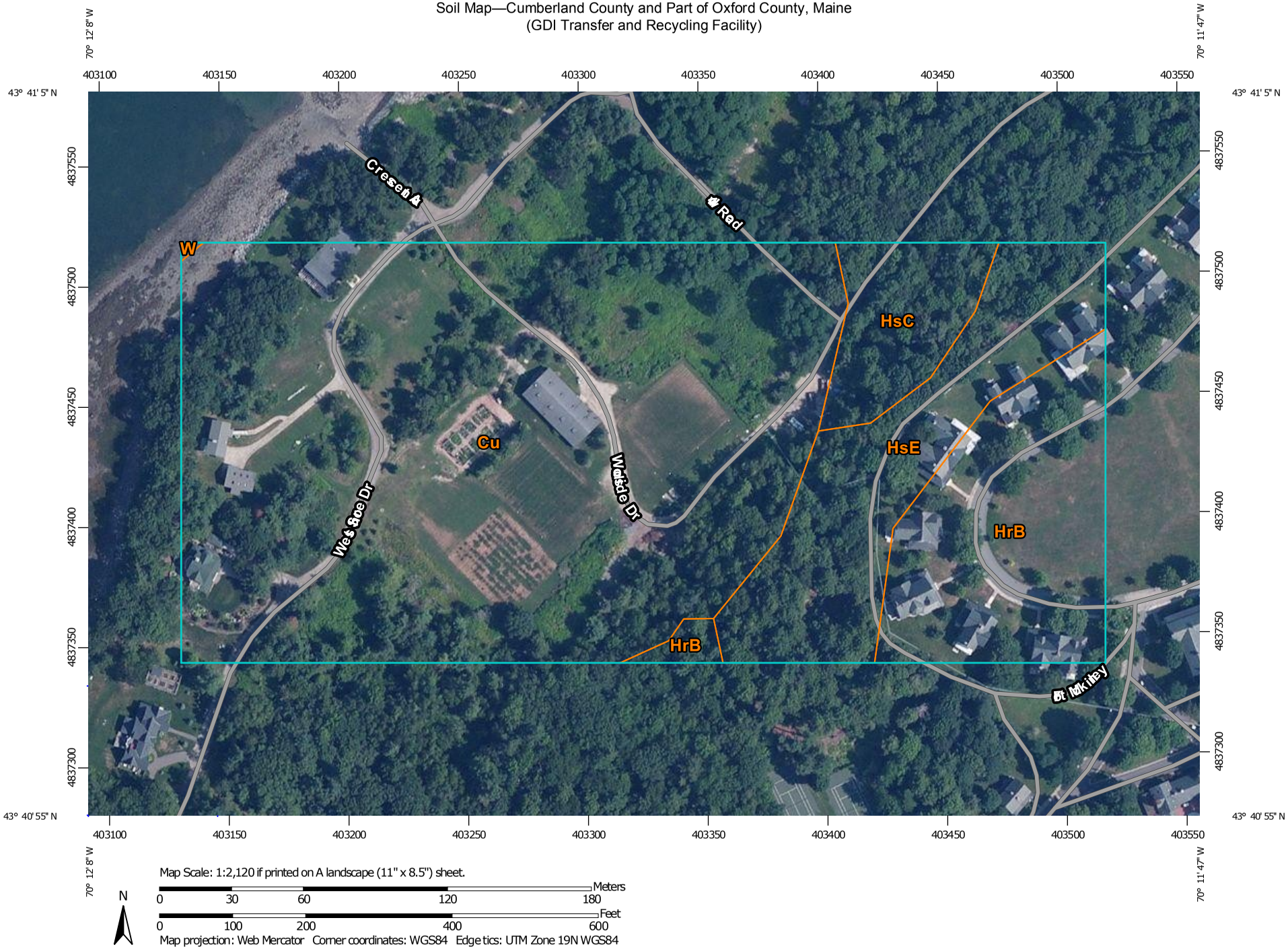
4. A grading, drainage and utility plan has also been prepared depicting proposed finish grading of the facility. This includes provisions for drainage collection and stormwater management, along with site specific erosion and sedimentation control measures. The plan has been prepared based upon a detailed stormwater management plan prepared as part of this design submittal following Maine DEP's Chapter 500 stormwater regulations.

5. Site construction details, including structural and non-structural drainage and erosion control details, along with supporting construction details for the project development.

Soil information obtained from the Cumberland County Soil Survey (included in this section) maps the site as Cut/Fill land and Hollis fine sandy loam and Hollis very rocky fine sandy loam with varying slope conditions. A site specific soils investigation was completed including test pits. Enclosed are copies of the test pit logs. These soils are expected to be suitable for the intended use to support the structures (retaining wall and site development).

In addition, site specific erosion and sedimentation control measures, along with the stormwater management plan, will be implemented consistent with the Maine DEP's chapter 500 Stromwater Management provisions. A stormwater management report is included in this section.

Soil Map—Cumberland County and Part of Oxford County, Maine
(GDI Transfer and Recycling Facility)



## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 8, Nov 27, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 20, 2010—Jul 18, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Cumberland County and Part of Oxford County, Maine (ME005) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| Cu | Cut and fill land | 11.0 | 65.9% |
| HrB | Hollis fine sandy loam, 3 to 8 percent slopes | 2.5 | 14.8% |
| HsC | Hollis very rocky fine sandy loam, 8 to 20 percent slopes | 0.9 | 5.4% |
| HsE | Hollis very rocky fine sandy loam, 20 to 35 percent slopes | 2.3 | 13.8% |
| W | Water | 0.0 | 0.1% |
| **Totals for Area of Interest** | | **16.7** | **100.0%** |

FORM F

09405

# SOIL PROFILE CLASSIFICATION INFORMATION

Project Name: TRANSFER AND RECYCLING FACILITY

Applicant Name: CITY OF PORTLAND - GREAT DIAMOND ISLAND

Project Location (municipality): PORTLAND

## SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-1 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

| Texture | Consistency | Color | Mottling |
|---|---|---|---|
| FINE SANDY LOAM | FRIABLE | 2.5Y 4/2 DARK GRAYISH BROWN | NONE OBSERVED |
| LEDGE AT 12" | | | |

■ hydric ☐ non-hydric

Slope %: 15-25

Limiting factor: 12"

■ ground water ☐ restrictive layer ■ bedrock

C.S.S. Soil Series / phase name: LYMAN — Drainage Class: SWED — Hydrologic Group: C/D

L.S.E. Soil Classification: — Profile — Drainage Class — Design Class

## SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-2 ■ Test Pit ☐ Boring

0 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

| Texture | Consistency | Color | Mottling |
|---|---|---|---|
| SANDY LOAM FILL | FRIABLE | 2.5Y 3/2 VERY DARK GRAYISH BROWN | |
| GRAVELLY LOAMY SAND | | 10YR 4/4 DARK YELLOWISH BROWN | |
| SILT LOAM | FIRM | 2.5Y 4/3 OLIVE BROWN | MANY, COARSE, & PROMINENT |
| LIMIT OF EXCAVATION = 60" | | | |

☐ hydric ■ non-hydric

Slope %: 0-3

Limiting factor: 36"

■ ground water ■ restrictive layer ☐ bedrock

C.S.S. Soil Series / phase name: ELMWOOD-LIKE — Drainage Class: MWD — Hydrologic Group: C

L.S.E. Soil Classification: — Profile — Drainage Class — Design Class

## SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-3 ■ Test Pit ☐ Boring

0-1 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

| Texture | Consistency | Color | Mottling |
|---|---|---|---|
| SANDY LOAM FILL WITH STONES AND BRICKS | FRIABLE | 2.5Y 3/2 VERY DARK GRAYISH BROWN | |
| LOAM | | 2.5Y 3/1 VERY DARK GRAY | COMMON, MEDIUM, & DISTINCT |
| FINE SANDY LOAM | SOMEWHAT FIRM | 10Y 5/1 GREENISH GRAY | |
| LIMIT OF EXCAVATION = 45" | | | |

☐ hydric ■ non-hydric

Slope %: 0-3

Limiting factor: 24"

■ ground water ☐ restrictive layer ☐ bedrock

C.S.S. Soil Series / phase name: ELMWOOD-LIKE — Drainage Class: MWD — Hydrologic Group: C

L.S.E. Soil Classification: — Profile — Drainage Class — Design Class

## SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-4 ■ Test Pit ☐ Boring

0 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

| Texture | Consistency | Color | Mottling |
|---|---|---|---|
| FINE SANDY LOAM FILL WITH METAL PIPES AND STONES | FRIABLE | 2.5Y 3/2 VERY DARK GRAYISH BROWN | |
| SILT LOAM | FIRM | 2.5Y 4/2 DARK GRAYISH BROWN | MANY, COARSE, & PROMINENT |
| LIMIT OF EXCAVATION = 54" | | | |

☐ hydric ■ non-hydric

Slope %: 3-8

Limiting factor: 36"

■ ground water ☐ restrictive layer ☐ bedrock

C.S.S. Soil Series / phase name: ELMWOOD-LIKE — Drainage Class: MWD — Hydrologic Group: C

L.S.E. Soil Classification: — Profile — Drainage Class — Design Class

## Professional Endorsements (as applicable)

C.S.S. signature: Gary M. Fullerton — Date: 5/29/14

name printed/typed: Gary M. Fullerton — Lic.#: 462

L.S.E. signature: — Date:

name printed/typed: — Lic.#:

STATE OF MAINE GARY M. FULLERTON NO. 462 CERTIFIED SOIL SCIENTIST

affix professional seal

**Sebago Technics, Inc.**

# Section 13

## Traffic Movement

## Provisions for Traffic Movement

The project site has been designed to accommodate circulation of truck traffic entering and exiting the site in addition to the loading and unloading of solid waste containers. Circulation areas will be paved and will provide sufficient room for the maneuverability of transport vehicles.

Operationally, it is anticipated that the unloading of solid waste materials will be completed by City Public Services personnel or DCHA staff generally utilizing 1 Ton trucks. Since the facility will not be open to the general public, operational times will vary depending on curbside pick-up schedules and seasonal fluctuations in usage. In general, it is anticipated the operational vehicles may access the site 6 -12 times a day during peak usage and at other times (mostly winter months) their maybe days of inactivity at the site. Transport vehicles removing solid waste containers is expected to occur 1 to 2 times per week seasonally influenced. Operations will need to be consistent with the lease agreement conditions.

The project site is located entirely on private property and does not require any Maine Department of Transportation permitting.

# Section 14

## Existing Uses and Scenic Character

## Existing Uses and Scenic Character

The project site is located within a former Military complex (Fort McKinley) that has since been renovated into a private community on the Island. Existing uses within the vicinity of the proposed transfer station includes open field that also serves as a community subsurface wastewater disposal system and a storage building commonly referred to as the "laundry building." Apparently, this building served as a common laundry facility during the military's occupation of the property. The nearest occupied residential dwellings are located up gradient approximately 250 feet easterly of the solid waste handing area. The residential dwellings are part of the Diamond Cove Homeowners Association (DCHA) who are also the land owners of the property and have granted approval for the project.

The project location is well suited for the intended use as the site is located away from developed areas and is near the end of a looped island roadway. Uses in the immediate are very compatible and include the community wastewater disposal fields and a storage building. Topographical conditions and forested areas provide for excellent buffering and screening from residential or other similar uses. As a result, the project location is not expected to have an adverse effect on existing uses

## Air Quality

Operations associated with the transfer station will produce minimal point source air emissions. These emissions will originate from operational vehicle traffic in the form of exhaust and dust.

The site design has incorporated a bituminous entrance road to reduce dust in the most heavily traveled corridor. Buffers and setbacks have also been incorporated to minimize the effect of dust, exhaust, and noise from the operational areas. With these provisions, it is anticipated that the proposed transfer station will have no significant negative effects on air quality in the area. Odors from MSW waste will be minimized by through the enclosed containers and removal of the waste in a timely manner. Should obnoxious odors become a concern, odor absorbent products or similar will be applied.

# Section 16

## Other Natural Resources

## Other Natural Resources

In conjunction with the topographical and subsurface test pit exploration program, a detailed site review was completed to delineate wetland areas. In November of 2012, the on-site wetlands were mapped by Sebago Technics, Inc. in accordance with standards and methods outlined in the 1987 wetlands delineation manual and regional supplement authored and published by the U.S. Army Corps of Engineers. Wetland delineation flags were field located by the City of Portland during controlled survey field work in April and May of 2013.

The delineated wetlands are forested wetlands and appear to be depressional in nature, receiving surface drainage from adjacent areas. The enclosed site design plans show the locations of these wetland areas as field delineated. As part of the project development, proposed improvements were sited to minimize impact to these wetlands and maintain the existing natural drainage paths that convey surface runoff to these wetland areas. Wetlands impacted by the development will be limited to two areas identified on the plans, for a total wetland impact area of approximately 2,386 s.f.

The start of an unnamed stream was identified near southerly portions of the lease area. Development will not encroach on the 75 foot stream natural resource setback.

# Section 17

## Adequate Provisions for Utilities

## Adequate Provisions for Utilities

City sewer and water currently extend into the existing site, however these services will not be upgraded to serve the transfer station.

Overhead utilities to include power is available at the project site and will be extended to serve the compactor and lights.

# Section 18

# Flooding

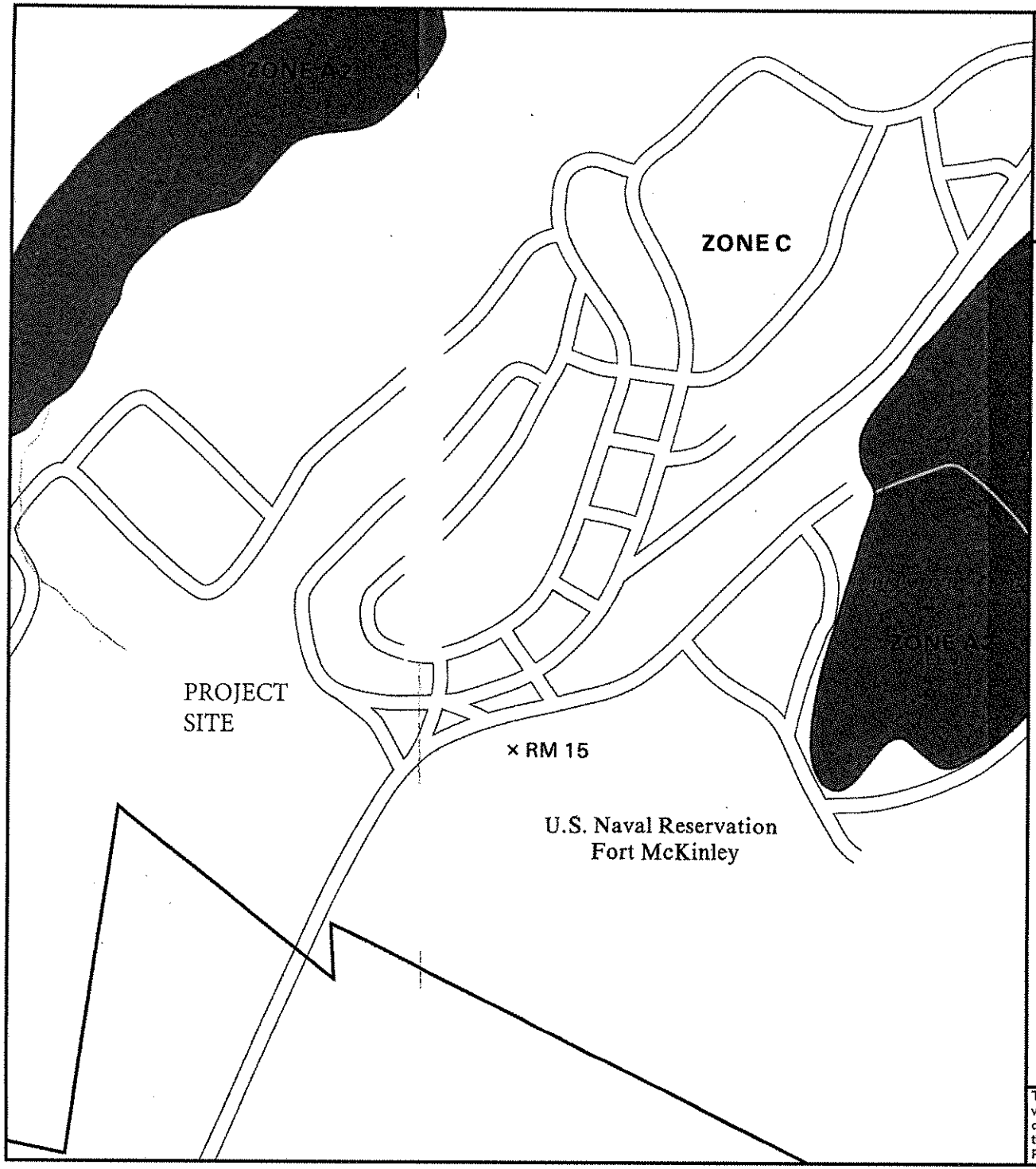
09405

**Section 18**

## Flooding

Included in this section for review is the FEMA Flood Insurance Rate Map (FIRM) that shows the 100-year floodplain zones.

Also included as part of the application are stormwater management report and runoff calculations that represent the site in the pre and post-development conditions. With the construction of two underdrained soil filters, stormwater runoff from the developed site will be detained and treated before discharging to offsite drainage ways. It is expected that there will be no increase in the potential for flooding of the site or the surrounding areas with the development of this project.




APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

# FIRM

## FLOOD INSURANCE RATE MAP

CITY OF
**PORTLAND, MAINE**
CUMBERLAND COUNTY

**PANEL 9 OF 17**
(SEE MAP INDEX FOR PANELS NOT PRINTED)

**COMMUNITY-PANEL NUMBER**
230051 0009 B

**EFFECTIVE DATE:**
JULY 17, 1986

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

SEBAGO
TECHNICS
CIVIL ENGINEERING · SURVEYING · LANDSCAPE ARCHITECTURE

# STORMWATER MANAGEMENT PLAN

# for

# Great Diamond Island Transfer and Recycling Facility

# Portland, Maine

prepared for

City of Portland
55 Portland Street
Portland, ME 04101

August 2014

75 John Roberts Road – Suite 1A, South Portland, ME 04106-6963 • 207.856.0277 • 207.856.2308

## TABLE OF CONTENTS

# STORMWATER MANAGEMENT PLAN

## Great Diamond Island Transfer and Recycling Facility
## Portland, Maine

## I. Introduction

This Stormwater Management Plan has been prepared to address the potential impacts associated with this project due to the proposed modification in stormwater runoff characteristics. The stormwater management controls that are outlined in this plan have been designed based on commonly accepted engineering methods and to comply with applicable regulatory requirements.

## II. Existing Conditions

The site is located within the Diamond Cove Association area of the Island near the former "laundry facility." This location is accessed from an existing gravel road and is currently used as storing miscellaneous materials for landscaping. The undeveloped portion of the site has moderate to steep topography to the northeast. The site contains approximately 8,924 square feet of disturbed surface area, including existing dirt/gravel drives, and material storage piles. The off-site stormwater is primary diverted around the site in through two wetland channels. The majority of the off-site runoff is collected in the eastern most wetland channel. This wetland drains to an existing underground storm drain system.

### A. Surface Water Features

There is a channelized forested freshwater wetland which abuts the site to the south and east.

### B. Site Topography

Slopes on the site are slight to steep, with the steep slopes mostly limited to the southern perimeter of the transfer station. The disturbed area has a slight slope and drains toward the eastern most wetland channel.

### C. Soils

Soil characteristics were obtained from the Soil Conservation Service (SCS) Medium Intensity Soil Survey of Cumberland County. Soils identified on the site

are identified below in Table 1. These soil boundaries have been identified on the attached Watershed Maps.

| Table 1 – Proximity Soil Types and Characteristics | | |
|---|---|---|
| Soil Type | Symbol | HSG |
| Cut and Fill Land | | C |
| Hollis Fine Sandy Loam | | C/D |

The hydrologic soil group (HSG) designation is based on a rating of the relative permeability of a soil, with Group "A" being extremely permeable such as coarse sand, to Group "D" having low permeability such as clay.

D. Historic Flooding

There are no apparent flooding problems associated with this site. Additionally, the Federal Emergency Management Agency (FEMA) has not identified a flood hazard area on the project site.

## III. Proposed Development

The applicant plans to construct a new transfer station. Associated work will include a new paved access drive around the facility, concrete dumpster pads, a compacter installation, and stormwater management BMP's.

A. Alterations to Land Cover

As a result of the proposed improvements, the site will include a development area of approximately 28,516 sf, of which 9,876 will be new impervious surface area.

## IV. Downstream Ponds and Waterbodies

Stormwater from the site mostly discharges to an existing military drainage system consisting of catch basin and drain pipes. This system appears to be in working order.

## V. Regulatory Requirements

A. City of Portland, Maine

This project is required to meet Chapter 500 standards to the regulations of Maine DEP Chapter 500 Stormwater Management Rules, including Basic, General and Flooding standards:

## VI. Stormwater Management Best Management Practices (BMPs)

Stormwater runoff from the project site will receive water quality treatment and attenuation of peak runoff management through the construction of stormwater BMPs consisting of Underdrained Soil Filters.

A. Underdrained Soil Filters

The Underdrained Soil Filters is designed to receive stormwater runoff from the circulation loading area below and drop-off area above. Stormwater will pond-up temporarily and filter through the soil media. The treated water will drain to a perforated underdrain pipe that outlets to the existing catch basin system.

## VII. Water Quality Analysis

In accordance with City of Portland Technical Design Manual and Maine DEP Chapter 500 we have provided stormwater quality treatment. We have provided stormwater quality treatment for approximately 9,382 s.f. of impervious surfaces. (See Attachment B for Calculations.)

## VIII. Peak Flow Analysis

In order to evaluate drainage characteristics as a result of the proposed development activities, a quantitative analysis was performed to determine peak rates of runoff for the 2, 10 and 25-year storms in the pre and post-development conditions. The evaluation was performed using the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds - Technical Release #55 (TR-55)". HydroCAD computer software was used to perform the calculations.

The results of the stormwater runoff calculations for the pre-development and post-development conditions are summarized in the tables below.

| Pre-development vs. Post-development Peak Flow Summary at Reach #2 | | | |
|---|---|---|---|
| 12" Culvert-Reach 1 | 2-year Peak Flow (cfs) | 10-year Peak Flow (cfs) | 25-year Peak Flow (cfs) |
| Pre-development | 2.60 | 3.03 | 3.03 |
| Post-development | 0.95 | 4.06 | 4.23 |
| Change | -1.55 | +1.03 | +1.20 |

In order to mitigate peak flows and handle this expected increase, two underdrained soil filters will be constructed. The soil filters will collect stormwater runoff and limit peak discharge rates to below pre-development rates for the 2 yr. storm. There will be a small increases during the 10 yr. and 25 yr. storm events. No adverse impacts to downstream drainage ways are expected as a result of the small increases because runoff is generally conveyed in a storm drainage system directly to the ocean.

## IX. Conclusions

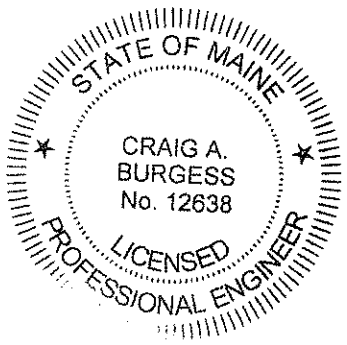
This Stormwater Management Plan has been designed with erosion and sedimentation controls, inspection and maintenance procedures and general housekeeping requirements to prevent unreasonable impacts to the surrounding environment and to provide a long-term plan for management of stormwater runoff from the site. Stormwater runoff should be adequately managed for the project if carried out in accordance with the design plans.

Prepared by,

SEBAGO TECHNICS, INC.

Craig Burgess

Craig Burgess, P.E.
Project Engineer

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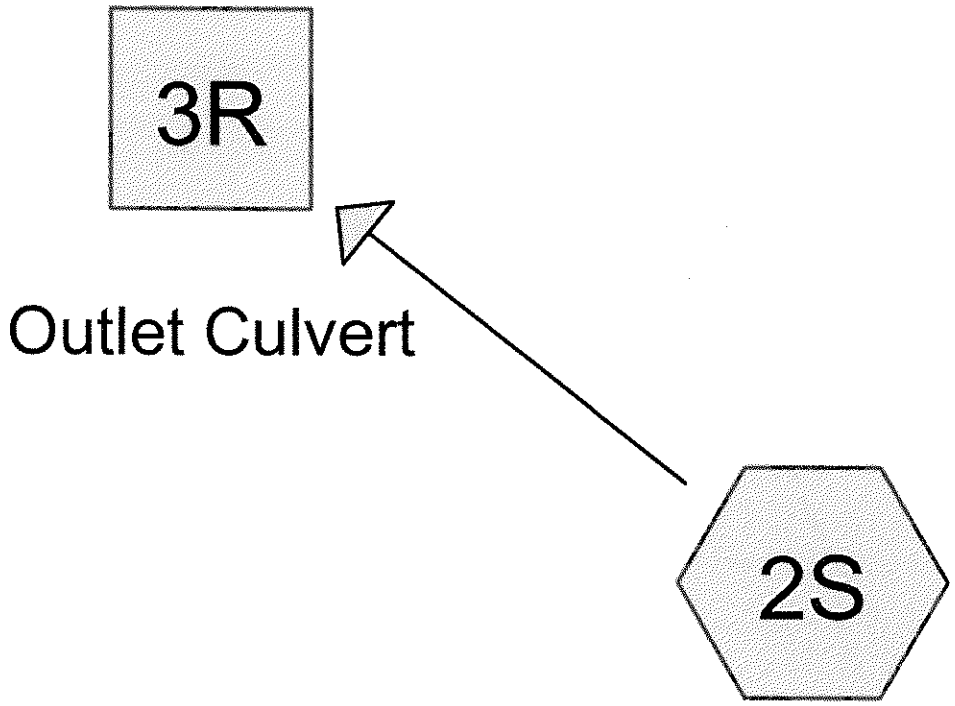
# Attachment A

## Hydrocad Output
## Pre- and Post-Development Tr-20 Model




Subcat Reach Pond Link

**Drainage Diagram for Pre-Development**
Prepared by Sebago Technics, Printed 8/19/2014
HydroCAD® 8.50 s/n 001856 © 2007 HydroCAD Software Solutions LLC

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 2.430 | 70 | Woods, Good, HSG C (2S) |
| 0.720 | 83 | 1/4 acre lots, 38% imp, HSG C (2S) |
| 0.200 | 87 | Dirt roads, HSG C (2S) |
| **3.350** | | **TOTAL AREA** |

## Summary for Subcatchment 2S: Pre-Development

Runoff = 8.57 cfs @ 12.19 hrs, Volume= 0.716 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.50"

| Area (ac) | CN | Description |
|---|---|---|
| 2.430 | 70 | Woods, Good, HSG C |
| 0.720 | 83 | 1/4 acre lots, 38% imp, HSG C |
| 0.200 | 87 | Dirt roads, HSG C |
| 3.350 | 74 | Weighted Average |
| 3.076 | | Pervious Area |
| 0.274 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 10.1 | 100 | 0.0200 | 0.16 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.00" |
| 2.0 | 120 | 0.1600 | 1.00 | | **Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps |
| 0.9 | 80 | 0.3200 | 1.41 | | **Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps |
| 13.0 | 300 | Total | | | |

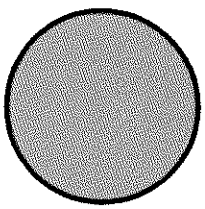
## Summary for Reach 3R: Outlet Culvert

Inflow Area = 3.350 ac, 8.17% Impervious, Inflow Depth > 2.57" for 25yr event
Inflow = 8.57 cfs @ 12.19 hrs, Volume= 0.716 af
Outflow = 3.03 cfs @ 12.05 hrs, Volume= 0.716 af, Atten= 65%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.40 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.65 fps, Avg. Travel Time= 0.5 min

Peak Storage= 64 cf @ 12.00 hrs, Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.03 cfs

12.0" Diameter Pipe, n= 0.020
Length= 81.0' Slope= 0.0172 '/'
Inlet Invert= 19.00', Outlet Invert= 17.61'



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 2S: Pre-Development** Runoff Area=3.350 ac 8.17% Impervious Runoff Depth>0.82"
Flow Length=300' Tc=13.0 min CN=74 Runoff=2.62 cfs 0.230 af

**Reach 3R: Outlet Culvert** Avg. Depth=0.72' Max Vel=4.35 fps Inflow=2.62 cfs 0.230 af
D=12.0" n=0.020 L=81.0' S=0.0172 '/' Capacity=3.03 cfs Outflow=2.60 cfs 0.230 af

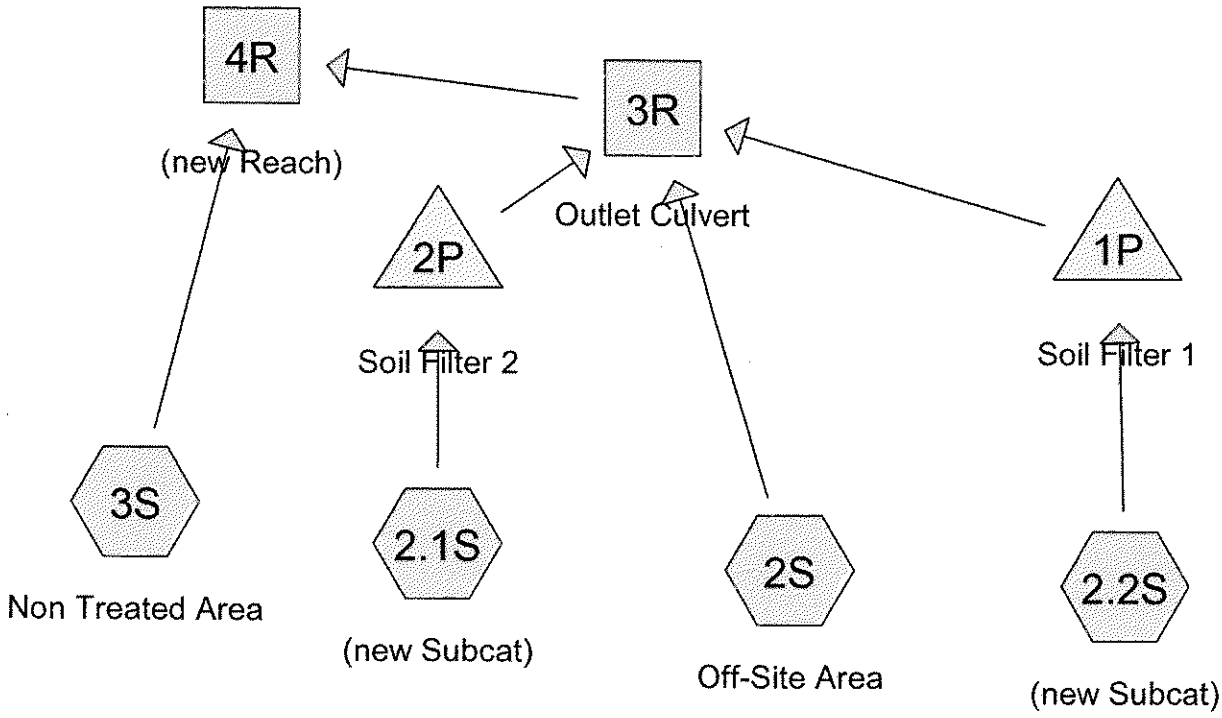
**Total Runoff Area = 3.350 ac Runoff Volume = 0.230 af Average Runoff Depth = 0.82"**
**91.83% Pervious = 3.076 ac 8.17% Impervious = 0.274 ac**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 2S: Pre-Development** Runoff Area=3.350 ac 8.17% Impervious Runoff Depth>1.96"
Flow Length=300' Tc=13.0 min CN=74 Runoff=6.54 cfs 0.548 af

**Reach 3R: Outlet Culvert** Avg. Depth=1.00' Max Vel=4.35 fps Inflow=6.54 cfs 0.548 af
D=12.0" n=0.020 L=81.0' S=0.0172 '/' Capacity=3.03 cfs Outflow=3.03 cfs 0.548 af

**Total Runoff Area = 3.350 ac Runoff Volume = 0.548 af Average Runoff Depth = 1.96"**
**91.83% Pervious = 3.076 ac 8.17% Impervious = 0.274 ac**




Subcat Reach Pond Link

**Drainage Diagram for Post-Development**
Prepared by Sebago Technics, Printed 8/19/2014
HydroCAD® 8.50 s/n 001856 © 2007 HydroCAD Software Solutions LLC

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 2.123 | 70 | Woods, Good, HSG C (2S) |
| 0.094 | 74 | >75% Grass cover, Good, HSG C (2.1S,2.2S) |
| 0.720 | 83 | 1/4 acre lots, 38% imp, HSG C (2S) |
| 0.567 | 98 | Paved parking & roofs (2.1S,2.2S,2S,3S) |
| **3.504** | | **TOTAL AREA** |

## Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 0.81 cfs @ 12.07 hrs, Volume= 0.057 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.50"

| Area (sf) | CN | Description |
|---|---|---|
| 5,316 | 98 | Paved parking & roofs |
| 1,600 | 74 | >75% Grass cover, Good, HSG C |
| 6,916 | 92 | Weighted Average |
| 1,600 | | Pervious Area |
| 5,316 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 0.90 cfs @ 12.07 hrs, Volume= 0.063 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.50"

| Area (sf) | CN | Description |
|---|---|---|
| 5,428 | 98 | Paved parking & roofs |
| 2,500 | 74 | >75% Grass cover, Good, HSG C |
| 7,928 | 90 | Weighted Average |
| 2,500 | | Pervious Area |
| 5,428 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 2S: Off-Site Area

Runoff = 7.53 cfs @ 12.19 hrs, Volume= 0.629 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.50"

| Area (ac) | CN | Description |
|---|---|---|
| 2.123 | 70 | Woods, Good, HSG C |
| 0.720 | 83 | 1/4 acre lots, 38% imp, HSG C |
| 0.100 | 98 | Paved parking & roofs |
| 2.943 | 74 | Weighted Average |
| 2.569 | | Pervious Area |
| 0.374 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 10.1 | 100 | 0.0200 | 0.16 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.00" |
| 2.0 | 120 | 0.1600 | 1.00 | | **Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps |
| 0.9 | 80 | 0.3200 | 1.41 | | **Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps |
| 13.0 | 300 | Total | | | |

## Summary for Subcatchment 3S: Non Treated Area

Runoff = 1.19 cfs @ 12.07 hrs, Volume= 0.089 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.50"

| Area (ac) | CN | Description |
|---|---|---|
| 0.220 | 98 | Paved parking & roofs |
| 0.220 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

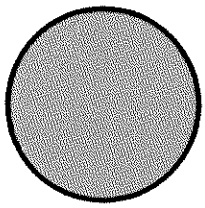
## Summary for Reach 3R: Outlet Culvert

Inflow Area = 3.284 ac, 18.89% Impervious, Inflow Depth > 2.73" for 25yr event
Inflow = 8.63 cfs @ 12.17 hrs, Volume= 0.747 af
Outflow = 3.03 cfs @ 12.00 hrs, Volume= 0.746 af, Atten= 65%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.38 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 0.6 min

Peak Storage= 64 cf @ 11.95 hrs, Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.03 cfs

12.0" Diameter Pipe, n= 0.020
Length= 81.0' Slope= 0.0172 '/'
Inlet Invert= 19.00', Outlet Invert= 17.61'



## Summary for Reach 4R: (new Reach)

Inflow Area = 3.504 ac, 23.98% Impervious, Inflow Depth > 2.86" for 25yr event
Inflow = 4.23 cfs @ 12.07 hrs, Volume= 0.836 af
Outflow = 4.23 cfs @ 12.07 hrs, Volume= 0.836 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

## Summary for Pond 1P: Soil Filter 1

Inflow Area = 0.182 ac, 68.47% Impervious, Inflow Depth > 4.12" for 25yr event
Inflow = 0.90 cfs @ 12.07 hrs, Volume= 0.063 af
Outflow = 0.89 cfs @ 12.08 hrs, Volume= 0.060 af, Atten= 1%, Lag= 0.6 min
Primary = 0.89 cfs @ 12.08 hrs, Volume= 0.060 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 24.06' @ 12.08 hrs Surf.Area= 486 sf Storage= 231 cf

Plug-Flow detention time= 36.4 min calculated for 0.060 af (97% of inflow)
Center-of-Mass det. time= 22.5 min ( 780.0 - 757.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 22.50' | 503 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Voids (%) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|---|
| 22.50 | 450 | 30.0 | 0 | 0 |
| 24.00 | 450 | 30.0 | 203 | 203 ← Water Quality Volume |
| 24.50 | 750 | 100.0 | 300 | 503 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 22.50' | **2.400 in/hr Exfiltration over Surface area** |
| #2 | Primary | 24.00' | **24.5' long x 4.0' breadth Broad-Crested Rectangular Weir** |
| | | | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 |
| | | | Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32 |

**Primary OutFlow** Max=0.86 cfs @ 12.08 hrs HW=24.06' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)
└—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.83 cfs @ 0.58 fps)

## Summary for Pond 2P: Soil Filter 2

Inflow Area = 0.159 ac, 76.87% Impervious, Inflow Depth > 4.33" for 25yr event
Inflow = 0.81 cfs @ 12.07 hrs, Volume= 0.057 af
Outflow = 0.80 cfs @ 12.08 hrs, Volume= 0.057 af, Atten= 1%, Lag= 0.7 min
Primary = 0.80 cfs @ 12.08 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 24.06' @ 12.08 hrs Surf.Area= 570 sf Storage= 283 cf

Plug-Flow detention time= 42.1 min calculated for 0.057 af (99% of inflow)
Center-of-Mass det. time= 39.6 min ( 791.3 - 751.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 22.50' | 756 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Voids (%) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | |
|---|---|---|---|---|---|
| 22.50 | 560 | 30.0 | 0 | 0 | |
| 24.00 | 560 | 30.0 | 252 | 252 | ← Water Quality Volume |
| 24.80 | 700 | 100.0 | 504 | 756 | |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 22.50' | **2.400 in/hr Exfiltration over Surface area** |
| #2 | Primary | 24.00' | **24.5' long x 4.0' breadth Broad-Crested Rectangular Weir** |
| | | | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 |
| | | | Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32 |

**Primary OutFlow** Max=0.77 cfs @ 12.08 hrs HW=24.05' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)
└—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.73 cfs @ 0.55 fps)

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 2.1S: (new Subcat)** Runoff Area=6,916 sf 76.87% Impervious Runoff Depth>1.16"
Tc=5.0 min CN=92 Runoff=0.23 cfs 0.015 af

**Subcatchment 2.2S: (new Subcat)** Runoff Area=7,928 sf 68.47% Impervious Runoff Depth>1.02"
Tc=5.0 min CN=90 Runoff=0.23 cfs 0.015 af

**Subcatchment 2S: Off-Site Area** Runoff Area=2.943 ac 12.69% Impervious Runoff Depth>0.31"
Flow Length=300' Tc=13.0 min CN=74 Runoff=0.70 cfs 0.076 af

**Subcatchment 3S: Non Treated Area** Runoff Area=0.220 ac 100.00% Impervious Runoff Depth>1.67"
Tc=5.0 min CN=98 Runoff=0.42 cfs 0.031 af

**Reach 3R: Outlet Culvert** Avg. Depth=0.34' Max Vel=3.22 fps Inflow=0.77 cfs 0.106 af
D=12.0" n=0.020 L=81.0' S=0.0172 '/' Capacity=3.03 cfs Outflow=0.76 cfs 0.106 af

**Reach 4R: (new Reach)** Inflow=0.95 cfs 0.137 af
Outflow=0.95 cfs 0.137 af

**Pond 1P: Soil Filter 1** Peak Elev=24.01' Storage=206 cf Inflow=0.23 cfs 0.015 af
Outflow=0.10 cfs 0.015 af

**Pond 2P: Soil Filter 2** Peak Elev=23.86' Storage=228 cf Inflow=0.23 cfs 0.015 af
Outflow=0.03 cfs 0.015 af

**Total Runoff Area = 3.504 ac Runoff Volume = 0.137 af Average Runoff Depth = 0.47"**
**76.02% Pervious = 2.664 ac 23.98% Impervious = 0.840 ac**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 2.1S: (new Subcat)** Runoff Area=6,916 sf 76.87% Impervious Runoff Depth>3.59"
Tc=5.0 min CN=92 Runoff=0.68 cfs 0.047 af

**Subcatchment 2.2S: (new Subcat)** Runoff Area=7,928 sf 68.47% Impervious Runoff Depth>3.39"
Tc=5.0 min CN=90 Runoff=0.75 cfs 0.051 af

**Subcatchment 2S: Off-Site Area** Runoff Area=2.943 ac 12.69% Impervious Runoff Depth>1.96"
Flow Length=300' Tc=13.0 min CN=74 Runoff=5.74 cfs 0.481 af

**Subcatchment 3S: Non Treated Area** Runoff Area=0.220 ac 100.00% Impervious Runoff Depth>4.15"
Tc=5.0 min CN=98 Runoff=1.02 cfs 0.076 af

**Reach 3R: Outlet Culvert** Avg. Depth=1.00' Max Vel=4.38 fps Inflow=6.65 cfs 0.579 af
D=12.0" n=0.020 L=81.0' S=0.0172 '/' Capacity=3.03 cfs Outflow=3.21 cfs 0.579 af

**Reach 4R: (new Reach)** Inflow=4.06 cfs 0.655 af
Outflow=4.06 cfs 0.655 af

**Pond 1P: Soil Filter 1** Peak Elev=24.05' Storage=227 cf Inflow=0.75 cfs 0.051 af
Outflow=0.74 cfs 0.050 af

**Pond 2P: Soil Filter 2** Peak Elev=24.05' Storage=280 cf Inflow=0.68 cfs 0.047 af
Outflow=0.68 cfs 0.047 af

**Total Runoff Area = 3.504 ac Runoff Volume = 0.656 af Average Runoff Depth = 2.25"**
**76.02% Pervious = 2.664 ac 23.98% Impervious = 0.840 ac**

# Attachment B

## Inspection, Maintenance and Housekeeping Plan

## STORMWATER MANAGEMENT
## INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

### Introduction

The following plan outlines the anticipated inspection and maintenance procedures for the erosion and sedimentation controls as well as stormwater management devices for the project site. This plan also outlines several housekeeping requirements that shall be followed during and after construction. These procedures should be followed in order to ensure the intended function of the designed measures and to prevent unreasonable adverse impacts to the surrounding environment.

The procedures outlined in this inspection and maintenance plan are provided as an overview of the anticipated practices to be used on this site. In some instances, additional measures may be required due to unexpected conditions. For additional detail on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the "Maine Erosion and Sedimentation Control BMP" manual and/or the "Stormwater Management for Maine: Best Management Practices" manual as published by the Maine Department of Environmental Protection (MDEP).

### During Construction

1. **Inspection:** During the construction process, it is the Contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.

2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (rainfall).

3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log, the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.

A. Sediment Barriers:

- Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
- If the fabric on a silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, it shall be replaced.
- Sediment deposits should be removed after each storm event. They must be removed before deposits reach approximately one-half the height of the barrier.
- Filter berms shall be reshaped as needed.
- Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required, should be dressed to conform to the existing grade, prepared, and seeded.

B. Riprap Materials:

- Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

C. Erosion Control Blankets:

- Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to the requirements of this plan.

D. Stone Check Dams:

- Inspect the center of the dam to make sure it is lower than the edges. Erosion caused by high flows around the edges of the dam must be corrected.
- Sediment accumulation shall be removed prior to reaching half of the original design height.
- Areas beneath stone check dams must be seeded and mulched upon removal.

E. Temporary Storm Drain Inlet Protection:

- The inlet protection structure shall be inspected before each rain event and repaired as necessary.
- Sediment shall be removed and the storm drain sediment barrier restored to its

original dimensions when the sediment has accumulated to half of the design depth of the trap.

- Structures shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the structure, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

F. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with the collected soil material. The entrance should then be reconstructed.
- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

G. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.
- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

H. Level Lip Spreaders:

- The level spreader pool should be inspected after rainfall events for sediment accumulation and debris that may reduce its capacity. Sediment and debris buildup should be removed once the volume of the pool has been reduced by 25%.
- The 18" stone berm must be constructed so that flows slowly seep through the berm into a sheet flow through the receiving buffer. Repair or reconstruction of the berm is required when flow from the spreader becomes channelized.
- Do not store snow removed from the street and/or parking lot within the area of a level spreader.

I. Stabilized Temporary Drainage Swales:

- Sediment accumulation in the swale shall be removed once the cross section of the swale is reduced by 25%.
- The swales shall be inspected after rainfall events. Any evidence of sloughing of the side slopes or channel erosion shall be repaired and corrective action should be taken to prevent reoccurrence of the problem.

- In addition to the stabilized lining of the channel (i.e. erosion control blankets), stone check dams may be needed to further reduce channel velocity.

J. Bioretention cells:

- The area of the basin may be excavated in preparation of the installation of the underdrain and can be used for a sediment trap from the site during construction. After excavation of the basin, the outlet structure and piping system must be installed at the appropriate elevation and protected with a sediment barrier. If the basin is to be used as a sediment trap, the sides of the embankments must be mulched and maintained to prevent erosion.
- The engineered base (including fabric, crushed stone, transition zone, soil filter bed material and surface bark mulch) should not be installed until upstream contributing drainage areas are stabilized.
- Refer to the Sequence of Construction provided in Section 1 of the Site Location of Development Act application.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

B. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

C. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

D. Debris and other materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

E. Trench or foundation dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation

basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

**After Construction**

1. **Inspection:** After construction, it is the responsibility of the owner or assigned heirs to comply with the inspection and maintenance procedures outlined in this section. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in all applicable permits, shall conduct the inspections.

2. **Specific Inspection and Maintenance Tasks:** The following is a list of permanent erosion control and stormwater management measures and the inspection and maintenance tasks to be performed after construction.

   A. Vegetated Areas:

   - Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems.
   - Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

   B. Ditches, Swales, and Other Open Channels:

   - Inspect ditches, swales and other open stormwater channels in the spring, in the late Fall, and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris, remove woody vegetative growth that could obstruct flow, and repair any erosion of the ditch lining.
   - Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity.
   - Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable.
   - If the ditch has a riprap lining, replace riprap in areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged.

   C. Culverts:

   - Inspect culverts in the spring, in the late fall, and after heavy rains to remove any obstructions to flow.
   - Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit.
   - Inspect and repair any erosion damage at the culvert's inlet and outlet.

- Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.
- Accumulations on pavement may be removed by pavement sweeping.
- Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader or other acceptable method.

H. Level Lip Spreaders:

- The level spreader pool should be inspected after significant rainfall events for sediment accumulation and debris that may reduce its capacity. Sediment and debris buildup should be removed once the volume of the pool has been reduced by 25%.
- The 18" stone berm must be constructed so that flows slowly seep through the berm into a sheet flow through the receiving buffer. Repair or reconstruction of the berm is required when flow from the spreader becomes channelized.
- Do not store snow removed from the street and/or parking lot within the area of a level spreader.

I. Bioretention cells:

- During the first year, the basin will be inspected semi-annually and following major storm events. Debris and sediment buildup shall be removed from the forebay and basin as needed. Mowing of a grassed basin can occur semiannually to a height no less than 6 inches. Any bare area or erosion rills shall be repaired with new filter media or sandy loam then seeded and mulched. Maintaining good grass cover will minimize clogging with fine sediments and if ponding exceeds 48 hours, the top of the filter bed must be rototilled to re-establish the soil's filtration capacity.
- Soil Filter Inspection: The soil filter should be inspected after every major storm in the first year to be sure it is functioning properly. Thereafter, the filter should be inspected at least once every six months to ensure that it is draining within 48 hours following a one inch storm or greater. And that following a storms that fill the system to overflow, it drains in no less than 36 to 6o hours. If the system drains too fast, an orifice may need to be added on the underdrain outlet or, if already present, may need to be modified.
- Soil Filter Replacement: The top several inches of the filter shall be replaced with fresh material when water ponds on the surface of the bed for more than 72 hours. The removed sediments should be disposed of in an acceptable manner.
- Sediment Removal: Sediment and plant debris should be removed from the pretreatment structure at least annually.
- Mowing: If mowing is desired, only handheld string trimmers or push-mowers are allowed on the filter (no tractor) and the grass bed should be mowed no more than 2 times per growing season to maintain grass heights of no less than 6 inches.

- Fertilization: Fertilization of the underdrained filter area should be avoided unless absolutely necessary to establish vegetation.
- Harvesting and Weeding: Harvesting and pruning of excessive growth will need to be done occasionally. Weeding to control unwanted or invasive plants may also be necessary. Add new mulch only as necessary for bioretention cell.

1. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of controls. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. A sample "Stormwater Inspection and Maintenance Form" has been included as Attachment 1 of this Inspection, Maintenance, and Housekeeping Plan.

2. **Recertification:** A certification of the following shall be submitted to the Maine Department of Environmental Protection (MDEP) within three months of the expiration of each five year interval from the date of issuance of MDEP permits.

   A. Identification and repair of erosion problems. All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
   B. Inspection and repair of stormwater control system. All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.
   C. The Inspection, Maintenance, and Housekeeping Plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the MDEP, and the maintenance log is being maintained.

3. **Duration of Maintenance:** Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the MDEP stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with MDEP standards. Upon such assumption of responsibility, and approval by the MDEP, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

***Bigelow Laboratory for Ocean Sciences***

**BMP MAINTENANCE LOG**

| ***BMP Structure*** | **Inspector (Name)** | ***Work Performed*** | ***Date Performed*** | ***Comments*** |
|---|---|---|---|---|
| Vegetated Areas | | | | |
| Swales | | | | |
| Drainage Piping / Culverts | | | | |
| Bioretention Cells | | | | |
| | | | | |
| | | | | |

Additional Comments:

# Attachment C

## Treatment Calculations

**Determination of Water Quality Volume Calculations**

Calculation of Minimum Required Water Quality Volume for Treatment

Maine DEP Stormwater regulations require the treatment of 95% of impervious area, and 80% developed area.

so;

Proposed Impervious 18,800 sf

Existing impervious incl. gravel drives, and stockpiles materials 8,924 sf

95% treatment of Impervious = (18,800 s.f. - 8,924 sf )x 95% = 9,382 s.f.

80% treatment of developed area = 1,192 s.f. x 80% = 953 s.f.

Additional areas outside of pavement will revert back to natural conditions and are not considered landscape/developed area

Based on the calculations above, treatment would be required on 8,924 sf of impervious area and 953 sf of landscaped area. Since impervious loading areas and driveways are a more intense use, the treatment portion of the proposed developed will be collected from mainly the loading areas /drives. Therefore, calculations have been completed to determine the required water quality volume required for treatment.

Determination of Required Water Quality Volume

| | |
|---|---|
| Impervious Area x 1" = 8,924 s.f. x 1 in = | 743 c.f. |
| Landscaped Area X 0.4" = 953 x 0.4 in = | 32c.f. |
| | **775 c.f. Total Water Quality Treatment Volume Required** |

Proposed Treatment Volume

Area to drain to proposed treatment **Underdrained Soil Filter 1** = 4,228 s.f. impervious (drives/parking), and 0 landscaped area

5428 s.f. x 1" = **452 c.f.** water quality volume required **503c.f.** provided Filter Pond,

Area to drain to proposed treatment **Underdrained Soil Filter 2** = 5,316 s.f. impervious (drives/parking), and 0 landscaped area

5316 s.f. x 1" = **443 c.f.** water quality volume required **480c.f.** provided Filter Pond,

# Section 19

# Operations Manual

09405

Section 19

# CITY OF PORTLAND
# Great Diamond Island Transfer Facility

## Operation and Maintenance Manual

# CITY OF PORTLAND
# City of Portland, Maine
# Great Diamond Island Solid Waste Transfer and Recycling Facility

## Operation & Maintenance Manual

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## 1.0 Purpose and Use of Manual

The purpose of this manual is to provide operators and users of the Great Diamond Island Solid Waste Transfer and Recycling Facility located within the Diamond Cove Homeowners Association Property (DCHA) on Great Diamond Island with information concerning all aspects of operation, safe usage, and maintenance of all associated facilities.

This operations plan shall be kept on site at all times. This manual should be revised as necessary by the City of Portland to keep current with the environmental regulations and solid waste trends and if operating procedures are changed. If at any time the operators are unsure of operating procedures or experience a situation not addressed in this manual, the operator shall notify the City designated representative to obtain guidance. The City designated representative shall contact the MDEP or seek qualified assistance if required.

1.1 The following is a listing of telephone numbers that the operator(s) shall keep on hand at all times:

| | |
|---|---|
| City of Portland Environmental Programs & Open Space Manager | 874-8467 |
| City of Portland Fire & Rescue | 911 (Emergency) |
| Department of Environmental Protection (Portland Office) | 822-6300 |
| Clean Harbors Environmental Services | 799-8111 |
| Poison Control | 1-800-442-6305 |
| Diamond Cover Homeowners Association Peaks Island Public Works | (207) 766-2423 |

## 2.0 Description of Facility and Background

### Introduction

The City of Portland is requesting MDEP approval for a Municipal Waste Transfer and Recycling Facility on Great Diamond Island in Portland, Maine. The proposed facility will offer improved solid waste management and recycling services to the residents and businesses of Great Diamond Island. MSW will be transferred from the Island by the City of Portland to ECO Maine. Construction and Demolition Debris will be transported to the Portland Riverside Street Facility operated by CPRC.

The facility will be operated and owned by The City of Portland in cooperation with the Diamond Cove Homeowners Association as stipulate in the lease agreement appended to this operations manual.

**Operation**

The City of Portland will oversee this operation and employ the necessary attendants at all times when the facility is open operation. The facility is not intended to be open to the general public but will provide a collection/transfer point for City solid waste collection. Under supervision of City/DCHA operators, private contractors working on the Island maybe given access to the facility. T

The facility will temporarily store bulky solid waste as well as Municipal solid waste (MSW) collected on the Island by City and DCHA staff. Hazardous or special wastes will not be accepted at this site. The Waste Transfer and Recycling Facility will provide roll-off containers and a dual compactor/hopper arrangement for collection of such items as:

- construction and demolition debris
- furniture
- sheetrock
- shingles
- tires
- metals
- MSW
- Single Sort Recyclables

The open top containers will be placed on concrete pads and will be behind retaining walls. The walls will deliver waste into the tops of the containers, while allowing trucks to remove and replace the containers from a lower level. No processing of materials is proposed at this site.

**Transfer of Materials**

All waste materials will be containerized by the City of Portland. MSW will be transferred from the Island by the City of Portland to ECO Maine. Construction and Demolition Debris will be transported to the Portland Riverside Street Facility operated by CPRC.

## 3.0 Definitions

The following definitions shall apply to this manual and all facility operations. Reference is made to the Maine Solid Waste Regulations (06-096 CMR 400.1).

Alter. Means to expand either horizontally or vertically beyond approved boundaries, to accept waste other than those specifically approved, or to operate or develop in any way inconsistent with the permit or license.

Administrator. Administrator is an official appointed by the City of Portland who has been assigned overall responsibility for administration of the solid waste facility.

Asbestos. "Asbestos" means a group of naturally occurring minerals that separate into fibers of high tensile strength and are resistant to heat, wear and chemicals, including, but not limited to chrysotile, amosite, crocidolite, actinolite, tremolite and anthophylite and any of these minerals that have been chemically treated or altered.

Asbestos - Containing Material. "Asbestos-containing material" means any material containing asbestos in quantities equal to or greater than 1% by weight.

Asbestos - Containing Waste Materials. "Asbestos - containing waste materials" means any waste that contains asbestos and is generated by a source subject to the provisions of these rules. This term includes, but is not limited to, asbestos-containing material from asbestos abatement projects, asbestos-containing materials from control devices, and friable and non-friable asbestos waste material.

Asbestos - Contaminated Wastes. "Asbestos-contaminated wastes" means any solid waste material that is contaminated with asbestos-containing waste materials including, for example, work clothes, bags and containers that previously contained asbestos, and equipment.

Asbestos Waste from Control Devices. "Asbestos waste from control devices" means any waste material that contains asbestos and is collected by a pollution control device.

Ash. "Ash" means the residue remaining after the combustion of a material such as coal, wood, oil or municipal solid waste.

Batteries, Acid: Acid Batteries include car and truck.

Boundary.

1. Boundary, property. "Property boundary" means the outermost perimeter of the total area of real property on which the Great Diamond Island Solid Waste Transfer and Recycling Facility is located.

2. Boundary, solid waste. "Solid waste boundary" means the outermost limit of the solid waste (projected on a horizontal plane) as it would exist at completion of the Department or Board approved waste facility, or the outermost limit of the solid waste at any exempted waste facility.

Commercial Waste. "Commercial waste" means solid waste generated by stores, offices, restaurants, warehouses, and other non-manufacturing, non-processing activities; but it does not include household, process, industrial or special wastes.

Compaction. "Compaction" means the physical crushing or grinding of solid waste as a method of volume reduction.

Composting. "Composting" means the biological decomposition and stabilization of organic matter under controlled aerobic conditions of high temperature.

Construction/Demolition Debris. "Construction/demolition debris" means debris resulting from construction, remodeling, repair, and demolition of structures. It includes but is not limited to building materials, asphalt, wall board, pipes, metal conduits, mattresses, household furniture, fish nets, rope, hose, wire and cable, fencing, carpeting and underlay; it excludes asbestos and other special wastes.

Contamination. As applied to ground water and surface water, "contamination" means exceeding water quality standards, attributable to the solid waste facility, specified in:

1. CMR 231 - Primary Drinking Water Standards, promulgated pursuant to 22 MRSA Section 2611

2. Appendix C - Maximum Exposure Guidelines - CMR 233 promulgated pursuant to 22 MRSA Section 2602-A

3. A statistically significant increase in concentration of measured parameters above established baseline (whether or not the existing concentration already exceeds the MCLs specified above) using the 95% Confidence Interval (CI) when the test is applied. The use of other statistical tests and confidence intervals shall be approved by the Department.

Equipment. "Equipment" means any item of machinery or implement used in the operation of a transfer/processing facility to perform such functions as site preparation, earth-moving and trucking, hauling, transporting, spreading, compacting or transferring of waste.

Equipment, Backup. Backup Equipment means equipment available to the Transfer Station Supervisor within a certain period of breakdown of the primary facility equipment.

Facility Site. "Facility site" means any developed land area of a waste facility used for purposes affected by DEP solid waste rules, including roads, drainage ways, structures, parking lots, and handling sites, or any areas thereof approved by the Board for such development.

Facility Supervisor. The Facility Supervisor has the responsibility to properly operate and maintain the facility. His/her direct supervisor is the Board of Selectmen or designee.

Garbage and Household Wastes. Garbage and Household Waste shall include animal or vegetable waste resulting from the handling, preparation, cooking and consumption of food in any private dwelling house, multiple dwelling, hotel, restaurant, building or institution. It shall also include mixed and bulk refuse originating in and around private dwellings, multiple dwellings, or dining facilities located in schools.

Hazardous Waste. "Hazardous waste" as defined in 38 M.R.S.A. Section 1303 (5) means a waste substance or material, in any physical state, designated as hazardous by the Board under 38 M.R.S.A. Section 1303-A. It does not include waste resulting from normal household or agricultural activities. The fact that a hazardous waste or a part or a

constituent may have value or other use or may be sold or exchanged does not exclude it from this definition.

Hot Load. Hot loads means any loads of solid waste that are on fire, smoldering, or are potentially flammable by spontaneous combustion. Hot loads include wood ashes, cigarette dry residue, coal ash and clinkers, residue from a fire, etc.

Inert Fill. "Inert Fill" means clean soil material, rocks, bricks, and cured concrete, which are not mixed with other solid or liquid waste, and which are not derived from an ore mining activity.

Land Clearing Debris. "Land Clearing Debris" means solid wastes resulting from the clearing of land and consisting solely of brush, stumps, soil material, and rocks.

Leaf Composting Facility. "Leaf composting facility" means a solid waste facility that is designed and operated for the exclusive purpose of composting leaves.

Maine Solid Waste Laws. "Maine Solid Waste Laws" means all the laws of the State of Maine relating to the management of solid waste. It includes the "Maine Hazardous Waste, Septage and Solid Waste Management Act," Subchapters I and IA (38 M.R.S.A. Section 1301 et. seq.); 38 M.R.S.A. Sections 417 and 420; the Three Hundred Foot Law (38 M.R.S.A. Section 421); the Waste Discharge Law (38 M.R.S.A. Section 413); and the Open Burning Law (38 M.R.S.A. Section 559).

Municipality. "Municipality" means City, Town or Plantation.

Municipal Solid Waste. "Municipal solid waste" means solid waste emanating from domestic and normal commercial sources. Municipal solid waste does not include wastes removed from or not introduced to these waste streams and which are regulated as a "residual" under Chapter 567 of the Department's Regulations.

Non-Hazardous Waste. "Non-hazardous waste" means any solid waste, sludge or septage that is not a hazardous waste.

Operator. "Operator" means any person, municipality, company or other responsible party who has care, charge or control of a waste facility subject to these rules. The operator may be the owner, an agent, or lessee of the owner, or an independent contractor. In the case of the Great Diamond Island Solid Waste Transfer and Recycling Facility, operations will be a shared responsibility between the City of Portland and its contractor operating the facility. See Section 4.6 for description.

Owner. "Owner" means any person who, alone or in conjunction with others, owns the real property upon which is located a waste facility subject to these rules.

Processing Facility. "Processing facility" means any structure, machine, device, system, or combination thereof, other than collection or transfer vehicles and incinerators, designed and operated to reduce the volume or change the chemical or physical characteristics of solid waste. Processing facilities may employ shredding, baling, mechanical and magnetic separation, composting or other techniques to reduce or otherwise change the nature of

solid waste requiring ultimate disposal. Processing facilities may also recover reusable or recyclable materials.

Protected Natural Resource. "Protected Natural Resource" means coastal sand dune system, coastal wetlands, significant wildlife habitat, fragile mountain areas, freshwater wetlands, great ponds or rivers, streams or brooks, as these terms are defined in 38 M.R.S.A. Section 480-B of the Natural Resources Protection Act.

Recyclable Materials. Recyclable Materials will include metal, glass, waste paper, cardboard and other materials that may be designated as recyclable materials.

Recycling. "Recycling" means the separating, collecting, and/or reprocessing of manufactured materials or residues for reuse either in the same form or as part of a different product.

Rubbish. Rubbish means all unusable, unwanted cardboard, plastic, metal, or glass food containers, waste paper, rags, sweepings, small pieces of wood, excelsior, rubber, leather, and similar waste materials. It shall also include wood furniture, ropes, rags and other debris.

Solid Waste. Solid Waste means unwanted or discarded solid material with insufficient liquid content to be free flowing, including by way of example and not by limitation, rubbish, garbage, refuse inert household wastes, material, landscape refuse, wood wastes, white goods, but shall not include sludge, septage, hazardous waste, agricultural or industrial wood by-products.

Solid Waste Facilities. Solid Waste Facilities means all facilities owned by the City of Portland used to transport or transfer solid waste.

Solid Waste Management. Solid Waste Management means purposeful, systematic, and unified control of the collection, storage, transportation, processing, salvaging and transfer of solid waste.

Special Waste. "Special waste" as defined in 38 M.R.S.A. Section 1303 (10-B), means any non-hazardous waste generated by sources other than domestic and typical commercial establishments that exists in such an unusual quantity or in such a chemical or physical state, or any combination thereof, which may disrupt or impair effective waste management or threaten the public health, human safety or transportation and disposal procedures. Special waste includes, but is not limited to:

a. Oil, coal, wood and multi-fuel boiler and incinerator ash;
b. Industrial and industrial process waste;
c. Wastewater treatment plant sludge, paper mill sludge and other sludge waste;
d. Debris and residuals from non-hazardous chemical spills and cleanup of those spills;
e. Contaminated soils and dredge spoils;
f. Asbestos and asbestos-containing waste;
g. Sand blast grit and non-liquid paint waste;
h. Medical and other potentially infectious or pathogenic waste;
i. High and low pH waste;

j. Spent filter media residue;
k. Shredder residue; and
l. Other waste designated by the Board, by rule.

Storage. "Storage" means the placement or containment of solid waste on a temporary basis in such a manner as not to constitute disposal of such wastes.

Tires. Tires shall include all tires, tubes and rubber protective flaps. Tire rims are not included under this definition.

Transfer Station Facility. Transfer Station Facility means a facility constructed and managed to store, dispose and/or process and place solid wastes in containers for transport to disposal facilities.

Unacceptable Wastes. Those wastes determined by the operator not to be consistent with the operations of the facility, or are not accepted at this facility. These wastes include, but are not limited to, asbestos, hazardous wastes and special wastes, household rubbish, contaminated soils, and petroleum fuels.

Vegetative Wastes. "Vegetative wastes" means wastes consisting of plant matter from farms, homes, plant nurseries, and greenhouses. These shall include plant stalks, hulls, leaves, and tree waste processed through a wood chipper.

White Goods. "White goods" means large appliances, including but not limited to, stoves, refrigerators, freezers, washing machines, clothes dryers, dishwashers and air conditioners. Refrigerators, air conditioners and other appliances containing Freon will be accepted at this facility. Patrons shall have the option to remove Freon from the appliance prior to depositing at this facility. Patrons who remove Freon prior to depositing at this facility shall provide the operator with written documentation indicating the method of removal and means of disposal/recycling. Patrons who choose not to remove Freon will be either assessed a charge for removal at the facility, or Freon will be removed after shipment to the designated metal recycling facility.

Wood Wastes. "Wood wastes" means brush, stumps, lumber, bark, woodchips, shavings, slabs, edgings, slash, sawdust, and pallets which are not mixed with other solid or liquid waste. Wood wastes shall be designated as two types:

a. Clean Wood Wastes shall include brush, stumps, tree trimmings, land clearing debris, slash, pallets (nails removed,) and construction lumber not mixed, painted or treated with any chemical agents or coatings, free from nails or any metal products.

b. Treated Wood Wastes shall include all wood products including painted, stained, treated or containing any chemical agents.

## 4.0 Site Operations

Operations at the Great Diamond Island Solid Waste Transfer and Recycling Facility shall be carried out in accordance with the provided operating rules, regulations and policies. The rules, regulations and policies shall be reviewed by the City as needed to provide for safe and efficient operation. Operation and maintenance shall be carried out in a manner consistent with the Maine Department of Environmental Protection Solid Waste Regulations and permit issued to the City of Portland for this facility. In the event of conflicts with this manual, the City shall be responsible for clarifying conflicts and shall contact the MDEP if necessary for guidance.

## 4.1 Personnel

4.1.1 Personnel involved in and responsible for the safe operation and maintenance of the Great Diamond Island Solid Waste Transfer and Recycling Facility shall include:

A. Administrator/Owner (City of Portland's Environmental Programs & Open Space Manager)

B Operator, Facility Safety Officer and Attendant (City of Portland designated employee)

4.1.2 The Great Diamond Island Solid Waste Transfer and Recycling Facility will be owned, administered and operated by the City of Portland in cooperation and coordination with the Diamond Cove Home Owners Association. The City of Portland's responsibilities shall include:

A. To provide adequate personnel necessary to perform commercial recycling, processing and composting operations during all operating hours. At all times during operating hours, personnel must be present.

B. Monitor and enforce all safety rules and regulations relevant to site operations.

C. Maintain vigilant surveillance of entering and exiting traffic, and unloading operations.

D. Provide required job training, safety education and supervision of all company employees.

F. To police and maintain commercial processing, transfer and composting areas. The operator shall be responsible for keeping the grounds clean from windblown litter and from deposition of materials in unapproved locations.

G. To coordinate transport of containers.

H. To perform periodic maintenance of all equipment, including inspection and an operational check of fire fighting/protection equipment.

I. To secure the facility. This shall include policing the area for safety violations, vandalism and other hazardous conditions.

J. To become completely familiar with this Operations Manual, the Maine Department of Environmental Protection regulations and requirements, and safety and fire procedures. In the case of emergencies, the contractor shall be required to inform the Operator, City of Portland Fire and Rescue Department, and City of Portland Police Department.

L. Maintain all grounds of the facility, including landscaping lawn areas (mowing, weed control and shrub maintenance), access roads and circulation areas. This shall include safety provisions for winter operation, including snow plowing and ice control, as well as general maintenance to promote safe passage of commercial and residential traffic.

M. Maintain manifest. Reports to contain the following:

- Types and quantities of materials collected and transferred at the facility.
- Times and days of materials transferred from the Island.

## 4.2 Safety

All operations carried out at this facility shall be performed to provide maximum public safety. Personnel operating this facility shall carry out all duties in a safety conscious manner and in accordance with all State and Federal safety guidelines. The access gate shall be closed at all times when not being used. Special precautions will be taken for snow removal from access ways and for sanding during the winter months to maintain safe vehicular access. In the event of injury, the operator shall contact the Fire and Rescue Department immediately for assistance.

## 4.3 Fire Prevention and Fire Protection Procedures

At the first sign of potential fire danger, the operator shall instruct all patrons to exit the facility, and contact the City of Portland Fire Department for assistance (911).

## 4.4 Site Plans

Plans for site preparation, development, construction and equipment installation are attached.

## 4.5 Hours of Operation - (Public Recycling)

The facility will not be open to the general public and will be utilized by the City of Portland Public Works Staff and Diamond Cove Homeowners Maintenance (DCHA) Staff. All materials will be collected offsite through the City curb side collection program and by DCHA staff. On occasion and under the supervision of City of DCHA staff, private contractors maybe allowed to deposit bulky wastes at the site.

## 4.6 Facility Operation

The operator(s) will be responsible for monitoring public usage and overall operation of the facility. The duties of the operator shall be as described in Section 4.1.2 and in accordance with this manual.

### 4.6.1 Startup

Prior to opening the facility for operation, the operator shall perform the following, at a minimum:

A. Inspect all areas of the facility for safety hazards, vandalism and general appearance. The operator shall police the grounds for windblown litter and rubbish not in designated locations.

B. Inspect all equipment for proper operating condition.

C. Perform scheduled and required maintenance of equipment to insure safe operation.

D. Note any operational or facility problems and contact supervisory staff.

E. Inspect access roadway and circulation areas for safe vehicular passage.

### 4.6.2 Traffic

Any vehicle traffic entering the site must utilize designated driveways and transfer areas.

### 4.6.3 Construction/Demolition Debris Transfer Area

Demolition debris may include wood wastes, shingles, insulation, masonry, furniture, wood, concrete, bricks, rocks and other similar building materials.

If unacceptable wastes are observed, these materials must be directed to a suitable licensed disposal facility. The operator shall maintain a list of

telephone numbers at the facility outlining environmental companies and the MDEP. At a minimum, the list shall include the following:

| | | |
|---|---|---|
| 1. | Maine Department of Environmental Protection | ☎ 822-6300 |
| 2. | BFI Waste Systems | ☎ 1-800-831-2791 |
| 3. | Waste Management of Maine | ☎ 1-800-244-8290 |
| 4. | Clean Harbors Environmental Services | ☎ 799-8111 |

4.6.4 Waste Oil and Discarded Batteries

Waste oil and batteries will not be accepted at this facility.

Waste Oil

Waste oil will not be accepted at this facility.

Batteries

Batteries will not be accepted at this facility.

4.6.5 Construction/Demolition Debris, White Goods, Oversize Bulky Wastes, and Recyclables

See Sections 4.10, 6.4 and 6.6.

4.6.6 Transfer Area (Compaction)

Garbage and household wastes shall deposit the solid waste in the designated hopper area and compactor for volume reduction. Single Sort Recyclables shall be deposited in the designated hopper area and compactor for volume reduction. A trained operator shall be present at all times to verify the type of solid waste being deposited in the hopper. When the level of solid waste reaches an acceptable height in the hopper, the operator shall activate the compactor to compact the rubbish into the enclosed transfer trailer. The compactor shall only be activated when personnel are located safely away from the hopper. This process shall be repeated until the transfer trailers are full. The compactor shall be operated in accordance with the manufacturer's safety guidelines. The compactor shall always be left in the locked position when the operator is not present and at night.

4.7 Equipment and Facility Maintenance

Maintenance of all equipment and the facility shall be performed by qualified persons on a scheduled routine to insure continuing safe operations and efficiency. Maintenance intervals shall be adjusted as required and shall be responsive to the

site and equipment needs. Initially, maintenance shall include, at a minimum, the following, but shall be expanded upon as needed for maintaining a safe, clean and efficient facility:

4.7.1 Perform work as specified in other sections if this manual. Operators and attendants shall place special attention on daily startup requirements (see Section 4.6.1 – Startup).

4.7.2 Equipment shall be maintained per manufacturer's operations manual, specifications and standards for equipment type.

4.7.3 The entire operations area shall be inspected daily for general cleanup needs to maintain an orderly, safe and efficient operation.

4.7.4 Gravel areas shall be maintained as needed.

Maintenance of gravel areas shall include general cleanup to remove extraneous wastes and regrading on pads as necessary to maintain integrity, including removal of surface material and installation of additional compacted gravel. This work shall be performed over the entire life of the facility.

4.7.5 Interior roads shall be maintained to include snow removal, resurfacing, removal of debris, and general cleanup repair of drainage infrastructures and associated maintenance. This work shall be performed on an as-needed basis.

4.7.6 Signage and other facilities shall be maintained in safe operational manner.

## 4.8 Facility Washdown and Odor Control

The dry nature of the solid waste will generally enable the operation to maintain acceptable cleanliness around the facility without the need for facility wash-down. However, any wash-down operations shall be limited to policing the area for windblown litter, sweeping, and the use of odor control absorption granules, along with periodic application of metauat germicidal cleaner as supplied by Spartan Chemical Company, 110 North Westwood, Toledo, OH 43607, or similar.

Application of odor zone crystals will be made around the transfer station as necessary to control odors. Odors will also be minimized by frequent transfer of the wastes during the summer months when peak usage is expected. During non-operating hours, the compactor will be left in its "locked mode" which means that the compactor is locked into place. This effectively seals the opening into the container to prevent any odors from escaping back through the compactor.

## 4.9 "White Goods" and Scrap Metal

White goods shall be deposited in the containers designed by the City. The materials shall be removed on an as-needed basis. Junked vehicles or oversized materials will not be accepted and will be directed to a local dealer.

4.10 Waste Removal Schedules

The City shall be responsible for monitoring and coordinating removal of all waste. Scheduled removal of solid waste will ultimately be dependent on the incoming waste stream volume. However, a representative waste removal schedule shall be as follows:

| | | |
|---|---|---|
| A. | MSW & Single Sort Recyclables: | When Full |
| B. | Tires: | As Needed |
| C. | White goods/scrap metal: | As Needed |
| D. | Recyclables: | As Needed |
| E. | Construction/demolition debris: | When Full |

4.11 Procedures for Emergency Hot Loads

In the unlikely event that a load catches fire during transportation and requires a location to unload the burning material, the Portland Fire Department shall be contacted to extinguish the fire. Ashes from the burning load shall be placed in the appropriate waste container and removed from the site by the City.

4.12 Winter Operation

Special care must be taken during winter operation to prevent freezing and to prevent ice build-up on any equipment, parking areas, or access ways.

The City will provide the necessary equipment and material to keep access ways and parking area adequately plowed and sanded.

All exterior exposed concrete slabs shall be coated within a non-toxic penetrating sealant.

4.13 Non-Acceptable Materials

The City will have the authority to reject all unacceptable materials. Unacceptable materials consist of all hazardous wastes, asbestos containing materials, oils, or other fuels and batteries.

4.14 Back-Up Equipment

In the event of an equipment failure, which cannot be repaired within a reasonable timeframe, City shall arrange for back-up equipment.

4.15 Vector Control

The City shall be responsible for the control of rodents. The operator shall be responsible for inspecting the site on a regular basis for signs of rodents. If the

presence of vectors is noticed or suspected, the operator shall obtain a common household type bait and distribute to the area of concern. If, after 5 days this measure is determined to be ineffective, the operator (City) shall retain a professional exterminator. The exterminator shall be required to utilize an environmentally safe means to eliminate rodents. The administrator shall obtain in writing from the exterminator a description of the means of rodent control, along with information on any bait utilized.

4.16 Operational Records

The City shall maintain daily records of operational information to include type and quantity of wastes received and transferred at the facility along with equipment and personnel used and any special circumstances or deviations from the approved operating plan. These records shall be sufficiently detailed to enable the facility owner and DEP to identify each solid waste load and the operational characteristics of this facility. Records shall be keep in a secure file system and be accessible to the owner and DEP at all times.

4.17 Water Supply

A water supply is not planned for this facility.

4.18 Wood Wastes

Wood wastes, as defined in Section 3.0 - Definitions, brought to the site shall be separated by type (i.e., clean, treated, mixed or separated). Wood waste will be deposited directly into the designated containers.

Clean wood waste maybe be chipped and stockpiled on site for re-use as forest and arbor-cultural products by the City not exceeding a total of 30 cubic yards. This may include mulch for plantings and erosion control.

Only trained operators familiar with the usage of grinders and chippers shall process wood waste. Operators shall be fully familiar with manufacturers' safety and operations procedures.

4.19 Signage

The City, shall provide adequate signage for public and operational information. Signage shall include the following, at a minimum:

| **Signage Schedule** | |
|---|---|
| **Location** | **Contents of Sign** |

| | | |
|---|---|---|
| 1. | Entrance to site | Signage indicating name of facility and general information. |
| 2. | Entrance to container area. | Traffic directional arrows. |
| 3. | Compactor and container area. | Signage indicating safety requirements and materials to be placed in hoppers and containers. |

Additional signage shall be installed as required to insure efficient and safe facility operations.

## 5.0 Equipment

The purpose of the Great Diamond Island Solid Waste Transfer and Recycling Facility is to provide a means for deposition, temporary storage and transfer of household waste, recyclables, bulky waste, and demolition debris generated by residences and businesses on Great Diamond and Little Diamond Islands.

Equipment associated with the transfer station will be limited to roll-off containers and operational vehicles for transporting materials. Chipping apparatus may be located temporarily at this facility for chipping clean wood waste only.

## 6.0 Permitted and Non-Permitted Wastes to be Handled at the Great Diamond Island Solid Waste Transfer and Recycling Facility

Wastes Accepted at the Great Diamond Island Solid Waste Transfer and Recycling Facility

The operator shall visually inspect all loads entering the site for unacceptable wastes. Loads deemed unacceptable shall not be accepted and the patron instructed to seek an alternative means of disposal. Wastes deemed acceptable shall be deposited in locations as directed by the City and DCHA staff. All operations shall be the responsibility of the City of Portland. Wastes, which are acceptable at this Waste Transfer Facility, are as follows:

6.1 White Goods and Scrap Metal. White goods and scrap metal will generally be brought to the Great Diamond Island Solid Waste Transfer and Recycling Facility separated from other materials. In some cases, scrap metal may be associated with construction and demolition debris, which will be brought to the site. All metals shall be placed in designated containers.

6.2 Tires. Tires shall be brought to the facility separated from other waste materials. Tires brought to the site will be placed in a container.

6.3 Wood Wastes. Wood wastes will generally be brought to the Great Diamond Island Solid Waste Transfer and Recycling Facility mixed with construction/demolition debris or pre-separated. Depending on the form of the wood waste brought to the site, the attendant will instruct the patron to deposit the materials in either an open-top roll-off container or directly in a clean wood waste stockpile. Clean wood waste may be chipped and utilized as mulch, or for landscaping.

6.4 Construction/Demolition Debris. Construction/demolition debris shall be deposited into roll-off containers for transport to a licensed disposal facility.

6.5 Recyclable Materials. Recyclables, to include paper, cardboard, glass, plastic, tin cans, mixed paper and newsprint, will be brought to the site for deposition into the zero sort hopper for volume reduction.

6.6 Bulky Waste (Furniture, Household Items)

6.7 MSW consisting of domestic household garbage and waste emanating from household and commercial establishments.

**Wastes Not Accepted at the Great Diamond Island Solid Waste Transfer and Recycling Facility**

The station operator shall inform anyone trying to deposit wastes that are deemed unacceptable that they must seek an alternative site. Persons with grievances regarding this rule shall be instructed to contact the Selectmen's office. Unacceptable wastes include, but are not limited to, the following:

6.8 Discarded Batteries

6.9 Waste Oil

6.10 Hazardous wastes as defined in the Definitions section of this manual.

6.11 Special wastes as defined in the Definitions section of this manual.

6.12 All asbestos materials as defined in the Definitions section of this manual.

6.13 Any other wastes deemed by the operator/ attendant to not be consistent with the intended use of the facility.

## 7.0 Groundwater Protection

The Great Diamond Island Solid Waste Transfer and Recycling Facility will be sited on property owned by the City of Portland. The typical site operations will not involve activities creating an unreasonable risk to ground or surface waters. As a result, no formal

groundwater monitoring is proposed. If, however, the operational characteristics of the facility change, creating a potential ground or surface water threat, a groundwater monitoring system shall be established to determine the quality of groundwater, presence of any contaminants, followed by implementation of a remedial program, if necessary.

## 8.0 Hazardous Waste Exclusion Plan

The Great Diamond Island Solid Waste Transfer and Recycling Facility shall accept only those wastes as described in Section 6 of the Operations Manual. Hazardous wastes, as described in the definitions section of this operating manual, asbestos and special wastes will not be accepted at this facility. The detection and identification of these wastes will be the responsibility of the facility operator.

The facility operator will be responsible for initial screening of all incoming wastes and shall also serve as the facility safety officer.

If the facility operator observes a suspicious material, the operator shall contact either the City of Portland's Environmental Manager or the City of Portland's Fire Department. In addition, the City Fire Department is trained in hazardous materials and the Fire Department has access to a response team trained in handling hazardous materials. The operator shall be fully familiar with this plan, the Operations Manual, and types/forms of hazardous and special wastes.

### 8.1 Identification

The station operator shall be responsible for the identification and detection of hazardous or special wastes. The station operator shall inspect each solid waste load brought to the Waste Transfer Facility and make a determination as to the presence of unacceptable wastes. Hazardous or special wastes are not to be accepted knowingly. If a load is suspected to contain hazardous or special wastes, the operator shall inform the patron that these wastes are not accepted at this facility. The operator shall further contact the facility safety officer and inform the patron to contact the DEP - Hazardous Waste Bureau (289-2591) and a qualified hazardous/special waste handler (see listing in Section 4.6.4). Whenever possible, the operator shall assist the patron in contacting the appropriate personnel at the DEP to assist in locating an acceptable means of waste disposal.

When identifying the type of hazardous waste, the type of container and origin of the waste (if known) may be helpful. The Great Diamond Island Solid Waste Transfer and Recycling Facility also maintains literature, which may be helpful in identifying hazardous wastes. The following list provides a brief description of hazardous wastes, which may be encountered along with potential exposure conditions.

**Asbestos**: Generally hard, friable insulation material but can take other forms. Treat as special; avoid breathing. (Shall not be accepted)

**Bio-Hazard Materials**: May be Red Bag waste from hospitals, laboratories, clinics, nursing homes and occasionally doctor's offices. Includes blood, body

parts, disposable instruments, linens and other soiled items. Avoid contact; treat as bio-hazard material. Disinfect with 1:3 bleach to water solution. (Shall not be accepted)

**Bottom Ash, Fly Ash**: Generally ash-like substances ranging from powder to almost granular. Generated by power production and some heavy industrial operations. Avoid skin contact and dust; treat as hazardous. (Shall not be accepted)

**Calcium Hypochlorite**: Used for disinfection of swimming pools but is reactive when wet. Can create toxic cloud. Treat as hazardous; avoid wetting; if wet, evacuate area. (Shall not be accepted)

**Electrical Capacitors and Transformers**: May be removed from white goods and other electrical equipment by individuals, scrap metal firms, or firms which work on appliances or motors. Avoid skin contact; treat as hazardous. (Shall not be accepted)

**Industrial Chemicals**: Generally, liquid in 5 gallon or larger pails or drums of either plastic or steel. Occasionally lined cardboard barrels are used. Also some solids, especially flakes or granular materials can cause excessive corrosion or be reactive with liquids. Solids may be in any form of container, including loose. Avoid skin contact and breathing; treat as hazardous. (Shall not be accepted)

**Industrial Sludges and Still Bottoms**: Generally viscous materials which may be either oily, plastic or organic appearing. Avoid skin contact; treat as hazardous. (Shall not be accepted)

**Laboratory Chemicals**: Usually in smaller containers of 1 pint to 1 gallon. Glass or plastic bottles. Can be severe irritants, highly toxic or explosive. Avoid skin contact; do not open or jar containers; treat as hazardous.

**Sand Blast Grit**: Generally fine sand or garnet mixed with paint, brick and/or masonry chips. Avoid breathing; treat as special waste. (Shall not be accepted)

8.2 Storage, Transportation and Handling of Wastes

As stated in Section 8.1, the City and DCHA shall not willingly accept any hazardous or special wastes at this facility. If a waste is suspected to contain hazardous or special wastes and it is necessary to temporarily store the waste at the site, the operator shall contact the City Environmental Manager and Fire Department. In the event it becomes necessary to temporarily store hazardous or special wastes on site, the following shall be considered mandatory:

A. The City and Fire Department shall be contacted immediately to enforce and coordinate all activities which include detection and identification of

wastes, safety related items, communication with DEP, handling, storage, transportation and disposal of special/ hazardous wastes.

B. The public shall not be permitted in or near the material.

C. The facility operator shall contact the DEP Hazardous Waste Bureau (289-2591) and advise them of the situation. The City of Portland's Office of Selectmen and Fire Department shall also be notified.

D. The operator shall comply with all applicable Federal and State laws regarding detection, identification, handling, storage, transportation and disposal of special/hazardous wastes. The City shall promote and assist in proper education of its transfer station operators.

E. Upon notifying the DEP, the facility operator shall utilize the DEP or qualified contractor acceptable to the DEP to remove and dispose of the waste. The facility safety officer shall prepare a written report containing, at a minimum, description of waste, date and times of actions taken, summary of communications with DEP and others, means of transportation/ disposal, unusual occurrences, and evidence of possible contamination to storage pad. The facility safety officer shall file a copy of this report with the DEP and City records.

F. The facility operator shall contact the DEP upon removal of the waste and determine the need for any analytical testing to determine if ground contamination at the site may have occurred resulting from the hazardous/special waste. If contamination is suspected, the safety officer, in coordination with the DEP, shall undertake reasonable measures to evaluate and initiate appropriate remediation measures.

G. The facility operator shall make an initial assessment of the potential exposure conditions of the material under guidance from the DEP. If necessary, the City shall acquire a qualified professional and utilize appropriate field meters to determine explosion potential, levels of toxicity and other relevant parameters particular to the waste. If required, the City of Portland shall retain licensed disposal personnel equipped to sample, remove and dispose of the waste. Test equipment may include, but are not limited to, volatile organic meters, pH meters, gas and explosion meters, etc.

H. The City of Portland shall be responsible with evaluating, transporting and disposing of the waste and shall take appropriate safety measures. At a minimum, safety gloves, safety glasses, clothing, and shoes shall be kept on hand at the site by City and DCHA staff. Other equipment may be required which generally will require the services of an independent trained contractor. All equipment shall be appropriately cleaned or disposed of and all personnel shall take appropriate decontamination measures relevant to the waste material. Personnel should contact the DEP for proper

decontamination procedures relevant to the waste. Any and all costs for disposal shall be the responsibility of the patron.

8.3 Medical Facilities

In the event medical services are needed, the Operator shall contact the Portland Fire Department for immediate assistance and transport off the Island to a medical facility.

# Section 20

## Provisions for Solid Waste Removal

## Section 20

## Provisions for Solid Waste Removal

The City of Portland Maine owns and operates its own Department of Public Services including sanitation removal. The City will collect and remove solid waste and recycling materials with City staff and equipment. Recyclable materials will be transported the Riverside Street Recycling Facility owned and operated by the City of Portland under contract with CPRC. Municipal Solid Waste will be transported to ECO Maine who the City of Portland is a Member Community.

# Section 21

## Variances

## Variances

There are no variances proposed for the development of this project.