



CAPE COD
COMMISSION

Application Cover Sheet

Cape Cod Commission
3225 Main Street, PO Box 226
Barnstable, MA 02630
Tel: (508) 362-3828 • Fax: (508) 362-3136

For Commission Use Only	
Date Received:	
Fee (\$):	
Check No:	
File No:	

A Type of Application (check all that apply)

<input checked="" type="checkbox"/> Development of Regional Impact (DRI)	<input type="checkbox"/> DRI Exemption	<input type="checkbox"/> Request for Joint MEPA/DRI Review
<input type="checkbox"/> DRI Scoping	<input type="checkbox"/> Hardship Exemption	<input type="checkbox"/> Decision Extension
	<input type="checkbox"/> Jurisdictional Determination	<input type="checkbox"/> Decision Modification

B Project Information

Project Name: Town of Bourne Integrated Solid Waste Management Facility Total Site Acreage: 111

Project/Property Location: 201 MacArthur Boulevard Zoning: B-3

Brief Project Description:
Include total square footage of proposed and existing development, gross floor area, number of lots existing or to be created, specific uses, description of existing conditions, as applicable (attach additional sheets if necessary).
The project is focused on the development of the Phase 7, Phase 8 and Phase 9 vertical and horizontal expansions. The application provide details of where each phase will be located and the volume of material they will contain. Additionally, there is detailed discussion of how the entire 111-acre site will be developed over time, including the relocation of facilities as the landfill grows. This includes a plan for how on-site undeveloped land will be permitted and cleared to accommodate structures that will be displaced by maximizing the landfill expansion plan.

C Owner(s) of Record

List the following information for all involved parcels. Provide copies of each Deed and Purchase and Sale Agreement and/or evidence of leasehold interest, if applicable, for all involved parcels. Proof of ownership/legal rights for Applicant(s) to proceed with the proposed development must be documented prior to the Commission deeming any application complete. List the local, state, or federal agencies from which permits or other actions have been/will be filed (attach additional sheets if necessary).

Map/Parcel	Owner's Name	Lot & Plan	Land Court Certificate of Title #	Registry of Deeds Book/Page #
28/13	Town of Bourne			1351/456
32/5	Town of Bourne			29639/278
32/9	Town of Bourne			13637/54

There **ARE ARE NOT** (circle one) court claims, pending or completed, involving this property (if yes, please attach relevant information).
Is there an existing CCC Decision for the Property? yes no (if so, recording information for decision, please attach relevant information).

D Certification

I hereby certify that all information provided on this application form and in the required attachments is true and accurate to the best of my knowledge. I agree to notify the Cape Cod Commission of any changes on the information provided in this application, in writing, as soon as is practicable. I understand failure to provide the required information and any fees may result in a procedural denial of my project.
NOTE: For wireless communication facilities, a licensed carrier should be either an applicant or a co-applicant.

APPLICANT

Applicant(s) Name: Mr. Daniel T. Barrett, General Manager Tel: 508-759-0600, x. 4240 Fax: N/A

Address: Town of Bourne, ISWM Department, 24 Perry Avenue, Buzzards Bay, MA 02532

Signature: [Signature] Date: 05/13/2021

CO-APPLICANT

Co-Applicant(s) Name: _____ Tel: _____ Fax: _____

Address: _____

Signature: _____ Date: _____

CONTACT

Contact: _____ Tel: _____ Fax: _____

Address: _____

Signature: _____ Date: _____

PROPERTY OWNER

Property Owner: Mr. Anthony E. Schianvi, Town Administrator Tel: 508-759-0600, x. 1308 Fax: N/A

Address: Town of Bourne, 24 Perry Avenue, Buzzards Bay, MA 02532

Signature: Anthony E. Schiavi Date: May 13, 2021

BILLABLE ENTITY

Name: N/A Tel: _____ Fax: _____

Address: _____



TOWN OF BOURNE

Department of Integrated Solid Waste Management



Mailing:
24 Perry Avenue
Buzzards Bay MA 02532
(508) 759-0600, ext. 4

Location:
201 MacArthur Blvd
Bourne MA 02532
Fax: (508) 759-0652

May 17, 2021

Ms. Erin Perry
Deputy Director
Cape Cod Commission
P.O. Box 226
Barnstable, MA 02630

RE: Town of Bourne Integrated Solid Waste Management Facility EEA #11333.
Development of Regional Impact (DRI) application for the Phase 7, Phase 8 and Phase 9
landfill expansion and site development master plan.

Dear Ms. Perry,

Enclosed for your review is our application for a Development of Regional Impact (DRI) for the Phase 7, Phase 8 and Phase 9 landfill expansion at the Town of Bourne, Department of Integrated Solid Waste Management (ISWM) facility located at 201 MacArthur Boulevard, Bourne, MA 02532. It also describes how the 111-acre site will be fully developed in the coming years to relocate solid waste handling facilities and construct needed office space and maintenance facilities as the landfill grows.

This site master plan will provide the Cape Cod Commission (CCC) with an overview of how the landfill will be developed, how ISWM will continue to serve the region long after the landfill operation ceases, and how its many operations fulfill the vision first described in the original DRI in 1998.

A PDF of this DRI application, as well as other relevant recent submittals to MEPA and DEP, may be easily downloaded from the ISWM website by going to link shown below. Relevant Town offices will be notified of our application, listed below, and ISWM will ensure that they and the boards or commission that they represent are aware of how to obtain an electronic copy of our application. If anyone requires a hard copy we will provide it to them.

<https://www.townofbourne.com/integrated-solid-waste-management/pages/landfill-expansion-permitting-documents>

By mutual agreement, ISWM and the CCC have agreed to an Extension Agreement to extend the DRI public hearing period until September 10, 2021 to provide adequate time for review and to schedule hearings.

Please, feel free to contact me at 508-759-0600, extension 4240, if you need further information or have any questions. Thank you for your consideration and to your staff for their assistance in the preparation of this application.

Sincerely,

Daniel T. Barrett
General Manager

Enclosures

Cc without enclosures:

Abutters list

Mr. Anthony E. Schiavi, Bourne Town Administrator

Mr. Glenn Cannon, Bourne Assistant Town Administrator

Bourne Board of Selectmen

Bourne Board of Health

Bourne Conservation Commission

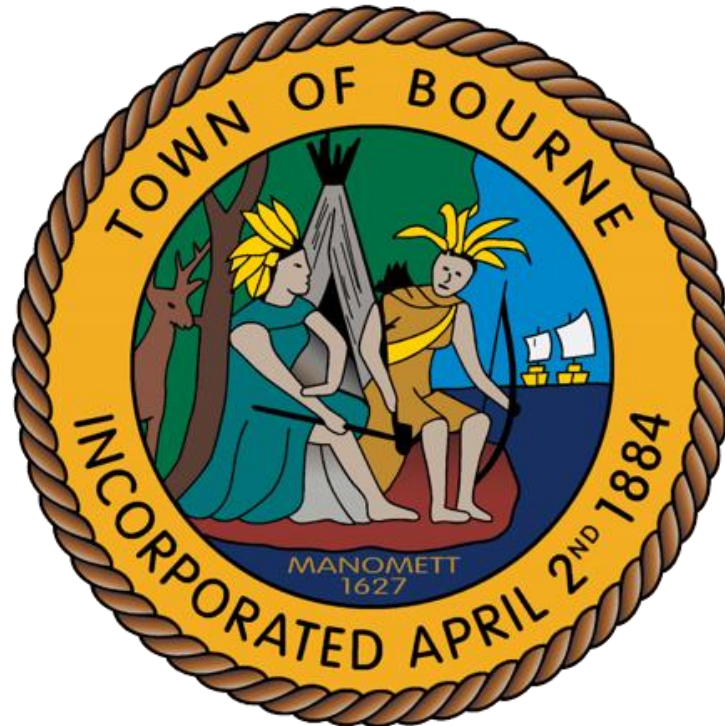
Bourne Planning Board

Ms. Terri Guarino, Bourne Board of Health Agent

Mr. Sam Haines, Bourne Conservation Agent

Ms. Coreen Moore, Bourne Town Planner

Mr. Tim Lydon, Bourne Engineering Technician



TOWN OF BOURNE, MA
DEPARTMENT OF INTEGRATED
SOLID WASTE MANAGEMENT
DEVELOPMENT OF REGIONAL
IMPACT

INTEGRATED SOLID WASTE
MANAGEMENT FACILITY
201 MACARTHUR BOULEVARD
BOURNE, MA 02532

EOEA # 11333

MAY 17, 2021



ISWM Facility December 2020

Town of Bourne, MA
Department of Integrated Solid Waste Management
Cape Cod Commission
Development of Regional Impact

Integrated Solid Waste Management Facility
201 MacArthur Boulevard
Bourne, MA 02532

EOEA # 11333

Prepared by:

Mr. Daniel T. Barrett
General Manager
Town of Bourne, MA
Department of Integrated Solid Waste Management

Mr. Philip A. Goddard
Manager of Facility Compliance and Technology Development
Town of Bourne, MA
Department of Integrated Solid Waste Management

Mr. Asa Mintz, P.E.
Operations Manager
Town of Bourne, MA
Department of Integrated Solid Waste Management

Mr. Ray Quinn, P.E., SITEC Environmental, Inc.

Mr. Ken Ryan, P.E., SITEC Environmental, Inc.

Ms. Amy Ball, Horsley Witten Group

Mr. Ben Wollman, Horsley Witten Group

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List of Attachments

Attachment 1

MEPA ENPC and SSEIR Certificates
CCC Phase 6 DRI Decision and Certificate of Compliance
CCC 2000 DRI Certificate of Compliance

Attachment 2

Site Locus
Landfill and Site Development Plans
Off-site Landfill Photographic Renderings
Historical Aerial Photographs

Attachment 3

Natural Resources Inventory

Attachment 4

Stormwater Management Plan

Attachment 5

Water Resources Communications

Attachment 6

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Bourne Board of Selectmen Vote

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Traffic Assessment Memorandum

Attachment 9

MA Historical Commission Information

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Excerpts from:
Cape Cod Commission Act
Cape Cod Commission Regional Policy Plan
Bourne Local Comprehensive Plan

Introduction

The Town of Bourne, Department of Integrated Solid Waste Management (ISWM) is submitting this Development of Regional Impact (DRI) application to address the final site development plan for its approximately 111-acre site located at 201 MacArthur Boulevard, Bourne, MA. 02532 (the Facility.) This plan is a culmination of decades of work by the Town to fulfill the maximum potential for the Facility to serve the communities in Barnstable County. It includes the landfill phasing plan and a conceptual site plan for the handling and transfer facilities that will be displaced by the landfill expansion. The Facility is divided into three distinct but adjacent parcels totaling 111 acres:

- a 74-acre site-assigned parcel that is the original parcel utilized for landfilling since 1967 and is the location for the proposed Phase 9 vertical expansion
- a 25-acre parcel that was purchased in 2001, which was site-assigned for solid waste handling in 2005 and is the area for proposed Phase 7 and Phase 8 horizontal landfill expansions
- a 12-acre parcel, purchased in 2016, which is the proposed location for new offices, maintenance facilities, and pending successful site-assignment, the solid waste handling and transfer operations that will be displaced by the landfill expansion over time

Figure 1, shown below, provides a site plan showing the configuration of the three parcels to guide you when reading this application. **Figure 2** shows the long-term layout of the facility at full build-out which is the purpose of this application. **Attachment 2** contains more detailed plans for the proposed expansion.

Figure 1

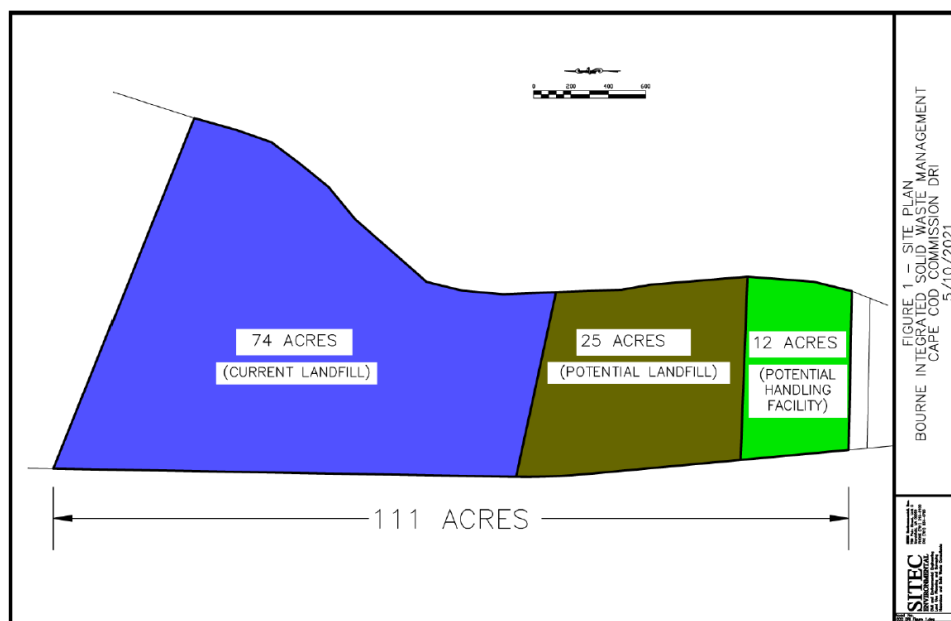
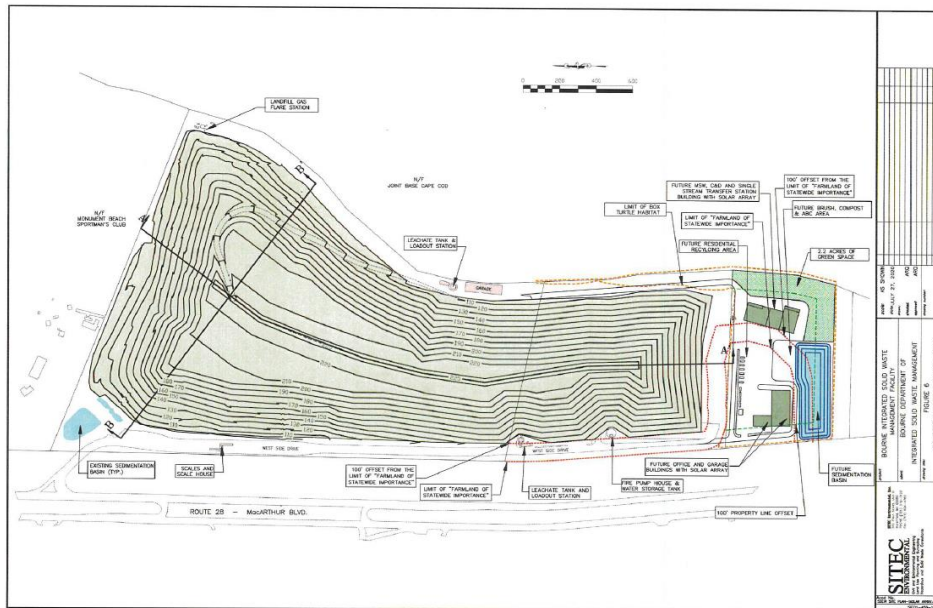


Figure 2



The proposed landfill expansion will provide approximately 5,175,000 cubic yards of airspace that is projected to potentially last until the early 2040s. Once the landfill is eventually closed, the Facility will still be positioned to continue providing regional services indefinitely with its handling and transfer operations. The development described herein shows the commitment and planning by the Town of Bourne to continue to play a leading role in managing solid waste in the region.

ISWM is literally the manifestation of the purpose of the Cape Cod Commission as described in the Cape Cod Commission Act, Section 1 (c) which states:

“The purpose of the Cape Cod commission shall be to further: ...the provision of adequate capital facilities, include transportation, water supply, and solid, sanitary and hazardous waste disposal facilities...”

Since its inception, ISWM has been an integrated operation that included disposal, transfer and processing operations that has served not only the residents of Bourne, but also the other municipalities on Cape Cod, as well as, local businesses. Its operations have been designed to be compliant with the goals of the solid waste master plans issued by Massachusetts Department of Environmental Protection (MassDEP), the Regional Policy Plan by the Cape Cod Commission and Bourne’s Local Comprehensive Plan.

Most notably, Bourne was there for the Cape communities in 2007 when the SEMASS municipal waste combustor in Rochester, MA was forced to close following a catastrophic fire. Overnight, Bourne worked with local and state regulators, and SEMASS, to ensure that all the trash on the Cape was safely diverted to the Bourne landfill until the plant came back on-line. This was accomplished without disruption in

service to the communities and with no financial impact.

Bourne, both directly and indirectly, supports the solid waste disposal systems of ten communities on the Cape. The following communities utilize SEMASS: Brewster, Chatham, Dennis, Eastham, Harwich, Sandwich, Truro and Yarmouth. The residual ash from SEMASS then comes to Bourne for management at the landfill. SEMASS recently closed its landfill, therefore Bourne plays a vital role in supporting the SEMASS facility which provides a critical local disposal option for towns. Additionally, ISWM directly manages the household trash from the Town of Falmouth through a long-term contract and the trash from the residents in Bourne at its landfill. **Therefore, on a daily basis, ISWM either directly or indirectly supports the solid waste disposal system for ten of the fifteen (66%) communities on Cape Cod.**

The Town will continue to be a reliable partner for years to come and looks forward to your review and approval of the plans contained in this DRI application.

Process Overview

The remaining development of the facility, which has been reviewed by the Cape Cod Commission (CCC) since 1998, will focus on the horizontal and vertical expansion of the landfill and the relocation of structures that will be displaced by that expansion onto a parcel located at the southern end of the Facility referred to as the 12-acre parcel. ISWM will need separate approval from the Massachusetts Department of Fisheries and Wildlife, Natural Heritage and Endangered Species Program (NHESP) to take this acreage as it is designated as habit for the Eastern Box Turtle which is a Species of Special Concern. This area is also designated as a Natural Area Placetype by the CCC Regional Policy Plan (RPP), and therefore ISWM will need to provide an open space offset. The plan for this area is described later in this application, including a Natural Resources Inventory (NRI) completed in accordance with the CCC Regional Policy Plan (RPP) that was updated in 2019.

A DRI was triggered because ISWM had to complete a Single Supplemental Environmental Impact Report (SSEIR) for the Massachusetts Environmental Policy Act unit (MEPA) which automatically requires that a DRI be filed. Specifically, the landfill expansion will result in the creation of at least ten acres of new impervious area which was the trigger for review by MEPA.

In February 2020, with the support of the Bourne Board of Selectmen, ISWM submitted to MEPA an Expanded Notice of Project Change (ENPC) relative to the Facility. The ENPC provided substantial details about the existing facility and the proposed full build-out development of the site.

The 2020 ENPC provided an updated site development plan for the overall 111-acre site including a conceptual design for the proposed phased development of Phase 7, Phase 8 and Phase 9 landfill expansions and relocation of facilities onto an undeveloped portion of the facility located at the southern end of the site, facility previously referenced as the 12-acre parcel. MEPA completed its review of the project and the Secretary issued a Final Certificate in December 2020 noting that the project “adequately and properly complies with MEPA and its implementing regulations.”

The ISWM staff and its consultants, SITEC Environmental, Inc. and Horsley Witten Group, have worked closely with staff at the CCC to ensure that this application contains the necessary updated information that fully describes this site development master plan for the Facility. It is the intent of the Town in filing this DRI that it will be the final DRI needed for this site and therefore ISWM has included as much detail about the configuration of future structures as possible and a comprehensive stormwater management plan to manage the site at full build-out. The Town is grateful for the cooperation and guidance the CCC staff has provided to ISWM and its team.

Previous Cape Cod Commission and MEPA reviews

As has been mentioned in the introduction, the Facility has been extensively reviewed by the MEPA office and the CCC for well over twenty years. Below is a timeline that lists the reviews that were conducted prior to this submittal. Of note is the recent issuance of a Single Supplemental EIR (SSEIR) Certificate. **Attachment 1** contains the MEPA Certificates associated with this submittal, as well as the decision for the previous Phase 6 DRI and the Phase 6 DRI Certificate of Compliance. ISWM also maintains an informative website that has a section containing all the relevant applications and materials regarding the landfill expansion. To download documents and for more information about ISWM, go to:

ISWM Department Homepage

<https://www.townofbourne.com/integrated-solid-waste-management>

Landfill Expansion

<https://www.townofbourne.com/integrated-solid-waste-management/pages/landfill-expansion-permitting-documents>

Changes addressed in these decisions listed below include; adding Municipal Solid Waste (MSW) and Municipal Combustor Ash (MCA) to the approved wastestreams for acceptance at the facility, incorporating adjacent land that the Town purchased into the site development plans, temporary disposal tonnage increases in response the fire at the Covanta SEMASS municipal waste combustor, plans for a landfill gas-to-energy facility, a final report on the Phase 1D/Phase 5 reclamation project, and the Phase 6 expansion.

MEPA - Final EIR Certificate	November 1999
CCC- Development of Regional Impact Decision	February 2000
CCC- Partial Certificate of Compliance	February 2001
MEPA- Advisory Opinion	August 2001
CCC- Minor Modification #2	August 2001
MEPA- Notice of Project Change	August 2003
CCC- Major Modification	March 2004
CCC- Minor Modification #2	April 2007
MEPA- Notice of Project Change	May 2007
CCC- Final Certificate of Compliance	May 2008
MEPA- Notice of Project Change	January 2009
CCC- Minor Modification #2	August 2009
MEPA- Notice of Project Change	February 2016
CCC- Minor Modification #1	April 2016
MEPA- Single Supplemental EIR Certificate	June 2018
CCC- Development of Regional Impact Decision	November 2018
CCC- Certificate of Compliance	January 2020
MEPA- Expanded Notice of Project Change	February 2020
MEPA- Single Supplemental EIR Certificate	December 2020

Project Background

The Town of Bourne, Department of Integrated Solid Waste Management (ISWM) operates as an Enterprise Fund for the Town of Bourne. It was created in 1998 and oversees all planning, permitting, construction and operation of the solid waste management facilities located at 201 MacArthur Boulevard, including all ancillary structures and equipment.

Currently, the facility has several operations including:

- a modern double-lined landfill with leak detection that accepts predominantly municipal waste combustor ash from Covanta SEMASS located in Rochester, MA
- a landfill gas collection system and flare for thermal destruction of landfill gas generated at the Bourne Landfill
- a leachate load-out system for off-site management of landfill leachate generated at the Bourne Landfill
- a residential recycling center that accepts materials from the Town of Bourne and neighboring communities
- a construction and demolition debris transfer station
- a single stream recyclables transfer station, open to commercial haulers
- a compost site, including yard waste and brush
- an area for asphalt, brick and concrete recycling

Bourne has invested significant resources to modernize the entire facility which began operations in 1967 and has fulfilled the intent as described in the original FEIR to build a multi-faceted facility that would serve a regional need. **Attachment 2** contains aerial photographs from 1972 and 2020 that demonstrate the dramatic changes that have been made over the decades and especially since ISWM was formed. As an integrated facility offering a diverse array of services to the region, the mission of ISWM will continue for many years even after the last phase of the landfill is capped and closed.

Since 1998, ISWM has been operated as an Enterprise Fund, separate from the Town of Bourne's General Fund which is funded primarily by the real estate tax levy. The ISWM Enterprise Fund, which is regulated by the MA Department of Revenue (DOR), primarily derives revenue from gate receipts for its various operations, of which, the landfill operation comprises the vast majority of revenue. All operations, debt service, insurance and closure and post-closure accounts are paid by the Enterprise Fund. In addition, as approved by DOR, ISWM pays for the curbside collection and management of municipal solid waste (MSW) and single-stream recyclables generated by Bourne residents that would otherwise have been paid out of the Town's General Fund. ISWM also pays a per ton fee, known as the Host Community Fee, directly to the General Fund for each ton it manages at the site. The amount of the Host Community Fee is

adjusted each year in accordance with the Boston Consumer Price Index. As a result, the operations at ISWM, and in particular the landfill, have become an integral part of the Town of Bourne's infrastructure and annual budget.

Beginning in January 2015, the Town switched its incoming wastestream mix to predominantly ash under a long-term contract with the Covanta SEMASS (SEMASS) municipal waste combustor located in Rochester, MA. Per the agreement, approximately 189,000 tons per year of the permitted 219,000 tons of annual disposal capacity is reserved exclusively for ash, which represents 86% of the annual permitted capacity through 2024. The remaining capacity is available for MSW from Bourne residents and MSW from the Town of Falmouth, MA under a ten-year contract. Both the SEMASS agreement and the Falmouth agreement run through the end of 2024. As has been the case since 2015, the remaining capacity will either be held in reserve or can be utilized as emergency capacity to accommodate unforeseen upsets in the disposal network as seen in 2007. If the need should arise, this emergency capacity will be made available to the Cape Cod towns first. Any additional capacity can be used by the Cape communities for items such as wastewater grit and screenings, soils or other difficult-to-manage wastestreams. This mix of wastestreams is consistent with the state's goal that landfill airspace be utilized for the irreducible minimum or residuals.

ISWM plays an integral role in supporting the towns on Cape Cod. In particular, by managing ash from SEMASS, ISWM supports all the towns that utilize SEMASS for managing their solid waste. This is vitally important now that SEMASS has closed its own landfill in Carver and is almost entirely dependent upon Bourne to manage its ash. Without a local option for managing its ash, the cost for its service would most certainly rise. The communities of Brewster, Chatham, Dennis, Eastham, Harwich, Sandwich, Truro and Yarmouth all utilize the SEMASS facility.

Additionally, ISWM directly manages the household trash from the Town of Falmouth through a long-term contract and the trash from the residents in Bourne at its landfill. **On a daily basis, ISWM either directly or indirectly supports the solid waste disposal system for ten of the fifteen (66%) communities on Cape Cod.**

The previous ENPC, submitted in November 2017, was related primarily to the development of the Phase 6 Landfill. After receiving approval from the MEPA office and the Cape Cod Commission (CCC), the Town submitted to Massachusetts Department of Environmental Protection (MassDEP) an application for an Authorization to Construct (ATC) Phase 6, which was approved. The MassDEP subsequently approved the Town's application for an Authorization-to-Operate (ATO) on January 17, 2020. Phase 6 was the next step in a sequence of landfilling that started with Phase 1, followed by Phase 2, Phase 3, Phase 2A/3A (valley fill), Phase 4 and Phase 5. Phase 6 is the last phase in a progressive filling plan first discussed in the 1998 EIR, which completed the horizontal expansion of landfill operations on the original 74-acre site. Maintaining its practice of capping as soon as feasible, ISWM will cap portions of Phase 4 and Phase 5 during the summer and fall of 2021.

Since the development of the original EIR, the Town purchased two parcels that will facilitate maximum development of the landfill phases as discussed. In 2001, a 25-acre parcel immediately abutting the Landfill to the south was purchased. This site was site-

assigned by the Bourne Board of Health (BOH) for solid waste handling and transfer operations and has allowed for the development of solid waste handling facilities and most recently, relocation of temporary offices. It was also the subject of an Advisory Opinion by the Secretary that indicated that a new EIR was not needed in order to develop this parcel for solid waste handling and transfer operations, but rather it should be viewed as an extension of the original EIR.

Project Description

As noted, the focus of this submittal is the horizontal and vertical expansion of the Bourne landfill into Phase 7, Phase 8 and Phase 9 and the development of displaced solid waste handling facilities and other structures, including an office/maintenance garage complex. These plans, except for Phase 9, were discussed in detail in the previous DRI for Phase 6, including a full build-out scenario. The main differences in this application are that the landfill is planned to expand 40 feet vertically to elevation 225' Mean Sea Level (MSL) and the design for the 12-acre parcel is much more detailed, including a final stormwater management plan which is contained in **Attachment 4**. **Attachment 2** contains plans that detail the development of the site including: a site locus; an existing conditions plan; an overall site development plan; a landfill full build-out plan; and cross-sectional depictions of the landfill. Also, it contains photographic renderings of the facility at full build-out as viewed from different areas off-site.

ISWM is proposing to build Phase 7 and Phase 8 horizontal expansions onto the 25-acre parcel, as well as a vertical expansion over the existing landfill on the original 74-acre parcel, known as Phase 9. This plan was developed to provide a maximum long-term site development master plan so that the Bourne community and regulators would have a clear picture of the full potential of the Bourne Landfill to service the region with an active landfill.

On August 12, 2019, these plans were shared in a joint public meeting with the Bourne Board of Selectmen (BOS), Bourne Board of Health (BOH), Finance Committee (FC), ISWM Business Model Working Group (Working Group) and the Energy Advisory Committee (EAC) in order to receive feedback and provide time for community response to the plan. A video recording of the meeting is on the ISWM website.

After receiving positive feedback from the community, the BOS voted on November 5, 2019 to pursue a full build-out site development plan. A certified copy of which is contained in **Attachment 7**,

Phase 9, while out of sequence numerically, will be the next phase constructed and will increase the maximum height of the landfill from elevation 185' Mean Sea Level (MSL) to elevation 225' MSL over previously lined and filled areas of the Landfill including Phases 2, 2A/3A, 3, 4, 5 and 6. By increasing the height of the landfill over already constructed phases in currently site-assigned areas and filling this area in conjunction with Phase 6, the Town can utilize the several years that this capacity will provide to develop a detailed plan for how and when to relocate structures that will be displaced by Phase 7 and Phase 8. This will allow ISWM to maximize the useful lifespan of the existing large handling facility assets which represent significant capital investments by the Town.

The addition of a vertical expansion to elevation 225' MSL for Phase 9 will also have an effect on the overall landfill as expansions move southward by allowing more capacity in

Phase 7 and Phase 8 than had been previously contemplated because those phases will be constructed in a manner to match the elevation of Phase 9. The total volumes for Phase 7 and Phase 8 will be 3,920,000 cubic yards which could provide up to fourteen years of capacity.

The Phase 9 vertical expansion alone will provide approximately 1,255,000 cubic yards of additional airspace which could extend the life of the landfill up to four and a half years. As noted earlier, by permitting and operating Phase 9 as the next area of landfill development after Phase 6, the Town will have additional time to create a schedule for the required permitting, financing and relocation of existing operations and site preparation for Phases 7 and 8, including excavating nearly 500,000 cubic yards of virgin soils.

The combination of Phase 7, Phase 8 and Phase 9 will ensure that ISWM can continue to provide vitally needed landfill capacity to the region into the late 2030s or early 2040s.

In 2016 the Town purchased an adjacent parcel to the south of the 25-acre parcel comprising approximately twelve acres. Subject to permitting, this area will allow for potential relocation of solid waste handling operations and construction of permanent offices so that Phase 7 and Phase 8 landfill expansions can be fully developed on the 25-acre site. Without access to this parcel, the landfill size will have to be significantly reduced and redesigned thereby shortening its operational life. This DRI application presents the maximize utilization of the ISWM facility to maintain landfill operations as long as possible to continue to serve the region.

The entire 12-acre parcel is habitat for the Eastern Box Turtle which is designated as a Species of Special Concern by the Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Department of Fisheries and Wildlife (DFW.) NHESP requires that any habitat that is taken must be replaced at a ratio of 1.5:1. This area is also designated as a Natural Area Placetype by the CCC which requires a mitigation ration of 3:1. ISWM has a mitigation plan that will meet the requirements of NHESP for this taking, however it is requesting a waiver of the 3:1 mitigation rate to match the NHESP mitigation rate of 1.5:1. ISWM has pursued mitigation land for several years and made every effort to adjust to regulatory changes that occurred after it acquired the 12-acre parcel in 2016 and discussed its plan in the Phase 6 DRI. The first regulatory change was that NHESP changed the designation of the habitat at the 12-acre parcel, and the second was that the CCC updated its Regional Policy Plan (RPP) with mitigation requirements. Despite these difficulties, ISWM is in the final stages of acquiring suitable land to meet the 1.5:1 mitigation ratio for the NHESP that is the proposed final mitigation if the waiver is approved.

However, regardless of the mitigation ratio, this parcel cannot be disturbed until all permitting is completed. This requested waiver is discussed in greater detail in the Identification of Impacts section and in **Attachment 3** which contains the Natural Resources Inventory (NRI) prepared by Horsley Witten Group. It is important to note that the NRI and any permitting with NHESP is only needed for the 12-acre parcel. All other currently site-assigned phases are exempt from further review under the Massachusetts Endangered Species Act (MESA) and do not need separate permits or mitigation.

The overall impact of these acquisitions is that the areas utilized for landfilling can be maximized to provide over five million cubic yards of additional airspace, while at the

same time providing area for other solid waste handling facilities such as a C&D transfer station, single-stream recyclables transfer station, a residential recycling center and ISWM offices along with new maintenance facilities, supporting continuing operations after the landfill closes.

The full development of the site requires several steps after the DRI. These include: major modification to the existing site assignment by the BOH which would include modifying the 25-acre waste handling operations site assignment to allow for landfilling; modifying the existing landfill site assignment on the 74-acre parcel to allow for the Phase 9 vertical expansion in that area; seeking a new site assignment to allow for solid waste handling on the 12-acre parcel and obtaining a Conservation and Management Permit (CMP) from NHESP prior to clearing any protected habitat on that parcel. Further, ISWM will need to obtain the necessary state and local permits to build each phase of the landfill, solid waste handling operations and other structures.

ISWM has filed an application with MassDEP to modify the BOH site assignment at the facility to accommodate a vertical expansion for Phase 9 and for the horizontal expansion of the landfill onto the 25-acre parcel. Should the MassDEP determines that the ISWM site is suitable for the expansion of the landfill, the BOH will schedule a hearing later this summer that will follow the review by the CCC.

Facility need

Landfill capacity projections from MassDEP reveal a significant reduction in the number of operational landfills in 2021. These landfills provide capacity for many types of municipal solid waste (MSW) including; household and commercial trash, processing residuals, storm/disaster debris, municipal waste combustor ash, contaminated soils, dredge spoils and special wastes. The best management option for much of this waste, which cannot be recycled, composted or combusted, is for it to be deposited in a landfill.

As a result, Bourne will play a critical role in providing infrastructure going forward. Primarily, ISWM will provide much needed local municipal waste combustor ash capacity. This is important because operators of combustors must show they have several years of capacity for their ash as part of their operating plan. ISWM will maintain its operational flexibility to accommodate unforeseen changes in the solid waste marketplace. If the mostly ash business model no longer serves the solid waste needs of the Cape and regional communities, ISWM may instead use its permitted disposal capacity to accept MSW from communities on the Cape and the region, including commercial sources. The Phase 7, Phase 8 and Phase 9 capacity will play a vital role in providing viable options as disposal capacity dwindles and communities are forced to look further away for options, including out-of-state rail and trucking options in Ohio and Virginia. Further exacerbating the regional capacity inventory are the recent closures of Massachusetts landfills in Southbridge, Taunton, Chicopee and most recently, the landfill operated by SEMASS in Carver which closed in December of 2020. Together, this represents approximately 1,065,120 tons of annual capacity. The closure of the landfill in Carver makes the capacity in Bourne even more critical for the SEMASS facility as it will no longer have its own local backup capacity for ash.

Landfill capacity projections from the latest MassDEP 2030 Solid Waste Master Plan (SWMP) issued in draft form in September 2019 reveal a significant reduction in the amount of landfill disposal capacity in Massachusetts in 2021 and even more significant reductions in 2025 and 2030. Projections show a reduction from 842,245 tons of capacity in 2019 to 86,000 tons per year in 2027. Regulatory projections of dwindling capacity exemplify the importance of this expansion to the overall wellbeing of the Cape and region and its ability to take care of itself. As previously mentioned on page 5, in 2007 when SEMASS was forced to shut down for an extended period Bourne was immediately made available to accommodate the Cape and regional disposal needs.

The MassDEP Solid Waste Master Plan (SWMP) outlines an aggressive goal to reduce waste disposal tonnage from a baseline of 5.7 million tons in 2018 to 4 million tons by 2030, representing a 30% reduction. By 2050, the state has goals of reducing disposal to 570,000 tons per year, or a 90% reduction. However, the SWMP plan notes that, “Massachusetts has a projected capacity shortfall of 700,000 tons/year by 2030, even assuming we meet our 2030 waste reduction goal. Massachusetts will retain capacity for municipal waste combustion within the existing 3.5 million tons of annual capacity.” The MassDEP further states that “... solid waste disposal capacity in Massachusetts and throughout the Northeast has continued to shrink as more landfills close and they are not replaced by new in-state disposal capacity. This tightening of disposal capacity has weakened the resiliency of Massachusetts waste disposal infrastructure and facility outages that were routine in the past are causing frequent operational problems.” Furthermore, MassDEP noted this looming disposal shortfall in the 2013 SWMP excerpted below:

“This capacity can be made up for by:

- *Preventing waste from being generated in the first place;*
- *Increasing recycling and composting;*
- *Developing new in-state disposal capacity; and/or*
- *Increasing export of waste to disposal facilities in other states.*

A loss of landfill capacity will also create issues for a number of special wastes that are currently managed (in part) at landfills. These materials, which are not generally tracked with MSW and C&D, include contaminated soil, residuals from vehicle shredding operations, dredge spoils, and some sewage sludge. Please see the text box on page 7 for more information on how these materials are managed. As there are fewer landfills in Massachusetts, in-state outlets for these materials are becoming scarcer. MA DEP will continue to track the status of how these materials are managed and identify and assess additional management alternatives.”

This excerpt highlights the unique role landfills play in an integrated solid waste management system. While export of waste to distant landfills, such as those in Ohio, is an option for generators in Massachusetts, it comes with the risks of increased transportation expense, potential exposure to import taxes from pending federal legislation and the availability of long-haul trucking or rail cars to manage waste flow in

a timely manner.

In addition to helping during disruptions, as noted earlier, ISWM works with the Cape communities in special circumstances too. ISWM again played this role in the summer of 2018 when it helped a Cape Cod municipality, who is a SEMASS customer, dispose of multiple loads of MSW that were displaced when SEMASS was operating under reduced capacity due to routine maintenance. More recently, ISWM helped another Cape municipality manage soils generated from repairing their landfill cap. The presence of the Facility and its several operations in the marketplace also puts pressure on competitors that keeps prices in check.

Maintaining well-run landfill facilities that can alleviate this pressure is an important part of the long-term planning calculus for solid waste managers and regulators in Massachusetts. Adding to the planning challenges is that Connecticut and Rhode Island are facing similar landfill capacity issues and will not be able to provide a closer waste export option, especially in Rhode Island where the Central Landfill is reserved for in-state capacity.

Barnstable County has taken note of the impacts of fewer facilities and is planning to issue a Request for Proposal (RFP) to determine options for out-of-state disposal and local options to manage a number of difficult-to-manage items. The ISWM facility was specifically mentioned as a subject of investigation in a recent presentation to the County Commissioners excerpted below which demonstrates the acknowledgment by local planners and management at the Barnstable County Administration, CCC, Barnstable County Department of Health and the Environment, and the Cape Cod Cooperative Extension of the importance of the Facility to the overall planning for solid waste management solutions for Cape Cod. The Commissioners approved \$150,000 to move forward with an RFP demonstrating the high degree of interest in locally sustainable solid waste infrastructure.

“On-Cape opportunities to collect, process for reuse or energy generation, and recycle materials at Joint Base Cape Cod UCRTS, the Bourne Integrated Solid Waste Management facility, and the Yarmouth transfer station will be examined”

Excerpted from: The Future of Solid Waste Management on Cape Cod
Understanding Options for Municipal Solid Waste Processing, Disposal, and Recycling
Barnstable County Commissioners August 5, 2020

Identification of impacts

The impacts of operations at the original site-assigned parcel, including the landfill were addressed as part of the original MEPA and CCC review processes in 1998, 1999 and in 2018 with the Phase 6 expansion. The proposed site master plan, including the change in uses of the 25-acre parcel and the 12-acre parcel, were discussed extensively in the SSEIR approved by MEPA in December of 2020.

ISWM has filed an application to MassDEP for a Major Modification to the existing site assignment that addresses the suitability of the ISWM facility for landfilling in relation to current regulations. ISWM will also be filing a separate New Site Assignment

Application for the proposed Large Handling Facility (LHF) on the 12-acre parcel at a later date. The current Major Modification application and the SSEIR application, are on the ISWM website referenced earlier and contain hundreds of pages of details that review all aspects of the proposed expansion. However, this application contains all the necessary information required for approval of the DRI under CCC regulations.

Phase 7, Phase 8 and Phase 9 will be located on previously disturbed land. Existing roads will provide access to and around the site. The southern 12-acre parcel is the proposed location of new offices and transfer station facilities that would replace the current operations that would be displaced by Phase 7 and Phase 8. Construction and operation of future landfill phases will not change the way waste is currently managed at the facility and the tonnage limits are not proposed to be changed.

A summary of the findings for each of the environmental criteria evaluated during the MEPA review process for the Bourne landfill are shown below. A detailed discussion greenhouse gas emissions, mitigation and climate change was included in the SSEIR.

Priority Habitat and Natural Area Placetype

The proposed areas identified for future landfilling include the 74-acre parcel currently used for landfilling and the 25-acre parcel used for handling and transfer operations located on previously disturbed land. These parcels do not contain habitat for rare species, vernal pools, and exemplary natural communities. Additionally, neither parcel is mapped as *Priority Habitat of Rare Species*. No alteration of designated significant habitat or taking of an endangered, threatened or special concern species will occur for either the vertical or horizontal expansions. This has been confirmed by the NHESP which has exempted all proposed landfill phases from further review under the Massachusetts Endangered Species Act (MESA.) **Attachment 3** contains correspondence with NHESP to this effect.

The full development of the Facility will result in the alteration of the 12-acre parcel mapped as *Priority Habitat* for the Eastern Box Turtle, which is a species of special concern. NHESP has confirmed that this will result in a regulatory “take” and will require additional permitting under MESA as noted in its letter contained in **Attachment 3**. To address the proposed taking of any lands needed for development, the Town will apply for a Conservation and Management Permit with NHESP which requires that any habitat that is lost as a result of a “take”, must be replaced at a ratio of 1.5:1.

The CCC has identified that the 12-acre parcel is a Natural Area Placetype as mapped by the CCC’s RPP Data Viewer. The remaining 100 acres are also identified as a Military and Transportation Placetypes, however this area has been fully developed for solid waste disposal and handling operations. ISWM does not plan to utilize any buffer land and therefore will not need to provide 1:1 land mitigation required for these placetypes.

ISWM has procured the services of Horsley Witten Group (HW) to guide the Town through the review process with CCC and NHESP with respect to rare species habitat and mitigation. **Attachment 3** contains a full NRI prepared by HW that

describes the conditions on the 12-acre parcel and the proposed mitigation. It also includes the MESA application and response from NHESP. **Attachment 3** also contains reports prepared by a licensed soil scientist who reviewed areas on both the 25-acre parcel and 12-acre parcel relative to U.S. Department of Agriculture soils maps for Barnstable County.

ISWM has identified a mitigation plan that will meet the requirements of NHESP for the regulatory taking under MESA that will address the state requirement, however ISWM is requesting a waiver of the 3:1 mitigation ratio described in the Open Space Technical Bulletin, to match the NHESP mitigation ratio of 1.5:1. This will be discussed in the next section in greater detail.

Historical/archaeological resources

The Facility does not include any structure, site or district listed in the State Register of Historic Places or inventory of historic and archaeological assets of the Commonwealth. The project will not destroy, alter or have any impacts on any historical or archaeological resource. **Attachment 9** contains communications with the MA Historical Commission.

Areas of Critical Environmental Concern

The proposed change will have no impact on the nearby Back River ACEC.

Land

The development of the landfill and relocation of associated transfer stations, buildings, roads and parking will result in an area greater than ten acres of new impervious area which triggered the need for an SSEIR and subsequently this DRI application.

Wetlands

The project will not alter any wetlands, waterways or tidelands, and the work performed to construct the project will not be within a 100-foot buffer zone of bordering vegetated wetlands.

Water

Water use by the project will not change from current usage rates. Employees utilize on-site facilities at the office trailers which are supplied by the Bourne Water District. A small non-potable water well will continue to be available to supply approximately 2,000 gallons per day if necessary for on-site operations.

Stormwater

All stormwater will be retained on-site for infiltration at existing and new stormwater basins. **Attachment 4** has a detailed Stormwater Management Plan that was developed in conjunction with ISWM staff and SITEC Environmental, Inc. based on guidance from the CCC staff. The plan addresses the necessary capacity for a full build-out of the landfill and a robust conceptual configuration of structures for development of the 12-acre parcel, including nitrogen calculations and bio-retention structures. ISWM is fully committed to continuing its efforts to properly manage stormwater on-site. While the final exact configuration of the stormwater structures

may vary when constructed, the components and intent of the system, capable of managing a 100-year storm event, will remain consistent. As noted, all stormwater is managed on-site and therefore no National Pollution Discharge Elimination System (NPDES) permit is required. This has been confirmed by the MassDEP and U.S. Environmental Protection Agency (EPA) in correspondence that was submitted with the site assignment major modification application.

Groundwater

Groundwater monitoring at ISWM is of paramount importance. The Town has worked extensively with the MassDEP, CCC and the BOH to ensure that a comprehensive monitoring system is in place will continue to be reviewed and updated as necessary. MassDEP and CCC have concluded that, while there have been impacts to groundwater from the old unlined landfill, which ceased operation in 1999, the Town has taken the appropriate measures to protect downgradient receptors of the facility and that the modern design of the landfill is protective of human health and the environment and therefore, expansions have been granted over the last twenty years. Since the FEIR Certificate was issued in 1999, the Town has conducted extensive hydrogeological investigations and modeling, including particle tracking, for areas downgradient of the ISWM facility, in full cooperation with and to the satisfaction of MassDEP and the CCC, which required expanded groundwater monitoring for several years as part of multiple DRI approval processes.

Additionally, all private well owners in the path of the particle tracking were provided connections to the Bourne Water District (BWD) supply system. The BWD has also confirmed that it has adequate and reserve capacity that is not near the landfill nor downgradient from it. As a precaution, the BOH passed a bylaw that prohibits the installation of any private drinking water wells or public drinking water supply wells in the downgradient area. Most importantly, MassDEP issued the Town its Final Approval for a Comprehensive Site Assessment (FCSA) on June 5, 2017, which provides an environmental monitoring plan for the facility moving forward, culminating decades of review of the site and surrounding areas. The groundwater samples for this monitoring plan are collected by the Barnstable County Health Department, who is on-site quarterly, and analyzed at the Barnstable County laboratory. The data is reviewed by MassDEP, ISWM, along with its engineering consulting firm SITEC Environmental, Inc., and based on relevant data trends, adjustments to the plan are made as needed.

Attachment 5 contains correspondence with the BOH Agent and the BWD, including a recent newsletter discussing reserve water supply, and particle tracking figures. A very detailed review of groundwater was included in the recent submittal to MassDEP for the major modification to the site assignment, which can be found on the ISWM website.

Wastewater

Landfill leachate and condensate will continue to be managed by a groundwater protection system similar to the current state of the art system that is installed for the current operation. Leachate is conveyed to two large on-site storage tanks and will

be either removed from the site via trucks or managed on-site at a proposed wastewater treatment plant, if it is constructed. ISWM is reviewing options for the possible construction of a leachate pre-treatment system on-site as well as construction of a large-scale comprehensive treatment system that would treat leachate to discharge standards under NPDES. If the latter option is pursued, ISWM may connect to the treated effluent on Joint Base Cape Cod (JBCC) which abuts the landfill, via a pending easement from the Massachusetts Department of Fish and Game (DFG). This option was discussed in greater detail as part of the Phase 6 DRI. If plans were approved to proceed, an additional easement will need to be obtained from the U.S. Army Corps of Engineers as well as Use Agreements with the MA Air National Guard, 102nd Intelligence Wing or any successor that will manage the system. Any such connection and discharge will need to be reviewed and permitted by MassDEP prior to construction and operation, as well as by representatives from the military authorities on JBCC and any related civilian oversight organizations that review base operations.

Currently, domestic wastewater that is generated on-site is treated and disposed by four Title 5 septic systems. The system for the existing garage and the system serving the scalehouse, is expected to remain and the two systems for the existing office and single stream recyclable transfer station will be abandoned in accordance with Title 5. Those two systems will be replaced by either two systems or a single combined system for the proposed facilities to be located on the 12-acre parcel. There will be no increase in flow to the new systems, thus there will be no net change to the site's wastewater discharge.

Transportation

The project will not result in a change in traffic. Trip generation has been reduced at the landfill since January 2015 as a result of ash from SEMASS becoming the primary wastestream accepted for disposal. Ash is delivered in large trailers that contain nearly twice the tonnage per trip when compared to packers containing MSW. Furthermore, the only MSW accepted at the facility is from the Town of Bourne packer trucks and from collection trucks bringing waste from the Town of Falmouth. The long-term contract with SEMASS for ash disposal, comprising 189,000 tons per year, and the long-term MSW disposal contract with Falmouth, representing about 12,000 tons per year, stabilize the trip generation and provide a predictable customer base. Finally, should the Town's plans to treat leachate on-site come to fruition, there is a potential to further reduce truck traffic by approximately 2,000 trips per year by leachate hauling tanker trucks.

Please note that as a result of the Phase 1D reclamation and relocation of the residential recycling center further to the south, the site entrance has been significantly improved with a relocated scale house and scales, better traffic patterns and longer queues for both inbound and outbound traffic. The Town has invested in significant site improvements that have excess capacity for its approved tonnage and is prepared to address any scenario for disposal and/or transfer whether it remains mostly ash or if it were to become mostly MSW. This is detailed in a Traffic Assessment Memorandum found in **Attachment 8**, which includes an analysis of recent crash data.

Energy

The project does not meet the size thresholds for MEPA review under energy. The Town does intend to review options for generating electricity on-site from solar photovoltaic (PV) arrays and/or small-scale wind turbines as the landfill reaches final closure in certain areas. **Attachment 2** contains a conceptual PV array layout for the landfill and surrounding buildings that could generate over six megawatts (MW) of electricity. However, placement of arrays on landfills are done once settlement has occurred after closure and therefore it may be many years before it is practicable to install a system on-site. As new facilities are built, solar panel installation will be considered. ISWM has reached out to the Cape Light Compact for guidance and will continue to seek advice about how to ensure new structures are energy efficient. Additionally, ISWM may utilize thermal energy from the flare in various applications, especially as it considers designs for the proposed new office and maintenance facilities.

Air

A major air plan approval has already been obtained from MassDEP and ISWM has also received an Operating Permit “application shield” while MassDEP reviews the application. The primary impacts to air quality were from emissions of landfill gas (LFG), which contains methane. The Town has made commitments to LFG collection and control in order to mitigate the air quality impacts. The project currently has a flare as the primary pollution control device for mitigating emissions of LFG to the environment. The secondary air emissions from the flaring of LFG are subject to MassDEP permit conditions. It should be noted however, that ISWM covers the landfill daily, utilizes intermediate cover where appropriate, caps sections of the landfill as soon as possible when they reach final grade and installs horizontal and vertical landfill gas collection systems in the active landfill as necessary to control emissions and direct gas to the flare for destruction. ISWM also files an annual greenhouse gas inventory with MassDEP which documents these efforts. The most recent filing this spring documented a capture rate of landfill gas of approximately 95%. The SSEIR also has an extensive section that discusses an analysis of potential greenhouse emissions as well as how the Town has provided mitigation. Additionally, there is a discussion regarding climate change. Both topics were required for MEPA review.

Solid and hazardous waste

The mitigation of impacts from solid waste disposal at the landfill were adequately addressed in the original FEIR and DRI as well as through each subsequent MassDEP approval for construction and operation. More recently the Phase 6 landfill was reviewed by MEPA and CCC and most recently, MEPA review has been completed for the Phase 7, Phase 8 and Phase 9 expansions, including the 12-acre development plan, that are the subject of this DRI application. Results of the recent aforementioned reviews have found Bourne’s handling of solid and hazardous wastes to be adequately addressed. No increase in daily or annual tonnage limits at the landfill, or the Facility overall, are proposed in this DRI.

As with all phases before, the construction and operation of each phase is subject to

state regulation and permit conditions contained in the Authorization to Construct (ATC) issued by MassDEP that is specifically designed for each phase. However, considering that future disposal airspace will be consumed with approximately 86% ash through 2024 and likely beyond, daily operations will result in fewer negative impacts. Ash is an inert, homogenous material that is unattractive to vectors, does not produce gases or odors and is easily shaped and compacted. Use of the landfill space for ash disposal is consistent with utilizing capacity for residuals. Nevertheless, even if ISWM reverts to accepting 100% MSW, it is prepared to manage any changes in operations as it has done so in the past. Additionally, several years ago the Town barred acceptance of construction and demolition debris fines and residuals at the landfill that previously were the source of odors.

ISWM supports diversion of hazardous wastes from disposal at the landfill by participating in and hosting regional household hazardous waste collections overseen by the Barnstable County Cooperative Extension. Additionally, the Facility has a residential recycling center that has sheds to accept waste oil, used oil filters, used antifreeze, batteries, fluorescent bulbs, mercury containing items and paint. White goods such as refrigerators are also collected and, where applicable, are routinely purged of chlorofluorocarbons (CFCs) by a licensed contractor.

As noted before, ISWM is truly integrated with landfill disposal operations, as well as transfer stations for C&D debris and single stream recyclables that are sent to qualified processors to recover as much material for reuse and recycling as possible before disposal. Also, ISWM maintains a compost site for yard waste and brush and an area for the acceptance of asphalt, brick and concrete (ABC) which is subsequently crushed and reused on-site for road building. While food waste is not currently accepted, ISWM is reviewing plans for adding food waste and manure to on-site compost operations.

Finally, as can be attested by the municipalities on the Cape, ISWM has led the way in regional cooperation on Zero Waste initiatives. Specifically, ISWM was the first host for the regional mattress recycling grant from MassDEP. Additionally, ISWM was the project lead for the regional latex paint recycling initiative in 2018 and 2019 supported by a MassDEP grant. Even after those grants have ended, ISWM continues to recycle incoming mattresses and is the lead town in organizing a latex paint collection event each summer. ISWM supports these efforts by advocating for Extended Producer Responsibility (EPR) programs for both mattresses and paint as is done in neighboring states.

Waiver Request

Section 9, Regional Regulatory Review, of the RPP, provides the option and flexibility for the Commission to waive compliance with sections of the RPP when special circumstances arise. The Town feels that the proposal qualifies as a special circumstance and is requesting relief from the 3:1 mitigation ration requirement for Natural Areas. The Town is proposing land mitigation at a ratio of 1.5:1 and is hereby respectfully requesting a waiver for the amount of Protected Open Space to Area of Development Impact for a Natural Area required in the Open Space Technical Bulletin.

The NRI contained in **Attachment 3** provides details of the area to be disturbed and the potential off-site mitigation land. The table below summarizes the square footage of mitigation normally required and the requested waiver.

Required CCC mitigation (3:1)	1,617,405 sq. ft.
<u>Proposed mitigation (1.5:1)</u>	<u>808,763 sq. ft.</u>
Request waiver of mitigation	808,642 sq. ft.

When considering this request we ask that the Commission consider the following factors when making its decision:

- The previous DRI for Phase 6 described the proposed use of the 12-acre parcel that was expressly purchased by the Town in 2016 to enhance the long-term life of the landfill, a regional benefit providing the Cape Cod communities disposal options south of the Cape Cod Canal well into the future. This would also provide waste handling operations to the Cape long after the landfill closes.
- The subsequent loss of habitat at the 12-acre parcel is balanced by utilizing this land to meet other objectives that are listed in the Technical Guidance in the RPP, specifically:
 - Objective WM1-To reduce waste and waste disposal by promoting waste diversion and other Zero Waste initiatives
 - Objective WM2- Support an integrated solid waste management system
 - Objective CAP1- Ensure capital facilities and infrastructure to promote long-term sustainability and resiliency
 - Objective CAP2-Coordinate the siting of capital facilities and infrastructure to enhance the efficient provision of services and facilities that respond to the needs of the region
- It is anticipated that the ensuing woody organic matter that will be removed will be chipped and reused as mulching or for heating.
- As further evidence of the community's support for this project, Bourne Town Meeting voted for the appropriation of sufficient funding to purchase the

identified suitable off-site mitigation land that has been reviewed by NHESP.

- Regulatory changes made to the RPP and by NHESP **after** the Town expended considerable funds to acquire the 12-acre parcel and the Phase 6 DRI was approved, have added complexity to the permitting process that were not originally anticipated. The first regulatory change was that NHESP changed the designation of the habitat at the 12-acre parcel, and the second was that the CCC updated its Regional Policy Plan (RPP) with mitigation requirements. Failure to acquire a waiver of the RPP Open Space off-site mitigation ratio would preclude the Cape Cod communities from having the option to maximize future disposal capacity.
- ISWM has pursued mitigation land for several years and has adjusted its proposal to meet every changing regulatory requirements even as locating available off-site mitigation land has become increasingly difficult. This is noted by the Bourne Conservation Agent in Attachment H of the NRI contained in **Attachment 3**. The parcels that have been identified will meet the NHESP mitigation requirements. Presently, the Town is reviewing two proposals from respondents to a Request for Proposals (RFP) issued by the Town seeking suitable off-site mitigation land. Both parcels provide ideal replacement habitat as determined through an on-site survey the results of which were shared with NHESP.
- The off-site mitigation parcels, located in Bourne along Route 28, will be protected as open space under Article 97 which provides the highest level of protection for conservation land in Massachusetts and will be controlled in perpetuity by the Bourne Conservation Commission (CC). Additionally, the parcels are abutted to the north and south by a combined 37.53 acres of similar habitat already owned and protected by the Town. Acquisition and transfer to the CC of the proposed mitigation land would then create a contiguous Town-controlled protected habitat corridor of approximately 54.83 acres. This corridor is also abutted by similar land to the east on Joint Base Cape Cod. Therefore, even with this waiver, the Town is still providing a net gain in protected habitat through off-site mitigation.
- As the landfill reaches capacity, ISWM installs a cap system which has a vegetative support layer with grass. At full build-out, there will be approximately 77 acres of minimally maintained grassy areas. In fact, this is already occurring with the approximately 37 acres of existing installed cap that provide habitat for large variety of native plants and animal species. In effect, ISWM will be creating new open space, potentially another 40 acres, as it closes sections of the landfill that will provide a form of alternative mitigation by providing a pollinator friendly habitat that is generally in decline. This is relevant because the Open Space Technical Bulletin notes that restoration of degraded areas, such as landfills, may be counted toward the open space requirement.
- Given the scarcity of suitable open space it is likely that without the waiver to provide mitigation at a 3:1 ratio, the Town will have to redesign the landfill

expansion and significantly reduce its capacity and years of operating life. This will leave the Cape no disposal capacity to accommodate unforeseen interruptions in available disposal capacity by events such as storms with debris and shutdowns at existing facilities.

- The waiver is necessary to fully realize the potential of the ISWM facility to provide active landfill disposal capacity south of the Cape Cod Canal for the Cape communities for as long as possible. In addition to protecting habitat, the Commission has identified solid waste management infrastructure as a regional goal.

Benefits of the ISWM facility

As part of the original DRI application in 1998, ISWM provided a list of benefits to the region. Below is a brief overview of how those have been fulfilled over the last 20 years and how the continued operation, including the development of Phase 7, Phase 8 and Phase 9 will benefit the region.

1998 DRI Benefits

Benefit		Outcome
Provides environmentally safe, affordable and convenient lined landfill capacity and processing options for difficult-to-manage wastes, thereby reducing the risk of illegal dumping off-site which could threaten the aquifer.		Over the last 23 years, the Town of Bourne has provided not only state-of-the-art lined landfill capacity for non-MSW items, MSW and ash, it has built a multi-faceted, integrated site that includes a construction and demolition (C&D) debris transfer station, ABC processing, a single stream recyclables transfer station and a residential recycling center open to other towns. Additionally, ISMW hosts an annual regional Household Hazardous Waste collection event, a regional latex paint collection event, and is a regional mattress transfer center.
Potential for future mitigation of existing unlined sections of the current landfill in future phases.		In 2011, ISWM completed reclamation of the Phase 1D unlined landfill which operated in the early 1970s. This was a tremendous success as describe in a Notice of Project Change to MEPA in great detail. The volume removed from Phase 1D provided capacity for the Phase 4 landfill. It also allowed for the complete redesign of the entrance to the facility that greatly increases the capacity, flow and safety of traffic on the site as well as the overall aesthetics of the site with the construction of a new scale house and scales.
Upgraded management and equipment will more effectively utilize landfill airspace thereby extending the lifespan of the facility.		ISWM has consistently been able to acquire the latest landfill and construction equipment. This has increased our compaction rates of in-place waste to meet modern industry standards, increased our overall efficiency of operations and reduced our air emissions as engine technology has improved.
Provide alternative disposal and processing options for municipalities that currently operate unlined landfills. This local option can help to accelerate the closure of these sites thereby reducing leachate generation and landfill gas migration.		By the late 1990s, Bourne was the only active landfill left on the Cape. ISWM has continuously worked with municipalities on the Cape in a variety of ways over the years to meet a need that was created by this reduction in capacity. This has included providing discounted landfill disposal, processing and later transfer options for non-MSW items such as grits and screening, catch basin cleanings, mattresses and other bulky items and C&D wastes.

<p>Increased groundwater monitoring infrastructure and testing.</p>	<p>This has been accomplished. The groundwater monitoring network has been upgraded over the years to become a comprehensive network. MA MassDEP and CCC have reviewed this plan, which has included temporary testing of an off-site monitoring well network installed as part of the original DRI. MassDEP has issued an approval of a Final Comprehensive Site Assessment (FCSA) which represent a review of long-term trends at the facility. The Board of Health has also passed a bylaw prohibiting the installation and use of private and/or public drinking water supply wells downgradient of the facility.</p>
<p>Less total travel by haulers and residents thereby reducing usage of fuel and generation of emissions.</p>	<p>Having local infrastructure provides an option for companies to manage materials here without having to travel over the bridge.</p>
<p>Possibility of using landfill gas for flares and/or energy production.</p>	<p>ISWM has explored many options over the years including; a stand-alone landfill gas-to-energy facility, with and without the contribution of biogas from an anaerobic digester; direct pipeline injection; and leachate evaporation. To date, an economic model, in an ever-changing energy and regulatory market, has not emerged, given the small amount of gas ISWM generates, especially now that it takes mostly ash which does not produce landfill gas. However, ISWM is still evaluating options to recover energy in some form, particularly thermal and will continue to do so as new structures are built. The SSEIR discussed this extensively.</p>
<p>Strategically plan to work to identify local waste management challenges facing Cape Cod and find creative solutions.</p>	<p>ISWM has participated extensively in regional solid waste management planning discussions, especially in the wake of the end of the Tier 1 contracts with the SEMASS facility in Rochester, MA. Bourne currently serves the Town of Falmouth, as well as its own MSW and will continue to play a role in regional planning and is actively exploring options for technologies that will provide services beyond the life of the landfill. Most recently ISWM was mentioned in an RFP issued by the County seeking alternatives for managing solid waste.</p>
<p>The residential drop-off area will be maintained and expanded.</p>	<p>ISWM built a new, expanded thoughtfully laid-out residential recycling center in 2011. It includes a new Swap Shop and has sheds for a variety of materials such as waste oil and antifreeze to mercury containing devices. ISWM has also opened up limited access to residential traffic from other towns on a pay by weight basis.</p>
<p>Develop education resources and facilities that can showcase state-of-the-art integrated solid waste management.</p>	<p>ISWM has had annual open houses since 2000 and the main open house now is in the spring during Earth Day celebrations, COVID dependent. This includes an extensive tour of all the operations of the facility. Additionally, ISWM staff have provided many arranged tours for schools and universities. ISWM staff has also appeared in regional cable media and the department maintains an informative website.</p>

Phase 7, Phase 8 and Phase 9 Benefits

- Provide much needed disposal capacity for municipal waste combustor ash from SEMASS. Eight Cape Cod communities send their waste to SEMASS and in order for SEMASS to continue to operate, it must have disposal capacity for its residual ash. Alternatively, this capacity may be utilized to provide MSW disposal options, instead of ash, for municipalities on the Cape whose current short-term contracts will be expiring in the near future. This is subject to the status of contracts, market conditions and negotiations with SEMASS in future years.
- Provide a local, in-state option that reduces the need to look for out of state options to manage residuals as well as other materials such as contaminated soils. Within the next 5 or 6 years landfill capacity in Massachusetts will likely shrink significantly and Bourne could be one of only three to five facilities remaining. This will mean exports to places such as Ohio by rail haul will rise along with potential increases in cost and logistical challenges such as obtaining an adequate supply of rail cars.
- As the main revenue source for the ISWM Department, the continuation of the landfill will provide the financial resources that will allow the continued investments in the operation and maintenance of needed local infrastructure. This not only includes the landfill, but also transfer stations for C&D materials and single stream recyclables, composting, and mattress diversion, as well as collection events for household hazardous waste (HHW) and latex paint. Additionally, by being on sound financial footing, ISWM can do advanced planning and investing in research and development of the site to host potential solid waste management technologies that could serve the region well beyond the life of the landfill.
- The proposed landfill capacity, that will extend the landfill operation life at least into the 2030s, will afford ISWM the time to work with MassDEP, MEPA, CCC and the entire Cape Cod community to further develop waste reduction infrastructure and goals to reduce dependence on disposal.
- Provide a platform for renewable energy or thermal recovery from the combustion of landfill gas. An extensive discussion of the Town's greenhouse gas mitigation efforts and potential for solar energy recover is discussed in the recently submitted SSEIR. **Attachment 2** contains a conceptual layout of PV arrays on the landfill and surrounding structures. As new facilities are built, solar panel installation will be considered. ISWM has reached out to the Cape Light Compact for guidance and will continue to seek advice about how to ensure new structures are energy efficient.
- Provide the region with emergency capacity in the event of disruptions to regional infrastructure or as a result of storm events. In 2007, ISWM managed all of the MSW from the towns on Cape Cod after a devastating fire at SEMASS closed the facility for many months. While the region has been fortunate and

has not experienced a hurricane since Hurricane Bob in 1991, it has had a near miss in recent years and having ISWM and its facilities operational in the time of need after a major storm event will be of critical importance. ISWM is also ideally located at one of the highest points on Cape Cod at around 90 MSL. As noted in the SSEIR as required by MEPA, the most extreme sea level rise predictions from the state by 2100 predict a 10 foot sea level rise from the current sea level. Therefore, the ISWM facility is very resilient to climate change effects and will continue to be an asset to the region for the foreseeable future.

Compliance with local policy plans and goals

The sections below will address local planning documents and goals. Relevant excerpts are contained in **Attachment 10**.

Bourne Local Comprehensive Plan

ISWM is compliant with the Town of Bourne Local Comprehensive Plan (LCP) which has been certified by the Cape Cod Commission. The first Waste Management Action listed, “Plan for long-term sustainable development of the ISWM facility and its integrated approach to solid waste management, including potential operations utilizing innovative technologies that can manage materials beyond the closure of the landfill” is the very mission of ISWM. The substantial infrastructure that Bourne has invested in at the site demonstrates its commitment to the principle of an integrated approach, including when it spent several years endeavoring to develop an innovative anaerobic digester and biogas (including landfill gas) powered electricity generating facility with a private vendor.

ISWM is charged with the responsibility of meeting and implementing the waste management goal and policies noted on page 49 which sets a goal of recycling or composting 60% of solid waste by 2030. These sections discuss the Town’s efforts to maximize recycling and composting and to dispose of what cannot be recycled in an economical and environmentally sound manner. These efforts include expansion of recycling programs both at the facility and at the curbside, improving enforcement of mandatory recycling, reducing the generation of solid waste, continued support of a household hazardous waste management program and expansion of composting operations. ISWM plays a leading role in conjunction with the Bourne DPW and the Bourne Recycling Committee to support these goals and is the source of funding.

Bourne’s LCP was approved at the Bourne Special Town Meeting on October 28, 2019 and certified by the Cape Cod Commission on December 5, 2019. A copy of the latest LCP can be found on the Town’s website at:

<https://www.townofbourne.com/planning/news/local-comprehensive-final-certified-plan>.

Information about the process for the updating the LCP can be found on a separate webpage at:

<https://townofbournelcp.wordpress.com/plan-elements/>.

Cape Cod Commission Regional Policy Plan

The Town has worked closely with the CCC over the course of the development of the Regional Policy Plan (RPP) to ensure that it is in concert with the goals and regulations for solid waste management outline in the RPP and its technical bulletins. As noted in the RPP, one of the key challenges facing the region is the provision of adequate infrastructure. ISWM has been a leader on Cape Cod in developing local recycling, composting and disposal infrastructure that serves other local municipalities. This includes the development of the modern, lined landfill (when every other town closed their unlined dumps) and the construction of a C&D (construction and demolition) debris transfer station and a single stream recyclables transfer station.

The Town also played an active role in helping communities and the CCC determine how to manage their MSW after the original contracts with SEMASS expired. This resulted in the Town of Falmouth signing a ten-year contract with Bourne to accept its MSW. The County currently has an open Request for Proposal (RFP) seeking long-term solutions for managing waste on Cape Cod and the ISWM facility is specifically listed as one of the options to consider.

ISWM has a well-financed and carefully planned “built system” that fully supports Objective WM1 and WM2 and the methods for achieving those objectives as outlined the RPP. Objective WM1 states “To reduce waste and waste disposal by promoting waste diversion and other Zero Waste initiatives.” Recent activities to support the region include being a host to a regional mattress recycling initiative as part of a MassDEP grant program, as well as managing the Cape Cod Latex Paint Collection and Recycling Initiative to divert clean reusable latex paint to a recycler in Hanover, MA. This was also done as part of a MassDEP grant program. Objective WM2 states- “Support an integrated solid waste management system.” This is the very mission of ISWM, which is integrated solid waste management, and the substantial infrastructure that Bourne has invested at the site demonstrates its commitment to the principle of an integrated approach. This includes composting, recycling, C&D transfer for recycling, scrap metal recycling and numerous sheds for diverting other items such as its popular Swap Shop. The RPP states the one of the methods to achieve the objective is to “support existing municipal waste facilities and encourage regional coordination between municipal facilities.” ISWM does this on a regular basis by working with fellow municipalities and the County to support regional events and to assist them in finding solutions, including disposal capacity if needed.

Additionally, ISWM plays a significant role in supporting Objective CAP1 and Objective CAP2. Objective CAP1 states- “Ensure capital facilities and infrastructure promote long-term sustainability and resiliency.” Objective CAP2 states- “Coordinate the siting of capital facilities and infrastructure to enhance the efficient provision of services and facilities that respond to the needs of the region.” The efficient and well-planned use of the land at the ISWM facility supports both of these objectives. In particular, the long-term site master plan as described in the MEPA SSEIR directly addresses both of these objectives.

Cape Cod Commission Act

ISWM is literally the manifestation of the purpose of the Cape Cod Commission as described in the Cape Cod Commission Act, Section 1 (c) which states:

“The purpose of the Cape Cod commission shall be to further: ...the provision of adequate capital facilities, include transportation, water supply, and solid, sanitary and hazardous waste disposal facilities...”

The Town would like to make note that goal seven of the Cape Cod Commission Act itself states “Further the provision of adequate capital facilities, including transportation, water supply, and solid, sanitary and hazardous waste disposal facilities, coordinated with the achievement of other goals. The RPP must include regional goals for the provision of capital facilities, including waste disposal.”

Increasingly, local leaders are recognizing the importance of Cape Cod controlling its own fate with regard to management of infrastructure. Solid waste is no different and finding a location where projects of all types, such as those that Bourne manages, is exceedingly difficult, let alone developing a sound financial business model to properly pay for operations, closure and post-closure. The Bourne landfill expansion is a critical part of what the Town needs to continue its mission to provide the region with a range of environmentally sound solid waste management options in concert with these goals.

Statutory and regulatory standards, required permits and approvals

As with all operations, ISWM must comply with all applicable Federal, State and local laws, regulations and obtain permits prior to commencement and operations of its facilities.

Phase 7, Phase 8 and Phase 9 landfill expansion and 12-acre development

The Town has already obtained a Certificate on the SSEIR from Secretary of the Executive Office of Energy and Environmental Affairs (EEA), under 301 Code of Massachusetts Regulations (CMR) 11 which states that it “**adequately and properly complies** with MEPA and its implementing regulations.”

While the ISWM facility already has a site-assignment from the Bourne Board of Health (BOH) that permits landfilling on the original 74-acre parcel through Phase 6, it will need a major modification for the Phase 9 vertical expansion over the existing landfill areas. The modification will also be needed on the 25-acre parcel where Phase 7 and Phase 8 landfill expansions will be located because that area is currently restricted to solid waste handling and transfer operations only. ISWM has filed a Site Suitability Application with MassDEP and it is expected that, after a positive determination, the BOH will hold a public hearing in August after the CCC has completed this DRI review. All future landfill phases and any solid waste facilities that will be relocated must first obtain an Authorization to Construct (ATC) and an Authorization to Operate (ATO) before it can accept waste. Landfills will further need to obtain a Corrective Action Design (CAD) which discusses how the landfill will be capped. Finally, any solid waste permit to

operate will require a Financial Assurance Mechanism (FAM) that identifies funding for closure of each landfill phase and for a minimum of 30 years of post-closure monitoring and maintenance once the last phase is capped. ISWM maintains such funding in cash in dedicated accounts.

Additionally, to fully realize the site development plan, the Town will need to obtain a Conservation and Management Permit from NHESP, part of the Massachusetts Division of Fisheries and Wildlife (DFW), with regard to the Massachusetts Endangered Species Act (MESA) pursuant to 321 CMR 10.14. Also, in order to manage solid waste on the 12-acre parcel, ISWM will have to file a new site assignment application with MassDEP and the BOH. The Bourne Planning Board will also have to approve an updated site master plan under its site plan review. Further, ISWM will also have to comply with all local zoning and building permit conditions.

Landfill leachate treatment facility

There are many steps that need to be accomplished prior to operating a leachate treatment facility. At the present time, this project is subordinate to the development of the landfill and other site projects as the economic case for on-site treatment of leachate to NPDES discharge standards has become tenuous since a private developer, which would have invested in the plant on-site with ISWM, terminated their lease with the Town for unrelated reasons. Nevertheless, ISWM is still considering development of an on-site leachate treatment facility as a possibility and the broad based steps involved in development are outlined below.

First and foremost, access to the clean effluent pipeline located on Canal View Road on Joint Base Cape Cod (JBCC) must be obtained. This requires approval by the National Guard Bureau, and easement with the U.S. Army Corps of Engineers on behalf of the MA Army National Guard which controls Camp Edwards where the pipeline is located on JBCC. An easement will also need to be obtained from the Massachusetts Department of Fish and Game (DFG) which oversees the particular area of the base.

The MA Air National Guard controls the utilities at JBCC and prior to construction of a facility, ISWM will need to complete a utilities service agreement with the 102nd Intelligence Wing or any successor that would take over this role. Finally, NHESP will need to review the appropriate level of oversight for accessing approximately 2,500 square feet on JBCC property and a small portion of the ISWM facility that will be disturbed during connection to the pipeline. As already noted, the Governor signed legislation which exempted the area in question from Article 97 which is designed to protect natural resources of the Commonwealth. This was discussed as part of the Phase 6 DRI approval.

Actual construction and operation of any leachate treatment facility and discharge to the pipeline on JBCC of the clean, treated effluent, and eventual injection into the infiltration basins on JBCC, will be overseen by the MassDEP. The details of the exact permitting and oversight process will be determined if the Town receives access to the pipeline and decides to move forward with development of a facility.

Future filings

This application provides a comprehensive site development plan and therefore the Town does not intend to come before the CCC with further plans. Staff has indicated that the detailed description of the 12-acre parcel with a site plan and conceptual structures, including a comprehensive stormwater management plan for the full build-out, is sufficient for its review and therefore ISWM will not need further CCC approval prior to the Town seeking MassDEP and Town construction permits.

ATTACHMENT 1

MEPA ENPC and SSEIR Certificates
CCC Phase 6 DRI Decision and Certificate of Compliance
CCC 2000 DRI Certificate of Compliance



The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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April 24, 2020

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED NOTICE OF PROJECT CHANGE

PROJECT NAME : Bourne Integrated Solid Waste Management Facility
PROJECT MUNICIPALITY : Bourne
PROJECT WATERSHED : Cape Cod
EOEA NUMBER : 11333
PROJECT PROPONENT : Town of Bourne
DATE NOTICED IN MONITOR : February 26, 2020

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G. L. c. 30, ss. 61-62I) and Section 11.10 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of a Supplemental Environmental Impact Report (EIR). The Town submitted an Expanded Notice of Project Change (NPC) with a request that I allow a Single Supplemental EIR to be submitted in lieu of the usual two-stage Draft and Final EIR process. While I hereby grant the Town's request to submit a Single Supplemental EIR in accordance with the Scope below, I expect that the Single Supplemental EIR will include a comprehensive response to the detailed comments from the Massachusetts Department of Environmental Protection (MassDEP) and remind the Town that I reserve the right to find the Single Supplemental EIR inadequate and require the Town to file a Second Supplemental EIR in accordance with 301 CMR 11.08(8)(d)(3).

The project was published in the Environmental Monitor on February 26, 2020. The Proponent requested an extended comment period which closed on February 10, 2020. The deadline for issuance of this Certificate was extended from April 17, 2020 pursuant to the Governor's Covid-19 Order No. 17: Order Suspending State Permitting Deadlines and Extending the Validity of State Permits.

Project Change Description

As described in the Expanded NPC, the project consists of the phased expansion (Phases 7, 8 and

9) of the Bourne Integrated Solid Waste Management Facility (ISWMF) project. Specifically, the Town of Bourne is proposing a vertical and horizontal landfill expansion and the relocation of the solid waste handling facility and other offices and facilities on the property. The three phase 25.0-acre expansion will provide a total of 5,175,000 cubic yards (cy) of disposal capacity which will extend the life of the landfill through 2040.

The horizontal expansion of the landfill (Phase 7 and 8) will require the development of new lined landfill cells in an area located south of Phase 6. These new cells will incorporate leachate collection and landfill gas management infrastructure. Phases 7 and 8 will provide approximately 3,920,000 cy of disposal capacity. The horizontal expansion will be located within a 25-acre parcel that is currently site assigned for solid waste handling and contains a residential recycling area, transfer station, office building, and other appurtenant structures. The development of Phases 7 and 8 will require the relocation of the transfer station and other structures to an adjacent 12-acre parcel which was acquired by the Town in 2016 and abuts the residential recycling center at the southern boundary of the site. The vertical expansion (Phase 9) is proposed over uncapped areas of the landfill and areas that have been capped with a final cover system. Phase 9 will increase the maximum height of the landfill by 40 feet (from 185 ft to 225 ft) and will provide approximately 1,255,000 cy of disposal capacity which could extend the life of the landfill up to four and a half years.

The Certificate on the Final Environmental Impact Report (FEIR), issued November 29, 1999, acknowledged that certain aspects of the landfill project, including future phases, were conceptual and required that the Town submit NPCs to the MEPA Office to address development of subsequent phases. This Expanded NPC provides an updated site development plan for the landfill and describes the development of Phase 7, Phase 8 and Phase 9 of the landfill expansion.

Procedural History

Review of the Bourne ISWMF project was initiated with the submission of an Environmental Notification Form (ENF) in 1997. As described in the 1997 ENF, the ISWMF project entailed the development of a regional waste management facility within the Bourne Landfill located off MacArthur's Boulevard (Route 28). The project was intended to meet a regional need for the processing and disposal of construction and demolition (C&D) material, and Difficult-To-Manage (DTM) wastes on Cape Cod. The project included the capping and/or mining of previously landfilled areas, as well as the development of a number of new lined landfill phases for regional non-municipal solid waste. The average disposal rate was identified as 300 to 500 tons per day (tpd). The project was designed to accept a maximum of 825 tpd of waste materials at full build-out. As described in the ENF, approximately 400 tpd would be disposed of on-site, 250 tpd of C&D waste would be processed; 100 tpd would be recycled; 50 tpd would be composted; and 25 tpd would consist of diverted waste. The ENF was followed by a Draft and a Final EIR in 1998 and 1999 (respectively), both of which were determined to be adequate. The Certificate on the FEIR, issued November 29, 1999, acknowledged that certain aspects of the landfill project were conceptual and required that the Town submit Notices of Project Change (NPCs) to the MEPA Office to address development of subsequent phases.

NPC-1 was submitted in April 2003 and expanded the waste stream to include Municipal Solid Waste (MSW) and Municipal Combustor Ash (MCA), increased the quantity of MCA it received, and allowed it to be co-mingled with MSW for landfilling with the Facility. NPC-1 did not increase the

maximum permitted capacity (825 tpd) accepted for disposal, reuse, composting, and recycling. The Town committed to cease accepting unprocessed C&D material by January 1, 2004 in accordance with the Authorization to Operate (ATO) permit. The August 7, 2003 Certificate on NPC-1 determined that the potential impacts associated with the proposed project change did not warrant the preparation of an EIR.

On April 2, 2007, the MEPA Office determined that the Bourne ISWMF's temporary increase in capacity of 500 additional tpd of MSW (1,325 tpd total) qualified as an Emergency Action pursuant to the MEPA regulations. The additional MSW would be diverted from the SEMASS waste-to-energy facility in Rochester, MA which was damaged by a fire on March 31, 2007. A second NPC (NPC-2) was filed on April 17, 2007 under the Emergency Action provisions of the MEPA Regulations to address these actions and the Certificate issued on May 25, 2007 determined that the emergency action did not warrant the preparation of an EIR.

In December 2008, the Town submitted a third NPC (NPC-3) which included the phased construction of five landfill gas (LFG) reciprocating engine/electric generator sets with equipment to recover and convert LFG from the facility to electricity. The proposed energy facility was designed to generate up to 4.3 megawatts (MW) of electricity. The Certificate issued on January 23, 2009 determined that the potential impacts associated with NPC-3 did not warrant the preparation of an EIR.

In January 2016, the Town submitted a fourth NPC (NPC-4) which included an update on the Phase 1D landfill reclamation project and a final development plan for Phase 5 of the landfill. The NPC proposed a hybrid version of two scenarios that were considered in prior MEPA review. The February 5, 2016 Certificate on NPC-4 determined that the potential impacts associated with the proposed project change did not warrant the preparation of an EIR.

The Proponent submitted an Expanded NPC (NPC-5) in December 2017 for Phase 6 with a request that I allow a Single Supplemental EIR to be prepared in lieu of a Draft and Final Supplemental EIR. The Certificate issued on January 12, 2018 granted that request. Phase 6 was designed to support Phase 7 and Phase 8 (described in this Certificate). In May 2018, the Town submitted a Single Supplemental Single Supplemental EIR. The Certificate issued on June 26, 2018 determined that it adequately and properly complied with MEPA and its implementing regulations.

Project Site

The Bourne ISWMF, located at 201 MacArthur Boulevard (Route 28), is comprised of a 74-acre site-assigned parcel which contains the landfill operations and facilities. In 2001, a 25-acre parcel immediately abutting the landfill to the south was purchased and has been used for recycling and transfer operations. The landfill contains lined and unlined waste disposal areas. Phases 1A, 1B, 1C, and 1D are unlined cells that comprise the oldest portion of the landfill. Phases 1A, 1B, and 1C are closed and capped. Phase 1D was part of a pilot landfill reclamation project with the Massachusetts Department of Environmental Protection (MassDEP) that removed the solid waste in this area in order to create additional landfill space. Phases 2 and Phase 3 are both lined and are closed and capped with leachate collection systems. Phase 4, an active landfill cell, is located in the area previously occupied by Phase 1D. Phase 5 consists of a vertical expansion proposed over Phases 1A, 1B, and 1C. MassDEP issued an Authorization to Construct (ATC) and ATO Permit in 2019 for Phase 6 which is currently

under construction.

Permits and Jurisdiction

The development of Phases 7, 8 and 9 is undergoing MEPA review and requires a NPC because it consists of a material change to the project prior to the taking of all Agency Actions. The project change exceeds the mandatory EIR threshold at 301 CMR 11.03 (1)(a)(2) because it will result in the creation of ten or more acres of impervious area. The project change also exceeds the Solid Waste ENF threshold at 301 CMR 11.03(9)(b)(1). Because it requires an EIR, the project change is subject to review in accordance with the MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol (“GHG Policy”).

The proposed landfill expansion will require the following Permits from MassDEP: Site Suitability Report for a Major Modification of an Existing Site Assignment (BWP SW 38), Authorization to Construct (ATC) a Large Landfill Expansion (BWP SW 26), and Authorization to Operate (ATO) (BWP SW 10). Relocation of the transfer station to the 12-acre parcel will require the following Permits from MassDEP: Site Suitability Report for a New Site Assignment (BWP SW 01), ATC a Large Handling Facility (BWP SW 05), and ATO a Large Handling Facility (BWP SW 06). The project may also require a Conservation Management Permit (CMP) from the Division of Fisheries and Wildlife’s (DFW) Natural Heritage and Endangered Species Program (NHESP).

The project will require a Development of Regional Impact (DRI) Modification from the Cape Cod Commission (CCC), Site Assignment Approval from the Bourne Board of Health, and a National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental protection Agency (EPA).

Because the project is not seeking Financial Assistance from the Commonwealth, MEPA jurisdiction extends to those aspects of the project that are within the subject matter of required, or potentially required, State Agency Actions and that may cause Damage to the Environment as defined in the MEPA regulations. The subject matter of the Site Assignment regulations is sufficiently broad to confer the equivalent of broad scope jurisdiction over the potential environmental impacts of the project. Therefore, MEPA jurisdiction is broad in scope and extends to all aspects of a project that are likely, directly or indirectly, to cause Damage to the Environment, as defined in the MEPA regulations.

Environmental Impacts and Mitigation

According to the Expanded NPC, potential environmental impacts of the project change will include alteration of 38 acres of land (112 total acres) and creation of 16.23 acres of impervious area. Measures to avoid, minimize, and mitigate project impacts include: construction period Best Management Practices (BMPs), permanent protection of rare species habitat, dust control measures, erosion and sedimentation controls, leachate management, and measures to maximize LFG collection efficiency.

Single EIR Request

The Expanded NPC included a request to file a Single Supplemental EIR and was subject to an extended comment period. Consistent with the criteria for granting a Single EIR, the NPC provided a

detailed project description, a baseline for evaluating environmental impacts and a comprehensive alternatives analysis. The Expanded NPC identified how the project is designed to achieve consistency with regulatory standards and measures to avoid, minimize and mitigate project impacts.

Review of Expanded NPC

The Expanded NPC described the project, identified existing conditions, and described potential environmental impacts and mitigation measures. It provided a brief description of applicable statutory and regulatory standards and requirements, and described how the project will meet those standards. The Expanded NPC provided a list of required local, state, and federal permits and provided an update on the status of each of these actions.

Comments from MassDEP identify information that should be provided in the Single Supplemental EIR to ensure the facility design and operational measures will comply with solid waste regulations and applicable polices. Comments from the Cape Cod Commission (CCC) request the Town provide a discussion of the project relative to the pertinent goals and objectives from the Cape Cod Regional Policy Plan.

Alternative Analysis

The Expanded NPC provided a limited alternative analysis that evaluated expanding the landfill with Phases 7-9 (the Preferred Alternative, as described herein) and a No-Build alternative which would close the landfill once Phase 6 has reached capacity. The Expanded NPC provided a series of plans and cross-section views for each alternative. The Expanded NPC indicated that the No-Build Alternative was dismissed as the existing landfill is approaching capacity and this alternative would not extend the life span of the facility. The Expanded NPC indicated that the Preferred Alternative was selected as it will provide flexibility for additional expansion of the landfill (Phases 7, 8 and 9).

Solid Waste

The project will be regulated under MassDEP's Site Assignment Regulations for Solid Waste Facilities and Solid Waste Regulations. The Town will be required to modify its Site Assignment with the Board of Health prior to development of Phases 7, 8 or 9. The Expanded NPC included a narrative that addressed the project's consistency with the applicable regulatory approval criteria. I refer the Town to MassDEP's detailed comment letter which identifies additional information necessary to evaluate compliance with site suitability criteria. The Scope for the Single Supplemental EIR requires that the Town provide additional information that addresses the applicable Site Assignment and Solid Waste regulatory approval criteria to support MassDEP permitting.

As described in the Expanded NPC, Phases 7 and 8 will be constructed in progression southward from Phase 6 (which was previously described in the 2018 NPC-5). Phase 7 will be constructed over the southern slope of Phase 6 and Phase 8 will be constructed over the southern slope of Phase 7. The Expanded NPC indicated that Phase 7 and 8 will be located in areas that are currently used for site-assigned solid waste handling activities. Both phases would be constructed using a double composite lined landfill design with leak detection designed to meet regulatory requirements for liner construction. Phase 9 will be constructed over previously lined and filled areas of the landfill including Phases 2, 2A/3A, 3, 4, 5 and 6. I refer the Town to comments from MassDEP which request that the Town

schedule a pre-filing meeting to discuss the design of Phase 9 and the requirements of 310 CMR 19.110(5). The Expanded ENF indicated that Phase 9 will be constructed above portions of the landfill that will remain uncapped by installing a long-term intermediate cover in lieu of a final cover system. According to the Expanded NPC, this is intended to avoid the need to cap an area that will then be disturbed a few years later to provide the new capacity. I refer the Town to comments from MassDEP which request a schedule for capping and proposed specifications for the long-term intermediate cover system, including provisions for the collection of landfill gas.

Wastewater from the landfill, including leachate and condensate, will be collected via a groundwater protection system and conveyed to on-site storage tanks prior to being trucked off-site for disposal at a wastewater treatment facility. The Expanded NPC indicated the Town is evaluating the potential construction of an on-site leachate pre-treatment system or full treatment system. An update on this evaluation should be provided in the Single Supplemental EIR.

The Expanded NPC indicated that the project does not require an increase to the permitted tonnage the site can accept and therefore will not generate new traffic or impact traffic patterns. The Expanded NPC included a traffic assessment memorandum (dated August 31, 2017) which indicated that traffic generation has decreased since 2015 when the ash, delivered in large trailers, became the primary waste stream. I refer the Town to comments from MassDEP which requests additional information regarding the traffic study, including recent crash data.

Land Alteration/Stormwater

The new liner areas and area required for new structures and associated pavement will create 16.23 total acres of impervious area. According to the Expanded NPC, stormwater will be managed onsite through the use of diversion berms, swales, culverts, retention basins, and infiltration basins. The Expanded NPC did not identify stormwater infrastructure that may need to be relocated nor provide an additional description of the existing or proposed stormwater management infrastructure. This should be provided in the Single Supplemental EIR.

Rare Species

According to the Expanded NPC, portions of the project site are located within mapped habitat of the Eastern Box Turtle (*Terrapene carolina*), which is state-listed as a species of Special Concern. This species and its habitat are protected pursuant to the Massachusetts Endangered Species Act (MESA; MGL c.131A) and its implementing regulations (321 CMR 10.00). Comments from NHESP indicate that the project is anticipated to result in a Take and, therefore, will require a CMP pursuant to 321 CMR 10.23. Projects resulting in a Take of state-listed species may be permitted only if they meet the performance standards for a CMP. In order for a project to qualify for a CMP, the Town must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species. The Expanded NPC indicated the Town intends to meet these performance standards by permanently protecting off-site land in the vicinity of the site as open space and state-listed species habitat. NHESP

anticipates that the project will provide a suitable long-term net benefit and meet the performance standards for issuance of a CMP.

Greenhouse Gas Emissions (GHG)

The project is subject to the GHG Policy because it exceeds thresholds for a mandatory EIR. The Policy requires Proponents to quantify carbon dioxide (CO₂) emissions and identify measures to avoid, minimize or mitigate such emissions. The Policy directs proponents to use applicable building codes to establish a project emissions baseline that is “code-compliant.” However, there is no building energy code equivalent that applies specifically to landfills or energy use models (such as eQUEST) designed to estimate the projected energy use of the landfill energy loads. Therefore, prior to the submittal of the Expanded NPC the Town had consulted with the MEPA Office and the Department of Energy Resources (DOER) in development of the GHG analysis. The Expanded NPC provided an overview of the measures the Proponent currently employs to avoid, minimize, and mitigation GHG emissions including: recycling, implementation of a LFG collection and flare system, improving collection efficiency (95% vs 75%), and use of Tier 4 emissions reduction equipment in all on-site heavy machinery. The Expanded NPC also provided an overview of additional measures to reduce GHG emissions which were pursued by the Town and ultimately determined to be financially or technically infeasible, including: LFG conversion to pipeline natural gas, microturbines fueled by LFG, LFG-to-energy facility, anaerobic digestion of organic materials and biogas-to-energy. I commend the Town for its ongoing commitment to GHG reduction and for continuing to evaluate and pursue options to reduce the impacts of LFG emissions.

The Town currently mitigates the emission of GHG through an extensive landfill gas collection system and thermal destruction system. A major reduction in the production of GHGs has been achieved by shifting the waste it accepts. Approximately 86 percent of its annual tonnage is in the form of municipal combustor ash (MCA) which does not produce gases. The Town’s 10-year contract to accept MCA from SEMASS will terminate at the end of 2021. The Town intends to extend the contract and to continue accepting up to 189,000 tpy of MCA and 30,000 tpy of biodegradable MSW from Bourne and Falmouth (Scenario 1). However, if the contract is not extended, the Town will return to accepting up to 219,000 tpy of biodegradable municipal solid waste (MSW) (Scenario 2). The Expanded NPC described both MSW/MCA contract scenarios, the decrease in LFG associated with each, the actual LFG collection system efficiency compared to industry standards, and the flare efficiency. It also quantified GHG emissions from direct (flaring and fugitive emissions) and indirect (flare and LFG collection motors) sources. The greenhouse gas evaluation of both scenarios reflect the reductions associated with aggressive measures to capture, collect and destroy landfill gas. The Expanded NPC identified the resulting CO₂ emissions that would be generated each year over a 20 year period (2021 through 2041) for each of the two scenarios. The GHG emissions associated with Scenario 1 would decline annually from 2021 to 2041 and would generate a total of 390,706 tons of GHG emissions over this period. The GHG emissions associated with Scenario 2 would increase annually from 2021 to 2036, and then decline annually to 2041. Scenario 2 would generate a total of 815,844 tons of GHG emissions over this period. The Town’s preferred scenario (Scenario 1), representing continued acceptance of MCA, would decrease GHG emissions by 425,138 total tons over the 40 year period (2021 through 2041) compared to Scenario 2. This represents an approximate 52 percent reduction in GHG emissions compared to Scenario 2.

According to the Expanded NPC, the Town is assessing the feasibility and potential development of the following projects which would provide additional reductions in GHG emissions:

- Recovering thermal energy (140 tpy);
- LFG-to-Energy (219,000 tpy);
- LFG Blower Powers with 40 horsepower motors (75 tpy); and
- Solar PV (6.2 MW) on final closed plateau of landfill and existing facility roof (3,714 tpy);
- Development of on-site leachate treatment (would eliminate 1,000 to 2,000 truck trips each year);
- Operation of an animal crematory that would use LFG as a fuel (and displace the use of natural gas from other sources);
- Additional thermal recovery of LFG from combustion to heat the maintenance building;
- Vertical axis wind turbines;
- Use of compressed natural gas for trucks; and,
- Regional composting.

Construction Period

The Expanded NPC identifies construction period impacts including increases in construction related truck traffic, dust, noise, stormwater runoff, and construction waste. Mitigation measures identified in the Expanded NPC include implementation of a traffic control and construction management plan, dust suppression measures, and construction waste management and recycling.

All construction and demolition activities should be managed in accordance with applicable MassDEP's regulations regarding Air Pollution Control (310 CMR 7.01, 7.09-7.10), and Solid Waste Facilities (310 CMR 16.00 and 310 CMR 19.00, including the waste ban provision at 310 CMR 19.017). The project should include measures to reduce construction period impacts (e.g., noise, dust, odor, solid waste management) and emissions of air pollutants from equipment, including anti-idling measures in accordance with the Air Quality regulations (310 CMR 7.11). I encourage the Town to require that its contractors use construction equipment with engines manufactured to Tier 4 federal emission standards, or select project contractors that have installed retrofit emissions control devices or vehicles that use alternative fuels to reduce emissions of volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment. Off-road vehicles are required to use ultra-low sulfur diesel fuel (ULSD). If oil and/or hazardous materials are found during construction, the Proponent should notify MassDEP in accordance with the Massachusetts Contingency Plan (310 CMR 40.00). All construction activities should be undertaken in compliance with the conditions of all State and local permits. I encourage the Town to reuse or recycle construction and demolition (C&D) debris to the maximum extent.

Conclusion

Based on review of the Expanded NPC, consultation with State Agencies and review of comment letters, I have determined that the Proponent may submit a Single Supplemental EIR. The Single Supplemental EIR should be prepared in accordance with the following Scope. The primary emphasis of this Scope is to demonstrate that the project's design and operational measures will comply with solid waste regulations and applicable polices and provide sufficient information for MassDEP to use in making their permitting decisions and associated Section 61 Findings.

SCOPE

General

The Single Supplemental EIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope.

Project Description and Permitting

The Single Supplemental EIR should include a detailed description of the proposed project and describe any changes to the project since the filing of the Expanded NPC. The project description should identify individual components of the project and identify impacts associated with each component. The Single Supplemental EIR should include updated plans as necessary to reflect modifications to infrastructure design, access roadways, and mitigation. It should provide a revised description and analysis of applicable statutory and regulatory standards and requirements, and a description of how the project will meet those standards. The Single Supplemental EIR should include a list of required State permits or other State approvals and provide any relevant updates. The Single Supplemental EIR should include an update on the CCC review process and a discussion of the project's compliance with the pertinent goals and objectives from the Cape Cod Regional Policy Plan.

According to the Expanded NPC, the landfill is anticipated to play a leading role in responding to future emergency conditions on Cape Cod in order to ensure that the public health and the environment are protected. The Expanded NPC included a request that MEPA review be waived for such emergencies and defer to MassDEP for any technical oversight. Specifically, the Expanded NPC requests presumptive approval to operate any or all of its facilities 24 hours per day, with a total inbound tonnage not to exceed 1,500 tons in any 24 hour period, for a minimum of five consecutive days, or 120 hours. The Expanded NPC did not describe the anticipated future emergency conditions nor provide additional details on what may trigger the need for implementation of this scenario. If there is a specific future emergency scenario to which this request relates, this should be described in the Single Supplemental EIR. It should also identify any additional Permits or Agency Actions that may be required specific to the emergency. Lastly, I note the MEPA regulations currently include provisions that address review of emergency actions necessary to avoid or eliminate an imminent threat to environmental resources or quality or public health or safety (301 CMR 11.13).

Solid Waste

Comments from MassDEP identify information required to demonstrate the project's consistency with the applicable Site Assignment and Solid Waste regulatory approval criteria. I hereby incorporate by reference the comment letter from MassDEP dated April 9, 2020, into the Scope for the Single Supplemental EIR. The Single Supplemental EIR should identify whether the Proponent intends to request a waiver of any Site Suitability Criteria identified at 310 CMR 16.40 and should include additional information and analysis to address the issues identified in MassDEP's comment letter.

The Single Supplemental EIR should include a description of the existing monitoring wells and leachate and landfill gas collection systems. It should provide plans and describe how leachate and

landfill gas will be collected and managed within Phase 7-9. The Single Supplemental EIR should identify any monitoring wells and leachate or gas collection infrastructure located within the footprint of the expansion that will need to be removed, modified, or relocated to accommodate the expansion. As noted above, the Town intends to keep a section of the landfill uncapped by installing a long-term intermediate cover system in lieu of a final cover system. In order to evaluate the adequacy of this plan, the Single Supplemental EIR should include a detailed capping sequence plan that includes a site plan and schedule for capping and proposed specifications for the long-term intermediate cover system including provisions for the collection of landfill gas.

The Single Supplemental EIR should develop and present the Preferred Alternative with both a Land Use Plan and a Water Resources Plan in accordance with the Site Assignment. The Single Supplemental EIR should include site plans depicting the proposed limits of site assignment and waste handling. The Single Supplemental EIR should also include site plans depicting the conceptual plan for the proposed landfill expansion areas and the proposed handling facility to demonstrate compliance with 310 CMR 16.40(4)(h) Size of Facility as requested by MassDEP. The Single Supplemental EIR should include a groundwater contour map in order to delineate where the nearest public drinking water supply or potential public water supply is located.

Land Alteration/Stormwater

The Single Supplemental EIR should include a graphic and narrative description of the impervious areas that will be created by the project and should review alternatives for minimizing new impervious surfaces associated with pavement. The Single Supplemental EIR should provide plans and a narrative that describes the existing and proposed stormwater management system. The plans should clearly identify stormwater infrastructure that will be eliminated, newly constructed, or modified. The Single Supplemental EIR should include additional information regarding construction sequencing that includes interim erosion controls and temporary stormwater structures (as applicable) to address the changing contours throughout the landfill.

Rare Species

The Single Supplemental EIR should analyze the impacts to Eastern Box Turtle and evaluate avoidance/mitigation strategies. It should provide an update on consultation with the NHESP and include additional details on how the project will provide a suitable long-term net benefit and meet the performance standards for issuance of a CMP. This should include information on the size (sf) and location of the land that will be permanently protected as open space and state-listed habitat. The Single Supplemental EIR should identify necessary project construction and post-construction conditions and commitments to avoid an adverse impact to resource area habitats of state-listed species located within and adjacent to the project areas.

Climate Change and GHG

Governor Baker's Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth (EO 569; the Order) was issued on September 16, 2016. The Order recognizes the serious threat presented by climate change and directs agencies within the administration to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for

its impacts. The Order seeks to ensure that Massachusetts will meet greenhouse gas (GHG) emissions reduction limits established under the Global Warming Solution Act of 2008 (GWSA) and will work to prepare state government and cities and towns for the impacts of climate change. Review of these issues through the GHG Policy and requirements to analyze the effects of climate change through EIR review is an important part of this statewide strategy. These analyses inform State Agencies and proponents' understanding of a project's GHG emissions and its vulnerability to the effects of climate change.

Adaptation and Resiliency

The Town is a participant in the Commonwealth's Municipal Vulnerability Preparedness (MVP) program. The MVP program is a community-driven process to define natural and climate-related hazards, identify existing and future vulnerabilities and strengths of infrastructure, environmental resources and vulnerable populations, and develop, prioritize and implement specific actions the Town can take to reduce risk and build resilience.

The Single should identify design features that could increase the resiliency of each of the proposed phases under future sea level conditions. The Town should consult the best available data on climate change predictions, including data available on the resilientMA.org website, to develop climate change scenarios for the project and identify potential adaptation measures for the appropriate design life of the project. EEA's Climate Change Adaptation Report (September 2011) and the Town's Climate Change Vulnerability Assessment (dated December, 2019) provide additional resources to assist in this analysis.

Greenhouse Gas Emissions

If the Town's contract with SEMASS is not extended, the Town will return to accepting up to 219,000 tpy of biodegradable municipal solid waste (MSW) (Scenario 2). As noted above, this scenario results in significant more GHG emissions than Scenario 1 (primarily MCA). The Single Supplemental EIR should provide an update on the SEMASS contract situation. It should indicate which of the two scenarios is likely to occur (to the extent this is feasible). The Single Supplemental EIR should identify additional measures which will be implemented to reduce GHG emissions should Scenario 2 occur. The project includes the relocation of the solid waste handling facility and other offices and facilities on the property. The Town should consult with MEPA staff and representatives of DOER prior to filing the Single Supplemental EIR to discuss how to assess the GHG impacts of this new construction.

To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed by the Town, I require Proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. The self-certification should be included in the draft Section 61 Findings.

Construction

The Single Supplemental EIR should include information regarding construction sequencing that includes interim erosion controls and temporary stormwater structures (as applicable) to address the changing contours throughout the phased development of the landfill. The Single Supplemental EIR

should describe proposed construction management components including site preparation and staging, hazardous and solid waste management, and implementation of measures to control construction traffic, noise, and air quality impacts. The Town should commit to participating in MassDEP's Clean Air Construction initiative and include this as a mitigation measure in its Section 61 findings. The Single Supplemental EIR should also address how the project will comply with the Massachusetts Idling regulation at 310 CMR 7.11.

Mitigation Measures/Section 61 Findings

The Single Supplemental EIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each permit or other approval to be issued by State Agencies. The Single Supplemental EIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and a schedule for implementation. The Single Supplemental EIR should clearly indicate which mitigation measures will be constructed or implemented based upon project phasing to ensure that adequate measures are in place to mitigate impacts associated with each phase of the landfill expansion.

Response to Comments

The Single Supplemental EIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the Single Supplemental EIR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the Scope of the Single Supplemental EIR beyond what has been expressly identified in this certificate.

Circulation

The Proponent should circulate the Single Supplemental EIR to those parties who commented on the EENF, to any State Agencies from which the Proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. Per 301 CMR 11.16(5), the Proponent may circulate copies of the Single Supplemental EIR to commenters in CD-ROM format or by directing commenters to a project website address. However, the Proponent must make a reasonable number of hard copies available to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. The Proponent should send correspondence accompanying the CD-ROM or website address indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. The Single Supplemental EIR submitted to the MEPA office should include a digital copy of the complete document. A copy of the Single Supplemental EIR should be made available for review at the Bourne public library.¹

¹ Requirements for hard copy distribution or mailings will be suspended during the Commonwealth's COVID-19 response. Please consult the MEPA website for further details on interim procedures during this emergency period: <https://www.mass.gov/orgs/massachusetts-environmental-policy-act-office>.

April 10, 2020

Date



Kathleen A. Theoharides

Comments received:

- 4/09/2020 Natural Heritage and Endangered Species Program (NHESP)
- 4/10/2020 Cape Cod Commission (CCC)
- 4/10/2020 Massachusetts Department of Environmental Protection (MassDEP) – Southeast Regional Office (SERO)

KAT/ACC/acc



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

April 9, 2020

Kathleen A. Theoharides
Secretary of Environment and Energy
Executive Office of Energy and
Environmental Affairs
ATTN: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: NPC Review. EOEEA 11333
BOURNE. Bourne Integrated Solid Waste
Management Facility at 201 MacArthur
Boulevard

Dear Secretary Theoharides,

The Southeast Regional Office of the Department of Environmental Protection (MassDEP) has reviewed the Notice of Project Change (NPC) for the Bourne Integrated Solid Waste Management Facility at 201 MacArthur Boulevard, Bourne, Massachusetts (EOEEA 11333). The Project Proponent provides the following information for the Project:

The purpose of this ENPC, which in effect is acting as an Expanded Environmental Notification Form (EENF), is to provide a comprehensive view of the full build-out potential of the Bourne Landfill and associated facilities. As noted in the final Certificate for Phase 6 in June 2018, the Secretary stated that "... the Town will submit a NPC to address development of Phase 7 and 8. This subsequent NPC should provide an updated development plan for Phase 7, Phase 8, the residential recycling center and relocated offices. The NPC should provide a cumulative assessment of potential impacts and avoidance, minimization, and mitigation measures for Phase 7 and Phase 8. As stated previously subsequent phases may result in a "Take" of the Eastern Box Turtle and require a CMP from the NHESP."

The submittal of this ENPC is in accordance with that path, however this NPC is in an expanded form so that it can act, in effect, as an Expanded Environmental Notification Form (EENF) in preparation for a Single Supplemental Environmental Impact Report (SSEIR) which the Town is requesting and is the process utilized to review Phase 6. The proposed site development plan for horizontal and vertical expansions of the landfill into the 2040s with new landfill liners, will also require relocation of existing structures such as offices and transfer operations onto currently pervious land. Together, the new liner areas and the areas required for the new structures and associated pavement will result in an increase of more than ten acres of new impervious land and therefore the preparation of an EIR is required.

Bureau of Water Resources Comments:

Wetlands and Waterways Comments: As proposed, this Project does not affect wetlands or waterways protected resources and is therefore not subject to the Wetlands Protection Act.

Industrial Stormwater Permit. The Facility appears to be a subject to the U.S. Environmental Protection Agency (US EPA) National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit (MSGP) for stormwater discharges from industrial activity as an activity under Sector L: Landfills and Land Application Sites. MassDEP reviewed the Notices of Intent (NOI) available for the 2015 MSGP in the EPA ECHO and E-enterprise databases and did not find an NOI for the Facility. More information on the MSGP may be found at:

https://www.epa.gov/sites/production/files/2015-10/documents/sector_1_landfills.pdf

Construction Stormwater Permit., The Project construction activities are scheduled to disturb 112 acres of land and therefore, may require a NPDES Stormwater Permit for Construction Activities. This permit is issued by the U.S. Environmental Protection Agency where the Proponent can access information regarding the NPDES Stormwater requirements and an application for the Construction General Permit at the EPA website: https://www.epa.gov/sites/production/files/2017-07/documents/cgp_flow_chart_do_i_need_a_permit2.pdf

The Proponent should also determine if any of the following U.S. EPA NPDES permits are necessary prior to commencing Project construction:

Dewatering General Permit - <https://www.epa.gov/npdes-permits/dewatering-general-permit-dgp-massachusetts-new-hampshire>.

Remediation General Permit - <https://www.epa.gov/npdes-permits/remediation-general-permit-rgp-massachusetts-new-hampshire>.

Additional information regarding these permits may be found at:

<http://www.epa.gov/region1/npdes/stormwater/assets/pdfs/CGP-DGP-RGP-Flow-Chart.pdf>

Bureau of Waste Site Cleanup Comments:

NPC #11333 – Based upon the information provided, the Bureau of Waste Site Cleanup (BWSC) searched its databases for disposal sites and release notifications that have occurred at or might impact the proposed Project area. A disposal site is a location where there has been a release to the environment of oil and/or hazardous material that is regulated under M.G.L. c. 21E, and the Massachusetts Contingency Plan [MCP – 310 CMR 40.0000].

There are several listed MCP sites located within 1000-feet of the proposed Project area. The disposal sites have all been closed under the MCP, and no further response actions or reporting are required. Note that one of the closed disposal sites is located at the Bourne ISWM facility (Release Tracking Number 4-14181). It is unlikely that any of these closed sites will impact the proposed MEPA Project area.

There are no other listed MCP disposal sites located at or in the vicinity of the site that would appear to impact the proposed Project area. Interested parties may view a map showing the location of BWSC disposal sites using the MassGIS data viewer (Oliver) at:

http://maps.massgis.state.ma.us/map_ol/oliver.php Under “Available Data Layers” select “Regulated Areas”, and then “DEP Tier Classified 21E Sites”. The compliance status and report

submittals for specific MCP disposal sites may be viewed using the BWSC Waste Sites/Reportable Release Lookup at: <https://eeaonline.eea.state.ma.us/portal#!/search/wastesite>

The Project Proponent is advised that if oil and/or hazardous material are identified during the implementation of this Project, notification pursuant to the Massachusetts Contingency Plan (310 CMR 40.0000) must be made to MassDEP, if necessary. A Licensed Site Professional (LSP) should be retained to determine if notification is required and, if need be, to render appropriate opinions. The LSP may evaluate whether risk reduction measures are necessary if contamination is present. The BWSC may be contacted for guidance if questions arise regarding cleanup.

Bureau of Air and Waste Comments:

Air Quality. Construction and operation activities shall not cause or contribute to a condition of air pollution due to dust, odor or noise. To determine the appropriate requirements please refer to:

310 CMR 7.09 Dust, Odor, Construction, and Demolition

310 CMR 7.10 Noise

Construction-Related Measures

MassDEP requests that all non-road diesel equipment rated 50 horsepower or greater meet EPA's Tier 4 emission limits, which are the most stringent emission standards currently available for off-road engines. If a piece of equipment is not available in the Tier 4 configuration, then the Proponent should use construction equipment that has been retrofitted with appropriate emissions reduction equipment. Emission reduction equipment includes EPA-verified, CARB-verified, or MassDEP-approved diesel oxidation catalysts (DOCs) or Diesel Particulate Filters (DPFs). The Proponent should maintain a list of the engines, their emission tiers, and, if applicable, the best available control technology installed on each piece of equipment on file for Departmental review.

Massachusetts Idling Regulation

The NPC reports that the Project Proponent proposes simply to "minimize idling." MassDEP reminds the Proponent that unnecessary idling (i.e., in excess of five minutes), with limited exception, is not permitted during the construction and operations phase of the Project (Section 7.11 of 310 CMR 7.00). With regard to construction period activity, typical methods of reducing idling include driver training, periodic inspections by site supervisors, and posting signage. In addition, to ensure compliance with this regulation once the Project is occupied, MassDEP requests that the Proponent install permanent signs limiting idling to five minutes or less on-site.

Spills Prevention. A spills contingency plan addressing prevention and management of potential releases of oil and/or hazardous materials from pre- and post-construction activities should be presented to workers at the site and enforced. The plan should include but not be limited to, refueling of machinery, storage of fuels, and potential on-site activity releases.

Solid Waste Management. MassDEP Solid Waste staff (Solid Waste) has reviewed the NPC for the Town of Bourne Integrated Solid Waste Management Facility in Bourne ("Project" or "Site" or "facility") EEA No. 11333.

NPC Project Information:

The Town of Bourne Department of Integrated Solid Waste Management (ISWM or Proponent or Town) is proposing a vertical and horizontal landfill expansion and the relocation of the solid waste handling facility and other offices and facilities on the property. The proposed vertical expansion, designated as Phase 9, involves placing waste vertically over previously landfilled areas

including Phase 2, 2A/3A, 3, 4, 5, and 6. Phase 9 would increase the maximum height of the landfill from elevation 185-ft MSL to elevation 220-ft MSL and would provide approximately 1,255,000 cubic yards of additional air space. The proposed horizontal expansion, designated as Phase 7 and Phase 8, involves the development of new landfill cells in an area located south of the existing Phase 6 landfill, within the 25-acre parcel that is currently site-assigned for solid waste handling. The Phase 7 and Phase 8 expansions would provide approximately 3,920,000 cubic yards of additional airspace. The development of Phase 7 and Phase 8 requires the relocation of the existing solid waste handling facility and other offices and facilities currently located on the 25-acre parcel. The Town has acquired a 12-acre parcel of undeveloped land, located south of the existing facility, and is proposing to use the land to develop a solid waste transfer station, residential recycling area, and other facilities.

1. The following Solid Waste permits are required for the proposed landfill expansion Project:
 - a. A Site Suitability Report for a Major Modification of an Existing Site Assignment (**BWP SW 38**) for the Phase 7 and Phase 8 horizontal expansion and the Phase 9 vertical expansion.

It should be noted that Page 20 of the ENPC states that the Phase 9 vertical expansion will not require a site assignment modification since it is within previously site assigned areas. MassDEP has reviewed the requirements of the 310 CMR 16.00 Site Assignment Regulations and determined that the Phase 9 vertical expansion requires a major modification to site assignment. The following criteria should be addressed for Phase 9: 16.40(4)(b) *Traffic and Access to the Site*; 16.40(4)(f) *Potential Air Quality Impacts*; 16.40(4)(g) *Potential for the Creation of Nuisances*; 16.40(4)(h) *Size of facility*; 16.40(4)(i) *Areas Previously Used for Solid Waste Disposal*; 16.40(4)(k) *Consideration of Other Sources of Contamination or Pollution*; and 16.40(5) *Promotion of Integrated Solid Waste Management*.

- b. The landfill expansion will also require the following permits from MassDEP's solid waste management section: Authorization to Construct a Large Landfill Expansion (**BMP SW 26**) and Authorization to Operate (**BWP SW 10**).
2. The following Solid Waste permits are required for the proposed solid waste transfer station:
 - a. A Site Suitability Report for a New Site Assignment (**BWP SW 01**);
 - b. Authorization to Construct a Large Handling Facility (**BWP SW 05**); and
 - c. Authorization to Operate a Large Handling Facility (**BWP SW 06**).
3. MassDEP would like to note that site assignment permits, described in comments 1.a and 2.a above, are unlike all other MassDEP solid waste permits, in that MassDEP does not make the decision whether to site assign or not site assign a property. MassDEP only reviews a Site Suitability Report Application and determines whether a parcel of land meets specific criteria for use as the site for a solid waste management facility. If the site meets all siting criteria, MassDEP issues a Site Suitability Report to the local Board of Health with a positive determination. If the site does not meet all siting criteria, MassDEP issues a Site Suitability Report to the local Board of Health with a negative determination. However, ultimately the local Board of Health will decide whether to approve or deny a Site Assignment for a proposed facility.

4. MassDEP has reviewed the draft site suitability criteria information submitted within the ENPC. It should be noted that additional information will be required for the formal site suitability application, including but not limited to, additional evaluation for each suitability criteria and all applicable engineering design plans. MassDEP requires a pre-application meeting to discuss comments received from the public on the ENPC and to ensure the facility design and operational measures will comply with solid waste regulations and applicable policies with an emphasis on odor, noise, and traffic mitigation.
5. Page 13 of the NPC discusses the Town's current contract with SEMASS which requires the Bourne Landfill to accept and dispose of combustion ash from SEMASS at a rate of up to 189,000 tons per year. The ENPC details two scenarios upon the conclusion of the contract with SEMASS which occurs at the end of 2021. In "Scenario 1", the Town would extend the contract with SEMASS which would result in the facility accepting mostly combustion ash and an additional 30,000 tons per year of biodegradable waste (i.e. MSW). In "Scenario 2", the Town would utilize its 219,000 tons per year of disposal capacity entirely for MSW. The Town should evaluate both scenarios in the application for Site Suitability Report for a Major Modification for the landfill expansion since siting criteria may be affected by the rate of MSW acceptance including, but not limited to, 16.40(4)(b) *Traffic and Access to the Site*; 16.40(4)(f) *Potential Air Quality Impacts*; and 16.40(4)(g) *Potential for the Creation of Nuisances*.
6. The Proponent will be required to prepare a Land Use Plan and Water Resources Plan in accordance with Section I.H of the site suitability application form. The Proponent should also prepare a site plan depicting the proposed limits of site assignment and waste handling. The Proponent should also prepare site plans depicting the conceptual plan for the proposed landfill expansion areas and the proposed handling facility to demonstrate compliance with 310 CMR 16.40(4)(h) *Size of Facility*. MassDEP recommends the Proponent submit the plans in the subsequent MEPA filing.
7. The Proponent should state whether or not any waivers of the site suitability criteria are being requested under provisions of 310 CMR 16.40(6).
8. Page 8 of the NPC describes the Town's plan to keep sections of the landfill uncapped by installing a long-term intermediate cover system in lieu of a final cover system. In order to evaluate the adequacy of this plan, the Proponent should submit to MassDEP a detailed capping sequence plan that includes a site plan and schedule for capping and proposed specifications for the long-term intermediate cover system including provisions for the collection of landfill gas for MassDEP approval pursuant to 310 CMR 19.130(15)(e)1.
9. The proposed Phase 9 vertical expansion includes the placement of waste over areas of fill that have been capped with a final cover system and areas that are uncapped. The Proponent should schedule a pre-application meeting with MassDEP to discuss the design of Phase 9 and the requirements of 310 CMR 19.110(5) *Vertical Expansions over Existing Fill*.
10. Page 21 of the NPC addresses criteria 16.40(3)(a)4 and states "the nearest public drinking water supply well is about 0.55 miles south and cross-gradient (not downgradient) to the 25-acre parcel. The Facility is not upgradient of an existing or potential public water supply." MassDEP recommends that the Proponent submit a groundwater contour map in the subsequent MEPA filing.

11. Page 21 of the NPC discusses criteria 16.40(3)(a)5 which addresses discharges from the facility. MassDEP recommends the Proponent discuss the status of the Landfill's compliance with U.S. EPA NPDES Industrial Stormwater Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP), Sector L, Landfills and Land Application Sites.
12. Page 22 of the NPC discusses criteria 16.40(3)(a)6 which addresses areas of waste deposition over the recharge area of a Sole Source Aquifer. The ENPC states "All previously identified water supply wells have been replaced with connections to the public water supply system." Mass DEP recommends the Proponent discuss when the most recent private well analysis in the vicinity of the Landfill was conducted. In addition, the ENPC states "The Bourne Water District has stated in a letter that it does not have, nor will it seek to locate future drinking water sources downgradient of the Landfill." The Proponent should include the letter from the Bourne Water District. The ENPC also states "The Bourne Water District public water supply system is capable of meeting the municipality's project needs." The Proponent should include a statement from the Bourne Water District.
13. Page 22 of the NPC discusses criteria 16.40(3)(a)10 which addresses areas of waste deposition within a Potentially Productive Aquifer. The Proponent must provide additional analysis, based on hydrogeological studies, to demonstrate that the Phase 7 and Phase 8 expansion will meet the requirements of 16.40(3)(a)10.b.
14. Page 24 of the NPC discusses criteria 16.40(3)(a)12 which addresses maximum high groundwater for the proposed landfill expansion. Similarly, page 27 of the ENPC discusses criteria 16.40(3)(d)7 which addresses maximum high groundwater for the proposed solid waste handling facility. The Proponent should provide a site plan depicting the locations of all groundwater monitoring wells. The Proponent should discuss the groundwater monitoring wells within the proposed Phase 7 and Phase 8 expansion areas and within the 12-acre parcel and discuss the facility's protocol for determining groundwater elevation (e.g. frequency of measurements).
15. Page 29 of the NPC discusses criteria 16.40(4)(b) which addresses traffic and access to the site. The ENPC states "Site access, volume and regional impacts of traffic coming and going from the Bourne ISWM were thoroughly analyzed during the EIR/DRI Joint review process with MEPA and CCC." MassDEP has comments on the assumption that the previously conducted traffic study can demonstrate suitability with criteria 16.40(4)(b). The Proponent should include the traffic study and discuss why the assumptions, analysis, and conclusions of the traffic study are still valid. In addition, the Proponent should include a discussion of recent crash data.

Asbestos Comment

16. Demolition and Asbestos Containing Waste Material:
The proposed Project includes the demolition of structures which may contain asbestos. The Project Proponent is advised that demolition activity must comply with both Solid Waste and Air Quality Control regulations. Please note that MassDEP promulgated revised Asbestos Regulations (310 CMR 7.15) that became effective on June 20, 2014. The new regulations contain requirements to conduct a pre-demolition/renovation asbestos survey by a licensed asbestos inspector and post abatement visual inspections by a licensed asbestos Project monitor. The

Massachusetts Department of Labor and Work Force Development, Division of Labor Standards (DLS) is the agency responsible for licensing and regulating all asbestos abatement contractors, designers, Project monitors, inspectors and analytical laboratories in the state of Massachusetts.

In accordance with the revised Asbestos Regulations at 310 CMR 7.15(4), any owner or operator of a facility or facility component that contains suspect asbestos containing material (ACM) shall, prior to conducting any demolition or renovation, employ a DLS licensed asbestos inspector to thoroughly inspect the facility or facility component, to identify the presence, location and quantity of any ACM or suspect ACM and to prepare a written asbestos survey report. As part of the asbestos survey, samples must be taken of all suspect asbestos containing building materials and sent to a DLS certified laboratory for analysis, using USEPA approved analytical methods.

If ACM is identified in the asbestos survey, the Proponent must hire a DLS licensed asbestos abatement contractor to remove and dispose of any asbestos containing material(s) from the facility or facility component in accordance with 310 CMR 7.15, prior to conducting any demolition or renovation activities. The removal and handling of asbestos from the facility or facility components must adhere to the Specific Asbestos Abatement Work Practice Standards required at 310 CMR 7.15(7). The Proponent and asbestos contractor will be responsible for submitting an *Asbestos Notification Form ANF-001* to MassDEP at least ten (10) working days prior to beginning any removal of the asbestos containing materials as specified at 310 CMR 7.15(6).

The Proponent shall ensure that all asbestos containing waste material from any asbestos abatement activity is properly stored and disposed of at a landfill approved to accept such material in accordance with 310 CMR 7.15 (17). The Solid Waste Regulations at 310 CMR 19.061(3) lists the requirements for any solid waste facility handling or disposing of asbestos waste. Pursuant to 310 CMR 19.061(3) (b) 1, no asbestos containing material; including VAT, asphaltic-asbestos felts or shingles; may be disposed at a solid waste combustion facility.

If you have any questions regarding the Solid Waste Management Program or Asbestos Program comments above, please contact Mark Dakers at (508) 946-2847 or Cynthia Baran at (508) 946-2887.

Climate Change Comments

Climate Change – Greenhouse Gas Emissions. Pursuant to the Global Warming Solutions Act of 2008 (GWSA) (Chapter 298 of the Acts of 2008) and the Commonwealth's Clean Energy and Climate Plan the Commonwealth has established economy-wide greenhouse gas (GHG) emission reduction limits for Massachusetts that will achieve reductions of 25 percent below statewide 1990 GHG emission levels by 2020 and 80 percent below statewide 1990 GHG emission levels by 2050. Furthermore, Section 7 of the GWSA amended Section 61 of Chapter 30 of the Massachusetts General Laws by inserting, "in considering and issuing permits, licenses and other administrative approvals and decisions, the respective agency, department, board, commission or authority shall also consider reasonably foreseeable climate change impacts, including additional greenhouse gas emissions, and effects, such as predicted sea level rise."

The Proponent should consider potential GHG impacts (e.g., energy demand, use of renewable energy sources, transportation modes, etc.) of its Project in the context of furthering the Commonwealth's goals and recommended GHG mitigation policies in the *Clean Energy and Climate Plan for 2020*. Additional information on the Commonwealth's efforts to reduce GHG emissions can be found at: <http://www.mass.gov/eea/air-water-climate-change/climate-change/massachusetts-global-warming-solutions-act/>.

Proposed s.61 Findings

The "Certificate of the Secretary of Energy and Environmental Affairs on the Notice of Project Change" may indicate that this Project requires further MEPA review and the preparation of an Environmental Impact Report. Pursuant to MEPA Regulations 301 CMR 11.12(5)(d), the Proponent will prepare Proposed Section 61 Findings to be included in the EIR in a separate chapter updating and summarizing proposed mitigation measures. In accordance with 301 CMR 11.07(6)(k), this chapter should also include separate updated draft Section 61 Findings for each State agency that will issue permits for the Project. The draft Section 61 Findings should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation.

Other Comments/Guidance

The MassDEP Southeast Regional Office appreciates the opportunity to comment on this NPC. If you have any questions regarding these comments, please contact George Zoto at (508) 946-2820.

Very truly yours,

 SETH PICKERING

FOR David Johnston
Deputy Regional Director
Bureau of Water Resources

DJ/GZ

Cc: DEP/SERO

ATTN: Millie Garcia-Serrano, Regional Director
Gerard Martin, Deputy Regional Director, BWSC
Seth Pickering, Deputy Regional Director, BAW
Jennifer Viveiros, Deputy Regional Director, ADMIN
Jonathan Hobbil, Regional Engineer, BWR
Dan Gilmore, Wetlands and Waterways, BWR
Mark Dakers, Solid Waste, BAW
Alison Cochrane, Solid Waste, BAW
Allen Hemberger, Site Management, BWSC



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DIVISION OF FISHERIES & WILDLIFE

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April 9, 2020

Kathleen A. Theoharides, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office
Anne Canaday, EEA No. 11333
100 Cambridge Street
Boston, Massachusetts 02114

Project Name: Bourne Integrated Solid Waste Management Facility
Proponent: Town of Bourne, Dept. of Integrated Solid Waste Management (ISWM)
Location: 201 MacArthur Boulevard, Bourne, MA
Project Description: Landfill Expansion – Phases 7, 8 and 9
Document Reviewed: Expanded Notice of Project Change
EEA File Number: 11333
NHESP Tracking No.: 17-36534

Dear Secretary Theoharides:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the Division) has reviewed the *Expanded Notice of Project Change* (ENPC) for the Town of Bourne ISWM's proposed Phase 7, 8 and 9 Landfill Expansion Project and would like to offer the following comments regarding state-listed species and their habitats.

According to the information provided in the ENPC, portions of the Project site are mapped as Priority Habitat for the Eastern Box Turtle (*Terrapene carolina*), a species state-listed as Special Concern according to the *Massachusetts Natural Heritage Atlas* (14th Edition). This species and its habitats are protected pursuant to the Massachusetts Endangered Species Act (MGL c.131A) and its implementing regulations (MESA; 321 CMR 10.00). A Fact Sheet for this species can be found on our website, www.mass.gov/nhesp.

All projects or activities proposed within Priority Habitat, which are not otherwise exempt pursuant to 321 CMR 10.14, require review through a direct filing with the Division for compliance with the MESA (321 CMR 10.18). The Division determined (letter dated February 5, 2020) that Phases 7, 8 and 9 of the Project, as currently proposed, appear to be exempt from MESA review pursuant to 321 CMR 10.14.

As noted in the Division's previous comments (dated June 19, 2018) on the Supplemental Single Environmental Impact Report, future development of the proposed Future Handling Area and proposed effluent connection projects will require a direct filing with the Division for compliance with the MESA. This includes any work within the "Limit of Box Turtle Habitat" shown on the site plans entitled "Conceptual Site Buildout Plan Through Phase 9 To Elevation 225" (ENPC, Attachment 3). The Proponent has initiated pre-filing consultations with the Division to discuss conceptual development plans associated with the Future Handling Area. In advance of a formal MESA filing, the Division anticipates –

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based on ongoing consultations with the Proponent and information submitted to date – that future development of the Future Handling Area, as proposed, will likely result in a Take (321 CMR 10.18 (2)(b)) of the Eastern Box Turtle.

Projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species; (b) demonstrate that an insignificant portion of the local population will be impacted; and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species.

The Proponent has continued to proactively consult with the Division on a pre-filing basis to avoid, minimize and mitigate impacts to state-listed species and their habitats associated with potential development of the Future Handling Area. Based on ongoing consultations and information submitted to date, we understand that the Proponent intends to meet the performance standards of a CMP by permanently protecting off-site land in the vicinity of the site as open space and state-listed species habitat. Although the exact details of the long-term net benefit required under a CMP have not yet been finalized, the Division anticipates that a suitable long-term net benefit can be achieved through the protection of suitable, high quality off-site habitat and that the Project should be able to meet the performance standards of a CMP.

The Division will not render a final decision regarding the Future Handling Area until the MEPA review process and its associated comment period is complete, and until all required MESA filing materials are submitted to the Division. No work associated with the Future Handling Area or proposed effluent connection projects shall occur on the property until the MESA review process is complete.

If you have any questions about this letter, please contact Jesse Leddick, Chief of Regulatory Review, at (508) 389-6386 or jesse.leddick@mass.gov. We appreciate the opportunity to comment on this project.

Sincerely,



Everose Schlüter, Ph.D.
Assistant Director

cc: Daniel T. Barrett, Town of Bourne ISWM Department
Phil Goddard, Town of Bourne ISWM Department
Town of Bourne Board of Selectmen
Town of Bourne Conservation Commission
Town of Bourne Planning Department
DEP Southeast Regional Office
Amy Ball, Horsley Witten Group, Inc.

March 30, 2020

Secretary Kathleen Theoharides
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Anne Canaday, EEA No. 11333
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Secretary Theoharides:

The Division of Marine Fisheries (MA DMF) has reviewed the Notice of Project Change (NPC) for the Town of Bourne's Integrated Solid Waste Management Facility. The project was reviewed with respect to potential impacts to marine fisheries resources and habitat.

Based on the information provided, MA DMF has no recommendation for sequencing, timing, or methods that would avoid or minimize impact at this time.

Questions regarding this review may be directed to John Logan in our New Bedford office at (508) 742-9722.

John Logan, Ph.D.
MA Division of Marine Fisheries
836 South Rodney French Boulevard
New Bedford, MA 02744
(508) 742-9722
<http://www.mass.gov/eea/agencies/dfg/dmf/>
https://www.researchgate.net/profile/John_Logan
Join the conversation! DMF is on [Twitter](#), [Flickr](#), [Facebook](#), and [YouTube](#).

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Via Email

April 10, 2020

Kathleen A. Theoharides, Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office, Eva Anne Canaday, MEPA Analyst
100 Cambridge Street, Suite 900, Boston, MA 02114

Re: Expanded Notice of Project Change — EEA No. 11333
Bourne Integrated Solid Waste Management Facility- Future Development

Dear Secretary Theoharides:

Commission staff believe the ENPC sufficiently details the scope of the Town's proposed future phases 7, 8 & 9 for the Facility and support the Town's request for, and the Secretary's allowance of, a Supplemental Single EIR (SSEIR). The Cape Cod Commission reserves further substantive comment on the proposal for later stages of the MEPA review. Ultimately, after MEPA review concludes, the Cape Cod Commission will undertake Development of Regional Impact review of the proposed future phases. Staff suggests that it may benefit MEPA review and ultimately better facilitate the Cape Cod Commission's review if the Town were to include in the EIR, among other things, discussion of the proposal relative to the pertinent goals and objectives from the Cape Cod Regional Policy Plan.

Thank you for the opportunity to comment on the above-referenced ENPC. Commission staff are available to discuss any questions you might have about these comments.

Sincerely,

Kristy Senatori
Executive Director

Cc: Project File
Phil Goddard, Bourne ISWM Department, via email
Bourne Cape Cod Commission Representative via email
Cape Cod Commission Chair via email
Cape Cod Commission Committee on Planning and Regulation Chair via email



The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Kathleen A. Theoharides
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
<http://www.mass.gov/eea>

December 30, 2020

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
SINGLE SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME : Bourne Integrated Solid Waste Management
Facility
PROJECT MUNICIPALITY : Bourne
PROJECT WATERSHED : Cape Cod
EOEA NUMBER : 11333
PROJECT PROPONENT : Town of Bourne
DATE NOTICED IN MONITOR : November 23, 2020

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G. L. c. 30, ss. 61-62I) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I have reviewed the Single Supplemental Environmental Impact Report (Single Supplemental EIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations.

Project Description

As described in the Single Supplemental EIR, the project consists of the phased expansion (Phases 7, 8 and 9) of the Bourne Integrated Solid Waste Management Facility (ISWMF) project. Specifically, the Town of Bourne is proposing a vertical and horizontal landfill expansion and the relocation of the solid waste handling facility and other offices and facilities on the property. The three phase 25.0-acre expansion will provide a total of 5,175,000 cubic yards (cy) of disposal capacity which will extend the life of the landfill through 2040.

The horizontal expansion of the landfill (Phase 7 and 8) will require the development of new lined landfill cells in an area located south of Phase 6. These new cells will incorporate leachate collection and landfill gas management infrastructure. Phases 7 and 8 will provide approximately 3,920,000 cy of disposal capacity. The horizontal expansion will be located within a 25-acre parcel that is currently site assigned for solid waste handling and contains a residential recycling area, transfer

station, office building, and other appurtenant structures. The development of Phases 7 and 8 will require the relocation of the transfer station and other structures to an adjacent 12-acre parcel which was acquired by the Town in 2016 and abuts the residential recycling center at the southern boundary of the site. The vertical expansion (Phase 9) is proposed over uncapped areas of the landfill and areas that have been capped with a final cover system. Phase 9 will increase the maximum height of the landfill by 40 feet (from 185 ft to 225 ft) and will provide approximately 1,255,000 cy of disposal capacity which could extend the life of the landfill up to four and a half years.

The Certificate on the Final Environmental Impact Report (FEIR), issued November 29, 1999, acknowledged that certain aspects of the landfill project, including future phases, were conceptual and required that the Town submit Notice of Project Changes (NPCs) to the MEPA Office to address development of subsequent phases. The Town submitted an Expanded NPC in February 2020 that provided an updated site development plan for the landfill and described the development of Phase 7, Phase 8 and Phase 9 of the landfill expansion. The Town was allowed to submit a Single Supplemental EIR in lieu of the usual two-stage Draft and Final EIR process.

Procedural History

The full procedural history for this project was reviewed in the Certificate on the Expanded NPC. Review of the Bourne ISWMP project was initiated with the submission of an Environmental Notification Form (ENF) in 1997. Several Notices of Project Change (NPC) were filed thereafter, including the Expanded NPC on this project change filed in February 2020. All prior phases through Phase 6 were previously reviewed, and the most recent Certificate on Phase 6 was issued on June 26, 2018.

Project Site

The Bourne ISWMP, located at 201 MacArthur Boulevard (Route 28), is comprised of a 74-acre site-assigned parcel which contains the landfill operations and facilities. In 2001, a 25-acre parcel immediately abutting the landfill to the south was purchased and has been used for recycling and transfer operations. The landfill contains lined and unlined waste disposal areas. Phases 1A, 1B, 1C, and 1D are unlined cells that comprise the oldest portion of the landfill. Phases 1A, 1B, and 1C are closed and capped. Phase 1D was part of a pilot landfill reclamation project with the Massachusetts Department of Environmental Protection (MassDEP) that removed the solid waste in this area in order to create additional landfill space. Phases 2 and Phase 3 are both lined and are closed and capped with leachate collection systems. Phase 4, an active landfill cell, is located in the area previously occupied by Phase 1D. Phase 5 consists of a vertical expansion proposed over Phases 1A, 1B, and 1C. MassDEP issued an Authorization to Construct (ATC) and ATO Permit in 2019 for Phase 6 which is currently under construction.

Permits and Jurisdiction

The development of Phases 7, 8 and 9 is undergoing MEPA review and requires an NPC because it consists of a material change to the project prior to the taking of all Agency Actions. The project change exceeds the mandatory EIR threshold at 301 CMR 11.03 (1)(a)(2) because it will result in the creation of ten or more acres of impervious area. The project change also exceeds the Solid Waste ENF

threshold at 301 CMR 11.03(9)(b)(1) because it will result in new capacity or expansion in capacity for combustion or disposal of any quantity of solid waste, or storage, treatment or processing of 50 or more tpd of solid waste. Because it requires an EIR, the project change is subject to review in accordance with the MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol (“GHG Policy”).

The proposed landfill expansion will require the following Permits from MassDEP: Site Suitability Report for a Major Modification of an Existing Site Assignment (BWP SW 38), Authorization to Construct (ATC) a Large Landfill Expansion (BWP SW 26), and Authorization to Operate (ATO) (BWP SW 10). Relocation of the transfer station to the 12-acre parcel will require the following Permits from MassDEP: Site Suitability Report for a New Site Assignment (BWP SW 01), ATC a Large Handling Facility (BWP SW 05), and ATO a Large Handling Facility (BWP SW 06). The project will likely require a Conservation Management Permit (CMP) from the Division of Fisheries and Wildlife’s (DFW) Natural Heritage and Endangered Species Program (NHESP).

The project will require a Development of Regional Impact (DRI) Modification from the Cape Cod Commission (CCC), Site Assignment Approval from the Bourne Board of Health, and a National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental protection Agency (EPA).

Because the project is not seeking Financial Assistance from the Commonwealth, MEPA jurisdiction extends to those aspects of the project that are within the subject matter of required, or potentially required, State Agency Actions and that may cause Damage to the Environment as defined in the MEPA regulations. The subject matter of the Site Assignment regulations is sufficiently broad to confer the equivalent of broad scope jurisdiction over the potential environmental impacts of the project. Therefore, MEPA jurisdiction is broad in scope and extends to all aspects of a project that are likely, directly or indirectly, to cause Damage to the Environment, as defined in the MEPA regulations.

Environmental Impacts and Mitigation

Potential environmental impacts of the project change will include alteration of 38 acres of land (112 total acres) and creation of 16.23 acres of impervious area. Measures to avoid, minimize, and mitigate project impacts include: construction period Best Management Practices (BMPs), permanent protection of rare species habitat, dust control measures, erosion and sedimentation controls, leachate management, and measures to maximize LFG (landfill gas) collection efficiency.

Review of Single Supplemental EIR

The Single Supplemental EIR was generally responsive to the Scope provided in the Certificate on the Expanded NPC. It described the project, identified existing conditions, and described potential environmental impacts and mitigation measures. It provided a brief description of applicable statutory and regulatory standards and requirements, and described how the project will meet those standards. The Single Supplemental EIR provided a list of required local, state, and federal permits and provided an update on the status of each of these actions. It also contained a response to comments received on the Expanded NPC and draft section 61 findings.

The primary emphasis of the Single Supplemental EIR was to demonstrate that the project’s

design and operational measures will comply with solid waste regulations and applicable policies and provide sufficient information for MassDEP to use in making its permitting decisions and associated Section 61 Findings. Comments from MassDEP indicate that the Single Supplemental EIR has provided information to support subsequent permitting where compliance with solid waste regulations and applicable policies will be determined. In addition, MassDEP's comments indicate that the Draft Section 61 Findings are in general compliance with solid waste compliance requirements.

The Single Supplemental EIR includes an update on the Cape Cod Commission (CCC) review process and a discussion of the project's compliance with the pertinent goals and objectives from the Cape Cod Regional Policy Plan.

I have received a comment from the Conservation Law Foundation (CLF) on behalf of Beyond Plastics, Clean Water Action, Community Action Works, the Global Alliance for Incinerator Alternatives, Massachusetts Rivers Alliance, MASSPIRG, Saugus Action Volunteers for the Environment, the Saugus River Watershed Council, Sierra Club, and Sustainable Practices. The comment letter is in opposition to the Town's Phase 7, 8, and 9 Integrated Solid Waste Management Facility expansion as proposed in the Single Supplemental EIR. CLF's comment indicates that the expansion would be a threat to public health and the environment and would continue to undermine the need to responsibly manage waste through source reduction, recycling, and composting.

CLF's comment letter also states that meaningful opportunities for public review of the expansion's potential environmental impacts have not been provided, because it is not possible for the public to access the majority of the historical project documents. As noted above, however, the FEIR Certificate issued in 1999 acknowledged that certain aspects of the landfill project, including future phases, were conceptual and required that the Town submit future NPC filings to disclose the impacts associated with those components. The Expanded NPC filed in February 2020 therefore was the operative document that contained all relevant details (*not* available in historic project filings) related to the phases at issue here, and members of the public have had full access to information and materials associated with this NPC filing. I am also aware that this Office responded to a public records request filed by CLF, and provided the historic files that were sought.

I note that the project will require extensive permitting after the conclusion of MEPA review, and such permitting procedures will include opportunities for public review. The proposed expansion will require the following solid waste permits:

a. For the proposed landfill expansion:

- Site Suitability Report for a Major Modification of an Existing Site Assignment (BWP SW 38).
- Authorization to Construct a Large Landfill Expansion (BMP SW 26), and
- Authorization to Operate (BWP SW 10).

b. For the proposed solid waste transfer station:

- Site Suitability Report for a New Site Assignment (BWP SW 01).
- Authorization to Construct a Large Handling Facility (BWP SW 05); and
- Authorization to Operate a Large Handling Facility (BWP SW 06).

Prior the submission of a BWP SW 38 or BWP SW 01 application, MassDEP requires a preapplication meeting to discuss comments received from the public on the Supplemental Single EIR

and to ensure the facility design and operational measures will comply with solid waste regulations and applicable policies with an emphasis on odor, noise, and traffic mitigation. In addition, the following permit applications have public comment periods or public hearing requirements:

- a. BWP SW 01 applications: There is a 21-day public comment period.
- b. BWP SW 38 applications: There is a 21-day public comment period.
- c. Board of Health Site Assignment Decisions: The Board of Health must hold a public hearing in accordance with 310 CMR 16.20.
- d. BWP SW 05 applications: There is a minimum 30-day public comment period.
- e. BWP SW 26 applications: There is a minimum 30-day public comment period.
- f. BWP SW 06 or BWP SW 10 applications: Public comments are not required prior to issuing a decision, but MassDEP comments indicate MassDEP may issue provisional approval with a deferred effective date to allow for 21-day public notice/comment period.

MEPA review is not a permitting process, nor does it serve as an appeal for local decisions. It does not pass judgment on whether a project is or is not beneficial, or whether a project can or should receive a particular permit. Rather, the MEPA process requires public disclosure of a project's environmental impacts as well as the measures that the proponent will undertake to avoid, minimize and mitigate these impacts. MEPA review occurs before public agencies act to issue permits and approvals for a proposed project to ensure that those agencies are fully cognizant of the environmental consequences of their actions. I have examined the record before me, including but not limited to the Scope issued on the Expanded NPC; the Supplemental Single EIR filed in response; and the numerous comments entered into the record. Given the long history of review of this project as detailed in the Certificate on the Expanded NPC, and the comprehensive information provided in response to the Scope and additional pre-filing consultations with Agencies, I do not find that further review is warranted on this project change.

Solid Waste

The project will be regulated under MassDEP's Site Assignment Regulations for Solid Waste Facilities and Solid Waste Regulations. The Town will be required to modify its Site Assignment with the Board of Health prior to development of Phases 7, 8 or 9. The Single Supplemental EIR included a narrative that addressed the project's consistency with the applicable regulatory approval criteria.

Leachate and Landfill Gas Collection

As required by the Scope, the Single Supplemental EIR provided information on the existing monitoring wells and leachate and landfill gas collection systems. It also provided plans and described how leachate and landfill gas will be collected and managed within Phase 7-9. The existing landfill operations include leachate collection and storage facilities, landfill gas collection and treatment systems and an environmental monitoring system that is sampled and evaluated for impacts to groundwater and soil gas conditions in the vicinity of the landfill. These systems will be expanded and maintained for the proposed expansions to the facilities. The leachate collection and storage systems include double composite liner system with primary and secondary leachate collection and monitoring capacity. The double composite liner system consists of 12 inches of low permeable soil, upon which multiple layers of geosynthetic liner materials are installed. MassDEP comments indicate that the double composite

liner system is consistent with systems used for hazardous waste sites.¹ As described in the Single Supplemental Certificate, the layers include primary and secondary geosynthetic clay liners (GCL) and geomembranes, with a leak detection/drainage layer material that drains to a secondary sump and allows for the measurement of leachate that might leak through the primary liner system. On top of the primary geomembrane is a leachate collection system consisting of a network of pipes and 18-inches of drainage sand which allows for the collection and discharge of leachate to the primary leachate sump. There are pumps installed in both the primary and secondary leachate sumps, which pump the collected leachate through a force main to one of two leachate storage tanks. The stored leachate is transferred to tanker trucks and hauled to licensed wastewater treatment plants for treatment and disposal. The leachate collection system will be expanded to Phase 7 by extending the existing Phase 6 leachate collection system. It is anticipated that Phase 8 will be designed and constructed with its own collection system and leachate sump. Phase 9 will be developed by removing any final or intermediate cover systems onto which it will be built, so that leachate will flow vertically into the existing landfill phases and collection system.

Phase 9 will be a vertical expansion of landfilling over existing double composite lined landfill phases. Some of the phase areas have final cap installations that will require the removal of those cap components, including geomembrane barriers. Other areas upon which Phase 9 will be developed (Phase 4, Stage 2 and Phase 5) are currently not capped, because they have just recently stopped operating, having reached their current approved final subgrades. The other portion of the Phase 9 overfill area will be constructed over the future plateau area of the active Phase 6 Landfill, when those approved grades are achieved. The Town plans to develop Phase 9 in stages. The first stage will be to fill the area that is over the Phase 5 Landfill. This will allow the final closure of the northwest corner of the landfill, which includes the currently uncapped Phase 5 sideslopes. The second stage would be to fill over the currently uncapped Phase 4, Stage 2 plateau and the completed Phase 6 plateau. This sequence will allow the postponement of removal of the existing final cap over the remainder of the Phase 9 footprint and will allow for the progressive modification to the existing gas collection system that underlays the Phase 9 Landfill. The completion of the Phase 9 overfill will require sequentially removing stages of the existing final caps of the Phase 2, Phase 2A/3A, Phase 3 and Phase 4, Stage 1 landfills. The sequential cap removal work will be done to minimize the area of open landfill surface at any one time. The Single Sup. EIR contained a Figure 4 in Attachment 3 that shows the anticipated sequential development of the Phase 9 Landfill. There will be areas that remain uncovered for several years before the Phase 9 filling occurs on them. In order to mitigate any impacts from occurring because of this, there will be an intermediate cover layer installed over these areas upon achieving the currently approved subgrades. The intermediate cover will be an application of soil materials meeting the requirements of 310 CMR 19.130(15)(d) Intermediate Cover. Because of the possible long-term exposure of the intermediate cover material until Phase 9 is constructed, the cover soils material will be applied across the subgrade surface, so as to form an intermediate cover that is at least twelve inches (12") thick.

MassDEP comments indicate that the Single Supplemental EIR addressed MassDEP's prior comments regarding the use of a long-term intermediate cover system. MassDEP will evaluate the plan for the long-term intermediate cover at solid waste permitting. MassDEP's decision on the use of long-term intermediate cover and the proposed capping schedule will depend on the waste stream (i.e. mainly ash in the "preferred alternative" or MSW only). If the Proponent decides to accept only MSW, the plan for a long-term intermediate cover system may not be feasible according to MassDEP. Comments from

¹ Supplemental information provided by MassDEP on December 29, 2020.

MassDEP make clear that MassDEP may require the Proponent to revise the proposed schedule for capping if there are issues with leachate management, nuisance conditions, or as necessary to ensure compliance with 310 CMR 19.000.

The current landfill facilities include an existing gas collection and treatment system. The system for the management of gas generated within the landfill includes vertical extraction wells and horizontal gas collectors. There is also a network of piping to collect generated landfill gases and convey them to a flare station for treatment. The existing flare station is located to the northeast of the Phase 2 landfill area and prevents the occurrence of odors and the off-site migration of landfill gas. The landfill gas collection system will be expanded by modifying the existing header system, by relocating portions of it to the perimeter sideslopes to prevent them from being buried by the Phase 9 vertical expansion. Existing gas extraction wells located within the proposed footprint of Phase 9 will be modified by converting the wells to having remote wellheads, also along the perimeter sideslopes. The Phase 7 and 8, as well as the Phase 9 overflow waste will have new extraction wells installed and operated in the same manner as the existing extraction wells.

Potential impact from the landfill to the environment has been monitored for several decades by a groundwater and soil gas monitoring program. The monitoring program has consisted of quarterly sampling that began in the 1990s. This program has contributed to the development and approval of a Comprehensive Site Assessment (CSA) for the site. The scope of the current monitoring program was established in MassDEP's approval of the CSA in 2017. According to the Single Supplemental EIR, the facility anticipates that MassDEP approvals for Phases 7 and 8 will include the placement of additional groundwater and gas monitoring wells along their perimeter.

Traffic Assessment

The Single Supplemental EIR included a traffic assessment memorandum (dated July 16, 2020) which indicated that traffic generation has decreased since 2015 when municipal combustor ash, delivered in large trailers, became the primary waste stream. The Single Supplemental EIR also described that if the MSW (municipal solid waste) Alternative were to occur and the facility were to operate at daily capacity, more truck traffic would be needed to deliver such waste to the facility. The Single Supplemental EIR concludes that even if the MSW alternative were adopted, the maximum level of traffic would be the same level that existed as of 2015. However, this is the operational scenario that existed at the facility prior to accepting ash even if the facility returned to receiving MSW waste (which is not the Preferred Alternative). Therefore, the Single EIR concludes that even if MSW alternative were adopted, the maximum traffic would be the same level that existed as of 2015. The Single Supplemental EIR indicated that the project does not otherwise require an increase to the permitted tonnage the site can accept and therefore will not generate new traffic or impact traffic patterns due to an increase in permitted tonnage limits. The traffic assessment memorandum concluded that if the facility runs at daily capacity through its life, the landfill will operate until approximately September 2041 under the Preferred Alternative of accepting ash, while the MSW Alternative will only operate until approximately January 2036. The Single Supplemental EIR also included crash data from the Massachusetts Department of Transportation (MassDOT) from January 1, 2013 to June 4, 2020 for locations near the facility. Analysis of the data confirms that traffic operations of the facility will not constitute a danger to public safety.

Land Use and Water Resources

As required by the Scope, the Single Supplemental EIR presented the Preferred Alternative with both a Land Use Plan and a Water Resources Plan in accordance with the Site Assignment. The Single Supplemental EIR also included plans that show the limits of site assignment and waste handling, the conceptual site plans for the proposed landfill expansion and relocation of the large handling facility as requested by MassDEP during the review of the Expanded NPC. The Single Supplemental EIR included a groundwater contour map which delineates where the nearest public drinking water supply is located.

The Single Supplemental EIR presented a detailed assessment of compliance with site suitability criteria for both the landfill and waste handling facility components of the project. The filing did not indicate that the Proponent would seek a waiver of any site suitability criteria by MassDEP. The Bourne Landfill is located over the Cape Cod Sole Source Aquifer, as designated by the EPA. However, the Single Supplemental EIR has established that there are no existing or potential public or private drinking water supplies downgradient from the Landfill. The Single EIR includes a letter from the Bourne Board of Health confirming that all previously identified downgradient water supply wells have been replaced with connections to the public water supply system. The Proponent also indicates that the project will comply with the 310 CMR 16.40(4)(a) related to agricultural lands. MassDEP indicates United States Department of Agriculture (USDA) mapping shows the presence of soil types associated with Prime, Unique, or State and Local Importance farmland designations on the property. The Single EIR included a site specific soil survey as attachment 12 which included test pits and an evaluation by a certified soil scientist to determine whether the USDA mapping is correct. MassDEP allows site specific soil surveys since the USDA soil surveys are based on soil examinations at 100-150 foot intervals. The site specific soil survey in the Single EIR did find some areas of agricultural lands, however as proposed all waste handling areas meet the agricultural land setback requirements of 310 CMR 16.40(4)(a). Therefore, MassDEP concludes that no waiver is required.² Compliance with site suitability criteria will be determined in subsequent permitting by the local board of health and MassDEP.

Emergency Authorization

According to the Single Supplemental EIR, the landfill is anticipated to play a leading role in responding to future emergency conditions on Cape Cod in order to ensure that the public health and the environment are protected. The Single Supplemental EIR included a request that MEPA review be waived for such emergencies such that deference is afforded to MassDEP for any technical oversight. Specifically, the Single Supplemental EIR requests presumptive approval to operate any or all of its facilities 24 hours per day, with a total inbound tonnage not to exceed 1,500 tons in any 24 hour period, for a minimum of five consecutive days, or 120 hours. The Single Supplemental EIR did not describe the anticipated future emergency conditions nor provide additional details on what may trigger the need for implementation of this scenario. I note the MEPA regulations already include provisions that address review of emergency actions necessary to avoid or eliminate an imminent threat to environmental resources or quality or public health or safety (301 CMR 11.13), though these provisions would be premised on the need for Agency Action by MassDEP.

Land Alteration/Stormwater

² Supplemental information provided by MassDEP dated December 29, 2020.

The new liner areas and area required for new structures and associated pavement will create 15.86 total acres of impervious area. The Single Supplemental EIR included both a graphic and narrative description of the impervious areas. The expansion of new impervious area on the 25-acre parcel will be for the landfill expansion and will be the portion of that parcel that is not currently paved or covered by a building. This area consists of approximately 10.28 acres. The expansion of new impervious area on the 12-acre parcel, which is currently undeveloped, will be for pavement, buildings and infrastructure to support the Large Handling Facility (LHF). The conceptual design of new impervious area is approximately 5.58 acres.

According to the Single Supplemental EIR, stormwater will be managed onsite through the use of diversion berms, swales, culverts, retention basins, and infiltration basins. The landfill has an established Stormwater Management Plan (SMP), which has evolved as the site has been developed. The current stormwater management facilities consist of a series of engineered runoff water quality diversion berms, let-down channels, perimeter swales, culverts and sedimentation/retention basins. The site is divided into three drainage basins. Generally, the northern two thirds of the western side of the site, which includes the site's access road and the northern and western sides of the landfill, drain to Stormwater Basin # 1 as tributary flows to a drainage swale along the western side of the landfill. The eastern side of the landfill and southern third of the site drains to Stormwater Basin #2. The interceptor is designed to collect flow at critical phase points at the toe of the eastern sideslope for Phases 6, 7 and 8 landfills. The Town is permitted to accept both fly ash and bottom ash for disposal, however the majority of ash they accept is bottom ash. All stormwater that comes into contact with solid waste including fly ash and bottom ash and/or daily cover is collected and controlled as leachate.³ According to the Single Supplemental EIR, all site runoff from developed areas of the site drains to either of these two basins. Each basin completely discharges to groundwater. The Single Supplemental EIR contains a SMP that takes into account the proposed full site buildout and provides details on stormwater management during the construction period.

Rare Species

According to the Single Supplemental EIR, portions of the project site are located within mapped habitat of the Eastern Box Turtle (*Terrapene carolina*), which is state-listed as a species of Special Concern. This species and its habitat are protected pursuant to the Massachusetts Endangered Species Act (MESA; MGL c.131A) and its implementing regulations (321 CMR 10.00). Comments from NHESP indicate that the project is anticipated to result in a Take and, therefore, will require a CMP pursuant to 321 CMR 10.23. Projects resulting in a Take of state-listed species may be permitted only if they meet the performance standards for a CMP. In order for a project to qualify for a CMP, the Town must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species. The Single Supplemental EIR indicated the Town intends to meet these performance standards by permanently protecting off-site land in the vicinity of the site as open space and state-listed species habitat. NHESP anticipates that the project will provide a suitable long-term net benefit and meet the

³ Supplemental information provided by MassDEP dated December 29, 2020

performance standards for issuance of a CMP.

The Single Supplemental EIR provided an update on consultation with the NHESP and included additional details on how the project will provide a suitable long-term net benefit and meet the performance standards for issuance of a CMP. The Town has researched parcels in the nearby area that would provide suitable mitigation and could be placed under permanent protection. This research has yielded a candidate parcel. The Town is preparing an assessment of the parcels for NHESP review to ensure that they are suitable. Comments from NHESP indicate that the Town intends to meet the performance standards of a CMP by permanently protecting off-site land as open space and state-listed species habitat through fee conveyance to the Town of Bourne Conservation Commission. According to NHESP the Town has identified a candidate parcel in the vicinity of the property which should provide an acceptable option to address the required long-term net benefit for Eastern Box Turtle associated with the project. The Town may also propose to permanently protect portions of the property, as shown on the “Conceptual Site Buildout Plan” included in the Single Supplemental EIR. Although the exact details of the long-term net benefit required under a CMP have not yet been finalized, NHESP anticipates that a suitable long-term net benefit can be achieved through the protection of high quality off- and on-site habitat and that the project should be able to meet the performance standards of a CMP.

Climate Change and GHG Emissions

Adaptation and Resiliency

The Town is a participant in the Commonwealth’s Municipal Vulnerability Preparedness (MVP) program. The MVP program is a community-driven process to define natural and climate-related hazards, identify existing and future vulnerabilities and strengths of infrastructure, environmental resources and vulnerable populations, and develop, prioritize and implement specific actions the Town can take to reduce risk and build resilience.

To aid in this assessment, the Town consulted resilientMA.org which contains a report entitled, Massachusetts Climate Change Projections - Statewide and for Major Drainage Basins Temperature, Precipitation, and Sea Level Rise Projections, prepared by the Northeast Climate Adaptation Science Center at the University of Massachusetts Amherst. The Single Supplemental EIR indicated that the Town has reviewed the prediction for sea level change noted in the report. The “Extreme”, or maximum physically plausible case, sea level rise scenario for as far into the future as the year 2100, predicts a maximum rise of 10.3 feet above current (or mean) sea level. Phase 9 will increase the maximum height of the Landfill from elevation 185 feet mean sea level (MSL) to elevation 225 feet MSL over previously lined and filled areas of the landfill including Phases 2, 2A/3A, 3, 4, 5 and 6. The Single Supplemental EIR concluded that the designs for the expansion of the Bourne Landfill and associated waste management and handling facilities would not be directly affected by this change because the facility is located on one of the highest points on Cape Cod and has elevations ranging from approximately 144 feet MSL to 90 feet MSL along the perimeter of the facility. The maximum predicted sea level rise of 10.3 feet MSL is well below this level as contained Massachusetts Climate Change Projections.

In addition to sea level rise, the Town considered predictive modeling regarding increases in precipitation during the design of its stormwater management systems. The model shows for the Buzzards Bay basin that by the end of the century in the 2090s, the maximum increase in annual

precipitation is predicted to be between 0.3 and 6.8 inches from the observed baseline amount of 47.8 inches per year. The model also shows predictions in the 2090s for the Cape Cod Basin, which is to the north of the facility, ranging from a decrease of 0.8 inches to an increase of 5.5 inches from the observed baseline amount of 44.9 inches per year. The Single Supplemental EIR states that the SMS systems at the ISWM facility are capable of handling this projected increase with available capacity and proposed drainage basins above the current 100-year storm event.

Greenhouse Gas Emissions (GHG)

This project is subject to review under the May 5, 2010 MEPA GHG Policy. The Policy requires Proponents to quantify carbon dioxide (CO₂) emissions and identify measures to avoid, minimize or mitigate such emissions. As previously disclosed in the Expanded NPC, a major reduction in the production of GHGs has been achieved by shifting the waste the Town accepts. As required by the Scope, the Town provided an update on its contract with SEMASS and an analysis of alternative scenarios, should this contract be suspended and the landfill returned to acceptance of MSW waste. Approximately 86 percent of its annual tonnage is in the form of municipal combustor ash (MCA) which does not produce gases. The Town's 10-year contract to accept MCA from SEMASS will terminate at the end of 2021. The Town intends to extend the contract and to continue accepting up to 189,000 tpy of MCA and 30,000 tpy of biodegradable MSW from Bourne and Falmouth (Scenario 1). However, if the contract is not extended, the Town will return to accepting up to 219,000 tpy of biodegradable municipal solid waste (MSW) (Scenario 2). The Single Supplemental EIR reiterated from the Expanded NPC that Scenario 2 would generate a total of 815,844 tons of GHG emissions over this period. The Town's preferred scenario (Scenario 1), representing continued acceptance of MCA, would decrease GHG emissions by 425,138 total tons over the 40 year period (2021 through 2041) compared to Scenario 2. This represents an approximate 52 percent reduction in GHG emissions compared to Scenario 2.

The Single EIR included a commitment to explore various options to utilize landfill gas as an energy source and identified the possibility of the installation of a solar photovoltaic array on the Landfill under both Scenario 1 and Scenario 2. Comments from MassDEP indicate any of the landfill gas use options that are described in the Single Supplemental EIR will require air permitting by MassDEP. The Single Supplemental EIR did not identify any additional measures which will be implemented to reduce GHG emissions should Scenario 2 occur if the SEMASS contract were not renewed. However, the Proponent indicates that the existing landfill gas collection is designed to capture and reuse 95% of gas emissions, and this rate will be maintained in either scenario. The Proponent reiterates that several other measures will continue to be explored to further GHG emissions, including, in particular: recovering thermal energy; operation of an animal crematory that would use the LFG as a fuel; vertical axis wind turbines; use of compressed natural gas for trucks; and, regional composting.

Construction Period

The Single Supplemental EIR identified construction period impacts including increases in construction related truck traffic, dust, noise, stormwater runoff, and construction waste. Mitigation measures identified in the Single Supplemental EIR include implementation of a traffic control and construction management plan, dust suppression measures, and construction waste management and recycling.

All construction and demolition activities will be managed in accordance with applicable MassDEP’s regulations regarding Air Pollution Control (310 CMR 7.01, 7.09-7.10), and Solid Waste Facilities (310 CMR 16.00 and 310 CMR 19.00, including the waste ban provision at 310 CMR 19.017). The project will include measures to reduce construction period impacts (e.g., noise, dust, odor, solid waste management) and emissions of air pollutants from equipment, including anti-idling measures in accordance with the Air Quality regulations (310 CMR 7.11). The Town plans to require that its contractors use construction equipment with engines manufactured to Tier 4 federal emission standards, or select project contractors that have installed retrofit emissions control devices or vehicles that use alternative fuels to reduce emissions of volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment. If oil and/or hazardous materials are found during construction, the Town will notify MassDEP in accordance with the Massachusetts Contingency Plan (310 CMR 40.00). All construction activities should be undertaken in compliance with the conditions of all State and local permits.

Mitigation and Draft Section 61 Findings

The Single Supplemental EIR contained a separate chapter on mitigation measures and draft Section 61 Findings for each Agency taking action on the project. It described mitigation measures and contained a table demonstrating the responsible party for implementing mitigation, monetary amounts where applicable, and a schedule for implementation. The draft Section 61 Findings will serve as the primary template for State Agency Permit conditions, and should be revised or updated as appropriate based on comments received and further consultation with Agencies after issuance of this Certificate. As described in the Single Supplemental EIR and prior MEPA documents, the Proponent has committed to implement the following measures to avoid, minimize, and mitigate environmental impacts:

MITIGATION MEASURE	IMPLEMENTATION SCHEDULE	COST ESTIMATE
Phased construction of Phase 7 & 8 double composite liner and leachate collection systems.	Starting in 2027	\$8,000,000
Continue on-going environmental monitoring of groundwater quality and landfill gas migration.	Until 30 years after the close of the landfill.	\$80,000/yr
Phased construction of final closure caps, including gas collections system extension, starting with Phase 9 and continuing as areas reach final subgrades.	Starting in 2022	\$12,000,000
Construct stormwater management facilities, as part of the construction of the Large Handling Facility (LHF).	Starting in 2024	\$800,000

Mitigate GHG by continuing to operate gas collection & treatment system, install solar photovoltaic arrays and evaluate other GHG mitigation measures. As heavy equipment is replaced purchase EPA air quality compliant equipment.	Ongoing operations with solar arrays added following area closure completions.	\$ 1,000,000
Enforce noise mitigation measures during construction and operations.	For the life of the Facility	\$1,000/yr
Enforce dust mitigation measures during construction and operations, including road sweeping and water applications.	For the life of the Facility	\$10,000/yr
Enforce odor mitigation measures during construction and operations, including continued operation of gas collection and treatment system, as included above.	For the life of the Facility	\$50,000/yr
Enforce vermin mitigation measures during construction and operations, including proper cover placement and maintaining exterminator services.	For the life of the Facility	\$30,000/yr
Enforce litter mitigation measures during operations, including maintenance of fencing, cover application and litter patrols.	For the life of the Facility	\$70,000/yr

For Rare Species:

MITIGATION MEASURE	IMPLEMENTATION SCHEDULE	COST ESTIMATE
Prepare and negotiate a Conservation Management Plan with NHESP.	Starting in 2020	\$75,000
Purchase proposed compensatory, mitigation properties.	2021	\$250,000

For Construction Period:

The measures that will be undertaken include:

- compliance with MassDEP regulations regarding air pollution control;
- designating areas for storage of equipment and supplies;
- ensuring that contractors keep all work areas neat and free from unsecured supplies such as gasoline, diesel fuel and other petroleum products;
- dust control measures such as regular road sweeping and watering as needed;

- requirement of a site-specific Health and Safety Plan by all contractors;
- installation of stormwater control structures to manage all stormwater on-site;
- requirement of a site-specific Erosion Control Plan by all contractors;
- requirement to follow anti-idling requirements;
- use of ultra-low sulfur diesel fuel (ULSD);
- use of and purchase of equipment with current low-emission engine types or other control mechanisms, including Tier 4 standards for engines (file maintained on-site); and
- coordination of on-site disposal and diversion of waste with the Town management to comply with waste bans and encourage recycling and diversion.

The Town will provide a GHG self-certification document to the MEPA Office that is signed by an appropriate professional (e.g., engineer, architect, transportation planner, general contractor) and indicates that all of the required mitigation measures, or their equivalents, have been completed.

Conclusion

Based on a review of the Single Supplemental EIR, comment letters, and consultation with State Agencies, I find that the Single Supplemental EIR adequately and properly complies with MEPA and its implementing regulations. State Agencies shall forward their final Section 61 Findings for publication in the Environmental Monitor.

December 30, 2020

Date

K. Theoharides

Kathleen A. Theoharides

Comments received:

- 12/17/2020 Natural Heritage & Endangered Species Program (NHESP), Massachusetts Division of Fisheries & Wildlife
- 12/23/2020 Conservation Law Foundation (CLF) in behalf of Beyond Plastics, Clean Water Action, Community Action Works, the Global Alliance for Incinerator Alternatives, Massachusetts Rivers Alliance, MASSPIRG, Saugus Action Volunteers for the Environment, the Saugus River Watershed Council, Sierra Club, and Sustainable Practices
- 12/23/2020 Cape Cod Commission (CCC)
- 12/23/2020 Massachusetts Department of Environmental Protection (MassDEP) – Southeast Regional Office (SERO)

KAT/ACC/acc

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Via Email

December 23, 2020

Kathleen A. Theoharides, Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office, Anne Canaday, MEPA Analyst
100 Cambridge Street, Suite 900, Boston, MA 02114

Re: Single Supplemental Environmental Impact Report (SSEIR)- EEA No. 11333- CCC File No. 20064
Town of Bourne Integrated Solid Waste Management Facility- Proposed Phases 7, 8 & 9

Dear Secretary Theoharides:

The following comments on the above-referenced matter are arranged by relevant issue areas from the Cape Cod Regional Policy Plan (RPP):

Natural Resources (Wetlands; Wildlife and Plant Habitat; Open Space)

As part of its Development of Regional Impact (DRI) review after MEPA review concludes, the Cape Cod Commission will consider the proposed development's impacts on natural resources like wetlands, wildlife and plant habitat, and open space, and assess the project's consistency with natural resources goals and objectives set out in the Cape Cod Regional Policy Plan.

As noted in the SSEIR, the Town is preparing a Natural Resources Inventory (NRI), which will facilitate the CCC's DRI review with respect to natural resources. There are a variety of mapped natural resource areas located on the project site, which among other resources, should be addressed in the NRI: Priority Habitat for eastern box turtle (a state-listed species of special concern); Prime Farmland soils; and BioMap2 Critical Natural Landscape (CNL). CNL areas provide habitat for a wide-range of native species, support intact ecological processes, maintain connectivity among habitats, enhance ecological resilience to natural and anthropogenic disturbances, and provide important ecological services including filtering air and water and storing and sequestering greenhouse gases. The characteristics of the CNL areas on or contiguous with the project site (such as extend onto Joint Base Cape Cod) include a large, intact area of forest, wetlands, and ponds. The undeveloped 12-acre southern parcel that makes up the project site is mapped CNL; on this basis, this entire parcel is considered a Natural Area Placetype for purposes of DRI review.

There are other important natural resource areas present within vicinity of the project site- protected open space, the Bourne Back River Area of Critical Environmental Concern, an Important Bird Area, and various wetlands, vernal pools, and their buffers- however, these natural resource areas are not anticipated to be directly or adversely impacted by the project.

The Town and its consultant have been in contact with Commission staff to confirm that the NRI is being prepared in accordance with the CCC's policies and regulations. Commission staff look forward to reviewing the NRI and working with the Town and its consultant on approaches to natural resources protection and mitigation. Staff notes that DRIs with impacts on natural resources are required to provide open space offsets appropriate to context up to a ratio of 3:1 (protected open space: development), calculated and proposed per the CCCs Open Space Technical Bulletin. According to the SSEIR, the Town is in close

communication and coordination with NHESP regarding Conservation and Management Permit for proposed development on the southern 12-acre parcel in box turtle habitat, and has identified open space offset land at the 1.5:1 ratio required by NHESP. Commission staff are available to review proposed open space offsets with the Town and NHESP to ensure the approach satisfies both NHESP and CCC objectives.

Water Resources

The primary RPP water resources interests relating to proposed Phases 7, 8, and 9 are the management of stormwater during construction, and during operations at full buildout. The SSEIR includes discussion of the potential impacts to groundwater as part of the Potential Section 61 Finding, which impacts are expected to be negligible as landfill leachate and condensate will continue to be collected and treated in the same manner as currently, and no new additional wastewater facilities are proposed. The SSEIR also includes an extensive discussion of the various reasons why private or public water supply wells are prevented from being installed downgradient of the ISWM, which minimize potential sensitive receptors that could be impacted by the landfill expansion activities. Further submittals during the CCCs DRI review should, however, provide additional detail regarding the sizing and location of any new septic systems installed in conjunction with the relocation of ISWM department offices and other operational facilities onsite.

The SSEIR includes a narrative and calculations regarding the planned stormwater management system to be employed at full buildout. The additional phases of landfill expansion are expected to slightly change the areas which contribute to several existing stormwater facilities, but significant changes to the volumes of flow to each basin are not anticipated. Phase 7 and 8 construction will require the abandonment of Stormwater Basin 2 and construction of a replacement basin (Stormwater Basin 3), as well as attendant stormwater management infrastructure to treat runoff from the new paved and rooftop areas, and will connect previous areas utilizing Stormwater Basin 2 to the new Stormwater Basin 3. A narrative and supporting calculations for the planned stormwater system at full buildout have been provided with the SSEIR. Reiterating comments provided during the ENPC process, CCC staff requests that the Town, in its DRI application, provide a clear description of which stormwater conveyances and treatment structures will be abandoned to facilitate Phase 8 landfill expansion, and provide details regarding the design and construction phasing for new stormwater infrastructure, to insure that adequate stormwater treatment will be provided throughout the long-term phased expansion plan.

Thank you for the opportunity to comment. Commission staff are available to discuss any questions you might have about these comments.

Sincerely,



Kristy Senatori
Executive Director

Cc: Project File
Phil Goddard, Bourne ISWM Department, via email
Bourne Cape Cod Commission Representative via email
Cape Cod Commission Chair via email
Cape Cod Commission Committee on Planning and Regulation Chair via email



December 23, 2020

Via Electronic Mail

Kathleen A. Theoharides
Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Anne Canaday, Environmental Analyst
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: Town of Bourne (Bourne), Department of Integrated Solid Waste Management, Integrated Solid Waste Management Facility (Facility), November 13, 2020 Single Supplemental Environmental Impact Report, EEA No. 11333

Dear Secretary Theoharides:

Conservation Law Foundation (CLF), Beyond Plastics, Clean Water Action, Community Action Works, the Global Alliance for Incinerator Alternatives, Massachusetts Rivers Alliance, MASSPIRG, Saugus Action Volunteers for the Environment, the Saugus River Watershed Council, Sierra Club, and Sustainable Practices, respectfully submit these comments in opposition to the Town of Bourne's Phase 7, 8, and 9 Integrated Solid Waste Management Facility expansion as proposed in the Town's November 13, 2020 Single Supplemental Environmental Impact Report (SSEIR).

As discussed below, meaningful opportunities for public review of the expansion's potential environmental impacts have not been provided. Additionally, Bourne's proposed expansion of 25-acres and 5,175,000 cubic yards of capacity to its current facility would be a threat to public health and the environment and would continue to undermine the need to responsibly manage waste through source reduction, recycling, and composting.

CLF is a nonprofit, member-supported, environmental organization working to conserve natural resources, protect public health, and promote thriving communities for all in the New England region, including Massachusetts. CLF has a long history of advocating for clean air, clean water, and healthy communities, including addressing the environmental and community impacts of solid waste disposal, and advocating for waste management strategies focused on waste reduction and recycling as opposed to landfilling and incineration. Other signatory organizations share CLF's commitment to protecting environmental resources and public health.

For the reasons set forth herein, Bourne's SSEIR is inadequate and the Phase 7, 8, and 9 expansion should undergo a full and rigorous MEPA review, starting with the submission of an Environmental Notification Form (ENF), and Draft and Final Environmental Impact Reports.

I. Introduction

A. The Bourne Landfill's History and Development

The Bourne Landfill is comprised of a 111-acre parcel located at 201 MacArthur Boulevard in Bourne, Massachusetts.¹ Landfill operations began at the Facility in 1967 with Phase 1 (approximately 31 acres).² In 1998, the Town of Bourne, Department of Integrated Solid Waste Management (ISWM) was created and began overseeing the management and operation of the Landfill.³ The current Facility operations include the active lined landfill, construction and demolition debris transfer station, residential recycling center, single stream recyclable collection and transfer, and composting.⁴

The Facility contains both lined and unlined waste disposal areas. The oldest portion of the landfill is comprised of Phases 1A, 1B, 1C and 1D, all of which are unlined cells.⁵ Phases 1A, 1B, and 1C (approximately 23 acres) have been closed and capped. Phase 1D (5.7 acres) was excavated under a pilot landfill reclamation project with MassDEP in order to create additional landfill space.⁶ Phase 2 (approximately 7.3 acres) is a closed, lined, and capped landfill cell, and Phase 3 (approximately 12 acres) is a closed, double composite lined landfill cell. Both Phase 2 and 3 have leachate collection systems.⁷ Phase 2A/3A (approximately 17.1 acres) is an inactive double composite lined landfill area. Phase 4 (approximately 9.9 acres) is a currently active

¹ *Final Comprehensive Site Assessment (CSA)*, June 5, 2017, Page 2.

² *CSA*, Page 3.

³ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 2.

⁴ *CSA*, Page 2.

⁵ Town of Bourne, *Expanded NPC Certificate*, April 24, 2020, Page 3.

⁶ *Id.*

⁷ *Id.*

landfill area and is located in the area previously occupied by Phase 1D. Phase 5 consists of a vertical expansion over Phases 1A, 1B, and 1C.⁸ MassDEP issued Authorization to Construct (ATC) and Authorization to Operate (ATO) Permits in 2019 for Phase 6, which is currently under construction.⁹ Phase 6 is the last phase in a progressive filling plan first discussed in the Town's 1998 Environmental Impact Report (EIR), which will complete the horizontal expansion of landfill operations on the original 74-acre site.¹⁰

In 2001, Bourne purchased a 25-acre parcel immediately abutting the landfill to the south.¹¹ This parcel has been site-assigned for solid waste handling and transfer operations.¹² Thus far, this parcel has only been used for recycling and transfer operations.¹³ In 2016, Bourne purchased an approximately 12-acre parcel to the south of the 25-acre parcel.¹⁴ Bourne intends to relocate the handling facility onto a portion of the 12-acre parcel so that Phases 7 and 8 can be fully developed on the 25-acre site.¹⁵

B. Waste Disposal and Capacity

Prior to 1998, the Landfill accepted residential and commercial waste from Bourne and the immediate surrounding area.¹⁶ From 1998 through 2014, the Landfill operated as a large regional disposal facility accepting residential and commercial solid waste that was largely Municipal Solid Waste (MSW) but with an increasing percentage comprised of municipal waste combustor ash.¹⁷

In 2015, Bourne signed a long-term contract with Covanta SEMASS (SEMASS), a municipal waste combustor located in Rochester, MA, which shifted the Landfill's waste stream to predominantly ash.¹⁸ Under the contract, approximately 86% of the landfill's permitted annual capacity (189,000 tons out of 219,000 tons per year) is reserved exclusively for ash through 2021.¹⁹ The remaining capacity is available for MSW disposal for residents of Bourne and Falmouth under a ten-year contract.²⁰ Any further remaining capacity will either be held in reserve or be utilized for soils or other difficult-to-manage waste streams.²¹ ISWM and Covanta are currently in active negotiations to extend their contract. Under Bourne's "Preferred

⁸ *Id.*

⁹ *Id.*

¹⁰ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 3.

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ Town of Bourne, *Single Supplemental Environmental Impact Report*, May 2018, Page 21.

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ *Id.* at 11.

²¹ *Id.*

Alternative” approach, the contract will extend and the Town will continue to accept up to 189,000 tons per year of ash²² and 30,000 tons per year of MSW from Bourne and Falmouth.²³

C. The Proposed Expansion

In February 2020, Bourne submitted an Expanded Notice of Project Change (ENPC), acting as an Expanded Environmental Notification Form (ENF), for the development of Phases 7, 8, and 9 of the Landfill.²⁴ In its ENPC, Bourne requested permission to submit a Single Supplemental Environmental Impact Report (SSEIR) in lieu of a draft and final EIR.²⁵ The Secretary of the Executive Office of Energy and Environmental Affairs issued a Certificate on the ENPC on April 24, 2020, granting Bourne’s request to submit an SSEIR, but reserving the right to find this submission inadequate.²⁶

As described in the ENPC, the proposed Project consists of the phased expansion (Phases 7, 8, and 9) of the Bourne Integrated Solid Waste Management Facility (ISWMF).²⁷ Bourne is proposing a 25-acre vertical and horizontal landfill expansion and the relocation of the solid waste handling facility and other offices and facilities on the property. The three-phase expansion will provide a total of 5,175,000 cubic yards (cy) of disposal capacity through 2040.²⁸

Phases 7 and 8 are a 25-acre horizontal expansion that will result in an additional 3,920,000 cy of disposal capacity through 2040. Phase 9 is a 40-foot vertical expansion over the entire footprint of the currently permitted landfill that will provide approximately 1,255,000 cy of disposal capacity through 2040.²⁹

²² As discussed more fully below, Bourne accepts approximately 44,000 tons of bottom ash each year. Therefore, the total amount of ash accepted by Bourne is over 230,000 tons every year, significantly more than the stated 189,000 tons.

²³ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 10.

²⁴ Town of Bourne, *Expanded Notice of Project Change*, February 2020, Page 4.

²⁵ *Id.*

²⁶ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 1. The Secretary erroneously granted Bourne’s request to submit an SSEIR because the ENPC does not meet the requirements of 301 CMR 11.06(8). Additionally, the Secretary should not determine that the SSEIR is adequate because it does not sufficiently describe certain aspects and issues of the Project as required by 301 CMR 11.08(8)(d).

²⁷ Town of Bourne, *Expanded Notice of Project Change*, February 2020.

²⁸ Town of Bourne, *Expanded NPC Certificate*, April 24, 2020, Page 2.

²⁹ *Id.*

II. A Comprehensive Review of the Potential Environmental Impacts of the Phase 7, 8, and 9 Expansion Has Not Been Undertaken, Nor Has the Public Been Provided with a Meaningful Opportunity to Review these Impacts

A. The Bourne Landfill Expansion has Consisted of Many Phases Over Twenty Years and has a Long Record that is Impossible for the Public to Fully Access

The Bourne landfill expansion has consisted of many phases over twenty years and has been the subject of seven NPCs. However, it is impossible for the public to access the majority of Project documents and to meaningfully review the Project's potential environmental impacts.

MEPA filings can be accessed electronically through the *Environmental Monitor* and the *Environmental Monitor Archives*. Filings made between 2002 and September 9, 2009 are only available in the *Environmental Monitor Archives*, while filings made from September 23, 2009 through the present are available in the *Environmental Monitor*. Filings made prior to 2002 are entirely unavailable through the online portal. Consequently, in order to access filings related to longstanding projects, one potentially must access and search multiple databases.³⁰ Even then, because the online portals only include records after 2002, any search of the online portal will fail to provide a complete disclosure of all records related to certain projects.³¹

Significantly, the missing documents for the Bourne project include the initial Environmental Notification Form (ENF), Draft Environmental Impact Report (DEIR), Final Environmental Impact Report (FEIR), and several NPCs. These documents are crucial to a complete understanding of the Project's scope and its environmental impacts and, in fact, are referenced repeatedly in later filings. For example, Bourne states in its SSEIR that the mitigation of impacts from solid waste disposal at the landfill was adequately addressed in the original FEIR and the Cape Cod Commission's initial Development of Regional Impact (DRI) review.³² However, the FEIR that Bourne submitted in 1999 only described a buildout through Phase 6 and did not even address Phases 7, 8, and 9. *Thus, a comprehensive review of the potential impacts of Phases 7, 8, and 9 has never been undertaken.*

Bourne has also been granted waivers from various MEPA requirements based in part on the alleged adequacy of its earlier project filings and actions. Indeed, Bourne was recently allowed to submit a SSEIR in lieu of the usual two-stage Draft and Final EIR.³³ *However, because the public cannot access all relevant MEPA submissions, it is impossible to verify that all proper procedures were followed and that this waiver was appropriate.* These deficiencies in

³⁰ Additionally, the database system for accessing documents is complex, difficult to navigate, and does not allow the public to obtain all project documents through a simple and direct project name or EEA number search. Instead, one must search individual issues of the *Environmental Monitor* or *Environmental Monitor Archives* in an attempt to locate the relevant records.

³¹ This is particularly problematic because members of the public can no longer physically review files at the MEPA office because of the COVID pandemic.

³² Town of Bourne, *Expanded Notice of Project Change*, February 2020, Page 86.

³³ *Certificate of the Secretary of Energy and Environmental Affairs on the Expanded Notice of Project Change*, April 24, 2020.

the MEPA process have made it impossible for the public to fully understand the scope of the landfill expansion project and its potential environmental impacts. *For these reasons, Bourne's SSEIR is inadequate and the expansion should undergo a full MEPA review, starting with the submission of an ENF, DEIR and FEIR.*

B. Every Year the Bourne Landfill is Burying Much More Ash Than Its Permitted Capacity and Its MEPA Filings Should be Resubmitted to Reflect This

According to its SSEIR, under Bourne's "Preferred Alternative" approach, 189,000 tons of permitted capacity would be reserved exclusively for ash through 2021.³⁴ The remaining capacity, about 30,000 tons per year, would be available for MSW disposal for residents of Bourne and Falmouth under a ten-year contract.³⁵ However, Bourne ISWM has reported to MassDEP that it landfills much more than 219,000 tons of waste each year. Every year 43,478 tons of "Bottom" Ash, and as much as 50,000 tons of contaminated soil and "other" materials, are disposed of at the Bourne Landfill as "cover."³⁶ For a predominantly ash landfill to use that much cover is ridiculous – until one remembers that ISWM can charge for cover materials. In 2019 about a third of what was buried at the landfill was cover (96,324 tons of cover for 207,987 tons of permitted waste, for a total of over 300,000 tons).³⁷ Bourne is ignoring capacity limits and instead filling this Facility with incinerator ash and other materials as quickly as possible.

To put this in perspective, the Shrewbury Ash Landfill buried 362,822 tons of mostly ash waste in 2019, but only used about 10,000 tons of cover materials, none of which was ash. Similarly, the Haverhill, Ward Hill Neck Ash Landfill buried 161,575 tons of ash and MSW in 2019, but only used 33,179 tons of cover, none of which was ash.

Given that the Bourne Landfill buries about 44,000 tons of Bottom Ash from SEMASS every year, it should be required to apply for a permit for a higher, and honest, fill rate that includes the 44,000 tons. Furthermore, ISWM should be required to revise and resubmit its ENF, DEIR, and FEIR to reflect this significant difference.

It is deeply concerning that the cover includes almost exactly 44,000 tons of Bottom Ash every year. If this is the case, the 189,000 tons of ash buried at the Bourne Landfill each year may have a higher percentage of Fly Ash, which is the more toxic of the two types of incinerator ash discussed in Bourne's MEPA filings. When ISWM refiles its MEPA reports, exactly what kind of ash they are disposing of should be investigated more carefully. SEMASS produces about 275,000 tons of ash each year. Is the Bourne Landfill getting a disproportionate amount of SEMASS's Fly Ash? If so, expanding this Landfill is even more dangerous than the information currently before us indicates. This should be thoroughly investigated through the MEPA process.

³⁴ *Id.*

³⁵ *Id.* at 11.

³⁶ The Bourne Landfill buries almost exactly 43,500 tons of Bottom Ash as "cover" each year. *See* Attachment 1, *Annual Solid Waste Facility Reports: Landfill Summary for Calendar Years 2015-2019.*

³⁷ *Id.*

C. The Proposed Expansion would be Unnecessary if Zero Waste Programs Were Enforced and Expanded

ISWM is asserting that there is a need for additional capacity at the Bourne Landfill due to future reductions in regional capacity. Increasing regional capacity, however, runs directly counter to MassDEP's 2010-2020 Solid Waste Master Plan and Draft 2030 Solid Waste Master Plan goals to reduce solid waste disposal.³⁸ The Commonwealth failed to meet MassDEP's goals, and disposal actually increased from 5,430,000 tons per year in 2010 to 5,510,000 tons per year in 2019.³⁹ Since 2010, permitted combustion of waste, and the resultant ash, has not changed at all in Massachusetts.⁴⁰ Increasing the acreage of the Bourne Landfill so that it is large enough to accept more than 230,000 tons of ash and 30,000 tons of MSW per year for twenty more years guarantees that the disposal numbers of 2019 will remain unchanged in 2030 and 2040. This is unacceptable.

The expansion of the Bourne Landfill is not just about landfill capacity – it is about allowing Covanta SEMASS in Rochester, Massachusetts to burn up to 1.25 million tons per year of MSW.⁴¹ Burning MSW is dangerous, polluting, expensive, a waste of resources, an inefficient manner to generate electricity, and horrible for the climate. If Massachusetts is to meet any of its long-term climate goals, then its seven incinerators, including SEMASS, will have to be shut down. Attached as Exhibit 2, please find a letter attached that provides further facts and resources explaining why Massachusetts' immediate goal should be to phase out incinerators, including SEMASS, as soon as possible, rather than to enable their continued operation through expanded landfill capacity.

Furthermore, if MassDEP enforced existing state regulations, SEMASS and the expansion of the Bourne Landfill would be unnecessary. In Massachusetts, the following are Waste Ban Items, meaning that they are not allowed to be buried in a landfill or burned in an incinerator (310 CMR 19.00):

- Asphalt pavement, brick, and concrete;
- Cathode ray tubes;
- Clean gypsum wallboard;
- Commercial food material (recently revised to include producers of more than half a ton per week – not promulgated yet);
- Ferrous and non-ferrous metals;
- Glass and metal containers;
- Lead acid batteries;

³⁸ MassDEP, Draft for Public Comment: Massachusetts 2030 Solid Waste Master Plan, 6-7 (September 2019), available at <https://www.mass.gov/doc/draft-2030-solid-waste-master-plan/download>.

³⁹ Solid Waste Advisory Committee, MassDEP, *2019 Solid Waste & Waste Reduction Data*, slide 6 (October 2020), available at <https://www.mass.gov/doc/presentation-2019-solid-waste-waste-reduction-data/download>.

⁴⁰ *Id.*, slide 12.

⁴¹ *Id.*

- Leaves and yard waste;
- Recyclable paper, cardboard, and paperboard;
- Single-resin narrow-necked plastic containers;
- Treated and untreated wood and wood waste (banned from landfills only);
- White goods (large appliances);
- Whole tires (banned from landfills only; shredded tires acceptable); and
- Textiles and Mattresses (recently added – not promulgated yet)

These materials are banned from disposal because it has been determined that: (a) disposal of the material presents a potential adverse impact to human health, safety or the environment; (b) a restriction or prohibition will result in the extension of the useful life or capacity of a facility or class of facilities or reduce its environmental impact; or (c) a restriction or prohibition will promote reuse, waste reduction, or recycling.⁴² Unfortunately, according to MassDEP, almost 40%, or over 2 million tons, of disposed items in Massachusetts are Waste Ban Items.⁴³ There are not enough dedicated Waste Ban inspectors at MassDEP, and enforcement has been spotty at best. No disposal facility should be expanded in Massachusetts until MassDEP reduces disposal by enforcing existing Waste Ban regulations.

Much of the waste burned at SEMASS – paper/cardboard, metal, glass, some plastic, some construction and demolition material, and some organics, are also Waste Ban Items. If the Waste Ban materials alone were diverted from the incinerator, SEMASS could burn at least 40% less and extend the life of the landfill where it buries its ash.⁴⁴

Furthermore, expanding the Bourne Landfill enables other facilities to shirk their responsibility to reduce solid waste disposal. For example, Bourne has contracted with SEMASS to accept ash generated from incinerating waste. SEMASS burned over 1.1 million tons of waste in 2019,⁴⁵ producing more than 250,000 tons of ash. As can be seen from the chart below, which SEMASS submitted as part of a report to MassDEP in February of 2020, almost 80% of what SEMASS is burning could be recycled and composted. Rather than needing to bury 250,000 tons of ash, SEMASS would then only need to dispose of 50,000 tons of ash each year.

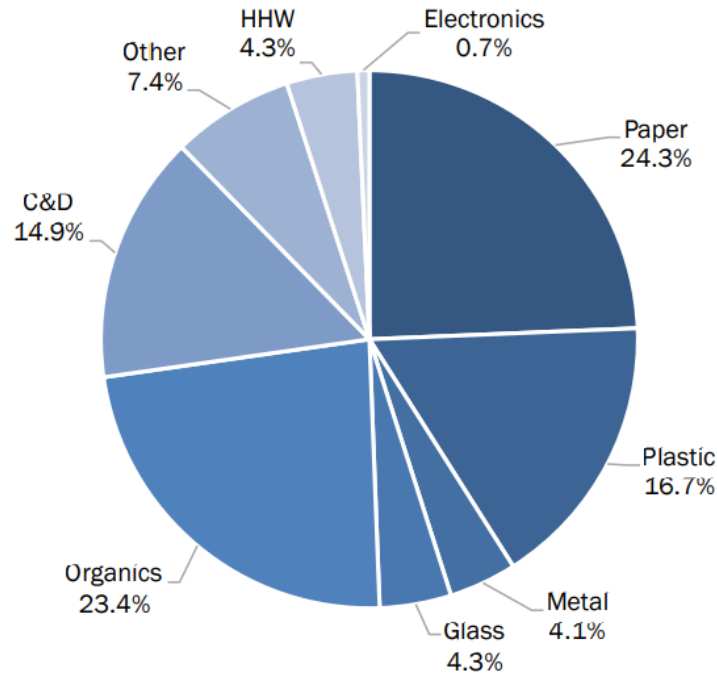
⁴² 310 CMR 19.017; *see also* MassDEP, *Massachusetts Waste Bans as a Tool to Drive Waste Reduction* (June 2016), available at <https://www.mass.gov/guides/massdep-waste-disposal-bans>.

⁴³ MassDEP, *Massachusetts Waste Bans as a Tool to Drive Waste Reduction* (June 2016), available at <https://www.mass.gov/guides/massdep-waste-disposal-bans>.

⁴⁴ *See* SAK Environmental, LLC, *Covanta SEMASS 2019 Waste Characterization Study in Support of Class II Recycling Program*, 2-11 (Feb. 11, 2020), available at <https://www.mass.gov/doc/class-ii-recycling-program-waste-characterization-study-april-2020-3/download>.

⁴⁵ *Id.*

Figure 3-1 Overall Waste Composition by Material Group



Similarly, the 30,000 tons of MSW buried each year at the Bourne Landfill could be sharply reduced – by as much as 80% if the Waste Bans were enforced and composting and recycling systems put in place. If this were done, the combined yearly disposal at Bourne Landfill would be 50,000 tons of ash and 6,000 tons of MSW – a fraction of what it is now. Minimizing the ash and MSW going into the Bourne Landfill would extend its life and render expansion moot. For these reasons, we recommend that the Waste Bans be enforced, and comprehensive recycling and composting programs be instituted rather than expanding the Bourne Landfill. Additionally, the Town should be required to revise and resubmit its ENF, DEIR, and FEIR to account for the actual amount of waste buried each year at the Landfill.

Additionally, while ISWM presents three expansion options for utilizing the remaining capacity at the Landfill, it does not provide enough information for these options to be evaluated in a meaningful way. Therefore, ISWM should be required to amend its MEPA filings to include the rate they use to calculate tonnage per cubic yard for ash, contaminated soil, and MSW. Furthermore, ISWM should detail how much capacity is available at the Landfill now, in cubic yards and in tons for each material, and how much additional capacity would be available if the Landfill were expanded as proposed. Reporting for disposal is always done in tons and presenting capacity in cubic yards is disingenuous. Compaction and material type lead to significant variation in how many tons per cubic yard can be buried at the landfill. ISWM must provide more information to clarify exactly what it is asking for.

Finally, because the above information about capacity is unclear, it is also unclear how long the expansion would allow the Landfill to operate vs. how much capacity already exists. MEPA should require ISWM to clarify this very central issue in a new ENF, DEIR, and FEIR.

III. The Landfill Expansion Poses a Threat to Public Health and the Environment

A. The Waste Buried at the Bourne Landfill is Extremely Toxic

1. Incinerator Ash

Bourne's contract to accept ash from SEMASS runs through to the end of 2021, with options to extend.⁴⁶ As a result, if the Phase 7, 8, and 9 expansion is permitted, 86% of the Facility's waste stream will continue to be comprised of toxic incinerator ash.⁴⁷ Incinerator ash is dangerous to human health, public safety, and the environment.

The incineration process produces two types of ash: fly ash from the air pollution control equipment, and bottom ash, which is the non-combustible residue remaining after combustion. Fly ash in particular has a high concentration of toxic compounds, and over the years has become more contaminated as improved air filtration equipment effectively removes more pollutants prior to emission.⁴⁸ These toxic compounds include dioxins, polychlorinated biphenyls (PCBs), polychlorinated naphthalenes (PCNs), and heavy metals, including lead, mercury, cadmium, and arsenic.⁴⁹ Dioxins have been described as the most toxic chemicals known to mankind and are recognized human carcinogens. Lead is known to cause cognitive and behavioral development in children. Mercury is known for its adverse impacts on the central nervous system, kidneys, and developing fetus. All of these compounds are known to be toxic to humans and animals.⁵⁰

Ash generated by municipal solid waste incinerators constitutes hazardous waste. However, EPA allows for the highly toxic fly ash to be diluted prior to toxicity testing by mixing it with bottom ash and lime.⁵¹ Diluting the fly ash allows incinerators to avoid hazardous waste

⁴⁶ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 1.

⁴⁷ Bourne accepts approximately 44,000 tons of bottom ash each year. Therefore, the total amount of ash accepted by Bourne is over 230,000 tons every year, significantly more than the stated 189,000 tons.

⁴⁸ Global Alliance for Incinerator Alternatives, *Incinerators Trash Community Health*, 5 (June 2008), available at <https://www.no-burn.org/wp-content/uploads/Incinerators-Trash-Community-Health.pdf>; IPEN, *After Incineration: The Toxic Ash Problem* (April 2005), available at https://ipen.org/sites/default/files/documents/ipen_incineration_ash-en.pdf.

⁴⁹ Jeremy Thompson and Honor Anthony, *The Health Effects of Waste Incinerators*, Report of the British Society for Ecological Medicine, 2nd ed, 42-44 (June 2008), available at <https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/project-submissions/2018/04/eastern-creek-energy-from-waste-facility-ssd-6236/20180521t165555/incinerator-report-health-effects-british-society-for-medicine.pdf>.

⁵⁰ *Id.*

⁵¹ Global Alliance for Incinerator Alternatives, *Incinerators Trash Community Health*, 5 (June 2008), available at <https://www.no-burn.org/wp-content/uploads/Incinerators-Trash-Community-Health.pdf>; IPEN, *After Incineration: The Toxic Ash Problem* (April 2005), available at https://ipen.org/sites/default/files/documents/ipen_incineration_ash-en.pdf.

regulations, but the ash itself is no less dangerous – the same toxic chemicals are merely spread out over a larger volume of combined ash. Further, incineration increases the mobility and bioavailability of toxic metals compared with raw municipal waste.⁵² The potential for leaching is also greatest under acidic conditions, which occur when solid waste breaks down into organic acids.⁵³ Given that the Bourne Facility was originally used for solid waste, soil acidification has already likely occurred and may continue to do so, which will increase the risk of leaching. Ultimately, the larger the Bourne Landfill is, the more dangerous and toxic incinerator ash it will store - permanently.

2. Municipal Solid Waste (MSW)

Bourne accepts up to 30,000 tons per year of MSW. The heterogenous nature of MSW results in a varied mix of metals, plastics, organics, and other materials that pose serious human health risks. For example, plastics contribute significant quantities of cadmium, chromium, lead, manganese, and mercury. Paper contributes lead, manganese, mercury, copper, and zinc. Organic matter in MSW also contains toxicants, including pesticides, herbicides, PCBs, VOCs, and SVOCs.⁵⁴ VOCs include benzene, dichloromethane, 1,2-dichloroethylene, ethylene benzene, tetrachloroethylene, trichloroethylene, toluene, and vinyl chloride. These compounds are known to cause cancer and present a particularly significant risk to human health because of their high mobility.⁵⁵

3. Contaminants of Emerging Concern

Polybrominated diphenyl ethers (PBDEs) and per and poly fluorinated alkyl substances (PFAS) are persistent organic pollutants that are found in virtually all landfills and are a serious public health concern. PBDEs, or flame retardants, are found in everyday household items, including cell phones, computers, mattresses, couches, and clothing.⁵⁶ Exposure to PBDEs has been linked to cancer and causes serious neurological and reproductive health problems.⁵⁷

⁵² *Id.*

⁵³ Michelle Allsopp, Pat Costner, and Paul Johnston, *Incineration and Human Health: State Knowledge of the Impacts of Waste Incinerators*, Greenpeace Research Laboratories (March 2001), available at <https://www.greenpeace.to/publications/euincin.pdf>.

⁵⁴ United States Environmental Protection Agency, *Analysis of the Potential Effects of Toxicants on Municipal Solid Waste Management Options* (April 1995).

⁵⁵ *Id.*

⁵⁶ F. Oliaei, Minnesota Pollution Control Agency, *Flame Retardants: Polybrominated Diphenyl Ethers (PBDEs) Background Paper*, 31 (2005); see also International Joint Commission, *Background on Polybrominated Diphenyl Ethers (PBDEs) Final Report*, (August 10, 2015), available at https://www.ijc.org/files/tinymce/uploaded/WQB/Appendix-B%20_Background_PBDEs.pdf.

⁵⁷ Thomas A. McDonald, *Chemosphere, A Perspective on the Potential Health Risks of PBDEs*, 745-755 (February 2002).

PFAS, or “forever chemicals,” have been going into landfills for over sixty years,⁵⁸ and recent studies have identified PFAS in both fly ash and bottom ash from municipal waste incinerators at part-per-billion levels.⁵⁹ These chemicals are toxic in small concentrations and cause a variety of adverse health effects, including kidney and testicular cancer; impaired liver, pancreatic, and immune system function; thyroid disease; fertility and pregnancy issues; high blood pressure; and growth and learning problems in infants and children.⁶⁰ They are found in many of the products we use in our homes every day, including non-stick cookware, water-repellant clothing, stain resistant fabrics and carpets, dental floss, and food packaging.

When products containing PBDEs and PFAS make their way into landfills, as either MSW or incinerator ash waste, they inevitably leach into the air, soil, and water.⁶¹ As the following section more fully discusses, all landfills leak and contaminate the environment. Given these facts, MassDEP should require the Town to enact testing protocols for the ash and leachate at the Landfill. These protocols should be fully discussed and analyzed in Bourne’s next MEPA submission.

The waste buried at the Bourne landfill is extremely toxic and a threat to public health and the environment. For this reason, we oppose the Landfill’s expansion. Additionally, Bourne’s SSEIR is inadequate and the expansion should undergo a full MEPA review, starting with the submission of an ENF, DEIR and FEIR.

B. All Landfills Leak Toxic Chemicals and Contaminate the Environment

In the 1950s, landfills, or sanitary dumps, were just holes in the ground where waste was covered by a layer of soil to reduce odors and vermin. In the 1970s, compacted soil and clay liners were proposed for waste containment.⁶² However, this technology was ultimately abandoned as ineffective at preventing leachate from escaping the landfill because a clay liner that is a foot thick will be breached in less than five years.⁶³ In the 1980s, landfills began installing plastic liners, but this method was also short-lived because plastic liners often develop holes during installation, continue to break down over time, and inevitably fail.

⁵⁸ A.H. Huset, M.A. Barlaz, D.F. Barofsky, J.A. Field, 82 *Chemosphere*, *Quantitative determination of fluorochemicals in municipal landfill leachates*, 1380-1386 (2011).

⁵⁹ Dennis Wohlin, *Analysis of PFAS in ash from incineration facilities from Sweden*, (June 2020), Örebro University, School of Science and Technology. The Commonwealth of Massachusetts regulates 6 PFAS substances in Drinking Water and under the Massachusetts Contingency plan at part-per-trillion level concentrations.

⁶⁰ See MassDEP, *Per- and Polyfluoroalkyl Substances (PFAS)*, available at <https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas#what-are-pfas-and-why-are-they-a-problem?>

⁶¹ Landfill liners themselves contain PFAS chemicals.

⁶² Overview of Subtitle D Landfill Design, Operation, Closure and Postclosure Care, 2 (January 2004), available at <http://www.gfredlee.com/Landfills/LFOverviewMSW.pdf>.

⁶³ G. Fred Lee & Associates, *Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste*, updated 13 (January 2015).

Over time, regulations evolved to require composite liner systems⁶⁴ – originally in the form of a two-foot-thick clay liner and a 60 mil-thick layer of plastic sheeting (about the thickness of paperboard). Today, landfill developers use geosynthetic clay liners as a substitute for clay to create Dry Tomb Landfills. In theory, these Dry Tomb Landfills are meant to entomb the landfill in plastic sheeting, thereby keeping water away from the MSW and minimizing the production and migration of leachate through the soil and groundwater surrounding the landfill.

Unfortunately, while one or two composite liners may delay the release of leachate into the environment, they do not prevent it, and the failure of these double liner systems is not only inevitable, but often rapid. EPA has itself stated that, “no liner... can keep all liquids out of the ground for all time. Eventually liners will either degrade, tear, or crack and will allow liquid to migrate out of the unit.”⁶⁵ For example, a geomembrane compacted clay composite liner system that was used to contain MSW landfill leachate was evaluated for 14 years and “field observation of the geomembrane revealed many defects, including holes, patches, and cracks,” and “contaminant modelling of the entire lagoon liner suggest[ed] that the geomembrane liner most likely stopped being effective as a contaminant barrier to ionic species sometime between 0 and 4 years after the installation.”⁶⁶

Furthermore, leachate generation can continue for thousands of years, long after a landfill’s operations have ceased.⁶⁷ Once a landfill cell is full, it is covered with gravel, a flexible plastic cap, and some sod. Landfill operators are then required to monitor the closed landfill for 30 years.⁶⁸ Unfortunately, the plastic caps develop holes over time, letting in more rain and snow, which leads to the production of more leachate and soil and groundwater contamination.

As described in its SSEIR, Bourne’s leachate collection and storage systems for Phases 3-9 include double composite geosynthetic clay liners and 60-mil HDPE geomembranes.⁶⁹ Phases 1A, 1B, and 1C have no liner, and Phase 2 has a single composite liner.⁷⁰ This system is not sufficient to prevent toxic chemicals from leaking and contaminating the soil and water, and there is evidence that this contamination has already started to occur. According to Bourne’s Comprehensive Site Assessment (CSA), fifty-one monitoring wells have been installed on-site and off-site to monitor the Facility and determine the vertical and horizontal extent of the

⁶⁴ In 1991, the United States Environmental Protection Agency promulgated regulations for landfilling municipal solid waste as part of the Resource Conservation Recovery Act, Subtitle D. Originally, Subtitle D required a single composite (plastic sheeting and compacted clay/geosynthetic) liner. It was later amended to require a two-liner system for all new landfill cells.

⁶⁵ Unites States EPA, *Hazardous Waste Management System; Permitting Requirements for Land Disposal Facilities*, 47 Fed. Reg. 32274 (July 26, 1982).

⁶⁶ Rowe, R.K.; Sangam, H.P. and Lake, C.B., *Evaluation of an HDPE Geomembrane after 14 Years as a Leachate Lagoon Liner*, *Canadian Geotechnical Journal*, 40(3): 536-550 (2003), available at https://www.researchgate.net/publication/233524743_Evaluation_of_an_HDPE_geomembrane_after_14_years_as_a_leachate_lagoon_liner.

⁶⁷ Landfills developed by the Roman Empire 2,000 years ago are still producing leachate. *See also* G. Fred Lee & Associates, *Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste*, 6 (updated January 2015).

⁶⁸ 40 C.F.R. § 264.117.

⁶⁹ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 8.

⁷⁰ *Id.*

impacts of contamination of groundwater.⁷¹ Bourne's own report indicates that the groundwater surrounding the facility has been contaminated:

The nature of the groundwater contamination at the Facility is nitrates, volatile organic compounds and heavy metals. Historically, eight compounds (arsenic, cadmium, lead, benzene, 1,2-dichloroethane, 1,4-dichlorobenzene, naphthalene and vinyl chloride) have been detected in groundwater samples at concentrations exceeding the GW-1 standards. Historically, four compounds (iron, manganese, total dissolved solids, and chloride) have been detected in groundwater samples at concentrations exceeding Secondary Maximum Contaminant Levels (SMCL). Sodium has been detected at concentrations exceeding the Massachusetts Drinking Water Guideline.⁷²

Additionally, Phase 9 of the expansion will be constructed above portions of the Landfill that will receive an intermediate cover system instead of a permanent cover system.⁷³ These areas will remain uncovered for several years before the Phase 9 filling occurs on them, increasing the likelihood of leakage and soil and groundwater contamination. Further, the Town intends to utilize the existing 22+ year old leachate collection system to manage leachate from Phase 9 – expected to operate until 2040, and, indeed well into the distant future. The integrity and adequacy of the existing aging leachate collection system is questionable, as is the system's ability to manage these wastes adequately. Therefore, Bourne must provide the Operations and Management plan, including inspection, maintenance and cleaning of the leachate system, and a detailed assessment of its adequacy to manage Phase 9 leachate well into the 21st century.

As discussed above, all landfill liners eventually leak and release dangerous contaminants into the environment. In fact, the Bourne Landfill is already polluting groundwater. For this reason, we oppose the Landfill's expansion. Additionally, Bourne's SSEIR is inadequate and the expansion should undergo a full MEPA review, starting with the submission of an ENF, DEIR and FEIR.

C. The Landfill Expansion Is a Threat to Water Resources

Bourne's SSEIR inadequately describes local water resources, groundwater/surface water interactions, groundwater flow regimes, and water quality.

1. Groundwater Impacts

As noted above, according to Bourne's CSA, fifty-one monitoring wells have been installed on-site and off-site to monitor the Facility and determine the vertical and horizontal extent of the impacts of contamination of groundwater.⁷⁴ However, Figure 8 of the SSEIR

⁷¹ CSA, Pages 5-6.

⁷² *Id.*

⁷³ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 5.

⁷⁴ CSA, Pages 5-6.

illustrates only 28 groundwater monitoring wells, and the SSEIR bases its understanding of the groundwater flow direction at the Facility on a single set of water level data that pre-date the operation of the Facility (1998) and that are taken from a fraction (11) of the reported 51 available monitoring wells at the Facility and surrounding area. Furthermore, the SSEIR does not discuss the existing water quality impacts to groundwater at the Facility by nitrates, volatile organic compounds, and heavy metals, despite the fact that they were documented in Bourne's 2017 Final CSA.⁷⁵

The SSEIR provides mention of rudimentary hydrogeological parameters such as horizontal hydraulic gradient and hydraulic conductivity, obtained from "numerous previous studies" but makes no effort to append these studies or provide documentation of the data derived from them.⁷⁶ It is unclear if the stated average hydraulic conductivity value of 258 ft/day is derived from recent data, or if the 1998 dataset is the basis of the statement.

The SSEIR's brief discussion of vertical hydraulic gradient is similarly rudimentary and sheds no insight into the hydrogeologic regime, the current facilities' impact on groundwater quality or flow patterns, or the impact of the proposed expansion on the groundwater system. Furthermore, according to the SSEIR:

Vertical hydraulic gradients measured at well couplets change depending upon the season, the amount of precipitation and site runoff controls and for the most part are minimal in relation to horizontal groundwater flow.⁷⁷

In nearly all hydrogeologic settings, hydraulic gradients are impacted by seasonal water table variation, and vertical hydraulic gradients are generally several orders of magnitude lower than horizontal gradients. The SSEIR mentions vertical hydraulic gradients being impacted by site runoff controls but does not expound upon how, when, and why site runoff impacts vertical hydraulic gradients, nor upon whether data indicate regular reversals of vertical gradients (from positive to negative) either seasonally, or as the result of other phenomena. In a landfill application, particularly where unlined cells are present, understanding the stability of the vertical hydraulic gradients is particularly crucial; if historical evidence reveals routine reversals of vertical hydraulic gradient at the site, an understanding of the dynamics involved and potential impacts of these reversals is key to predicting long-term impacts from operation and expansion of the landfill. The SSEIR does not include, or refer to, any specific data supporting its commentary on vertical hydraulic gradients at the site, or the impact that changing vertical and horizontal gradients at the site may have on groundwater flow patterns.

Further, Section 5.4 of the SSEIR states:

⁷⁵ *Id.*

⁷⁶ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 31.

⁷⁷ *Id.*

Groundwater monitoring at ISWM is of paramount importance and the Town has worked extensively with the DEP, CCC and the BOH to ensure that a comprehensive monitoring system is in place which will continue to be reviewed and updated as necessary. DEP and CCC have concluded that, while there have been impacts to groundwater from the old unlined landfill which ceased operation in 1999, the Town has taken the appropriate measures to protect downgradient receptors of the facility and that the modern design of the landfill is protective of human health and the environment and therefore, expansions have been granted over the last twenty years.⁷⁸

Despite the Town's statement of the critical importance of groundwater monitoring, the discussion of the groundwater flow regime in the SSEIR is cursory; virtually no raw data is provided to support Bourne's statements on groundwater flow direction, hydraulic, or vertical conductivity parameters. Furthermore, the raw data on groundwater flow direction is taken from 11 of the purported 51 monitoring wells identified in the CSA, and the data from which Figure 13 is developed dates to 1998 – prior to the operation of the Landfill. According to the SSEIR:

This round of groundwater measurements, (1998) which used eleven monitoring wells, is the most conclusive map of groundwater flow at the site because there were a number of measuring points within the footprint of the Landfill that were subsequently and properly abandoned and are now beneath the Landfill. This round of water level is not only the most precise measurements available for groundwater flow, but also represents the maximum groundwater levels recorded to date for the site.⁷⁹

This statement is inconsistent with the information provided in the 2017 CSA and fails to provide a comprehensive and up-to-date conceptual model of the site's hydrogeologic regime, which is critical to understanding the impact caused by the operations to-date, and to identify and mitigate any potential future impacts to groundwater quality, quantity, or flow direction from the proposed expansion. In order to come to any conclusions as to the potential impacts from the expansion, Bourne must submit a new ENF, DEIR, and FEIR that includes this information. The submission must be supported by a comprehensive dataset of water quality and groundwater flow maps, with data from several different dates, prior to and during current site activities, as well as a predictive model of impacts from the expansion.

⁷⁸ *Id.* at 84.

⁷⁹ *Id.*

2. Surface Water Resources

The SSEIR addresses surface water resources proximal to the Facility in a similarly cursory manner. Groundwater-surface water interactions are not addressed whatsoever in the SSEIR.

The report discusses a number of surface water bodies in the vicinity of the Facility but does not describe their role in the hydrogeologic regime. A number of apparent kettle ponds abut the Facility: Donnelly and Little Halfway Ponds to the immediate east, Deep Bottom Pond to the northeast, Great Pond to the north, and Mill Pond and Clay Ponds to the east and southeast.⁸⁰ Inlet and outlet streams to these ponds are not depicted on the USGS topographic map, indicating these are kettle ponds, consistent with outwash plain hydrology. As kettle ponds, these waterbodies are expressions of groundwater at the surface; yet the SSEIR makes no attempt to integrate these resources into a holistic understanding of the hydrogeologic regime in the immediate site vicinity.

Indeed, the SSEIR's description of the groundwater/surface water regime is so rudimentary it engenders little confidence. The Facility is located within the sole-source Cape Cod sand and gravel outwash deposit, approximately 5 miles from the former Otis Air Force Base (now Joint Base Cape Cod), one of the most studied aquifer systems in New England, if not in the entire United States; the SSEIR fails to even include current USGS or MassDEP surficial and hydrogeologic maps of the locale.

In order for a robust assessment of the impacts of the current and proposed operations on the groundwater system to be completed with confidence, MEPA must require Bourne to submit an ENF, DEIR, and FEIR. These submissions must include a comprehensive review of *all* site and regional hydrogeologic data, including USGS, Massachusetts and Air Force-sourced local and regional hydrogeologic data, along with a conceptual site model, supporting existing analytical and/or numerical models. The Town has failed to submit this information and for this reason we oppose the Landfill expansion.

D. The Landfill Expansion is a Threat to Air Quality and Accelerates Climate Change

1. Landfill Gas is a Threat to Human Health

As Bourne acknowledges in its SSEIR, Phases 7, 8, and 9 will result in the emission of Landfill Gas,⁸¹ including methane and carbon dioxide.⁸² Landfill gas is a serious public safety and health concern because it is flammable, includes toxic gases, migrates through soil, accumulates in confined spaces, causes very strong odors, and leads to asthma and other serious

⁸⁰ *Id.* 31-34.

⁸¹ Landfill gas is produced by anaerobic bacteria that consume organic matter in Municipal solid waste and is comprised of methane (55%), carbon dioxide (45%), and small amounts of oxygen, nitrogen, and other dangerous gases, including volatile organic compounds and hydrogen sulfide

⁸² Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 16.

health problems.⁸³ Methane in particular is a potent greenhouse gas that also contributes to smog, aggravates asthma, and can cause permanent lung damage and other serious health effects.⁸⁴

MSW landfills are the third-largest source of human-related methane emissions in the United States, accounting for approximately 15.1 percent of these emissions in 2018.⁸⁵ Although the Bourne Landfill accepts primarily ash waste, it also accepts up to 30,000 tons per year of MSW. To mitigate the dangerous effects of landfill gas generated at the Facility, Bourne uses a gas collection system and flare for thermal destruction.⁸⁶ However, these measures are not sufficient to prevent the emission of toxic landfill gases. Methane and other dangerous constituents of landfill gas *always* escape the landfill, even if utility flares are utilized or there is a gas-to-energy system.

Further, and despite Bourne’s claim that they capture 95 percent of all gas generated at the Landfill, it is impossible to accurately determine how much methane is produced by a landfill or what percentage of it is ultimately captured in a flare or landfill to energy system. According to Kerry Kelly, Senior Director of Federal Affairs for Waste Management, “it’s simply not possible to accurately assess methane leakage. You can measure how much gas you’re collecting. You can’t measure how much gas the landfill actually generates.”⁸⁷ In fact, estimates by USEPA and scientists outside of the waste industry run from 10 to 90 percent gas capture over the life of the landfill – a large margin for error.

Bourne’s proposed landfill expansion will inevitably increase methane emissions because the larger the landfill, and the more waste it accepts (particularly organics, which make up more than half of MSW), the more methane it will produce and release into the environment.

To reduce methane emissions and eliminate the need for the landfill expansion, Bourne should reduce the number of methane-generating materials going into the Landfill by diverting organic waste. For example, the Town should continue to work with MassDEP to eliminate all food, yard waste, textiles, cardboard, and paper from this facility.⁸⁸ Bourne could also generate methane safely, with minimal environmental releases, through the low-heat anaerobic digestion of organic materials or biogas-to-energy, as suggested in its SSEIR.⁸⁹ These actions would drastically reduce the amount of methane produced at the Bourne Landfill and also extend its existing capacity, thereby eliminating the need for the proposed expansion.

Relevantly, Bourne relies on a report from 2003 to assert that the proposed Facility will not constitute a danger to the public health, safety, or the environment from anticipated emissions.⁹⁰ The Town made this determination using data that is *17 years old* and no longer

⁸³ Erica Gies, *Landfills Have a Huge Greenhouse Gas Problem. Here’s What We Can Do About It*, ENSIA, (October 26, 2016), available at <https://ensia.com/features/methane-landfills/>.

⁸⁴ *Id.*

⁸⁵ United States Environmental Protection Agency, *Basic Information About Landfill Gas*, available at <https://www.epa.gov/lmop/basic-information-about-landfill-gas>.

⁸⁶ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 2.

⁸⁷ Erica Gies, *Landfills Have a Huge Greenhouse Gas Problem. Here’s What We Can Do About It*, ENSIA, (October 26, 2016), available at <https://ensia.com/features/methane-landfills/>.

⁸⁸ These materials should also not be burned at SEMASS, but rather similarly diverted.

⁸⁹ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 22.

⁹⁰ *Id.* at 53.

relevant. Therefore, in addition to the above stated actions, Bourne should be required to conduct new research and provide current data that demonstrates the Project's air quality impacts in a new ENF, DEIR, and FEIR.

2. Landfill Gas is a Threat to the Environment

Landfill gas also contributes significantly to climate change and is a serious threat to our environment. In fact, landfills are the fourth largest contributors to climate change.⁹¹ A study released in February 2016 indicates that, because of climate change, sea levels along the Massachusetts coastline and other areas of New England are expected to continue rising and that sea level rise in our region will outpace other parts of the world.⁹² The study found that while the global sea level rose by about 5.4 inches between 1900 and 2000, the water rose 9.3 inches in Revere, MA. Throughout New England and beyond, coastal management agencies and public officials are working diligently to identify and minimize environmental and public health risks associated with facilities and infrastructure that could be negatively impacted by climate change and sea level rise. Efforts to mitigate emissions and protect public health, the environment, and coastal infrastructure from impacts of climate change are also well underway across Cape Cod. The proposed expansion of the Bourne Landfill is completely out of step with these efforts.

As discussed above, landfill gas is a threat to human health and the environment. Bourne must be required to submit an ENF, DEIR, and FEIR that provides current and accurate information regarding the Landfill's impact on air quality. Bourne has failed to provide this information in its SSEIR, and for this reason, we oppose the Landfill's expansion.

E. Development of Phases 7, 8, and 9 Will Involve the Expansion of Impervious Area Beyond What was Discussed in the Original FEIR and Exceeds the Ten-Acre Threshold

The development of Phases 7, 8, and 9 will involve the expansion of impervious area beyond what was discussed in the original FEIR.⁹³ The expansion of new impervious area on the 25-acre parcel will be for the landfill expansion and consists of approximately 10.28 acres.⁹⁴ The expansion of new impervious area on the 12-acre parcel consists of approximately 5.58 acres for pavement, buildings, and infrastructure to support the LHF.⁹⁵ The total new impervious area is 15.86 acres and exceeds the ten-acre threshold. Therefore, pursuant to 11.03(1)(a), Bourne is required to submit a new ENF and draft and final EIR and the SSEIR is insufficient.

⁹¹ *How Do Landfills Contribute to Global Warming?*, Greentumble (August 23, 2016), available at <https://greentumble.com/how-do-landfills-contribute-to-global-warming/>.

⁹² Matt Rocheleau, *The sea levels are rising fast – and even faster in Massachusetts*, The Boston Globe, (February 25, 2016), available at <https://www.bostonglobe.com/metro/2016/02/25/sea-level-rise-here-was-quicker-century-than-elsewhere-and-that-bodes-ill-for-future/t7XOCWqGsnW1kPKH84W5BJ/story.html>.

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.*

IV. The Proposed Expansion Does Not Meet Site Suitability Criteria

A. The Landfill Expansion Will Have an Adverse Impact on a Species of Special Concern

The entire 12-acre parcel and portions of the 25-acre parcel are located within mapped habitat of the Eastern Box Turtle, which is state-listed as a species of Special Concern.⁹⁶ This species and its habitat are protected pursuant to the Massachusetts Endangered Species Act (MESA; MGL c.131A) and its implementing regulations (321 CMR 10.00).⁹⁷

The landfill expansion is anticipated to result in a taking of Eastern Box Turtle habitat and will require a Conservation and Management Permit (CMP) pursuant to 321 CMR 10.23.⁹⁸ In order for the Project to qualify for a CMP, Bourne must demonstrate that the Project has “avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species.”⁹⁹

Bourne has not sufficiently demonstrated that the Project meets these performance standards. Although the Town is working with the Natural Heritage and Endangered Species Program (NHESP) to submit a CMP that will address the affected areas, this plan is only in its conceptual stages.¹⁰⁰ Bourne has identified land for potential mitigation but has not definitively determined that this land is suitable, nor has it purchased this land or placed it under permanent protection.¹⁰¹ Therefore, Bourne’s request for the Phase 7, 8, and 9 expansion should be denied unless and until the Town demonstrates that it has met the required performance standards through the submission of a new ENF, DEIR, and FEIR.

B. The Proposed Expansion Includes Agricultural Land Determined to be of Statewide Importance

Pursuant to 310 CMR 16.40(4)(a), “no site shall be determined to be suitable or be assigned as a solid waste management facility where the land is classified as Prime, Unique, or of State and Local Importance by the United States Department of Agriculture, Natural Resources Conservation Service.”

⁹⁶ *Certificate of the Secretary of Energy and Environmental Affairs on the Expanded Notice of Project Change*, April 24, 2020, Page 6.

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 13.

¹⁰¹ *Id.*

The United States Department of Agriculture prepared a custom soil resource report for Bourne and determined that parts of the 12 and 25-acre landfill parcels are classified as farmland of statewide importance.¹⁰² Specifically, the report included a soil map that identified the western portion of the 12-acre parcel and the 25-acre parcel, as well as the state-owned abutting land along the western boundary, to be “Soil Group 431B, Barnstable sandy loam, 3 to 8 percent slopes, very stony and 431C, Barnstable sandy loam, 8 to 15 percent slopes, very stony with a Farmlands Classification of Farmland of statewide importance.”¹⁰³

The Town questions whether this classification is accurate.¹⁰⁴ However, Bourne does not provide any information to demonstrate that these parcels do not qualify as farmland of statewide importance. Until Bourne does so, through the submission of a new ENF, DEIR, and FEIR, this land is not suitable for assignment as a solid waste management facility. For this reason, we oppose the Landfill expansion.

C. The Proposed Expansion Includes Land Identified as a Natural Area by the Cape Cod Commission

The Cape Cod Commission (CCC) has identified the 12-acre parcel as a Natural Area as mapped by the CCC’s RPP Data Viewer.¹⁰⁵ The CCC defines Natural Areas as “the region’s least developed and most sensitive areas. These identified areas comprise natural shoreline, barrier beaches, banks, and dunes, areas with highest habitat value and natural landscapes, undeveloped lands in wellhead protection areas, buffers to wetlands and vernal pools, and undeveloped areas subject to flooding.”¹⁰⁶ The vision for these areas is to:

Minimize adverse development impacts to sensitive resource areas, to preserve lands that define Cape Cod’s natural landscape and contribute to its scenic character, and to improve the Cape’s resilience to severe storms and the effects of climate change. *Natural Areas are lands with the highest significance for resource protection or conservation and are appropriate for permanent protection through acquisition and conservation restriction or for transfer of development rights to less vulnerable areas.*

The Landfill expansion is grossly inconsistent with the CCC’s goal of preserving this sensitive land as a Natural Area. In fact, the Town has stated that it is likely to seek a waiver

¹⁰² Town of Bourne, *Single Supplemental Environmental Impact Report*, November 2020, Page 46.

¹⁰³ *Id.*

¹⁰⁴ *Id.* at 47.

¹⁰⁵ *Id.* at 83. CCC’s RPP Data Viewer available at

<https://cccommission.maps.arcgis.com/apps/MapSeries/index.html?appid=efa7276c967f48658c6190d53196ba1d>.

¹⁰⁶ *Cape Cod Regional Policy Plan*, 77 (February 22, 2019), available at

https://www.capecodcommission.org/resource-library/file/?url=/dept/commission/team/rpp/rpp_final/Cape_Cod_Regional_Policy_Plan_Effective%2002-22-2019.pdf.



from the RPP's requirement of off-site mitigation for the taking of this Natural Area.¹⁰⁷ Such action is completely out of step with the CCC's determination that this land should be permanently protected and not further developed. For these reasons, we oppose the Landfill expansion.

V. Conclusion

Thank you for the opportunity to provide these comments. For the reasons discussed above, the signatories oppose the Phase 7, 8, and 9 Landfill expansion, and respectfully request that Bourne's expansion request be denied, and that the Town undergo a full and rigorous MEPA review, starting with the submission of an Environmental Notification Form, and Draft and Final Environmental Impact Reports.

Respectfully submitted,

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¹⁰⁷ *Id.*



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EXHIBIT 1

Annual Solid Waste Facility Reports: Landfill Summary

Calendar Year 2015

Sorted by Municipality

17-Jan-2017

Municipality **Region** **Reg Obj Name and Address** **Reg Obj Name reflects the most recent data and may not reflect 2015**

ADAMS WE SPECIALTY MINERALS COMBINED NOTCH RD LF **Receipt Status:** **Rec'd 3/22/2016**
Reg Obj Acct: 343090 NOTCH RD **Class:** LF

Accepted: 38,930 38,930 Check: **OK** Cover/Accept Cover: 12,500

Waste/Material Type	State	Tons			Cover Type	Tons
Other (NonMSW)	MA	38,930		<u>0.321</u>	Soil/Sand	12,500

Days Open: 365 Leachate (gal): 0 Leach Treatment/Disposal:

AGAWAM WE BONDIS ISLAND ASH LANDFILL **Receipt Status:** **Rec'd 3/14/2016**
Reg Obj Acct: 173282 M STREET EXT **Class:** LF

Accepted: 53,150 53,150 Check: **OK** Cover/Accept Cover: 24,159

Waste/Material Type	State	Tons			Cover Type	Tons
Ash	CT	12,698		<u>0.455</u>	Bottom Ash	21,169
Ash	MA	40,452			Street Sweepings	2,990

Days Open: 312 Leachate (gal): 11,084,915 Leach Treatment/Disposal: Sewer

BARRE CE BARRE LANDFILL **Receipt Status:** **Rec'd 2/15/2016**
Reg Obj Acct: 259260 99 BARRE DEPOT RD **Class:** LF

Accepted: 16,586 16,586 Check: **OK** Cover/Accept Cover: 92,758

Waste/Material Type	State	Tons			Cover Type	Tons
MSW	MA	16,196		<u>5.593</u>	Auto Shredder Residue/Auto Fluff	5,165
Sludge (WWTP)	MA	390			Contaminated Soil	87,593

Days Open: 250 Leachate (gal): 5,117,398 Leach Treatment/Disposal: Truck off-site

BOURNE SE BOURNE LANDFILL **Receipt Status:** **Rec'd 3/14/2016**
Reg Obj Acct: 172356 201 MACARTHUR BLVD **Class:** LF

Accepted: 215,963 215,963 Check: **OK** Cover/Accept Cover: 63,162

Waste/Material Type	State	Tons			Cover Type	Tons
C&D Waste	MA	5,685		<u>0.292</u>	Bottom Ash	44,206
Ash	MA	181,715			Contaminated Soil	16,973
Other (NonMSW)	MA	853			Soil/Sand	213
Bypass (MSW)	MA	26,391			Street Sweepings	1,770
Bypass (MSW)	RI	1,319				

Days Open: 354 Leachate (gal): 11,882,792 Leach Treatment/Disposal: Truck off-site

CARVER SE CARVER MARION WAREHAM ASH LANDFILL **Receipt Status:** **Rec'd 3/9/2016**
Reg Obj Acct: 172399 118 FEDERAL ST **Class:** LF

Accepted: 75,110 75,110 Check: **OK** Cover/Accept Cover: 24,174

Waste/Material Type	State	Tons			Cover Type	Tons
MSW	MA	50,446		<u>0.322</u>	Bottom Ash	18,105
Ash	MA	13,475			C&D Fines	6,069
Recycling Residue	MA	4,207				
Bulky Waste	MA	6,982				

Days Open: 339 Leachate (gal): 11,751,466 Leach Treatment/Disposal: Truck off-site

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2015

CHICOPEE

WE CHICOPEE LANDFILL

Receipt Status: **Rec'd 2/9/2016**

Reg Obj Acct: 291515

161 NEW LOMBARD RD

Class: LF

Accepted: Check: **Problem** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	CT	42,193
MSW	MA	183,578
MSW	VT	235
DPW Waste	CT	546
DPW Waste	MA	2,949
Other (NonMSW)	CT	2,191
Other (NonMSW)	MA	4,250

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	31,548
Bottom Ash	4,374
Contaminated Soil	127,813
Foundry Sand	4,634
Sludge Ash	7,892
Soil/Sand	2,253
Street Sweepings	4,421
WTP Fines	7,556

Days Open: 278 Leachate (gal): 12,944,800 Leach Treatment/Disposal: Sewer

DARTMOUTH

SE CRAPO HILL LANDFILL

Receipt Status: **Rec'd 2/24/2016**

Reg Obj Acct: 172448

300 SAMUEL BARNET BLVD

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	96,329
Sludge (WWTP)	MA	584
Sludge (WTP)	MA	16
DPW Waste	MA	9,902

Cover Type	Tons
C&D Fines	12,683
Soil/Sand	52,140
Street Sweepings	11,502
Tire Chips	300
TriPak (Emulsion Mix)	919
Wood Chips	2,347

Days Open: 287 Leachate (gal): 8,550,482 Leach Treatment/Disposal: Sewer

FALL RIVER

SE ALLIED SERVICES OF MASSACHUSETTS

Receipt Status: **Rec'd 2/5/2016**

Reg Obj Acct: 172513

1080 AIRPORT RD

Class: LF

Accepted: Check: **Problem** Cover/Accept

Cover:

Waste/Material Type	State	Tons
Soil/Sand		31,800
TriPak (Emulsion Mix)		15,420

Cover Type	Tons
Soil/Sand	31,800
TriPak (Emulsion Mix)	15,420

Days Open: 0 Leachate (gal): 51,379,730 Leach Treatment/Disposal: Sewer

HAVERHILL

NE WARD HILL NECK LANDFILL

Receipt Status: **Rec'd 2/26/2016**

Reg Obj Acct: 173281

100 RECOVERY WAY

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
Ash	MA	145,250

Cover Type	Tons
Posi-shell	2,080

Days Open: 255 Leachate (gal): 11,942,890 Leach Treatment/Disposal: Sewer&OffSite

HULL

SE HULL LANDFILL

Receipt Status: **Rec'd 3/3/2016**

Reg Obj Acct: 172619

LOGAN AVE

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	260
DPW Waste	MA	200

Cover Type	Tons
Soil/Sand	90
Street Sweepings	600

Days Open: 144 Leachate (gal): 200,000 Leach Treatment/Disposal: Sewer

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2015

MIDDLEBOROUGH SE ANGEL VIEW PET CEMETERY
Reg Obj Acct: 274537 465 WAREHAM ST

Receipt Status: **Rec'd 2/15/2016**
Class: SMLF

Accepted: Check: **Problem** Cover/Accept Cover:

Waste/Material Type	State	Tons
Ash	MA	180

Cover Type	Tons
Soil/Sand	1

Days Open: 256 Leachate (gal): 0 Leach Treatment/Disposal: On Site

MIDDLEBOROUGH SE MIDDLEBOROUGH LANDFILL
Reg Obj Acct: 172728 207 PLYMPTON ST

Receipt Status: **Rec'd 2/15/2016**
Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
MSW	MA	39,804
Sludge (WWTP)	MA	5,162
Ash	MA	166
Recycling Residue	MA	6,921
Other (NonMSW)	MA	2,027

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	10,064
Contaminated Soil	12,509
Other	236
Street Sweepings	342

Days Open: 260 Leachate (gal): 4,569,859 Leach Treatment/Disposal: Truck off-site

NANTUCKET SE NANTUCKET LANDFILL
Reg Obj Acct: 172753 188 MADAKET RD

Receipt Status: **Rec'd 2/15/2016**
Class: LF

Accepted: Check: **Problem** Cover/Accept Cover:

Waste/Material Type	State	Tons
Other (NonMSW)	MA	2,700

Cover Type	Tons
Other	75

Days Open: 355 Leachate (gal): 0 Leach Treatment/Disposal: Truck off-site

PEABODY NE PEABODY ASH MONOFILL
Reg Obj Acct: 266442 0 FARM AVE

Receipt Status: **Rec'd 3/9/2016**
Class: LF

Accepted: Check: **Problem** Cover/Accept Cover:

Days Open: 0 Leachate (gal): 3,905,497 Leach Treatment/Disposal: Sewer

SAUGUS NE WHEELABRATOR SAUGUS INC ASH LANDFILL
Reg Obj Acct: 172913 100 SALEM TPKE

Receipt Status: **Rec'd 2/12/2016**
Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
Ash	MA	123,769

Cover Type	Tons
Contaminated Soil	8,388
Soil/Sand	1,520

Days Open: 365 Leachate (gal): 43,198,943 Leach Treatment/Disposal: OnSite&Sewer

SHREWSBURY CE SHREWSBURY LANDFILL
Reg Obj Acct: 172931 620 HARTFORD TPKE

Receipt Status: **Rec'd 1/12/2016**
Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
Sludge (WWTP)	MA	100
Ash	MA	252,991
Ash	NH	48,579
Other (NonMSW)	MA	57
Other (NonMSW)	NH	2,057

Cover Type	Tons
LANLOC	15,535
Street Sweepings	1,597

Days Open: 309 Leachate (gal): 12,423,212 Leach Treatment/Disposal: Sewer

SOMERSET SE BRAYTON POINT ENERGY LLC Receipt Status: **Rec'd 2/5/2016**
 Reg Obj Acct: 407198 1 BRAYTON POINT RD Class: LF

Accepted: 1,300 1,300 Check: **OK** Cover/Accept Cover: 1

Waste/Material Type	State	Tons	Cover Type	Tons
Sludge (WWTP)	MA	1,300	Other	1

Days Open: 12 Leachate (gal): 2,000,000 Leach Treatment/Disposal: On Site

SOUTHBRIDGE CE SOUTHBRIDGE LANDFILL Receipt Status: **Rec'd 2/11/2016**
 Reg Obj Acct: 172947 165 BAREFOOT RD Class: LF

Accepted: 404,059 404,059 Check: **OK** Cover/Accept Cover: 150,427

Waste/Material Type	State	Tons	Cover Type	Tons
MSW	CT	36,475	Contaminated Soil	82,545
MSW	MA	325,113	Road Base	41,318
Residuals C&D	MA	42,471	Sludge Ash	6,127
			Street Sweepings	20,225
			WWTP Grit	212

Days Open: 261 Leachate (gal): 6,376,340 Leach Treatment/Disposal: Truck off-site

STURBRIDGE CE STURBRIDGE LANDFILL Receipt Status: **Rec'd 2/10/2016**
 Reg Obj Acct: 172975 154 BREAKNECK RD Class: LF

Accepted: 275 275 Check: **OK** Cover/Accept Cover: 7,720

Waste/Material Type	State	Tons	Cover Type	Tons
MSW	MA	275	Soil/Sand	7,600
			Street Sweepings	120

Days Open: 156 Leachate (gal): 1,351,000 Leach Treatment/Disposal: Truck off-site

TAUNTON SE TAUNTON LANDFILL Receipt Status: **Rec'd 2/15/2016**
 Reg Obj Acct: 172994 340 EAST BRITANNIA ST Class: LF

Accepted: 112,481 112,481 Check: **OK** Cover/Accept Cover: 45,859

Waste/Material Type	State	Tons	Cover Type	Tons
MSW	MA	101,658	Auto Shredder Residue/Auto Fluff	16,572
Sludge (WWTP)	MA	7,750	Contaminated Soil	23,184
Other (NonMSW)	MA	3,073	Other	3,982
			Soil/Sand	575
			Street Sweepings	1,546

Days Open: 312 Leachate (gal): 16,896,483 Leach Treatment/Disposal: Sewer

WESTMINSTER CE FITCHBURG WESTMINSTER LANDFILL Receipt Status: **Rec'd 2/15/2016**
 Reg Obj Acct: 39885 101 FITCHBURG RD Class: LF

Accepted: 343,809 343,809 Check: **OK** Cover/Accept Cover: 71,669

Waste/Material Type	State	Tons	Cover Type	Tons
MSW	MA	227,908	Auto Shredder Residue/Auto Fluff	22,819
MSW	RI	90,195	C&D Fines	1,126
Sludge (WWTP)	MA	10,392	C&D Residuals	1,094
Contaminated Soil	MA	7	Compost	2,600
DPW Waste	MA	945	Contaminated Soil	38,002
DPW Waste	NH	9	Dredge (fresh)	219
Special/Supplemental	CT	347	Foundry Sand	4,518
Special/Supplemental	MA	14,006	Street Sweepings	510
			WWTP Grit	781

Days Open: 302 Leachate (gal): 17,312,680 Leach Treatment/Disposal: Sewer

Report Summary

Number of Annual Reports Listed: 21

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2016

CHICOPEE

WE

CHICOPEE LANDFILL

Receipt Status: **Rec'd 2/9/2017**

Reg Obj Acct: 291515

161 NEW LOMBARD RD

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	CT	16,770
MSW	MA	182,772
MSW	VT	616
Ash	CT	107
DPW Waste	CT	679
DPW Waste	MA	3,110
Other (NonMSW)	CT	2,950
Other (NonMSW)	MA	2,846

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	22,273
Contaminated Soil	135,193
Foundry Sand	2,757
Paper Fibers	11,644
Sludge Ash	7,456
Street Sweepings	1,476

Days Open: 269 Leachate (gal): 10,524,100 Leach Treatment/Disposal: Sewer

DARTMOUTH

SE

CRAPO HILL LANDFILL

Receipt Status: **Rec'd 2/9/2017**

Reg Obj Acct: 172448

300 SAMUEL BARNET BLVD

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	91,922
Sludge (WTP)	MA	17
DPW Waste	MA	9,562
Other (NonMSW)	MA	605

Cover Type	Tons
Bottom Ash	4,952
Other	34,700
Soil/Sand	25,524
Street Sweepings	11,568
Wood Chips	2,896

Days Open: 287 Leachate (gal): 9,325,951 Leach Treatment/Disposal: Sewer

FALL RIVER

SE

ALLIED SERVICES OF MASSACHUSETTS

Receipt Status: **Pending**

Reg Obj Acct: 172513

1080 AIRPORT RD

Class: LF

Accepted: Check: Cover/Accept

Cover:

Days Open: Leachate (gal): Leach Treatment/Disposal:

HAVERHILL

NE

WARD HILL NECK LANDFILL

Receipt Status: **Rec'd 2/9/2017**

Reg Obj Acct: 173281

100 RECOVERY WAY

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
Ash	MA	133,708

Cover Type	Tons
Contaminated Soil	7,692
Posi-shell	60
Soil/Sand	2,945

Days Open: 310 Leachate (gal): 9,553,225 Leach Treatment/Disposal: Sewer&OffSite

HULL

SE

HULL LANDFILL

Receipt Status: **Rec'd 6/14/2017**

Reg Obj Acct: 172619

LOGAN AVE

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	240
DPW Waste	MA	201

Cover Type	Tons
Street Sweepings	561

Days Open: 144 Leachate (gal): 200,000 Leach Treatment/Disposal: Sewer

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2016

MIDDLEBOROUGH SE ANGEL VIEW PET CEMETERY
Reg Obj Acct: 274537 471 WAREHAM ST

Receipt Status: **Rec'd 2/14/2017**
Class: SMLF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
Ash	MA	76
Other (NonMSW)	MA	104

Days Open: 256 Leachate (gal): Leach Treatment/Disposal:

MIDDLEBOROUGH SE MIDDLEBOROUGH LANDFILL
Reg Obj Acct: 172728 207 PLYMPTON ST

Receipt Status: **Rec'd 3/10/2017**
Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
MSW	MA	52,639
Sludge (WWTP)	MA	3,771
Recycling Residue	MA	64
Other (NonMSW)	MA	1,566

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	1,227
Contaminated Soil	9,906
Other	8,724
Street Sweepings	113

Days Open: 308 Leachate (gal): 4,287,530 Leach Treatment/Disposal: Truck off-site

NANTUCKET SE NANTUCKET LANDFILL
Reg Obj Acct: 172753 188 MADAKET RD

Receipt Status: **Rec'd 2/7/2017**
Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
Other (NonMSW)	MA	2,800

Cover Type	Tons
Posi-shell	75

Days Open: 355 Leachate (gal): 0 Leach Treatment/Disposal: Truck off-site

PEABODY NE PEABODY ASH MONOFILL
Reg Obj Acct: 266442 0 FARM AVE

Receipt Status: **Rec'd 2/25/2017**
Class: LF

Accepted: Check: **Problem** Cover/Accept Cover:

Days Open: 0 Leachate (gal): 4,579,414 Leach Treatment/Disposal: Sewer

SAUGUS NE WHEELABRATOR SAUGUS INC ASH LANDFILL
Reg Obj Acct: 172913 100 SALEM TPKE

Receipt Status: **Rec'd 2/10/2017**
Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
Ash	MA	113,511

Cover Type	Tons
Contaminated Soil	22,154
Dredge (marine)	1,209
Soil/Sand	2,873

Days Open: 365 Leachate (gal): 52,291,179 Leach Treatment/Disposal: OnSite&Sewer

SHREWSBURY CE SHREWSBURY LANDFILL
Reg Obj Acct: 172931 620 HARTFORD TPKE

Receipt Status: **Rec'd 2/10/2017**
Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
Sludge (WWTP)	MA	147
Ash	CT	9,347
Ash	MA	233,611
Ash	NH	54,932
Ash	NY	56,403
Other (NonMSW)	MA	14,043
Other (NonMSW)	NH	1,002

Cover Type	Tons
Street Sweepings	1,338
TriPak (Emulsion Mix)	16,136

Days Open: 309 Leachate (gal): 15,317,596 Leach Treatment/Disposal: Sewer

Municipality: SOMERSET Region: SE Reg Obj Name and Address: BRAYTON POINT LLC Reg Obj Name reflects the most recent data and may not reflect 2016
 Reg Obj Acct: 407198 1 BRAYTON POINT RD Receipt Status: **Rec'd 1/26/2017**
 Class: LF
 Accepted: Check: **Problem** Cover/Accept Cover:
 Days Open: 0 Leachate (gal): 2 Leach Treatment/Disposal: On Site

SOUTHBRIDGE CE SOUTHBRIDGE LANDFILL Receipt Status: **Rec'd 2/14/2017**
 Reg Obj Acct: 172947 165 BAREFOOT RD Class: LF
 Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
MSW	CT	4,567
MSW	MA	257,302
Residuals C&D	MA	64,020

Cover Type	Tons
Bottom Ash	2,008
Contaminated Soil	9,181
Road Base	30,263
Street Sweepings	14,073
WWTP Grit	251

 Days Open: 240 Leachate (gal): 4,215,907 Leach Treatment/Disposal: Truck off-site

STURBRIDGE CE STURBRIDGE LANDFILL Receipt Status: **Rec'd 11/15/2017**
 Reg Obj Acct: 172975 154 BREAKNECK RD Class: LF
 Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
MSW	MA	275

Cover Type	Tons
Soil/Sand	7,600
Street Sweepings	120

 Days Open: 156 Leachate (gal): 2,793,000 Leach Treatment/Disposal: Truck off-site

TAUNTON SE TAUNTON LANDFILL Receipt Status: **Rec'd 3/13/2017**
 Reg Obj Acct: 172994 340 EAST BRITANNIA ST Class: LF
 Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons
MSW	MA	110,013
MSW	RI	73
Sludge (WWTP)	MA	8,080
Other (NonMSW)	MA	906

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	23,627
Contaminated Soil	54,165
Other	2,743
Soil/Sand	1,458

 Days Open: 309 Leachate (gal): 13,124,345 Leach Treatment/Disposal: Sewer

WESTMINSTER CE FITCHBURG WESTMINSTER LANDFILL Receipt Status: **Rec'd 2/14/2017**
 Reg Obj Acct: 39885 101 FITCHBURG RD Class: LF
 Accepted: Check: **Problem** Cover/Accept Cover:

Waste/Material Type	State	Tons
MSW	MA	238,761
MSW	RI	148,794
C&D Waste	MA	10
Sludge (WWTP)	MA	9,573
DPW Waste	MA	2,059
Other (NonMSW)	MA	699
Special/Supplemental	CT	348
Special/Supplemental	MA	17,221

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	35,943
Contaminated Soil	78,039
Street Sweepings	1,565

 Days Open: 309 Leachate (gal): 20,531,382 Leach Treatment/Disposal: Sewer

Report Summary

Number of Annual Reports Listed: 21

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2017

CHICOPEE

WE

CHICOPEE LANDFILL

Receipt Status: **Rec'd 2/12/2018**

Reg Obj Acct: 291515

161 NEW LOMBARD RD

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	CT	45,500
MSW	MA	178,135
MSW	VT	558
Ash	CT	212
DPW Waste	CT	352
DPW Waste	MA	3,044
Other (NonMSW)	CT	4,846
Other (NonMSW)	MA	2,638

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	27,774
Contaminated Soil	111,693
Foundry Sand	4,386
Sludge Ash	9,780
Street Sweepings	3,803
WWTP Grit	4,557

Days Open: 268 Leachate (gal): 9,564,700 Leach Treatment/Disposal: Sewer

DARTMOUTH

SE

CRAPO HILL LANDFILL

Receipt Status: **Rec'd 2/14/2018**

Reg Obj Acct: 172448

300 SAMUEL BARNET BLVD

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	102,191
Sludge (WTP)	MA	3
DPW Waste	MA	3,931
Other (NonMSW)	MA	508

Cover Type	Tons
Bottom Ash	594
Other	269
Soil/Sand	19,591
Street Sweepings	20,145
Wood Chips	4,490

Days Open: 287 Leachate (gal): 7,792,955 Leach Treatment/Disposal: Sewer

FALL RIVER

SE

ALLIED SERVICES OF MASSACHUSETTS

Receipt Status: **Pending**

Reg Obj Acct: 172513

1080 AIRPORT RD

Class: LF

Accepted: Check: Cover/Accept

Cover:

Days Open: Leachate (gal): Leach Treatment/Disposal:

HAVERTHILL

NE

WARD HILL NECK LANDFILL

Receipt Status: **Rec'd 2/22/2018**

Reg Obj Acct: 173281

100 RECOVERY WAY

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
Ash	MA	138,674

Cover Type	Tons
Contaminated Soil	25,648

Days Open: 310 Leachate (gal): 14,245,767 Leach Treatment/Disposal: On Site

HULL

SE

HULL LANDFILL

Receipt Status: **Rec'd 2/8/2018**

Reg Obj Acct: 172619

LOGAN AVE

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	240
DPW Waste	MA	221

Cover Type	Tons
Street Sweepings	580

Days Open: 144 Leachate (gal): 390,000 Leach Treatment/Disposal: Sewer

MIDDLEBOROUGH

SE

ANGEL VIEW PET CEMETERY

Receipt Status: **Rec'd 5/18/2018**

Reg Obj Acct: 274537

471 WAREHAM ST

Class: SMLF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
Ash	MA	76
Other (NonMSW)	MA	7

Cover Type	Tons
Other	15

Days Open: 256 Leachate (gal): 0 Leach Treatment/Disposal:

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2017

MIDDLEBOROUGH SE MIDDLEBOROUGH LANDFILL
Reg Obj Acct: 172728 207 PLYMPTON ST

Receipt Status: **Rec'd 3/12/2018**
Class: LF

Accepted: 55,106 55,106 Check: **OK** Cover/Accept

Cover: 29,328

Waste/Material Type	State	Tons
MSW	MA	49,602
Sludge (WWTP)	MA	3,837
Other (NonMSW)	MA	1,667

0.532

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	20,600
Contaminated Soil	377
Other	5,419
Soil/Sand	1,997
Street Sweepings	935

Days Open: 305 Leachate (gal): 7,212,835 Leach Treatment/Disposal: Truck off-site

NANTUCKET SE NANTUCKET LANDFILL
Reg Obj Acct: 172753 188 MADAKET RD

Receipt Status: **Rec'd 2/13/2018**
Class: LF

Accepted: 2,720 2,720 Check: **OK** Cover/Accept

Cover: 1,000

Waste/Material Type	State	Tons
MSW	MA	1,088
Other (NonMSW)	MA	1,632

0.368

Cover Type	Tons
Soil/Sand	1,000

Days Open: 355 Leachate (gal): 632,636 Leach Treatment/Disposal: Truck off-site

PEABODY NE PEABODY ASH MONOFILL
Reg Obj Acct: 266442 0 FARM AVE

Receipt Status: **Rec'd 2/23/2018**
Class: LF

Accepted: 0 Check: **Problem** Cover/Accept

Cover:

Days Open: 0 Leachate (gal): 6,166,948 Leach Treatment/Disposal: Sewer

SAUGUS NE WHEELABRATOR SAUGUS INC ASH LANDFILL
Reg Obj Acct: 172913 100 SALEM TPKE

Receipt Status: **Rec'd 2/14/2018**
Class: LF

Accepted: 116,261 116,261 Check: **OK** Cover/Accept

Cover: 15,559

Waste/Material Type	State	Tons
Ash	MA	116,261

0.134

Cover Type	Tons
Dredge (marine)	964
Soil/Sand	14,595

Days Open: 365 Leachate (gal): 50,365,674 Leach Treatment/Disposal: On Site

SHREWSBURY CE SHREWSBURY LANDFILL
Reg Obj Acct: 172931 620 HARTFORD TPKE

Receipt Status: **Rec'd 2/14/2018**
Class: LF

Accepted: 417,081 417,081 Check: **OK** Cover/Accept

Cover: 22,653

Waste/Material Type	State	Tons
Sludge (WWTP)	MA	87
Ash	CT	45,948
Ash	MA	231,642
Ash	NH	53,486
Ash	NY	49,533
Other (NonMSW)	MA	33,312
Other (NonMSW)	NH	3,073

0.054

Cover Type	Tons
Other	21,194
Street Sweepings	1,459

Days Open: 312 Leachate (gal): 19,790,886 Leach Treatment/Disposal: Sewer

SOMERSET SE BRAYTON POINT LLC
Reg Obj Acct: 407198 1 BRAYTON POINT RD

Receipt Status: **Rec'd 1/11/2018**
Class: LF

Accepted: 0 Check: **Problem** Cover/Accept

Cover:

Days Open: 0 Leachate (gal): 2,000,000 Leach Treatment/Disposal: On Site

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2017

SOUTHBRIDGE CE SOUTHBRIDGE LANDFILL
Reg Obj Acct: 172947 165 BAREFOOT RD

Receipt Status: **Rec'd 1/30/2018**
Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	CT	5,532
MSW	MA	188,622
Residuals C&D	MA	63,271

Cover Type	Tons
Contaminated Soil	32,776
Road Base	20,554
Street Sweepings	9,920
WWTP Grit	271

Days Open: 241 Leachate (gal): 5,430,693 Leach Treatment/Disposal: Truck off-site

STURBRIDGE CE STURBRIDGE LANDFILL
Reg Obj Acct: 172975 154 BREAKNECK RD

Receipt Status: **Pending**
Class: LF

Accepted: Check: Cover/Accept

Cover:

Days Open: Leachate (gal): Leach Treatment/Disposal:

TAUNTON SE TAUNTON LANDFILL
Reg Obj Acct: 172994 340 EAST BRITANNIA ST

Receipt Status: **Rec'd 3/12/2018**
Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	106,849
MSW	RI	41
Sludge (WWTP)	MA	8,695
Sludge (WTP)	MA	306
Sludge (WTP)	RI	16
Recycling Residue	MA	453
Special/Supplemental	MA	3,250
Shingles Asphalt	MA	71

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	39,471
Contaminated Soil	22,410
Cullet (crushed glass)	9,690
Other	42,500
Soil/Sand	2,548
Street Sweepings	915

Days Open: 305 Leachate (gal): 13,745,249 Leach Treatment/Disposal: Sewer&OffSite

WESTMINSTER CE FITCHBURG WESTMINSTER LANDFILL
Reg Obj Acct: 39885 101 FITCHBURG RD

Receipt Status: **Rec'd 2/14/2018**
Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	266,717
MSW	RI	143,155
Sludge (WWTP)	MA	9,905
Other (NonMSW)	CT	310
Other (NonMSW)	MA	24,937

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	48,520
C&D Residuals	4,430
Compost	4,057
Contaminated Soil	75,063
Foundry Sand	2,185
Paper Sludge	7,165
Street Sweepings	768
WWTP Grit	2,812

Days Open: 304 Leachate (gal): 29,312,781 Leach Treatment/Disposal: Sewer

Report Summary

Number of Annual Reports Listed: 20

Annual Solid Waste Facility Reports: Landfill Summary

Calendar Year 2018

Sorted by Municipality

01-Dec-2020

Municipality: ADAMS Region: WE Reg Obj Name and Address: SPECIALTY MINERALS COMBINED NOTCH RD LF **Reg Obj Name reflects the most recent data and may not reflect 2018**
 Reg Obj Acct: 343090 NOTCH RD Receipt Status: **Rec'd 2/14/2019**
 Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons	Cover/Accept	Cover Type	Tons
Other (NonMSW)	MA	90,000	<input type="text" value="0.172"/>	Soil/Sand	15,500

Days Open: 365 Leachate (gal): 0 Leach Treatment/Disposal:

Municipality: AGAWAM Region: WE Reg Obj Name and Address: BONDIS ISLAND ASH LANDFILL **Reg Obj Name reflects the most recent data and may not reflect 2018**
 Reg Obj Acct: 173282 M STREET EXT Receipt Status: **Rec'd 3/14/2019**
 Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons	Cover/Accept	Cover Type	Tons
Ash	CT	55,873	<input type="text" value="0.162"/>	Bottom Ash	14,511
Ash	MA	42,753		Street Sweepings	2,374
Recycling Residue	MA	1,347			
Compostables/Organics	MA	4,250			

Days Open: 280 Leachate (gal): 15,081,508 Leach Treatment/Disposal: Sewer

Municipality: BOURNE Region: SE Reg Obj Name and Address: BOURNE LANDFILL **Reg Obj Name reflects the most recent data and may not reflect 2018**
 Reg Obj Acct: 172356 201 MACARTHUR BLVD Receipt Status: **Rec'd 3/13/2019**
 Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons	Cover/Accept	Cover Type	Tons
MSW	MA	28,645	<input type="text" value="0.345"/>	Bottom Ash	43,796
C&D Waste	MA	2,428		Contaminated Soil	28,055
Sludge (WTP)	MA	978		Street Sweepings	1,217
Ash	MA	179,892		TriPak (Emulsion Mix)	99
Other (NonMSW)	MA	5			

Days Open: 355 Leachate (gal): 15,234,177 Leach Treatment/Disposal: Truck off-site

Municipality: CARVER Region: SE Reg Obj Name and Address: CARVER MARION WAREHAM ASH LANDFILL **Reg Obj Name reflects the most recent data and may not reflect 2018**
 Reg Obj Acct: 172399 118 FEDERAL ST Receipt Status: **Rec'd 3/14/2019**
 Class: LF

Accepted: Check: **OK** Cover/Accept Cover:

Waste/Material Type	State	Tons	Cover/Accept	Cover Type	Tons
MSW	MA	86,888	<input type="text" value="0.302"/>	Bottom Ash	19,305
Ash	MA	5,983		C&D Fines	12,168
Recycling Residue	MA	8,294			
Bulky Waste	MA	3,145			

Days Open: 317 Leachate (gal): 14,387,873 Leach Treatment/Disposal: Truck off-site

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2018

CHICOPEE

WE

CHICOPEE LANDFILL

Receipt Status: **Rec'd 2/7/2019**

Reg Obj Acct: 291515

161 NEW LOMBARD RD

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	CT	13,003
MSW	MA	108,913
MSW	VT	167
DPW Waste	CT	315
DPW Waste	MA	3,150
Special/Supplemental	CT	5,226
Special/Supplemental	MA	2,749

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	25,636
Contaminated Soil	104,846
Foundry Sand	5,289
Sludge Ash	11,974
Street Sweepings	1,624
WWTP Grit	274

Days Open: 266 Leachate (gal): 10,594,536 Leach Treatment/Disposal: Sewer

DARTMOUTH

SE

CRAPO HILL LANDFILL

Receipt Status: **Rec'd 2/8/2019**

Reg Obj Acct: 172448

300 SAMUEL BARNET BLVD

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	101,950
Sludge (WTP)	MA	4
DPW Waste	MA	3,103
Other (NonMSW)	MA	530

Cover Type	Tons
Bottom Ash	623
Other	858
Soil/Sand	16,838
Street Sweepings	20,137
Wood Chips	6,070

Days Open: 287 Leachate (gal): 8,150,060 Leach Treatment/Disposal: Sewer

FALL RIVER

SE

ALLIED SERVICES OF MASSACHUSETTS

Receipt Status: **Pending**

Reg Obj Acct: 172513

1080 AIRPORT RD

Class: LF

Accepted: Check: Cover/Accept

Cover:

Days Open: Leachate (gal): Leach Treatment/Disposal:

HAVERHILL

NE

WARD HILL NECK LANDFILL

Receipt Status: **Rec'd 3/14/2019**

Reg Obj Acct: 173281

100 RECOVERY WAY

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	3,923
Ash	MA	146,647

Cover Type	Tons
Contaminated Soil	32,136

Days Open: 260 Leachate (gal): 10,926,770 Leach Treatment/Disposal: OnSite&Sewer

HULL

SE

HULL LANDFILL

Receipt Status: **Rec'd 2/15/2019**

Reg Obj Acct: 172619

LOGAN AVE

Class: LF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
MSW	MA	240
DPW Waste	MA	221

Cover Type	Tons
Street Sweepings	580

Days Open: 144 Leachate (gal): 390,000 Leach Treatment/Disposal: Sewer

MIDDLEBORO

SE

FINAL GIFT USA LLC

Receipt Status: **Rec'd 3/15/2019**

Reg Obj Acct: 274537

471 WAREHAM ST

Class: SMLF

Accepted: Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
Ash	MA	83

Days Open: 306 Leachate (gal): 0 Leach Treatment/Disposal:

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2018

MIDDLEBORO SE MIDDLEBOROUGH LANDFILL
Reg Obj Acct: 172728 207 PLYMPTON ST

Receipt Status: **Rec'd 2/15/2019**
Class: LF

Accepted: 58,279 58,279 Check: **OK** Cover/Accept

Cover: 24,776

Waste/Material Type	State	Tons
MSW	MA	46,497
Sludge (WWTP)	MA	3,587
Recycling Residue	MA	1,081
DPW Waste	MA	433
Other (NonMSW)	MA	1,218
Special/Supplemental	MA	5,463

0.425

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	12,236
Contaminated Soil	8,411
Other	2,880
Soil/Sand	1,059
Street Sweepings	190

Days Open: 304 Leachate (gal): 10,150,206 Leach Treatment/Disposal: Truck off-site

MIDDLEBOROUGH SE FINAL GIFT USA LLC
Reg Obj Acct: 274537 471 WAREHAM ST

Receipt Status: **Rec'd 3/15/2019**
Class: SMLF

Accepted: 83 83 Check: **OK** Cover/Accept

Cover:

Waste/Material Type	State	Tons
Ash	MA	83

Days Open: 306 Leachate (gal): 0 Leach Treatment/Disposal:

MIDDLEBOROUGH SE MIDDLEBOROUGH LANDFILL
Reg Obj Acct: 172728 207 PLYMPTON ST

Receipt Status: **Rec'd 2/15/2019**
Class: LF

Accepted: 58,279 58,279 Check: **OK** Cover/Accept

Cover: 24,776

Waste/Material Type	State	Tons
MSW	MA	46,497
Sludge (WWTP)	MA	3,587
Recycling Residue	MA	1,081
DPW Waste	MA	433
Other (NonMSW)	MA	1,218
Special/Supplemental	MA	5,463

0.425

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	12,236
Contaminated Soil	8,411
Other	2,880
Soil/Sand	1,059
Street Sweepings	190

Days Open: 304 Leachate (gal): 10,150,206 Leach Treatment/Disposal: Truck off-site

NANTUCKET SE NANTUCKET LANDFILL
Reg Obj Acct: 172753 188 MADAKET RD

Receipt Status: **Rec'd 2/18/2019**
Class: LF

Accepted: 2,800 2,800 Check: **OK** Cover/Accept

Cover: 1,000

Waste/Material Type	State	Tons
MSW	MA	2,800

0.357

Cover Type	Tons
Soil/Sand	1,000

Days Open: 355 Leachate (gal): 432,531 Leach Treatment/Disposal: Truck off-site

PEABODY NE PEABODY ASH MONOFILL
Reg Obj Acct: 266442 0 FARM AVE

Receipt Status: **Rec'd 3/14/2019**
Class: LF

Accepted: 0 Check: **Problem** Cover/Accept

Cover:

Waste/Material Type	State	Tons

Days Open: 0 Leachate (gal): 11,360,821 Leach Treatment/Disposal: Sewer

SAUGUS NE WHEELABRATOR SAUGUS INC ASH LANDFILL
Reg Obj Acct: 172913 100 SALEM TPKE

Receipt Status: **Rec'd 2/26/2019**
Class: LF

Accepted: 91,606 91,606 Check: **OK** Cover/Accept

Cover: 32,482

Waste/Material Type	State	Tons
Ash	MA	91,606

0.355

Cover Type	Tons
Contaminated Soil	26,229
Soil/Sand	6,253

Days Open: 365 Leachate (gal): 56,601,613 Leach Treatment/Disposal: On Site

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2018

SHREWSBURY

CE

SHREWSBURY LANDFILL

Receipt Status: **Rec'd 2/15/2019**

Reg Obj Acct: 172931

620 HARTFORD TPKE

Class: LF

Accepted: 376.090 376.090 Check: **OK** Cover/Accept

Cover: 8.192

Waste/Material Type	State	Tons
Sludge (WWTP)	MA	92
Ash	CT	24,893
Ash	MA	250,129
Ash	NH	52,219
Ash	NY	47,183
Other (NonMSW)	MA	71
Other (NonMSW)	NH	1,503

0.022

Cover Type	Tons
Contaminated Soil	438
Dredge (marine)	8
Other	5,515
Street Sweepings	2,231

Days Open: 312 Leachate (gal): 19,556,055 Leach Treatment/Disposal: Sewer

SOMERSET

SE

BRAYTON POINT LLC

Receipt Status: **Pending**

Reg Obj Acct: 407198

1 BRAYTON POINT RD

Class: LF

Accepted: Check: Cover/Accept

Cover:

Days Open: Leachate (gal): Leach Treatment/Disposal:

SOUTHBRIDGE

CE

SOUTHBRIDGE LANDFILL

Receipt Status: **Rec'd 2/13/2019**

Reg Obj Acct: 172947

165 BAREFOOT RD

Class: LF

Accepted: 261.957 261.957 Check: **OK** Cover/Accept

Cover: 47.831

Waste/Material Type	State	Tons
MSW	CT	27,108
MSW	MA	199,396
Recycling Residue	MA	35,453

0.183

Cover Type	Tons
Contaminated Soil	22,408
Road Base	10,539
Street Sweepings	14,845
WWTP Grit	39

Days Open: 224 Leachate (gal): 7,607,956 Leach Treatment/Disposal: Truck off-site

STURBRIDGE

CE

STURBRIDGE LANDFILL

Receipt Status: **Pending**

Reg Obj Acct: 172975

154 BREAKNECK RD

Class: LF

Accepted: Check: Cover/Accept

Cover:

Days Open: Leachate (gal): Leach Treatment/Disposal:

TAUNTON

SE

TAUNTON LANDFILL

Receipt Status: **Rec'd 2/15/2019**

Reg Obj Acct: 172994

340 EAST BRITANNIA ST

Class: LF

Accepted: 123.410 123.410 Check: **OK** Cover/Accept

Cover: 59.337

Waste/Material Type	State	Tons
MSW	MA	103,476
MSW	RI	173
Sludge (WWTP)	MA	8,958
Recycling Residue	MA	3,432
DPW Waste	MA	819
DPW Waste	RI	26
Special/Supplemental	MA	6,426
Special/Supplemental	NH	11
Special/Supplemental	RI	6
Shingles Asphalt	MA	83

0.481

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	8,595
Contaminated Soil	45,830
Cullet (crushed glass)	2,575
Soil/Sand	2,215
Street Sweepings	122

Days Open: 304 Leachate (gal): 19,342,816 Leach Treatment/Disposal: Sewer

Municipality

Region Reg Obj Name and Address

Reg Obj Name reflects the most recent data and may not reflect 2018

WESTMINSTER

CE

FITCHBURG WESTMINSTER LANDFILL

Receipt Status: **Rec'd 2/13/2019**

Reg Obj Acct: 39885

101 FITCHBURG RD

Class: LF

Accepted: 441.505 441.505 Check: **OK**

Cover/Accept

Cover: 135.586

Waste/Material Type	State	Tons
MSW	MA	277,834
MSW	RI	137,472
MSW	VT	574
Sludge (WWTP)	MA	9,597
Other (NonMSW)	MA	998
Special/Supplemental	MA	15,030

0.307

Cover Type	Tons
Auto Shredder Residue/Auto Fluff	55,709
C&D Residuals	1,804
Compost	6,358
Contaminated Soil	55,712
Paper Sludge	4,226
Sludge Ash	11,366
Street Sweepings	411

Days Open: 305 Leachate (gal): 36,366,278 Leach Treatment/Disposal: Sewer

Report Summary

Number of Annual Reports Listed: 22

Annual Solid Waste Facility Reports: Handling Facility Summary

Calendar Year 2019

Sorted by Municipality & Regulated Object Name

01-Dec-2020

Municipality: ACTON Region: CE Reg Obj Name and Address: ACTON TRANSFER STATION Receipt Status: **Pending**

Reg Obj Acct: 173143 14 FOREST RD Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: OpenDays:

Diverted:

Vendor/End User	Town	State	Tons	Material Type
Acton Compost Site	Acton	MA		Compostables/Organics
Empire Recycling	Billerica	MA		General Recyclables
Tombarello & Sons	Lawrence	MA		Metals

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
Wheelabrator	North Andover	MA		MSW

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

Municipality: AGAWAM Region: WE Reg Obj Name and Address: PIONEER VLY RESOURCE RECOVERY TRANS STAT Receipt Status: **Rec'd 2/12/2020**

Reg Obj Acct: 374839 188 M ST Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
MSW	MA	114

Diverted:

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
Bethlehem LF	Bethlehem	NY		MSW
Colebrook Landfill	Colebrook	NH		MSW
Covanta	Pittsfield	MA		MSW
Covanta Haverhill WTE Facility	Haverhill	MA		MSW
COVANTA SECONN	Preston	CT		MSW
Ontario County Landfill	Stanley	NY		MSW
SEMASS	Rochester	MA		MSW
Seneca Meadows LF	Waterloo	NY		MSW
South Hadley LF	South Hadley	MA		MSW

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

AUBURN CE CASELLA AUBURN TRANSFER STATION Receipt Status: **Rec'd 2/10/2020**
 Reg Obj Acct: 330392 15 HARDSCRABBLE RD Class: LGTRAN - Large Transfer Station

Accepted: 70,411 Waste/Material Type State Tons 70,411 Check Accepted: **OK** OpenDays: 261

Waste/Material Type	State	Tons
MSW	MA	70,167
C&D Waste	MA	244

Diverted: 290

Vendor/End User	Town	State	Tons	Material Type
C&D Tires	Fairhaven	MA	39	Tires
EXCEL	Charlton	MA	138	Metals
Northcoast Services	Portsmouth	NH	37	Electronics/Computers
RE Energy	Lewiston	ME	28	C&D Waste
UMM	Millbury	MA	48	C&D Waste

Disposed: 69,715

Disposal Site Name	Town	State	Tons	Waste Type
Arrowhead Landfill	Perrycounty	AL	237	MSW
clinton county lf	Morrisonville	NY	9,161	MSW
Covanta	Rochester	MA	1,510	MSW
fulton county	Johnston	NY	15,849	MSW
north country landfill	Bethlehem	NH	13,850	MSW
PERC	Orrington	ME	17,732	MSW
Wheelabrator	Millbury	MA	11,376	MSW

Divert + Dispose = 70,005 (Divert+Dispose) - Accept: -406 % Difference: -0.58%

AYER CE DEVENS RECYCLING CENTER Receipt Status: **Rec'd 2/7/2020**
 Reg Obj Acct: 429157 45 INDEPENDENCE DR Class: CDLG - Large C&D Waste Processing Facility

Accepted: 183,928 Waste/Material Type State Tons 183,928 Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
MSW	MA	47,358
C&D Waste	CT	6
C&D Waste	MA	120,033
C&D Waste	ME	1
C&D Waste	NH	8,208
C&D Waste	RI	14
Bulky Waste	MA	8,308

Diverted: 95,974

Vendor/End User	Town	State	Tons	Material Type
CoVANTA	Haverhill	ME	348	MSW
EXCEL	Charlton	MA	1,149	Metals
kennedy recycling	Chelmsford	MA	3,199	Asphalt Brick Concrete
LL & S	Salem	NH	71	Metals
mitrano	Shirley	MA	7	Gypsum
OFFICE PAPER RECOVERY	Wilmington	MA	36	Cardboard
SCHNITZER	Everett	MA	3,706	Metals
Sunny Farms Landfill	Astoria	OH	37,319	C&D Waste
TAFISA	Lac-Megantic	QC	7,571	C&D Waste
Waste management	Rochester	NH	13,770	MSW
Waste management	Fitchburg	MA	1,369	MSW
wheelabrator millbury	North Andover	MA	27,429	MSW

Disposed: 85,205

Disposal Site Name	Town	State	Tons	Waste Type
east coast rail	Lordstown	OH	15,232	Residuals C&D
Sunny Farms Landfill	Fostoria	OH	42,226	Residuals C&D
Sunny Farms Landfill	Fostoria	OH	27,747	C&D Waste

Divert + Dispose = 181,179 (Divert+Dispose) - Accept: -2,749 % Difference: -1.49%

AYER CE FBS TIRE RECYCLING INC Receipt Status: **Rec'd 2/12/2020**
 Reg Obj Acct: 264949 1 BERKSHIRE BLVD Class: LGHNDL - Large Handling Facility

Accepted: 28,739 Waste/Material Type State Tons 28,739 Check Accepted: **OK** OpenDays: 250

Waste/Material Type	State	Tons
Tires	CT	4,942
Tires	MA	11,589
Tires	NH	4,201
Tires	NY	6,300
Tires	RI	498
Tires	VT	1,209

Diverted: 29,054

Vendor/End User	Town	State	Tons	Material Type
BDS	Norridgewock	ME	15,269	Tires
great lakes metals	Peterburg	PA	570	Metals
multilantas	Hondouras	NA	627	Tires
NB Tire Reduction	New Bedford	MA	88	Tires
ND paper	Rumford	ME	12,329	Tires
SCHNITZER	Worcester	MA	171	Metals

Disposed: 106

Disposal Site Name	Town	State	Tons	Waste Type
WM- Barre Martone LF	Norridgewock	ME	106	Tires

Divert + Dispose = 29,160 (Divert+Dispose) - Accept: 421 % Difference: 1.46%

BOSTON NE HOWARD TRANSFER STATION Receipt Status: **Rec'd 1/25/2020**
 Reg Obj Acct: 329121 68 NORFOLK AVE Class: LGTRAN - Large Transfer Station

Accepted: 284,247 Waste/Material Type State Tons 284,247 Check Accepted: **OK** OpenDays: 365

Waste/Material Type	State	Tons
MSW	MA	284,247

Diverted: 133

Vendor/End User	Town	State	Tons	Material Type
casella charlestown	Charlestown	MA	31	Cardboard
j.p. routhier & sons	Ayer	MA	10	Tires
Prolerized NE Co	Everett	MA	2	Metals
RE Energy	Roxbury	MA	17	General Recyclables
RE Energy	Roxbury	MA	27	C&D Waste
Scrap It	Everett	MA	37	Metals
turner metal	Lynn	MA	3	Metals
wm stoughton	Stoughton	MA	6	General Recyclables

Disposed: 284,325

Disposal Site Name	Town	State	Tons	Waste Type
Covanta Haverhill	Haverhill	MA	63,198	MSW
lee country landfill	Bishopville	SC	1,069	MSW
RESCO	Saugus	MA	5,618	MSW
SEMASS	Bourne	MA	64,078	MSW
Turnkey LF	Rochester	NH	149,201	MSW
Wheelabrator	North Andover	MA	1,161	MSW

Divert + Dispose = 284,458 (Divert+Dispose) - Accept: 211 % Difference: 0.07%

BOSTON NE JAMES G GRANT CO TRANSFER STATION Receipt Status: **Rec'd 2/6/2020**
 Reg Obj Acct: 173213 28 WOLCOTT ST Class: -

Accepted: 15,209 Waste/Material Type State Tons 15,209 Check Accepted: **OK** OpenDays: 300

Waste/Material Type	State	Tons
C&D Waste	MA	14,152
Tires	MA	53
Metals	MA	320
Asphalt Brick Concrete	MA	684

Diverted: 10,254

Vendor/End User	Town	State	Tons	Material Type
BoBbs Tire	New Bedford	MA	16	Tires
Champion City	Brockton	MA	3,538	C&D Waste
DeVENS RECYCLING	Devens	MA	1,415	C&D Waste
grant co.	Boston	MA	320	Metals
jr vinagro corp	Johnston	RI	683	Asphalt Brick Concrete
jr vinagro corp	Johnston	RI	4,245	C&D Waste
N.B. Tire Reduction	New Bedford	MA	37	Tires

Disposed: 4,955

Disposal Site Name	Town	State	Tons	Waste Type
dunn landfill	Rensellaer	NY	4,955	C&D Waste

Divert + Dispose = 15,209 (Divert+Dispose) - Accept: 0 % Difference: 0.00%

BOSTON NE REENERGY ROXBURY LLC
 Reg Obj Acct: 173138 101-111 GERARD ST

Receipt Status: **Rec'd 2/12/2020**

Class: CDLG - Large C&D Waste Processing Facility

Accepted: 174,948 Waste/Material Type State Tons 174,948 Check Accepted: **OK** OpenDays: 308

Waste/Material Type	State	Tons
C&D Waste	MA	148,649
Bulky Waste	MA	19,401
Cardboard	MA	46
Metals	MA	20
Asphalt Brick Concrete	MA	4,921
Gypsum	MA	76
Wood C&D	MA	1,835

Diverted: 92,689

Vendor/End User	Town	State	Tons	Material Type
AkS Recycling Inc.	Fitchburg	MA	39	Cardboard
C&D Tires	Fairhaven	MA	20	Tires
carney	Raynham	MA	6,772	Asphalt Brick Concrete
Complete Recycling Solutions	Fall River	MA	6	Electronics/Computers
coventry landfill	Coventry	RI	196	Fines C&D
dynamic waste systems	Methuen	MA	23	Cardboard
Gateway Recycling	Salem	NH	2,560	Metals
jr vinagro corp	Johnston	RI	3,957	Asphalt Brick Concrete
LL & S	Salem	NH	1,321	Metals
Miller Recycling Corp	Attleboro	MA	11	Cardboard
northeast packaging	Billerica	MA	135	Cardboard
RE Energy	Lewiston	ME	53,175	Wood C&D
SCHNITZER	Attleboro	MA	23	Metals
Seneca Meadows Landfill	Seneca Meadows	NY	8,196	Fines C&D
Spiegel	Avon	MA	1,666	Metals
TAFISA	Lac-Megantic	QC	8,280	Wood C&D
USA GYPSUM	Denver	PA	92	Gypsum
Waste management	Middleboro	MA	6,195	Residuals C&D
Waste management	Norridgewock	ME	22	Residuals C&D

Disposed: 91,886

Disposal Site Name	Town	State	Tons	Waste Type
CASELLA	Holyoke	MA	91	Residuals C&D
Champion City	Brockton	MA	351	Residuals C&D
ReEnergy	Ware	MA	60,737	Residuals C&D
S A Drum	Rensselaer	NY	27,016	Residuals C&D
Waste Management	Fitchburg	MA	3,691	Residuals C&D

Divert + Dispose = 184,575 (Divert+Dispose) - Accept: 9,627 % Difference: 5.50%

BOURNE SE BOURNE TRANSFER STATION Receipt Status: **Rec'd 2/11/2020**
 Reg Obj Acct: 362723 201 MACARTHUR BLVD Class: LGTRAN - Large Transfer Station

Accepted: 26,853 Waste/Material Type State Tons 26,853 Check Accepted: **OK** OpenDays: 302

Waste/Material Type	State	Tons
MSW	MA	974
C&D Waste	MA	14,060
C&D Waste	RI	11
Tires	MA	18
General Recyclables	MA	6,359
Compostables/Organics	MA	3,668
Compostables/Organics	ME	1
Textiles/Clothing	MA	28
Metals	MA	1,031
Plastics	MA	1
Asphalt Brick Concrete	MA	478
Household Haz Waste	MA	6
Electronics/Computers	MA	81
Mattresses	MA	137

Diverted: 22,774

Vendor/End User	Town	State	Tons	Material Type
ACE Mattress Recycling	West Warwick	RI	137	Mattresses
BoBbs Tire	New Bedford	MA	18	Tires
Champion City	Brockton	MA	3,231	C&D Waste
crs	Fall River	MA	81	Electronics/Computers
EL Harvey	Westborough	MA	1	Plastics
EL Harvey	Westborough	MA	6,359	General Recyclables
jr vinagro corp	Johnston	RI	7,716	C&D Waste
Mid City Scrap	Everett	MA	1,031	Metals
Middleboro Recycling	Middleboro	MA	6	Household Haz Waste
Raynham Transfer	Raynham	MA	19	C&D Waste
Red Cross	Boston	MA	28	Textiles/Clothing
Town of Bourne	Bourne	MA	478	Asphalt Brick Concrete
Town of Bourne	Bourne	MA	3,669	Compostables/Organics

Disposed: 4,052

Disposal Site Name	Town	State	Tons	Waste Type
Bourne Landfill	Bourne	MA	3,105	Residuals C&D
Bourne Landfill	Bourne	MA	947	MSW

Divert + Dispose = 26,826 (Divert+Dispose) - Accept: -27 % Difference: -0.10%

BRAINTREE SE BRAINTREE TRANSFER STATION Receipt Status: **Rec'd 3/13/2020**
 Reg Obj Acct: 173139 257 IVORY ST Class: LGTRAN - Large Transfer Station

Accepted: 289,154 Waste/Material Type State Tons 289,154 Check Accepted: **OK** OpenDays: 305

Waste/Material Type	State	Tons
MSW	MA	289,146
C&D Waste	MA	8

Diverted: 68

Vendor/End User	Town	State	Tons	Material Type
McConnel Enterprises	Braintree	MA	67	Metals
User Friendly Recycling	Stoughton	MA	1	Electronics/Computers

Disposed: 290,939

Disposal Site Name	Town	State	Tons	Waste Type
Bourne ISWF	Bourne	MA	126	MSW
CMW Landfill	Carver	MA	76,396	MSW
SEMASS	Rochester	MA	214,417	MSW

Divert + Dispose = 291,007 (Divert+Dispose) - Accept: 1,853 % Difference: 0.64%

Municipality

Region Reg Obj Name and Address

BREWSTER SE CAPE SAND & RECYCLING WOOD RECLAMATION Receipt Status: Rec'd 2/13/2020
Reg Obj Acct: 298388 1515 FREEMANS WAY Class: SMHNDL - Small Handling Facility

Accepted: 24,780 Waste/Material Type State Tons 24,780 Check Accepted: OK OpenDays: 324
Wood Waste MA 10,492
Asphalt Brick Concrete MA 14,288

Diverted: 37,426 Vendor/End User Town State Tons Material Type
retail sale Various MA 17,000 Loam
retail sale Various CN 14,174 Asphalt Brick Concrete
retail sale Various MA 6,252 Wood Waste

Disposed:

Divert + Dispose = 37,426 (Divert+Dispose) - Accept: 12,646 % Difference: 51.03%

BROCKTON SE CHAMPION CITY C&D TRANSFER STATION Receipt Status: Rec'd 2/5/2020
Reg Obj Acct: 344386 138 WILDER ST Class: LGTRAN - Large Transfer Station

Accepted: 243,805 Waste/Material Type State Tons 243,805 Check Accepted: OK OpenDays: 307
C&D Waste MA 25,839
Bulky Waste MA 79,517
Residuals C&D MA 138,449

Diverted: 6,759 Vendor/End User Town State Tons Material Type
East Coast Computer Recycling Medford MA 16 Electronics/Computers
F&B Rubberized New Bedford MA 51 Tires
MIGHTY FLAME Rindge NH 2 Metals
STOUGHTON RECYCLING Stoughton MA 5,187 General Recyclables
USA GYPSUM Denver PA 22 Gypsum
Various Various MA 1,481 Metals

Disposed: 248,004 Disposal Site Name Town State Tons Waste Type
Sunny Farms Landfill Fostoria OH 6,403 Residuals C&D
Sunny Farms Landfill Fostoria OH 642 Asphalt Brick Concrete
tunnel Hill reclamation LF New Lexington OH 220,160 Residuals C&D
tunnel Hill reclamation LF New Lexington OH 20,799 Asphalt Brick Concrete

Divert + Dispose = 254,763 (Divert+Dispose) - Accept: 10,958 % Difference: 4.49%

BROCKTON SE TROJAN C&D TRANSFER STATION Receipt Status: **Rec'd 2/11/2020**
 Reg Obj Acct: 279564 71 FOREST ST Class: CDLG - Large C&D Waste Processing Facility

Accepted: 99,511 Waste/Material Type State Tons 99,511 Check Accepted: **OK** OpenDays: 305

Waste/Material Type	State	Tons
C&D Waste	MA	23,000
Other (NonMSW)	MA	281
Bulky Waste	MA	76,134
Asphalt Brick Concrete	MA	96

Diverted: 4,420

Vendor/End User	Town	State	Tons	Material Type
BFI	Brockton	MA	403	Cardboard
BoBbs Tire	Fall River	MA	45	Tires
BRS	Bridgewater	MA	433	Asphalt Brick Concrete
BRS	Bridgewater	MA	394	Wood Waste
carney	Raynham	MA	22	Gypsum
CRTR	Assonet	MA	3	Electronics/Computers
New England Recycling	Taunton	MA	1,063	Wood Waste
Speigel	Brockton	MA	2,057	Metals

Disposed: 95,174

Disposal Site Name	Town	State	Tons	Waste Type
LAFARGE	Lordstown	OH	95,174	Residuals C&D

Divert + Dispose = 99,594 (Divert+Dispose) - Accept: 83 % Difference: 0.08%

BROOKLINE NE BROOKLINE TRANSFER STATION Receipt Status: **Rec'd 1/13/2020**
 Reg Obj Acct: 173140 815 NEWTON ST Class: LGTRAN - Large Transfer Station

Accepted: 30,711 Waste/Material Type State Tons 30,711 Check Accepted: **OK** OpenDays: 248

Waste/Material Type	State	Tons
MSW	MA	22,983
Wood Waste	MA	470
C&D Waste	MA	2,468
DPW Waste	MA	1,847
Tires	MA	9
Compostables/Organics	MA	2,739
Metals	MA	158
Electronics/Computers	MA	37

Diverted: 6,116

Vendor/End User	Town	State	Tons	Material Type
BoBbs Tire	Mattapoissett	MA	9	Tires
Good point recycling	Brockton	MA	37	Electronics/Computers
granite shore power	Bow	NH	498	Wood Waste
Lorusso Corp	Plainville	MA	4,041	Compostables/Organics
Lorusso Corp	Plainville	MA	1,362	DPW Waste
McConnel Enterprises	Braintree	MA	169	Metals

Disposed: 22,999

Disposal Site Name	Town	State	Tons	Waste Type
Covanta	Rochester	MA	22,999	MSW

Divert + Dispose = 29,115 (Divert+Dispose) - Accept: -1,596 % Difference: -5.20%

Municipality

Region Reg Obj Name and Address

CHATHAM SE TW NICKERSON WOOD RECLAMATION Receipt Status: Rec'd 2/17/2020
Reg Obj Acct: 361836 160 MILL HILL RD Class: LGHNDL - Large Handling Facility

Accepted: 11,163 Waste/Material Type State Tons 11,163 Check Accepted: OK OpenDays: 300
Wood Waste MA 6,935
Compostables/Organics MA 1,308
Asphalt Brick Concrete MA 2,920

Diverted: 3,260 Vendor/End User Town State Tons Material Type
Various Various MA Loam
Various Various MA 3,260 Asphalt Brick Concrete
Various Various MA Compostables/Organics

Disposed:

Divert + Dispose = 3,260 (Divert+Dispose) - Accept: -7,903 % Difference: -70.80%

DANVERS NE DANVERS TRANSFER STATION Receipt Status: Rec'd 3/26/2020
Reg Obj Acct: 173130 POPES RD/EAST COAST RD Class: LGTRAN - Large Transfer Station

Accepted: 85,151 Waste/Material Type State Tons 85,151 Check Accepted: OK OpenDays: 302
MSW MA 85,151

Diverted: 299 Vendor/End User Town State Tons Material Type
Complete Recycling Solutions Little Falls MA 6 Electronics/Computers
JRM Newburyport MA 293 Metals

Disposed: 82,964 Disposal Site Name Town State Tons Waste Type
Covanta Haverhill Haverhill MA 78,234 MSW
CoVANTA SEAMASSI Rochester MA 752 MSW
Turnkey LF Rochester NH 1,359 MSW
wm fitchburg Fitchburg MA 247 MSW
WTI SAUGUS Saugus MA 2,372 MSW

Divert + Dispose = 83,263 (Divert+Dispose) - Accept: -1,888 % Difference: -2.22%

DiscrepExplan: due to drying material while sitting in storage at the facility DiscrepRspns:

DEDHAM NE DEDHAM TRANSFER STATION Receipt Status: Pending
Reg Obj Acct: 210300 5 INCINERATOR RD Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: OpenDays:

Diverted: Vendor/End User Town State Tons Material Type
Framingham Salvage Framingham MA Metals
Recycle America Springfield MA Electronics/Computers
WM Raynham TS Raynham MA C&D Waste
WM western processing fac Wilbraham MA C&D Waste

Disposed: Disposal Site Name Town State Tons Waste Type
Fitchburg-Westminster LF Westminster MA MSW
Wheelabrator Millbury Millbury MA MSW

Divert + Dispose = 0 (Divert+Dispose) - Accept: % Difference:

Municipality

Region Reg Obj Name and Address

DENNIS SE ROBERT CHILDS WOOD RECLAMATION Receipt Status: **Rec'd 1/28/2020**
 Reg Obj Acct: 324535 169 GREAT WESTERN RD Class: LGHN DL - Large Handling Facility

Accepted: 11,797 Waste/Material Type State Tons 11,797 Check Accepted: **OK** OpenDays: 304
 Wood Waste MA 11,797

Diverted: 64,263

Vendor/End User	Town	State	Tons	Material Type
Various	Various	MA	53,553	Loam
Various	Various	MA	10,530	Wood Waste
Various (Misc)	Various	MA	180	Mulch

Disposed:

Divert + Dispose = 64,263 (Divert+Dispose) - Accept: 52,466 % Difference: 444.74%

DENNIS SE S&J EXCO C&D HANDLING FACILITY Receipt Status: **Rec'd 2/10/2020**
 Reg Obj Acct: 173241 200 GREAT WESTERN RD Class: LGTRAN - Large Transfer Station

Accepted: 18,589 Waste/Material Type State Tons 18,589 Check Accepted: **OK** OpenDays: 304
 C&D Waste MA 18,589

Diverted: 18,541

Vendor/End User	Town	State	Tons	Material Type
Allied	Walpole	MA	327	Metals
ERRCO	Epping	NH	1,786	C&D Waste
jr vinagro corp	Johnston	RI	10,830	C&D Waste
NER	Tauton	MA	5,522	C&D Waste
S&J Exco	Dennis	MA	76	Asphalt Brick Concrete

Disposed: 28

Disposal Site Name	Town	State	Tons	Waste Type
Champion City	Brockton	MA	28	C&D Waste

Divert + Dispose = 18,569 (Divert+Dispose) - Accept: -20 % Difference: -0.11%

EDGARTOWN SE EDGARTOWN CENTRAL FACILITY
Reg Obj Acct: 285171 750 WEST TISBURY RD

Receipt Status: **Rec'd 1/30/2020**

Class: LGTRAN - Large Transfer Station

Accepted: 10,767

Waste/Material Type	State	Tons
MSW	MA	9,182
Wood Waste	MA	200
Tires	MA	6
General Recyclables	MA	526
Compostables/Organics	MA	7
Textiles/Clothing	MA	17
Metals	MA	276
Household Haz Waste	MA	16
Electronics/Computers	MA	17
Mulch	MA	520

10,767

Check Accepted: **OK**

OpenDays: 349

Diverted: 1,585

Vendor/End User	Town	State	Tons	Material Type
Amercian Red Cross	Boston	MA	17	Textiles/Clothing
BoBbs Tire	Mattapoissett	MA	6	Tires
CRT Inc	East Freetown	MA	17	Electronics/Computers
EL Harvey	East Freetown	MA	127	Metals
EL Harvey	Westborough	MA	526	General Recyclables
INTERSTATE BATTERY	Dartmouth	MA	16	Household Haz Waste
island grown initive	Oak Bluffs	MA	520	Mulch
island grown initive	Oak Bluffs	MA	7	Compostables/Organics
John Keene	West Tisbury	MA	200	Wood Waste
Mid City Scrap	Westport	MA	149	Metals

Disposed: 9,182

Disposal Site Name	Town	State	Tons	Waste Type
Covanta	Rochester	MA	9,182	MSW

Divert + Dispose = 10,767 (Divert+Dispose) - Accept: 0 % Difference: 0.00%

EVERETT NE WOOD WASTE OF BOSTON INC
Reg Obj Acct: 328984 85-87 BOSTON ST

Receipt Status: **Pending**

Class: CDLG - Large C&D Waste Processing Facility

Accepted:

Check Accepted:

OpenDays:

Diverted:

Vendor/End User	Town	State	Tons	Material Type
Crow Lane Landfill	Newburyport	MA		Asphalt Brick Concrete
Prolerized NE Co	Everett	MA		Metals

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
Casella Waste	Hampden	ME		C&D Waste
Turnkey LF (WMI/TREE)	Rochester	NH		C&D Waste

Divert + Dispose = 0 (Divert+Dispose) - Accept: % Difference:

Municipality

Region Reg Obj Name and Address

FALL RIVER SE REPUBLIC FALL RIVER TRANSFER STATION Receipt Status: Rec'd 1/14/2020
Reg Obj Acct: 547901 1080 AIRPORT RD Class: LGHNDL - Large Handling Facility

Accepted: 153,172 Waste/Material Type State Tons 153,172 Check Accepted: OK OpenDays: 307

Table with 4 columns: Waste/Material Type, State, Tons. Rows: MSW (MA, 141,583), General Recyclables (MA, 11,589)

Diverted: 10,680

Table with 6 columns: Vendor/End User, Town, State, Tons, Material Type. Rows: AuBURN CASELLA (Auburn, MA, 9,697, General Recyclables), BoBbs Tire (New Bedford, MA, 12, Tires), EL Harvey (Westborough, MA, 883, General Recyclables), Mid City Scrap (Wesport, MA, 88, Metals)

Disposed: 136,556

Table with 5 columns: Disposal Site Name, Town, State, Tons, Waste Type. Rows: Crapo Hill Landfill (Dartmouth, MA, 1,477, MSW), SEMASS (West Wareham, MA, 105,148, MSW), Waste Management (Middleborough, MA, 29,931, MSW)

Divert + Dispose = 147,236 (Divert+Dispose) - Accept: -5,936 % Difference: -3.88%

FALMOUTH SE BLACKSMITH SHOP FARMS WOOD RECLAMATION Receipt Status: Pending
Reg Obj Acct: 186654 716 BLACKSMITH SHOP RD Class: LGHNDL - Large Handling Facility

Accepted: Check Accepted: OpenDays:

Diverted:

Table with 6 columns: Vendor/End User, Town, State, Tons, Material Type. Rows: Various (Barnstable, MA, Mulch), Various (Barnstable, MA, Loam), Various (Barnstable, MA, Compostables/Organics)

Disposed:

Table with 5 columns: Disposal Site Name, Town, State, Tons, Waste Type. Row: Bourne Landfill (Bourne, MA, Wood Waste)

Divert + Dispose = 0 (Divert+Dispose) - Accept: % Difference:

FITCHBURG

CE AKS RECYCLING INC

Receipt Status: **Rec'd 2/14/2020**

Reg Obj Acct: 366279

15 COBBLER DR

Class: CDLG - Large C&D Waste Processing Facility

Accepted: 108.509

Waste/Material Type	State	Tons
MSW	CT	9
MSW	MA	69,793
MSW	ME	6
MSW	NH	8,388
Wood Waste	MA	71
Wood Waste	NH	76
C&D Waste	CT	2
C&D Waste	MA	17,881
C&D Waste	NH	5,247
C&D Waste	VT	16
Tires	MA	3
Tires	NH	1
Compostables/Organics	MA	246
Metals	MA	258
Asphalt Brick Concrete	MA	3,778
Electronics/Computers	MA	14
Electronics/Computers	NH	1
Wood C&D	MA	2,227
Wood C&D	NH	492

108.509

Check Accepted: **OK**

OpenDays: 308

Diverted: 16.306

Vendor/End User	Town	State	Tons	Material Type
complete Material Management	Southbridge	MA	424	Wood Waste
EERCO	Epping	NH	3,558	Wood Waste
EL Harvey	Westborough	MA	1,691	Wood Waste
EXCEL	Westport	MA	1,890	Metals
F&B Rubberized	New Bedford	MA	62	Tires
Harding Metals	Northwood	NH	24	Metals
intera materials	Jessup	MD	66	Household Haz Waste
northeast packaging	Billerica	MA	179	Cardboard
SCHNITZER	Everett	MA	923	Metals
Scrap It	Everett	MA	108	Metals
Scrap X	Providence	RI	32	Metals
Trl County	Ware	MA	1,285	C&D Waste
United Material Management	Millbury	MA	26	C&D Waste
United Material Management	Millbury	MA	2,475	Wood Waste
Western Recycling	Wilbraham	MA	910	C&D Waste
WTE	Greenfield	MA	56	Metals
zero waste	Bow	NH	2,597	C&D Waste

Disposed: 272.752

Disposal Site Name	Town	State	Tons	Waste Type
APEX SANITARY LANDFILL	Amsterdam	OH	6,880	MSW
Covanta	Haverhill	MA	14,549	MSW
North County Environmental	Bethlehem	NH	4,387	C&D Waste
North County Environmental	Bethlehem	NH	217	MSW
Turnkey LF (WMI/TREE)	Rochester	NH	1,695	C&D Waste
Waste Management	Rochester	NH	329	MSW
Waste Management	Fitchburg	MA	199,980	MSW
Western Recycling	Wilbraham	MA	25	MSW
Wheelabrator	Penacook	NH	10,533	MSW

Disposal Site Name	Town	State	Tons	Waste Type
Wheelabrator	Millbury	MA	32,863	MSW
zero waste	Bow	NH	1,294	MSW

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

FITCHBURG

CE HARVEY RECYCLING OF FITCHBURG LLC

Receipt Status: **Pending**

Reg Obj Acct: 427718

50 ARBOR WAY

Class: CDLG - Large C&D Waste Processing Facility

Accepted:

Check Accepted:

OpenDays:

Diverted:

Vendor/End User	Town	State	Tons	Material Type
E.L. Harvey	Westborough	MA		Plastics
E.L. Harvey	Westborough	MA		Mixed Paper
SCHNITZER NE	Everett	MA		Metals

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
Boralex	Livermore Falls	ME		Demo Wood Chips
Domtar		CN		Demo Wood Chips
Thompson Enterprises	South China	ME		C&D Waste
Waste Management	Westminister	MA		C&D Waste

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

HARWICH

SE OUR WOOD RECLAMATION FACILITY

Receipt Status: **Rec'd 2/10/2020**

Reg Obj Acct: 329066

24 GREAT WESTERN RD

Class: LGHNDL - Large Handling Facility

Accepted:

Waste/Material Type	State	Tons
Wood Waste	MA	9,898

Check Accepted: **OK**

OpenDays: 304

Diverted:

Vendor/End User	Town	State	Tons	Material Type
homeowners/small contractors	Various	MA	1,075	Mulch
homeowners/small contractors	Various	MA	40,059	Loam
homeowners/small contractors	Various	MA	244	Wood Waste

Disposed:

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

HOLLISTON CE HOLLISTON TRANSFER STATION Receipt Status: **Rec'd 3/13/2020**
 Reg Obj Acct: 330447 115 WASHINGTON ST Class: LGTRAN - Large Transfer Station

Accepted: 123,008 Waste/Material Type State Tons 123,008 Check Accepted: **OK** OpenDays: 255

Waste/Material Type	State	Tons
MSW	MA	89,162
C&D Waste	MA	30,740
General Recyclables	MA	3,106

Diverted: 33,894

Vendor/End User	Town	State	Tons	Material Type
EL Harvey	Westborough	MA	3,084	General Recyclables
Framingham Salvage	Framingham	MA	99	Metals
RE Energy	Salem	NH	30,705	C&D Waste
User Friendly Recycling	Stoughton	MA	6	Electronics/Computers

Disposed: 89,037

Disposal Site Name	Town	State	Tons	Waste Type
CMW Landfill	Carver	MA	25,754	MSW
Covanta	Springfield	MA	162	MSW
covanta S.E Connecticut EfW facility	Preston	CT	18	C&D Waste
covanta S.E Connecticut EfW facility	Preston	CT	3,419	MSW
Fitchburg LF	Fitchburg	MA	4,383	MSW
SEMASS	Rochester	MA	24	C&D Waste
SEMASS	Rochester	MA	52,935	MSW
Wheelabrator	Millbury	MA	3	Gypsum
Wheelabrator	Millbury	MA	2,339	MSW

Divert + Dispose = 122,931 (Divert+Dispose) - Accept: -77 % Difference: -0.06%

HOLYOKE WE CASELLA OF HOLYOKE INC TRANSFER STATION Receipt Status: **Rec'd 2/5/2020**
 Reg Obj Acct: 449795 686 MAIN ST Class: LGTRAN - Large Transfer Station

Accepted: **178,308** Waste/Material Type State Tons **178,308** Check Accepted: **OK** OpenDays: 302

Waste/Material Type	State	Tons
MSW	MA	115,145
C&D Waste	MA	24,226
Other (NonMSW)	MA	902
Bulky Waste	MA	29,607
Asphalt Brick Concrete	MA	1
Residuals C&D	MA	8,427

Diverted: **3,389**

Vendor/End User	Town	State	Tons	Material Type
F&B Rubberized	New Bedford	MA	4	Tires
freeman	Springfield	MA	143	Metals
K&W Materials and Recycling	West Springfield	MA	702	Wood C&D
kane Metal	Chicopee	MA	20	Metals
max salvage	Holyoke	MA	1,278	Asphalt Brick Concrete
max salvage	Holyoke	MA	2	Metals
Northcoast Services	Claremont	NH	6	Electronics/Computers
Northstar	Longmeadow	MA	176	Cardboard
Sullivan Steel	Holyoke	MA	872	Metals
WTE	Greenfield	MA	186	Metals

Disposed: **174,538**

Disposal Site Name	Town	State	Tons	Waste Type
Chemung countyLF	Elmira	NY	241	MSW
Chicopee Landfill	Chicopee	MA	1,899	MSW
clinton county lf	Morrisonville	NY	43,196	MSW
Covanta	Springfield	MA	924	Wood C&D
Covanta	Pittsfield	MA	5,122	MSW
fulton county	Johnston	NY	182	MSW
Ontario County Landfill	Stanley	NY	1,005	MSW
pine avenue landfill	Niagara Falls	NY	4,803	Residuals C&D
Seneca Meadows Landfill	Waterloo	NY	67,366	MSW
Sunny Farms Landfill	Fostoria	OH	36,483	Residuals C&D
Wheelabrator	Hudson Falls	NY	13,060	MSW
Wheelabrator	Millbury	MA	257	MSW

Divert + Dispose = **177,927** (Divert+Dispose) - Accept: **-381** % Difference: **-0.21%**

HOPKINTON CE MATERIALS RECOVERY & RECYCLING FACILITY Receipt Status: **Rec'd 2/14/2020**
 Reg Obj Acct: 356519 0 WOOD ST Class: LGHNDL - Large Handling Facility

Accepted: **84,912** Waste/Material Type State Tons **84,912** Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
General Recyclables	MA	84,912

Diverted: **60,481**

Vendor/End User	Town	State	Tons	Material Type
EL Harvey	Hopkinton	MA	60,481	General Recyclables

Disposed: **24,431**

Disposal Site Name	Town	State	Tons	Waste Type
Various	Various	VA	3,792	Recycling Residue
Various	Various	NY	16,389	Recycling Residue
Wheelabrator	Millbury	MA	4,250	Recycling Residue

Divert + Dispose = **84,912** (Divert+Dispose) - Accept: **0** % Difference: **0.00%**

HUDSON CE HUDSON TRANSFER STATION Receipt Status: **Rec'd 2/15/2020**
 Reg Obj Acct: 280116 300 COX ST Class: LGTRAN - Large Transfer Station

Accepted: **51,955** Waste/Material Type State Tons **51,955** Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
MSW	MA	43,050
Tires	MA	10
General Recyclables	MA	389
Compostables/Organics	MA	997
Metals	MA	260
Wood C&D	MA	7,249

Diverted: **8,905**

Vendor/End User	Town	State	Tons	Material Type
BoBbs Tire	Fall River	MA	10	Tires
BP Trucking	Ashland	MA	89	Cardboard
carney	Raynham	MA	67	Glass
FCR	Auburn	MA	233	General Recyclables
Framingham Salvage	Framingham	MA	260	Metals
JOBARB FARM	Hudson	MA	997	Mulch
LL & S	Salem	NH	7,249	Wood C&D

Disposed: **64,305**

Disposal Site Name	Town	State	Tons	Waste Type
Covanta	Agawam	MA	24,709	MSW
Finch	Ganesvoort	NY	13,897	MSW
Seneca Meadows Landfill	Seneca Falls	MA	7,358	MSW
Wheelabrator	North Andover	MA	18,341	MSW

Divert + Dispose = **73,210** (Divert+Dispose) - Accept: **21,255** % Difference: **40.91%**

LENOX WE LENOX VALLEY WASTE TRANSFER FACILITY Receipt Status: **Rec'd 2/7/2020**
 Reg Obj Acct: 174773 68 WILLOW CREEK RD Class: LGTRAN - Large Transfer Station

Accepted: 20,308 Waste/Material Type State Tons 20,308 Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
MSW	MA	1,019
Wood Waste	MA	133
C&D Waste	MA	17,501
General Recyclables	MA	75
Compostables/Organics	MA	342
Cardboard	MA	206
Metals	MA	553
Plastics	MA	12
Electronics/Computers	MA	35
Shingles Asphalt	MA	432

Diverted: 1,356

Vendor/End User	Town	State	Tons	Material Type
Ben Weitsman	Albany	NY	553	Metals
MEADOW FARMS	Lee	MA	342	Compostables/Organics
raw maqterial recovery corp	Gardner	MA	35	Electronics/Computers
Sonoco	Holyoke	MA	206	Cardboard
TAM recycling Inc	Pownal	VT	12	Plastics
TAM recycling Inc	Pownal	VT	75	General Recyclables
Wm. Biers	Albany	NY	133	Wood Waste

Disposed: 18,952

Disposal Site Name	Town	State	Tons	Waste Type
Sunny Farms Landfill	Fostoria	OH	18,952	C&D Waste

Divert + Dispose = 20,308 (Divert+Dispose) - Accept: 0 % Difference: 0.00%

LEOMINSTER CE LEOMINSTER TRANSFER STATION Receipt Status: **Rec'd 2/6/2020**
 Reg Obj Acct: 369009 256 NEW LANCASTER ST Class: LGTRAN - Large Transfer Station

Accepted: 44,020 Waste/Material Type State Tons 44,020 Check Accepted: **OK** OpenDays: 271

Waste/Material Type	State	Tons
MSW	MA	34,874
C&D Waste	MA	614
Tires	MA	1
Bulky Waste	MA	19
General Recyclables	MA	8,510
Electronics/Computers	MA	2

Diverted: 7,809

Vendor/End User	Town	State	Tons	Material Type
EL Harvey	Westborough	MA	132	General Recyclables
Electronic Recycling internationa	Holliston	MA	2	Electronics/Computers
LIBERTY TIRE	Ayer	MA	8	Tires
RRT recycling	Springfield	MA	1,007	Cardboard
SCHNITZER	Everett	MA	8	Metals
vinagro	Johnston	RI	325	C&D Waste
Waste management	Avon	MA	6,314	General Recyclables
WASTE MANAGEMENT RECY	BillERICA	MA	13	General Recyclables

Disposed: 35,156

Disposal Site Name	Town	State	Tons	Waste Type
Fitchburg-Westminster LF	Westminster	MA	34,891	MSW
Wheelabrator Millbury	Millbury	MA	265	MSW

Divert + Dispose = 42,965 (Divert+Dispose) - Accept: -1,055 % Difference: -2.40%

DiscrepExplan: waste stream on floor from prior year DiscrepRspns:

LYNN NE LYNN TRANSFER STATION Receipt Status: **Rec'd 3/26/2020**
 Reg Obj Acct: 360908 247A COMMERCIAL ST Class: LGTRAN - Large Transfer Station

Accepted: 198,887 Waste/Material Type State Tons 198,887 Check Accepted: **OK** OpenDays: 250

Waste/Material Type	State	Tons
MSW	MA	198,887

Diverted: 33

Vendor/End User	Town	State	Tons	Material Type
Complete Recycling Solutions	Fall River	MA		Other (NonMSW)
turner metal	Lynn	MA	33	Metals

Disposed: 196,932

Disposal Site Name	Town	State	Tons	Waste Type
Bourne ISWF	Bourne	MA	371	MSW
CMW Landfill	Carver	MA	1,909	MSW
Covanta Haverhill	Haverhill	MA	76,285	MSW
Fitchburg LF	Fitchburg	MA	715	MSW
preston, ct	Preston	CT	1,194	MSW
SEMASS	Bourne	MA	88,371	MSW
Turnkey LF	Rochester	NH	28,087	MSW

Divert + Dispose = 196,965 (Divert+Dispose) - Accept: -1,922 % Difference: -0.97%

MARLBORO CE POST ROAD TRANSFER & RECYCLING FACILITY Receipt Status: **Rec'd 2/10/2020**
 Reg Obj Acct: 173173 791 BOSTON POST RD Class: LGTRAN - Large Transfer Station

Accepted: 35,655 Waste/Material Type State Tons 35,655 Check Accepted: **OK** OpenDays: 266

Waste/Material Type	State	Tons
MSW	MA	35,044
C&D Waste	MA	584
Tires	MA	2
Bulky Waste	MA	2
Metals	MA	1
Electronics/Computers	MA	4
Mattresses	MA	18

Diverted: 235

Vendor/End User	Town	State	Tons	Material Type
Beaupre Scrap	Worcester	MA	6	Metals
EL Harvey	Westborough	MA	1	Cardboard
Electronic Recycling internationa	Holliston	MA	4	Electronics/Computers
LIBERTY TIRE	Littleton	MA	12	Tires
MiGHTY FLAME	Clyde	NY	1	Metals
vinagro	Johnston	RI	211	C&D Waste

Disposed: 35,204

Disposal Site Name	Town	State	Tons	Waste Type
RCI FITCHBURG LF	Westminister	MA	34,356	MSW
WTI SAUGUS	Saugus	MA	848	MSW

Divert + Dispose = 35,439 (Divert+Dispose) - Accept: -216 % Difference: -0.61%

DiscrepExplan: waste still on floor DiscrepRspns:

MARLBORO CE WECARE ENVIRONMENTAL COMPOST FACILITY Receipt Status: **Rec'd 2/14/2020**
 Reg Obj Acct: 378494 856 BOSTON POST RD Class: CMPOST - Site Assigned Compost Facility

Accepted: 26,292 Waste/Material Type State Tons 26,292 Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
MSW	CT	34
MSW	MA	10,553
Wood Waste	MA	334
Sludge (WWTP)	MA	6,161
Tires	MA	18
Bulky Waste	MA	1,571
General Recyclables	MA	629
Compostables/Organics	MA	6,297
Compostables/Organics	NY	336
Metals	MA	359

Diverted: 2,360

Vendor/End User	Town	State	Tons	Material Type
carney	Raynham	MA	923	Compostables/Organics
Framingham Salvage	Framingham	MA	359	Metals
JP Routhier	Littleton	MA	18	Tires
smithfield peat	Smithfield	RI	334	Wood Waste
WeCare environmental	Marlboro	MA	726	Sludge (WWTP)

Disposed: 14,235

Disposal Site Name	Town	State	Tons	Waste Type
Arrowhead Landfill	Perrycounty	AL	695	MSW
clinton county lf	Morrisonville	NY	168	MSW
Seneca Meadows LF	Waterloo	NY	13,372	MSW

Divert + Dispose = 16,595 (Divert+Dispose) - Accept: -9,697 % Difference: -36.88%

MARLBOROUGH CE POST ROAD TRANSFER & RECYCLING FACILITY Receipt Status: **Rec'd 2/10/2020**
 Reg Obj Acct: 173173 791 BOSTON POST RD Class: LGTRAN - Large Transfer Station

Accepted: 35,655 Waste/Material Type State Tons 35,655 Check Accepted: **OK** OpenDays: 266

Waste/Material Type	State	Tons
MSW	MA	35,044
C&D Waste	MA	584
Tires	MA	2
Bulky Waste	MA	2
Metals	MA	1
Electronics/Computers	MA	4
Mattresses	MA	18

Diverted: 235

Vendor/End User	Town	State	Tons	Material Type
Beaupre Scrap	Worcester	MA	6	Metals
EL Harvey	Westborough	MA	1	Cardboard
Electronic Recycling internationa	Holliston	MA	4	Electronics/Computers
LIBERTY TIRE	Littleton	MA	12	Tires
MIGHTY FLAME	Clyde	NY	1	Metals
vinagro	Johnston	RI	211	C&D Waste

Disposed: 35,204

Disposal Site Name	Town	State	Tons	Waste Type
RCI FITCHBURG LF	Westminister	MA	34,356	MSW
WTI SAUGUS	Saugus	MA	848	MSW

Divert + Dispose = 35,439 (Divert+Dispose) - Accept: -216 % Difference: -0.61%

DiscrepExplan: waste still on floor DiscrepRspns:

MARLBOROUGH

CE WECARE ENVIRONMENTAL COMPOST FACILITY

Receipt Status: **Rec'd 2/14/2020**

Reg Obj Acct: 378494

856 BOSTON POST RD

Class: CMPOST - Site Assigned Compost Facility

Accepted: 26,292

Waste/Material Type	State	Tons
MSW	CT	34
MSW	MA	10,553
Wood Waste	MA	334
Sludge (WWTP)	MA	6,161
Tires	MA	18
Bulky Waste	MA	1,571
General Recyclables	MA	629
Compostables/Organics	MA	6,297
Compostables/Organics	NY	336
Metals	MA	359

26,292

Check Accepted: **OK**

OpenDays: 307

Diverted: 2,360

Vendor/End User	Town	State	Tons	Material Type
carney	Raynham	MA	923	Compostables/Organics
Framingham Salvage	Framingham	MA	359	Metals
JP Routhier	Littleton	MA	18	Tires
smithfield peat	Smithfield	RI	334	Wood Waste
WeCare environmental	Marlboro	MA	726	Sludge (WWTP)

Disposed: 14,235

Disposal Site Name	Town	State	Tons	Waste Type
Arrowhead Landfill	Perrycounty	AL	695	MSW
clinton county lf	Morrisonville	NY	168	MSW
Seneca Meadows LF	Waterloo	NY	13,372	MSW

Divert + Dispose = 16,595 (Divert+Dispose) - Accept: -9,697 % Difference: -36.88%

MARSHFIELD SE MARSHFIELD TRANSFER STATION
 Reg Obj Acct: 299300 23 CLAY PIT RD

Receipt Status: **Rec'd 2/11/2020**

Class: LGTRAN - Large Transfer Station

Accepted: 14,918 14,918 Check Accepted: **OK** OpenDays: 302

Waste/Material Type	State	Tons
MSW	MA	7,633
Wood Waste	MA	175
C&D Waste	MA	1,953
Tires	MA	7
General Recyclables	MA	3,220
Compostables/Organics	MA	1,350
Textiles/Clothing	MA	20
Metals	MA	501
Household Haz Waste	MA	1
Electronics/Computers	MA	58

Diverted: 5,332

Vendor/End User	Town	State	Tons	Material Type
Bay State Textile	Marston Mills	MA	16	Textiles/Clothing
Complete Recycling Solutions	Fall River	MA	58	Electronics/Computers
fbs tire recycling	Littleton	MA	7	Tires
Marshfield Residents	Marshfield	MA	1,350	Compostables/Organics
Red Cross	Marshfield	MA	4	Textiles/Clothing
REPUBLIC SERVICES	Fall River	MA	3,220	General Recyclables
RINDGE ENERGY	Rindge	NH	1	Metals
Speigel	Brockton	MA	500	Metals
Synergy Metals Recycling	Seekonk	MA	1	Household Haz Waste
town of mashfield	Mashfield	MA	175	Wood Waste

Disposed: 9,587

Disposal Site Name	Town	State	Tons	Waste Type
Covanta	Rochester	MA	1,953	C&D Waste
Covanta	Rochester	MA	7,634	MSW

Divert + Dispose = 14,919 (Divert+Dispose) - Accept: 1 % Difference: 0.01%

Municipality

Region Reg Obj Name and Address

MELROSE NE WMI CONNOLLY TRANSFER STATION
Reg Obj Acct: 318665 740 BROADWAY

Receipt Status: **Rec'd 2/11/2020**

Class: LGTRAN - Large Transfer Station

Accepted: 49,847 Waste/Material Type State Tons 49,847 Check Accepted: **OK** OpenDays: 255

Waste/Material Type	State	Tons
MSW	MA	49,645
MSW	NH	14
C&D Waste	MA	174
Tires	MA	1
Electronics/Computers	MA	6
Mattresses	MA	7

Diverted: 158

Vendor/End User	Town	State	Tons	Material Type
Organic Waste Management	Malden	MA	2	Cardboard
rsr recycling	Raynham	MA	49	C&D Waste
SCHNITZER	Everett	MA	30	Metals
vinagro	Johnston	RI	77	C&D Waste

Disposed: 49,459

Disposal Site Name	Town	State	Tons	Waste Type
RCI FITCHBURG LF	Fitchburg	MA	621	MSW
Turnkey LF	Rochester	NH	44,908	MSW
WTI NORTH ANDOVER	North Andover	MA	609	MSW
WTI SAUGUS	Saugus	MA	3,321	MSW

Divert + Dispose = 49,617 (Divert+Dispose) - Accept: -230 % Difference: -0.46%

METHUEN NE METHUEN TRANSFER STATION
Reg Obj Acct: 173278 HUNTINGTON AVE

Receipt Status: **Pending**

Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: OpenDays:

Diverted:

Vendor/End User	Town	State	Tons	Material Type
City of Methuen	Methuen	MA		Compostables/Organics
City of Methuen	Methuen	MA		Wood Waste
Daves Scrap Tire	North Reading	MA		Tires
Windfield Alloy	Lawrence	MA		Electronics/Computers
Windfield Alloy	Lawrence	MA		General Recyclables

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
LL&S	Salem	NH		C&D Waste

Divert + Dispose = 0 (Divert+Dispose) - Accept: % Difference:

MILLBURY CE UNITED MATERIAL MANAGEMENT OF MILLBURY Receipt Status: Rec'd 2/13/2020
Reg Obj Acct: 575274 333A SOUTHWEST CUTOFF Class: CDLG - Large C&D Waste Processing Facility

Accepted: 175,835 Waste/Material Type State Tons 175,835 Check Accepted: OK OpenDays: 307

Table with 4 columns: Waste/Material Type, State, Tons. Rows include MSW, C&D Waste, Bulky Waste.

Table with 6 columns: Vendor/End User, Town, State, Tons, Material Type. Rows include Various, Gypsum, Fines C&D, Asphalt Brick Concrete, Metals, Cardboard, Wood Waste.

Table with 5 columns: Disposal Site Name, Town, State, Tons, Waste Type. Rows include Residuals C&D, MSW.

Divert + Dispose = 179,386 (Divert+Dispose) - Accept: 3,551 % Difference: 2.02%

DiscrepExplan: additional tons due to water from misting system and inventory fluctuation DiscrepRspns:

MILLBURY CE WHEELABRATOR MILLBURY TRANSFER STATION Receipt Status: Rec'd 2/19/2020
Reg Obj Acct: 325504 331 SOUTHWEST CUTOFF RD Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: Problem OpenDays: 0

Diverted:

Disposed:

Divert + Dispose = 0 (Divert+Dispose) - Accept: % Difference:

NANTUCKET SE NANTUCKET COMPOST FACILITY Receipt Status: Rec'd 2/14/2020
Reg Obj Acct: 303223 188 MADAKET RD Class: CMPOST - Site Assigned Compost Facility

Accepted: 13,213 Waste/Material Type State Tons 13,213 Check Accepted: OK OpenDays: 355

Table with 4 columns: Waste/Material Type, State, Tons. Rows include Wood Waste, C&D Waste, Tires, Other (NonMSW), Metals, Asphalt Brick Concrete, Electronics/Computers.

Table with 6 columns: Vendor/End User, Town, State, Tons, Material Type. Rows include A&P Enterprises, Champion City, F&B Rubberized, Miller Recycling Corp, nantucket composting, Nantucket Landfill, Spiegal.

Disposed:

Divert + Dispose = 13,198 (Divert+Dispose) - Accept: -15 % Difference: -0.11%

NANTUCKET SE NANTUCKET HANDLING FACILITY
 Reg Obj Acct: 457936 188 MADAKET RD

Receipt Status: **Rec'd 2/14/2020**

Class: SMHNDL - Small Handling Facility

Accepted: 53,607 53,607 Check Accepted: **OK** OpenDays: 355

Waste/Material Type	State	Tons
MSW	MA	11,440
Wood Waste	MA	14,996
C&D Waste	MA	9,023
Tires	MA	15
General Recyclables	MA	403
Compostables/Organics	MA	209
Cardboard	MA	1,116
Metals	MA	820
Glass	MA	921
Asphalt Brick Concrete	MA	261
Electronics/Computers	MA	4
Sludge (Industrial)	MA	1,693
Loam	MA	12,706

Diverted: 53,331

Vendor/End User	Town	State	Tons	Material Type
A&P Enterprises	Berkley	MA	36	Electronics/Computers
Champion City	Brockton	MA	8,710	C&D Waste
F&B Rubberized	New Bedford	MA	94	Tires
Miller Recycling Corp	Mansfield	MA	1,116	Cardboard
Miller Recycling Corp	Mansfield	MA	403	General Recyclables
Spiegel	Brockton	MA	729	Metals
Various	Nantucket	MA	17	Loam
Waste Options	Nantucket	MA	12,706	Loam
Waste Options	Nantucket	MA	1,902	Sludge (Industrial)
Waste Options	Nantucket	MA	261	Asphalt Brick Concrete
Waste Options	Nantucket	MA	921	Glass
Waste Options	Nantucket	MA	14,996	Wood Waste
Waste Options	Nantucket	MA	11,440	MSW

Disposed: 3,300

Disposal Site Name	Town	State	Tons	Waste Type
Nantucket Landfill	Nantucket	MA	3,300	Recycling Residue

Divert + Dispose = 56,631 (Divert+Dispose) - Accept: 3,024 % Difference: 5.64%

NEEDHAM NE NEEDHAM TRANSFER STATION Receipt Status: **Pending**
 Reg Obj Acct: 173149 1421 CENTRAL AVE Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: OpenDays:

Diverted:

Vendor/End User	Town	State	Tons	Material Type
CRT Recycle	Raynham	MA		Electronics/Computers
fiore trucking	Fitchburg	MA		General Recyclables
Framingham Salvage	Framingham	MA		Metals
Goodwill Industries	Boston	MA		Textiles/Clothing
Integrated Paper Recycling	Salem	MA		General Recyclables
Needham Compost Site	Needham	MA		Compostables/Organics
Routhier & Sons	Littleton	MA		Tires

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
Commercial Paving	Scarborough	ME		Demo Wood Chips
Crapo Hill Landfill	New Bedford	MA		DPW Waste
Devito Trucking Inc	Salem	NH		Demo Wood Chips
Wheelabrator Millbury	Millbury	MA		MSW

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

NEW BEDFORD SE NEW BEDFORD TRANSFER STATION Receipt Status: **Pending**
 Reg Obj Acct: 319489 1103 SHAWMUT AVE Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: OpenDays:

Diverted:

Vendor/End User	Town	State	Tons	Material Type
AAA Recycling	New Bedford	MA		Plastics
AW Martin	New Bedford	MA		Mixed Paper
BFI Brockton	Brockton	MA		General Recyclables
Bobs Tire	Mattapoissett	MA		Tires
ElectroniCycle	Gardner	MA		Electronics/Computers
EXCEL	Westport	MA		Metals
Got Books	North Reading	MA		Swap Shop
Mid City Scrap	Westport	MA		Metals
New Bedford Waste Services	New Bedford	MA		Mattresses
New Bedford Waste Services	New Bedford	MA		C&D Waste
Red Cross		MA		Textiles/Clothing
STRATEGIC MATERIALS	Franklin	MA		Glass

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
Crapo Hill Landfill	Dartmouth	MA		MSW

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

NEW BEDFORD SE NEW BEDFORD WASTE SERVICES TRANS STATION Receipt Status: **Rec'd 2/10/2020**
 Reg Obj Acct: 319953 1245 SHAWMUT AVE Class: CDLG - Large C&D Waste Processing Facility

Accepted: 98,881 Waste/Material Type State Tons 98,881 Check Accepted: **OK** OpenDays: 279

Waste/Material Type	State	Tons
MSW	MA	64,522
Wood Waste	MA	714
C&D Waste	MA	30,023
Asphalt Brick Concrete	MA	143
Residuals C&D	MA	1,315
Wood C&D	MA	2,164

Diverted: 18,013

Vendor/End User	Town	State	Tons	Material Type
A&E Metals Recycling & Packag	Westport	MA	128	General Recyclables
Attleboro LF	Attleboro	MA	8,988	Fines C&D
Crapo Hill Landfill	Dartmouth	MA	4,005	Residuals C&D
david farias	Westport	MA	17	Asphalt Brick Concrete
Domtar	Bromptonville	QC	253	Wood C&D
double s farms	Dartmouth	MA	129	Asphalt Brick Concrete
Eco Recycling	Brockton	MA	161	General Recyclables
EXCEL	Westport	MA	78	General Recyclables
F&B Rubberized	New Bedford	MA	29	Tires
green mattress	Milford	MA	179	Mattresses
JM Equipmet	Freetown	MA	92	Asphalt Brick Concrete
Mid City Scrap	Westport	MA	760	General Recyclables
nbws	New Bedford	MA	212	General Recyclables
NE RECYLING	Taunton	MA	23	C&D Waste
TAFISA	Lac-Megantic	QC	2,928	Wood C&D
zero waste	Rochester	MA	31	MSW

Disposed: 79,287

Disposal Site Name	Town	State	Tons	Waste Type
AGGREGATE RECYCLING CORP	Eliot	ME	2,053	MSW
APEX SANITARY LANDFILL	Amsterdam	OH	132	MSW
baunswick lf	Lawrenceville	VA	21	MSW
Bourne ISWF	Bourne	MA	106	MSW
Carbon LF	Lowellville	OH	867	MSW
cfs	Victoria	VA	21	MSW
Champion City	Brockton	MA	8,586	MSW
dunn landfill	Rensellaer	NY	1,115	C&D Waste
Fitchburg LF	Fitchburg	MA	30,938	MSW
Middleborough Landfill	Middleborough	MA	2,038	MSW
SEMASS	Bourne	MA	24,892	MSW
Taunton Landfill	Taunton	MA	4,795	MSW
Turnkey LF	Rochester	NH	3,723	MSW

Divert + Dispose = 97,300 (Divert+Dispose) - Accept: -1,581 % Difference: -1.60%

NORTH ANDOVER

NE

TBI RECYCLING FACILITY

Receipt Status: **Rec'd 2/13/2020**

Reg Obj Acct: 291858

210 HOLT RD

Class: CDLG - Large C&D Waste Processing Facility

Accepted: 57,861

Waste/Material Type	State	Tons
C&D Waste	MA	18,749
Other (NonMSW)	MA	27,646
Bulky Waste	MA	11,466

57,861Check Accepted: **OK**

OpenDays: 200

Diverted: 6,447

Vendor/End User	Town	State	Tons	Material Type
charles george	Billerica	MA	76	Cardboard
dynamic waste systems	North Andover	MA	273	Cardboard
ERRCO	Epping	NH	747	C&D Waste
EXCEL	Westport	MA	490	Metals
prospect I & S	Lawrence	MA	344	Metals
Sappi	Westbrook	ME	2,628	Wood Waste
SCHNITZER	Everett	MA	640	Metals
Scrap It	Chelsea	MA	219	Metals
TAFISA	Lac-Megantic	QC	878	Wood Waste
UMM	Millbury	MA	152	C&D Waste

Disposed: 51,465

Disposal Site Name	Town	State	Tons	Waste Type
Covanta	Haverhill	MA	3,448	Other (NonMSW)
mount carberry	Berlin	NH	4,593	Other (NonMSW)
north country landfill	Bethlehem	NH	6,235	Other (NonMSW)
Tri-Country Recycling	Ware	MA	12,182	Residuals C&D
Waste Management	Rochester	NH	23,877	Residuals C&D
Western Recycling	Wilbraham	MA	1,093	Fines C&D
Wheelabrator	North Andover	MA	37	Other (NonMSW)

Divert + Dispose = 57,912 (Divert+Dispose) - Accept: 51 % Difference: 0.09%

NORTHAMPTON WE NORTHAMPTON EASTHAMPTON ROAD TRANS STAT Receipt Status: **Rec'd 2/10/2020**
 Reg Obj Acct: 174929 234 EASTHAMPTON RD Class: LGTRAN - Large Transfer Station

Accepted: 63,610 Waste/Material Type State Tons 63,610 Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
MSW	MA	34,840
C&D Waste	MA	27,585
General Recyclables	MA	1,185

Diverted: 4,822

Vendor/End User	Town	State	Tons	Material Type
Empire Tires	Planfield	CT	18	Tires
goldstar recycling	Palmer	MA	13	Electronics/Computers
kane Metal	Chicopee	MA	411	Metals
MRF	Springfield	MA	299	General Recyclables
Sonoco	Holyoke	MA	472	Mixed Paper
Sonoco	Holyoke	MA	229	Cardboard
USA Babalon	Berlin	CT	66	C&D Waste
USA ELM St	Hatfield	MA	35	General Recyclables
Western Recycling	Wilbraham	MA	1,929	C&D Waste
wheelabrator	Hudson Falls	NY	935	Wood Waste
WTE	Greenfield	MA	415	Metals

Disposed: 58,239

Disposal Site Name	Town	State	Tons	Waste Type
clinton county lf	Morrisonville	NY	387	MSW
Covanta	Pittsfield	MA	2,318	MSW
dunn landfill	Rensellaer	NY	6,594	MSW
ECO Power	Springfield	MA	519	MSW
fulton county	Johnston	NY	3,193	MSW
Ontario County Landfill	Stanley	NY	23,328	MSW
Seneca Meadows Landfill	Seneca Falls	NY	14,784	MSW
Wheelabrator	Hudson Falls	NY	7,116	MSW

Divert + Dispose = 63,061 (Divert+Dispose) - Accept: -549 % Difference: -0.86%

ORLEANS SE DANIELS C&D TRANSFER FACILITY Receipt Status: **Rec'd 2/13/2020**
 Reg Obj Acct: 379180 29 GIDDIAH HILL RD Class: SMHNDL - Small Handling Facility

Accepted: 7,665 Waste/Material Type State Tons 7,665 Check Accepted: **OK** OpenDays: 306

Waste/Material Type	State	Tons
C&D Waste	MA	7,665

Diverted: 7,228

Vendor/End User	Town	State	Tons	Material Type
jr vinagro corp	Johnston	RI	4,497	C&D Waste
Mid City Scrap	Westport	MA	156	Metals
Mid City Scrap	Westport	MA	319	Cardboard
NER	Taunton	MA	2,256	C&D Waste

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
Boralex	Livermore Falls	ME		Demo Wood Chips

Divert + Dispose = 7,228 (Divert+Dispose) - Accept: -437 % Difference: -5.70%

Municipality

Region Reg Obj Name and Address

OXFORD

CE

OXFORD TRANSFER STATION

Receipt Status: **Rec'd 2/10/2020**

Reg Obj Acct: 290748

200 LEICESTER ST

Class: LGTRAN - Large Transfer Station

Accepted:

Waste/Material Type	State	Tons
MSW	MA	52,752
C&D Waste	MA	24,298

Check Accepted: **OK**

OpenDays: 261

Diverted:

Vendor/End User	Town	State	Tons	Material Type
C&D Tires	Fairhaven	MA	27	Tires
casella	Auburn	MA	29	Cardboard
casella	Holyoke	MA	207	C&D Waste
Excel Recycling	Charlton	MA	156	C&D Waste
Northcoast Services	Portsmouth	NH	64	Electronics/Computers
RE Energy	Lewiston	ME	12,041	C&D Waste
superior waste	Worcester	MA	12	Mattresses
UMM	Millbury	MA	72	Gypsum
UMM	Millbury	MA	9,209	C&D Waste

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
Arrowhead Landfill	Uniontown	AL	27	MSW
CASELLA	Morrisonville	NY	7,644	MSW
Covanta	Rochester	MA	5,335	MSW
fulton county	Johnston	NY	10,967	MSW
North County Environmental	Bethlehem	NH	14,650	MSW
PERC	Orrington	ME	2,395	MSW
Wheelabrator	Millbury	MA	14,028	MSW

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

PEABODY

NE

ALLIED PEABODY TRANSFER STATION

Receipt Status: **Pending**

Reg Obj Acct: 326369

295 FOREST ST

Class: LGTRAN - Large Transfer Station

Accepted:

Check Accepted:

OpenDays:

Diverted:

Disposed:

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

PEABODY NE ALLIED WASTE SYSTEMS DBA Receipt Status: **Rec'd 1/28/2020**

Reg Obj Acct: 326372

300 FOREST ST

Class: LGTRAN - Large Transfer Station

Accepted: 177,086 Waste/Material Type State Tons 177,086 Check Accepted: **OK** OpenDays: 274

Waste/Material Type	State	Tons
MSW	MA	119,624
C&D Waste	MA	57,462

Diverted: 31,447

Vendor/End User	Town	State	Tons	Material Type
casella	Charlestown	MA	3	Mixed Paper
DeVENS RECYCLING	Devens	MA	9,987	C&D Waste
JP Routhier	Littleton	MA	7	Tires
north gate recycling	Revere	MA	70	Asphalt Brick Concrete
North Shore Recycled Fibers	Salem	MA	15	Mixed Paper
RE Energy	Lewiston	ME	12,616	C&D Waste
Scrap It	Everett	MA	157	Metals
Stoughton Landfill	Stoughton	MA	34	Gypsum
Trl County	Ware	MA	1,078	C&D Waste
Western Recycling	Wilbraham	MA	2,349	C&D Waste
zero waste	Bow	NH	5,131	C&D Waste

Disposed: 148,423

Disposal Site Name	Town	State	Tons	Waste Type
Covanta	Haverhill	MA	34,730	MSW
Fitchburg LF	Fitchburg	MA	245	MSW
PERC	Orrington	ME	5,366	MSW
SEMASS	West Wareham	MA	6,209	MSW
Turnkey LF	Rochester	NH	99,096	MSW
Wheelabrator	North Andover	MA	2,777	MSW

Divert + Dispose = 179,870 (Divert+Dispose) - Accept: 2,784 % Difference: 1.57%

RAYNHAM

SE

RAYNHAM REGIONAL PROCESSING & TRNSFR FAC

Receipt Status: **Rec'd 3/13/2020**

Reg Obj Acct: 373036

35 THRASHER ST

Class: CDLG - Large C&D Waste Processing Facility

Accepted: **104,478**

Waste/Material Type	State	Tons
MSW	MA	51,486
C&D Waste	MA	36,859
C&D Waste	RI	504
Bulky Waste	MA	12,805
Bulky Waste	RI	157
General Recyclables	MA	2
Cardboard	MA	1
Metals	MA	14
Electronics/Computers	MA	7
Gypsum	MA	61
Mattresses	MA	6
Shingles Asphalt	MA	1,732
Shingles Asphalt	RI	3
Wood C&D	MA	841

104,478Check Accepted: **OK**

OpenDays: 306

Diverted: **19,092**

Vendor/End User	Town	State	Tons	Material Type
Attleboro LF	Attleboro	MA	32	Asphalt Brick Concrete
bridgewater farms	Bridgewater	MA	8	Wood Waste
brs inc.	Bridgewater	MA	7	Wood Waste
carney	Raynham	MA	132	Gypsum
carney	Raynham	MA	1,340	Asphalt Brick Concrete
Crapo Hill Landfill	Dartmouth	MA	183	Residuals C&D
data recycling	Assonet	MA	5	Electronics/Computers
Eco Recycling	Brockton	MA	99	Metals
F&B Enterprises	Littleton	MA	30	Tires
Fitchburg LF	Fitchburg	MA	28	Residuals C&D
Middleboro Landfill	Middleboro	MA	3,517	Residuals C&D
NE RECYLING	Taunton	MA	64	Wood Waste
new england waste disposal	Taunton	MA	23	Wood C&D
Plainfield power	Plainfield	CT	1,253	Wood Waste
pondview	Providence	RI	23	Residuals C&D
pondview	Providence	RI	264	Wood Waste
SCHNITZER	Attleboro	MA	389	Metals
SCHNITZER everett	Everett	MA	76	Metals
SCHNITZER providence	Providence	RI	63	Metals
SCHNITZER worcester	Worcester	MA	14	Metals
TAFISA	Lac-Megantic	QC	5,075	Wood Waste
Taunton Landfill	Taunton	MA	647	Asphalt Brick Concrete
Taunton Landfill	Taunton	MA	4,377	Residuals C&D
taunton scrap	Taunton	MA	1,443	Metals

Disposed: **87,511**

Disposal Site Name	Town	State	Tons	Waste Type
Bourne ISWF	Bourne	MA	114	MSW
casella holyoke	Holyoke	MA	2,907	Fines C&D
CMW Landfill	Carver	MA	3,830	Fines C&D
Fitchburg LF	Fitchburg	MA	18,509	MSW
new england waste	Taunton	MA	6	Gypsum
new england waste	Taunton	MA	1,302	Residuals C&D
new england waste disposal	Taunton	MA	3,894	Fines C&D

Disposal Site Name	Town	State	Tons	Waste Type
SEMASS	Bourne	MA	28,966	MSW
Taunton Landfill	Taunton	MA	292	MSW
Western Recycling	Wilbraham	MA	1,315	Fines C&D
Wheelabrator Millbury	Millbury	MA	10,562	MSW
Wheelabrator North Andover	North Andover	MA	4,766	MSW
Wheelabrator Saugus	Saugus	MA	11,048	MSW

Divert + Dispose = 106,603 (Divert+Dispose) - Accept: 2,125 % Difference: 2.03%

DiscrepExplan: addition of water for dust control DiscrepRspns:

RAYNHAM SE WASTE MANAGEMNT OF MASSACHUSETTS INC Receipt Status: **Pending**
 Reg Obj Acct: 605468 35 THRASHER ST Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: OpenDays:
 Diverted:
 Disposed:

Divert + Dispose = 0 (Divert+Dispose) - Accept: % Difference:

ROCHESTER SE NEW BEDFORD WASTE SERVICES LLC ROCHESTER Receipt Status: **Rec'd 2/10/2020**
 Reg Obj Acct: 281845 48 CRANBERRY HWY Class: CDLG - Large C&D Waste Processing Facility

Accepted: 20,911 Waste/Material Type State Tons 20,911 Check Accepted: **OK** OpenDays: 253

Waste/Material Type	State	Tons
C&D Waste	MA	18,056
General Recyclables	MA	2,396
Cardboard	MA	375
Asphalt Brick Concrete	MA	84

Diverted: 7,523

Vendor/End User	Town	State	Tons	Material Type
casella charlestown	Charlestown	MA	2,828	General Recyclables
Mid City Scrap	Westport	MA	103	General Recyclables
nbws	New Bedford	MA	2,072	Wood C&D
NE RECYCLING	Taunton	MA	1,658	C&D Waste
nws	New Bedford	MA	436	C&D Waste
Patriot Disposal	Johnston	RI	348	C&D Waste
STOUGHTON RECYCLING	Stoughton	MA	78	C&D Waste

Disposed: 12,710

Disposal Site Name	Town	State	Tons	Waste Type
Champion City	Brockton	MA	12,710	C&D Waste

Divert + Dispose = 20,233 (Divert+Dispose) - Accept: -678 % Difference: -3.24%

ROCHESTER SE SEMASS RESOURCE RECOVERY FACILITY Receipt Status: **Pending**
 Reg Obj Acct: 522119 141 CRANBERRY HWY Class: SMHNDL - Small Handling Facility

Accepted: Check Accepted: OpenDays:
 Diverted:
 Disposed:

Divert + Dispose = 0 (Divert+Dispose) - Accept: % Difference:

Municipality

Region

Reg Obj Name and Address

SALEM

NE

SALEM TRANSFER STATION

Receipt Status: **Pending**

Reg Obj Acct: 173161

12 SWAMPSCOTT RD

Class: LGTRAN - Large Transfer Station

Accepted:

Check Accepted:

OpenDays:

Diverted:

Vendor/End User	Town	State	Tons	Material Type
BDS	Norridgewock	ME		Tires
Miles River	Ipswich	MA		Asphalt Brick Concrete
Pro Bark	Plaistow	NH		Compostables/Organics
Prolerized NE Co	Everett	MA		Metals

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
NE Solid Waste Comm	North Andover	MA		C&D Waste

Divert + Dispose = (Divert+Dispose) - Accept: % Difference:

SANDWICH SE NEW BEDFORD WASTE SERVICES LLC SANDWICH Receipt Status: **Rec'd 1/22/2020**
 Reg Obj Acct: 513300 295 SERVICE RD Class: LGHNDL - Large Handling Facility

Accepted: **19,250** Waste/Material Type State Tons **19,250** Check Accepted: **OK** OpenDays: 162

Waste/Material Type	State	Tons
MSW	MA	1,555
General Recyclables	MA	15,911
Cardboard	MA	1,728
Mixed Paper	MA	21
Plastics	MA	35

Diverted: **9,523**

Vendor/End User	Town	State	Tons	Material Type
Amercian Chung Nam LLC	City Of Industry	CA	260	General Recyclables
Amercian Paper Recycling	Claremont	NH	46	General Recyclables
Canaan Recycling	Valley Sream	NY	28	General Recyclables
CANUSA HERSHMAN RECYCL	Branford	CT	2,781	General Recyclables
casella	Scarborough	ME	319	General Recyclables
continental paper grading	Chicago	IL	291	General Recyclables
ekman recycling	Wall	NY	306	General Recyclables
gottlieb inc	Neville Island	PA	19	General Recyclables
gp harmon domestic	Dotham	AL	457	General Recyclables
gp harmon export	Dotham	AL	1,589	General Recyclables
khanna paper inc	N Beagen	NJ	923	General Recyclables
Mid City Scrap	Westport	MA	323	General Recyclables
Nathan H Kelman inc	Cohoes	NY	51	General Recyclables
NBW Environmental services	New Bedford	MA	203	General Recyclables
selectr trading	Caldwell	NJ	1,400	General Recyclables
storelli recycling	Ft Lauderdale	FL	527	General Recyclables

Disposed: **4,664**

Disposal Site Name	Town	State	Tons	Waste Type
APEX SANITARY LANDFILL	Amsterdam	OH	188	MSW
brunswick	Lawrenceville	VA	114	MSW
Carbon LF	Lowellville	OH	520	MSW
cfs	Victoria	VA	88	MSW
Fitchburg LF	Westminister	MA	1,890	MSW
Middleborough Landfill	Middleborough	MA	688	MSW
NBWS	New Bedford	MA	844	MSW
Ricova international	Detriot	MI	86	MSW
Taunton Landfill	Taunton	MA	246	MSW

Divert + Dispose = **14,187** (Divert+Dispose) - Accept: **-5,063** % Difference: **-26.30%**

SANDWICH SE NEW BEDFORD WASTE SERVICES LLC SANDWICH Receipt Status: **Rec'd 2/10/2020**
 Reg Obj Acct: 308543 295 SERVICE RD Class: CDLG - Large C&D Waste Processing Facility

Accepted: 23,092 Waste/Material Type State Tons 23,092 Check Accepted: **OK** OpenDays: 253

Waste/Material Type	State	Tons
C&D Waste	MA	21,740
General Recyclables	MA	1,342
Asphalt Brick Concrete	MA	10

Diverted: 7,065

Vendor/End User	Town	State	Tons	Material Type
casella charlestown	Charlestown	MA	756	General Recyclables
Mid City Scrap	Westport	MA	98	General Recyclables
nbws	New Bedford	MA	4,469	C&D Waste
NE RECYCLING	Taunton	MA	184	C&D Waste
Patriot Disposal	Johnston	RI	953	C&D Waste
STOUGHTON RECYCLING	Stoughton	MA	26	C&D Waste
zero waste	Rochester	MA	579	General Recyclables

Disposed: 15,624

Disposal Site Name	Town	State	Tons	Waste Type
Champion City	Brockton	MA	15,624	C&D Waste

Divert + Dispose = 22,689 (Divert+Dispose) - Accept: -403 % Difference: -1.75%

SANDWICH SE UPPER CAPE REGIONAL TRANSFER STATION Receipt Status: **Rec'd 2/12/2020**
 Reg Obj Acct: 329412 GENERALS BLVD Class: LGTRAN - Large Transfer Station

Accepted: 19,675 Waste/Material Type State Tons 19,675 Check Accepted: **OK** OpenDays: 306

Waste/Material Type	State	Tons
MSW	MA	107
C&D Waste	MA	12,439
Bulky Waste	MA	5,759
Cardboard	MA	400
Asphalt Brick Concrete	MA	970

Diverted: 2,881

Vendor/End User	Town	State	Tons	Material Type
carney	Raynham	MA	5	Gypsum
cavossa	Falmouth	MA	970	Asphalt Brick Concrete
Mid City Scrap	Everett	MA	490	Metals
Mid City Scrap	Westport	MA	609	Cardboard
NER	Taunton	MA	807	Wood Waste

Disposed: 16,794

Disposal Site Name	Town	State	Tons	Waste Type
LAFARGE	Lordstown	OH	11,681	C&D Waste
pine avenue landfill	Niagara Falls	NY	5,006	C&D Waste
SEMASS	Rochester	MA	107	MSW

Divert + Dispose = 19,675 (Divert+Dispose) - Accept: 0 % Difference: 0.00%

SPRINGFIELD WE FP MCNAMARA TRANSFER STATION Receipt Status: **Rec'd 1/21/2020**
 Reg Obj Acct: 418670 44 ROSE ST Class: LGTRAN - Large Transfer Station

Accepted: 73,730 Waste/Material Type State Tons 73,730 Check Accepted: **OK** OpenDays: 304

Waste/Material Type	State	Tons
MSW	MA	65,456
C&D Waste	MA	1,518
General Recyclables	MA	6,756

Diverted: 6,677

Vendor/End User	Town	State	Tons	Material Type
Bobs Tire	Mattapoisett	MA	67	Tires
casella	Auburn	MA	6,444	General Recyclables
Northstar	Springfield	MA	108	Cardboard
SuLLIVAN	Holyoke	MA	58	Metals

Disposed: 67,785

Disposal Site Name	Town	State	Tons	Waste Type
CASELLA	Holyoke	MA	1,111	C&D Waste
Chicopee Landfill	Chicopee	MA	8,776	MSW
rail	Lee County	SC	50,276	MSW
Wheelabrator	Millbury	MA	4,575	MSW
wm fitchburg	Fitchburg	MA	3,047	MSW

Divert + Dispose = 74,462 (Divert+Dispose) - Accept: 732 % Difference: 0.99%

STOUGHTON SE STOUGHTON RECYCLING TECHNOLOGIES Receipt Status: **Rec'd 2/14/2020**
 Reg Obj Acct: 172972 100 PAGE ST Class: CDLG - Large C&D Waste Processing Facility

Accepted: 94,642 Waste/Material Type State Tons 94,642 Check Accepted: **OK** OpenDays: 249

Waste/Material Type	State	Tons
C&D Waste	MA	61,317
Bulky Waste	MA	28,076
Asphalt Brick Concrete	MA	36
Wood C&D	MA	5,213

Diverted: 46,980

Vendor/End User	Town	State	Tons	Material Type
Attleboro LF	Attleboro	MA	26	Fines C&D
C&D Tires	New Bedford	MA	10	Tires
casella	Boston	MA	278	Cardboard
Champion City	Brockton	MA	13	Gypsum
Champion City	Brockton	MA	16,581	Asphalt Brick Concrete
East Coast Computer Recycling	Shirley	MA	4	Electronics/Computers
MJM CONSTRUCTION	Brockton	MA	3,782	Asphalt Brick Concrete
multiple metal recyclers	Various	MA	3,559	Metals
New England Recycling	Taunton	MA	2,338	Asphalt Brick Concrete
Patriot Recycling	Raynham	MA	28	Asphalt Brick Concrete
TAFISA	Lac-Megantic	QC	20,029	Wood C&D
Waste management	Avon	MA	332	Cardboard

Disposed: 49,577

Disposal Site Name	Town	State	Tons	Waste Type
Champion City	Brockton	MA	42,670	Residuals C&D
Champion City	Brockton	MA	4,835	Fines C&D
Wheelabrator	Millbury	MA	2,072	Residuals C&D

Divert + Dispose = 96,557 (Divert+Dispose) - Accept: 1,915 % Difference: 2.02%

TAUNTON SE NEW ENGLAND RECYCLING CO INC Receipt Status: **Rec'd 2/6/2020**
 Reg Obj Acct: 301481 569 WINTHROP ST Class: CDLG - Large C&D Waste Processing Facility

Accepted: 128,550 Waste/Material Type State Tons 128,550 Check Accepted: **OK** OpenDays: 304

Waste/Material Type	State	Tons
C&D Waste	MA	126,741
Bulky Waste	MA	1,809

Diverted: 44,727

Vendor/End User	Town	State	Tons	Material Type
Allied	Walpole	MA	131	Metals
banyan plastics	Troy	AL	226	Plastics
BFI	Brockton	MA	245	Cardboard
carney	Raynham	MA	84	Gypsum
carney	Raynham	MA	227	Shingles Asphalt
casella	Bethlehem	NH	3,796	Residuals C&D
Clean Harbors	Portland	ME	229	Wood C&D
coventry landfill	Coventry	RI	522	Fines C&D
cyn environmental	Stoughton	MA	246	Wood Waste
EXCEL	Charlton	MA	47	Metals
F&B Rubberized	Littleton	MA	274	Tires
full circle recycling	Johnston	RI	360	Metals
Future Fuel	Taunton	MA	3,428	Wood Waste
jr vinagro corp	Johnston	RI	625	C&D Waste
jr vinagro corp	Johnston	RI	694	Asphalt Brick Concrete
lopes construction	Raynham	MA	49	Wood Waste
lopes construction	Raynham	MA	4,121	Asphalt Brick Concrete
Norridgewock LF	Norridgewock	ME	116	Residuals C&D
Plainfield power	Plainfield	CT	7,288	Wood C&D
Sappi	Westbrook	ME	3,970	Wood C&D
Scrap X	Providence	RI	56	Metals
TAFISA	Lac-Megantic	QC	6,430	Wood C&D
tauton scrap metal	Tauton	MA	4,972	Metals
tradebe environmental	Bridgeport	CT	4,001	Wood C&D
tradebe environmental	Stoughton	MA	1,222	Wood Waste
tradebe environmental	Newington	NH	1,347	Wood C&D
United Material Management	Millbury	MA	21	C&D Waste

Disposed: 83,421

Disposal Site Name	Town	State	Tons	Waste Type
new england waste	Taunton	MA	62,547	Residuals C&D
new england waste	Taunton	MA	20,665	Fines C&D
Norridgewock Landill	Norridgewock	ME	209	Residuals C&D

Divert + Dispose = 128,148 (Divert+Dispose) - Accept: -402 % Difference: -0.31%

TAUNTON SE NEW ENGLAND WASTE DISPOSAL INC Receipt Status: **Pending**
 Reg Obj Acct: 586446 101 PRINCE HENRY DR Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: OpenDays:

Diverted:

Disposed:

Divert + Dispose = 0 (Divert+Dispose) - Accept: % Difference:

WARE WE REENERGY WARE Receipt Status: **Rec'd 2/11/2020**
 Reg Obj Acct: 377540 198 EAST ST Class: CDLG - Large C&D Waste Processing Facility

Accepted: 121,284 Waste/Material Type State Tons 121,284 Check Accepted: **OK** OpenDays: 257

Waste/Material Type	State	Tons
C&D Waste	MA	1,878
Bulky Waste	MA	18
Metals	MA	277
Asphalt Brick Concrete	MA	503
Residuals C&D	MA	118,608

Diverted: 3,857

Vendor/End User	Town	State	Tons	Material Type
BoBbs Tire	Fall River	MA	2	Tires
Complete Recycling Solutions	Fall River	MA	5	Electronics/Computers
ercc	Epping	NH	45	Wood C&D
EXCEL	Charlton	MA	36	Metals
George Apkins & Sons	North Adams	MA	33	Metals
LL & S	Salem	NH	1	Plastics
LL & S	Salem	NH	186	Metals
McConnel Enterprises	Braintree	MA	13	Metals
RE Energy	Ware	MA	3,500	Asphalt Brick Concrete
SCHNITZER	Worcester	MA	36	Metals

Disposed: 122,098

Disposal Site Name	Town	State	Tons	Waste Type
Sunny Farms Landfill	Fostoria	OH	122,098	Residuals C&D

Divert + Dispose = 125,955 (Divert+Dispose) - Accept: 4,671 % Difference: 3.85%

WEBSTER CE WEBSTER TRANSFER STATION Receipt Status: **Pending**
 Reg Obj Acct: 40035 15 CUDWORTH RD Class: LGTRAN - Large Transfer Station

Accepted: Check Accepted: OpenDays:

Diverted:

Vendor/End User	Town	State	Tons	Material Type
Beaupre Scrap	Worcester	MA		Metals
Cohen Rags	Worcester	MA		Textiles/Clothing
East Coast Electronics Recyclin	Leominster	MA		Electronics/Computers
Willimantic Waste Paper	Willimantic	CT		General Recyclables

Disposed:

Disposal Site Name	Town	State	Tons	Waste Type
Wheelabrator	Lisbon	CT		MSW
Wheelabrator Millbury	Millbury	MA		MSW

Divert + Dispose = 0 (Divert+Dispose) - Accept: % Difference:

WELLESLEY NE WELLESLEY TRANSFER STATION
 Reg Obj Acct: 173057 169 GREAT PLAIN AVE

Receipt Status: **Rec'd 2/12/2020**

Class: LGTRAN - Large Transfer Station

Accepted: 15,241

Waste/Material Type	State	Tons
MSW	MA	4,759
C&D Waste	MA	2,781
Tires	MA	11
Other (NonMSW)	MA	129
General Recyclables	MA	2,422
Compostables/Organics	MA	3,417
Metals	MA	431
Asphalt Brick Concrete	MA	230
Electronics/Computers	MA	48
Wood C&D	MA	1,013

15,241

Check Accepted: **OK**

OpenDays: 335

Diverted: 7,666

Vendor/End User	Town	State	Tons	Material Type
360 recycling llc	Wesfield	MA	824	Compostables/Organics
AIIIED RECYCLING	Walpole	MA	3	General Recyclables
AIIIED RECYCLING	Walpole	MA	420	Metals
American Fiber	Smyrna	GA	110	General Recyclables
American Red Cross	Boston	MA	40	Textiles/Clothing
autism services assoc.	Wellesley	MA	7	Textiles/Clothing
Bay State Textile	Marston Mills	MA	8	Textiles/Clothing
benefit box company	Brighton	MA	6	Textiles/Clothing
blackbridge investments	Huntington	NY	20	General Recyclables
BoBbs Tire	Fall River	MA	11	Tires
boston Premier Flooring	Wellesley	MA	4	Wood Waste
Cans and Bottle REDEMPTION	Milford	MA	16	General Recyclables
CANUSA HERSHMAN RECYCL	Branford	CT	86	General Recyclables
caviccio greenhouse inc	Sudbury	MA	1,178	Compostables/Organics
CELL PHONES FOR SOLDIER	Boston	MA	1	General Recyclables
charles river landscape	Holliston	MA	1	Textiles/Clothing
Cook and Company	Upton	MA	961	Compostables/Organics
earth connections	Framingham	MA	292	Compostables/Organics
EL Harvey	Westborough	MA	948	Wood C&D
EL Harvey	Westborough	MA	9	General Recyclables
lions club	Natick	MA	1	General Recyclables
More Than Words	Waltham	MA	13	General Recyclables
Morgan Memorial	Boston	MA	58	Textiles/Clothing
Norhstarpulp and paper Co	Springfield	MA	23	General Recyclables
Northeast Resource Recovery	Epsom	NH	215	General Recyclables
norwood bottled gas	Norwood	MA	3	Metals
other	Various	MA	1	General Recyclables
other	Various	MA	58	Compostables/Organics
Patriot Recycling	Raynham	MA	65	Wood C&D
Patriot Recycling	Raynham	MA	8	Gypsum
Patriot Recycling	South Easton	MA	100	General Recyclables
Planet Aid	Holliston	MA	10	Textiles/Clothing
SAVE THAT STUFF	Charlestown	MA	100	Compostables/Organics
SAVE THAT STUFF	Charlestown	MA	1,764	General Recyclables
trigon plastics	New Holland	PA	45	General Recyclables
UnIVERSAL COMMODITY SER	Brooklyn	NY	19	General Recyclables
Waste management	Phoenix	AZ	8	Metals
wellesley	Wellesley	MA	230	Asphalt Brick Concrete

Disposed: 7,540	Disposal Site Name	Town	State	Tons	Waste Type
	Fitchburg LF	Fitchburg	MA	2,781	C&D Waste
	Fitchburg LF	Fitchburg	MA	4,759	MSW

Divert + Dispose = **15,206** (Divert+Dispose) - Accept: **-35** % Difference: **-0.23%**

WEST SPRINGFIELD WE WEST SPRINGFIELD TRANSFER STATION Receipt Status: **Rec'd 2/10/2020**

Reg Obj Acct: 527259

138 PALMER AVE

Class: CDLG - Large C&D Waste Processing Facility

Accepted: **80,123** Waste/Material Type State Tons **80,123** Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
MSW	MA	35,684
C&D Waste	MA	23,344
Bulky Waste	MA	21,095

Diverted: 7,910	Vendor/End User	Town	State	Tons	Material Type
	kane Metal	Chicopee	MA	511	Metals
	kudlic construction	West Springfield	MA	316	Asphalt Brick Concrete
	Pre-Greenleaf	Plainfield	CT	2,153	Wood C&D
	Recycle America	Springfield	MA	3	Plastics
	Seneca Meadows Landfill	Seneca Meadows	NY	3,878	Fines C&D
	Sonoco	Holyoke	MA	66	Cardboard
	willamansett waste	Chicopee	MA	14	Metals
	WTE Recycling	Greenfield	MA	969	Metals

Disposed: 72,187	Disposal Site Name	Town	State	Tons	Waste Type
	clinton county lf	Morrisonville	NY	793	MSW
	Covanta	Agawam	MA	14	Wood C&D
	dunn landfill	Rensellaer	NY	21,004	Residuals C&D
	fulton county	Johnston	NY	5,849	MSW
	Ontario County Landfill	Stanley	NY	192	MSW
	Seneca Meadows Landfill	Seneca Falls	MA	44,335	MSW

Divert + Dispose = **80,097** (Divert+Dispose) - Accept: **-26** % Difference: **-0.03%**

WESTBOROUGH CE EL HARVEY C&D PROCESSING FACILITY Receipt Status: **Rec'd 2/14/2020**
 Reg Obj Acct: 12 68 HOPKINTON RD Class: CDLG - Large C&D Waste Processing Facility

Accepted: 108,187 Waste/Material Type State Tons 108,187 Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
C&D Waste	MA	84,632
Bulky Waste	MA	13,270
Metals	MA	988
Asphalt Brick Concrete	MA	670
Wood C&D	MA	8,627

Diverted: 71,671

Vendor/End User	Town	State	Tons	Material Type
carney	S.Easton	MA	334	Shingles Asphalt
carver LF	Carver	MA	6,220	Fines C&D
Clinton Landfill	Clinton	MA	19,404	C&D Waste
CTI Douglas	Douglas	MA	834	Asphalt Brick Concrete
fbs tire recycling	Mattapoisett	MA	58	Tires
Framingham Salvage	Framingham	MA	8,780	Metals
Kruger	Bromptonville	QC	7,633	Wood Waste
Mass Natural	Westminster	MA	1,468	Asphalt Brick Concrete
New Bedford LF	New Bedford	MA	1,059	Fines C&D
Seneca Meadows Landfill	Seneca Meadows	NY	12,490	Fines C&D
TAFISA	Lac-Megantic	QC	13,298	Wood Waste
USA GYPSUM	Denver	PA	93	Gypsum

Disposed: 36,516

Disposal Site Name	Town	State	Tons	Waste Type
Fitchburg LF	Fitchburg	MA	10,153	Residuals C&D
Fitchburg LF	Fitchburg	MA	13,270	Bulky Waste
Various	Various	VA	13,093	Residuals C&D

Divert + Dispose = 108,187 (Divert+Dispose) - Accept: 0 % Difference: 0.00%

WESTBOROUGH CE EL HARVEY TRANSFER & RECYCLING FACILITY Receipt Status: **Rec'd 2/14/2020**
 Reg Obj Acct: 173212 68 HOPKINTON RD Class: LGTRAN - Large Transfer Station

Accepted: 84,912 Waste/Material Type State Tons 84,912 Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
General Recyclables	MA	84,912

Diverted: 60,481

Vendor/End User	Town	State	Tons	Material Type
EL Harvey	Hopkinton	MA	60,481	General Recyclables

Disposed: 24,889

Disposal Site Name	Town	State	Tons	Waste Type
Various	Various	NY	16,389	Contaminated Soil
Various	Various	NY	4,250	MSW
Wheelabrator Millbury	Millbury	MA	4,250	MSW

Divert + Dispose = 85,370 (Divert+Dispose) - Accept: 458 % Difference: 0.54%

WESTMINSTER

CE

FITCHBURG SW CONVENIENCE CTR & COMPOST

Receipt Status: **Rec'd 2/24/2020**

Reg Obj Acct: 394210

101 FITCHBURG RD

Class: CMPOST - Site Assigned Compost Facility

Accepted: **8,881**

Waste/Material Type	State	Tons
MSW	MA	2,566
Wood Waste	MA	1,517
C&D Waste	MA	226
Tires	MA	2
Other (NonMSW)	MA	3,137
Bulky Waste	MA	6
General Recyclables	MA	183
Compostables/Organics	MA	211
Cardboard	MA	161
Metals	MA	226
Newspaper	MA	114
Electronics/Computers	MA	11
Sludge (Paper)	MA	521

8,881

Check Accepted: **OK**

OpenDays: 286

Diverted: **10,054**

Vendor/End User	Town	State	Tons	Material Type
EL Harvey	Fitchburg	MA	114	Newspaper
EL Harvey	Fitchburg	MA	161	Cardboard
EL Harvey	Fitchburg	MA	183	General Recyclables
EL Harvey	Fitchburg	MA	226	C&D Waste
Electronic Recyclers	Holliston	MA	11	Electronics/Computers
Fitchburg/Westminster LF	Westminster	MA	9,126	Compostables/Organics
INTERSTATE BATTERY	Tyngsborough	MA	4	Metals
interstate refridgerant recovery	Everett	MA	6	Metals
LIBERTY TIRE	Littleton	MA	2	Tires
MIGHTY FLAME	Rindge	NH	1	Metals
SCHNITZER	Everett	MA	220	Metals

Disposed: **2,566**

Disposal Site Name	Town	State	Tons	Waste Type
RCI FITCHBURG LF	Fitchburg	MA	2,566	MSW

Divert + Dispose = **12,620** (Divert+Dispose) - Accept: **3,739** % Difference: **42.10%**

WILBRAHAM
Reg Obj Acct: 291801

WE WESTERN RECYCLING
120 OLD BOSTON RD

Receipt Status: **Rec'd 2/4/2020**

Class: LGTRAN - Large Transfer Station

Accepted: **121,124**

Waste/Material Type	State	Tons
MSW	CT	10,583
MSW	MA	24,541
C&D Waste	CT	73
C&D Waste	MA	2,847
Sludge (WWTP)	MA	753
Bulky Waste	CT	892
Bulky Waste	MA	35,310
Bulky Waste	VT	693
General Recyclables	CT	1
General Recyclables	MA	2,897
Fines C&D	CT	1,269
Fines C&D	MA	5,049
Residuals C&D	MA	32,957
Shingles Asphalt	CT	57
Shingles Asphalt	MA	3,202

121,124

Check Accepted: **OK**

OpenDays: 304

Diverted: **5,487**

Vendor/End User	Town	State	Tons	Material Type
automated material	Berlin	CT	599	General Recyclables
babylon Recycling center	Suffield	CT	7	General Recyclables
Capitol Recycling	Hartford	CT	2,323	General Recyclables
EXCEL	Charlton	MA	147	Metals
F&G Recycling	East Windsor	CT	2,339	C&D Waste
metal management	North Haven	CT	72	Metals

Disposed: **36,205**

Disposal Site Name	Town	State	Tons	Waste Type
clinton county lf	Morrisonville	NY	35	MSW
Covanta	Pittsfield	MA	10,782	MSW
Wheelabrator	Hudson Falls	NY	5,980	MSW
Wheelabrator	Millbury	MA	14,666	MSW
WM chicopee	Chicopee	MA	2,515	MSW
wm green ridge	Ganesvoort	NY	2,227	MSW

Divert + Dispose = **41,692** (Divert+Dispose) - Accept: **-79,432** % Difference: **-65.58%**

WINCHESTER NE WINCHESTER TRANSFER STATION
 Reg Obj Acct: 173111 15 MCKAY AVE

Receipt Status: **Rec'd 2/14/2020**

Class: LGTRAN - Large Transfer Station

Accepted: **18,407**

Waste/Material Type	State	Tons
MSW	MA	9,206
Wood Waste	MA	3,205
C&D Waste	MA	307
Tires	MA	4
General Recyclables	MA	1,486
Compostables/Organics	MA	53
Textiles/Clothing	MA	90
Metals	MA	331
Asphalt Brick Concrete	MA	107
Household Haz Waste	MA	1
Electronics/Computers	MA	37
Swap Shop	MA	78
Mulch	MA	3,500
Mattresses	MA	2

18,407

Check Accepted: **OK**

OpenDays: 260

Diverted: **5,352**

Vendor/End User	Town	State	Tons	Material Type
Bay State Textile	Pembroke	MA	2	Textiles/Clothing
BoBbs Tire	Fall River	MA	4	Tires
discover books	Attleboro	MA	5	Newspaper
graniteville	Westford	MA	107	Asphalt Brick Concrete
JRM Recycling	Peabody	MA	1,486	General Recyclables
Landscape Express	Woburn	MA	50	Compostables/Organics
mayer tree service	Essex	MA	3,205	Wood Waste
More Than Words	Boston	MA	18	Newspaper
Planet Aid	Holliston	MA	8	Textiles/Clothing
RECYCLE THAT, LLC	Federal Heights	CO	8	Textiles/Clothing
Red Cross	Peabody	MA	25	Textiles/Clothing
RMG	Londonderry	NH	37	Electronics/Computers
St Vincent de Paul	Woburn	MA	14	Textiles/Clothing
Swap Shop	Winchester	MA	50	Other (NonMSW)
TURNER STEEL	Lynn	MA	331	Metals
UTEC	Lowell	MA	2	Mattresses

Disposed: **9,513**

Disposal Site Name	Town	State	Tons	Waste Type
Covanta	Haverhill	MA	9,513	MSW

Divert + Dispose = **14,865** (Divert+Dispose) - Accept: **-3,542** % Difference: **-19.24%**

WORCESTER CE MASSACHUSETTS MATERIALS MANAGEMENT Receipt Status: **Rec'd 2/13/2020**
 Reg Obj Acct: 511231 2 KANSAS ST Class: SMHNDL - Small Handling Facility

Accepted: 5,963 Waste/Material Type State Tons 5,963 Check Accepted: **OK** OpenDays: 307

Waste/Material Type	State	Tons
MSW	MA	3,618
General Recyclables	MA	2,345

Diverted: 2,340

Vendor/End User	Town	State	Tons	Material Type
Beaupre Scrap	Worcester	MA	598	Metals
central mass landscapes	Worcester	MA	2	Compostables/Organics
East Coast Computer Recycling	Portsmouth	NH	7	Electronics/Computers
empire tire	Plainville	CT	233	Tires
f&D trucking	Millbury	MA	507	Metals
habitat for humanity	Worcester	MA	80	General Recyclables
Rand-Whitney Recycling	Worcester	MA	24	Newspaper
Rand-Whitney Recycling	Worcester	MA	193	Cardboard
south worcester clothing	Worcester	MA	20	Textiles/Clothing
troiano trucking	Grafton	MA	46	Compostables/Organics
United Material Management	Millbury	MA	210	Wood C&D
urban missionaries of our lady of	Worcester	MA	160	General Recyclables
Various	Various	CN	210	Wood Waste
worcester sand and gravel	Shrewsbury	MA	50	Asphalt Brick Concrete

Disposed: 3,618

Disposal Site Name	Town	State	Tons	Waste Type
united materials management	Millbury	MA	3,618	MSW

Divert + Dispose = 5,958 (Divert+Dispose) - Accept: -5 % Difference: -0.08%

YARMOUTH SE YARMOUTH BARNSTABLE REG TRANSFER STATION Receipt Status: **Rec'd 3/13/2020**
 Reg Obj Acct: 329275 50 WORKSHOP RD Class: LGTRAN - Large Transfer Station

Accepted: 89,240 Waste/Material Type State Tons 89,240 Check Accepted: **OK** OpenDays: 350

Waste/Material Type	State	Tons
MSW	MA	88,771
General Recyclables	MA	469

Diverted: 451

Vendor/End User	Town	State	Tons	Material Type
EL Harvey	Westborough	MA	447	General Recyclables
Mid City Scrap	Westport	MA	4	Metals

Disposed: 88,717

Disposal Site Name	Town	State	Tons	Waste Type
SEMASS	Rochester	MA	88,717	MSW

Divert + Dispose = 89,168 (Divert+Dispose) - Accept: -72 % Difference: -0.08%

YARMOUTH SE YARMOUTH TRANSFER STATION
 Reg Obj Acct: 266530 606 FOREST RD

Receipt Status: **Rec'd 2/15/2020**

Class: LGTRAN - Large Transfer Station

Accepted: **28,586**

Waste/Material Type	State	Tons
MSW	MA	8,428
Wood Waste	MA	2,517
C&D Waste	MA	15,220
Tires	MA	47
Other (NonMSW)	MA	33
General Recyclables	MA	460
Compostables/Organics	MA	52
Textiles/Clothing	MA	75
Mixed Paper	MA	762
Metals	MA	712
Household Haz Waste	MA	30
Electronics/Computers	MA	83
Mattresses	MA	167

28,586

Check Accepted: **OK**

OpenDays: 354

Diverted: **20,157**

Vendor/End User	Town	State	Tons	Material Type
A&P Enterprises	Berkley	MA	83	Electronics/Computers
A&P Enterprises	Berkley	MA	6	Metals
ACE Mattress Recycling	West Warwick	RI	167	Mattresses
Bay State	New Bedford	MA	6	Textiles/Clothing
best buy beverages	Mashpee	MA	29	General Recyclables
CRT Inc	Taunton	MA	1	General Recyclables
discover books	Pawtucket	RI	33	Mixed Paper
EL Harvey	Westborough	MA	460	General Recyclables
EXCEL	Westport	MA	349	Metals
F&B Rubberized	New Bedford	MA	47	Tires
Goodwill Industries	Boston	MA	21	Textiles/Clothing
intercity battery	Yarmouth	MA	30	Household Haz Waste
mayer tree services	Essex	MA	453	Wood Waste
Mid City Scrap	Westport	MA	357	Metals
Mid City Scrap	Westport	MA	577	General Recyclables
MiGHTY FLAME	Rindge	ME	2	Metals
Miller Recycling Corp	Westport	MA	152	General Recyclables
New England Recycling	Taunton	MA	15,220	C&D Waste
New England Recycling	Taunton	MA	1,003	Wood Waste
Red Cross	Boston	MA	33	Textiles/Clothing
Robert Childs Inc	South Dennis	MA	348	Wood Waste
S&J Exco	Dennis	MA	713	Wood Waste
Salvation Army	Boston	MA	15	Textiles/Clothing
TW Nickerson	Chatam	MA	52	Compostables/Organics

Disposed: **8,428**

Disposal Site Name	Town	State	Tons	Waste Type
Yarmouth-Barnstable TS	Yarmouth	MA	8,428	MSW

Divert + Dispose = **28,585** (Divert+Dispose) - Accept: **-1** % Difference: **0.00%**

Report Summary

Number of Annual Reports Listed: 77

EXHIBIT 2

Joint Environmental Comments on Proposed Changes to Waste Incineration Regulations in the Renewable Energy Portfolio Standard (225 C.M.R. 14.00 and 225 C.M.R. 15.00)

Conservation Law Foundation; Global Alliance for Incinerator Alternatives; Acadia Center; Alliance for Health and Environment; Berkshire Environmental Action Team; Clean Water Action; Climate Action Now Western Massachusetts; Cooperative Energy, Recycling, and Organics; Environmental League of Massachusetts; Institute for Local Self Reliance; Massachusetts Sierra Club; MASSPIRG; No Fracked Gas in Mass; Partnership for Policy Integrity; Sustainable Wellesley; Toxics Action Center; Judith Enck, founder Beyond Plastics, former EPA Regional Administrator; Mike Ewall, Esq., Executive Director Energy Justice Network

Thank you for the opportunity to provide comments regarding the proposed changes to Massachusetts' Renewable Portfolio Standard ("RPS") Class I and RPS Class II Regulations. These comments were prepared by the Conservation Law Foundation ("CLF")¹ and are being submitted on behalf of the groups and individuals listed above (collectively "Commenters").

In the RPS Class II "waste-to-energy" section of the proposed changes, DOER proposes increasing the amount of energy our utilities must purchase from qualifying facilities from 3.5% to 3.7% for 2019 through 2025. DOER also proposes increasing the RPS Class II waste-to-energy rate to align with the RPS Class II Renewable Energy alternative compliance rate, effective this year.

The Commenters oppose both the proposed increase in energy to be purchased from incinerators, and proposed increase in rate because:

- 1) Incinerators do not produce renewable energy, and should not benefit from programs meant to support renewable energy;**
- 2) Incinerators' toxic emissions and ash are bad for the environment, public health, and the economy;**

¹ Portions of these comments were previously published on CLF's website in a blog post authored by Ahmina Maxey, the U.S. and Canada Regional Coordinator with Global Alliance for Incinerator Alternatives. See Ahmina Maxey, What's Wrong with Burning Our Trash, Anyway? So very, very much, <https://www.clf.org/blog/whats-wrong-with-burning-our-trash-anyway/>.

- 3) Incinerators in Massachusetts are disproportionately located in already overburdened Environmental Justice Communities;**
- 4) The RPS should not be adjusted to prop up and extend the life of outdated, aging incinerators;**
- 5) Incinerators are more expensive and provide fewer jobs than the alternatives;**
- 6) Any changes to the RPS should be made after the 2020-2030 Solid Waste Master Plan is adopted.**

RPS and programs like it are meant to support and stimulate the sustainable energy field and to protect the environment, yet as analyzed in a recent Boston College Law Review article, incineration is neither economically sound nor environmentally sustainable:²

Because [Waste-To-Energy] superficially appears to be renewable, it was able to become a thriving industry by taking government subsidies that should have been reserved for wind, solar, and geothermal energy. Thus this “dirty” industry has continued to benefit under federal and state programs, while they simultaneously expel persistent, bioaccumulative toxics into the environment.³

1. Incinerators do not produce renewable energy, and should not benefit from programs meant to support renewable energy.

Incineration, often referred to as “waste-to-energy” by the industry, is a high-heat waste treatment technology that involves burning municipal solid waste (“MSW”), a.k.a. the combination of commercial, residential, and industrial wastes. Massachusetts’ MSW comprises primarily food, yard waste, cardboard, paper, textiles, metals, glass, construction and demolition materials, plastics, household hazardous waste, and electronics.⁴ High-heat incineration converts these materials into bottom ash, fly ash, combustion gases, air pollutants, wastewater, wastewater treatment sludge, and heat.

Municipal Solid Waste comprises many materials that are not “renewable.” Incineration of MSW that contains fossil fuels, such as plastics and rubber, releases the bound carbon stored in those

² Hale McAnulty, *A Dirty Waste – How Renewable Energy Policies Have Financed the Unsustainable Waste-To-Energy Industry*, 60 B.C.L. Rev. 385 (2019), <https://lawdigitalcommons.bc.edu/bclr/vol60/iss1/9>.

³ *Id.* at 412.

⁴ See Massachusetts DEP, *Overall Waste Composition By Primary Material Category—Winter and Fall 2016 Sampling*, <https://www.mass.gov/doc/summary-of-waste-combustor-class-ii-recycling-program-waste-characterization-studies-includes/download>.

fossil fuels.⁵ According to the U.S. Environmental Protection Agency (“EPA”), in 2016, MSW incineration released 11.0 million metric tons of carbon dioxide equivalent (“CO₂e”) greenhouse gases.⁶ Per unit of electricity generated, waste incineration emits more carbon dioxide (2,988 lbs/MWh) than coal-fired power plants (2,249 lbs/MWh).⁷

Moreover, according to EPA, zero waste practices such as source reduction, recycling, and composting provide a significant net life-cycle reduction in greenhouse gas emissions compared to incineration.⁸ And in fact, these zero waste practices conserve significantly more energy than can be generated via incineration.⁹ Source reduction, recycling, and composting can conserve three to five times more energy, per ton of waste, than can be generated by incinerating that same ton of waste.¹⁰ Tellus Institute, in its “Assessment of Materials Management Options for the Massachusetts Solid Waste Master Plan Review” submitted to the Massachusetts Department of Environmental Protection (“DEP”), estimated that waste diversion through recycling saves 1,665 kWh over incineration per ton of solid waste.¹¹ According to another estimate, the amount of energy wasted by not recycling aluminum and steel cans, paper, printed materials, glass, and plastic equals the annual output of 15 medium-sized power plants.¹²

In 2016, more than 70% of the MSW incinerated in Massachusetts was paper, plastic, metal, glass, or organic material,¹³ most of which could have been recycled or composted. In terms of

⁵ Tellus Institute, Assessment of Materials Management Options for the Massachusetts Solid Waste Master Plan Review 9, 11 (2008), https://www.tellus.org/pub/Final_Report-Materials_Management_Options_for_MA_SW_Master_Plan_Review_-_With_Appendices_-_12-08.pdf. See also U.S. EPA, Solid Waste Management and Greenhouse Gases, a Life-Cycle Assessment of Emissions and Sinks 76 (3d ed. 2006) (“Combustion of plastics results in substantial net [greenhouse gas] emissions. . . . This result is primarily because of the high content of nonbiomass carbon in plastics.”).

⁶ EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2016, 3-51–3-53 (2018).

⁷ Morris, Jeffrey, Bury or Burn North America MSW? LCAs Provide Answers for Climate Impacts & Carbon Neutral Power Potential, Environmental Science & Technology, Volume 44, NO. 20, September, 2010. See also Energy Justice Network, Trash Incineration More Polluting Than Coal, <http://www.energyjustice.net/incineration/worsethancoal> (when “biogenic” emissions are included in the calculus, incineration releases carbon dioxide “at a rate 2.5 times that of coal power plants”).

⁸ U.S. EPA, *supra* note 5, at 116–19.

⁹ Marie Donahue, Institute for Local Self-Reliance, Waste Incineration: A Dirty Secret in How States Define Renewable Energy 11 (2018), <https://ilsr.org/wp-content/uploads/2018/12/ILSRIncinerationFinalDraft-6.pdf>.

¹⁰ *Id.*

¹¹ Tellus Institute, *supra* note 5, at 3, 51–52.

¹² Recycling Investment Saves Energy, S. 3654, 109th Cong. § 2 (2006).

¹³ See Massachusetts DEP, *supra* note 4.

greenhouse gas generation and energy production, even rudimentary zero waste alternatives are far more advantageous than using these materials to generate non-renewable energy.¹⁴

2. Incinerators’ toxic emissions and ash are bad for the environment, public health, and the economy.

Waste incineration not only emits greenhouse gases at a much higher rate than other non-renewable energy sources, but it also releases significant levels of toxic pollutants to nearby communities. On average, to produce the same amount of energy as a coal power plant, waste incinerators release:

- 28 times as much dioxin;
- twice as much carbon monoxide;
- three times as many nitrogen oxides;
- 6–14 times as much mercury;
- nearly six times as much lead; and
- 70% more sulfur dioxides.¹⁵

Incinerators are also significant sources of particulate matter emissions.¹⁶ Inhalation of particulate matter, from a variety of sources, has been linked to respiratory and cardiovascular problems and may cause approximately 2 million excess deaths worldwide each year.¹⁷ And a 2011 study published in the *American Economic Review* found that among U.S. industries, waste incineration has the highest ratio of negative economic impacts from air pollution compared to the financial value added by the industry.¹⁸

¹⁴ See Tellus Institute, *supra* note 5, at 1 (“From a lifecycle environmental emissions and energy perspective, source reduction, recycling, and composting are the most advantageous management options for all (recyclable/compostable) materials in the waste stream.”).

¹⁵ Energy Justice Network, *supra* note 7; see also Environmental Integrity Project, *Dirtying Maryland’s Air by Seeking a Quick Fix on Renewable Energy?* 3–8 (2011), http://www.environmentalintegrity.org/wp-content/uploads/2016/11/FINALWTE_INCINERATORREPORT-101111.pdf (Maryland’s two major incinerators release mercury, lead, nitrogen oxides, and carbon monoxide at significantly higher rates than Maryland’s four coal-fired power plants).

¹⁶ The New School, *U.S. Municipal Solid Waste Incinerators: An Industry in Decline* 34 (2019), https://tishmancenter.org/wp-content/uploads/2019/05/CR_GaiaReportFinal_05.21.pdf.

¹⁷ Howard, C. Vyvyan, *Statement of Evidence, Particulate Emissions and Health, Proposed Ringaskiddy Waste-to-Energy Facility* 4–5 (2009).

¹⁸ Muller, Nicholas Z., Robert Mendelsohn, and William Nordhaus, 101 Environmental Accounting for Pollution in the United States Economy, *American Economic Review* 5, 1649, 1664–69 (2011).

Some newer incinerators are equipped with air pollution control devices such as air filters, but these filters do not efficiently prevent the escape of ultrafine particular matter.¹⁹ And in any event, filters do not eliminate pollutants; they merely capture those pollutants and transfer them to incinerator by-products such as ash and wastewater treatment sludge.²⁰

Incineration is often touted as a landfill alternative, but after incineration, roughly 25% of the weight of incoming waste remains in the form of residual ash.²¹ This ash, which contains high levels of dioxin, mercury, lead, polychlorinated biphenyls (“PCBs”), and polychlorinated naphthalenes (“PCNs”),²² is disposed of in landfills. Dioxins have been described as the most toxic chemicals known to mankind and are recognized human carcinogens; mercury and lead impair cognitive and behavioral development in children and impact the central nervous system, kidneys, and developing fetuses. When incinerator ash is deposited in landfills, these pollutants eventually leach out and pose an immediate threat to groundwater, drinking water, and surface water bodies.²³ In 2004, Massachusetts’ waste incinerators produced approximately 790,000 tons of combustion ash, 700,000 tons of which was deposited in landfills.²⁴

3. Incinerators in Massachusetts are disproportionately located in already overburdened Environmental Justice Communities.

The impacts of incinerators’ emissions and toxic ash are disproportionately borne by already overburdened environmental justice (“EJ”) communities. Most waste incinerators in the U.S. are located in EJ communities,²⁵ and incinerators in Massachusetts are no exception.

In 2002, Massachusetts established an Environmental Justice Policy (“EJ Policy”), revised most recently in 2017, to help address the disproportionate share of environmental burdens

¹⁹ Vyvyan, *supra* note 17, at 21–22.

²⁰ Global Alliance for Incinerator Alternatives, *Incinerators: Myths vs. Facts* 1 (2010), https://www.weal.org/ARCHIVE%20Waste/Incinerator_Myths_vs_Facts.pdf.

²¹ U.S. EPA, *Municipal Solid Waste in the United States: 2011 Facts and Figures* 143–44 (2013), https://archive.epa.gov/epawaste/nonhaz/municipal/web/pdf/mswcharacterization_fnl_060713_2_rpt.pdf.

²² Global Alliance for Incinerator Alternatives, *supra* note 20, at 1; Jindrich Petrlik and Ralph Anthony Ryder, *After Incineration: The Toxic Ash Problem* 4–6 (2005), https://ipen.org/sites/default/files/documents/ipen_incineration_ash-en.pdf; Michelle Allsopp, Pat Costner, and Paul Johnston, *Incineration and Human Health* 11–12 (2001).

²³ Allsopp, *supra* note 22 at 54–56.

²⁴ Massachusetts DEP, *Solid Waste Master Plan: 2006 Revision* 43 (2006), <https://www.mass.gov/files/documents/2016/08/vo/swmprev.pdf>.

²⁵ The New School, *supra* note 16, at 4 (“58 incinerators, or 79 percent of all MSW incinerators in the U.S. are located in environmental justice communities.”).

experienced by lower-income families and communities of color.²⁶ The EJ Policy is designed to help protect these communities from environmental pollution and promote community involvement in planning and environmental decision-making to maintain and/or enhance the environmental quality of their neighborhoods.²⁷

The EJ Policy defines an EJ community as a neighborhood (or “block group”) in which either 25 percent of the households have an annual median household income less than or equal to 65 percent of the statewide median, 25 percent of the population is minority, or 25 percent of the population identifies as a household that has English isolation.²⁸ The following table identifies Massachusetts municipalities in which there are active incinerators,²⁹ and lists whether the municipality comprises an EJ population, and, if applicable, the specific EJ criteria met and the percentage of the municipality population that meets the EJ criteria.³⁰ Six of the seven incinerators in Massachusetts are located in EJ communities:

Active Incinerators	Maximum Permitted Tonnage per Year	EJ Populations Present	EJ Criteria Met	Percent of Population in EJ Block Groups
Agawam ³¹	148,920	Yes	Income	4.3%
Haverhill	602,250	Yes	Minority, Income	35%
Millbury	547,500	Yes	Income	7.2%
North Andover ³²	547,500	Yes	Minority, Income	14.6%
Pittsfield	87,600	Yes	Minority, Income	36.8%
Rochester	1,095,000	No	--	--
Saugus	547,500	Yes	Income	7.0%

²⁶ Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs 2 (2017), https://www.mass.gov/files/documents/2017/11/29/2017-environmental-justice-policy_0.pdf.

²⁷ *Id.*

²⁸ *Id.* at 3.

²⁹ See Municipal Waste Combustors, <https://www.mass.gov/guides/municipal-waste-combustors>.

³⁰ Massachusetts DEP, 2010 Environmental Justice Populations, <http://www.mass.gov/anf/docs/itd/services/massgis/ej-2010-communitystatistics.pdf>.

³¹ The Agawam incinerator is located near the border with Springfield, which meets Minority, Income, and English Isolation EJ criteria, and in which 89.6% of the population is in an EJ block group.

³² The North Andover incinerator is located within one mile of Lawrence, which meets Minority, Income, and English Isolation EJ criteria, and in which 100% of the population is in an EJ block group.

For those forced to live near these facilities, the effects are dire. Throughout the U.S., many of the incinerators with the highest total emissions of lead, mercury, nitrogen oxides, sulfur dioxides, and particulate matter are located in EJ communities.³³ Exposure to these pollutants can cause a wide range of cardiovascular, respiratory, and neurological damage, and can lead to decreased life expectancy.³⁴ EJ communities face a multitude of social vulnerabilities and are often confronted with many sources of dangerous pollution.³⁵ Throughout Massachusetts and the U.S., these communities should not be forced to endure the negative impacts of other communities' waste.

4. The RPS should not be adjusted to prop up and extend the life of outdated, aging incinerators.

The proposed changes to the RPS would provide unwarranted life support to the outdated, unsafe, and unreliable incinerator facilities that disproportionately impact the Commonwealth's most vulnerable communities. Each of the incinerators in Massachusetts is at least 30 years old: the oldest, Saugus, began operating in 1975,³⁶ and the youngest, Haverhill, began operating in 1989.³⁷

Incinerators typically have a lifespan of 20–30 years,³⁸ and require increasing capital investments as they age.³⁹ Many aging incinerators in the U.S. have been unable to keep up with maintenance requirements and/or emissions limits and have been forced to shut down as a result. For example, a Detroit incinerator, operating since 1986 and increasingly unable to comply with emissions limits,⁴⁰ recently announced that it would shut down in the face of a Clean Air Act lawsuit that would have forced the incinerator to spend tens of millions of dollars to upgrade its pollution control equipment.⁴¹ A 33-year-old Wheelabrator incinerator in Baltimore, which has received an estimated \$10 million in renewable energy subsidies, emits nitrogen oxides at twice the rate of newer Maryland facilities, and would need to invest millions of dollars to comply with

³³ The New School, *supra* note 16, at 39–41.

³⁴ *Id.*

³⁵ *Id.* at 14.

³⁶ See <https://www.wtienergy.com/plant-locations/energy-from-waste/wheelabrator-saugus>.

³⁷ See <https://www.covanta.com/Our-Facilities/Covanta-Haverhill>.

³⁸ The New School, *supra* note 16, at 22; National Research Council, *Waste Incineration and Public Health* 29–30 (The National Academies Press 2000).

³⁹ The New School, *supra* note 16, at 22–23.

⁴⁰ See Rebecca Stoner, *Why Communities Across America Are Pushing to Close Waste Incinerators*, *Pacific Standard*, Dec. 12, 2018, <https://psmag.com/environment/why-communities-across-america-are-pushing-to-close-waste-incinerators>.

⁴¹ See The New School, *supra* note 16, at 15.

new, stricter, emissions limits.⁴² An aging incinerator in Hartford, Connecticut, has been unable to afford necessary equipment upgrades and shut down for more than two months between November 2018 and January 2019 because of a mechanical failure.⁴³

Massachusetts' incinerators are, again, no exception. The Wheelabrator Saugus incinerator, operating since 1975, has suffered from regular shutdowns and outages in recent years.⁴⁴ During 2018, according to emissions data reported to DEP by Wheelabrator, either or both of the waste furnaces at the Saugus incinerator were shut down for all or part of 89 separate days.⁴⁵ These shutdowns are particularly problematic because the furnaces often emit much higher concentrations of pollutants such as carbon monoxide, sulfur dioxide, and nitrogen oxides during shutdown and startup than during normal operation. For example, during shutdown operations on December 2, 2018, the Saugus incinerator emitted average concentrations of 1,127.4 parts per million ("ppm") of carbon dioxide and 113.5 ppm of sulfur dioxide over two separate one-hour periods.⁴⁶ These average emissions significantly exceed the incinerator's Air Quality Operating Permit emissions limits of 100 ppm for carbon dioxide and 29 ppm for sulfur dioxide.⁴⁷

Shutdowns and maintenance can also blanket nearby communities with disruptive and dangerous noise pollution. During a three-week period in June and July, 2019, Wheelabrator Saugus shut down one of its steam turbines to perform necessary maintenance, resulting in loud steam venting that forced neighbors indoors and kept them awake at night.⁴⁸

⁴² See Rebecca Stoner, *supra* note 40.

⁴³ See The New School, *supra* note 16, at 24; Cole Rosengren and Rina Li, Connecticut WTE facility partially back online after double turbine failure, Waste Dive (Jan. 31, 2019), <https://www.wastedive.com/news/Materials-Innovation-Recycling-Authority-wte-double-turbine-failure/545359/>.

⁴⁴ See, e.g., Mike Gaffney, Fire Ignites in Wheelabrator Saugus boiler, Wicked Local Saugus (Sept. 30, 2015), <https://saugus.wickedlocal.com/article/20150930/news/150939906>; Mike Gaffney, Firefighters douse trash fires at Wheelabrator Saugus, Wicked Local Saugus (Aug. 2, 2017), <https://saugus.wickedlocal.com/news/20170802/firefighters-douse-trash-fires-at-wheelabrator-saugus>.

⁴⁵ Emissions data can be retrieved at <http://eeaonline.eea.state.ma.us/DEP/MWC/facilityReport.aspx>.

⁴⁶ See *id.*

⁴⁷ See Final Air Quality Operating Permit MBR-95-OPP-011A5 at 5, <https://www.mass.gov/files/documents/2019/06/27/op-wheels.pdf>.

⁴⁸ See Kristina Rex, 'No One Sleeps': Revere, Saugus Residents Frustrated By Noise From Waste Plant, CBS Boston (July 2, 2019), <https://boston.cbslocal.com/2019/07/02/revere-saugus-wheelabrator-residents-frustrated-loud-noise-waste-plant/>; Mike Gaffney, Wheelabrator Saugus temporarily stops processing waste to address noise complaints, Saugus Wicked Local (June 26,

Moreover, Wheelabrator has stated that its aging Saugus incinerator cannot comply with revised nitrogen oxides emissions limits without major modifications.⁴⁹ RPS subsidies, intended to support and spur innovation in renewable energy, should not prop up these aging, polluting incinerators.

5. Incinerators are more expensive and provide fewer jobs than the alternatives.

In part owing to the capital costs of aging facilities, waste incineration is a losing financial proposition for state and local governments. As both a means of energy generation and waste disposal, incineration is more expensive than available alternatives. According to 2010 estimates by the U.S. Energy Information Administration, both capital costs and operations and maintenance costs are higher for MSW incineration than for all other forms of electricity generation, including coal, natural gas, nuclear, biomass, solar, geothermal, and hydroelectric.⁵⁰ In light of this imbalance, incineration facilities typically derive a much larger portion of their revenue from tipping fees⁵¹ than from electricity sales.⁵²

These tipping fees are significantly more expensive than alternatives such as recycling or composting. Baltimore, for example, pays approximately \$18 per ton for recycling, but \$50 per ton in incineration tipping fees.⁵³ Hennepin county, Minnesota, pays more than \$80 per ton in incineration tipping fees, but charges only \$25 per ton for organics composting.⁵⁴ And because incineration facilities rely on tipping fees to stay financially viable, municipalities are often

2019), <https://saugus.wickedlocal.com/news/20190626/wheelabrator-saugus-temporarily-stops-processing-waste-to-address-noise-complaints>.

⁴⁹ Mike Gaffney, Proposed Wheelabrator Saugus emission control plan modification riles officials, Wicked Local Saugus (Dec. 13, 2018), <https://saugus.wickedlocal.com/news/20181212/proposed-wheelabrator-saugus-emission-control-plan-modification-riles-officials>.

⁵⁰ U.S. Energy Information Administration, Updated Capital Cost Estimates for Electricity Generation Plants 7 (2010), <http://large.stanford.edu/courses/2018/ph241/wang-k2/docs/eia-nov10.pdf>.

⁵¹ “Tipping fees . . . are charged by a waste disposal site, such as an incinerator or landfill, to a municipality or private waste hauler for each tonnage of waste deposited at the site.” The New School, *supra* note 16, at 25.

⁵² *Id.* (“Municipal solid waste incinerators rely primarily on tipping fees and secondarily on electricity sales for revenues. As an example, Covanta (which owns 22 facilities and operates 39 facilities in the U.S.), on average, derives its revenues: 71 percent from tipping fees, 18 percent from electricity sales, 5 percent from metal recycling and 6 percent from ‘other’ (i.e. revenues derived from construction revenues, resale of purchased energy, fees from operating transfer facilities, etc.).”).

⁵³ Donahue, *supra* note 9, at 14.

⁵⁴ *Id.*

forced to enter into “put or pay” contracts with incinerators—these clauses require the municipalities to supply a minimum amount of waste or pay a penalty.⁵⁵

And despite the higher costs of incineration, incinerators generate fewer jobs than alternatives such as recycling and composting facilities. In a 2011 report, Tellus Institute estimated that composting generates five times as many jobs as incineration—and recycling twenty times as many jobs—per ton of waste disposed.⁵⁶ The Institute for Local Self Reliance has similarly estimated that composting facilities can create more than three times as many jobs as incinerators per ton of waste.⁵⁷ Tellus also estimated in its 2011 report that the implementation of “an aggressive recycling and composting program” resulting in the diversion of 75% of overall MSW by 2030, could result in the creation of 739,000 additional jobs in the U.S. compared to the status quo.⁵⁸

RPS subsidies should not support an expensive system that generates fewer jobs than zero waste alternatives.

6. Any changes to the RPS should be made after the 2020–2030 Solid Waste Master Plan is adopted.

DEP has begun holding Solid Waste Action Committee meetings of stakeholders to develop the new Solid Waste Master Plan. DEP expects to release a draft plan in the fall of 2019, and to publish a final plan by the end of 2020.⁵⁹ Goals under consideration include a 33% reduction in waste disposal by 2030 compared to 2017 waste totals.⁶⁰ In light of potentially drastic changes to the waste stream in Massachusetts, DOER should not alter RPS subsidies to waste incinerators until after the final 2020–2030 Solid Waste Master Plan is adopted.

Conclusion

Increasing the amount of energy to be purchased from aging, polluting, and expensive incineration facilities or increasing the waste-to-energy Class II rate would only serve to direct more money to existing generators without any benefit to the people of Massachusetts. Indeed, as discussed above, incinerators significantly disadvantage the Commonwealth’s people, in particular those that live in EJ communities. The RPS should not be adjusted to prop up and

⁵⁵ The New School, *supra* note 16, at 25.

⁵⁶ Tellus Institute, *More Jobs, Less Pollution: Growing the Recycling Economy in the U.S.* 34–35 (2011), https://www.nrdc.org/sites/default/files/glo_11111401a_0.pdf.

⁵⁷ Donahue, *supra* note 9, at 15.

⁵⁸ Tellus Institute, *supra* note 56, at 36.

⁵⁹ John Fischer, MassDEP, *MassDEP Updates 5* (2019), <https://recyclingworksma.com/wp-content/uploads/2019/05/MassDEP-2019-Spring-WasteWise-Forum.pdf>.

⁶⁰ John Fischer, MassDEP, *2030 Solid Waste Master Plan Discussion of Goal and Capacity Data 4* (2019), <https://www.mass.gov/files/documents/2019/06/19/swmp519.pdf>.



extend the operation of aging incineration facilities, nor should it be used to facilitate the development of new trash-burning plants, at the expense of the health and lives of residents of the Commonwealth.

Thank you again for the opportunity to comment on the proposed changes to Massachusetts' Renewable Portfolio Standard ("RPS") Class I and RPS Class II Regulations.

Very truly yours,

Kirstie L. Pecci
Director Zero Waste Project
Conservation Law Foundation

Global Alliance for Incinerator Alternatives

Acadia Center

Alliance for Health and Environment

Berkshire Environmental Action Team

Clean Water Action

Climate Action Now Western Massachusetts

Cooperative Energy, Recycling, and Organics

Environmental League of Massachusetts

Institute for Local Self Reliance

Massachusetts Sierra Club

MASSPIRG

No Fracked Gas in Mass

Partnership for Policy Integrity

Sustainable Wellesley

Toxics Action Center



Judith Enck
Founder, Beyond Plastics
Former EPA Regional Administrator

Mike Ewall, Esq.
Executive Director, Energy Justice Network



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

December 23, 2020

Kathleen A. Theoharides
Secretary of Energy and Environment
Executive Office of Energy and
Environmental Affairs
100 Cambridge Street, Suite 900
ATTN: MEPA Office
Boston, MA 02114

RE: SEIR Review. EOEEA 11333
BOURNE. Integrated SWM Facility at 201
MacArthur Boulevard

Dear Secretary Theoharides,

The Southeast Regional Office of the Department of Environmental Protection (MassDEP) has reviewed the Single Environmental Impact Report (SEIR) for BOURNE. Integrated SWM Facility, Barnstable, Massachusetts (EOEEA #16148). The Project Proponent provides the following information for the Project:

The following Project Description is consistent with the description included in the ENPC, with minimal changes that respond to the comments that were received on it. In 2016, the Town acquired approximately twelve acres of undeveloped land, abutting the residential recycling center at the extreme southern boundary of the site. This acquisition has enabled the Town to contemplate a site development plan whereby offices, maintenance and handling facilities would be relocated to that new parcel. By doing this, Phase 7 and Phase 8 could be developed on the 25-acre parcel thereby extending the life of the landfill operations. Currently the 25-parcel is site-assigned only for solid waste handling and is the location of the C&D transfer station, single stream recyclables transfer station, the residential recycling center, and other facilities. In order to expand the Landfill into this area, the site assignment will need a major modification from the Bourne Board of Health. In addition, MA DEP commented in the ENPC that the Phase 9 vertical expansion requires a major modification to the Site Assignment. The site assignment process is contemplated to be undertaken in late 2020 after the MEPA process has been completed. Attachment 3 contains plans for the site master plan that show the phasing options for the landfill and a conceptual layout of relocated infrastructure on the 12-acre parcel.

Bureau of Water Resources Comments

Wetlands. SEIR addresses the Wetlands and Waterways Program's comments.

Wastewater/(Leachate). The Proponent has met with representatives of MassDEP to discuss the option of treating leachate onsite and disposing the treated wastewater at the Joint Base Cape Cod infiltration basin. The Proponent is aware of the permitting requirements.

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.

TTY# MassRelay Service 1-800-439-2370

MassDEP Website: www.mass.gov/dep

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Bureau of Waste Site Cleanup Comments

Based upon the information provided, the Bureau of Waste Site Cleanup (BWSC) searched its databases for disposal sites and release notifications that have occurred at or might impact the proposed Project area. A disposal site is a location where there has been a release to the environment of oil and/or hazardous material that is regulated under M.G.L. c. 21E, and the Massachusetts Contingency Plan [MCP – 310 CMR 40.0000].

There are several listed MCP sites located within 1000-feet of the proposed Project area. The disposal sites have all been closed under the MCP, and no further response actions or reporting are required. Note that one of the closed disposal sites is located at the Bourne ISWM facility (Release Tracking Number 4-14181). It is unlikely that any of these closed sites will impact the proposed MEPA Project area.

There are no other listed MCP disposal sites located at or in the vicinity of the site that would appear to impact the proposed Project area. Interested parties may view a map showing the location of BWSC disposal sites using the MassGIS data viewer (Oliver) at: http://maps.massgis.state.ma.us/map_ol/oliver.php Under “Available Data Layers” select “Regulated Areas”, and then “DEP Tier Classified 21E Sites”. The compliance status and report submittals for specific MCP disposal sites may be viewed using the BWSC Waste Sites/Reportable Release Lookup at: <https://eeaonline.eea.state.ma.us/portal#!/search/wastesite>

The Project Proponent is advised that if oil and/or hazardous material are identified during the implementation of this project, notification pursuant to the Massachusetts Contingency Plan (310 CMR 40.0000) must be made to MassDEP, if necessary. A Licensed Site Professional (LSP) should be retained to determine if notification is required and, if need be, to render appropriate opinions. The LSP may evaluate whether risk reduction measures are necessary if contamination is present. The BWSC may be contacted for guidance if questions arise regarding cleanup.

Bureau of Air and Waste (BAW) Comments

Solid Waste Management. Based on its review of the Single Environmental Impact Report for the Town of Bourne Integrated Solid Waste Management Facility in Bourne, EEA No. 11333, the Massachusetts Department of Environmental Protection (MassDEP) Solid Waste Management Section has determined that the Proponent has adequately addressed its comments previously provided in the Expanded Notice of Project Change documents. MassDEP has verified that the Draft Section 61 Findings are in general compliance with solid waste compliance requirements.

1. Solid Waste Permitting: The proposed expansion will require the following solid waste permits:
 - a. For the proposed landfill expansion:
 - Site Suitability Report for a Major Modification of an Existing Site Assignment (BWP SW 38).
 - Authorization to Construct a Large Landfill Expansion (BMP SW 26), and
 - Authorization to Operate (BWP SW 10).
 - b. For the proposed solid waste transfer station:
 - Site Suitability Report for a New Site Assignment (BWP SW 01).
 - Authorization to Construct a Large Handling Facility (BWP SW 05); and
 - Authorization to Operate a Large Handling Facility (BWP SW 06).

Prior the submission of a BWP SW 38 or BWP SW 01 application, MassDEP requires a preapplication meeting to discuss comments received from the public on the SEIR and to ensure

the facility design and operational measures will comply with solid waste regulations and applicable policies with an emphasis on odor, noise, and traffic mitigation.

2. **Additional Public Participation:** The following permit applications have public comment periods:
 - a. BWP SW 01 applications: There is a 21-day public comment period.
 - b. BWP SW 38 applications: There is a 21-day public comment period.
 - c. Board of Health Site Assignment Decisions: The Board of Health must hold a public hearing in accordance with 310 CMR 16.20.
 - d. BWP SW 05 applications: There is a minimum 30-day public comment period.
 - e. BWP SW 26 applications: There is a minimum 30-day public comment period.
 - f. BWP SW 06 or BWP SW 10 applications: Public comments are not required prior to issuing a decision, but MassDEP may issue provisional approval with a deferred effective date to allow for 21-day public notice/comment period.

All solid waste applications may be reviewed online at:

<https://eeaonline.eea.state.ma.us/EEA/PublicApp/>.

3. **Waste Types:** Regarding the type of waste accepted for disposal at the Landfill, the SEIR discusses a “preferred alternative” in which the Town continues landfilling ash at approximately 80% and MSW at approximately 20% and a “MSW alternative” in which the Town landfills only MSW. During MassDEP solid waste permitting, the Town will be required to evaluate both scenarios. However, regardless of waste type, MassDEP solid waste regulations require the Proponent to ensure that landfill operations do not create nuisance problems with vectors, odors, dust, noise, litter, or other nuisance conditions.
4. The SEIR provided additional details regarding the Proponent’s plan to install a long-term intermediate cover system prior to the installing the final cover system. MassDEP will further evaluate this plan including the proposed schedule for capping the landfill during solid waste permitting. MassDEP may require the Proponent to revise the proposed schedule for capping if there are issues with leachate management, nuisance conditions, or as necessary to ensure compliance with 310 CMR 19.000.
5. If you should have any further questions please contact Mark Dakers, Solid Waste Section chief at (508) 946-2847.

Air Quality. The Proponent is aware that Air Quality Permitting is likely required for any of the landfill gas use options that are described in the SEIR and advised to contact the Air Quality Permitting Section early in any planning stages.

Stormwater Management EPA Permitting. The Proponent states that the Project needs neither a NPDES Construction General Permit nor a NPDES Multi Sector General Permit and has consulted a MassDEP representative regarding the need for these permits. Although is it likely that these permits are not needed. The Proponent is advised to directly contact the EPA for a final determination since these permits are under the sole jurisdiction of the EPA. The New England NPDES contact is [Dave Gray](mailto:gray.davidj@epa.gov) (gray.davidj@epa.gov), 617-918-1577.

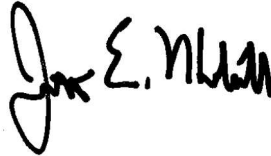
Climate Change / GHG

The Proponent has extensively analyzed the potential for using landfill gas as an energy source. The Department is supportive for its reuse and encourages the Proponent to advance any feasible options while also reducing its operational emissions of methane.

Other Comments/Guidance

The MassDEP Southeast Regional Office appreciates the opportunity to comment on this SEIR. If you have any questions regarding these comments, please contact George Zoto at (508) 946-2820.

Very truly yours,

A handwritten signature in black ink, appearing to read "Jon E. Hobill". The signature is written in a cursive, somewhat stylized font.

Jonathan E. Hobill,
Regional Engineer,
Bureau of Water Resources

JH/GZ

Cc: DEP/SERO

ATTN: Millie Garcia-Serrano, Regional Director
David Johnston, Deputy Regional Director, BWR
Gerard Martin, Deputy Regional Director, BWSC
Seth Pickering, Deputy Regional Director, BAW
Jennifer Viveiros, Deputy Regional Director, ADMIN
Dan Gilmore, Wetlands and Waterways, BWR
Carlos Fragata, Wetlands and Waterways, BWR
Mark Dakers, Solid Waste, BAW
Alison Cochrane, Solid Waste, BAW
Elza Bystrom, Solid Waste, BAW
Allen Hemberger, Site Management, BWSC



MASSWILDLIFE

DIVISION OF FISHERIES & WILDLIFE

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December 17, 2020

Kathleen A. Theoharides, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office
Anne Canaday, EEA No. 11333
100 Cambridge Street
Boston, Massachusetts 02114

Project Name: Bourne Integrated Solid Waste Management Facility
Proponent: Town of Bourne, Dept. of Integrated Solid Waste Management (ISWM)
Location: 201 MacArthur Boulevard, Bourne, MA
Project Description: Landfill Expansion
Document Reviewed: Single Supplemental Environmental Impact Report
EEA File Number: 11333
NHESP Tracking No.: 17-36534

Dear Secretary Theoharides:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the Division) has reviewed the *Single Supplemental Environmental Impact Report* (SSEIR; dated November 13, 2020) for the Town of Bourne ISWM's Landfill Expansion Project (the Project) and would like to offer the following comments regarding state-listed species and their habitats.

According to the information provided in the SSEIR, portions of the Project site are mapped as Priority Habitat for the Eastern Box Turtle (*Terrapene carolina*), a species state-listed as Special Concern according to the *Massachusetts Natural Heritage Atlas* (14th Edition). This species and its habitats are protected pursuant to the Massachusetts Endangered Species Act (MGL c.131A) and its implementing regulations (MESA; 321 CMR 10.00). A Fact Sheet for this species can be found on our website, www.mass.gov/nhesp.

All projects or activities proposed within Priority Habitat, which are not otherwise exempt pursuant to 321 CMR 10.14, require review through a direct filing with the Division for compliance with the MESA (321 CMR 10.18). The Division determined (letter dated February 5, 2020) that Phases 7, 8 and 9 of the Project, as currently proposed, appear to be exempt from MESA review pursuant to 321 CMR 10.14. However, as noted in the Division's previous comments to MEPA on the Project (dated June 19, 2018), development of the proposed Future Handling Area – and specifically, any work within the "Limit of Box Turtle Habitat" shown on the site plans (SSEIR, Attachment 3, Figures 2, 3 and 6) – will require a direct filing with the Division for compliance with MESA.

The Proponent has been working with the Division on a pre-filing basis to evaluate impacts associated with development of the Future Handling Area. In advance of a formal MESA filing, the Division anticipates – based on ongoing consultations with the Proponent and information submitted to date – that development of the Future Handling Area, as proposed, will likely result in a Take (321 CMR 10.18 (2)(b)) of Eastern Box Turtle.

MASSWILDLIFE

Projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species; (b) demonstrate that an insignificant portion of the local population will be impacted; and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species.

The Proponent has also proactively consulted with the Division on a pre-filing basis to avoid, minimize and mitigate impacts to state-listed species and their habitats associated with development of the Future Handling Area. Based on ongoing consultations and information submitted to date, we understand that the Proponent intends to meet the performance standards of a CMP by permanently protecting off-site land as open space and state-listed species habitat through fee conveyance to the Town of Bourne Conservation Commission. The Proponent has identified a candidate parcel in the vicinity of the property which should provide an acceptable option to address the required long-term net benefit for Eastern Box Turtle associated with the Project. The Division understands that the Proponent may also propose to permanently protect portions of the property, as shown on the "Conceptual Site Buildout Plan (SSEIR, Attachment 3, Figure 6). Although the exact details of the long-term net benefit required under a CMP have not yet been finalized, the Division anticipates that a suitable long-term net benefit can be achieved through the protection of suitable, high quality off- and on-site habitat and that the Project should be able to meet the performance standards of a CMP.

The Division will not render a final decision regarding the Future Handling Area until the MEPA review process and its associated comment period is complete, and until all required MESA filing materials are submitted to the Division. No work associated with the Future Handling Area shall occur on the property until the MESA review process is complete.

If you have any questions about this letter, please contact Jesse Leddick, Chief of Regulatory Review, at (508) 389-6386 or jesse.leddick@mass.gov. We appreciate the opportunity to comment on the Project.

Sincerely,



Everose Schlüter, Ph.D.
Assistant Director

cc: Phil Goddard, Town of Bourne ISWM Department
Daniel T. Barrett, Town of Bourne ISWM Department
Town of Bourne Board of Selectmen
Town of Bourne Conservation Commission
Town of Bourne Planning Department
DEP Southeast Regional Office
Amy Ball, Horsley Witten Group, Inc.

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DEVELOPMENT OF REGIONAL IMPACT DECISION

PROJECT: BOURNE INTEGRATED SOLID WASTE MANAGEMENT FACILITY – PHASE 6
(CCC FILE NO. 17024)

PROJECT TOWN OF BOURNE
APPLICANT: DEPARTMENT OF INTEGRATED SOLID WASTE MANAGEMENT
C/O DANIEL T. BARRETT, GENERAL MANAGER
201 MACARTHUR BOULEVARD, BOURNE, MA 02532

PROJECT LOCATION: 201 MACARTHUR BOULEVARD, BOURNE, MA 02532
(ASSESSORS MAP/ PARCEL NOS. 28/13, 32/5, 32/9)

TITLE REFERENCE: BCRD BOOK 1351 PAGE 456, BOOK 29639 PAGE 278,
BOOK 13637 PAGE 54

DATE: NOVEMBER 15, 2018

SUMMARY

The Cape Cod Commission (Commission) grants Development of Regional Impact approval, with conditions, for Phase 6 of the Bourne Integrated Solid Waste Management Facility pursuant to Sections 12 and 13 of the Cape Cod Commission Act (Act). This decision is rendered pursuant to a vote of the Cape Cod Commission on November 15, 2018.

FINDINGS

The Cape Cod Commission hereby finds and determines as follows:

GF1. The Bourne Integrated Solid Waste Management Facility (Facility) is located at 201 MacArthur Boulevard in Bourne and is operated by the Bourne Department of Integrated Solid Waste Management (Department) on three (3) contiguous parcels totaling approximately 112 acres owned by the town of Bourne (Project Site). Previously disturbed, developed, and utilized

areas of the Project Site (approximately 100 acres) have the benefit of a Site Assignment from the Bourne Board of Health (BOH) for the existing and proposed uses and development referenced herein.

GF2. The Facility serves as important solid waste infrastructure for the town of Bourne, the Cape Cod region, and southeastern Massachusetts. It is the last remaining operating municipal solid waste landfill on Cape Cod, and one of a handful remaining in the Commonwealth.

GF3. Operations at the Facility include: a double-lined landfill with leak detection, a landfill gas collection system and flare for thermal destruction of landfill gas, and a leachate load-out system for off-site management of landfill leachate; a residential recycling center that accepts materials from neighboring communities, including mattresses for recycling under a Massachusetts Department of Environmental Protection (DEP) program; a construction and demolition debris transfer station; a single-stream recyclables transfer station open to commercial haulers; a compost site including yard waste and brush; and, an area for asphalt, brick, and concrete recycling.

GF4. The town of Bourne (Town) now proposes to implement Phase 6 of the Facility which includes expanding the location of the existing lined landfill up to approximately 9.82 acres of previously disturbed site area, together with associated support infrastructure such as a double composite liner with leak detection, and expanded leachate and landfill gas collection (Project, or Phase 6).

GF5. The incoming waste mix to the Facility is predominantly municipal waste combustor ash (representing approximately 86% of the permitted annual capacity of 219,000 tons) under a long-term contract with Covanta SEMASS in Rochester, MA. The remaining yearly capacity is available for municipal solid waste (MSW) disposal for Bourne and Falmouth residents, and for difficult-to-manage waste streams. Any remaining capacity not used is held in reserve and carried over to successive years.

GF6. The existing daily tonnage and waste composition for the Facility will remain unchanged with Phase 6. Phase 6 is expected to extend the life of current landfill operations at the Project Site into the 2020s.

GF7. Phase 6 will be located on previously disturbed land at the southern end of the existing landfill, which has been site-assigned by the Bourne BOH and DEP for landfill use. Exiting roads will provide access to and throughout the Project Site. Construction and operation of Phase 6 will not change the way waste is currently managed at the site. In preparation for construction of Phase 6, former facilities and operations of the Bourne Department of Public Works (DPW), which were located where the additional lined landfill will be constructed, were relocated to a new DPW complex that was constructed off-site and is now in operation.

GF8. The Project qualifies as a Development of Regional Impact and requires Commission review under Section 2(d)(i) of Chapter A: *Enabling Regulations Governing Review of Developments of Regional Impact*, as revised April 2018 (Enabling Regulations) because the Project required preparation of an Environmental Impact Report (EIR) pursuant to the Massachusetts Environmental Policy Act, M.G.L. c. 30, §§61-62I (MEPA).

GF9. Between 1998-2000, the Town pursued regulatory reviews and obtained the required permits and approvals to establish the Facility in what is generally its current state of use and development (for so-called Phases 2, 3, and 4 of the Facility), including a certificate of adequacy on an EIR under MEPA; Development of Regional Impact (DRI) approval from the Cape Cod Commission (Commission) (See Commission File No. #97031, DRI decision dated February 17, 2000, "original DRI decision"); and Authorization to Construct (ATC) and Authorization to Operate (ATO) permits from DEP.

GF10. Those EIR and DRI reviews contemplated and included conceptual planning (though not detailed design) for the development of Phases 5 and 6. Phase 6 is the last Phase in a progressive development plan first discussed in the original EIR filed in 1998.

GF11. Since that time, the Facility has been built out and operated in accordance with those permits and approvals, including in accordance with several modifications to those permits and approvals obtained by the Town for the Facility through the present. Such modifications included authorization for Phase 5. The Commission has issued Certificates of Compliance for the Facility up to and including Phase 5.

GF12. In November 2017, the Town submitted an Expanded Notice of Project Change (ENPC) under MEPA for Phase 6. The ENPC also included conceptual design for potential Phases 7 and 8 for which the Town is currently undertaking planning and due diligence. Should the Town opt to pursue it, Phase 6 is designed to support development of Phase 7. The Secretary of Energy and Environmental Affairs (EEA) issued a Certificate on the ENPC requiring the Town to prepare a Single Supplemental EIR (SSEIR) to include a detailed description of the Project, identify potential impacts associated with the Project, provide updated information on state regulatory reviews and approvals, and provide an updated conceptual plan for Phases 7 and 8. The Town submitted an SSEIR to the MEPA office in May 2018. The Secretary of EEA issued a Certificate on the SSEIR in June 2018 and determined that the SSEIR adequately and properly complies with MEPA.

GF13. Development associated with Phases 7 and 8 includes expanding the lined landfill and associated infrastructure, with the purpose to extend the anticipated life of operations at the Project Site until approximately 2034. Phases 7 and 8 would require further MEPA review and preparation of an EIR and would require further DRI review by the Commission.

GF13A. The Town has undertaken strategic planning in anticipation of potentially pursuing Phases 7 and 8:

In 2016, the Town purchased land adjacent to the Facility (now included within the approximately 112-acre Project Site) for further landfill expansion. Such land is mapped as Priority Habitat for the Eastern Box Turtle under the Massachusetts Endangered Species Act (MESA); accordingly, the Town has been coordinating with the MA Division of Fish and Wildlife Natural Heritage and Endangered Species Program (NHESP) on what permitting and mitigation actions might be necessary to authorize future development of that land under MESA;

Additionally, the Town has been granted a 2,500 square-foot easement on Canal View Road at Joint Base Cape Cod (JBCC) from the MA Department of Fish and Game (DFG). The purpose of the easement is to provide a potential future connection to the JBCC wastewater treatment plant to accept treated effluent from a potential leachate and/or industrial wastewater treatment works at the Facility. As the easement area was located within land subject to protection under Article 97 of the Massachusetts Constitution, the Town granted the DFG conservation restrictions on land owned by the Town totaling 77 acres in order to secure approval by the Legislature for the disposition of such Article 97 land.

GF14. The Town filed an application for DRI review of Phase 6 on October 1, 2018 with associated Attachments 1 through 6. A DRI Subcommittee held a public hearing in the town of Bourne on October 29, 2018, where the Subcommittee voted to recommend to the Commission that it adopt the draft written decision for the Project, and that the Commission approve the Project subject to the conditions in said decision. The Subcommittee voted to continue the public hearing on the Project to the full Commission meeting on November 15, 2018.

GF15. Section 7(c)(viii) of the Commission's Enabling Regulations contains the standards for DRI approval, which include finding consistency with the Cape Cod Regional Policy Plan (RPP), with District of Critical Planning Concern (DCPC) implementing regulations (as applicable), with municipal development bylaws or ordinances, and with applicable Local Comprehensive Plans (LCP). The Commission must also find that the probable benefit from the proposed development is greater than the probable detriment.

GF15A. There are no DCPC implementing regulations applicable to the Project.

GF15B. The Town of Bourne's Local Comprehensive Plan was certified by the Commission in 2007, but according to the Commission's Local Comprehensive Plan Regulations, such certification is not current. The Project is consistent with Section 19 (*Solid Waste Management*) of said plan, however, which outlines the Town's efforts to "...continue to maximize recycling and composting of solid waste...and to dispose of the waste that cannot be recycled in an economical and environmentally sound manner."

GF15C. The Town has received documentation that the work associated with Phase 6 is exempt from NHESP review under the Massachusetts Endangered Species Act (MESA), and has received ATC approval from DEP. No further state or local reviews or approvals are required for Phase 6.

GF15D. Probable benefits of the Project are that it:

1. Provides for predictable waste disposal and management not only for Cape Cod but the larger Massachusetts region;
2. Provides an in-state option for managing solid waste that decreases potential costs and logistical challenges from exporting waste to other states;
3. Supports local municipalities' waste management needs; and
4. Provides disposal capacity in the event of an emergency (i.e. storm debris).

REGIONAL POLICY PLAN FINDINGS

The Project is consistent with the relevant issue areas, and corresponding goals and standards, from the applicable 2009 RPP, as amended August 2012, as those are referenced and discussed in more detail below.

LAND USE

LUF1. A landfill has operated at this location since the late 1960s. The Project is consistent and compatible with land use and development on and neighboring the Site. The proposed use and development are consistent with the Town's comprehensive approach to land use planning and regulation. The Department has permitted, managed and executed operations and construction of the Facility since 1998, including multiple phases of landfilling, which have received ATC and ATO approvals from DEP and been reviewed and approved by the Commission.

LUF2. The Project will not change the way waste is currently managed at the Facility. The operation and location of current development at the Project Site has been site-assigned by the Bourne BOH and approved by DEP, which considers a broad range of potential impacts on water resources, wildlife, public health and safety, transportation, and air quality. DEP issued an ATC permit for the construction of Phase 6 to the Department on July 16, 2018.

LUF3. Phase 6 will be located on previously disturbed land, will overlay part of Phases 3 and 4, and will contain a double composite liner with leak detection. The landfill liner will include a new primary composite liner with leachate collection system and a secondary composite liner with leak detection. By overlaying landfill material adjacent to and on top of preceding landfill Phases, and with the construction of a double composite liner system with leak detection, the Project uses land efficiently and protects sensitive resources.

ECONOMIC DEVELOPMENT

EDF1. Since 1998 the Facility has operated as an Enterprise Fund where the Department derives revenue from its various operations at the Site (largely the landfill operation), which Fund pays for all operations, debt service, insurance, and closure and post-closure accounts. In addition, the Department pays for the curbside collection and management of MSW and single-stream recyclables generated by Bourne residents. The Department also pays a Host Community Fee to the Bourne General Fund of \$3.60 per ton for each ton it manages at the site. In total, the Department Enterprise Fund provides approximately \$2,000,000 per year in value to the residents of Bourne.

EDF2. Local, state, and Commission regulations for waste management look to source reduction, reuse, and recycling and composting to divert certain waste streams from landfills, preserving existing landfill capacity for waste which cannot be recycled, composted, or combusted. The number of and capacity at landfills in Massachusetts is decreasing. There will be a reduction in the number of operational landfills in Massachusetts by 2021, which provide capacity for wastes including but not limited to household and commercial waste, municipal waste combustor ash, storm/disaster debris, contaminated soils, and dredge spoils. In Massachusetts, landfill capacity is expected to decrease by at least 300,000 tons per year with the anticipated closures of landfills in Southbridge by the end of 2018 and Carver in 2021.

Landfill capacity in Connecticut and Rhode Island is also decreasing and is not expected to provide a closer waste export option. Future options for waste management in Massachusetts will include increased export of Massachusetts trash to other states. There are currently no new MSW disposal facilities proposed and under review by DEP (there is also currently a moratorium on municipal waste combustor facilities in the Commonwealth). Because of the associated legal and permitting requirements, and practical and policy considerations, in pursuing such a new MSW disposal facility in the Commonwealth, it is unlikely that such a facility would be proposed or developed in the Commonwealth in the near future.

EDF3. The Facility provides for the disposal of municipal waste combustor ash from SEMASS. SEMASS must show it has several years of disposal capacity for ash generated at that facility as part of the company's operating plan. A landfill in Carver which also provides for the disposal of SEMASS combustor ash is scheduled to close in 2021.

EDF4. The Project will provide capital facilities and infrastructure in response to existing regional demand, meets community and regional needs, and expands community access to services.

WATER RESOURCES

WRF1. For prior phases of the Facility, the Town has conducted hydrogeological investigations and modeling, including particle tracking, for areas down-gradient of the Facility in coordination with DEP and the Commission. All private well owners in the path of the particle tracking were provided connections to the Bourne Water District. The Bourne BOH passed a bylaw prohibiting the installation of any private wells or public water supply wells in the area downgradient of the Facility. The Town has also installed a network of groundwater monitoring wells upgradient and downgradient of the Facility to collect water quality data.

WRF2. The Phase 6 landfill liner, which is a double composite liner with leak detection, has been designed to provide greater than four (4) feet of vertical separation between the lowest point of the liner system and the maximum observed groundwater elevations, which were determined using an existing network of groundwater monitoring wells installed throughout the Site, including a US Geological Survey (USGS) well installed in the 1970s.

WRF3. The stormwater management system includes two (2) infiltration basins, a series of drainage channels and water quality swales, and a network of catch basins and pipe conveyances. The system is unique and responsive to the current, operational status of the Facility. The system provides water quality treatment, total suspended solids (TSS) removal, and infiltration of stormwater. All Site stormwater is contained and managed on-site. Maintenance protocols for the stormwater management system are included in the Facility Operations and Maintenance Plan.

TRANSPORTATION

TF1. As required in the original DRI decision, the Town provided a monetary payment to mitigate peak hour trips on MacArthur Boulevard and through the Bourne Rotary, expanded the curbside recycling program to reduce vehicle trips to the Site, constructed deceleration and acceleration lanes at the entrance into the Facility, and has since made other improvements to the site entrance and site circulation. Phase 6 represents a continuation of existing operations at the Facility, where existing roads will provide adequate access to and around the Site and will not result in a change or degradation in traffic or trip generation patterns, or in access to the Site.

WASTE MANAGEMENT

WM1. The Facility manages solid waste using an integrated solid waste management system that includes waste reduction, recycling, and composting and meets a regional need for the processing and disposal of wastes on Cape Cod. The Facility currently manages: municipal solid waste and municipal waste combustor ash; commercial waste; a residential recycling center that accepts materials from neighboring communities, including mattresses for recycling under a DEP grant program; a construction and demolition debris transfer station; a single-stream recyclables transfer station open to commercial haulers; composting; asphalt, brick, and concrete recycling; and can accept contaminated soils, dredge spoils, storm/disaster debris, and Difficult to Manage waste. The Facility is the only solid waste disposal facility on Cape Cod.

COMMUNITY CHARACTER

CCF1. As required in the original DRI decision, the Town committed to maintain the existing 230-foot wide vegetated area along MacArthur Boulevard to screen the Facility from the roadway. The Town also supplemented this vegetated area with evergreen and deciduous trees. Supporting infrastructure for the landfill, Facility offices, and recycling and composting transfer facilities are not visible from a regional roadway (MacArthur Boulevard, Route 28).

CONCLUSION

Based on the Findings above, the Commission hereby concludes, determines, and finds further that:

1. Subject to and upon satisfaction of the conditions identified in this decision, the Project is consistent with the 2009 RPP (as amended).
2. The Project is consistent with Bourne's Local Comprehensive Plan, as applicable.
3. The Project is consistent with municipal development bylaws.
4. There are no DCPC implementing regulations applicable to the Project.
5. The probable benefit of the Project is greater than its probable detriment.

The Commission hereby grants DRI approval to the town of Bourne for Phase 6 of its Integrated Solid Waste Management Facility, subject to the following conditions:

CONDITIONS

C1. When final, this decision shall be valid and in effect and local development permits may be issued pursuant hereto for a period of seven (7) years from the date of this written decision. No development work, as the term "development" is defined or referred to in the Cape Cod Commission Act, and as approved herein, shall be undertaken until this decision is final. This decision shall be final when the appeal period set out in Section 17 of the Cape Cod Commission Act has elapsed without appeal (or if such an appeal has been filed, when the appeal has been finally settled, dismissed, adjudicated, or otherwise disposed of in favor of the Applicant), and a copy of this decision has been recorded with the Barnstable County Registry of Deeds.

C2. Phase 6 shall be undertaken, operated, and maintained consistent with the plans and other information contained in the following documents, approved, referenced, and incorporated herein:

- Town of Bourne, MA Department of Integrated Solid Waste Management Single Supplemental Environmental Impact Report, dated May 9, 2018, prepared by the Town of Bourne Department of Integrated Solid Waste Management;
- Town of Bourne Integrated Solid Waste Management Facility DRI application, dated October 1, 2018.

C3. Changes to the Project shall require that the Applicant seek a modification to this decision in accordance with the "Modification" section of the Commission's Enabling Regulations Governing Review of Developments of Regional Impact.

C4. Upon issuance of a DEP Authorization to Operate Phase 6, the Applicant shall apply for and obtain a Certificate of Compliance for the Project from the Commission. Issuance of the Certificate of Compliance is contingent on Commission staff's review and confirmation that the Project has been undertaken in accordance with this decision. As part of its review, Commission staff may make, and the Applicant hereby authorizes, site inspections upon reasonable notice to the Applicant, as such visits are needed.

C5. In the event the Town does not propose to pursue further phases and expansion of landfilling development and operations at the Site beyond Phase 6, the Town shall then prepare and submit to Commission staff for review and approval a revised stormwater management plan for the Facility that reflects such eventuality and provides water quality treatment for parking and recycling areas on the Site. In such event and upon Commission staff's review and approval, the Town shall implement and maintain such plan as so approved.

SIGNATURE PAGE FOLLOWS

SIGNATURE PAGE

Executed this 15 day of November 2018.

Harold W Mitchell
Signature

Harold W Mitchell Chairman Cape Cod Commission
Print Name and Title

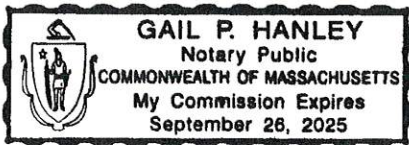
COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss

November 15, 2018

Before me, the undersigned notary public, personally appeared Harold W. Mitchell,

in his/her capacity as Chairman of the Cape Cod Commission, whose name is signed on the preceding document, and such person acknowledged to me that he/she signed such document voluntarily for its stated purpose. The identity of such person was proved to me through satisfactory evidence of identification, which was [] photographic identification with signature issued by a federal or state governmental agency, [] oath or affirmation of a credible witness, or [] personal knowledge of the undersigned.



Gail P. Hanley
Notary Public

My Commission Expires: 9-28-25

ORIGINAL



3225 MAIN STREET • P.O. BOX 226
BARNSTABLE, MASSACHUSETTS 02630

(508) 362-3828 • Fax (508) 362-3136 • www.capecodcommission.org

CAPE COD
COMMISSION

CERTIFICATE OF COMPLIANCE

PROJECT: BOURNE INTEGRATED SOLID WASTE MANAGEMENT FACILITY – PHASE 6
201 MACARTHUR BOULEVARD, BOURNE, MA 02532 (CCC FILE NO. 17024)

TO: APPLICANT/ TOWN OF BOURNE,
DEPARTMENT OF INTEGRATED SOLID WASTE MANAGEMENT
C/O DANIEL T. BARRETT, GENERAL MANAGER
201 MACARTHUR BOULEVARD, BOURNE, MA 02532

TITLE REFERENCE: BOOK 1351 PAGE 456, BOOK 29639 PAGE 278, BOOK 13637 PAGE 54
DRI DECISION RECORDED IN BOOK 31737 PAGE 257

DATE: JANUARY 10, 2020

The Cape Cod Commission hereby issues this Certificate certifying that the Applicant has completed Phase 6 (the Project) in accordance with the terms and conditions set out in the above-referenced Development of Regional Impact Decision, dated November 15, 2018. This Certificate incorporates by reference the “as-built” site plans for the Project.¹

Signature page follows

¹ As-Built Survey (Subgrade) Town of Bourne Phase 6 Landfill Expansion, 201 MacArthur Boulevard, Bourne Massachusetts (Barnstable County), prepared by Welch Associates Land Surveyors, Inc., stamped and dated April 24, 2019; As-Built Survey (Low Permeability Soil Layer) Town of Bourne Phase 6 Landfill Expansion, 201 MacArthur Boulevard, Bourne Massachusetts (Barnstable County), prepared by Welch Associates Land Surveyors, Inc., stamped and dated December 18, 2019; As-Built Survey (Primary Geomembrane Liner) Town of Bourne Phase 6 Landfill Expansion, 201 MacArthur Boulevard, Bourne Massachusetts (Barnstable County), prepared by Welch Associates Land Surveyors, Inc., stamped and dated December 18, 2019; As-Built Survey (Sand Drainage Layer) Town of Bourne Phase 6 Landfill Expansion, 201 MacArthur Boulevard, Bourne Massachusetts (Barnstable County), prepared by Welch Associates Land Surveyors, Inc., stamped and dated December 18, 2019; Pipe As-Built Worksheet (Primary Leachate Collection) Town of Bourne Phase 6 Landfill Expansion, 201 MacArthur Boulevard, Bourne Massachusetts (Barnstable County), prepared by Welch Associates Land Surveyors, Inc., consisting of three sheets, stamped and dated December 23, 2019.

SIGNATURE PAGE

Executed this 10th day of January 2020.

For the Cape Cod Commission by:



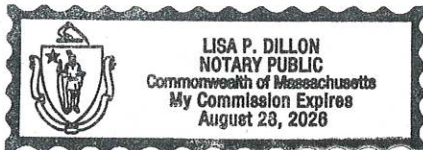
Jonathon Idman, Chief Regulatory Officer

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

January 10, 2020

Before me, the undersigned notary public, personally appeared Jonathon Idman, whose name is signed on the preceding document, and such person acknowledged to me that he signed such document voluntarily for its stated purpose in his capacity as Chief Regulatory Officer of the Cape Cod Commission. The identity of such person was proved to me through satisfactory evidence of identification, which was [] photographic identification with signature issued by a federal or state governmental agency, [] oath or affirmation of a credible witness, or [X] personal knowledge of the undersigned.



SEAL



8-23-26

Notary Public:
My Commission Expires:



CAPE COD COMMISSION

3225 MAIN STREET
P.O. BOX 226
BARNSTABLE, MA 02630
(508) 362-3828
FAX (508) 362-3136

E-mail: frontdesk@capecodcommission.org

ORIGINAL

Final Certificate of Compliance

DATE: May 6, 2008

TO: Brent T. Goins, General Manager
Department of Integrated Solid Waste Management
24 Perry Avenue
Buzzards Bay, MA 02532

FROM: Cape Cod Commission

PROJECT: Integrated Solid Waste Management Facility
DRI # 97031

PROJECT LOCATION: 210 MacArthur Boulevard, Bourne, MA

OWNER: Town of Bourne
C/o Board of Selectmen
24 Perry Avenue
Buzzards Bay, MA 02532

BOOK/PAGE: Book 1351 Pages 456 & 457

Description of Certificate of Compliance

I hereby certify that the Board of Selectmen, on behalf of the Town of Bourne, Applicant on the above-referenced project, has properly complied with the conditions noted below of the Cape Cod Commission's (Commission) February 17, 2000 Development of Regional Impact (DRI) decision, as modified by decisions dated August 21, 2001, March 4, 2004 and April 30, 2007.

The Applicant has complied with conditions G8, G10, Trans-2, CC2, WR1, WR2, WR3, WR4 and WR5 of the February 17, 2000 DRI decision as modified.

As detailed in Finding WR3 of the March 4, 2004 modification decision, the quality of groundwater down gradient from the landfill will continue to be monitored through 2008. Following joint review of the monitoring results by ISWMF and Commission staff, a joint determination by ISWMF and Commission staff will be made regarding the potential



value of further monitoring.

Issuance of the Final Certificate of Compliance

As regards requirements set forth by the Cape Cod Commission, the Town of Bourne has satisfied conditions in order for a Final Certificate of Compliance to be issued.


Paul Niedzwiecki, Executive Director

5/6/08
Date

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss

5/6/, 2008

Before me, the undersigned notary public, personally appeared

Paul Niedzwiecki, in his capacity as Executive Director of the Cape Cod Commission, whose name is signed on the preceding document, and such person acknowledged to me that he signed such document voluntarily for its stated purpose. The identity of such person was proved to me through satisfactory evidence of identification, which was personal knowledge of the undersigned.

Gail P. Hanley
Notary Public

My Commission Expires:

10/13/11

ATTACHMENT 2

Site Locus
Landfill and Site Development Plans
Off-site Landfill Photographic Renderings
Historical Aerial Photographs

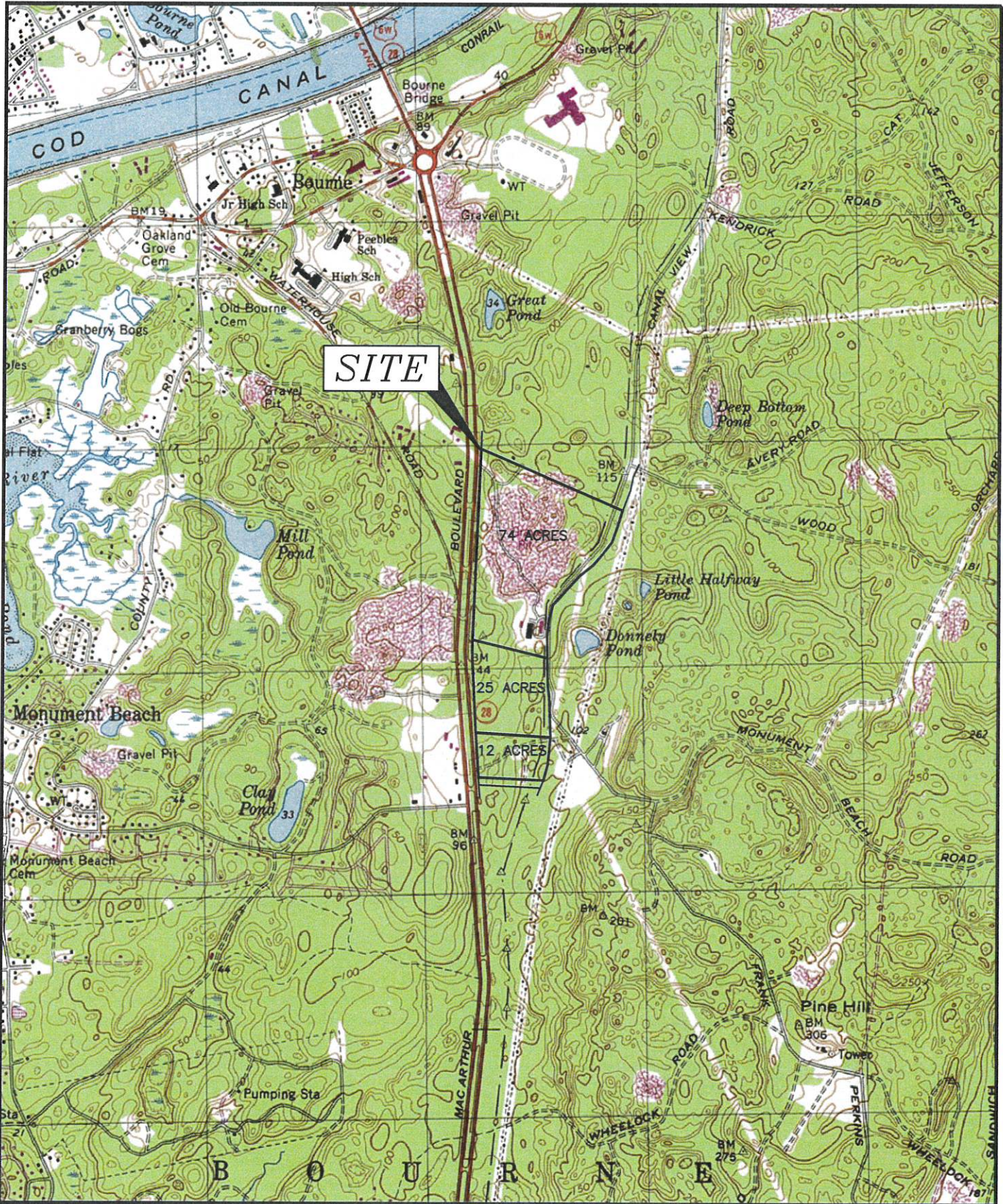
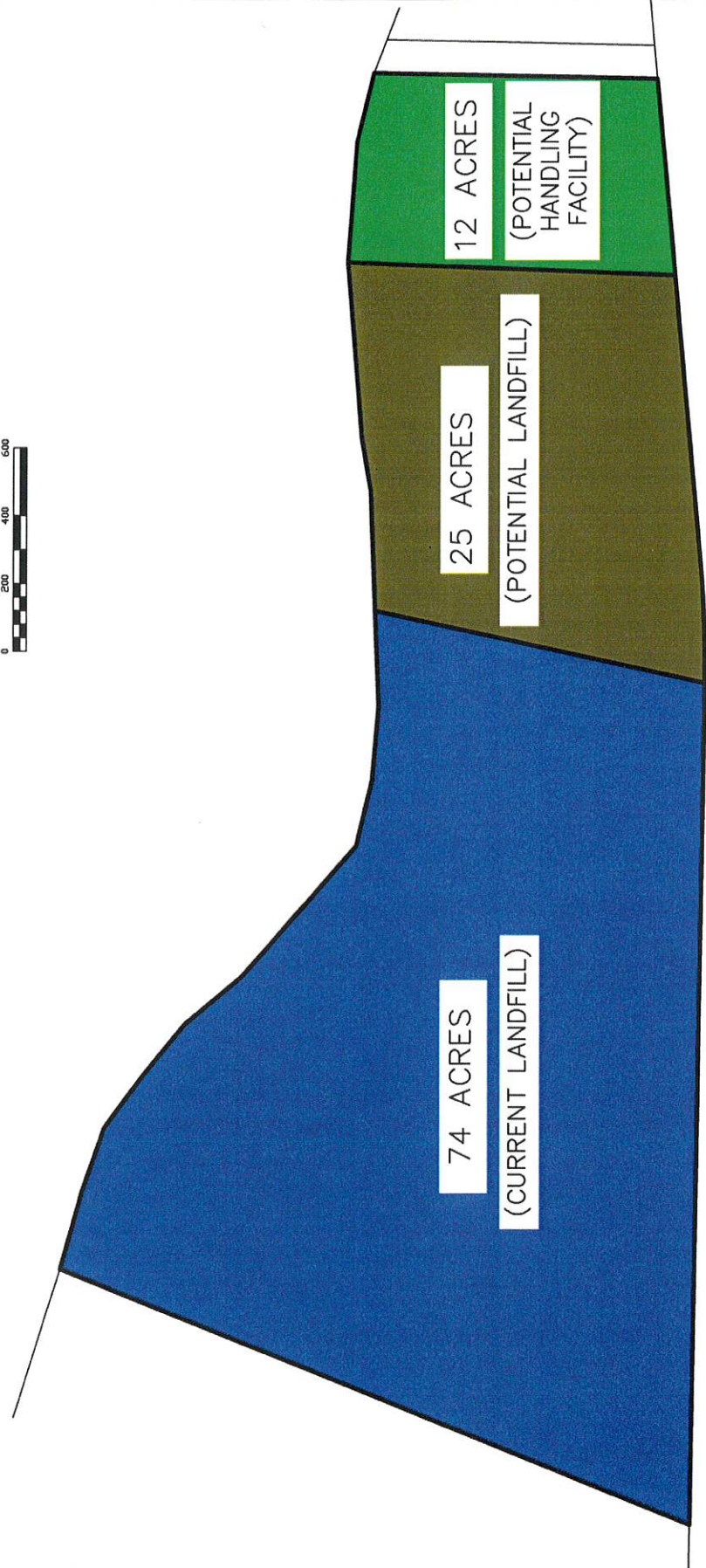
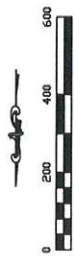


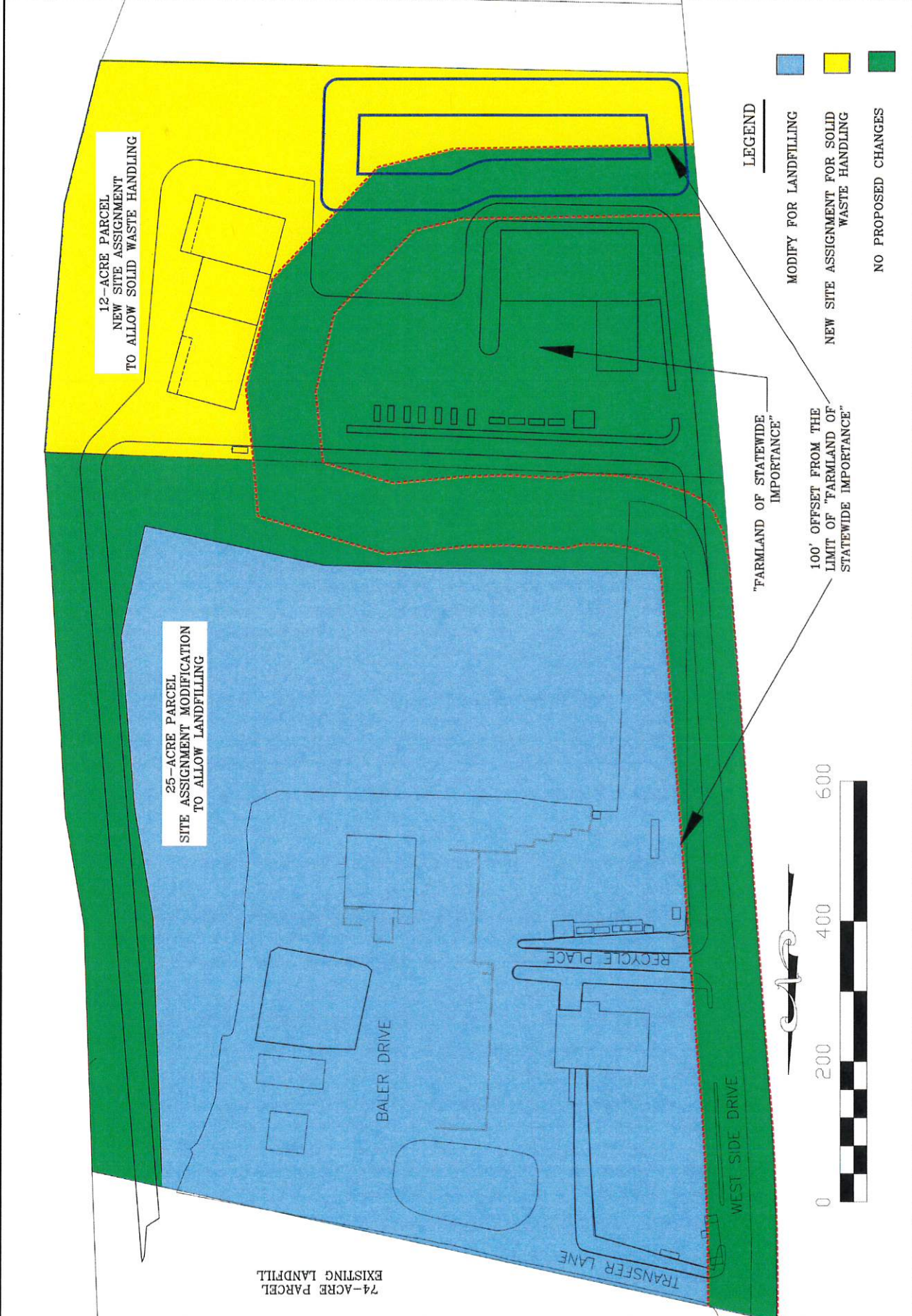
FIGURE 1 - LOCUS PLAN
 BOURNE LANDFILL
 201 MACARTHUR BOULEVARD
 BOURNE, MASSACHUSETTS

SITEC
ENVIRONMENTAL
 Civil and Environmental Engineering
 Land Use Planning and Surveying
 Hazardous and Solid Waste Consultants
 700 Flinn Street, Unit C
 Marlfield, MA 02050
 PHONE (781)-319-0100
 FAX (781) 894-4700





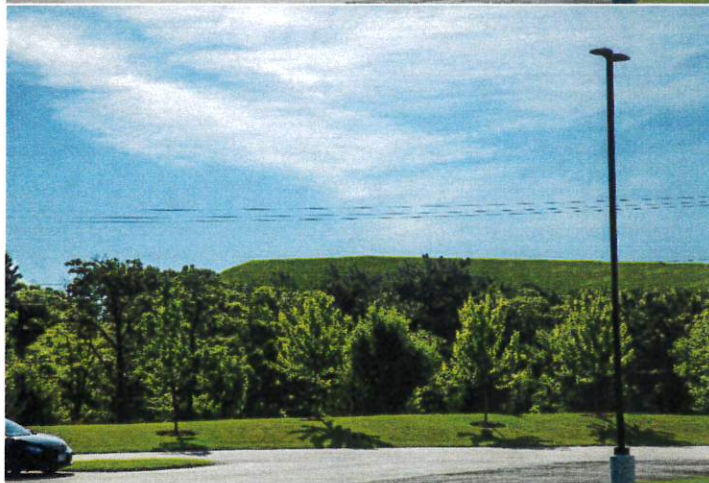
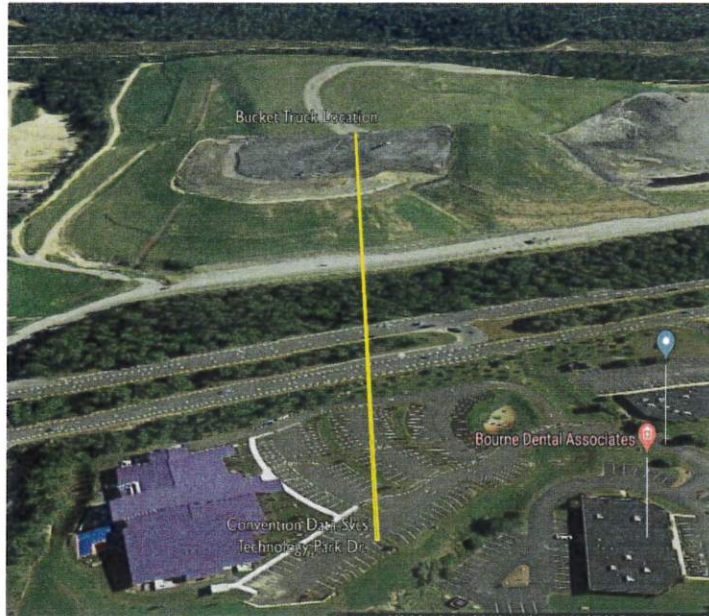
111 ACRES



Bourne Bridge



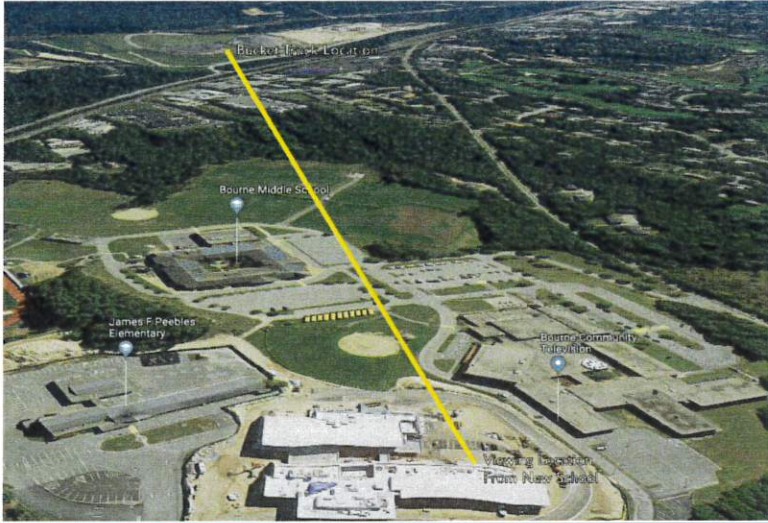
Convention Data Services



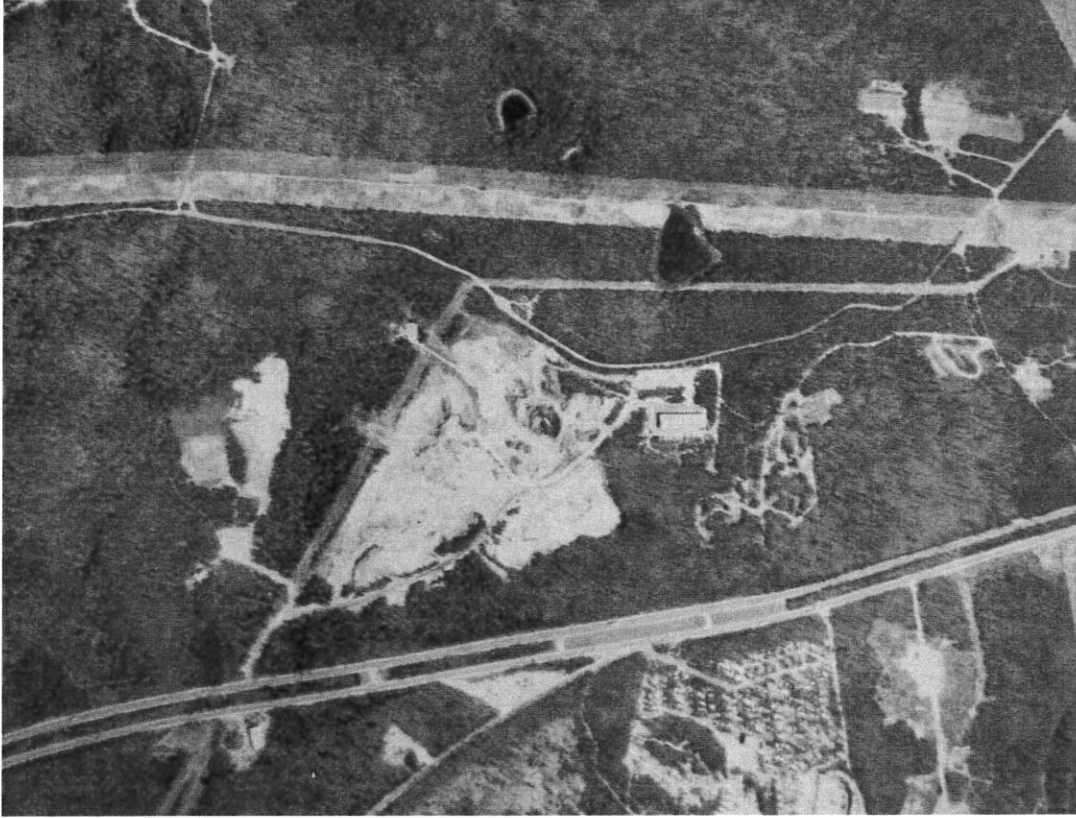
Canal Bluffs Apartments



Bourne Intermediate School



ISWM Facility circa 1972



ISWM Facility 1999



ISWM Facility December 2020



ATTACHMENT 3

Natural Resources Inventory

NATURAL RESOURCES INVENTORY

Bourne Integrated Solid Waste Management Facility Expansion
Assessor's Map 32, Parcel 5 and Parcel 9
Bourne, Massachusetts

April 2021



Prepared for:

Daniel Barrett, General Manager
Town of Bourne
Department of Integrated Solid Waste Management
24 Perry Avenue
Buzzards Bay, MA 02532

Prepared by:

Horsley Witten Group
Sustainable Environmental Solutions

90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com



NATURAL RESOURCES INVENTORY
Bourne Integrated Solid Waste Management Facility Expansion

MacArthur Boulevard, Bourne, MA
Assessor's Map 32, Parcel 5 and Parcel 9

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ATTACHMENTS

Attachment A – Project Plans and Site Context (prepared by SITEC Environmental, Inc.)

Attachment B – Locus Maps

Figure 1 – USGS Topographic Map

Figure 2 – Aerial Photograph

Figure 3 – FEMA Flood Zone Maps

Figure 4 – Environmental Constraints

Figure 5 – NRCS Soils Map

Attachment C – Project Perimeter Plan and Site Topography (prepared by SITEC)

Attachment D – NHESP Correspondence

MESA Project Review

MESA “Take” Letter

Previous NHESP Comment Letters

Attachment E – Qualifications

Attachment F – Site Specific Soils Reports & NRCS Report

Attachment G – Wildlife Observations

Attachment H – Conservation Commission Correspondence

Attachment I – Special Town Warrant Articles

Attachment J – Mitigation Parcel Baseline Report and Plan

NATURAL RESOURCES INVENTORY

Bourne Integrated Solid Waste Management Facility Expansion

MacArthur Boulevard, Bourne, MA
Assessor's Map 32, Parcel 5 and Parcel 9

1.0 INTRODUCTION

As part of a master development planned project, the Town of Bourne Department of Integrated Solid Waste Management (ISWM), proposes to expand its facilities for future solid waste handling within a 12.13- acre forested parcel (Map 32, Parcel 5) to the south of the existing facility. The proposed expansion includes relocating the residential recycling center, single stream recyclables transfer station, construction and demolition debris (C&D) transfer station, a future sedimentation basin area, brush and composting area, administrative offices and maintenance facility.

ISWM retained Horsley Witten Group, Inc. (HW) to conduct a Natural Resources Inventory (NRI) on the subject parcel to support the filing of the Cape Cod Commission (CCC) Development of Regional Impact (DRI) which addresses the landfill expansion and overall site development master plan for the ISWM facility and to supplement the permitting process with the Massachusetts Natural Heritage and Endangered Species Program (NHESP) office of the Massachusetts Division of Fisheries and Wildlife (MassDFW). The NRI has been completed in accordance with the guidelines developed by the CCC in the Wildlife and Plant Technical Bulletin associated with its 2018 Regional Policy Plan (RPP), effective date February 22, 2019.

This report focuses specifically on the 12.13-acre parcel (Map 32, Parcel 5), and very small portions of an abutting parcel to the north (Map 32, Parcel 9). The small section of the northern parcel (Map 32, Parcel 9) has previously been surveyed by HW and evaluated to be consistent in habitat type and quality with that of the 12.13-acre parcel (Map 32, Parcel 5). The full, combined area surveyed by HW is delineated by the orange flagging boundary as shown on NRI Figure 1 in **Attachment A** (see 'Extent of Box Turtle Habitat' in the figure key). This report provides a brief site overview; details the methodology used in the inventory; describes the soils, plant communities, and wildlife habitat present within the site; and discusses potential impacts associated with the proposed development with respect to the *Wildlife and Plant Habitat* and *Open Space* Goals and Objectives described in the RPP and further detailed in the respective Technical Bulletins. This report also discusses best management practices that are recommended during construction to avoid and/or minimize potential impacts related to erosion and sedimentation and introduction or spread of invasive species and discusses proposed mitigation and protection measures intended to reduce impact on plant and wildlife habitat and/or local populations.

2.0 HISTORY AND BACKGROUND

According to the ISWM website, the Bourne landfill, at its present location on MacArthur Boulevard, began in 1967 in an area which is now referred to as Phases 1A, 1B, 1C, located in the northernmost section of the facility. This unlined area ceased accepting waste in 1999 and is now closed and capped. The capped areas have a layered system of a plastic membrane, drainage layers and soils that have been seeded to provide stabilization of the soils. In addition to the cap, these areas also have a network of gas extraction wells that is connected to a landfill-wide system of wells and header pipes. This system captures landfill gas that is then piped to a flare located in the northeast corner of the landfill. The purpose of the flare is to burn landfill gas that might otherwise be vented into the atmosphere. This serves to reduce air emissions, destroy methane, control odors, and prevent off-site migration. The vegetated surfaces are maintained to allow for access to monitoring wells and stormwater management structures. As active areas reach design grades, they are capped in accordance with Massachusetts Department of Environmental Protection (MassDEP) regulations and permit approvals.

Phase 2, at the far northeast corner of the facility, is the first lined landfill cell, which is now capped and no longer active. Beginning with Phase 2, and for all future landfill cells, precipitation that falls on the landfill and leaches through the waste (i.e., leachate) is collected in pipes under the waste and is pumped to holding tanks. This leachate is then sent off-site for proper disposal.

Adjacent to Phase 2 is Phase 3 that is also a lined landfill cell but has incorporated additional layers of groundwater protection and is equipped with a leak detection system to meet MassDEP regulations. All future landfill cells will also consist of this “double composite liner” design. According to the ISWM website, the Bourne landfill was one of the first facilities in Massachusetts to install this state-of-the-art liner system. Phase 3 has also been capped, along with a valley-fill called Phase 2A/3A which connected Phases 1A-1B-1C to Phase 2 and Phase 3. Part of Phase 4 has been capped and in the summer of 2021, ISWM anticipates capping the second stage of Phase 4 and Phase 5. A significant portion of Phase 4 that was constructed in the previous Phase 1D which was one of the original unlined areas dating back to the early 1970s. Rather than cap Phase 1D in place, ISWM worked with the MassDEP to develop a reclamation plan to remove the waste and line the resulting void.

Attachment A contains a site master plan that shows the phases of the landfill as well as the subject parcel with a conceptual site development plan.

Phase 6 is the current area of active landfill located in the space previously occupied by the previous DPW garage and ISWM and DPW offices. The DPW operations were moved off-site in 2015 to allow access to the area that is now Phase 6.

Currently approximately 85% of ISWM’s waste stream consists of municipal waste combustor ash from the SEMASS waste-to-energy facility in Rochester MA. operated by Covanta Energy. ISWM entered into a long-term contract with Covanta in January of 2015 and both parties recently reached an agreement to extend the relationship through December of 2024. The remaining waste will consist of MSW from Bourne and Falmouth (under a contract agreement) and various other approved waste streams from independent customers.

ISWM also operates residential recycling center located at the southern end of the landfill operations on a 25-acre parcel that the Town acquired in 2001. Other operations within this parcel (Map 32, Parcel 9) include the ISWM administrative office, a single-stream recyclables transfer station, a construction and demolition (C&D) transfer station, a residential recycling center and compost operations. ISWM plans to relocate its offices and maintenance facility in 2023 onto the 12.13-acre parcel (Map 32, Parcel 5) that is the primary subject of this NRI. The other structures will follow several years later. The relocation will become necessary as landfill operations will continue to move southward into this area with the Phase 7 and Phase 8 expansions. A Phase 9 is planned as well, but that will be a vertical expansion at the northern end of the facility.

In the interim until those facilities are needed, this parcel will be used for soils stockpiling and other storage in areas not otherwise occupied. Therefore, the entire site will be cleared as soon as permits are attained to meet these needs.

3.0 GENERAL SITE DESCRIPTION

The subject project site is a forested parcel located at the southern end of the existing ISWM operations at 201 MacArthur Boulevard (Route 28), in Bourne, Massachusetts (latitude 41.720188 N; longitude -70.581877 W) (**Attachment B**, Figures 1 and 2). This 12.13-acre parcel (Map 32, Parcel 5) directly abuts the existing Bourne ISWM Facility to its north with the Joint Base Cape Cod to the east, and a vacant forested parcel owned by Eversource to the south. An approximately 200-foot-wide strip of state-owned forested land buffers this parcel from the northbound lane of MacArthur Boulevard (Route 28). The Eversource utility along the eastern boundary is located within the Joint Base Cape Cod boundaries. The property is defined by the Bourne Assessors Department as Map 32 Parcel 5 and is within the Business 3 zoning district under the Bourne Zoning Bylaw.

The subject parcel consists of undeveloped forested land with a plant community indicative of a typical Cape Cod pine/oak forest habitat. The tree canopy is primarily composed of pitch pine (*Pinus rigida*) and mixed oak species (*Quercus* spp.) with a patchy understory that ranges from densely vegetated to sparse with very little groundcover. Standing snags, fallen dead trees (boles), and occasional boulders are scattered throughout, with some evidence of past land-use activity (e.g., cart paths and informal paths), and a partially-paved road traverses the parcel within the southern and southeastern portions, partially bisecting the forested habitat. The topography generally slopes from northwest to southeast and consists of gently rolling hills and depressions. A surveyed plan of the subject parcel and a detail plan depicting site topography, both prepared by SITEC Environmental, Inc., are provided in **Attachment C**.

3.1 State-listed Rare Species Habitat

According to the most recent version of the *Massachusetts Natural Heritage Atlas* (14th Edition, August 1, 2017), the project parcel (Map 32, Parcel 5) occurs in whole or in part within *Priority Habitat of Rare Species* (PH 490) and within *Estimated Habitat of Rare Wildlife and Certified Vernal Pools* (EH 435) as designated by NHESP (**Attachment B**, Figure 3). In response to a Massachusetts Endangered Species Act (MESA) Information Request (Tracking No. 17-36534), NHESP has indicated that this designation is due to the presence of the state-listed

species, eastern box turtle (*Terrapene carolina*). There are no certified or potential vernal pools at this site.

ISWM submitted a MESA Project Review application to NHESP on March 1, 2021; NHESP issued its “Take” determination on March 21, 2021 (**Attachment D**).

3.2 Other Considerations

The subject parcel (Map 32, Parcel 5) is located outside of the MassDEP approved Zone II wellhead protection area (**Attachment B**, Figure 4).

3.3 FEMA Designation

The site is located entirely within X-Zone, an area of minimal flood hazard, as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel Number 25001C0502J revised July 16, 2014 (**Attachment B**, Figures 5 and 5A).

4.0 METHODOLOGY

HW field biologists followed the guidance provided in the CCC’s current Wildlife Plant Habitat Technical Bulletin. Prior to conducting field assessments, HW reviewed existing source data, including the CCC’s 2018 Regional Policy Plan Data Viewer, the USGS topographic map, NHESP Natural Heritage Atlas and common and rare species lists, the USDA Natural Resources Conservation Service (NRCS) Soils Survey for Barnstable County, MA, and available source data from the Massachusetts Geographic Information Service (MassGIS) to identify the presence of natural resources within the project area.

Field investigations were conducted by qualified individuals with academic backgrounds in related disciplines, including botany, soil science, and wildlife biology, and with prior professional experience in conducting natural resources inventories on Cape Cod. The credentials of personnel involved are provided in **Attachment E**.

4.1 Wildlife Assessment

All site evaluations focused upon the documentation of the following with respect to wildlife habitat:

- Avifauna, both migratory and resident species;
- Mammals;
- Herpetofauna (reptiles and amphibians); and
- Rare Species.

Observations of wildlife usage, including but not limited to, nests, wildlife travel corridors, or presence of snags or significant dead vegetation that may provide habitat for a variety of species were also noted.

As noted above, and in **Attachment D**, NHESP has indicated that the site is mapped for the presence of eastern box turtle habitat.

4.2 Vegetation Communities Inventory

HW staff conducted four site assessments to take inventory of the natural resources located on the site, including the presence, if any, of wetland plant communities or vernal pools. Plant species and their relative abundance were observed within the canopy, shrub, and groundcover/herbaceous layers. HW noted the presence, if any, of specimen trees or rare or unusual vegetation communities. HW also noted the presence of non-native, invasive plant species.

4.3 Soil Survey

The Natural Resources Conservation Service (NRCS) identifies this site as falling within well-drained sandy soil types, as described in the Soil Map – Barnstable County, Massachusetts (**Attachment B**, Figure 6). The soils underlying the site are classified as, follows:

- Barnstable sandy loam, 3 to 8 percent slopes (431C) is described as “very stony, moderately well drained soils formed in glacial fluvial deposits on outwash plains, delta, kames, and ice contact deposits”. This is the second most abundant soil with approximately 33% cover.
- Plymouth loamy coarse sand, 3 to 8 percent slopes(435B) is described as “loose sandy glaciofluvial deposits and/or loose sandy ablation till’ loose sandy ablation till and/or loose sandy glaciofluvial deposits; loose sandy ablation till and/or loose sandy glaciofluvial deposits.” This is the most abundant soil on the parcel with approximately 52% coverage.
- Plymouth loamy coarse sand, 8 to 15 percent slopes (435C) is described as “loose sandy glaciofluvial deposits and/or loose sandy ablation till; loose sandy ablation till and/or loose sandy glaciofluvial deposits.” This soil is the least abundant (8%) and only present along the southernmost border.

HW’s site observations are consistent with the wide range of slopes, as topography at this site is somewhat undulating, with pits and mounds and occasional, randomly located rocks and boulders. Additionally, the Town performed a site-specific soil survey to confirm the soils at this site; details are provided in **Attachment F**. A copy of the NRCS soils report is also provided in **Attachment F**.

5.0 RESULTS

5.1 Field Investigations

For the purpose of wildlife use assessment, HW conducted four site visits “within one hour of sunrise and within one hour of sunset during good weather,” in accordance with the CCC’s Wildlife Plant Habitat Technical Bulletin. Date, time, and weather details for site observations are provided in Table 1 below. Additional site observations have been made outside of these site visits to further document and qualify the habitat at this site, and any additional wildlife observations made have been added to **Attachment G**.

Table 1. Site Conditions during Wildlife Surveys

Site Visit Date	Visit Time/Duration	Weather Conditions
02/02/2017	6:45 – 9:00 am (dawn)	Partly sunny & unseasonably warm with low winds and rolling fog
02/23/2017	4:00 – 5:30 pm (dusk)	Partly sunny & unseasonably warm with low winds
05/20/2020	5:00 – 8:30 am (dawn)	Mostly sunny, light wind, temperature rising from mid-40s to mid-50s F during visit
05/27/2020	5:30 – 8:30 pm (dusk)	Mostly sunny, light wind, temperature falling from 70 to 60 F during visit

5.2 Existing Vegetation Communities

HW documented the general plant communities observed at the site, following the *Classification of the Natural Communities of Massachusetts* (Swain 2020). The community type best describing the forested habitat at this site is the Pitch Pine – Oak Forest/Woodland, although small portions of the site could also be classified as Pitch Pine - Scrub Oak.

Pitch Pine – Oak Forest/Woodland

The predominant terrestrial plant community type for this site is best categorized as Pitch Pine – Oak Forest/Woodland. HW observed commonly occurring canopy species of pitch pine, eastern white pine (*Pinus strobus*), white oak (*Quercus alba*), scarlet oak (*Quercus coccinea*), and black oak (*Quercus velutina*). Less commonly observed canopy species include sassafras (*Sassafras albidum*), black cherry (*Prunus serotina*), and red maple (*Acer rubrum*). Live trees are generally between seven and twelve inches in diameter at breast height (DBH) with a few trees of larger diameter, including several hardwood and softwood trees observed that would qualify as specimen trees by regulatory definition.

The tree canopy provides nearly complete cover across the site at full leaf-out. Occasional standing dead trees (snags) and trees of poor health are located throughout the parcel (Map 32, Parcel 5). In addition, several fallen trees were observed, some due to natural causes, but others observed within the footprint of cart paths that traverse primarily the eastern portion of the site that are likely a result of past fire training exercises with large all-terrain vehicles. This is evident in the field where HW observed more open, linear swaths of forest understory that are generally devoid of mature trees. Vegetation has begun to regrow, and these areas are not a predominant feature of the site.

The understory plant community is shrub-dominated with sparse herbaceous cover. Commonly observed species include dense patches of black huckleberry (*Gaylussacia baccata*), ink berry (*Ilex glabra*), patches of sheep laurel (*Kalmia angustifolia*), low bush blueberry (*Vaccinium angustifolium*), with scattered patches of inkberry (*Ilex glabra*), occasional arrowwood (*Viburnum dentatum*) and witherod (*Viburnum nudum* var. *cassinoides*), and seedling pine (*P. strobus* and *P. rigida*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), dwarf chinquapin oak (*Quercus prinoides*), and sassafras (*Sassafras albidum*). As noted, HW

observed areas supporting dense patches of scrub oak (*Quercus ilicifolia*) at this site, particularly in the far southwestern corner and in the southeastern corner just south of the overgrown paved road. In these areas, the habitat is more characteristic of a Pitch Pine - Scrub Oak community.

Groundcover consists of patches of wintergreen (*Gaultheria procumbens*), tree-clubmoss (*Dendrolycopodium obscurum*), bracken fern (*Pteridium aquilinum*), hay-scented fern (*Dennstaedtia punctilobula*), pink lady's slipper (*Cypripedium acaule*), and Canada mayflower (*Maianthemum canadense*). Occasional entanglements of bull brier (*Smilax rotundifolia*) and cat greenbrier (*Smilax glauca*) were observed, primarily along edges adjacent to cart paths, and occasional patches of poison ivy (*Toxicodendron radicans*) were also encountered. HW also observed a fair number of moss-covered rocks ranging in size from a foot to several feet across. The understory varies in consistency throughout the site being relatively thin along the western side and denser in the interior sections. Western portions of the site showed lower abundance of tree and shrub species overall with a lack of mid-story and sapling trees and mature medium to large-sized shrubs.

The floor of the forested habitat is a relatively thick, covered with a three to six-inch duff layer, consisting of oak leaves, pine needles, and small branches and twigs.

Presence of Invasive Species

HW observed, three non-native, invasive plant species at this site. Patches and individuals of glossy false buckthorn (*Frangula alnus*) occur within interior portions of the site, although not in large numbers, and largely within the northwestern portions. There are also multiple patches of autumn olive (*Elaeagnus umbellata*) observed growing along the northern edge of this parcel, where the woodland parcel (Map 32, Parcel 5) perimeter interfaces with the southern limit of the Bourne ISWM's active operations area (Map 32, Parcel 9). Additionally, the site contains a stand of mature Black Locust (*Robinia pseudoacacia*) near the south-central parcel boundary.

5.3 Wildlife Habitat

As required in the Regional Policy Plan (RPP) and Wildlife and Plant Habitat Bulletin, the NRI is designed to survey and document significant wildlife habitat, including physical evidence of wildlife use such as the presence of nests; burrows; dens; active snags in standing dead timber; feeding, migratory or breeding activities; presence of scat; browse or antler rubs; scent posts; or game rails; and identification of migration corridors used along unfragmented or contiguous landscapes. Following the literature review and identification of vegetation communities, each of the cover types was inspected for the presence of significant wildlife features.

In an inventory of wildlife habitat, it is the physical structure of the landscape and associated features that are observed and assessed for relative habitat quality, rather than the presence of individual animal species. However, direct sightings of mammals, avifauna, and herpetofauna (reptiles and amphibians), as well as other indirect evidence of wildlife use of this site, were recorded during the course of the field visits. Potential species utilizing this habitat, given the species' range, documented occurrences on Cape Cod, and the likelihood of a given habitat to provide food, cover, breeding, over-wintering, dispersal, or migratory habitat, are listed in **Attachment G**.

Avifauna

Various bird species were noted, most being edge or woodland species. During the site visits, HW observed or heard common year-round and migratory bird species. Given the location of the site in proximity to an active solid waste facility, gulls and American crows were common occurrences. However, many other species were also heard or observed during the visits, with a higher diversity of species evident during the two site visits in May of 2020, as would be expected. Species observed during the February 2017 visits included the American crow, black-capped chickadee, tufted titmouse, gulls, dark-eyed junco, white-breasted nuthatch, and American robin. Additional species observed during the visits in May 2020 included, American goldfinch, Baltimore oriole, blue jay, gray catbird, chipping sparrow, common grackle, common yellowthroat, downy woodpecker, eastern towhee, eastern wood-pewee, field sparrow, hairy woodpecker, house wren, great blue heron, northern cardinal, northern flicker, ovenbird, pine warbler, red-breasted nuthatch, song sparrow, turkey vulture, wild turkey, and wood thrush. HW noted considerable noise pollution from the nearby highway, which made auditory observations more challenging at this site. Evidence of woodpecker activity was noted in numerous trees. The presence of snags and dead trees, both upright and on the ground, which may serve as nesting sites or cavities for birds, was noted.

Mammals

The vegetation community offers suitable habitat for food and cover for mammalian species common to Cape Cod. Indications of wildlife use were observed throughout the property, including wildlife trails traversing the property and mammalian scat (coyote, fox, rabbit, and deer).

Herpetofauna

Amphibians

The project site is unlikely to support breeding habitat for amphibian species due to the absence of wetlands; and no certified or potential vernal pools are documented within the general surrounding area. The closest waterbody, Donnelly Pond, is located approximately 1,000 feet northeast of the 12.13-acre parcel (Map 32, Parcel 5) at the closest point and over 500 feet east of the closest site areas within the active ISWM parcel (Map 32, Parcel 9); there are two NHESP certified vernal pools located within 0.25-miles further northeast of Donnelly Pond (see **Attachment B**, Figure 3). One of the certified vernal pools (#4774) is located in an unnamed depression in the topography, and the other vernal pool (#3920) is located within the named Little Halfway Pond basin. Although there are no ponds or vernal pools in close proximity to the site, during the site visit on May 27, 2020, HW observed gray tree frogs (*Hyla versicolor*) chorusing at the northeastern corner of the 12.13-acre parcel (Map 32, Parcel 5). Donnelly Pond and/or one of the vernal pools likely provides the nearest potentially suitable breeding habitat in proximity to the site.

Reptiles

Suitable habitat exists on and adjacent to the site for a number of reptiles, including snakes and turtles, with the eastern box turtle being of particular note as a rare species of Special Concern. This forested habitat is characteristic of upland habitat favored by the box turtle, and the

exposed sandy soils along the unimproved dirt access roads along the eastern and southern portions of the parcel may provide suitable nesting habitat within close proximity to the site.

Invertebrates

It is anticipated that the subject site would support invertebrate species common to Cape Cod pitch-pine oak forest communities. However, there are no water sources near enough by to support aquatic invertebrate species that are dependent on an aquatic environment for at least a portion of their life cycle.

5.4 Rare Species

No federally or state-listed species were observed during HW's site visits. As noted above, the site is mapped for habitat for the eastern box turtle.

As noted above, the eastern box turtle (*Terrapene carolina*) is listed in Massachusetts as a species of "Special Concern." It has no federal status. Eastern box turtles are small to mid-sized terrestrial turtles ranging from 4.5 to 6.6 inches (11-17 cm). Box turtles have an oval, high-domed shell with variable black and yellow or orange coloration and markings. They live in open woods, wet meadows, pastures, and brushy fields and are commonly found near ponds, streams, and wetlands. During hibernation season (roughly late October until April), box turtles burrow into the earth, stump holes, and stream bottoms. Females nest in June and early July and can travel as much as one mile to find appropriate nesting habitat. Nesting areas vary widely and include fields, meadows, utility rights-of-way, woodland openings, roadsides, and abandoned gravel pits. Given the open woods and sandy soil nature of this site and the lack of ponds, wetlands or streams, this parcel could possibly provide nesting area and or hibernation burrow opportunities. NHESP will review the project under Massachusetts Endangered Species Act (M.G.L. Ch. 131A; MESA) following the submittal of a Conservation and Management Permit, which is in progress. The Town will continue to update CCC on the status of the NHESP review.

6.0 PROPOSED PROJECT

ISWM proposes to expand its existing operations in accordance with the Town's master plan for this facility. The proposed project will adjust and expand the landfill operations, utilizing Parcel 9 (part of the existing active landfill area) to support future Phase 7 and Phase 8 landfill expansion, as well as an abutting 12.13-acre parcel (Map 32, Parcel 5) to the south of the existing facility to accommodate future solid waste handling areas and administrative offices. The proposed expansion into Parcel 5 will provide a residential recycling center, a single-stream recyclables transfer station, a C&D transfer station, brush and composting area, sedimentation basin area, an office building, a maintenance garage and associated access roads and parking.

This municipal proposed project serves a municipal and county need by providing solid waste disposal and transfer operations on Cape Cod and the surrounding region for residential and commercial waste as well as recyclables. A more detailed explanation of the future development plans can be found in the "Landfill Expansion Permitting Documents" (<https://www.townofbourne.com/integrated-solid-waste-management/pages/landfill-expansion-permitting-documents>).

7.0 DEVELOPMENT IMPACT

The proposed development will result in both short-term and long-term alterations to the existing vegetation and wildlife habitat of the 12.13-acre parcel (Map 32, Parcel 5). Although this parcel is within Priority and Estimated Habitat, it abuts, to the east, more than 15,000 acres of forested and minimally disturbed habitat. The proposed project is part of the master planning for the build-out of the Bourne ISWM facility, which serves an important municipal, county, and regional need. It is one of the few active municipal landfills in the Commonwealth, and the only one on Cape Cod. Furthermore, the project parcel abuts the existing ISWM operations to the north (Map 32, Parcel 9), and was purchased expressly for the purpose of providing area for the structures that will be displaced by the expansion of the landfill as was previously discussed in the Phased Development of Regional Impact (DRI) in 2018.

The proposed project activities that will occur within identified eastern box turtle habitat (see NRI Figure 1, **Attachment A**) will require mitigation to the satisfaction of NHESP, including preservation of off-site mitigation lands. ISWM consulted with the Conservation Commission regarding the need for off-site mitigation early in the project planning and worked in conjunction with the Conservation Commission to review the Town's inventory of parcels to identify appropriate off-site lands. A letter from the Bourne Conservation Agent describes this process and the subsequent identification of suitable privately-owned off-site mitigation lands (**Attachment H**).

Below is a discussion of the goals, objectives, and methods for wildlife and plant habitat and for open space as described in the Technical Bulletins.

7.1 Wildlife and Plant Habitat Goal, Objects, and Methods

The CCC has identified the Wildlife and Plant Habitat goal and related objectives:

GOAL: To protect, preserve, or restore wildlife and plant habitat to maintain the region's natural diversity.

OBJECTIVE WPH1 – Maintain existing plant and wildlife populations and species diversity

The following Objective Methods apply.

WPH1.1 Natural Resources Inventory
Applications for Developments of Regional Impact that propose to alter undeveloped areas shall contain a natural resources inventory. Such inventory shall identify the presence and location of wildlife and plant habitat, including vernal pools, and serve as a guide for the layout of the development.
Developments shall be planned to minimize adverse impacts to wildlife and plant habitat.

A natural resource inventory has been conducted. The purpose of the inventory was to assess the project site for the presence of wildlife and plant habitat. Details of the assessment can be found above and in **Attachment G – Wildlife Observations**.

WPH1.2 Resource Areas: Important Bird Areas, ACECs, and DCPCs

In addition to the more broadly distributed significant resources such as rare species habitat and BioMap2 habitats, as discussed in the Wildlife and Plant Habitat Technical Bulletin, several areas on Cape Cod have been designated as significant for more comprehensive resource protection interests (IBAs, ACECs, & DCPCs). Applicants should review the mapped boundaries of these resources when planning a development activity, and take appropriate steps to address the resource protection interests of each, if applicable.

The mapped boundaries for Important Bird Areas (IBAs), Areas of Critical Environmental Concern (ACECs), and Districts of Critical Planning Concern (DCPCs) have been reviewed in relation to the proposed project site. The project site does not fall within any applicable IBA, ACEC, or DCPC boundaries.

WPH1.3 Minimize Clearing and Grading

Developments should be planned to minimize adverse impacts to wildlife and plant habitat, including new land clearing and alteration of topography. Reuse of existing buildings, parking, and other infrastructure is strongly encouraged, and clearing of new land for development should be minimized. Minimizing impacts includes designing the project to minimize the total cleared and disturbed area on a site, clustering buildings, locating infrastructure under, on, or adjacent to buildings and paved areas, and utilizing existing disturbed areas. Locating structured parking under buildings or in a multi-level garage is encouraged. Clearing new land for solar field development is strongly discouraged; however, locating solar panels above parking or on rooftops is strongly encouraged. In addition to the benefits to wildlife and plant habitat, reusing existing building and paved or disturbed areas, as well as "co-locating" uses or infrastructure on a site helps to reduce costs associated with heating and cooling new structures, managing stormwater, and the additional infrastructure costs associated with longer site drives and running utility lines.

Full clearing of vegetation and grading of the project site is necessary to accommodate the proposed facilities for the ISWM operations. It is anticipated that the ensuing woody organic matter will be ground down to be reused as mulching or for heating.

Since almost the entire 12.13- acre parcel (Map 32, Parcel 5) is mapped as Priority Habitat of Rare Species for the eastern box turtle, along with very small parts of Map 32, Parcel 9 (see **Attachment A**, NRI Figure 1), the Town will be filing for a Conservation and Management Permit from NHESP following completion of the agency's MESA Project Review. As part of the mitigation under the CMP, the Town proposes to off-set impacts to state-listed species habitat by providing mitigation habitat from two source locations. One being located at a parcel (Map 52, Parcel 41, Lot 1 and Lot 2) located off of Route 28 south of the ISMW facility,) and the other as a connected strip of mapped eastern box turtle habitat along the eastern boundaries of the ISWM parcels (Map 32, Parcels 5 and 9).

In anticipation of the need for mitigation, and in the absence of available Town-owned parcels (see **Attachment H**), the Town issued a Request for Proposals (RFP) following approval at Town meeting to appropriate funds to purchase these two lots for permanent land protection. These transactions were placed on the Town Warrant and approved at the Town Meeting on October 28, 2019. Copies of Articles 15 and 16 of the October 28, 2019 Town Meeting are

included as **Attachment I**. (These were also included as part of the MESA Project Review in **Attachment D**). An additional article was considered at the November 16, 2020 Special Town Meeting toward increasing an appropriation for the purchase of these lands, and is also provided in **Attachment I**. The Town anticipates successfully concluding procurement of both parcels and taking ownership of them in 2021.

The off-site mitigation source is located on two contiguous lots of a nearby parcel totaling approximately 17.5 acres (Map 52, Parcel 41). Previously referred to as the “Harding Parcel,” this parcel was recently subdivided, and the land is collectively referred to here as “Lots 1 and 2” or the off-site mitigation parcel. Lot 1 (also referred to as the “Mac Hunter Lot”) consists of 11 acres and Lot 2 (“Flyover Lot”) consists of 6.5 acres. This collective, off-site mitigation parcel is located south of the ISWM property, and east of MacArthur Boulevard, and supports similar habitat to that found on the Town’s 12.13-acre parcel (Map 32, Parcel 5) and undisturbed portions of Map 32, Parcel 9. This land is abutted to the north and south by town-owned land that has a conservation restriction on it and by Joint Base Cape Cod to the east. HW field biologists conducted a field assessment of the proposed off-site mitigation parcel on April 10, 2018 and prepared a baseline report that describes the general site characteristics, soils, plant communities, existing wildlife habitat, and potential for provision of wildlife habitat as mitigation. A copy of this report is provided as **Attachment J**. (This baseline report was also included as part of the MESA Project Review in **Attachment D**). ISWM has been in correspondence with NHESP staff and has received confirmation that these parcels are suitable for mitigation land.

The second mitigation source is located on ISWM’s Parcels 5 and 9 (Map 32). Portions of each of these parcels include undisturbed areas of mapped eastern box turtle habitat totaling 46,463 SF (1.07 acres) that will be preserved (see **Attachment A**). A similar baseline assessment was also conducted for the lands on Map 32, Parcels 5 and 9. The report for this assessment is provided within **Attachment D**.

Overall, the undeveloped condition of these parcels, as well as that of the adjacent land to the north and east of Map 32, Parcels 5 and 9, supports similarly vegetated plant communities as the proposed project site. The entirety of Lots 1 and 2 of the off-site mitigation parcel (Map 52, Parcel 41) and portions of the on-site parcels (Map 32, Parcels 5 and 9) are mapped by NHESP as *Priority Habitat for Rare Species* and *Estimated Habitat for Rare Wildlife* and collectively are anticipated to provide suitable, high-quality habitat to off-set the 12.38-acre total loss of habitat from Parcels 5 and 9 of Map 32.

The mechanism for habitat preservation is anticipated to be land conveyance through the so-called Article 97, to be held under the care and custody of the Bourne Conservation Commission in perpetuity. Placement of these parcels under permanent habitat protection will allow additional protection of a large area of contiguous wildlife habitat for a variety of species, including the eastern box turtle, and will further the interests of habitat protection and contribute to the protection of eastern box turtle habitat.

WPH1.4 Specimen Trees

Whenever possible, standing specimen trees should be protected. Possible exceptions include invasive species, which will be evaluated on a case by case basis. Defining a specimen tree on Cape Cod will vary depending on the species of tree, but typically softwoods greater than 18" dbh and hardwoods greater than 12" dbh are considered specimens. Protecting specimen trees means not disturbing an area equivalent to 10 feet greater than the canopy perimeter, at a minimum, and ideally protecting a larger area around them, including trees which provide buffering to the specimen tree from storms.

There are a small number of specimen trees (e.g., 2-3 eastern white pine and black or scarlet oak species) located within the footprint of the proposed project area. As noted previously, the entire parcel will need to be cleared to provide the necessary area for future facilities.

WPH1.5 Habitat Fragmentation

Projects should be designed to minimize fragmentation of wildlife and plant habitat. Greenfield development in the Natural Areas Placetype is strongly discouraged, especially in Key Sites as identified in the State Wildlife Action Plan and in BioMap2 Core Habitat and Critical Natural Landscapes. Development on parcels that may provide connections to a larger habitat network should be laid out to protect large unfragmented areas, and make connections to undeveloped areas offsite. Where appropriate, greenways and wildlife corridors of sufficient width to benefit edge species and those that inhabit the interior forest should be provided. Wildlife should be provided with opportunities for passage under or across roads and safely through developments where such opportunities will maintain the integrity of wildlife corridors. The Commission may require designation of building envelopes (for structures, driveways, lawns, etc.), where appropriate, to limit removal of vegetation. Fencing should not be constructed so as to interfere with identified wildlife migration corridors.

The 12.13-acre parcel is located within a Natural Areas Placetype (see **Attachment B**, Figure 3). The project site directly abuts the active ISWM areas to its north, creating a practical extension of these facilities, as part of the master plan. The undeveloped forested corridor located between this area and Route 28 will remain, as will the undeveloped forested habitat to the south, which is privately owned. To the east, the project site abuts a utility right-of-way, which is a relatively undeveloped area. Beyond the utility right-of-way, exists Joint Base Cape Cod and the Upper Cape Regional Water Supply Reserve, which comprise approximately 15,000 acres of relatively undeveloped land and a wide expanse of unfragmented habitat. The project site layout was specifically designed in such a way as to leave a buffer along the eastern boundary adjacent to Joint Base Cape Cod.

OBJECTIVE WPH2 – Restore degraded habitats through use of native plant communities

The following Objective Methods apply.

WPH2.1 Habitat Restoration

Opportunities to restore native habitat communities that are found within the Southeastern Massachusetts pine barrens eco-region are encouraged. According to the State Wildlife Action Plan (SWAP), Cape Cod hosts many distinct habitat types that together comprise the pine barrens ecoregion: Habitats such as Pitch Pine-Oak Upland Forest, Shrub Swamps, Lakes and Ponds, Salt Marsh, Coastal Dunes, Beaches, and Small Islands, Grasslands, Vernal Pools, and Coastal Plain Ponds are some of the habitats that create the vibrant landscape mosaic of Cape Cod.

(cont.)

Efforts to restore the natural habitats found within the region with native vegetation is strongly encouraged. Restoration projects or development projects, including "undevelopment", with a habitat restoration component should provide a plan detailing the nature of the restoration, including grading changes, native species to be planted (including types, sizes, quantities), plans to ensure establishment (irrigation and/or invasive species management), a narrative discussing the purpose and objectives of the restoration, and monitoring as needed.

Habitat restoration for the proposed project is not applicable. As discussed under WPH1.3 above, ISWM proposes to offer 808,763 SF (18.57 ac) from connected or nearby mitigation parcels to be preserved under Article 97 as part of the Conservation and Management Permit application with NHESP that will also support the goals and objectives of the CCC for the DRI.

OBJECTIVE WPH3 – Protect and preserve rare species habitat, vernal pools, 350-foot buffers to vernal pools

The following Objective Methods apply.

WPH3.1 Rare Species

Where development is proposed within mapped state or federal rare species habitat areas, the proponent must submit the development proposal to the Massachusetts Natural Heritage and Endangered Species Program (NHESP) for review and comment. As a matter of practice, development that would adversely affect habitat of local populations of rare wildlife and plants is not permitted. However, development in mapped rare species habitat may be allowed if the NHESP provides written comment that the work will not adversely affect rare species (or not result in a "take").

Development which NHESP determines may result in a "take" of state listed species may be permitted where the proponent can demonstrate that such development will not adversely affect rare species habitat. An applicant may be able to address a determination of take or likely take through redesign of the project, utilizing best management practices during construction, timing of construction activities, or occasionally through mitigation. Only through a determination by NHESP will mitigation be allowed to address impacts to rare species. In those cases, a wildlife and plant habitat management plan may be required as a condition of approval when development or redevelopment is permitted in rare species habitat areas.

As noted, the NHESP has identified portions of Parcels 5 and 9 (Map 32) as habitat for the eastern box turtle which is a state-listed species of Special Concern. The eastern box turtle and its habitat are protected and regulated under MESA and its implementing regulations (321 CMR 10.00). A MESA Project Review under MESA was submitted to NHESP on March 1, 2021. NHESP staff visited the site with HW and ISWM during its MESA Project Review. The outcome of the NHESP review is that the project will result in a regulatory "Take" of this species (see **Attachment D**), and that in order for the project to move forward it must obtain a Conservation and Management Permit (CMP) under MESA.

A CMP requires that an applicant meet the following performance standards:

- 1) The applicant has adequately assessed alternatives to both temporary and permanent impacts to State-listed Species;
- 2) An insignificant portion of the local population would be impacted by the Project or Activity, and;
- 3) The applicant agrees to carry out a conservation and management plan that provides a long-term Net Benefit to the conservation of the State-listed Species. The applicant may propose various options for "Net Benefit" which may include, but are not limited to, one or more of the following:
 - on or off-site permanent habitat protection
 - management or restoration of state-listed species habitat
 - conservation research designed to benefit the species affected by a given project. (...)

Many of the same mitigation provisions required under MESA will also apply to the mitigation requirements under the CCC regulations.

Although this parcel is within Priority and Estimated Habitat, it abuts, to the east, more than 15,000 acres of forested and minimally disturbed habitat that offers suitable and documented habitat for this species, and as such, the loss of the vegetation on the subject parcel is less likely to have an adverse effect on the existing populations of wildlife or on the species diversity.

In order to provide a long-term net benefit for the state-listed eastern box turtle, ISWM is proposing to offer 808,763 SF (18.57 ac) of mitigation from connected or nearby parcels under CRs as part of the MESA permitting (see **Attachment J**). This will provide a net gain of 269,628 SF (6.2 ac) of protected eastern box turtle habitat within the region, when considering the proposed project as a whole.

WPH3.2 Vernal Pools

Vernal pools are ephemeral pools of water that typically appear in the spring with winter snowmelt and spring rains, and often (but not always) disappear by summer's end. They are not resources protected under the state Wetlands Protection Act, but they are recognized as a significant habitat and are protected under the RPP. NRIs should identify vernal pools that may be present on a site according to the criteria established by the Natural Heritage and Endangered Species Program (see reference below and details in NRI). Where a project site is located adjacent to a vernal pool, including pools that include the criteria for certification as a vernal pool, development must be located outside of a 350-foot undisturbed buffer around these resources in order to protect both the pool habitat as well as the important upland habitat around them. Studies have demonstrated that vernal pool species, which spend most of their yearly lifecycles in upland vegetated buffers outside of the pool, may migrate up to 1,000 feet to breed in the temporary pools. Additionally, new stormwater discharges should be located a minimum of 100 feet from vernal pools in order to protect these resources from the adverse effects of sedimentation, nutrient inputs, or significant changes in water level or water period.

Not applicable – No vernal pools or areas having potential to be or function as vernal pools were identified during the site visits. Therefore, no adverse impact to vernal pools or wildlife relying on vernal pools is anticipated for this project.

OBJECTIVE WPH4 – Manage invasive species

WPH4.1 Invasive Species

Development on sites where a NRI identifies the presence of invasive plant species should provide and implement a management and restoration plan detailing the management of, and where possible, the eradication of the invasive species present, and the proposed revegetation of the site with native species. Where significant or sensitive wildlife or plant habitat is threatened, the invasive species management plan should strive to eradicate or reduce the threat to those sensitive species. A current listing of invasive species can be found on the web at www.massnrc.org/mipag/invasive.htm.

Development activities permitted by the Commission should also take steps to avoid introducing invasive species to a development site during construction through use of best management practices. Construction vehicles should be washed prior to initiating work on the project site, and should be inspected and/or washed periodically during construction.

Three Massachusetts State-listed non-native, invasive plant species were observed at the site during NRI field visits. These include glossy buckthorn (*Frangula alnus*), autumn olive (*Elaeagnus umbellata*), and black locust (*Robinia pseudoacacia*). All three of these species have the potential to threaten native wildlife and plant habitats, via aggressive competition with the native plant inhabitants for resources (light, water, nutrients, etc.), and progressive takeover of areas currently made up of a healthy diversity of native constituents. None of the three species were present in significant abundance or spread widely over large areas, which favors the success of a well-executed management plan.

Below are details on management methods that can be employed against these species. An adaptive management plan will be utilized to address the invasive plants observed at the MacArthur Blvd site with the best combination of control methods. Given the proposed clearing work, mechanical removal and on-site stockpiling of the invasive plant material will be the preferred method. The site and stockpile areas will be monitored for any recurrence of pre-existing or new observed invasive species, and follow-up treatments will be performed, as needed, during subsequent years to maintain control and prevent spread of these species. Typically, good long-term control can be achieved after a period of 3-5 years of vigilant follow-up eradication efforts.

Recommended Initial & Follow-Up Management Methods

Glossy false buckthorn (*Frangula alnus*)

- Mechanical Control – seedlings and smaller-sized individuals can be pulled out of the soil. Those harder to pull out can be dug out, if feasible. Additionally, if complete root extraction cannot be achieved, managers can cut the individual at the base and implement follow-up cutting at regular intervals until control is achieved. Management via continuous cutting of re-sprouting individuals typically takes multiple years for success and should be scheduled in a manner that prevents additional seed production and dispersal.

Autumn olive (*Elaeagnus umbellata*)

- **Mechanical Control** – seedlings and smaller-sized individuals can be pulled out of the soil. Those harder to pull out can be dug out, if feasible. Additionally, if complete root extraction cannot be achieved, managers can cut the individual at the base and implement follow-up cutting at regular intervals until control is achieved. Management via continuous cutting of re-sprouting individuals typically takes multiple years for success and should be scheduled in a manner that prevents additional seed production and dispersal.

Black Locust (*Robinia pseudoacacia*)

- **Mechanical Control** – seedlings and smaller-sized individuals can be pulled out of the soil. Those harder to pull out can be dug out, if feasible. Complete root extraction of larger individuals may be difficult without heavier equipment types such as bulldozers due to the extensive lateral root systems produced by this species. Mechanical damage (such as cutting) to this species triggers vigorous re-sprouting from the wide-spread root system. Cutting or mowing as a sole means of control should only be utilized in instances where frequent follow-up cutting/mowing can be performed during a subsequent multi-year period (typically 3-5 years), otherwise should only be considered in combination with chemical control methods.

This recommended invasive species management plan may be done in conjunction with the initial construction phases (i.e., site preparation and demolition) for the proposed project. Longer term, ISWM will monitor the presence of invasives, particularly along the periphery of open space areas to ensure the integrity of the existing native plant communities in proximity to the built environment.

OBJECTIVE WPH5 – Promote best management practices to protect wildlife and plant habitat from the adverse impacts of development

WPH5.1 Protect Habitat from Development Impacts

In general, development on Cape Cod is strongly encouraged to retain as much of the natural vegetation as possible. As discussed elsewhere (above, and in the Community Design technical guidance), development should be clustered on a site to use land as efficiently as possible, minimize impervious surfaces and minimize impacts to native vegetation and habitats. Construction fencing and/or building envelopes may be employed to limit disturbance to existing trees, shrubs, and groundcovers. Building envelopes will typically reduce restoration and other mitigation costs, and help retain native forested and other vegetative covers to protect the services these natural materials provide in filtering nutrients and stormwater, improving air quality, and providing shade and wildlife habitat. Building envelopes established in a property deed can ensure that impacts from development are not expanded and that these natural services are protected over the long term. The Commission may require the use of building envelopes where sensitive habitats or resources are present.

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Erosion control barriers should be used anywhere that slopes or proximity to wetlands or other sensitive resources are present to ensure that the impacts from construction are managed within the construction site. In longer-term construction projects where unvegetated soils may be present through several seasons, seeding and/or erosion control blankets should be employed to manage loss of soils off-site and prevent gullyng.

Construction activities can also pose direct threats to wildlife. Where turtles or other slow moving or sensitive wildlife species may be present (such as vernal pool species or amphibians), construction fencing should be employed to redirect wildlife away from the construction site.

Prior to initiation of on-site construction activities, necessary measures will be taken to control erosion and sedimentation in accordance with state and local permit conditions. The project will address potential threats to wildlife, particularly the eastern box turtle, whereby pre-clearing and pre-construction monitoring (e.g., turtle sweeps) will be performed prior to work commencement. Additional, detailed protection measures will be implemented based on requirements, recommendations, and guidance provided by NHESP.

7.2 Open Space - Goal, Objectives, and Methods

The RPP has identified the following Open Space Goal and related objectives:

GOAL: To conserve, preserve, or enhance a network of open space that contributes to the region's natural and community resources and systems.

OBJECTIVE OS1 – Protect and preserve natural, cultural, and recreational resources

The following Objective Methods apply.

OS1.1 Protect and Preserve High Value Resources and Minimize Development Impacts

OS1.1.1 Regional Protection Priorities

The permanent protection of land and resources within the Natural Areas Placetype is a regional priority. High value resources that are priorities for protection on Cape Cod include: BioMap2 Core Habitat, Critical Natural Landscapes, habitat for rare or endangered species, vernal pools and their buffers, Wellhead Protection Areas, potential future drinking water supply sites, lands adjacent to water resources such as lakes, rivers, shoreline, and wetlands, areas that provide a critical function in preserving the integrity and viability of Cape Cod's significant and diverse ecosystems, and large unfragmented blocks of undeveloped land and wildlife corridors. Additional high priorities for protection or preservation include: historic, cultural, and archaeological resources; regionally significant scenic vistas and roads; agricultural lands; the region's working waterfronts and maritime heritage; and unique landforms.

OS1.1.2 Site Design

Projects within all Placetypes should be designed to protect and/or preserve those areas with the highest natural resource value and to ensure that the most sensitive elements of a site are not impacted by development. A Natural Resources Inventory (see Wildlife and Plant Habitat Technical Bulletin) will provide guidance on significant natural resources and characteristics that should be given consideration

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during site design, including identifying lands that are a high priority for conservation. On sites where high value natural resources, important wildlife habitat, or other significant resources are not present or do not create site design constraints, development should be sited close to existing development, roadways, and infrastructure to limit the area of site disturbance. By limiting impervious surfaces, more land will be left in its natural state, which will provide ecological benefits and may reduce the development footprint. Approaches for minimizing impervious surfaces include reducing paved areas by reducing parking or using asphalt alternatives, or providing some or all of a development's parking requirements under buildings or in multi-level parking structures. Siting a project outside of Natural Areas will lessen the open space requirement and may also allow for flexibility in how open space is provided.

The proposed project site is located within areas designated as BioMap2 Critical Natural Landscape (#340), NHESP Priority Habitat of Rare Species, and Potential Public Water Supply Area.

OS1.2 Protect Lands Suitable for Future Water Supply Site

Lands identified as future water supply sites are a priority for protection. Ideally, development should not be located in these areas. Permanent protection of land identified as a high priority for protection due to suitability as a future water supply site may allow for a reduction in the open space required. The Water Resources Technical Bulletin provides additional strategies and resources for protecting the region's drinking water supply.

According to the CCC's RPP Data Viewer, the project site is located within Potential Public Water Supply Area (PLAAP), DEP Zone II, ponds, vernal pools, and associated buffers are well beyond the project site (see **Attachment B**, Figure 3). It should also be noted that the areas being proposed for mitigation (Map 52, Parcel 41 and portions of Map 32, Parcels 5 and 9) are also located within Potential Public Water Supply Area.

OS1.3 Preserve Wildlife Habitat and Unfragmented Blocks of Open Space

Clustering development will reduce fragmentation of open lands and habitat, which supports healthy ecosystem function, and preserves interior wildlife habitat. For residential subdivisions and commercial subdivision of land, clustering of development is strongly encouraged unless it is inconsistent with local bylaws. The design of cluster residential and commercial developments should preserve natural and community resources, maximize contiguous open space, respect the natural topography and character of the site, and employ wastewater treatment alternatives to allow for more compact development

Mitigation areas will provide expanded, contiguous open space and wildlife habitat corridors at a 1.5:1 ratio over the proposed ISWM expansion area.

OS1.4 Preserve the Region's Cultural Heritage and Community Character

The preservation of the region's rich cultural heritage and community character is supported through flexibility in open space requirements within Maritime Areas and Historic Areas. Provision of public access to and community greenspaces within Historic Areas and Maritime Areas may be proposed as methods for meeting Objective OS1.

The viability and sustainability of working landscapes, including lands in agricultural production and working waterfronts, should be preserved to the greatest extent possible, to support the local economy,

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preserve Cape Cod's cultural heritage, and provide opportunities to meet some of region's needs locally and sustainably.

If there are regionally significant views within, towards, or across a site, sites should be designed to allow for continued access to those views to the greatest extent possible. The preservation or reestablishment of historic views to water or landscape vistas is encouraged (see also the Community Design Technical Bulletin)

Not applicable – The proposed project does not occur within or adjacent to Historic or Maritime areas and does not contain regionally significant views.

OS1.5 Provide and Enhance Recreational Opportunities and Access

The provision of public access to on-site open space or a designated greenway within the property to off-site publicly accessible open space may be a component of the open space proposal, depending on factors which include whether there is a public benefit, the characteristics of the open space that access is being provided to, and the Placetype context.

The preservation of public access to resource-dependent recreational activities, such as swimming, boating, fishing, and sailing, is a high regional priority. On-site or off-site provision of open space that preserves public access may allow for a reduction in the open space required.

The provision of public access that benefits people of all ages and abilities through the establishment of ADA compliant pathways is also encouraged.

Not applicable – While there will be public access to the site, it will be for the purpose of solid waste handling and transfer activities in designated areas rather than recreational activities.

OBJECTIVE OS2 – Maintain or increase the connectivity of open space

The following Objective Methods apply.

OS2.1 Protect Open Space Contiguous to Undeveloped Lands or Protected Open Space

In cases where the project site abuts land that has been permanently restricted for conservation or preservation purposes, or where it is adjacent to working landscapes such as lands in active agricultural production, site design should protect contiguous open space. This will expand unfragmented wildlife habitat, buffer development, and support healthy ecosystem function.

Protection of open space that is contiguous to undeveloped land that is not restricted provides for future expansion of the block of unfragmented open space, should the opportunity arise.

The Context Map (see Resources) is a useful resource in identifying contiguous open space that should be taken into consideration during site design

An area on the east side of the project site is designated for eastern box turtle habitat mitigation. Keeping this area undeveloped is in keeping with designing to maintain open space connections and be contiguous with the adjacent open space.

OS2.2 Preserve Wildlife Corridors and Opportunities for the Movement of Wildlife

By reviewing the habitat types present on the property, as described in the Natural Resources Inventory and the Context Map, significant blocks of wildlife habitat and corridors of connected open space for the movement of wildlife across the landscape can be identified and protected. Topography, existing and proposed land use, and species requirements should be factored in when determining the necessary wildlife corridor width. Preservation of wildlife corridors is required to be factored into the placement of fencing on-site when this method is applicable.

The proposed project will not significantly impact wildlife corridors or opportunities for wildlife movement, as the proposed project site is located on the western edge of a vast, 15,000-acre contiguous natural landscape located at Camp Edwards on Joint Base Cape Cod.

There is no proposed fencing associated with the project so any wildlife corridors or passage of wildlife would not be restricted. However, after permits are acquired, the Town intends to erect fencing along any open space buffer areas to prevent wildlife from migrating into active areas utilized by the town. This is in keeping with other existing fencing at the landfill, which discourages wildlife passage within active landfill and ISWM operations. These include perimeter containment wire grid fencing (**Photo 1**) and litter fencing (**Photo 2**).

Existing wire grid fencing is found along the eastern boundary of the landfill extending southward from the gate at the spur road leading to the off-site perimeter road on Joint Base Cape Cod (see NRI Figure 2 in **Attachment A**). Litter fencing is located along the eastern property extending from the landfill gas flare station at the northeastern corner of the landfill south to approximately the leachate tank and loadout station (NRI Figure 2, **Attachment A**).



Photo 1. Wire grid fencing along the eastern property line extending from the access gate to the perimeter road within Joint Base Cape Cod.



Photo 2. Litter fencing located along the eastern boundary of landfill operations.

OS2.3 Establish, Enhance, and Connect Greenways and Recreational Trails

The Context Map is a useful tool for identifying existing pathways to water, trails, and/or multi-modal greenways –a linear open space along either a natural corridor or a right-of-way converted to recreational use –on the project site itself and/or on neighboring properties. When designing the site, any greenway connections already existing on the property should be preserved to the greatest extent possible. The establishment of a new multi-modal greenway section across the property, connected to an existing off-site multi-modal greenway, may contribute to meeting any open space requirement in certain Placetypes.

Not applicable – There are no greenway or recreational trail opportunities currently associated with the proposed project site, or the proposed mitigation areas. Additionally, any space not being proposed for development is proposed to be preserved and protected as high-quality natural habitat which necessitates exclusion of multi-modal greenways.

OBJECTIVE OS3 – Protect or provide open space appropriate to context

The following Objective Methods apply.

OS3.1 Calculate Area of Development Impact

The Area of Development Impact is the total undeveloped area on the site anticipated to be impacted by the proposed development (see Definitions for development). The project's civil engineer should calculate the square footage of areas disturbed by development activity and provide this on the proposed conditions plan.

In redevelopment projects, landscaped areas adjacent to existing buildings or parking may be considered as already disturbed area and excluded from the Area of Development Impact.

Where land is being subdivided for the purpose of residential, commercial, or other lot development, the Area of Development Impact includes the total undeveloped area proposed to be subdivided and/or developed. This provision encourages the efficient use of land and clustering to reduce overall impacts.

Any open space lot/area preserved in perpetuity as part of the project can be excluded from the Area of Development Impact and may be counted towards the open space protection requirement.

To incentivize reducing impervious surfaces due to parking, provision of some or all of a development's parking under buildings or in multi-level parking structures reduces the Area of Development Impact on a site, which in turn reduces the open space requirement. On sites with structured parking, reduce the Area of Development Impact by twice the area of the structured parking.

The area proposed for development totals approximately 12.38 acres (see **Attachment A**).

OS3.2 Protect Open Space Appropriate to Context

How a project meets the open space requirement varies by Placetype, but may include the protection of land onsite (required in some areas), protection of land on an offsite parcel (may be the preferred method if the land protected has higher resource-protection value), or provision of a cash contribution to the town's open space acquisition fund. A combination of these methods may also be permitted

***Military and Transportation Areas**—If high value natural resource areas are impacted, open space onsite, or open space of equal or higher ecological value offsite should be permanently conserved. Maintaining adequate buffers between incompatible uses is a priority in designing industrial sites, and quality buffers may be used to meet the open space requirement. Permanent protection of offsite open space in a Natural Area or Rural Development Area, or a cash contribution may also be used to meet the open space requirement.*

The mitigation areas will be placed under permanent protection through the Article 97 process and will be conveyed to the Bourne Conservation Commission as a means of habitat and open space protection with the proposed project.

OS3.3 Protect Open Space of High Natural Resource Value

The protection of open space of high natural, cultural, and/or recreational resource value, including current and potential future drinking water supply sites and areas that contribute to preserving the integrity and viability of Cape Cod's diverse ecosystems is a priority. The presence of rare species habitat, wetlands, and other sensitive resources on-site will affect site design, project review, and open space requirements. Areas of high natural resource value include BioMap2 Core Habitat, Critical Natural Landscapes, habitat for rare or endangered species, vernal pools and their buffers, and Wellhead Protection Areas. The methods outlined in the previous sections provide guidance on preserving unfragmented blocks of undeveloped land, connections with contiguous open space, scenic vistas, landscapes that contribute to community character, working landscapes, wildlife corridors, and habitat for Cape Cod's native flora and fauna.

ISWM plans to relocate its offices and maintenance facility in 2023 onto the 12.13-acre parcel (Map 32, Parcel 5), which will become necessary as landfill operations will continue to move southward into the parcel currently occupied by these facilities (i.e., Map 32, Parcel 9) with the Phase 7 and Phase 8 expansions. The other structures will follow several years later. In the interim, and until those facilities are needed, Parcel 5 will be used for soils stockpiling and other storage in areas not otherwise occupied. Therefore, the entire site will be cleared as soon as permits are attained to meet these needs with the exception of the northeastern corner (see **Attachment A**).

As mitigation, ISWM will provide permanent protection on 808,763 SF (18.57 ac) of high value natural resource area, mapped for BioMap2 Critical Natural Landscape, NHESP Priority Habitat of Rare Species, Open Space, DEP Zone II Wellhead Protection Area, and Potential Public Water Supply Area. ISWM will seek a waiver of the full mitigation required under the CCC's Open Space provisions (i.e., for the 3:1 ratio, entailing 1,617,405 SF), and specifically, for the remaining 808,642 SF not provided by the off-site and on-site mitigation areas.

OS3.4 Preserve Open Space that Benefits Natural and Community Systems

In determining how to incorporate open space into a project, form and function consistent with the natural and community systems context should be taken into consideration. The proposed project must demonstrate how natural and community systems have been factored into site design and proposed open space. The Context Map (see Resources) is a tool for reviewing the site in the context of the systems it is a part of.

The project site should be designed to support and sustain natural and community systems, irrespective of property boundaries. This will allow for a systems-based approach to open space protection, as ecosystems, watersheds, wildlife habitat, multi-modal greenways, and other resources extend beyond property boundaries. Applicants should strive to take advantage of opportunities to link on-site and off-site open space to expand the contiguity of open space.

Protection or restoration of key areas which contribute to coastal resiliency support natural and community systems long-term. On-site or off-site provision of open space to improve coastal resiliency is encouraged. The "Coastal Resiliency" section of this technical guidance provides additional strategies and resources for meeting additional Coastal Resiliency objectives.

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Based on the characteristics of a specific project and the resources present, the Commission may consider allowing stormwater management systems which incorporate LID principles, protect floodplain function, provide significant flood reduction benefits, or support coastal resiliency to meet open space requirements (see Water Resources and Community Design Technical Bulletins).

While there is flexibility in how and where open space is provided based on Placetype, open space should benefit natural or community resources and systems to meet the open space requirements. For example, landscaped islands within parking lots, narrow buffers between developed areas, and drainage structures/detention basins may not be counted towards open space requirements.

The proposed project will utilize most of the 12.13-acre parcel directly south of the existing, active ISWM facility, to expand operations capacity as needed to provide vital waste management services to the community and region. With the expansion, ISWM is proposing to preserve and permanently protect 808,763 SF (18.57 acres) of connected or nearby lands (Map 52, Parcel 41 (Lots 1 and 2) and portions of Map 32, Parcels 5 and 9), which are connected to the proposed development site as part of the same BioMap2 Critical Natural Landscape unit.

OS3.5 Off-Site Open Space

As detailed in the summary table, open space may be provided by one of three methods, based on Placetype. In Natural Areas and Rural Development Areas, onsite open space is required, but in other Placetypes open space may be met by one or a combination of onsite, offsite, or cash contribution methods. Offsite open space may be suitable for project sites with low natural resource values, or dependent on the type of development being proposed. The determination of the appropriateness of off-site protection of open space will be made by the Commission in consultation with the Town (including but not limited to planning departments, conservation committees, open space committees, and land trusts), based upon the size and type of development that will be mitigated with open space protection, and the resource values of the proposed off-site location. The Commission will work with the town and local land trusts to help identify appropriate off-site parcels. Open space proposed for off-site protection should be of equal or higher natural resource value as the land being impacted by development.

In the case of off-site open space protection, development rights on the property must be permanently extinguished and the land may not be used toward the calculation of densities for future development on the subject parcel or any other parcels.

The connected and nearby mitigation areas totaling 808,763 SF (18.57 acres) will be permanently protected under the care and custody of the Bourne Conservation Commission. The mitigation areas consist of undeveloped, forested land that supports a pitch-pine oak community typical of Cape Cod. Protection of these areas provides on and off-site open space at the required 1.5:1 ratio relative to the proposed development footprint and will also serve as high-quality habitat for the state-listed eastern box turtle (see Table 2 below) and as shown in NRI Figure 1 in **Attachment A**.

Table 2. Summary of Box Turtle Habitat Disturbance and Anticipated Mitigation

	Land Area	
	(SF)	(ac)
Total Mapped Box Turtle Habitat (Parcels 9 & 5)	585,597	13.44
Area of Habitat Disturbance	539,135	12.38
Mitigation Required (based on SSC 1.5:1)	808,703	18.57
Mitigation Available		
Total Undisturbed Habitat (Parcels 9 & 5)	46,463	1.07
Mitigation Parcel (Map 52, Parcel 41)		
Lot 1 ("Mac Hunter Lot")	479,160	11.00
Lot 2 ("Flyover Lot")	283,140	6.50
Total Preservation of Habitat	808,763	18.57

OS3.6 Contribute Funds For Open Space Protection

In appropriate cases, the commission may allow a DRI to meet the open space requirement through a cash contribution to a town or land trust's open space acquisition fund. This provision allows a community to protect higher value or priority open space off-site and allow for more concentrated development in certain locations. The availability of this option is limited by Placetype (see Summary Table) and based on whether sensitive resources are present and consultation with the Town.

The cash contribution is determined by Commission staff by the following method, utilizing current Town Assessor's data for the town where the project is located:

- 1 extract all residentially zoned developable parcels in excess of two acres,*
- 2 determine the per acre value for each of these properties, sort by value,*
- 3 remove the top and bottom 10 percent of properties, and*
- 4 average the remaining properties to calculate the per acre open space value.*

The per-acre open space value may be adjusted by a reasonable inflation factor for years where current Assessor's data is not available.

Not Applicable – The project proposes to provide on and off-site open space protection of 808,763 SF (18.57 acres) of undeveloped land. ISWM will seek a waiver from the CCC for the Natural Areas offset requirement of 3:1.

OS3.7 Incorporate Greenspace into the Built Environment

All people on Cape Cod should have access to greenspace in their communities. Projects in more densely developed Placetypes, should support the natural and community systems they are a part of by designing sites and providing greenspace in a manner that integrates the built environment through landscape improvements, provides access to outdoor spaces, and enriches community connections. In Community Activity Centers, for example, pocket parks, recreational areas, multi-modal greenways, walking paths shaded by native trees, and community gathering spaces may be incorporated into the built environment to sustain community health and well-being. (see also the Community Design Technical Bulletin).

Not Applicable – The project is proposing to expand landfill operations into a parcel (Map 32, Parcel 5) that is directly adjacent to the existing active operations site. There is currently a narrow buffer along the eastern boundary that exists on the adjacent parcel (Map 32, Parcel 9) to the north of the parcel proposed for development (Map 32, Parcel 5). Additionally, any undisturbed areas within the parcels proposed for development (Map 32, Parcels 5 & 9) and the off-site parcel (Map 52, Parcel 41, Lots 1 & 2) will be permanently protected.

While there will be public access to the site, it will be for solid waste handling and transfer activities in designated areas rather than recreational activities.

OS3.8 Restore Degraded Areas to a Natural State

The restoration of degraded areas on-site to provide significant natural, scenic, and/or recreational benefits may meet some or all of the open space requirement, depending on the specific natural or community systems the site is a part of. The removal of existing structures on-site to reestablish scenic vistas, reducing the amount of fragmented habitat, or enabling wildlife corridor connections are all encouraged. Any site revegetation should be consistent with the natural and community systems the site is a part of and should utilize native species. Where projects located on severely degraded areas such as gravel pits and landfill sites are revegetated, at the Commission's discretion, the revegetated areas may be counted toward meeting the open space requirement; these areas should be regraded consistent with the surrounding topography in a manner that reduces or eliminates potential erosion.

Not applicable – There are no on-site degraded areas available to propose for restoration. However, the project proposes to place CRs on proposed mitigation areas that will protect an additional 808,763 SF (18.57 acres) of native pitch-pine woodland at locations connected to and nearby the proposed development site.

7.3 Minimizing Project Impacts

The proposed development of this site is positioned toward the western and southern portions of the site to maintain contiguous wildlife habitat and corridors along the eastern boundary. As discussed, fencing is proposed along the perimeter of Parcel 5 to discourage migration of wildlife into active areas of the ISWM facilities.

8.0 SUMMARY

The subject project site (portions of Map 32, Parcels 5 and 9) consists of approximately 12.38 acres of undeveloped forested land that supports a pitch pine-mixed oak community typical of Cape Cod. No wetland resource areas are located at the site or within close proximity, and no unique features were encountered, with the exception of 2-3 specimen trees. Overall, the undeveloped condition represents a plant community that is typical of a pitch pine- mixed oak plant community found on Cape Cod. The site context with close proximity to a well-used road and an existing solid waste transfer station to the west and south (respectively) reduces the ability of this parcel to provide habitat for species other than commonly occurring wildlife species that have become adapted to more urban-type settings. However, it is recognized that the land is mapped as a Natural Area Placetype and designated as *Priority Habitat of Rare Species*. ISWM is proposing to provide 808,763 SF (18.57 acres) of high-quality pitch pine-mixed oak woodland habitat as protected open space through Article 97, to be placed under the care and custody of the Bourne Conservation Commission, which provides 1.5:1 mitigation for the

proposed expansion ISWM facilities expansion. ISWM will seek a waiver of the 3:1 Natural Areas offset requirement for open space in lieu of the important municipal, county, and regional need that the Bourne landfill and ISWM facility fulfills. As such we believe that the proposed project is consistent with the Minimum Performance Standards (MPS) under the RPP for wildlife and plant habitat.

9.0 REFERENCES

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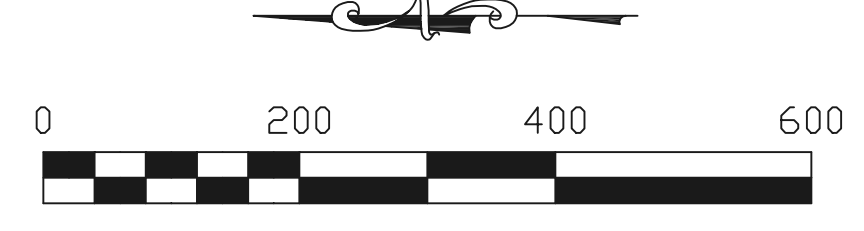
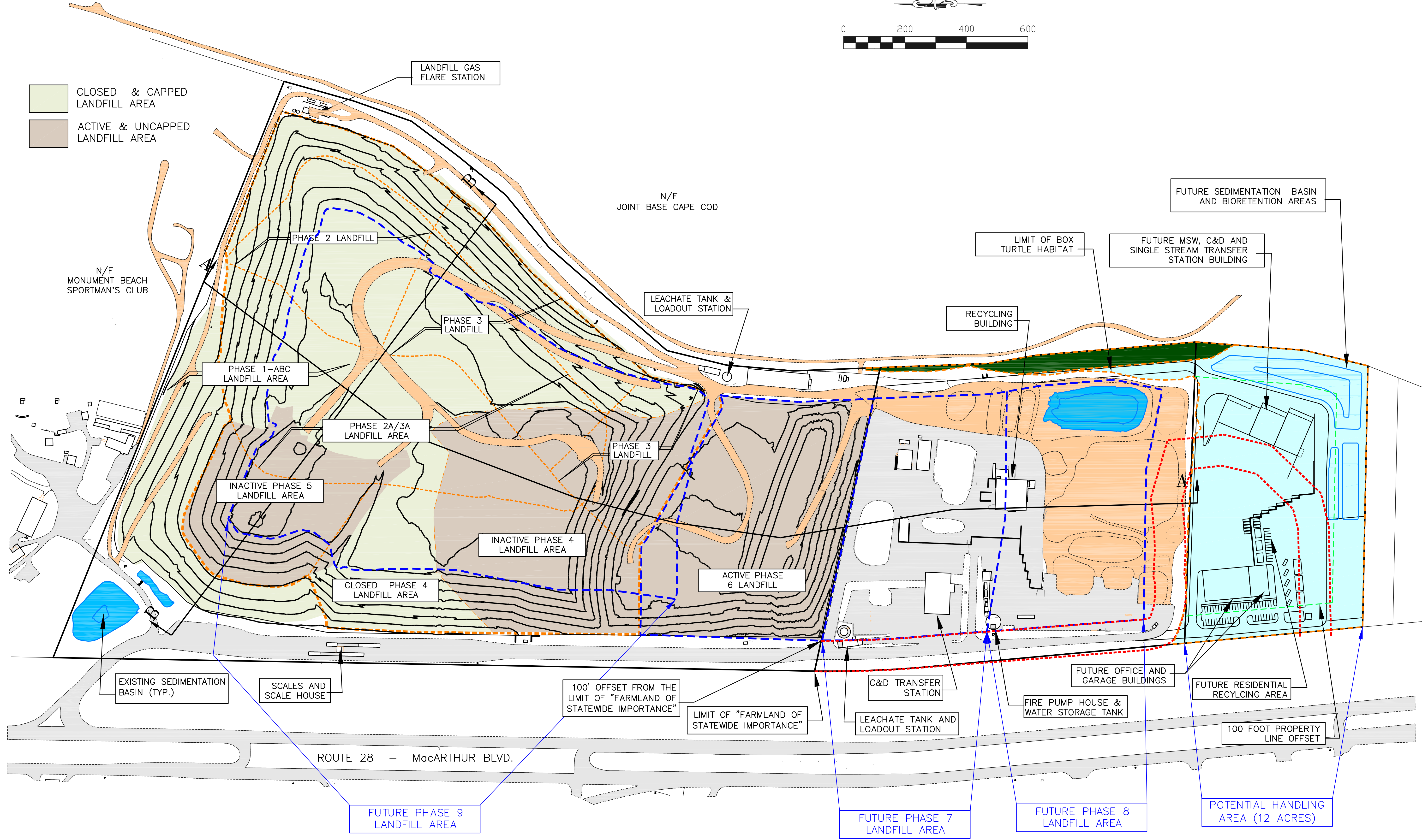
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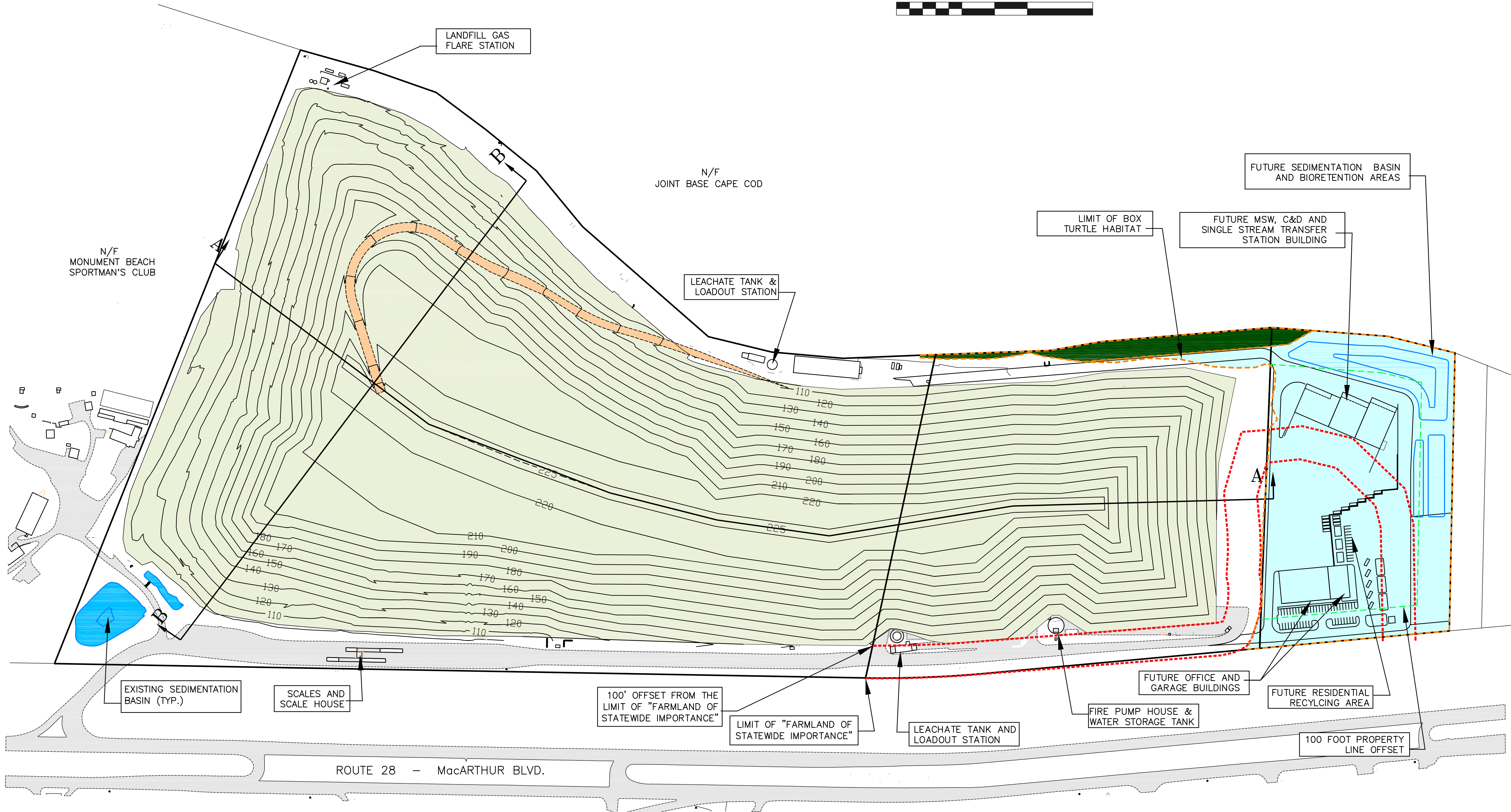
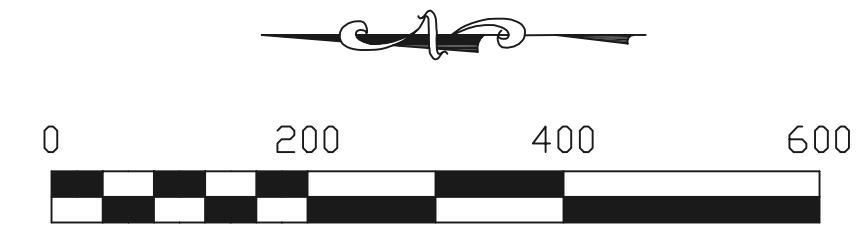
Attachment A – Project Plans and Site Context



CLOSED & CAPPED LANDFILL AREA
 ACTIVE & UNCAPPED LANDFILL AREA

EXTENT OF BOX TURTLE HABITAT
 ACERAGE OF DISTURBANCE - 539,135 sf
 UNDISTURBED HABITAT - 46,463 sf

SCALE:	DATE:	DRAWN:	CHECKED:	APPROVED:	DRAWING NUMBER:
AS SHOWN	MAR. 30, 2021	ARQ	ARQ	ARQ	ARQ
PROJECT:		CLIENT:		DRAWING TITLE:	
BOURNE INTEGRATED SOLID WASTE MANAGEMENT FACILITY		BOURNE DEPARTMENT OF INTEGRATED SOLID WASTE MANAGEMENT		NRI FIGURE 2 EXISTING CONDITIONS	
SITEC ENVIRONMENTAL 89 Plain Street, Suite 200, Cape Cod, MA 02549 PHONE (781) 318-0100 FAX (781) 834-4783 Civil and Environmental Engineering Land Use Planning and Surveying Hazardous and Solid Waste Consultants					
Acad No: SSEIR SITE PLAN-SOLAR ARRAY.dwg SE01-456-12					



- - - EXTENT OF BOX TURTLE HABITAT
- ACERAGE OF DISTURBANCE - 539,135 sf
- UNDISTURBED HABITAT - 46,463 sf

scale:	AS SHOWN
date:	MAR. 30, 2021
drawn:	ARQ
checked:	ARQ
approved:	ARQ
drawing number:	

project:	BOURNE INTEGRATED SOLID WASTE MANAGEMENT FACILITY
client:	BOURNE DEPARTMENT OF INTEGRATED SOLID WASTE MANAGEMENT
drawing title:	NRI FIGURE 3 FUTURE LANDFILL BUILDOUT

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SITEC ENVIRONMENTAL
 Civil and Environmental Engineering
 Remediation and Construction Management
 Hazardous and Solid Waste Consultants

Attachment B – Locus Maps

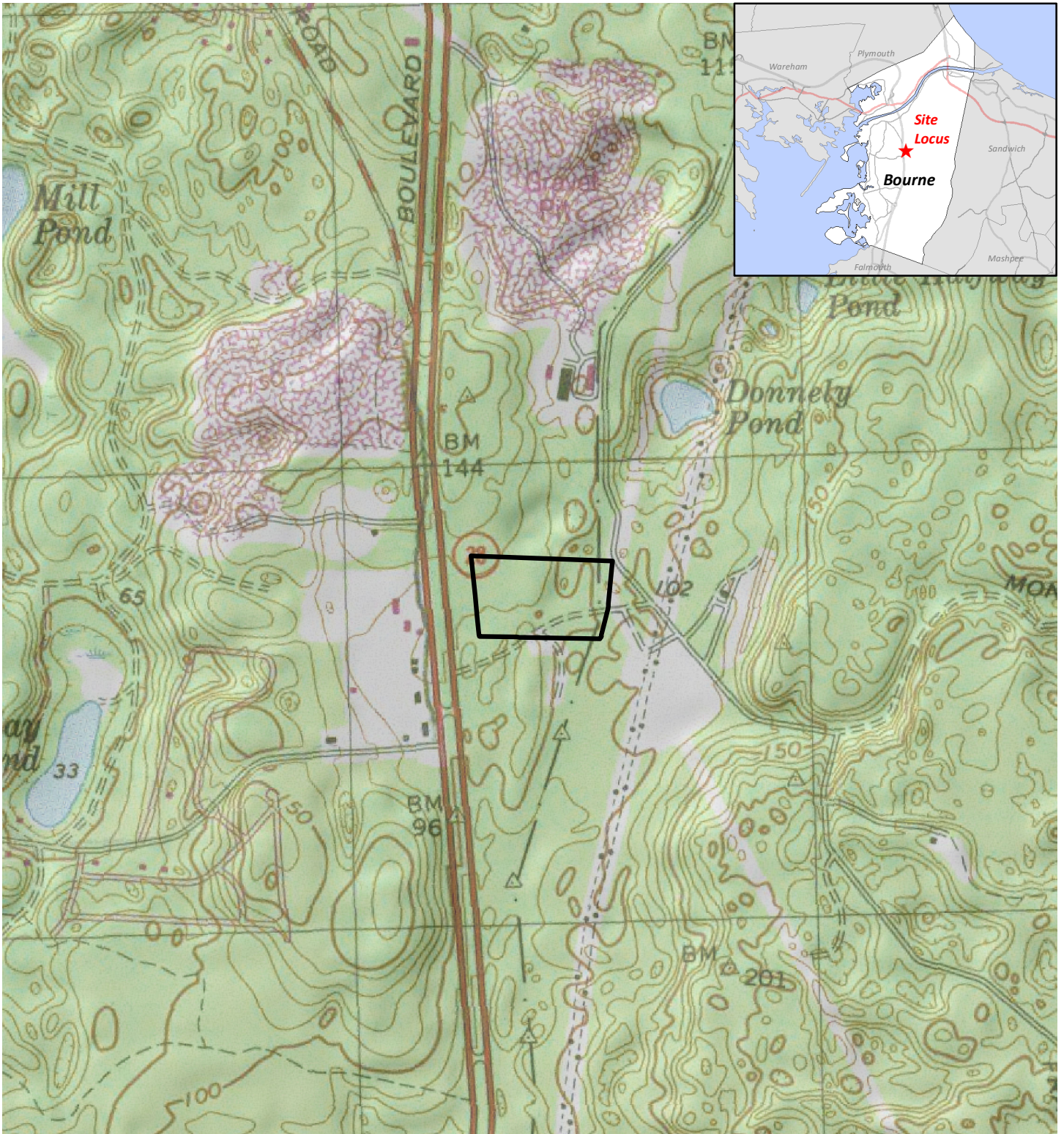
Figure 1 – USGS Topographic Map

Figure 2 – Aerial Photograph

Figure 3 – FEMA Flood Zone Maps

Figure 4 – Environmental Constraints

Figure 5 – NRCS Soils Map



Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\USGS_Locus.mxd

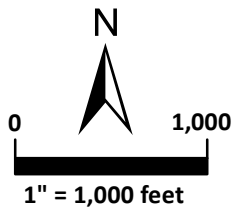
Legend

 Site Parcel

*Pocasset Topographic Quadrangle

Horsley Witten Group
Sustainable Environmental Solutions

90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-8600 • horsleywitten.com



USGS Locus
201 MacArthur Blvd.
Bourne, MA

Date: 6/26/2020

Figure 1



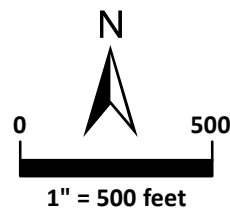
Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\Aerial_Photo.mxd

Legend

-  Site Parcel
-  Parcels

*Imagery - ESRI World Imagery (Clarity)
Parcels - MassGIS 2015

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Aerial Photo
201 MacArthur Blvd.
Bourne, MA

Date: 6/26/2020









Figure 2

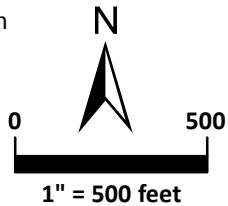


Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\Constraints.mxd

Legend

*Imagery - ESRI World Imagery (Clarity)
 Parcels - MassGIS 2015
 GIS Data - MassGIS

-  Site Parcel
-  CCC - Natural Areas 2018
-  Parcels
-  Areas of Critical Environmental Concern
-  NHESP Certified Vernal Pools
-  Open Water
-  NHESP Priority Habitats of Rare Species
-  NHESP Estimated Habitats of Rare Wildlife



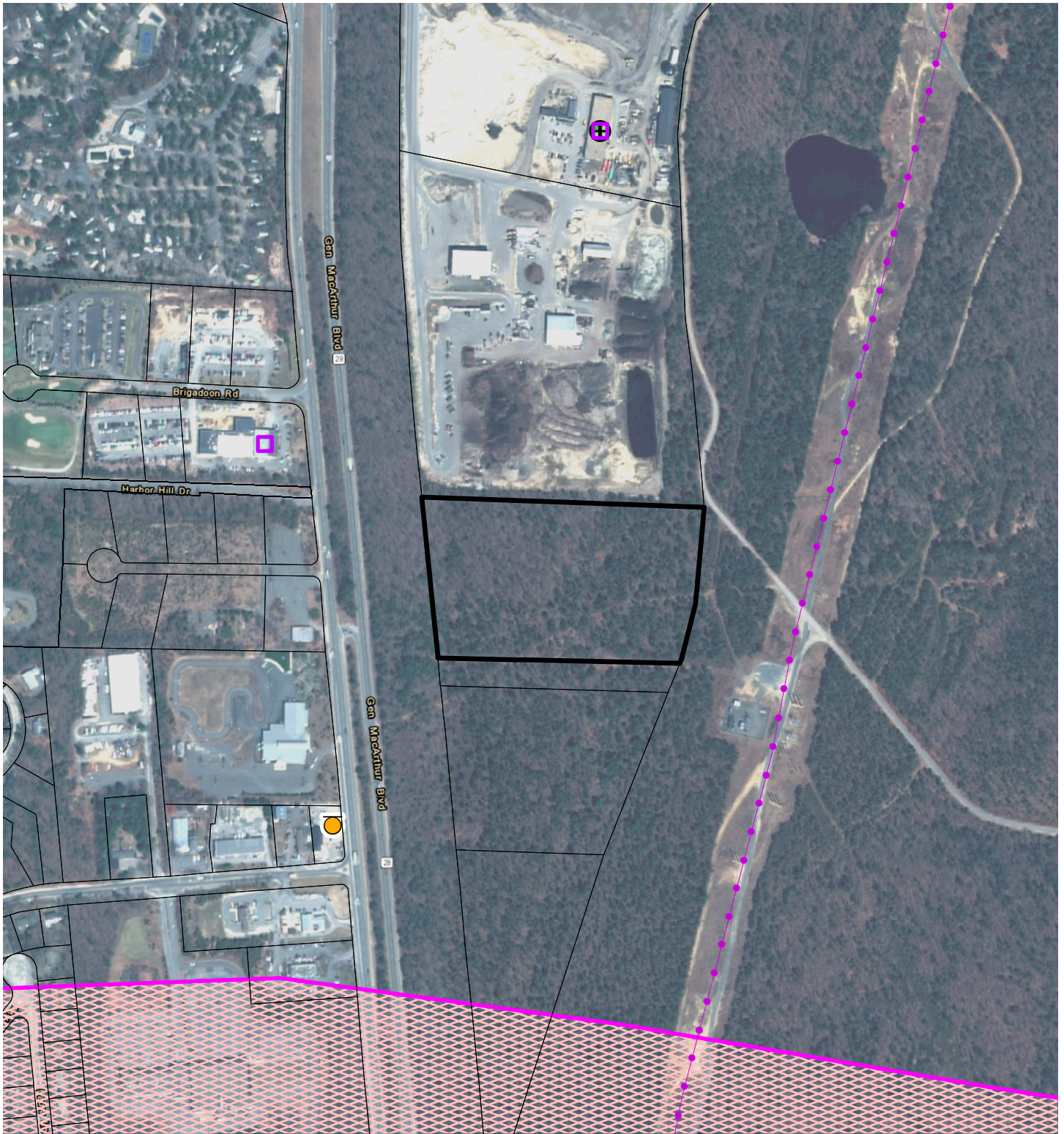
Horsley Witten Group
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 508-833-8600 • horsleywitten.com



Existing Constraints
 201 MacArthur Blvd.
 Bourne, MA

Date: 6/26/2020

Figure 3

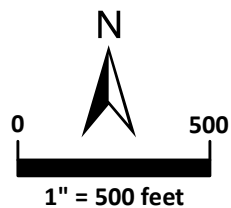


Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\Regulated_Areas.mxd

Legend

- | | | | |
|--|---------------------------|---------------------------------|----------------------------|
| | Site Parcel | MassDEP Major Facilities | |
| | Parcels | | MA-regulated Hazard. Waste |
| | Powerline | | Air Permit |
| | Underground Storage Tanks | | |
| | DEP Approved Zone II | | |

*Imagery - MassGIS 2015
 Parcels - MassGIS 2015
 GIS Data - MassGIS



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 508-833-8600 • horsleywitten.com



Regulated Areas
 201 MacArthur Blvd.
 Bourne, MA

Date: 2/1/2017

Figure 4



Area of Minimal Flood Hazard - Zone X

Area of Minimal Flood Hazard - Zone X

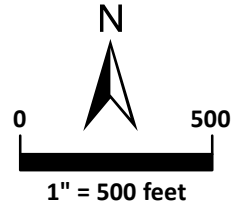
Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\FEMA.mxd

Legend

-  Site Parcel
-  Parcels

**Imagery - ESRI World Imagery (Clarity)
Parcels - MassGIS 2015
FEMA's National Flood Hazard Layer - July 2014*

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Sustainable Environmental Solutions
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FEMA's National Flood Hazard Layer
201 MacArthur Blvd.
Bourne, MA

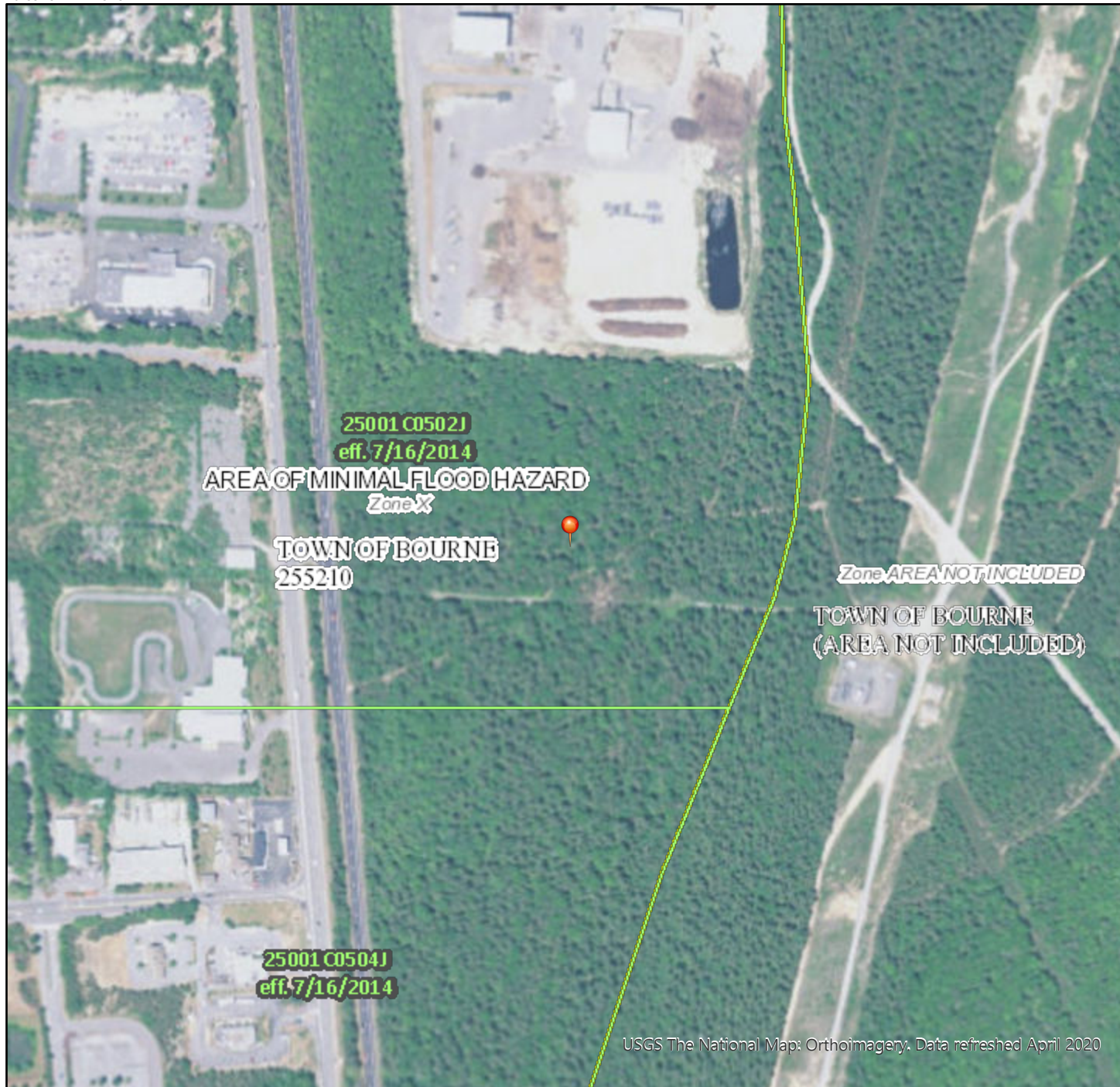
Date: 6/26/2020

Figure 5

National Flood Hazard Layer FIRMette



70°35'13"W 41°43'25"N



USGS The National Map: Orthoimagery. Data refreshed April 2020



70°34'35"W 41°42'58"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
MAP PANELS		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



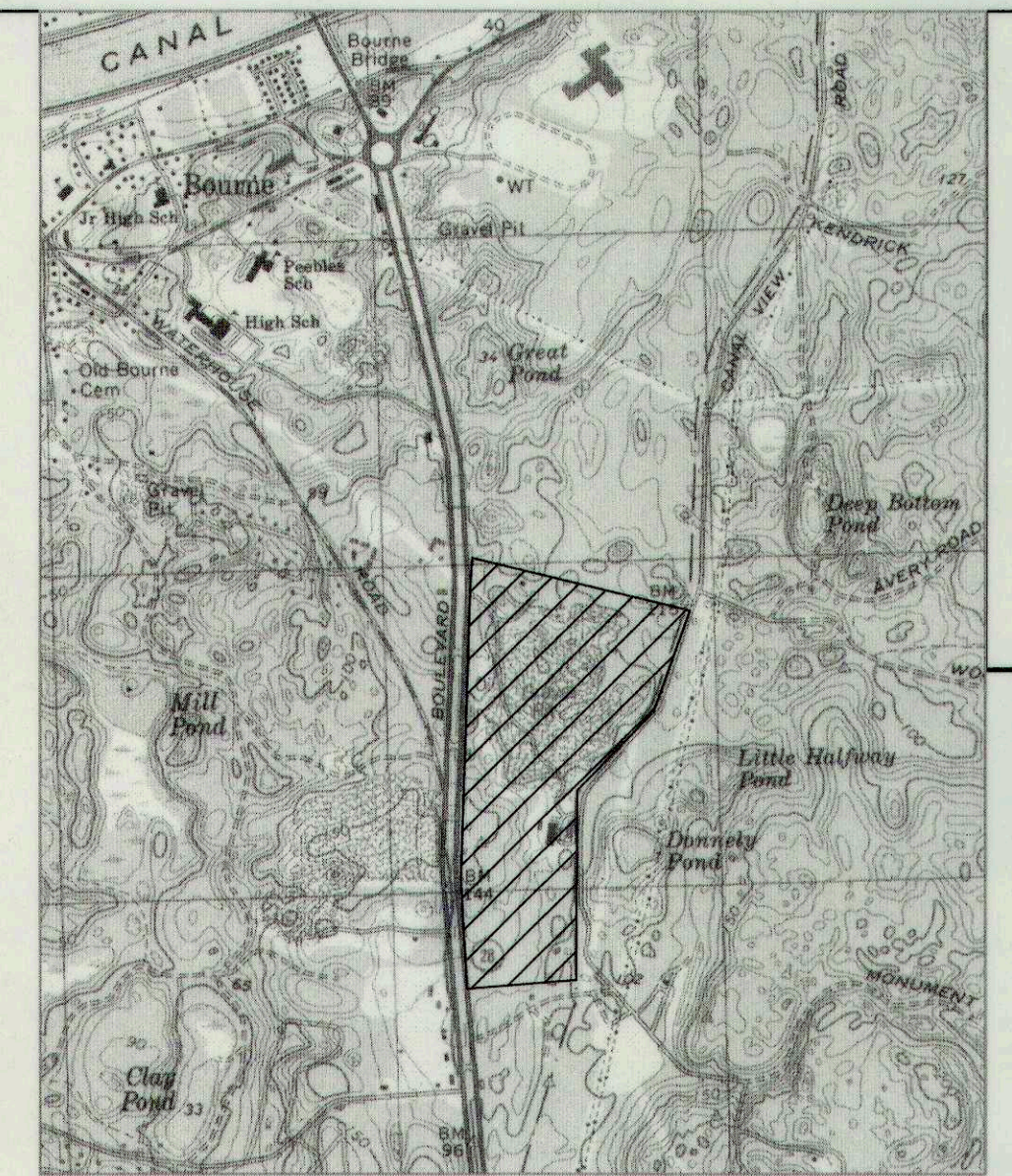
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **8/5/2020 at 2:03 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

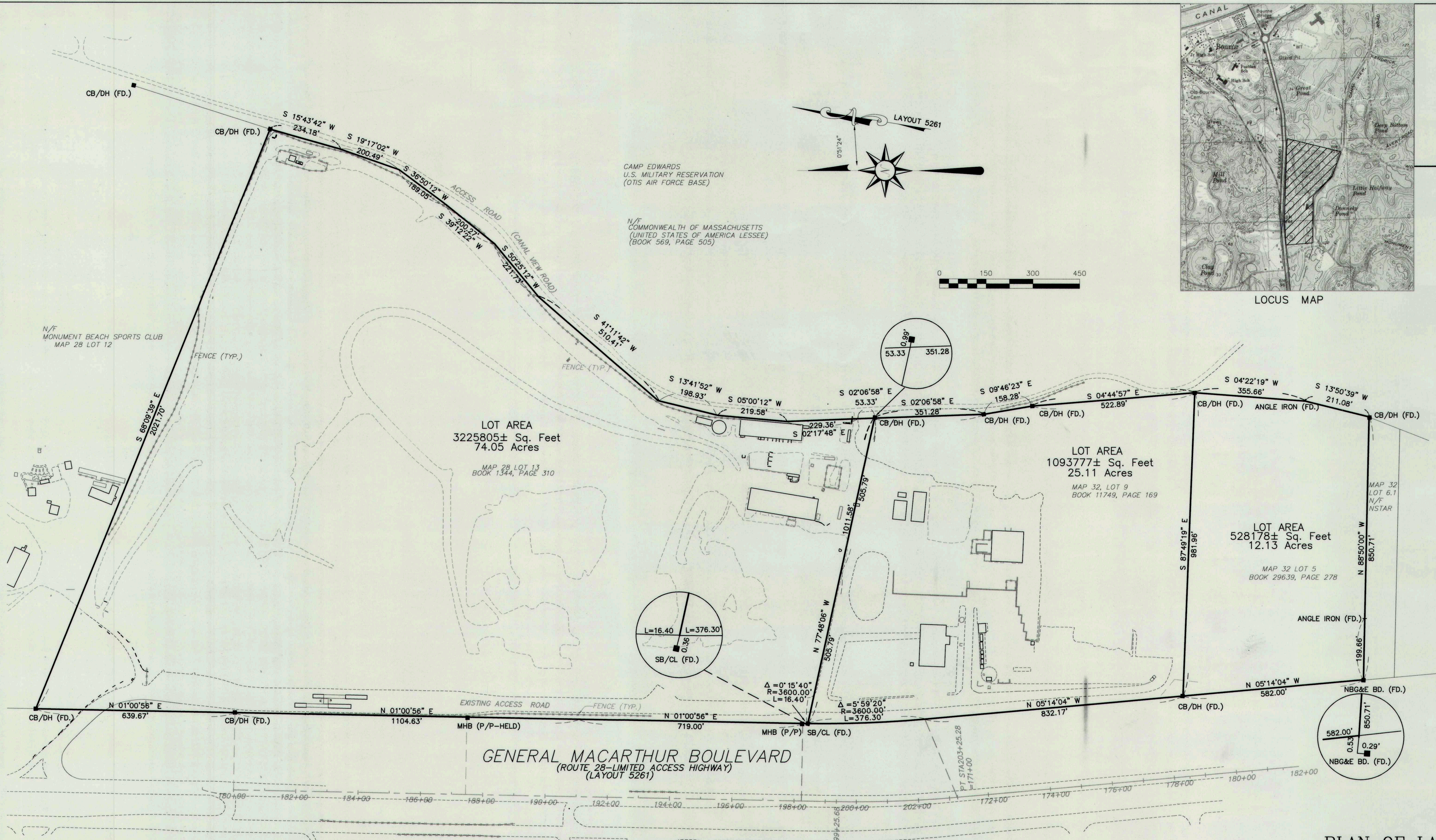
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Figure 5A

Attachment C – Project Perimeter Plan and Site Topography



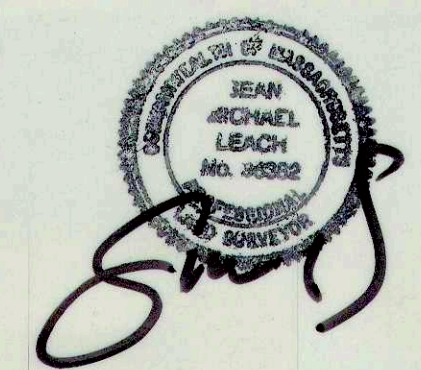
LOCUS MAP



PLAN REFERENCES
 PLAN BOOK 300, PAGE 98
 PLAN BOOK 562, PAGE 14
 PLAN BOOK 565, PAGE 63
 LAYOUT # 5261(1962)
 "RESERVATION MAP, CAMP EDWARDS"
 DRAWING 911-803
 DATED 5-15-41

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS, AND;
 THAT THE LINES SHOWN HEREON ARE THE LINES DIVIDING EXISTING OWNERSHIPS AND THE LINES OF THE STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS AND WAYS ALREADY ESTABLISHED, AND THAT NO NEW LINES FOR THE DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.

PLS *[Signature]* DATE 4/12/2017



PLAN OF LAND
 IN
BOURNE, MA
 PREPARED FOR
 TOWN OF BOURNE

SCALE: 1"=150' APRIL 17, 2017
 PREPARED BY

SITEC
 Civil and Environmental Engineering
 Land Use Planning
 SITEC, Inc.
 449 Faunce Corner Road
 Dartmouth, MA 02747
 (508) 998-2125
 FAX (508) 998-7554

Attachment D – NHESP Correspondence

MESA Project Review

MESA “Take” letter

Previous NHESP Comment Letters

Attachment D1 – MESA Project Review



Horsley Witten Group

Sustainable Environmental Solutions

90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com



MESA Project Review

Town of Bourne Integrated Solid Waste Management
Facility Expansion
Bourne, Massachusetts

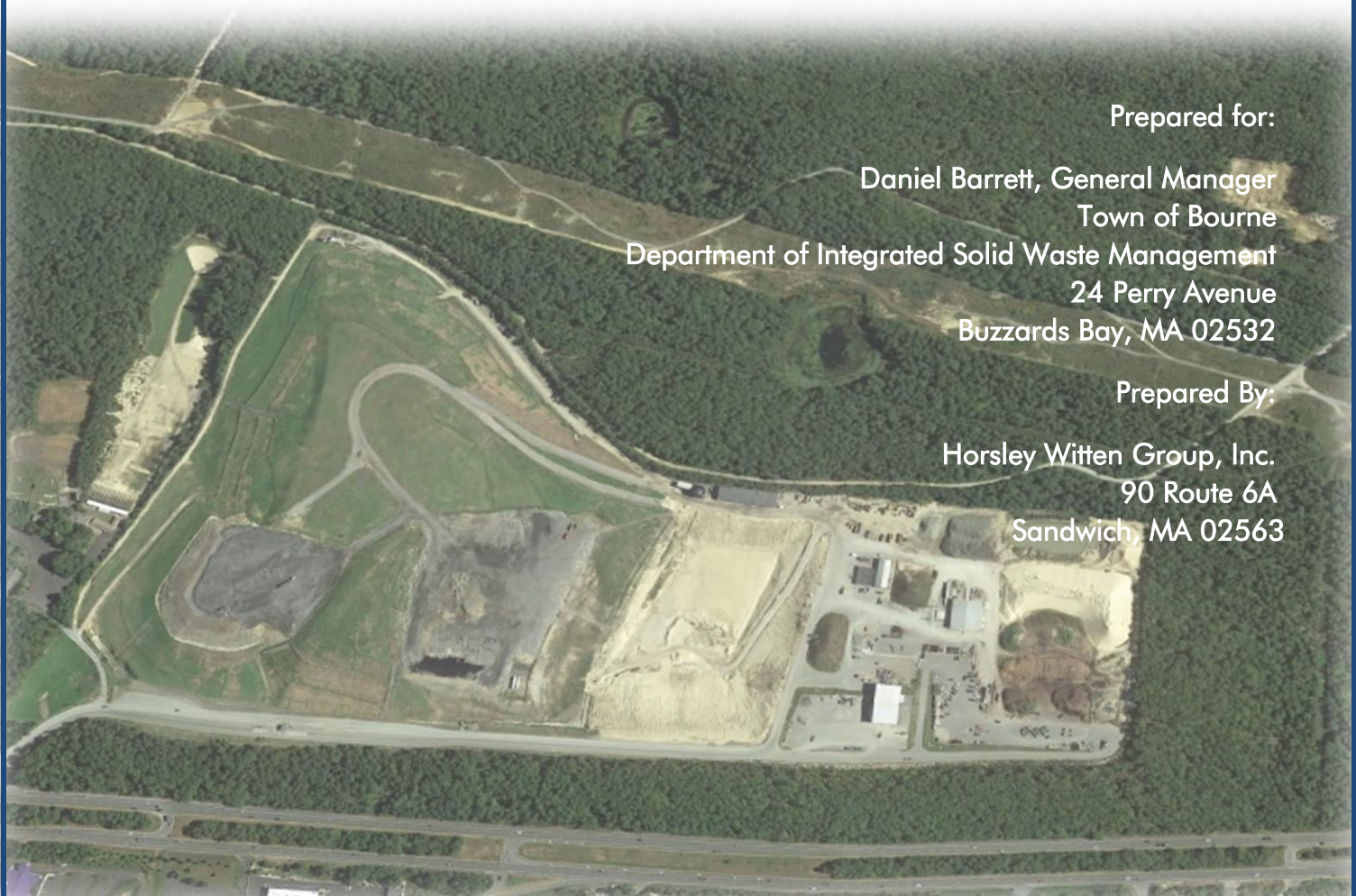
March 2021

Prepared for:

Daniel Barrett, General Manager
Town of Bourne
Department of Integrated Solid Waste Management
24 Perry Avenue
Buzzards Bay, MA 02532

Prepared By:

Horsley Witten Group, Inc.
90 Route 6A
Sandwich, MA 02563





March 1, 2021

Mr. Jesse Leddick
Natural Heritage and End. Species Program
MA Division of Fisheries and Wildlife
One Rabbit Hill Road
Westborough, MA 01581

Re: MESA Project Review – Bourne Landfill Facility
Assessor's Map 32, Parcel 005, 201 MacArthur Boulevard, Bourne, MA
NHESP Tracking No. 17-36534

Dear Mr. Leddick:

On behalf of the Town of Bourne Department of Integrated Solid Waste Management (ISWM), and in accordance with the Massachusetts Endangered Species Act (M.G.L. Ch. 131A) or MESA, the Horsley Witten Group, Inc. (HW) is submitting the enclosed MESA Project Review along with supporting documentation for the proposed expansion of the Bourne ISWM Facility at the referenced parcel located off Route 28 (MacArthur Boulevard) in Bourne, Massachusetts.

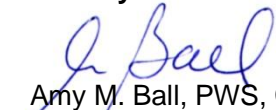
According to the most recent version of the *Massachusetts Natural Heritage Atlas* (14th Edition, August 1, 2017), the project parcel occurs in whole or in part within *Priority Habitat of Rare Species* (PH 490) and within *Estimated Habitat of Rare Wildlife and Certified Vernal Pools* (EH 435) as designated by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). In response to a MESA Information Request, NHESP has indicated that this designation is due to the presence of the state-listed Species of Special Concern, Eastern Box Turtle (*Terrapene carolina*).

Enclosed please find a completed MESA Project Review Filing Checklist and required documentation, along with a check for \$1,800.00 made payable to the Natural Heritage & Endangered Species Fund, for review as an "intermediate" project (5 to 20 acres of disturbance).

Thank you in advance for your review of this information. Please do not hesitate to contact me directly at (508) 833-6600 or at aball@horsleywitten.com with any questions you may have pertaining to this application.

Sincerely,

Horsley Witten Group, Inc.


Amy M. Ball, PWS, CWS
Senior Project Manager – Senior Ecologist

Enclosures

cc: Daniel Barrett, ISWM
Phil Goddard, ISWM
Melany Cheeseman, NHESP



MASSWILDLIFE

DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

p: (508) 389-6300 | f: (508) 389-7890

MASS.GOV/MASSWILDLIFE

MESA Project Review Checklist

Massachusetts Endangered Species Act M.G.L. c.131A and Regulations (321 CMR 10.00)

1) Project Location:

Street Address/Location City/Town Zip Code

Assessors Map/Plat Number Parcel /Lot Number

Property recorded at the Registry of Deeds for:

County Certificate # (if registered land)

Book Page Number

2) Applicant:

First Name Last Name Company

Mailing Address

City/Town State Zip Code

Phone Number Fax Number Email address

3) Property owner (if different from applicant):

First Name Last Name Company

Mailing Address

City/Town State Zip Code

Phone Number Fax Number Email address

4) Representative (if any):

Horsley Witten Group, Inc.

Company

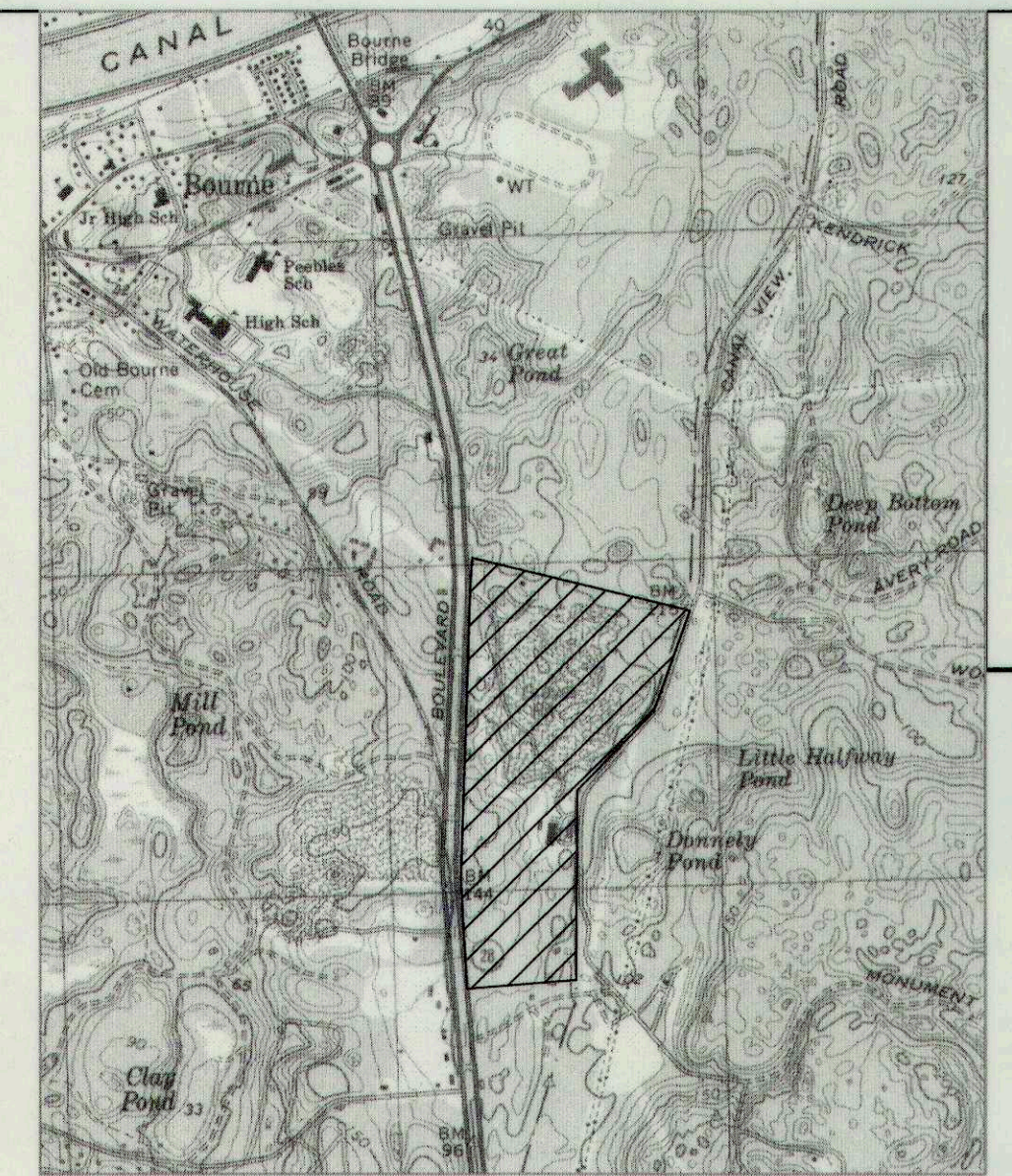
Contact Person First Name Contact Person Last Name

Mailing Address

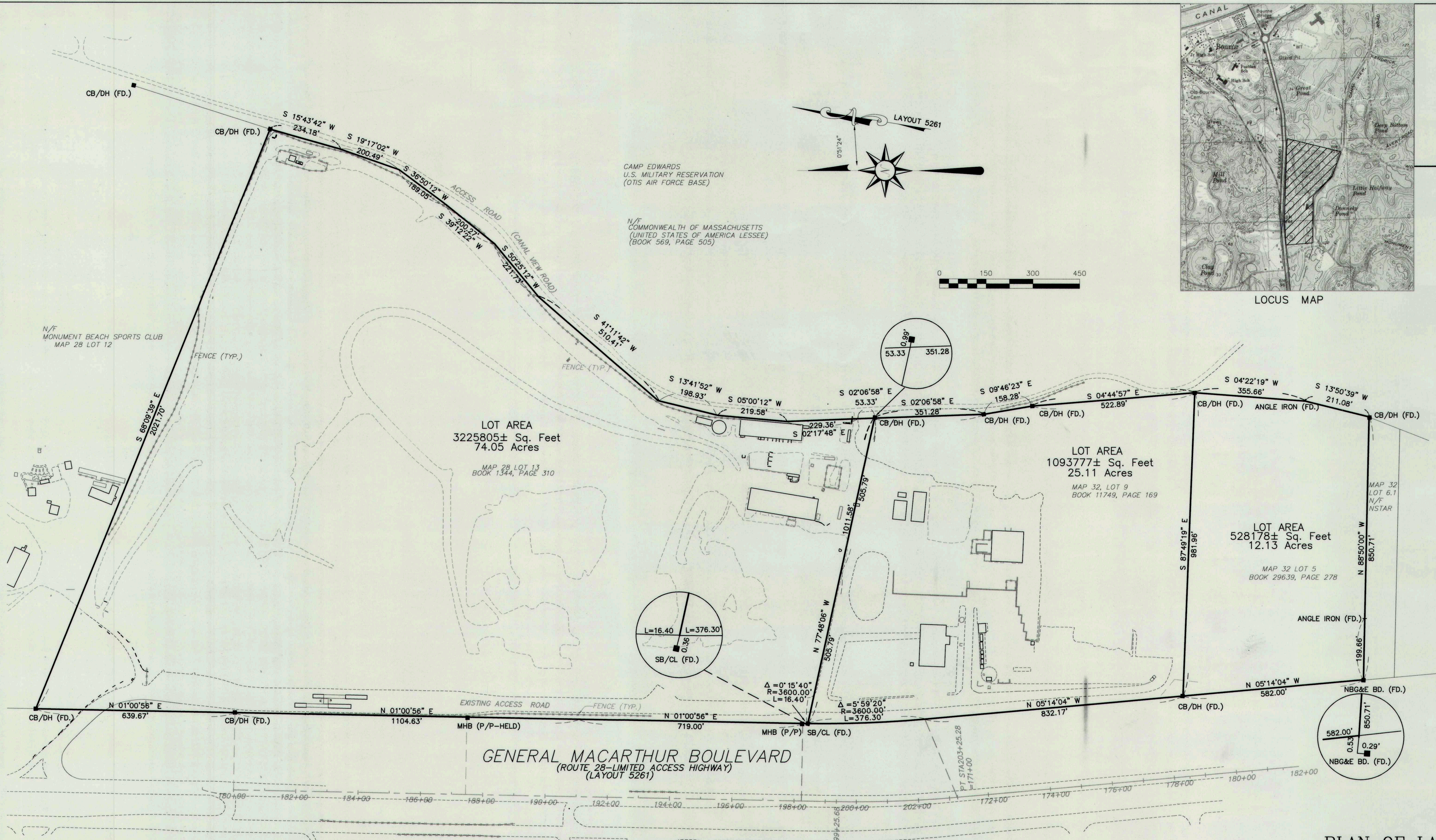
City/Town State Zip Code

Phone Number Fax Number Email address

MASSWILDLIFE



LOCUS MAP



PLAN OF LAND
IN
BOURNE, MA
PREPARED FOR
TOWN OF BOURNE

SCALE: 1"=150' APRIL 17, 2017
PREPARED BY

SITEC
Civil and Environmental Engineering
Land Use Planning

SITEC, Inc.
449 Faunce Corner Road
Dartmouth, MA 02747
(508) 998-2125
FAX (508) 998-7554

QUITCLAIM DEED

I, **Laura L. L. Peterson, Trustee of the Red Wolf Realty Trust established u/d/t dated April 7, 1998 and recorded with Barnstable County Registry of Deeds at Book 11425, Page 177**, with a mailing address of Post Office Box 517, Barnstable, Barnstable County, Massachusetts 02630,

for consideration paid and in full consideration of **One Million Eight Hundred Thousand and no/100 (\$1,800,000.00) Dollars**

grant to **The Town of Bourne, a Massachusetts Municipality**, with a principal place of business at 24 Perry Avenue, Buzzards Bay, Massachusetts 02532

with QUITCLAIM COVENANTS

The land on General McArthur Boulevard, Bourne, Barnstable County, Massachusetts, bounded and described as follows:

The Town of Bourne Tax Assessor Map 32 Parcel 5.

Beginning at a stone bound in the easterly side line of the State Highway leading from Falmouth to Buzzards Bay, known as Route 28, where said line intersects the southerly boundary line of land now or formerly of the heirs of Arthur C. Burgess; thence running South 71°55'30" East 1204.45 feet by said land now or formerly of Burgess to a pile of stones at land now or formerly of Massachusetts Military Reservation known as Camp Edwards; thence South 20°14'30" West 336.14 feet by said Reservation land to a pile of stones; South 28°56'30" West 230.50 feet by said Reservation land to a stake and stones; thence North 72°55'30" West 1072.20 feet by land now or formerly of Tristan C. Phinney to said line of said State Highway; thence continuing North 72°55'30" West 2668.85 feet by land now or formerly of Louise P. Walsh to a pile of stones; thence North 6°58'00" East 229.15 feet by land now or formerly of Eda M. Lytle to an iron post and stones by the "Old Cutting Road"; thence Easterly and Northerly 800 feet more or less along and in said "Old Cutting Road" to a pile of stones in the northwesterly side line of said "Old Cutting Road"; thence South 71°55'30" East 1997.81 feet by said land now or formerly of Burgess to the westerly side line of said State Highway; and thence continuing South 71°55'30" East 181.54 feet across said State Highway to the point of beginning. Containing 47.64 acres more or less. Excepting therefrom (a) the portions thereof taken by or sold and conveyed to the Commonwealth of Massachusetts and included within said State Highway more particularly described in a Taking for State Highway recorded with Barnstable Registry of Deeds in Book 574, Page 1; a release deed to the Commonwealth recorded with said Deeds in Book 587, Page 462; and a Taking for State Highway recorded with said Deeds in Book 1172, Page 415 and (b) 32.75 acres conveyed by Clay Pond Realty Corp. by deed dated February 16, 1961 and recorded with said Deeds in Book 1105, Page 369. Total land being conveyed is shown on Town of Bourne Tax Assessor Map 32 Parcel 5, containing approximately 12 acres ±

**PROPERTY LOCATION: off MacArthur Boulevard (Route28), Bourne, Massachusetts
02532**

5

Also known as Town of Bourne Tax Assessors Map 32 Parcel 5, consisting of approximately 12 acres.

Said premises are conveyed subject to and together with any rights, easements, restrictions and reservations of record, insofar as they may be in force and applicable.

The Grantor hereby states that the Trust does not have a Declaration of Homestead recorded at the Barnstable County Registry of Deeds, impacting this property, and furthermore relinquishes any rights and/or privileges associated with said Homestead created by declaration or operation of law.

Meaning and intending to convey the premises conveyed to the Trust by deed dated May 7, 1998 and recorded with Barnstable County Registry of Deeds at Book 11425 Page 183, to which reference is hereby made for title. See Trustee Certificate attached hereto.

See Certificate of Appointment of Successor Trustee of Laura L. Peterson as successor sole Trustee dated March 19, 2001 recorded with Deeds at Book 13909, Page 348.

See Certificate of Acceptance of Appointment of Successor Trustee dated March 19, 2001 and recorded with Barnstable County Registry of Deeds at Book 13909, Page 349.

See Certificate of Resignation of Trustee dated March 19, 2001 and recorded with Barnstable County Registry of Deeds at Book 13909, Page 350.

See Trustee Certificate attached hereto.

**PROPERTY LOCATION: off MacArthur Boulevard (Route28), Bourne, Massachusetts
02532**

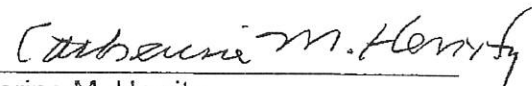
Signed under the pains and penalties of perjury this 10th day of May, 2016.


Laura L. L. Peterson, Trustee

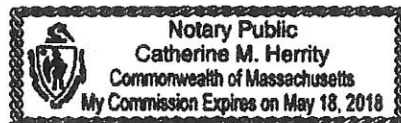
COMMONWEALTH OF MASSACHUSETTS

Barnstable: ss

On this 10th day of May, 2016, before me, the undersigned notary public, personally appeared **Laura L. L. Peterson, Trustee**, proved to me through satisfactory evidence of identification, which was a Massachusetts driver's license to be the person whose name is signed on the preceding document, and acknowledged to me that he signed it voluntarily for its stated purpose.


Catherine M. Herrity
Notary Public
My Commission Expires: 5/18/2018

(Seal)



TRUSTEE CERTIFICATE

I, Laura L. L. Peterson, Trustee of the Red Wolf Realty Trust, under Declaration of Trust dated April 7, 1998 and recorded at Barnstable County Registry of Deeds at Book 11425, Page 177, with a mailing address of Post Office Box 517, Barnstable, Massachusetts 02630, hereby state the following:

1. I am the Trustee of said Trust ;
2. Said trust has not been altered, amended or revoked;
3. I am duly authorized and directed by the beneficiaries of said trust to execute and deliver the attached deed to the Town of Bourne for property located off MacArthur Boulevard (Route 28), Bourne, Massachusetts for consideration of One Million Eight Hundred Thousand and no/100 (\$1,800,000.00) dollars;
4. None of the beneficiaries of said trust are underage or disabled at the time of execution of these documents.

Executed as a sealed instrument this 10th day of May 2016, 2016.

L. L. L. Peterson, TR
Laura L. L. Peterson, Trustee

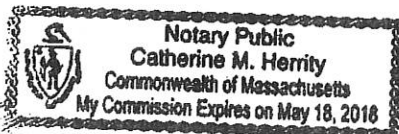
COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

May 10, 2016

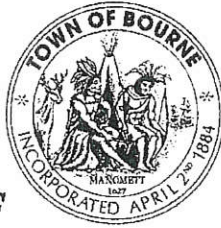
Before me, the undersigned notary public, personally appeared Laura L. L. Peterson, Trustee, proved to me by MA Drivers License, to be the person whose name is signed on the attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Catherine M. Herrity
Catherine Herrity, Notary Public
My commission expires: 5/18/2018



BARRY H. JOHNSON
Town Clerk

Bk 29639 Pg282 #23041
WENDY CHAPMAN
Assistant Town Clerk



TOWN OF BOURNE
Office of the Town Clerk

At a legal meeting of the Town of Bourne held February 16, 2016, a quorum being present, the following business was transacted under Article 9:

ARTICLE 9. To see if the Town will vote to authorize the Board of Selectmen to acquire by purchase, gift or eminent domain a parcel of land owned by Red Wolf Realty Trust in the Town of Bourne designated on Bourne Assessors Maps as Parcel 5 on Map 32, approximately 12 acres in the area, for the purposes of the Department of Integrated Solid Waste Management Facility, on terms and conditions deemed by the Selectmen to be in the best interest of the Town, and to raise and appropriate, transfer from available funds or borrow, a sum of money for the purposes of this Article or act anything in relation thereto.

Sponsor – Board of Selectmen

ARTICLE 9: MOTION: We move that the Town vote to authorize the Board of Selectmen to acquire by purchase, gift or eminent domain a parcel of land owned by Red Wolf Realty, designated on the Bourne Assessors Maps as Parcel 5 on Map 32, approximately 12 acres, as shown on a plan on file in the Office of the Town Clerk, for the purposes of the Department of Integrated Solid Waste Management Facility, on terms and conditions deemed by the Selectmen to be in the best interest of the Town, and to meet this appropriation, the Treasurer, with the approval of the Board of Selectmen, shall be authorized to borrow the sum of \$1,800,000.00 under and pursuant to Chapter 44 Section 7(3) of the General Laws as amended and supplemented, or any other enabling authority and to issue bonds or notes of the Town therefor.

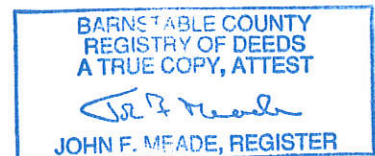
Voted: Ayes 158, Nays 4, Declared a 2/3rd vote, Motion Passes

A true copy,

Attest:

Barry H. Johnson

Town Clerk



24 Perry Avenue
Buzzards Bay, Massachusetts 02532
Phone 508-759-0600 x505

BARNSTABLE REGISTRY OF DEEDS
John F. Meade, Register



AERO SERVICE
 Litton Philadelphia, Pennsylvania 19135
 PREPARED FOR THE TOWN OF BOURNE
 FOR TAX PURPOSES ONLY
 NOT TO BE USED FOR CONVEYANCE

DATE OF REVISION 2001
 DATE OF COMPILATION MAY 31, 1973 DATE OF PHOTOGRAPHY APRIL 18, 1972
 PROPERTY DATA FROM DEED RESEARCH, FIELD RECONNAISSANCE AND RECORDED PLATS.
 SHEET LAYOUT BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM.

**TOWN OF BOURNE
 MASSACHUSETTS**
 SCALE 1 INCH = 200 FEET



LEGEND	
	County line
	Town line
	Military reservation line
	Water district line
	Easement line
	Original lot line
	Property line
	Map parcel number
	Original lot number
	Map scaled dimension
	Plan dimension
	Denotes same owner
All Dimensions Shown in Feet	

PROPERTY MAP
 SHEET 32

Project Narrative

MESA PROJECT REVIEW
Bourne Integrated Solid Waste Management Facility Expansion

MacArthur Boulevard, Bourne, MA
Assessor's Map 32, Parcel 005

Table of Contents

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2.0 HISTORY AND BACKGROUND..... 1
3.0 GENERAL SITE DESCRIPTION..... 2
 3.1 State-listed Rare Species Habitat3
 3.2 Other Considerations.....4
 3.3 FEMA Designation.....4
4.0 PROPOSED PROJECT 4
5.0 HABITAT IMPACTS..... 4
6.0 ANTICIPATED MITIGATION 5
7.0 SUMMARY 6

ATTACHMENTS

Attachment A – Locus Maps

- Figure 1 – USGS Locus
- Figure 2 – Aerial Photo
- Figure 3 and 3A – FEMA National Flood Hazard Layer and Flood Insurance Rate Maps
- Figure 4 – Existing Constraints
- Figure 5 – Soils

Attachment B – Project Plans

Attachment C – Habitat Assessment, Map 32, Parcels 9 & 5

Attachment D – Mitigation Parcel Baseline Report

Attachment E – Special Town Meeting Warrants

MESA PROJECT REVIEW

Bourne Integrated Solid Waste Management Facility Expansion

March 2021

1.0 INTRODUCTION

As part of a master development planned project, the Town of Bourne Department of Integrated Solid Waste Management (ISWM), proposes to expand its facilities for future solid waste handling within a 12.13-acre forested parcel to the south of the existing facility. The proposed expansion includes relocating the residential recycling center, single stream recyclables transfer station, construction and demolition debris (C&D) transfer station, a future sedimentation basin area, brush and composting area, administrative offices and maintenance facility.

2.0 HISTORY AND BACKGROUND

According to the ISWM website, the Bourne landfill, at its present location on MacArthur Boulevard, began in 1967 in an area which is now referred to as Phases 1A, 1B, 1C, located in the northernmost section of the facility. This unlined area ceased accepting waste in 1999 and is now closed and capped. The capped areas have been seeded to provide stabilization of the soils. In addition to the cap, these areas also have a network of gas extraction wells that capture landfill gas that is then piped to a flare located in the northeast corner of the landfill. The purpose of the flare is to burn landfill gas that might otherwise be vented into the atmosphere. This serves to reduce air emissions, destroy methane, control odors, and prevent off-site migration. All future capped areas will have a similar network and be stabilized with vegetation. Vegetated surfaces are maintained to allow for access to monitoring wells and stormwater management structures.

Phase 2, at the far northeast corner of the facility, is the first lined landfill cell, which is now capped and no longer active. Beginning with Phase 2, and for all future landfill cells, precipitation that falls on the landfill and leaches through the waste (i.e., leachate) is collected in pipes under the waste and is pumped to holding tanks. This leachate is then sent off-site for proper disposal.

Adjacent to Phase 2 is Phase 3 that is also a lined landfill cell but has incorporated additional layers of groundwater protection and is equipped with a leak detection system. All future landfill cells will also consist of this “double composite liner” design. According to the ISWM website, the Bourne landfill was one of the first facilities in Massachusetts to install this state-of-the-art liner system. Phase 3 has also been capped, along with a valley-fill called Phase 2A/3A which connected Phases 1A-1B-1C to Phase 2 and Phase 3. Part of Phase 4 has been capped and in the summer of 2021, ISWM anticipates capping the second stage of Phase 4 and Phase 5. A significant portion of Phase 4 was constructed within the footprint of Phase 1D which was one of the original unlined areas dating back to the early 1970s. Rather than cap Phase 1D in place,

ISWM worked with the Massachusetts Department of Environmental Protection (MassDEP) to develop a reclamation plan to remove the waste and line the resulting void.

Phase 6 is the current area of active landfill located in the space previously occupied by the previous DPW garage and ISWM and DPW offices. The DPW operations were moved off-site in 2015 to allow access to the area that is now Phase 6.

Currently approximately 85% of ISWM's waste stream consists of municipal waste combustor ash from the SEMASS waste-to-energy facility in Rochester MA, operated by Covanta Energy. ISWM entered into a long-term contract with Covanta in January of 2015 and both parties recently reached an agreement to extend the relationship through December 2024. The remaining waste will consist of municipal solid waste (MSW) from Bourne and Falmouth (under a contract agreement) and various other approved waste streams from independent customers.

ISWM also operates a residential recycling center located at the southern end of the landfill operations on a 25-acre parcel that the Town acquired in 2001. Other operations within this parcel (Map 32, Parcel 9) include the ISWM administrative office, a single-stream recyclables transfer station, a construction and demolition (C&D) transfer station, a residential recycling center, and compost operations.

ISWM plans to relocate its offices and maintenance facility in 2023 onto the 12.13-acre parcel (Map 32, Parcel 5), which is the subject of this MESA Project Review. The relocation will become necessary as landfill operations will continue to move southward into this area (Map 32, Parcel 9) with the Phase 7 and Phase 8 expansions. (A Phase 9 is planned as well, but that will be a vertical expansion of the northern end of the existing facility.) The other structures will follow several years later. In the interim, and until those facilities are needed, this Parcel 5 will be used for soils stockpiling and other storage in areas not otherwise occupied. Therefore, the entire site will be cleared once permits are attained to meet these needs.

3.0 GENERAL SITE DESCRIPTION

The project site is a 12.13-acre forested parcel located at the southern end of the existing ISWM operations at 201 MacArthur Boulevard (Route 28), in Bourne, Massachusetts (latitude: 41.720188 N; longitude: -70.581877 W) (**Attachment A**, Figures 1 and 2). The property is defined by the Bourne Assessors Department as Map 32 Parcel 005 and is within the Business 3 zoning district under the Bourne Zoning Bylaw.

The subject parcel directly abuts the existing Bourne ISWM Facility to its north with the Joint Base Cape Cod to the east, and a vacant forested parcel owned by Eversource to the south. An approximately 200-foot wide strip of State-owned forested land buffers this parcel from the northbound lane of Route 28. The Eversource utility along the eastern boundary is located on Joint Base Cape Cod property.

Parcel 5 consists of undeveloped forested land with a plant community indicative of a typical Cape Cod pine/oak forest habitat. The tree canopy is primarily composed of pitch pine (*Pinus rigida*) and mixed oak species (*Quercus* spp.) with a patchy understory that ranges from densely vegetated to sparse with very little groundcover. Standing snags, fallen dead trees (boles), and occasional boulders are scattered throughout, with some evidence of past land-use activity

(e.g., cart paths and informal paths), and a partially-paved road traverses the parcel within the southern and southeastern portions, partially bisecting the forested habitat. The topography generally slopes from northwest to southeast and consists of gently rolling hills and depressions.



Photo 1. Examples of the Cape Cod pitch pine/oak forest habitat found throughout the parcel (Photos taken May 2020).

3.1 State-listed Rare Species Habitat

According to the most recent version of the *Massachusetts Natural Heritage Atlas* (14th Edition, August 1, 2017), the project parcel occurs in whole or in part within *Priority Habitat of Rare Species* (PH 490) and within *Estimated Habitat of Rare Wildlife and Certified Vernal Pools* (EH 435) as designated by the Massachusetts Natural Heritage and Endangered Species Program (NHESP) (**Attachment A**, Figure 3). In response to a MESA Information Request (Tracking No. 17-36534), NHESP has indicated that this designation is due to the presence of the state-listed species, eastern box turtle (*Terrapene carolina*). ISWM has been corresponding with NHESP staff since 2017 regarding this project.

3.2 Other Considerations

The subject parcel is located outside of the MassDEP approved Zone II wellhead protection area (**Attachment A**, Figure 4).

3.3 FEMA Designation

The site is located entirely within X-Zone, an area of minimal flood hazard, as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel Number 25001C0502J revised July 16, 2014 (**Attachment A**, Figures 5 and 5A).

4.0 PROPOSED PROJECT

ISWM proposes to expand its existing operations in accordance with the Town's master plan for this facility. The proposed project will adjust and expand the landfill operations southward from Map 28, Parcel 13 where the current landfill operates, onto Map 32, Parcel 9 that is currently utilized for solid waste handling operations. This change will require modification by the Board of Health of the current site assignment to allow for landfilling. To support the future Phase 7 and Phase 8 landfill expansion onto Parcel 9, the Town will need to fully utilize the abutting 12.13-acre parcel (Map 32, Parcel 5), the subject of this MESA Project Review to accommodate future solid waste handling areas, maintenance facilities, and administrative offices. The proposed expansion into Parcel 5 will provide area for a residential recycling center, a combined municipal solid waste (MSW), single-stream recyclables, and a construction and demolition debris (C&D) transfer station, brush and composting area, asphalt, brick and concrete (ABC) management area, stormwater management structures, an office building, a maintenance garage, and associated access roads and parking.

This municipal proposed project serves a municipal and county need by providing solid waste disposal and transfer operations on Cape Cod and the surrounding region for residential and commercial waste, as well as recyclables and organics. A more detailed explanation of the future development plans can be found in the "Landfill Expansion Permitting Documents" at <https://www.townofbourne.com/integrated-solid-waste-management/pages/landfill-expansion-permitting-documents>.

5.0 HABITAT IMPACTS

The proposed development will result in both short-term and long-term alterations to the existing vegetation and wildlife habitat within portions of Parcel 5. Clearing of vegetation and grading of the project site is necessary to accommodate the proposed facilities to support future ISWM operations.

An overview of the proposed project relative to the acreage of disturbance is contained in **Attachment B**: Figure 1 (Acreage of Disturbance), Figure 2 (Existing Conditions) and Figure 3 (Future landfill buildout) as prepared by SITEC Environmental, Inc. Collectively, these figures are intended to provide the greater context of the contiguous uses of the ISWM facility over time and how they relate to the project area.

Horsley Witten Group, Inc. (HW) field ecologists previously assessed undisturbed portions of both Parcels 5 and 9 as potential habitat for the Eastern Box Turtle. This survey was conducted in part to support ISWM's continued review under the Massachusetts Environmental Policy Act, M.G.L. c. 30 §§ 61 through 62H, inclusive (MEPA; EEA No. 11333) for future Phase 7 and Phase 8 landfill expansions on Parcel 9 and future solid waste handling area and administrative offices to the south on Parcel 5.

This field assessment was also made in response to an inquiry by NHESP in the agency's assessment of whether the future phased expansion of the landfill would occur outside the limit of habitat deemed suitable for the box turtle. A copy of this habitat assessment memo prepared by HW and the subsequent correspondence from NHESP is provided as **Attachment C**. The development of the landfill had been previously reviewed by NHESP and determined to be exempt from MESA review (see Massachusetts Division of Fisheries & Wildlife letters dated January 19, 2018 and February 5, 2020 included in **Attachment C**).

As a result of this effort, NHESP issued a letter to MEPA dated April 9, 2020, indicating that areas not previously determined to be exempt from MESA review will require full review and permitting through NHESP. This was reiterated in the Division's letter of December 17, 2020 following the MEPA review of the Single Supplemental Environmental Impact Report (SSEIR). Both letters are also included in **Attachment C**.

6.0 ANTICIPATED MITIGATION

As the 12.13-acre Parcel 5 is mapped as *Priority Habitat of Rare Species* for the Eastern Box Turtle, a Species of Special Concern, the Town will be filing for a Conservation and Management Permit (CMP) from NHESP.

In anticipation of the CMP, the Town issued a Request for Proposals (RFP) for suitable mitigation land and is in the process of finalizing acquisition of two, contiguous parcels in Bourne (Map 52, Parcel 41). The parcels consist of undeveloped, forested land that supports a pitch-pine oak community typical of Cape Cod. Overall, the undeveloped condition of these parcels as well as the adjacent land to the north, east, and south supports similarly vegetated plant communities as the project parcel. HW field biologists conducted a field assessment of the proposed mitigation parcel on April 10, 2018 and prepared a baseline report that describes the general site characteristics, soils, plant communities, existing wildlife habitat, and potential for provision of wildlife habitat as mitigation. A copy of this report is provided as (**Attachment D**.)

Recently subdivided, these are collectively referred to here as "Parcels 1 and 2" or the mitigation parcels. Parcel 1 (also referred to as the "Mac Hunter Lot") consists of 11 acres and Parcel 2 ("Flyover Lot") consists of 6.5 acres. Both parcels are located south of the ISWM property, and east of MacArthur Boulevard, and support similar habitat to that found on the Town's 12.13-acre parcel. Both parcels are mapped by NHESP as Priority Habitat for Rare Species and Estimated Habitat for Rare Wildlife and collectively are anticipated to provide suitable, high-quality habitat to off-set the loss of habitat on the 12.13-acre parcel at a 1.5:1 mitigation ratio for a state-listed Species of Special Concern in accordance with the MESA regulations at 321 CMR 10.23(7)(a)3) and as summarized in Table 1 below.

The Town intends to purchase these parcels for permanent protection in accordance with the approved Special Town Meeting Articles (**Attachment E**). The mechanism for preservation is anticipated to be land conveyance through the so-called Article 97, to be held under the care and custody of the Conservation Commission in perpetuity.

Placement of these parcels under permanent habitat protection will allow additional protection of a large area of contiguous wildlife habitat for a variety of species, including the Eastern Box Turtle, and will further the interests of habitat protection and contribute to the protection of Eastern Box Turtle habitat. The overall result from the project will be a net gain of approximately 6.2 acres of preserved and protected habitat within the region, which will help to maintain overall plant and wildlife species populations and habitat diversity.

An additional benefit is that these parcels connect existing town-owned parcels to the north and south that have conservation restrictions and undeveloped land to the east on JBCC, together which will create a contiguous corridor for species protection.

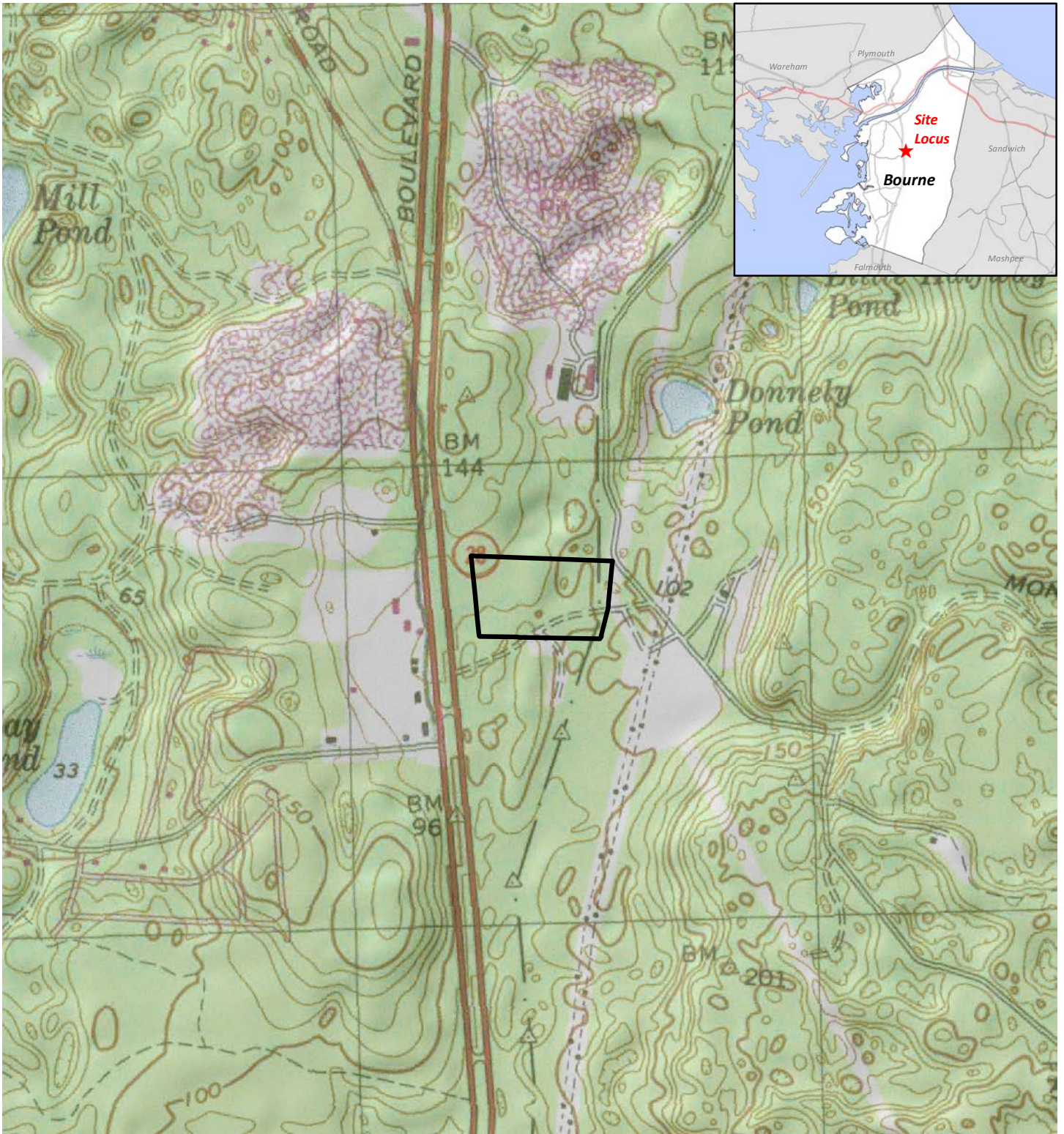
Table 1. Summary of Box Turtle Habitat Disturbance and Anticipated Mitigation

	Land Area	
	(SF)	(ac)
Total Mapped Box Turtle Habitat (Parcels 9 & 5)	585,597	13.44
Area of Habitat Disturbance	539,135	12.38
Mitigation Required (based on SSC 1.5:1)	808,703	18.57
Mitigation Available		
Total Undisturbed Habitat (Parcels 9 & 5)	46,463	1.07
Mitigation Parcel (Map 52, Parcel 41)		
Lot 1 ("Mac Hunter Lot")	479,160	11.00
Lot 2 ("Flyover Lot")	283,140	6.50
Total Preservation of Habitat	808,763	18.57

7.0 SUMMARY

The project site consists of approximately 12.13 acres of undeveloped forested land that supports a pitch pine-mixed oak community typical of Cape Cod. No wetland resource areas or vernal pools are located at the site or within close proximity, and no unique features were encountered, with the exception of 2-3 larger specimen trees. Overall, the undeveloped condition represents a plant community that is typical of a pitch pine- mixed oak plant community found on Cape Cod, and which provides suitable habitat for the state-listed Species of Special Concern, the Eastern Box Turtle. It is anticipated that the proposed project will result in a regulatory Take of this species, and in anticipation of this, the Town has made steps toward identifying appropriate mitigation that will be realized during subsequent project permitting.

Attachment A – Locus Maps



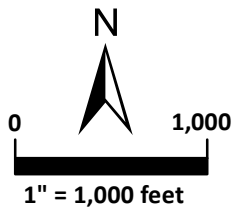
Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\USGS_Locus.mxd

Legend

 Site Parcel

*Pocasset Topographic Quadrangle

Horsley Witten Group
 Sustainable Environmental Solutions
 90 Route 6A • Unit 1 • Sandwich, MA 02563
 508-833-6600 • horsleywitten.com

USGS Locus
 201 MacArthur Blvd.
 Bourne, MA

Date: 6/26/2020

Figure 1



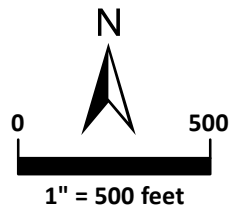
Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\Aerial_Photo.mxd

Legend

-  Site Parcel
-  Parcels

*Imagery - ESRI World Imagery (Clarity)
Parcels - MassGIS 2015

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Aerial Photo
201 MacArthur Blvd.
Bourne, MA

Date: 6/26/2020









Figure 2

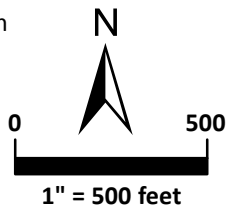


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Legend

*Imagery - ESRI World Imagery (Clarity)
 Parcels - MassGIS 2015
 GIS Data - MassGIS

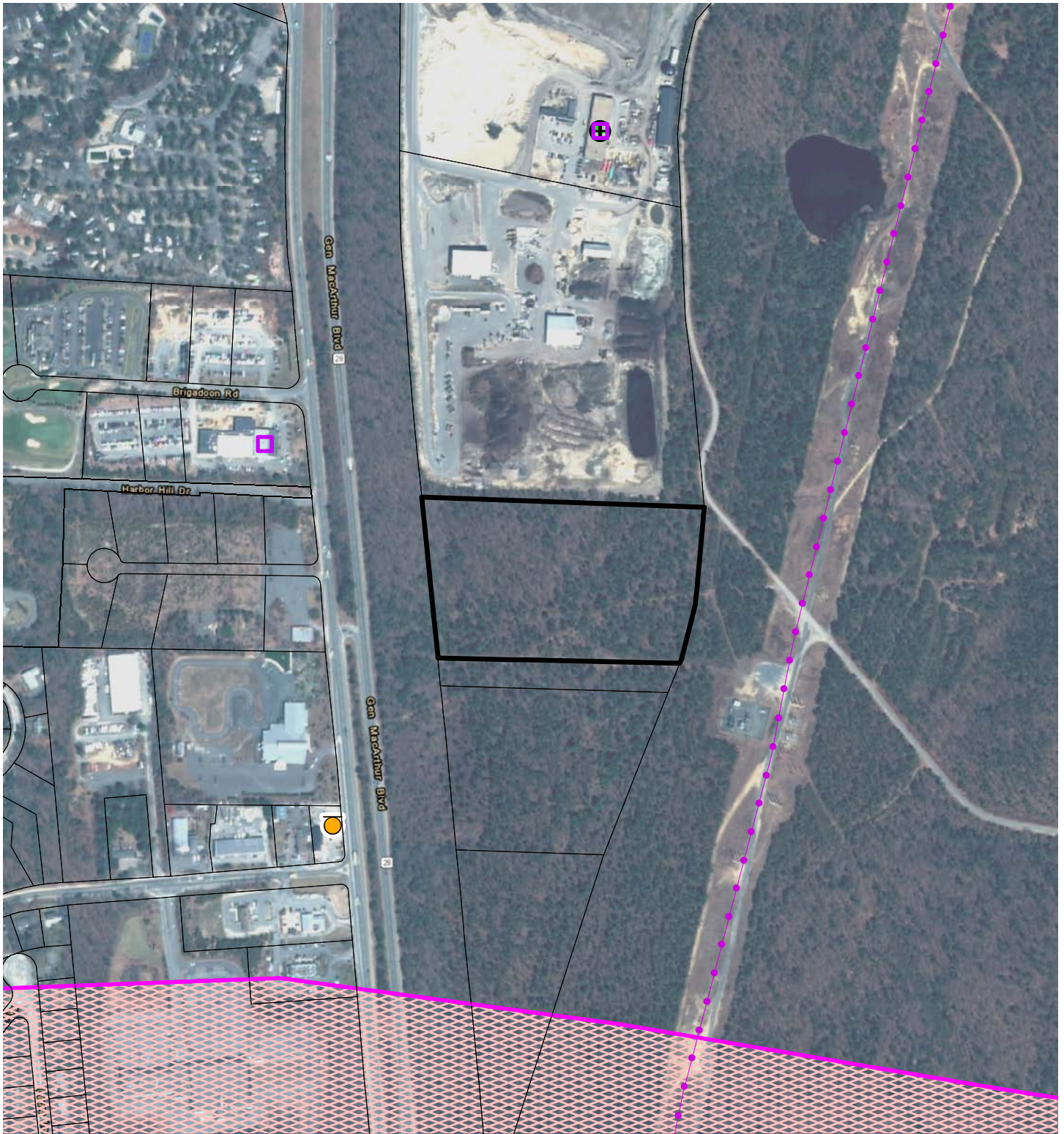
-  Site Parcel
-  CCC - Natural Areas 2018
-  Parcels
-  Areas of Critical Environmental Concern
-  NHESP Certified Vernal Pools
-  Open Water
-  NHESP Priority Habitats of Rare Species
-  NHESP Estimated Habitats of Rare Wildlife



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Existing Constraints
 201 MacArthur Blvd.
 Bourne, MA

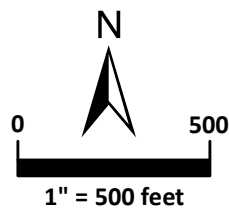


Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\Regulated_Areas.mxd

Legend

- | | | |
|--|---------------------------|---------------------------------|
| | Site Parcel | MassDEP Major Facilities |
| | Parcels | MA-regulated Hazard. Waste |
| | Powerline | Air Permit |
| | Underground Storage Tanks | |
| | DEP Approved Zone II | |

*Imagery - MassGIS 2015
 Parcels - MassGIS 2015
 GIS Data - MassGIS



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Regulated Areas
 201 MacArthur Blvd.
 Bourne, MA

Date: 2/1/2017

Figure 4



Area of Minimal Flood Hazard - Zone X

Area of Minimal Flood Hazard - Zone X

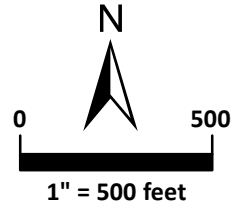
Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\FEMA.mxd

Legend

-  Site Parcel
-  Parcels

**Imagery - ESRI World Imagery (Clarity)
Parcels - MassGIS 2015
FEMA's National Flood Hazard Layer - July 2014*

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FEMA's National Flood Hazard Layer
201 MacArthur Blvd.
Bourne, MA

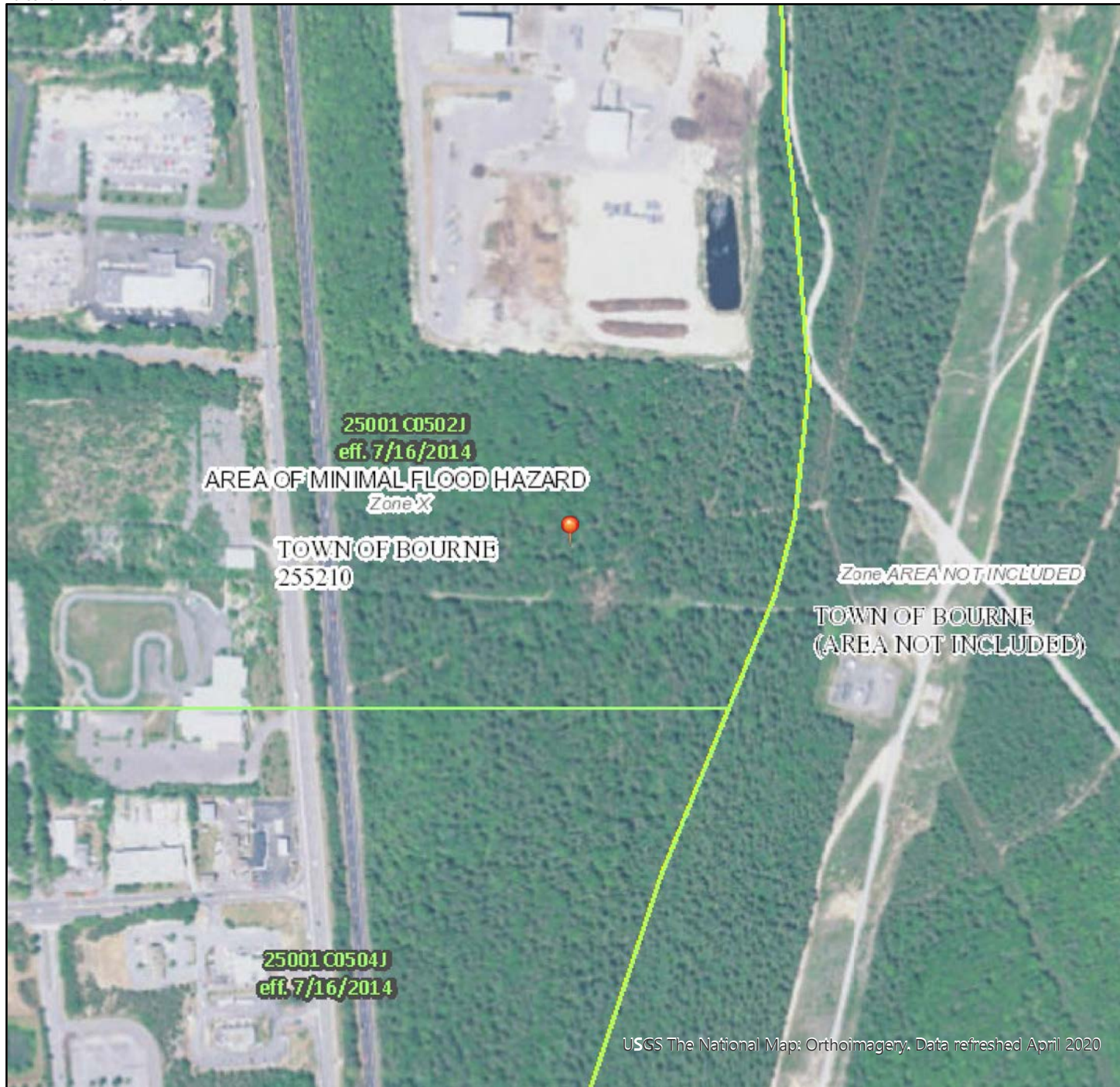
Date: 6/26/2020

Figure 5

National Flood Hazard Layer (NFHL) Metadata



70°35'13"W 41°43'25"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway	

		0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainage area of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levees Note Zone X
		Area with Flood Risk due to Levees Zone D

OTHER AREAS OF FLOOD HAZARD	NO SCREEN Area of Minimal Flood Hazard Zone X	
	Effective LOMRs	
		Area of Undetermined Flood Hazard Zone D

OTHER AREAS	GENERAL STRUCTURES	
		Channel, Culvert or Storm Sewer
		Levee Dike or Floodwall

	20.2	Cross Sections with 1% Annual Chance
	17.5	Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Base Line
		Profile Base Line
		Hydrographic Feature

OTHER FEATURES	MAP PANELS
	Digital Data Available
	No Digital Data Available
	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described above. The base map shown complies with FEMA's base map accuracy standards.

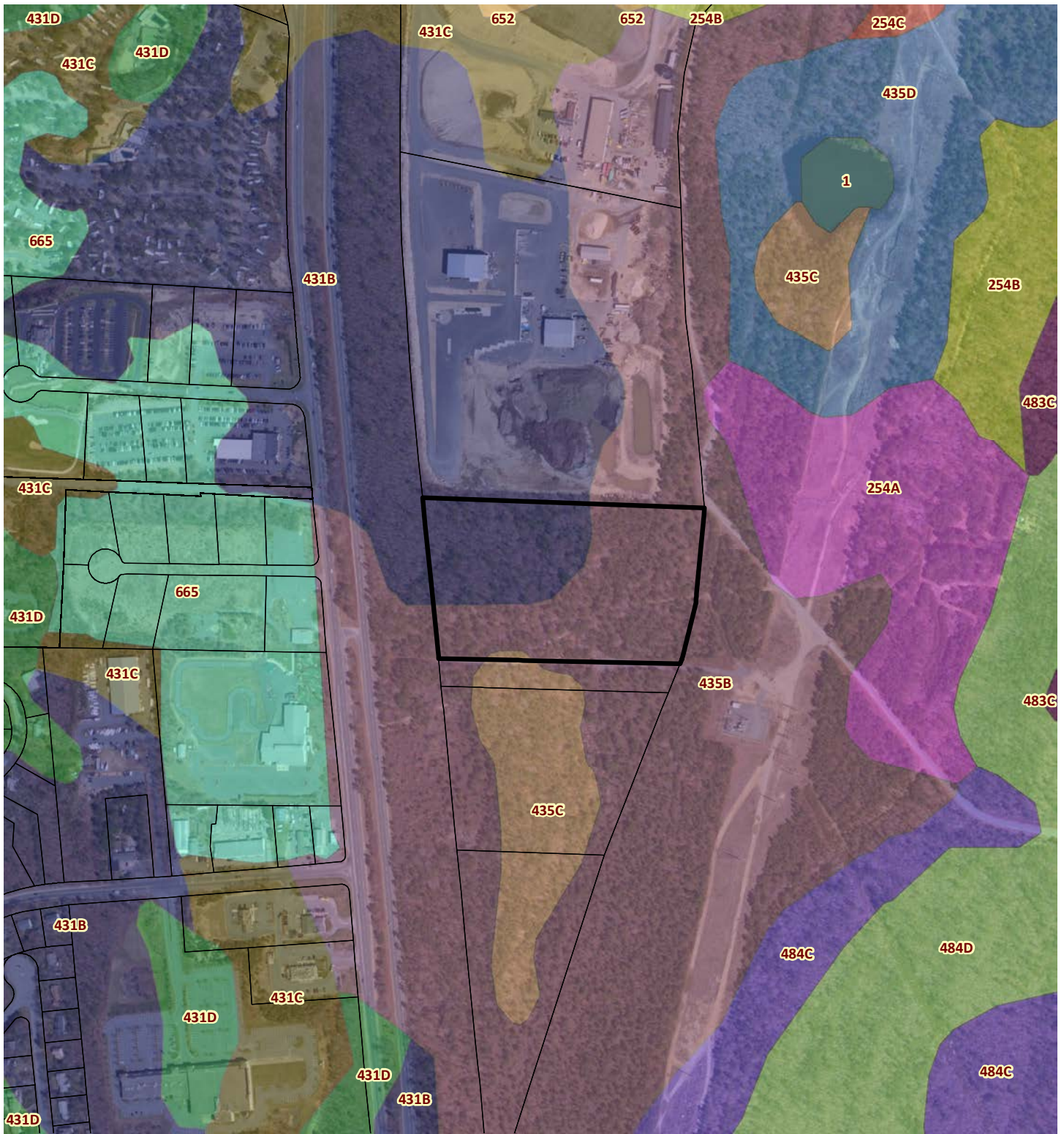
The flood hazard information is derived directly from the authoritative NFHL we provide by FEMA. This map was exported on 8/5/2020 at 2:03 PM and does not reflect change or amendments subsequent to this date and time. The NFHL and effective information may change or be superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear on a base map image, flood zone labels, legend, scale bar, map creation date, community identification, FIRM panel number, and FIRM effective date. Map image for unmapped and unmapped areas cannot be used for regulatory purposes.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

70°34'35"W 41°42'58"N

Figure 5A

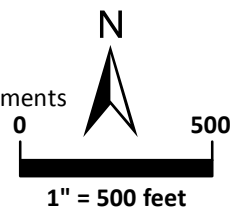


Document Path: H:\Projects\2017\17009 Bourne Landfill\GIS\Maps\Soils.mxd

Legend

-  Site Parcel
-  Parcels
-  1, Water
-  254A, Merrimac
-  254B, Merrimac
-  254C, Merrimac
-  431B, Barnstable
-  431C, Barnstable
-  431D, Barnstable
-  435B, Plymouth
-  435C, Plymouth
-  435D, Plymouth
-  483C, Plymouth
-  484C, Plymouth
-  484D, Plymouth
-  652, Dumps
-  665, Udipsamments

*Imagery -
ESRI World Imagery (Clarity)
Parcels - MassGIS 2015
Soils - MassGIS



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Soils
201 MacArthur Blvd.
Bourne, MA

Date: 6/26/2020

Figure 6

Attachment B – Project Plans

Attachment C – Habitat Assessment, Map 32, Parcels 9 & 5



MEMORANDUM

To: Daniel Barrett, General Manager
Town of Bourne Integrated Solid Waste Management

From: Amy M. Ball, PWS, CWS

Date: April 6, 2020; updated June 24, 2020

Re: Habitat Assessment, Map 32, Lots 9 and 5

At your request, Horsley Witten Group, Inc. (HW) field ecologists conducted an on-site survey within the undisturbed portions of the referenced Lots owned by the Town of Bourne, located east and south of the existing Department of Integrated Solid Waste Management (ISWM) operations to serve as potential habitat for the Eastern Box Turtle (*Terrapene carolina*), a state-listed Species of Special Concern. This survey was conducted in part to support ISWM's continued review under the Massachusetts Environmental Policy Act, M.G.L. c. 30 §§ 61 through 62H, inclusive (MEPA) for future Phase 7 and Phase 8 landfill expansions on Parcel 9 and future solid waste handling area and administrative offices to the south on Parcel 5.

This field assessment was also made in the response to an inquiry by the Massachusetts Natural Heritage and Endangered Species Program (NHESP) in the agency's assessment of whether the future phased expansion of the landfill would occur within existing landfill operations, and outside the limit of habitat deemed suitable for the box turtle.

Site Observations

HW conducted a site visit on December 18, 2019; a light dusting of snow occurred during our site visit. The area observed includes a narrow strip of forested land bounded by the active landfill to the west and an unimproved road to the east. This area is currently cordoned off from the active areas of the landfill by an approximately 3-foot tall wire fence positioned along the outer perimeter of the landfill; a low wooden barricade serves as a demarcation of the unimproved road (Photo 1). Between these two barricades there is a narrow strip of undeveloped forested land becomes progressively wider as one travels from north to south.

The western portion of the Lot 9 parcel consists an undeveloped forested community, typical of a pine/oak forest habitat found on Cape Cod. Here, the canopy is primarily composed of pitch pine (*Pinus rigida*), eastern white pine (*Pinus strobus*), and mixed oak species, including white oak (*Quercus alba*) and scarlet oak (*Quercus coccinea*) with occasional black cherry (*Prunus serotina*). Trees typically have a DBH of 5-12 inches. The variable understory ranges from

densely vegetated patches of shrubs to areas with sparse shrub cover and dense groundcover. Shrub species observed include scrub oak (*Quercus ilicifolia*), huckleberry (*Gaylussacia baccata*), arrowwood (*Viburnum dentatum*), nannyberry (*Viburnum lentago*), occasional northern bayberry (*Morella pensylvanica*), and sheep laurel (*Kalmia angustifolia*). Herbaceous groundcover includes sometimes dense patches of wintergreen (*Gaultheria procumbens*) interspersed with bracken fern (*Pteridium aquilinum*) and patches of dewberry (*Rubus flagellaris*) and poison ivy (*Toxicodendron radicans*). Areas closer to the edge of the active landfill occasional support non-native, invasive species such as honeysuckle (*Lonicera* sp.), hairy willow-herb (*Epilobium hirsuta*), and Asiatic bittersweet (*Celastrus orbiculatus*) as well as other weedy herbaceous species. Occasional sedimentation also occurs in these areas.



Photo 1. View of narrowest portion of forested habitat with unimproved road visible in background located on Joint Base Cape Cod.

The ground surface is covered with a three to six-inch duff layer consisting of oak leaves, pine needles, and small branches. Topography within this forested portion is somewhat variable: at the northeastern portion of the parcel, the terrain is relatively flat; as one travels to the south, the terrain changes with increased topography, slight, gently rolling hills, and a few depressions. Occasional boulders and small glacial erratics punctuate the landscape (Photo 2). Standing snags, fallen dead trees (boles), and fallen branches are also common. Soil sampling indicates the presence of coarse sandy spodosols with a relatively thick E horizon.



Photo 2. View of variable topography and glacial erratic within the forested landscape immediately east of Lot 9.

At the southeastern corner of Lot 9, near the boundary of Lot 5, a series of strewn rocks and boulders is present (Photo 3).



Photo 3. View facing north-northwest of strewn boulders at the southeastern corner of Lot 9 with stockpiled soils in the background.

Lot 5 to the south is a relatively undisturbed forested community demarcated by a row of pitch pine seedlings along a small slope present between the active landfill and this parcel (Photo 4).



Photo 4. View facing west along the boundary between Lot 9 future landfill) to the north (right) and Lot 5 (future solid waste handling area to the south (left).

Eastern Box Turtle Habitat

Based on HW's site observations, and an understanding of the habitat requirements for the Eastern Box Turtle, typically considered a generalist species, HW delineated the boundary of the undisturbed, native plant community using neon yellow flagging that was later survey-located by ISWM personnel. Flagging stations 1 through 32 demarcate this boundary. Attachment A shows the delineated boundary. Attachment B shows the parcels.

Permitting Considerations

Based on the letter from NHESP dated February 4, 2020, contained in Attachment C, the NHESP has determined that future work within the demarked Eastern Box Turtle habitat, predominantly on Parcel 5, will require additional review and permitting under Massachusetts Endangered Species Act (M.G.L. Ch. 131A; MESA) prior to moving forward. The remaining land outside of the demarked boundary is exempt from further MESA review, including areas on Map 29, Parcel 13 that include the active landfill, and future Phase 9. Attachment D contains a letter NHESP date January 19, 2018 memorializing this assessment. Please recall that HW has

Mr. Daniel Barrett, ISWM
April 6, 2020; updated June 24, 2020
Page 6 of 6

previously performed a site assessment of the habitat within Lot 5 and will utilize the data collected to assist ISWM in its permitting efforts.

Please do not hesitate to contact me directly at 508-833-6600 or aball@horsleywitten.com with any questions or comments you may have regarding this memo.

Enclosures



FUTURE PHASE 7
LANDFILL AREA

FUTURE PHASE 8
LANDFILL AREA

POTENTIAL HANDLING
AREA (11.7 ACRES)

APPARENT LIMIT
OF HABITATION AREA

<p>SITEC ENVIRONMENTAL Civil and Environmental Engineering and Land Use Planning Hazardous and Solid Waste Consultants</p> <p>700 Peach Street, Unit C Bourne, MA 01929 PHONE (781) 319-2100 FAX (781) 534-4753</p>		<p>AS SHOWN DATE: JAN. 29, 2020</p> <p>DRAWN: KWR CHECKED: KWR APPROVED: KWR DRAWING NUMBER:</p>	
<p>BOURNE INTEGRATED SOLID WASTE MANAGEMENT FACILITY</p>		<p>BOURNE DEPARTMENT OF INTEGRATED SOLID WASTE MANAGEMENT</p>	
<p>client:</p>		<p>drawing title:</p>	
<p>HABITAT BOUNDARY</p>		<p>HABITAT BOUNDARY</p>	
<p>Acad No. Bourne_LF Dec12_2018 - PL + ADWA-R1.dwg SE01-456-04</p>			



MASSWILDLIFE

ATTACHMENT C
DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

February 5, 2020

Town of Bourne, ISWM Department
c/o Phil Goddard, Manager of Facility Compliance and Technology Development
24 Perry Avenue
Buzzards Bay, MA 02532

RE: Project Location: 201 MacArthur Boulevard, Bourne, MA
Project Description: Phases 7-9 Landfill Expansion
NHESP Tracking No.: 17-36534

Dear Applicant:

Thank you for submitting the project plans entitled "Schematic Site Buildout Plan" (dated February 4, 2020) and supporting documentation to the Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife (the "Division") for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

The project, as currently proposed, includes the expansion of an existing landfill in three phases (Phases 7, 8 and 9). All work associated with Phases 7-9 of the project shall occur within areas already disturbed by existing landfill operations and, in particular, shall occur outside of the "Limit of Box Turtle Habitat" shown on the project plans. Any future work proposed within the "Limit of Box Turtle Habitat" shown on the project plans shall require a direct filing with the Division for compliance with the MESA.

Based on a review of the information that was provided, the Division has determined that Phases 7, 8 and 9 of this project, as currently proposed, appear to be **exempt from a MESA review** pursuant to 321 CMR 10.14. Any changes to the proposed project or any additional work beyond that provided may require a filing with the Division pursuant to the MESA regulations. If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the Division so that it is received at the same time as the local conservation commission.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions about this letter, please contact Melany Cheeseman, Endangered Species Review Assistant, at melany.cheeseman@mass.gov or 508-389-6357.

Sincerely,

A handwritten signature in black ink, reading "Everose Schlüter".

Everose Schlüter, Ph.D.
Assistant Director

cc: Amy Ball, Horsley Witten Group, Inc.

MASSWILDLIFE



MASSWILDLIFE

ATTACHMENT D
DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

Jack Buckley, *Director*

January 19, 2018

Town of Bourne, ISWM Department
c/o Phil Goddard
24 Perry Avenue
Buzzards Bay, MA 02532

RE: Project Location: 201 MacArthur Boulevard, Bourne, MA
Project Description: Phase 6 Landfill Expansion
NHESP Tracking No.: **17-36534**

Dear Applicant:

Thank you for submitting the project plans (dated January 10, 2018) and supporting documentation to the Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife (the "Division") for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

Based on a review of the information that was provided, the Division has determined that this project, as currently proposed, appears to be **exempt from a MESA review** pursuant to 321 CMR 10.14. Any changes to the proposed project or any additional work beyond that provided may require a filing with the Division pursuant to the MESA regulations. If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the Division so that it is received at the same time as the local conservation commission.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions about this letter, please contact Melany Cheeseman, Endangered Species Review Assistant, at melany.cheeseman@state.ma.us or 508-389-6357.

Sincerely,

A handwritten signature in black ink that reads "Thomas W. French".

Thomas W. French, Ph.D.
Assistant Director

cc: Amy Ball, Horsley Witten Group, Inc.

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DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

p: (508) 389-6300 | f: (508) 389-7890

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April 9, 2020

Kathleen A. Theoharides, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office
Anne Canaday, EEA No. 11333
100 Cambridge Street
Boston, Massachusetts 02114

Project Name: Bourne Integrated Solid Waste Management Facility
Proponent: Town of Bourne, Dept. of Integrated Solid Waste Management (ISWM)
Location: 201 MacArthur Boulevard, Bourne, MA
Project Description: Landfill Expansion – Phases 7, 8 and 9
Document Reviewed: Expanded Notice of Project Change
EEA File Number: 11333
NHESP Tracking No.: 17-36534

Dear Secretary Theoharides:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the Division) has reviewed the *Expanded Notice of Project Change* (ENPC) for the Town of Bourne ISWM's proposed Phase 7, 8 and 9 Landfill Expansion Project and would like to offer the following comments regarding state-listed species and their habitats.

According to the information provided in the ENPC, portions of the Project site are mapped as Priority Habitat for the Eastern Box Turtle (*Terrapene carolina*), a species state-listed as Special Concern according to the *Massachusetts Natural Heritage Atlas* (14th Edition). This species and its habitats are protected pursuant to the Massachusetts Endangered Species Act (MGL c.131A) and its implementing regulations (MESA; 321 CMR 10.00). A Fact Sheet for this species can be found on our website, www.mass.gov/nhesp.

All projects or activities proposed within Priority Habitat, which are not otherwise exempt pursuant to 321 CMR 10.14, require review through a direct filing with the Division for compliance with the MESA (321 CMR 10.18). The Division determined (letter dated February 5, 2020) that Phases 7, 8 and 9 of the Project, as currently proposed, appear to be exempt from MESA review pursuant to 321 CMR 10.14.

As noted in the Division's previous comments (dated June 19, 2018) on the Supplemental Single Environmental Impact Report, future development of the proposed Future Handling Area and proposed effluent connection projects will require a direct filing with the Division for compliance with the MESA. This includes any work within the "Limit of Box Turtle Habitat" shown on the site plans entitled "Conceptual Site Buildout Plan Through Phase 9 To Elevation 225" (ENPC, Attachment 3). The Proponent has initiated pre-filing consultations with the Division to discuss conceptual development plans associated with the Future Handling Area. In advance of a formal MESA filing, the Division anticipates –

MASSWILDLIFE

based on ongoing consultations with the Proponent and information submitted to date – that future development of the Future Handling Area, as proposed, will likely result in a Take (321 CMR 10.18 (2)(b)) of the Eastern Box Turtle.

Projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species; (b) demonstrate that an insignificant portion of the local population will be impacted; and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species.

The Proponent has continued to proactively consult with the Division on a pre-filing basis to avoid, minimize and mitigate impacts to state-listed species and their habitats associated with potential development of the Future Handling Area. Based on ongoing consultations and information submitted to date, we understand that the Proponent intends to meet the performance standards of a CMP by permanently protecting off-site land in the vicinity of the site as open space and state-listed species habitat. Although the exact details of the long-term net benefit required under a CMP have not yet been finalized, the Division anticipates that a suitable long-term net benefit can be achieved through the protection of suitable, high quality off-site habitat and that the Project should be able to meet the performance standards of a CMP.

The Division will not render a final decision regarding the Future Handling Area until the MEPA review process and its associated comment period is complete, and until all required MESA filing materials are submitted to the Division. No work associated with the Future Handling Area or proposed effluent connection projects shall occur on the property until the MESA review process is complete.

If you have any questions about this letter, please contact Jesse Leddick, Chief of Regulatory Review, at (508) 389-6386 or jesse.leddick@mass.gov. We appreciate the opportunity to comment on this project.

Sincerely,



Everose Schlüter, Ph.D.
Assistant Director

cc: Daniel T. Barrett, Town of Bourne ISWM Department
Phil Goddard, Town of Bourne ISWM Department
Town of Bourne Board of Selectmen
Town of Bourne Conservation Commission
Town of Bourne Planning Department
DEP Southeast Regional Office
Amy Ball, Horsley Witten Group, Inc.

Attachment D – Mitigation Parcel Baseline Report

Conservation Restriction Baseline Assessment

MacArthur Boulevard, Bourne, MA
Assessor's Map 52, Parcel 041.00

INTRODUCTION AND OVERVIEW

The Town of Bourne Department of Integrated Solid Waste Management (ISWM) proposes a planned expansion of the existing Integrated Solid Waste Management Facilities within a ~11.7-acre parcel to the south of the existing facility. The proposed expansion includes relocating the residential recycling area, residential transfer station, a future sedimentation basin area, brush and composing area and an office building.

The entire ISWM parcel is mapped as *Priority Habitat of Rare Species* (PH 490), and activities proposed at the site will require review and permitting by Massachusetts Division of Fisheries & Wildlife, the Massachusetts Natural Heritage and Endangered Species Program (NHESP). As the 11.7-acre parcel is mapped as habitat for the Eastern Box Turtle (*Terrapene carolina*), its alteration will require the filing of a Conservation and Management Permit application with NHESP, and the provision of mitigation to off-set impacts to state-listed species habitat. In accordance with the MESA regulations at 321 CMR 10.23(7)(a)3., the mitigation ratio for a state-listed Species of Special Concern is 1.5:1. The Town has identified a 17.8 acre parcel located nearby that is also mapped within the same Priority Habitat area. ISWM is investigating this as potential mitigation for the alteration of the ISWM land.

Horsley Witten Group, Inc. (HW) was retained by the Town (ISWM) to conduct a baseline inventory of the natural resources on the undeveloped parcel located south of the proposed project site that will serve as mitigation for developing the 11.7-acre parcel. Through the Town of Bourne, ISWM is pursuing a conservation restriction (CR) for this mitigation parcel.

This report provides a brief site overview; describes the soils, plant communities, and wildlife habitat present within the site; and discusses the potential for this site to provide wildlife habitat as mitigation for the expansion of the ISWM facility. Based on our assessments, HW believes that this parcel would provide suitable habitat to mitigate for the development of the ISWM parcel.

SITE VISIT

HW field ecologists conducted a site visit on April 10, 2018, accompanied by Mr. Phil Goddard, Manager of Facility Compliance and Technology Development for ISWM, and Mr. Mark Robinson, Executive Director of The Compact of Cape Cod Conservation Trusts, Inc., who will assist the Town with the preparation of the CR documentation.

Prior to conducting the field assessment, HW reviewed existing source data, including USGS topographic map, Massachusetts Natural Heritage and Endangered Species Program (NHESP) Natural Heritage Atlas and common and rare species lists, the USDA Natural Resources Conservation Service (NRCS) Soils Survey for Barnstable County, MA, and available source data from the Massachusetts Geographic Information Service (MassGIS) to identify the presence of natural resources within the project area.

For the purpose of an existing conditions assessment, HW generally followed the requirements for providing a Natural Resources Inventory (NRI) in accordance with the guidelines developed by the Cape Cod Commission in Technical Bulletin 92-002 entitled *Development of Regional Impact Guidelines for Natural Resources Inventory (Plant and Wildlife Habitat Assessment)*. During our initial site visit, we were able to find two of the four property boundaries that were later confirmed to be associated with the parcel directly to the north of the intended CR Site. Mr. Mark Robinson returned to the general area later and located the bounds for the CR Parcel, and confirmed that the group had traversed a portion of both properties at the initial site visit, and further confirmed that the site characteristics, plant communities and habitat are similar at both. Photos and site maps included with this report are from the intended CR Site.

EXISTING CONDITIONS

The proposed CR site at 0 MacArthur Boulevard is on a 17.8 acre rectangle lot located along the east side of MacArthur Boulevard (Route 28) (latitude: 41° 40' 05.5" N; longitude: -70° 35' 52.9" W) (Figures 1 and 2). According to the Plan of Land, the parcel is Lot 41 from plan book 593, page 85, with 17.8 acres, dated October 21, 1982. The property is defined by the Bourne Assessors Department as Map 52 Parcel 5 and is within a Zone II and the Residential 40 (R40) zoning district under the Bourne Zoning Bylaw. The parcel is an undeveloped wooded lot with a plant community indicative of a typical Cape Cod pine/oak forest habitat. The terrain is very hilly with depressions and steep slopes rising to a mid-parcel ridgeline. Several large and small boulders and glacial erratics are dispersed throughout the site.

The CR Site directly abuts undeveloped forested parcels to the north, east, and south. The parcel to the east is the Federal Regional National Cemetery, on the Joint Base Cape Cod (BJCC). An approximately 200-foot wide strip of forested land buffers this parcel from the northbound lane of Route 28 (MacArthur Blvd) to the west.

The parcel is depicted on the "Plan of Land" as Lot 41 from plan book 593, page 85, with 17.8 acres, dated October 21, 1982. Three of the four bounds were located and their GIS coordinates documented by Mark Robinson (Figure 6). Additionally, a Massachusetts Highway Bound (MHB) was found between the two bike trails that ran roughly parallel to Route 28 on the western edge of the property.

No encroachments were noted, however there was evidence of current land use activities, namely well-established pathways that are likely used by mountain bikers and hikers.



Photo 1. Aerial image of parcel and surrounding land (Google Earth). Yellow box is approximate location of the parcel proposed for conservation restriction.

Plant Community

The site is generally forested, undeveloped, and undisturbed (Photos 1 & 2). The predominant terrestrial plant community type is Pitch Pine – Oak Forest/Woodland, a widespread plant community in southeastern Massachusetts (Swain 2016). The tree canopy is primarily composed of pitch pine (*Pinus rigida*) and eastern white pine (*Pinus strobus*), white oak (*Quercus alba*), and black oak (*Quercus velutina*). Less commonly observed trees species include American holly (*Ilex opaca*). Trees are generally between seven and twelve inches in diameter at breast height, and the canopy provides nearly complete cover across the site. There are numerous standing snags, fallen dead trees, and occasional boulders and erratics, with some evidence of past land-use activity (i.e., cart paths or informal paths).

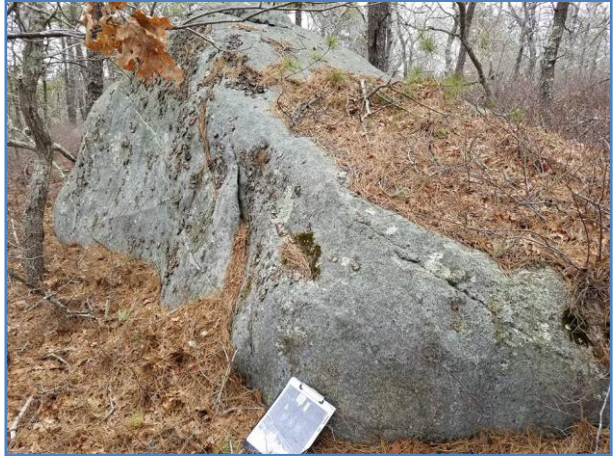


Photo 2 and 3. Typical Pitch Pine-Oak Forest/Woodland plant community at the proposed CR site. Example of large boulder near ridgeline on right.

The patchy understory ranges from densely vegetated to sparse with very little groundcover. Commonly observed species include black huckleberry (*Gaylussacia baccata*), sheep-laurel (*Kalmia angustifolia*), highbush blueberry (*Vaccinium corymbosum*), along with seedlings from the shrub and canopy communities.



Photo 4. Typical understory consisting of black huckleberry and wintergreen.

Groundcover consists primarily of patches of wintergreen (*Gaultheria procumbens*), tree-clubmoss (*Dendrolycopodium obscurum*), Pennsylvania sedge (*Carex pensylvanica*) and bracken fern (*Pteridium aquilinum*). HW also observed occasional dense patches of scrub oak (*Quercus ilicifolia*).

[FEMA Designation](#)

According to the most recent FEMA National Flood Hazard Layer, this zone area is not included on the maps, as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel Number 25001C0512J revised July 16, 2014 (Figure 3).

[State-listed Rare Species Habitat](#)

According to the most recent version of the *Massachusetts Natural Heritage Atlas* (14th Edition, August 1, 2017), the CR parcel occurs entirely within *Priority Habitat of Rare Species* (PH 490) and within *Estimated Habitat of Rare Wildlife and Certified Vernal Pools* (EH 435) as designated by the Massachusetts Natural Heritage and Endangered Species Program (NHESP) (Figure 4).

There are no certified or potential vernal pools at this site. Likewise, HW did not observe any wetlands, streams or ponds on or near the project site. HW also did not observe any federally or state-listed species during the site visit.

However, given the open woods and sandy soil nature of this site and that it is surrounding on the north, east and south by undeveloped forested land, this parcel has the potential to provide suitable for the Eastern Box Turtle. The eastern box turtle is listed in Massachusetts as a species of "Special Concern." This species has no Federal status under the Endangered Species Act.

Eastern Box Turtle is a small to mid-sized terrestrial turtle ranging from 4.5 to 6.6 inches (11-17 cm). Box turtles have an oval, high-domed shell with variable black and yellow or orange coloration and markings. They live in open woods, wet meadows, pastures, and brushy fields and are commonly found near ponds, streams and wetlands. During hibernation season (roughly late October until April), box turtles burrow into the earth, stump holes, and stream bottoms. Females nest in June and early July and can travel as much as one mile to find appropriate nesting habitat. Nesting areas vary widely and include fields, meadows, utility right-of-ways, woodland openings, roadsides and abandoned gravel pits.

[Soils](#)

According to the USDA NRCS Barnstable County custom soil report this site is located on a moraine with Plymouth-Barnstable complex (484C & 484D), soils consisting of loose sandy glaciofluvial deposits and/or loose sandy ablation till (Figure 5). As indicated above, site topography consists of rolling hills, and steep slopes with numerous boulders. The runoff class is high and it is characterized as excessively drained with very high runoff potential. Based on the soil types the area does not frequently flood or pond.

SUMMARY

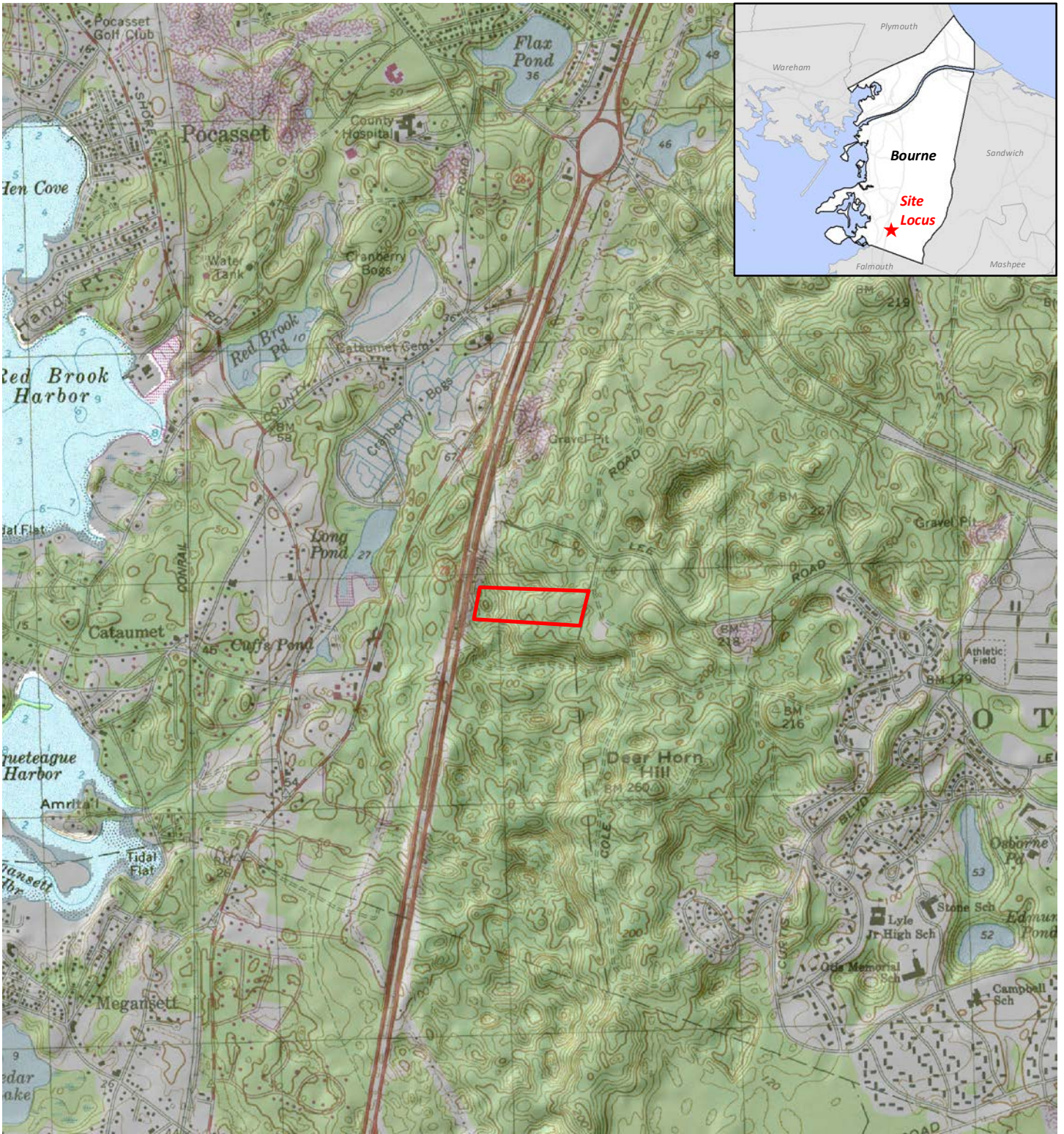
The CR site consists of approximately 17.8 acres of undeveloped, forested land that supports a pitch pine-mixed oak community typical of Cape Cod. No wetland resource areas are located at the site or within close proximity, and no unique features or specimen trees were encountered.

Overall, the undeveloped condition and the site context adjacent to undeveloped land bordering on the north, east and south consisting of similarly vegetated plant community increases the ability of this parcel to provide habitat providing a large swath of undeveloped open space which allows for maintaining contiguous wildlife habitat. The parcel would likely serve as good habitat for a variety of species including the state listed eastern box turtle.

The subject site is located within NHESP mapped priority habitats of rare species and estimated habitats for rare wildlife. Additionally, the subject site is located within an area designated on the Cape Cod Significant Natural Resource Areas (SNRA) Map as Public Land Acquisition Assessment Project (PLAAP) and zoned by the Town of Bourne as a Zone II area of drinking water contribution. Its protection under a CR would further the interests of habitat protection and contribute to the protection of Eastern Box Turtle habitat.

REFERENCES

- DeGraaf, R.M., and D.A. Richard. Forest Wildlife of Massachusetts: Cover Type, Size Class, and Special Habitat Relationships. Cooperative Extension, University of Massachusetts, Amherst, Massachusetts.
- DeGraaf, R.M. and D.D. Rudis. September 1983. New England Wildlife: Habitat, Natural History, and Distribution. United States Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. General Technical Report NE-108.
- Development of Regional Impact Guidelines for Natural Resources Inventory (Plant and Wildlife Habitat Assessment), Technical Bulletin 92-002, Cape Cod Commission (Revised 4/24/03).
<http://www.capecodcommission.org/resources/regulatory/NRItechbulletin0403.pdf>
- Plan of Land survey plan – as surveyed for Jennie R. Riggs in Cataumet, Bourne. October 1982. Plan Book 593 Page 85, Lot 41.
- Swain, P.C. and J.B. Kearsley. 2011. Classification of the Natural Communities of Massachusetts. Version 1.4. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries and Wildlife. Westborough, MA. URL:
<http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/natural-communities/classification-of-natural-communities.html#>
- Woolsey, H., A. Finton, J. DeNormandie. 2010. BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World. MA Department of Fish and Game/Natural Heritage & Endangered Species Program and The Nature Conservancy/Massachusetts Program.
http://www.mass.gov/dfwele/dfw/nhesp/land_protection/biomap/biomap2_summary_report.pdf



Document Path: H:\Projects\2017\17009 Bourne Landfill\Permitting\NHESP - MESA\GIS\Locus.mxd

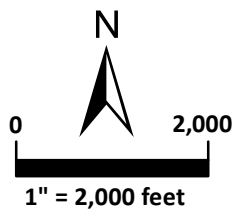
Legend

 Site Parcel

*Pocasset Topographic Quadrangle

Horsley Witten Group
Sustainable Environmental Solutions

90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com



USGS Locus
Harding Parcel
Off of Route 28
Bourne, MA

Date: 5/4/2018

Figure 1



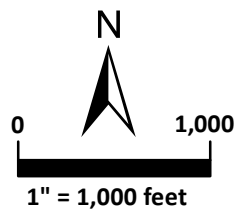
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Legend

-  Site Parcel
-  Parcels

*Aerial Imagery - ESRI

Horsley Witten Group
 Sustainable Environmental Solutions
 90 Route 6A • Unit 1 • Sandwich, MA 02563
 508-833-6600 • horsleywitten.com

Aerial Photo
 Harding Parcel
 Off of Route 28
 Bourne, MA

Date: 5/4/2018





Figure 2

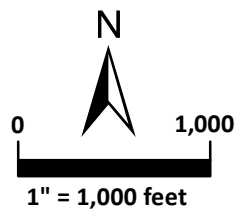


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*FEMA's National Flood Hazard Layer, MassGIS 2017

Legend

-  Site Parcel
-  Parcels
-  AE - 1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard



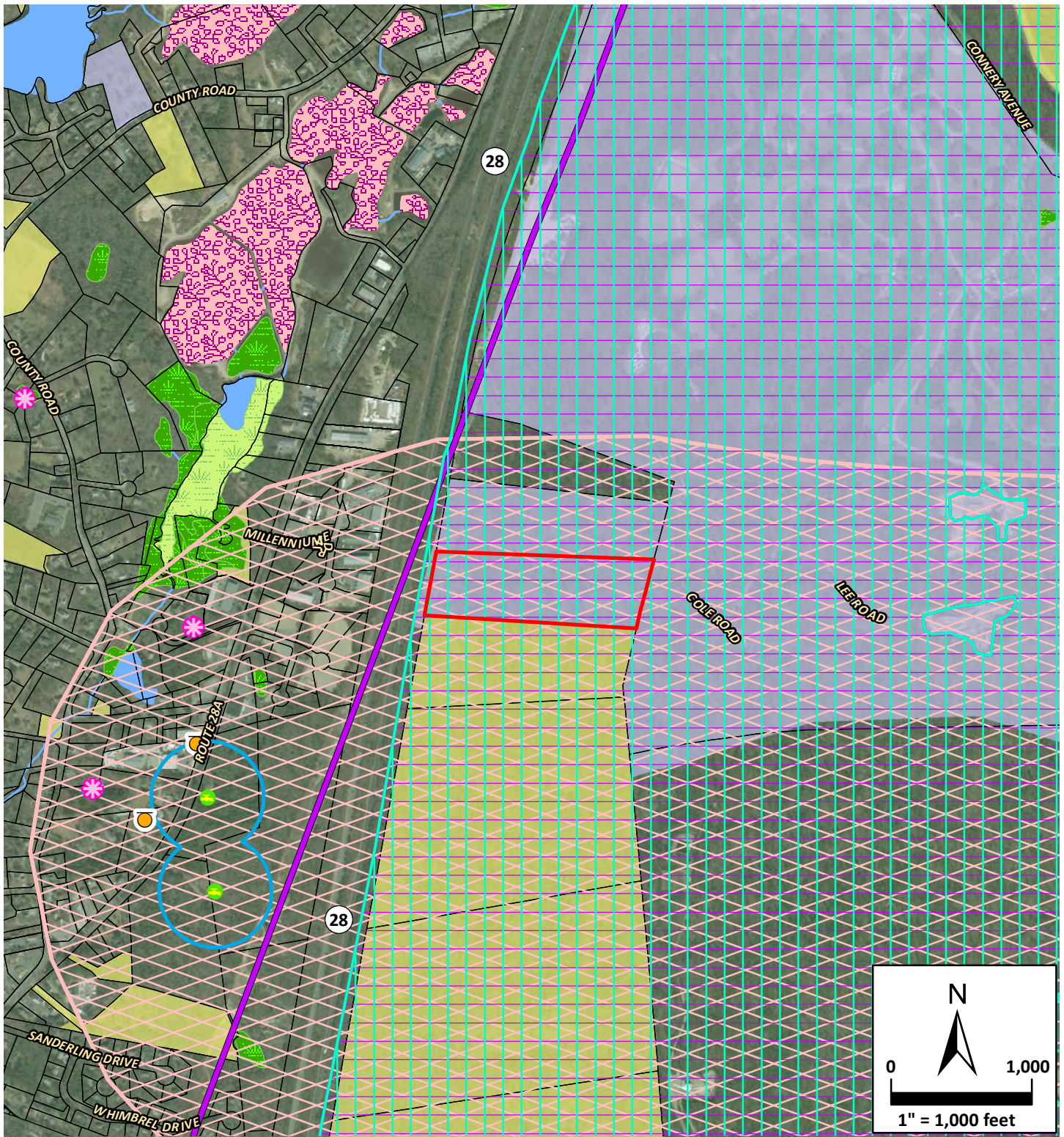
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FEMA's National Flood Hazard Layer
 Harding Parcel
 Off of Route 28
 Bourne, MA

Date: 5/4/2018

Figure 3



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Legend

- Site Parcel
- Potential Vernal Pools
- NHESP Priority Habitats of Rare Species
- NHESP Estimated Habitats of Rare Wildlife
- Underground Storage Tanks
- Conservation
- Historical/Cultural
- DEP Approved Zone I
- DEP Approved Zone II
- Powerline
- Community Groundwater Source

Protected and Recreational OpenSpace

DEP Wetlands

- Hydrologic Connection
- Marsh/Bog
- Wooded marsh
- Cranberry Bog
- Open Water

*GIS Data - MassGIS

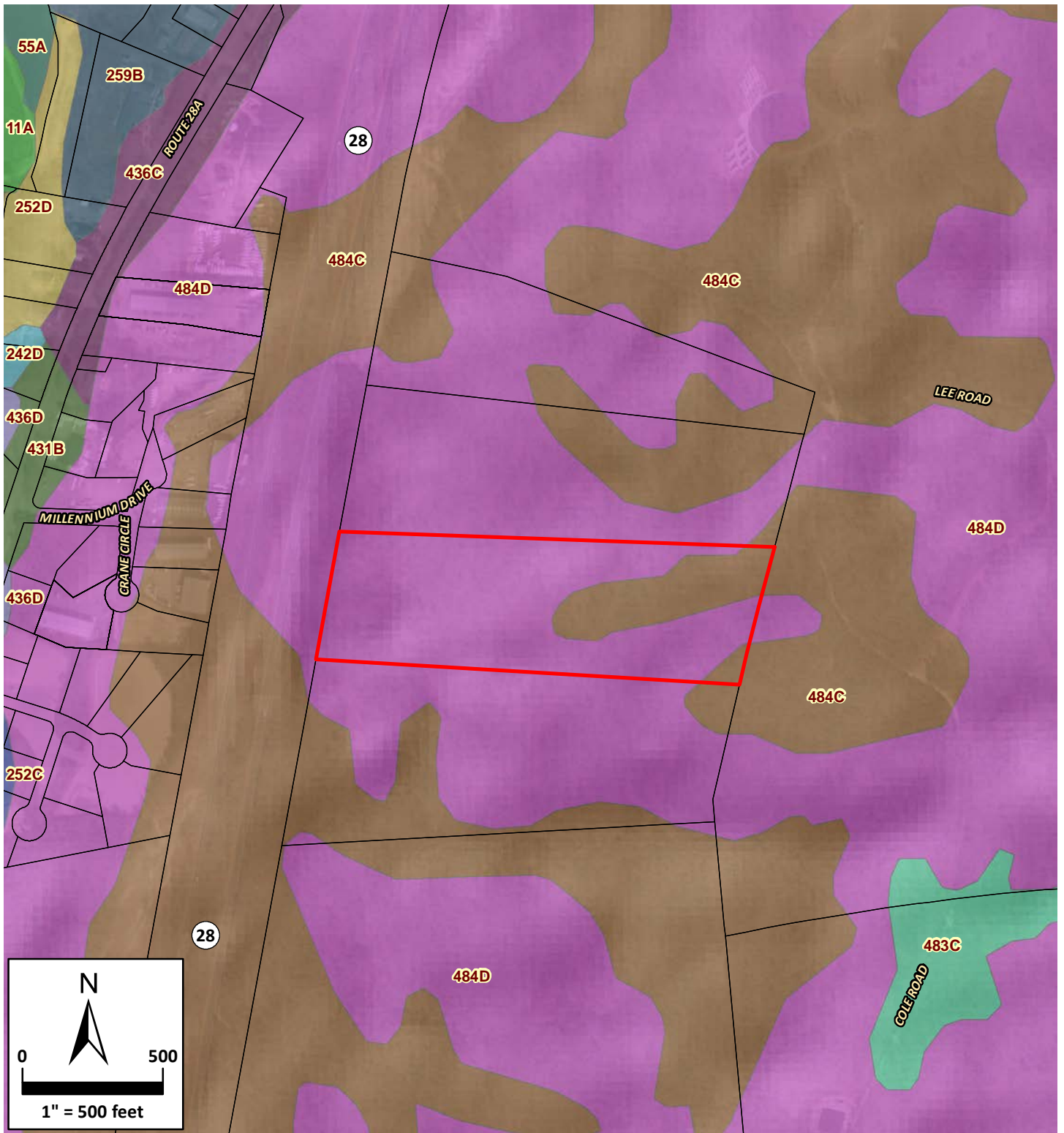
Horsley Witten Group
 Sustainable Environmental Solutions
 90 Route 8A • Unit 1 • Sandwich, MA 02563
 508-833-6600 • horsleywitten.com



Existing Constraints
 Harding Parcel
 Off of Route 28
 Bourne, MA

Date: 5/4/2018

Figure 4



Document Path: H:\Projects\2017\17009 Bourne Landfill\Permitting\NHESP - MESA\GIS\Soils.mxd

Legend

- | | | | | | |
|--|---------------------|---|---------------------|---|-------------------|
|  | Site Parcel |  | 252C, Carver, A |  | 483C, Plymouth, A |
|  | Parcels |  | 252D, Carver, A |  | 484C, Plymouth, A |
|  | 1, Water, N/A |  | 259B, Carver, A |  | 484D, Plymouth, A |
|  | 11A, Berryland, B/D |  | 431B, Barnstable, B |  | 55A, Freetown, D |
|  | 242D, Hinckley, A |  | 436C, Plymouth, A |  | 600, Pits, N/A |
| | |  | 436D, Plymouth, A | | |

*Soils - MassGIS

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 508-833-6600 • horsleywitten.com



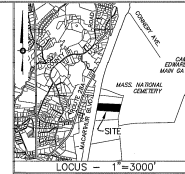
**Soils Map
 Harding Parcel
 Off of Route 28
 Bourne, MA**

Date: 5/4/2018

Figure 5

675-72

RECEIVED AND REGISTERED
JUN 25 11 A 11:35
REGISTRY OF DEEDS
JOHN F MEADE



Current Zoning:

R-40 & Water Resource District (See Note 4)
Min. Lot Area: 40,000 s.f. (Single Family)
80,000 s.f. (Two Family)
Min. Frontage: 150'
Min. Front Yard: 30'
Min. Side Yard: 15'
Min. Rear Yard: 15'
Max. Off-Street Parking: 20%
Max. Lot Coverage: 20%
Max. Lot Slope Factor: 30

THE BELOW ENDORSEMENTS NOT A
DETERMINATION AS TO CONFORMANCE
WITH ZONING REGULATIONS.

APPROVAL UNDER THE SUBDIVISION
CONTROL LAW NOT REQUIRED
John Meade
BOURNE PLANNING BOARD
DATE: 6/29/2018
PLANNING BOARD ENDORSEMENT IS NOT
A DETERMINATION AS TO CONFORMANCE
WITH ZONING REGULATIONS

N/E
UNITED STATES OF AMERICA
MAP 46 PARCELS 22
BOOK 2363 PAGE 306

- This survey and plan are based on a field survey performed on May 17, 2018.
- The bearings on this plan are referenced to NAD27.
- The purpose of this plan is to divide Parcel 41 on Map 52 into two lots.
- The property lies within the Flight Path Height Restriction area shown on Section 3485 of the Bourne Zoning Bylaw. No WECS located in the flight path as shown on a map entitled USCG Air Station Cape Cod Emergency Visual Routes is indicated. Weather balloons, Massachusetts, dated January 25, 2007 shall be erected or altered to a height, which would exceed one hundred (100) feet. WECS erected between 80 to 100 feet within the USCG flight path shall include a flood warning light.
- Lot 1 is not a buildable lot under current zoning due to the fact that MacArthur Blvd is a State Highway laid out with Limited Access Provisions and right of access has not been granted across the Right of Way line along the frontage of Lot 1.

The following plans were used in the preparation of this survey:

Unrecorded:
Plan of Land Prepared for Fred A. and Susan S. Abbe, Stephen J. Doyle and Associates, Bourne MA, March 17, 2012. Scale 1" = 20'

Barnstable County Registry of Deeds:
- Plan Book 300 Page 56
- Plan Book 250 Page 147

RESERVED FOR REGISTRY USE

THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTRY OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.



TIMOTHY R. BENNETT, PLS
MASSACHUSETTS REG. NO. 16552

CURRENT OWNER:

FLYOVER NOMINEE TRUST,
JOHN HARDING, TR.
Assessors Map 52 Parcel 41
Deed Book 19474 Pages 287

THIS MAPPING IS MADE FOR THE PARTY NAMED HERON, HIS OR HER MORTGAGEE AND GUARANTY, EXCLUSIVELY. NO FURTHER LIABILITY IS ASSUMED.

© 2018 GREEN SEAL ENVIRONMENTAL, INC.

REVISIONS		
DATE	DESCRIPTION	BY
6/18/18	Note 5, Lot 1 not buildable	TBR

PLAN OF LAND
of
ASSESSOR'S MAP 52
PARCEL 41
MACARTHUR BLVD.
BOURNE, Mass
prepared for
FLYOVER NOMINEE TRUST

Green Seal Environmental, Inc.
114 Stone Rd., Higg. St.
Sagamore Beach, MA 02562
Tel: (508) 888-0034
Fax: (508) 888-1506
www.gseenv.com

PLS:	CAD:
T. Bennett	B.Hood
JOB NO:	SHEET:
FLYO-2499	1 of 1
SCALE:	DATE:
1" = 80'	May 30, 2018

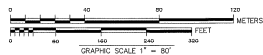
675-72

ROUTE 28 STATE HIGHWAY
500' WIDE
STATE HIGHWAY (UNIMPROVED)

LOT 1
11.04 AC ± or 479,160 SF ±
Shape Factors: 18.21
NOT A BUILDABLE LOT

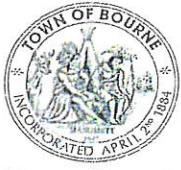
LOT 2
6.5 AC ± or 283,140 SF ±
Shape Factors: 18.37
NOT A BUILDABLE LOT

N/E
TOWN OF BOURNE
24 PERRY AVENUE
MAP 52 PARCEL 42
BOOK 8306 PAGE 243

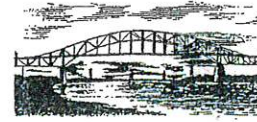


GRAPHIC SCALE 1" = 80'

Attachment E – Town Warrant Articles



Town Clerk
24 Perry Avenue
Buzzards Bay, MA 02532
(508) 759-0600 Ext 1505



Barry H. Johnson
Town Clerk

Wendy J. Chapman
Asst. Town Clerk

At a legal meeting of Town of Bourne held October 28, 2019, a quorum being present, the following business was transacted under Article 15:

ARTICLE 15: To see if the Town will vote to authorize the Board of Selectmen to acquire by purchase or gift, a parcel of land in the Town of Bourne shown as Lot 1 on the plan recorded in the Barnstable County Registry of Deeds in Plan Book 675, Page 72 entitled "Plan on Land of Assessor's Map 52, Parcel 41, MacArthur Boulevard, Bourne, MA prepared for Flyover Nominee Trust, Prepared by Green Seal Environmental, Inc. Scale 1"=80', dated May 30, 2018", a copy of which is on file at the Office of the Town Clerk, consisting of approximately 11 acres in total, owned by Mac Hunter, LLC, and designated by Bourne Assessors Map 52, Parcel 41, for conservation and wildlife habitat protection under the provisions of M.G.L. Ch. 40, and Article 97 of the Articles of Amendment of the Massachusetts Constitution, and for mitigation purposes for the Town of Bourne, Department of Integrated Solid Waste Management Facility, with the care, custody, control and management of such parcel to be vested with the Bourne Conservation Commission, pursuant to M.G.L. Chapter 40, Section 8C, and to appropriate or transfer available funds from the Integrated Solid Waste Management Enterprise Fund retained earnings, or borrow a sum of money, for the purposes of this article, and, if necessary, to authorize the Bourne Board of Selectmen and Bourne Conservation Commission to grant a qualified organization a perpetual conservation restriction pursuant to the provisions of M.G.L. Chapter 184, Sections 31-33, protecting the property for the purposes for which it is acquired, or act on anything in relation thereto.

Sponsor – Board of Selectmen

MOTION: We move that the Town vote to authorize the Board of Selectmen to acquire by purchase or gift, a parcel of land in the Town of Bourne shown as Lot 1 on the plan recorded in the Barnstable County Registry of Deeds in Plan Book 675, Page 72 and on file at the Office of the Bourne Town Clerk, entitled "Plan on Land of Assessor's Map 52, Parcel 41, MacArthur Boulevard, Bourne, MA prepared for Flyover Nominee Trust, Prepared by Green Seal Environmental, Inc. Scale 1"=80', dated May 30, 2018", consisting of approximately 11 acres in total, owned by Mac Hunter, LLC, and designated by Bourne Assessors Map 52, Parcel 41, for conservation and wildlife habitat protection under the provisions of M.G.L. Ch. 40, Section 8C, and Article 97 of the Articles of Amendment of the Massachusetts Constitution, and for mitigation purposes for the Town of Bourne, Department of Integrated Solid Waste Management Facility, with the care, custody, control and management of such parcel to be vested with the Bourne Conservation Commission, on terms and conditions deemed by the Selectmen to be in the best interest of the Town, and to appropriate or transfer from available funds from the Integrated Solid Waste Management Enterprise Fund retained earnings, or borrow a sum of money, not to exceed the appraised value of \$175,000.00, for the purposes of this article and if necessary, to authorize the Bourne Board of Selectmen and Bourne Conservation Commission to grant to a qualified organization a perpetual conservation restriction pursuant to the provisions of M.G.L. Chapter 184, Sections 31-33, protecting the property for the purposes for which it is acquired.

Voted: Ayes 684; Nays 62, Declared a 2/3rd vote, Motion Passes

A true copy,
Attest:

Barry H. Johnson
Barry H. Johnson
Town Clerk



Town Clerk,
24 Perry Avenue
Buzzards Bay, MA 02532
(508) 759-0600 Ext 1505



Barry H. Johnson
Town Clerk

Wendy J. Chapman
Asst. Town Clerk

At a legal meeting of the Town of Bourne held October 28, 2019, a quorum being present, the following business was transacted under Article 16:

ARTICLE 16: To see if the Town will vote to authorize the Board of Selectmen to acquire by purchase or gift a parcel of land in the Town of Bourne shown as Lot 2 on the plan recorded in the Barnstable County Registry of Deeds in Plan Book 675, Page 72 entitled "Plan of Land of Assessor's Map 52, Parcel 41, MacArthur Boulevard, Bourne, MA prepared for Flyover Nominee Trust, Prepared by Green Seal Environmental, Inc., Scale 1"=80', dated May 30, 2018," a copy of which is on file at Office of The Town Clerk, consisting of approximately 6.5 acres, owned by Flyover Nominee Trust, Kathryn L. Harding Trustee, and designated by Bourne Assessors Map 52, Parcel 96, for conservation and wildlife habitat protection under the provisions of M.G.L. Ch. 40, and Article 97 of the Articles of Amendment of the Massachusetts Constitution, and for mitigation purposes for the Town of Bourne, Department of Integrated Solid Waste Management Facility, with the care, custody, control and management of such parcel to be vested with the Bourne Conservation Commission, pursuant to M.G.L. Chapter 40, Section 8C, and to appropriate or transfer from funds from the Integrated Solid Waste Management Enterprise Fund retained earnings, or borrow a sum of money, for the purposes of this article, and, if necessary, to authorize the Bourne Board of Selectmen and Bourne Conservation Commission to grant to a qualified organization a perpetual conservation restriction pursuant to the provisions of M.G.L. Ch. 184, Sections 31-33, protecting the property for the purposes for which it is acquired, or act on anything in relation thereto.

Sponsor – Board of Selectmen

MOTION: We move that the Town vote to authorize the Board of Selectmen to acquire by purchase or gift a parcel of land in the Town of Bourne shown as Lot 2 on the plan recorded in the Barnstable County Registry of Deeds in Plan Book 675, Page 72, and on file at the office of the Bourne Town Clerk entitled "Plan of Land of Assessor's Map 52, Parcel 41, MacArthur Boulevard, Bourne, MA prepared for Flyover Nominee Trust prepared by Green Seal Environmental, Inc. Scale 1" = 80', dated May 30, 2018", consisting of approximately 6.5 acres, owned by Flyover Nominee Trust, Kathryn L. Harding Trustee, and designated by Bourne Assessors Map 52, Parcel 96, for conservation and wildlife habitat protection under the provision of M.G.L. Ch. 40, Section 8C, and Article 97 of the Articles of the Amendment of the Massachusetts Constitution, and for mitigation purposes for the Town of Bourne, Department of Integrated Solid Waste Management Facility, with the care, custody, control and management of such parcel to be vested with the Bourne Conservation Commission, on the terms and conditions deemed by the Selectmen to be in the best interest of the Town, and to raise, appropriate or transfer from the Integrated Solid Waste Management Enterprise Fund retained earnings, or borrow a sum of money, not to exceed the appraised value of \$105,000.00, for the purposes of this article, and, if necessary, to authorize the Bourne Board of Selectmen and Bourne Conservation Commission to grant to a qualified organization a perpetual conservation restriction pursuant to the provisions of M.G.L. Chapter 184, Sections 31-33, protecting the property for the purposes for which it is acquired.

Voted : Ayes 595, Nays 60, Declared a 2/3rd vote, Motion Passes

A true copy,

Attest:

Barry H. Johnson

Barry H. Johnson
Town Clerk



Barry H. Johnson
Town Clerk

Town Clerk
24 Perry Avenue
Buzzards Bay, MA 02532
(508) 759-0600 Ext 1505



Wendy J. Chapman
Asst. Town Clerk

At a legal meeting of the Town of Bourne held November 16, 2020, a quorum being present the following business was transacted under Article 11:

ARTICLE 11: To see if the Town will vote to transfer from available funds a sum of money for the purpose of funding an amendment to ***Article 16*** voted at the October 28, 2019 Special Town Meeting authorizing the Board of Selectmen to acquire by purchase or gift a certain **6.5 acre parcel of land in the Town of Bourne designated on Bourne Assessors Map 52, Parcel 96, on file at the office of the Town Clerk**, or take any other action in relation thereto: Sponsor – Board of Selectmen

MOTION: *We move that the Town vote to appropriate the sum of \$25,000 for the purposes of this Article and to meet this appropriation to transfer the sum of \$25,000 from the ISWM Enterprise Fund Retained Earnings.*

Voted: *Ayes have it, motion passes, declared and unanimous vote*

A true copy,

Attest:

Wendy J. Chapman
Wendy J. Chapman
Asst., Town Clerk

Attachment D2 – MESA “Take” Letter

Dated March 22, 2021



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DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

p: (508) 389-6300 | f: (508) 389-7890

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March 22, 2021

Town of Bourne
Department of Integrated Solid Waste Management (ISWM)
c/o Daniel Barrett, General Manager
24 Perry Avenue
Buzzards Bay, MA 02532

RE: Applicant: Town of Bourne, Department of ISWM
 Project Location: 201 MacArthur Boulevard, Buzzards Bay
 Project Description: Expansion of ISWM Facility
 NHESP File No.: **17-36534**

Dear Applicant:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Project Review Checklist, site plans entitled "MESA Figure 3 Future Landfill Buildout" (dated February 16, 2021; prepared by SITEC Environmental; the "Project Plans") and additional materials in compliance with the Massachusetts Endangered Species Act (MGL. c. 131A) and its implementing regulations (321 CMR 10.00) (MESA).

The MESA prohibits the Take of state-listed species, which includes actions that "in reference to animals, means to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct... Disruption of nesting, breeding, feeding or migratory activity may result from, but is not limited to, the modification, degradation or destruction of habitat of state-listed wildlife species" (321 CMR 10.02).

The Division has determined that the proposed project is located within the mapped Priority Habitat of the Eastern Box Turtle (*Terrapene carolina*), state-listed as Special Concern. This species and its habitats are protected pursuant to the MESA. Fact Sheets for state-listed species can be found on our website, www.mass.gov/nhesp.

The project, as currently proposed, includes the expansion of an existing landfill facility for future solid waste handling, maintenance facilities, administrative offices, and associated site work resulting in approximately 12.38 acres of habitat loss, as shown on the Project Plans. Based on a review of the information that was provided and the information that is currently contained in our database, the Division has determined that the project, as currently proposed, **will result in a Take (321 CMR 10.18 (2)(b)) of the Eastern Box Turtle** due to the permanent loss of suitable habitats and interference with the feeding, breeding, over-wintering and migratory activities of this species.

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Projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the Applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species.

This Determination is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.18. Any person aggrieved by this decision shall have the right to an adjudicatory hearing at the Division pursuant to M.G.L. c. 30A, s.11 in accordance with the procedures for informal hearings set forth in 801 CMR 1.02 and 1.03. Any notice of claim for an adjudicatory hearing shall be made in writing, accompanied by a filing fee in the amount of \$500.00 and the information specified in 321 CMR 10.25 (3). The notice of claim shall be sent to the Division's Director, Mark S. Tisa, by certified mail, hand delivered or postmarked within twenty-one (21) days of the date of the Division's Determination.

Please note that no soil or vegetation disturbance, work, clearing, grading or other activities related to the subject filing shall be conducted anywhere within the "Limit of Box Turtle Habitat" show on the Project Plans until the MESA permitting process is complete. If you have any questions regarding this letter, please contact Jesse Leddick, Chief of Regulatory Review, at jesse.leddick@mass.gov or (508) 389-6386.

Sincerely,



Everose Schlüter, Ph.D.
Assistant Director

cc: Phil Goddard, Town of Bourne ISWM
Amy Ball, Horsley Witten Group, Inc.

Attachment D3 – Previous NHESP Comment Letters

Phase 6 Landfill Expansion Exemption Letter dated January 19, 2018

Phases 7-9 Landfill Expansion Exemption Letter dated February 5, 2020

Expanded Notice of Project Change (EEA File No. 11333) Comment Letter to MEPA
dated April 9, 2020

Single Supplemental Environmental Impact Report Comment Letter to MEPA
dated December 17, 2020



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ATTACHMENT C
DIVISION OF
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1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
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February 5, 2020

Town of Bourne, ISWM Department
c/o Phil Goddard, Manager of Facility Compliance and Technology Development
24 Perry Avenue
Buzzards Bay, MA 02532

RE: Project Location: 201 MacArthur Boulevard, Bourne, MA
Project Description: Phases 7-9 Landfill Expansion
NHESP Tracking No.: 17-36534

Dear Applicant:

Thank you for submitting the project plans entitled "Schematic Site Buildout Plan" (dated February 4, 2020) and supporting documentation to the Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife (the "Division") for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

The project, as currently proposed, includes the expansion of an existing landfill in three phases (Phases 7, 8 and 9). All work associated with Phases 7-9 of the project shall occur within areas already disturbed by existing landfill operations and, in particular, shall occur outside of the "Limit of Box Turtle Habitat" shown on the project plans. Any future work proposed within the "Limit of Box Turtle Habitat" shown on the project plans shall require a direct filing with the Division for compliance with the MESA.

Based on a review of the information that was provided, the Division has determined that Phases 7, 8 and 9 of this project, as currently proposed, appear to be **exempt from a MESA review** pursuant to 321 CMR 10.14. Any changes to the proposed project or any additional work beyond that provided may require a filing with the Division pursuant to the MESA regulations. If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the Division so that it is received at the same time as the local conservation commission.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions about this letter, please contact Melany Cheeseman, Endangered Species Review Assistant, at melany.cheeseman@mass.gov or 508-389-6357.

Sincerely,

A handwritten signature in black ink that reads "Everose Schlüter".

Everose Schlüter, Ph.D.
Assistant Director

cc: Amy Ball, Horsley Witten Group, Inc.

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ATTACHMENT D
DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
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Jack Buckley, *Director*

January 19, 2018

Town of Bourne, ISWM Department
c/o Phil Goddard
24 Perry Avenue
Buzzards Bay, MA 02532

RE: Project Location: 201 MacArthur Boulevard, Bourne, MA
Project Description: Phase 6 Landfill Expansion
NHESP Tracking No.: **17-36534**

Dear Applicant:

Thank you for submitting the project plans (dated January 10, 2018) and supporting documentation to the Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife (the "Division") for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

Based on a review of the information that was provided, the Division has determined that this project, as currently proposed, appears to be **exempt from a MESA review** pursuant to 321 CMR 10.14. Any changes to the proposed project or any additional work beyond that provided may require a filing with the Division pursuant to the MESA regulations. If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the Division so that it is received at the same time as the local conservation commission.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions about this letter, please contact Melany Cheeseman, Endangered Species Review Assistant, at melany.cheeseman@state.ma.us or 508-389-6357.

Sincerely,

Thomas W. French, Ph.D.
Assistant Director

cc: Amy Ball, Horsley Witten Group, Inc.

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DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

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April 9, 2020

Kathleen A. Theoharides, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office
Anne Canaday, EEA No. 11333
100 Cambridge Street
Boston, Massachusetts 02114

Project Name: Bourne Integrated Solid Waste Management Facility
Proponent: Town of Bourne, Dept. of Integrated Solid Waste Management (ISWM)
Location: 201 MacArthur Boulevard, Bourne, MA
Project Description: Landfill Expansion – Phases 7, 8 and 9
Document Reviewed: Expanded Notice of Project Change
EEA File Number: 11333
NHESP Tracking No.: 17-36534

Dear Secretary Theoharides:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the Division) has reviewed the *Expanded Notice of Project Change* (ENPC) for the Town of Bourne ISWM's proposed Phase 7, 8 and 9 Landfill Expansion Project and would like to offer the following comments regarding state-listed species and their habitats.

According to the information provided in the ENPC, portions of the Project site are mapped as Priority Habitat for the Eastern Box Turtle (*Terrapene carolina*), a species state-listed as Special Concern according to the *Massachusetts Natural Heritage Atlas* (14th Edition). This species and its habitats are protected pursuant to the Massachusetts Endangered Species Act (MGL c.131A) and its implementing regulations (MESA; 321 CMR 10.00). A Fact Sheet for this species can be found on our website, www.mass.gov/nhesp.

All projects or activities proposed within Priority Habitat, which are not otherwise exempt pursuant to 321 CMR 10.14, require review through a direct filing with the Division for compliance with the MESA (321 CMR 10.18). The Division determined (letter dated February 5, 2020) that Phases 7, 8 and 9 of the Project, as currently proposed, appear to be exempt from MESA review pursuant to 321 CMR 10.14.

As noted in the Division's previous comments (dated June 19, 2018) on the Supplemental Single Environmental Impact Report, future development of the proposed Future Handling Area and proposed effluent connection projects will require a direct filing with the Division for compliance with the MESA. This includes any work within the "Limit of Box Turtle Habitat" shown on the site plans entitled "Conceptual Site Buildout Plan Through Phase 9 To Elevation 225" (ENPC, Attachment 3). The Proponent has initiated pre-filing consultations with the Division to discuss conceptual development plans associated with the Future Handling Area. In advance of a formal MESA filing, the Division anticipates –

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based on ongoing consultations with the Proponent and information submitted to date – that future development of the Future Handling Area, as proposed, will likely result in a Take (321 CMR 10.18 (2)(b)) of the Eastern Box Turtle.

Projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species; (b) demonstrate that an insignificant portion of the local population will be impacted; and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species.

The Proponent has continued to proactively consult with the Division on a pre-filing basis to avoid, minimize and mitigate impacts to state-listed species and their habitats associated with potential development of the Future Handling Area. Based on ongoing consultations and information submitted to date, we understand that the Proponent intends to meet the performance standards of a CMP by permanently protecting off-site land in the vicinity of the site as open space and state-listed species habitat. Although the exact details of the long-term net benefit required under a CMP have not yet been finalized, the Division anticipates that a suitable long-term net benefit can be achieved through the protection of suitable, high quality off-site habitat and that the Project should be able to meet the performance standards of a CMP.

The Division will not render a final decision regarding the Future Handling Area until the MEPA review process and its associated comment period is complete, and until all required MESA filing materials are submitted to the Division. No work associated with the Future Handling Area or proposed effluent connection projects shall occur on the property until the MESA review process is complete.

If you have any questions about this letter, please contact Jesse Leddick, Chief of Regulatory Review, at (508) 389-6386 or jesse.lednick@mass.gov. We appreciate the opportunity to comment on this project.

Sincerely,



Everose Schlüter, Ph.D.
Assistant Director

cc: Daniel T. Barrett, Town of Bourne ISWM Department
Phil Goddard, Town of Bourne ISWM Department
Town of Bourne Board of Selectmen
Town of Bourne Conservation Commission
Town of Bourne Planning Department
DEP Southeast Regional Office
Amy Ball, Horsley Witten Group, Inc.



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1 Rabbit Hill Road, Westborough, MA 01581

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December 17, 2020

Kathleen A. Theoharides, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office
Anne Canaday, EEA No. 11333
100 Cambridge Street
Boston, Massachusetts 02114

Project Name: Bourne Integrated Solid Waste Management Facility
Proponent: Town of Bourne, Dept. of Integrated Solid Waste Management (ISWM)
Location: 201 MacArthur Boulevard, Bourne, MA
Project Description: Landfill Expansion
Document Reviewed: Single Supplemental Environmental Impact Report
EEA File Number: 11333
NHESP Tracking No.: 17-36534

Dear Secretary Theoharides:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the Division) has reviewed the *Single Supplemental Environmental Impact Report* (SSEIR; dated November 13, 2020) for the Town of Bourne ISWM's Landfill Expansion Project (the Project) and would like to offer the following comments regarding state-listed species and their habitats.

According to the information provided in the SSEIR, portions of the Project site are mapped as Priority Habitat for the Eastern Box Turtle (*Terrapene carolina*), a species state-listed as Special Concern according to the *Massachusetts Natural Heritage Atlas* (14th Edition). This species and its habitats are protected pursuant to the Massachusetts Endangered Species Act (MGL c.131A) and its implementing regulations (MESA; 321 CMR 10.00). A Fact Sheet for this species can be found on our website, www.mass.gov/nhesp.

All projects or activities proposed within Priority Habitat, which are not otherwise exempt pursuant to 321 CMR 10.14, require review through a direct filing with the Division for compliance with the MESA (321 CMR 10.18). The Division determined (letter dated February 5, 2020) that Phases 7, 8 and 9 of the Project, as currently proposed, appear to be exempt from MESA review pursuant to 321 CMR 10.14. However, as noted in the Division's previous comments to MEPA on the Project (dated June 19, 2018), development of the proposed Future Handling Area – and specifically, any work within the "Limit of Box Turtle Habitat" shown on the site plans (SSEIR, Attachment 3, Figures 2, 3 and 6) – will require a direct filing with the Division for compliance with MESA.

The Proponent has been working with the Division on a pre-filing basis to evaluate impacts associated with development of the Future Handling Area. In advance of a formal MESA filing, the Division anticipates – based on ongoing consultations with the Proponent and information submitted to date – that development of the Future Handling Area, as proposed, will likely result in a Take (321 CMR 10.18 (2)(b)) of Eastern Box Turtle.

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Projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species; (b) demonstrate that an insignificant portion of the local population will be impacted; and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species.

The Proponent has also proactively consulted with the Division on a pre-filing basis to avoid, minimize and mitigate impacts to state-listed species and their habitats associated with development of the Future Handling Area. Based on ongoing consultations and information submitted to date, we understand that the Proponent intends to meet the performance standards of a CMP by permanently protecting off-site land as open space and state-listed species habitat through fee conveyance to the Town of Bourne Conservation Commission. The Proponent has identified a candidate parcel in the vicinity of the property which should provide an acceptable option to address the required long-term net benefit for Eastern Box Turtle associated with the Project. The Division understands that the Proponent may also propose to permanently protect portions of the property, as shown on the "Conceptual Site Buildout Plan (SSEIR, Attachment 3, Figure 6). Although the exact details of the long-term net benefit required under a CMP have not yet been finalized, the Division anticipates that a suitable long-term net benefit can be achieved through the protection of suitable, high quality off- and on-site habitat and that the Project should be able to meet the performance standards of a CMP.

The Division will not render a final decision regarding the Future Handling Area until the MEPA review process and its associated comment period is complete, and until all required MESA filing materials are submitted to the Division. No work associated with the Future Handling Area shall occur on the property until the MESA review process is complete.

If you have any questions about this letter, please contact Jesse Leddick, Chief of Regulatory Review, at (508) 389-6386 or jesse.leddick@mass.gov. We appreciate the opportunity to comment on the Project.

Sincerely,



Everose Schlüter, Ph.D.
Assistant Director

cc: Phil Goddard, Town of Bourne ISWM Department
Daniel T. Barrett, Town of Bourne ISWM Department
Town of Bourne Board of Selectmen
Town of Bourne Conservation Commission
Town of Bourne Planning Department
DEP Southeast Regional Office
Amy Ball, Horsley Witten Group, Inc.

Attachment E – Qualifications

Attachment E QUALIFICATIONS

Personnel involved in conducting the Natural Resources Inventory have academic backgrounds in disciplines related to the specific components of the investigation including botany, soil science, and wildlife biology. Each of these professionals has experience in conducting related investigations on Cape Cod.

Amy M. Ball, PWS, CWS

Amy Ball has more than 25 years of professional experience as a wetland scientist and ecologist. Her specific expertise is in wetland botany and ecology, rare species and wildlife habitat assessments, wetland mitigation, wetland assessment and monitoring, invasive species management, environmental policy evaluation, environmental permitting, and regulatory compliance. As a Senior Project Manager and Senior Ecologist with the Horsley Witten Group, she served as the project manager for the natural resources investigation. Ms. Ball has directed and participated in several large and small scale natural resources inventories on Cape Cod, including a substantial vegetative community assessment in the Pleasant Bay Area of Critical Environmental Concern and at the Provincetown Municipal Airport, each of which included rare species and habitat assessments. Ms. Ball also manages project permitting for projects requiring federal, state, regional, and local permits pursuant to laws, regulations, and policies governing water resource and rare species protection. Ms. Ball frequently appears before local conservation commissions and state and federal regulatory authorities as a project representative or reviewing consultant and has served as an expert witness on several occasions.

Benjamin Wollman, CERP

Ben Wollman is a Certified Ecological Restoration Practitioner (CERP) with over 10 years of professional experience in the ecological restoration and bioengineering field, working as a Restoration Ecologist and Environmental Scientist, specializing in assessment, planning, permitting, implementation, maintenance, and monitoring associated with native ecosystem restoration projects for a wide variety of natural community types, including Pitch Pine – Oak Forest, Sandplain Heathland, Salt Marsh, Brackish Tidal Marsh, Maritime Shrubland, and others common to the Cape Cod ecoregion. Mr. Wollman possesses a wide variety of experience and success on hundreds of projects with a significant diversity of scopes, scales, locations, stakeholders, and goals, including projects with federal, state, regional, and local regulatory compliance standards related to natural/environmental resource conservation and protection. Mr. Wollman has performed many natural resource inventories for project planning and permitting purposes, requiring collection of ecosystem component data related to site vegetation, wildlife, soils, hydrology, and natural and/or human-driven disturbance factors, among others. As an Environmental Scientist with Horsley Witten Group, Mr. Wollman facilitates as a collaborator on projects requiring inland and coastal wetland resource area determinations, wildlife habitat assessments, impact mitigation, and regulatory compliance. Mr. Wollman also has extensive training and expertise in invasive species identification and management and has been certified through the UMass Extension's Invasive Plant Management Program.

Attachment F – Site Specific Soils Reports & NRCS Report

December 28, 2017

Email (rquinn@sitecenv.com)

Raymond Quinn, PE
SITEC Environmental, Inc.
769 Plain Street, Unit C
Marshfield, MA 02050
Tel: 781-319-0100, Ext. 12
FAX: 781-834-4783

Re: Site Specific Soil Survey Report
SITEC Environmental, Inc.
769 Plain Street, Unit C
Marshfield, MA 02050
For: Bourne Landfill, Town of Bourne, MA

[LEC File #: SIEC \17-395.01]

Dear Mr. Quinn:

On November 28, 2017, we performed a site-specific soil survey of approximately four acres of land, adjacent and south of the solid waste disposal facility in Bourne Massachusetts. This soil survey was performed in accordance to USDA, Natural Resources Conservation Service (NRCS) National Cooperative Soil Survey standards, at a more detailed level than the published NRCS Web Soil Survey¹. The purpose of this site-specific soil survey was to determine if the published, NRCS map properly reflects actual soil composition on this site, in the area mapped as 431B (*Barnstable sandy loam, 3 to 8 percent slopes, very stony*). The 431B map unit is classified as “farmland of statewide importance” in Barnstable County, Massachusetts.

In the course of our field investigation, we collected three detail soil profile descriptions and data from fifteen additional soil borings within the 431B map unit. A soil profile description that represents the 431B map unit that we investigated, is included in the following narrative.

Data and Site Specific Soil Survey

Soil data we collected is consistent with the published NRCS information. The soils in the study area consistently fall within the range of characteristics for the Barnstable Soil Series. The principal soil map unit in the study area is *Barnstable sandy loam, 3 to 8 percent slopes*. This map unit has the statewide numerical symbol *430B* and the Barnstable County published map unit symbol *BaB*.

¹ Soil Survey of Barnstable County Massachusetts, Web Soil Survey, December 4, 2017

The Barnstable series consists of very deep, well drained soils formed in loamy glacial till overlying loose, sandy glacial-fluvial material. They are on nearly level to moderately steep soils of moraines. On this site the slope ranges from 0 through 15 percent. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. The seasonal high, water table is greater than 60 inches from the surface. Mean annual precipitation is about 43 inches (1092 mm) and mean annual temperature is about 48° F (9° C). These soils are classified as: Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Typic Dystrudepts.

The principal difference between the NRCS Web soil survey map and map unit specific to this site, is surface stoniness. The site is virtually stone-free (map unit 430), whereas the NRCS map unit for the site is described as *very stony* (map unit 431). The lack of surface stones does not change the farmland classification. Both map units: 430B and 431B, are classified as “farmland of statewide importance”.

On this site, textures in the solum are sandy loam, fine sandy loam and very fine sandy loam and coarse fragment content is less than 5 percent. Textures in the substratum are medium sand, coarse sand, very coarse sand. Course fragments including gravel and small cobbles make up less than 15 percent in the substratum. No contrasting inclusions were encountered, similar inclusions make up less than 5 percent of the map unit.

A representative soil profile description of the Barnstable soils (“S-1”) on this site is described as follows:

- 2-0” – Oe horizon of hemic material composed of partially and well decomposed pine needles, leaves and twigs.
- 0-2.5” – A horizon consisting of black (7.5YR 2.5/1) very fine sandy loam; massive; very friable with a clear irregular boundary.
- 2.5-3.5” – E horizon (discontinuous) consisting of gray (10YR 4/1) fine sandy loam; massive; very friable with a broken irregular boundary.
- 3.5-10” – Bs horizon; brown (7.5YR 4/4) very fine sandy loam; weak sub-angular blocky; friable; gradual wavy boundary.
- 10-27” – Bw horizon; dark yellowish brown (10YR 4/6) fine sandy loam; weak sub-angular blocky; friable; 5 percent gravel, 5 percent cobbles in the lower part; clear wavy boundary.
- 27-42” - 2C horizon; yellowish brown (10YR 5/4) coarse and very coarse sand; single grain; loose; 5 percent gravel.



Barnstable Soil Profile @ S-1

Conclusion

Eighteen soil profile observations all confirm that the Barnstable soil series dominates the entire portion of the parcel that we investigated. Based on our investigation, we cannot recommend adjusting or changing the NRCS published soil map at this specific location. As a result, the state farmland classification would remain: "Farmland of Statewide Importance".



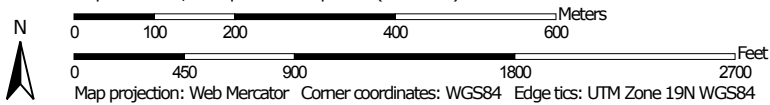
Thomas A. Peragallo, CPSS/SC ASA #2148
Certified Professional Soil Scientist/Soil Classifier

Soil Map—Barnstable County, Massachusetts
(Bourne Landfill, Bourne, MA)




Soil Map may not be valid at this scale.

Map Scale: 1:9,410 if printed on A portrait (8.5" x 11") sheet.





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 1:25,000.

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:

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: Barnstable County, Massachusetts

Survey Area Data: Version 14, Oct 6, 2017

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

Date(s) aerial images were photographed: Mar 30, 2011—Oct 8, 2011

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	2.1	0.6%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	20.6	6.0%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	40.5	11.9%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	5.9	1.7%
430B	Barnstable sandy loam, 3 to 8 percent slopes	31.7	9.3%
430C	Barnstable sandy loam, 8 to 15 percent slopes	9.4	2.8%
431B	Barnstable sandy loam, 3 to 8 percent slopes, very stony	57.9	17.0%
431C	Barnstable sandy loam, 8 to 15 percent slopes, very stony	23.2	6.8%
435B	Plymouth loamy coarse sand, 3 to 8 percent slopes	53.2	15.6%
435C	Plymouth loamy coarse sand, 8 to 15 percent slopes	6.5	1.9%
435D	Plymouth loamy coarse sand, 15 to 35 percent slopes	29.0	8.5%
436C	Plymouth loamy coarse sand, 8 to 15 percent slopes, very stony	0.4	0.1%
483C	Plymouth-Barnstable complex, rolling, very bouldery	3.4	1.0%
484C	Plymouth-Barnstable complex, rolling, extremely bouldery	0.0	0.0%
484D	Plymouth-Barnstable complex, hilly, extremely bouldery	7.9	2.3%
600	Pits, sand and gravel	15.6	4.6%
652	Dumps, landfill	29.3	8.6%
665	Udipsamments, smoothed	4.7	1.4%
Totals for Area of Interest		341.3	100.0%



August 9, 2018

Email (rquinn@sitecenv.com)

Raymond Quinn, PE
SITEC Environmental, Inc.
769 Plain Street, Unit C
Marshfield, MA 02050

**Re: Site Specific Soil Survey Report
Bourne Landfill
Department of Integrated Solid Waste Management
201 MacArthur Boulevard
Bourne, Massachusetts**

[LEC File #: SITEC \17-395.01]

Dear Mr. Quinn:

On July 17, 2018, LEC Environmental Consultants, Inc. (LEC) performed a soil survey on approximately twenty acres of land at the solid waste disposal facility in Bourne Massachusetts. This soil survey was performed in accordance with USDA, Natural Resources Conservation Service (NRCS) National Cooperative Soil Survey standards.

The purpose of the survey was to identify the boundaries of soil types at a more detailed level than the published NRCS Web Soil Survey¹. The end-product is a Site-Specific Soil Survey for the purpose of determining the classification as Massachusetts prime, important, and unique farm land. The Farmland Classification is from the USDA-NRCS Field Office Technical Guide, Version 12, September 28, 2015 (Web source).

The base map used in the field for the site-specific soil survey consists of an existing conditions plan, with topography at two-foot contours overlaid by a color aerial photograph. The base map was produced by SITEC Environmental, Inc. and the Bourne Department of Integrated Solid Waste Management at a scale of 1" = 40'. This report and the site-specific soil map are two parts of the Site-Specific Soil Survey and are intended to be used together.

In the course of our field investigation, we collected twenty soil profile descriptions that represent the primary map units and additional data from hand-borings throughout the site that represent the various map units. The detailed soil descriptions are included in Appendix A. The survey area consists of the three principal soil map units described below.

¹ Soil Survey of Barnstable County Massachusetts, Web Soil Survey, July 27, 2018

Soil Map Unit Descriptions

Barnstable sandy loam, 3 to 8 percent (431B) consists of very deep, well drained soils formed in loamy glacial till overlying loose, sandy glacial-fluvial material. They are on nearly level to moderately steep soils of moraines. In this survey, these soils occur along the western and southern boundaries of the active landfill work area. Slopes range from 0 to 4 percent. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. The seasonal, high water table is greater than 60 inches from the surface. Mean annual precipitation is about 43 inches (1092



millimeters) and mean annual temperature is about 48 degrees F (9 degrees C). These soils are classified as Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Typic Dystrudepts.

Included within this map unit are large areas that do not have stones on the surface. The A and B horizon (solum) textures range from very fine sandy loam to sandy loam. Coarse fragment content is less than 5 percent throughout the solum. Textures in the substratum are medium sand, coarse sand, very coarse sand. Course fragments, including gravel and small cobbles, make up less than 15 percent. No contrasting inclusions were encountered in this map unit and similar inclusions make up less than 5 percent of the map unit. Seven detailed soil profile descriptions (TP-3, TP-4, TP-16, TP-17, TP-18, TP-19, TP-20) were collected where this soil occurs and are included in Appendix A.

Urban Land (602). This nearly level to gently sloping unit dominates the survey area and consists of impervious surfaces including pavement (primarily asphalt) and buildings. Underlying soils are unknown



but are most likely dominated by coarse sand from prior excavations of cutting and filling. This map unit supports the principal daily landfill activities of recycling, transport, and storage of useable soil and non-soil material.

Included with this unit in mapping are small areas of Udipsamments, smoothed and storage piles of non-soil debris including undecomposed yard waste, chipped woody debris, building rubble, stones and boulder piles, recycled material such as crushed glass, piles of crushed stone and rip-rap. The piles of non-soil material are constantly changing in size, distribution, and elevation as a result of machine handling. This Site-Specific Soil map identifies some of the non-soil areas as they existed at the time of this survey, adjusted from aerial photography taken in January of 2018.

Udipsammets, smoothed (655). These gently sloping to very steep areas consist of excavated, filled and re-graded soil, originating from the underlying substrata or manufactured on-site. Slopes range from



2 to 70 percent. The nearly level areas make up portions of the site where equipment is traveling. The remaining areas are dominated by steep side slopes (40 to 70 percent) of stored soil material and landscaped side slopes adjacent to some buildings. The soil textures are dominantly coarse and very coarse sand, excavated from a newly constructed land fill cell to the north of the survey area. Other stored piles contain various blends of

“topsoil” constructed from mixing sand with organic material and compost. The topsoil storage piles have soil textures that range from very coarse sand to loamy sand and their gravelly analogs.



Included with this unit in mapping are small areas of non-soil debris, areas with extremely stony and boulder surfaces and areas where textures range to coarse sandy loam. The soil storage piles periodically change in size, distribution, and elevation, as a result of machine handling. This Site-Specific Soil map identifies the boundary of these areas as they existed at the time of this survey and based on aerial photography taken in

January of 2018. Seven detailed soil profile descriptions (TP-1, TP-2, TP-5, TP-6, TP-7, TP-8, TP-9, TP-10, TP-11, TP-12, TP-13, TP-14, TP-15) were collected where this soil occurs and are included in Appendix A.

Non-soil Areas



*Chipped Woody Debris (foreground)
Yard Waste background)*



Asphalt, Brick, and Concrete Rubble



Soil Map Legend

The Soil Map Legend is correlated with the Barnstable County Soil Survey legend, referenced to the USDA-NRCS Web Soil Survey, July 27, 2018. The Farmland Classification is from the USDA-NRCS Field Office Technical Guide, Version 12, September 28, 2015 (Web). A number of non-soil areas are shown on the map and are considered to be map unit inclusions.

MA Statewide Numeric Symbol	Barnstable County Alpha-Numeric Symbol	Map Unit Name	Farmland Classification
431B	BbB	Barnstable sandy loam, 3 to 8 percent slopes, very stony	Farmland of Statewide Importance
602	Ur	Urban Land	None
665	Ud	Udipsamments, smoothed	None
Non-soil Areas			
1	W	Water (Sediment Pond)	None
N/A	N/A	Yard Waste	None
N/A	N/A	Woody Debris (chipped)	None
N/A	N/A	Asphalt, brick and concrete rubble	None

Conclusion

The re-surveyed area of this site is currently mapped Barnstable sandy loam, 3 to 8 percent slopes, very stony (431B) and classified as Farmland of Statewide Importance on the current NRCS Barnstable County Web Soil Survey. Based on our field investigation, the Barnstable map unit (431B) does not exist in most of the Bourne landfill work area. This area consists of soil and non-soil material that has been disturbed by human activity, related to the operation of the landfill. This Site-Specific Soil Survey redefines most of this area as Urban Land (602) and Udipsamments, smoothed (655), which are not Prime, Important or Unique Farmland in Massachusetts.

Thank you for the opportunity to assist the Bourne Department of Integrated Solid Waste Management with re-mapping of the solid waste disposal facility. Should you have any questions or need additional information I may be contacted in our Rindge, New Hampshire Office.

Sincerely,

LEC Environmental Consultants, Inc.

Thomas A. Peragallo, CPSS/SC
Certified Professional Soil Scientist/Soil Classifier

Attachments

Appendix A

Soil Profile Descriptions

Soil Profile Description

Observation Hole Number: TP-1	Date: 7-17-18
Location: Bourne Landfill, Rte. 28, Bourne, MA	
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management	
Described by: Thomas A. Peragallo, LEC Environmental Consultants, Inc.	
Time: AM	Weather: Cloudy, 70's
Landform, Landscape Position & Parent Material: Sand storage pile, removed from recently excavated cell (north)	
Slope: 8-70 %	Aspect: north Stoniness: none
Soil Drainage: ED	Soil Classification: Udipsamments (Great Group) Depth to Bedrock: >20'

Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
^C	0-60	Gravelly Coarse Sand (Gr CoS)	2.5Y 5/4	None	20% Gravel, loose, single grain



Landscape Setting



Soil Profile

Soil Profile Description

Observation Hole Number: TP-2			Date: 7-17-18		
Location: Bourne Landfill, Rte. 28, Bourne, MA					
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management					
Described by: Thomas A. Peragallo, LEC Environmental Consultants, Inc.					
Time: AM		Weather: Cloudy, 70's			
Landform, Landscape Position & Parent Material: "Topsoil" storage pile, manufactured on-site from sand and composted yard waste					
Slope: 4-60 %		Aspect: south		Stoniness: none	
Soil Drainage Class: ED		Soil Series: Udipsamments (Great Group) Depth to Bedrock: >25'			
Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
^C1	0-72	Loamy Coarse Sand (LCoS)	10YR 2/3 and 2/3 - mixed	None	10% woody debris 10% gravel, massive, mvfr buried log



Soil Profile

Soil Profile Description

Observation Hole Number: TP-5	Date: 7-17-18
Location: Bourne Landfill, Rte. 28, Bourne, MA	
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management	
Described by: Thomas A. Peragallo, LEC Environmental Consultants, Inc.	
Time: AM	Weather: Cloudy, 70's
Landform, Landscape Position & Parent Material: Fill and non-soil debris overlying glacial fluvial material. On access way at the southern edge of the disturbed area, adjacent to undisturbed forest boundary	
Slope: 4 %	Aspect: south Stoniness: none
Soil Drainage: ED	Soil Classification: Udipsamments (Great Group) Depth to Bedrock: 4'

Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
C^	0-34	Loamy coarse sand (LCoS)	10YR 3/2 (mixed)	None	Massive, mfr 50% foreign debris: tailings, stones, wood, stumps
2C	34-48	Coarse Sand (CoS)	2.5Y 5/4	None	5% gravel, loose, single grain



Soil Profile

Soil Profile Description

Observation Hole Number: TP-6	Date: 7-17-18
Location: Bourne Landfill, Rte. 28, Bourne, MA	
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management	
Described by: Thomas A. Peragallo, LEC Environmental Consultants, Inc.	
Time: AM	Weather: Cloudy, 70's
Landform, Landscape Position & Parent Material: Sandy fill storage pile	
Slope: 40%	Aspect: north Stoniness: none
Soil Drainage: ED	Soil Classification: Udipsamments (Great Group) Depth to Bedrock: >20'

Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
^C1	0-14	Very gravelly loamy sand (VGrLS)	2.5Y 4/4	None	Massive, mfr 25% gravel
^C2	14-60	Coarse Sand & Loamy Sand (CoS &LS)	2.5Y 5/4 & 10YR 5/2	None	massive, mvfr, 10% gravel,



Soil Profile

Soil Profile Description

Observation Hole Number: TP-7	Date: 7-17-18
Location: Bourne Landfill, Rte. 28, Bourne, MA	
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management	
Described by: Thomas A. Peragallo, LEC Environmental Consultants, Inc.	
Time: AM	Weather: Cloudy, 70's
Landform, Landscape Position & Parent Material: Re-graded sandy fill in work area	
Slope: 2%	Aspect: south Stoniness: none
Soil Drainage: ED Soil Classification: Udipsamments (Great Group) Depth to Bedrock: >20'	

Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
^C	0-48	Loamy coarse sand (LCoS)	10YR 3/2	None	Massive, mfr About 25% asphalt, stone, bricks, steel debris



Landscape Setting



Soil Profile

Soil Profile Description

Observation Hole Number: TP-8	Date: 7-17-18
Location: Bourne Landfill, Rte. 28, Bourne, MA	
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management	
Described by: T. A. Peragallo, LEC Environmental Consultants, Inc.	
Time: AM	Weather: Cloudy, 70's
Landform, Landscape Position & Parent Material: Re-graded sandy fill in work area	
Slope: 2%	Aspect: south Stoniness: none
Soil Drainage: ED	Soil Classification: Udipsamments (Great Group) Depth to Bedrock: >20'

Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
^C1	0-32	Loamy coarse sand (LCoS)	10YR 3/2	None	Massive, mfr About 25% asphalt, stone, bricks, steel debris
^C2	32-50	Coarse sand (CoS)	2.5Y 5/4	None	Loose, single grain Refusal-boulder



Soil Profile

Soil Profile Description

Observation Hole Number: TP-12		Date: 7-17-18			
Location: Bourne Landfill, Rte. 28, Bourne, MA					
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management					
Described by: Thomas A. Peragallo, LEC Environmental Consultants, Inc.					
Time: AM		Weather: Cloudy, 70's			
Landform, Landscape Position & Parent Material: Smooth re-graded area between soil storage piles					
Slope: 3 %		Aspect: north		Stoniness: none	
Soil Drainage: ED		Soil Classification: Udipsamments (Great Group)		Depth to Bedrock: N/A	
Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
^C1	0-10	Coarse Sand (CoS)	2.5Y 5/3 and 5/4 - mixed	None	5% cobbles, loose, single grain Extremely cobbly surface
^C2	10-40	Coarse Sand (CoS)	2.5Y 5/4	None	10% Gravel, loose, single grain



Landscape Setting

Soil Profile Description

Observation Hole Number: TP-13	Date: 7-17-18
Location: Bourne Landfill, Rte. 28, Bourne, MA	
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management	
Described by: Thomas A. Peragallo, LEC Environmental, Inc.	
Time: PM	Weather: Cloudy, 70's
Landform, Landscape Position & Parent Material: Re-graded sandy fill in work area (SW corner), overlying glacial fluvial material	
Slope: 3%	Aspect: south Stoniness: none
Soil Drainage: ED	Soil Classification: Udipsamments (Great Group) Depth to Bedrock: >20'

Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
^C1	0-3	Loamy sand (LS)	10YR 4/4	None	Massive, mvfr
^C2	3-20	Loamy coarse sand (LCoS)	10YR 5/4	None	Massive, mvfr
^C3	20-48	Coarse sand (CoS)	2.5Y 5/4	None	Loose, single grain



Landscape Setting



Soil Profile

Soil Profile Description

Observation Hole Number: TP-15	Date: 7-17-18
Location: Bourne Landfill, Rte. 28, Bourne, MA	
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management	
Described by: Thomas A. Peragallo, LEC Environmental Consultants, Inc.	
Time: PM	Weather: Cloudy, 70's
Landform, Landscape Position & Parent Material: Manufactured "topsoil" storage pile (west slope)	
Slope: 70%	Aspect: west Stoniness: none
Soil Drainage: WD-ED	Soil Classification: Udorthents (Great Group) Depth to Bedrock: >20'

Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
^C	0-60	Coarse sandy loam (CoSL) & Loamy sand (LCoS) Mixed	10YR 3/2	None	Massive, mfr



Landscape Setting



Soil Profile

Soil Profile Description

Observation Hole Number: TP-16	Date: 7-17-18
Location: Bourne Landfill, Rte. 28, Bourne, MA	
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management	
Described by: Thomas A. Peragallo, LEC Environmental Consultants, Inc.	
Time: PM	Weather: Cloudy, 70's
Landform, Landscape Position & Parent Material: Aeolian material, along the western boundary of the landfill, east of Route 28. Natural soil in forested area.	
Slope: 2 %	Aspect: south Stoniness: none
Soil Drainage Class: WD	Soil Classification: Barnstable (Series) Depth to Bedrock: >4'

Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
A	0-3	Very fine sandy loam (VFSL)	10YR 3/2	None	wfgr, mvfr, CS
E	3-5	Loamy very fine sand (LVFS)	10YR 5/3	None	Massive, mvfr, CS
Bw	5-30	Very fine sandy loam (VFSL)	10YR 5/6	None	1mbsk, mfr, GW
C	30-40+	Very fine sandy loam (VFSL)	10YR 5/4	None	Massive, mvfr



Landscape Setting

Soil Profile Description

Observation Hole Number: TP-19	Date: 7-17-18
Location: Bourne Landfill, Rte. 28, Bourne, MA	
Requested by: SITEC Environmental, Inc. & Bourne Dept. of Integrated Solid Waste Management	
Described by: Thomas A. Peragallo, LEC Environmental, Inc.	
Time: PM	Weather: Cloudy, 70's
Landform, Landscape Position & Parent Material: Aeolian material overlying glacial fluvial material, along the western boundary of the landfill, east of Route 28. Natural soil in forested area.	
Slope: 4 %	Aspect: south Stoniness: stony - 50' apart
Soil Drainage Class: WD	Soil Classification: Barnstable (Series) Depth to Bedrock: >4'

Horizon	Depth (inches)	Soil Texture	Moist Color	Redoximorphic Features	Other Features (structure, consist.)
Oe	2-0	Mpt	10YR 2/2	None	Hemic
A	0-1	Loamy sand (LS)	10YR 2/2	None	Massive, mvfr, CS
E	1-2	Loamy sand (LS)	2.5Y 5/3	None	Loose, single grain, CS
Bs	2-20	Very fine sandy loam (VFSL)	7.5YR 4/6	None	1msbk, mfr, GW
Bw	20-23	Sandy loam (SL)	10YR 4/6	None	Massive, mfr, CW
2C	23-40+	Medium & Coarse sand (MS & CoS)	2.5Y 4/6	None	Loose, single grain



Soil Profile

Appendix B

Detailed Soil Profile Description Locations

Detailed Soil Profile Description Locations



Appendix C

Site Specific Soil Survey Map



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Barnstable County, Massachusetts**

**Town of Bourne, ISWM
Department**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

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individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

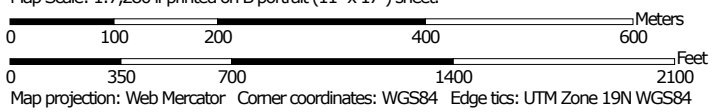
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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Soil Map




Map Scale: 1:7,280 if printed on B portrait (11" x 17") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84


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 1:25,000.

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: Barnstable County, Massachusetts
 Survey Area Data: Version 12, Sep 28, 2015

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

Date(s) aerial images were photographed: Mar 30, 2011—Oct 8, 2011

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

Barnstable County, Massachusetts (MA001)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	1.9	0.4%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	20.8	4.3%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	33.4	7.0%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	4.5	0.9%
430B	Barnstable sandy loam, 3 to 8 percent slopes	31.5	6.6%
430C	Barnstable sandy loam, 8 to 15 percent slopes	9.4	2.0%
431B	Barnstable sandy loam, 3 to 8 percent slopes, very stony	72.2	15.1%
431C	Barnstable sandy loam, 8 to 15 percent slopes, very stony	42.5	8.9%
431D	Barnstable sandy loam, 15 to 25 percent slopes, very stony	6.8	1.4%
435B	Plymouth loamy coarse sand, 3 to 8 percent slopes	100.4	21.0%
435C	Plymouth loamy coarse sand, 8 to 15 percent slopes	11.3	2.4%
435D	Plymouth loamy coarse sand, 15 to 35 percent slopes	25.7	5.4%
483C	Plymouth-Barnstable complex, rolling, very bouldery	0.8	0.2%
484C	Plymouth-Barnstable complex, rolling, extremely bouldery	24.1	5.0%
484D	Plymouth-Barnstable complex, hilly, extremely bouldery	34.7	7.3%
600	Pits, sand and gravel	15.6	3.3%
652	Dumps, landfill	29.3	6.1%
665	Udipsamments, smoothed	13.2	2.8%
Totals for Area of Interest		478.1	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

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A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

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An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Barnstable County, Massachusetts

1—Water

Map Unit Setting

National map unit symbol: 98s8
Frost-free period: 120 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

254A—Merrimac fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tyqr
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Kames, outwash plains, outwash terraces, moraines, eskers
Landform position (two-dimensional): Summit, shoulder, footslope, backslope
Landform position (three-dimensional): Crest, side slope, tread, riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low

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Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 1.0

Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Minor Components

Sudbury

Percent of map unit: 5 percent

Landform: Terraces, outwash plains, deltas

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread, dip

Down-slope shape: Concave

Across-slope shape: Linear

Hinckley

Percent of map unit: 5 percent

Landform: Deltas, kames, eskers, outwash plains

Landform position (two-dimensional): Backslope, shoulder, summit

Landform position (three-dimensional): Head slope, crest, side slope, nose slope, rise

Down-slope shape: Convex

Across-slope shape: Convex, linear

Agawam

Percent of map unit: 3 percent

Landform: Eskers, kames, stream terraces, outwash terraces, outwash plains, moraines

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Convex

Windsor

Percent of map unit: 2 percent

Landform: Dunes, deltas, outwash terraces, outwash plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread, riser

Down-slope shape: Convex, linear

Across-slope shape: Convex, linear

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash terraces, moraines, eskers, kames, outwash plains
Landform position (two-dimensional): Shoulder, summit, footslope, backslope
Landform position (three-dimensional): Crest, side slope, tread, riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

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Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear

Hinckley

Percent of map unit: 5 percent
Landform: Eskers, outwash plains, deltas, kames
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Head slope, crest, side slope, nose slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear

Windsor

Percent of map unit: 3 percent
Landform: Deltas, outwash plains, outwash terraces, dunes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Agawam

Percent of map unit: 2 percent
Landform: Eskers, kames, outwash plains, outwash terraces, moraines, stream terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
Elevation: 0 to 1,030 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent

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Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Eskers, outwash plains, moraines, kames, outwash terraces

Landform position (two-dimensional): Footslope, backslope, shoulder, summit

Landform position (three-dimensional): Side slope, crest, tread, riser

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam

Bw1 - 10 to 22 inches: fine sandy loam

Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand

2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 1.0

Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Minor Components

Hinckley

Percent of map unit: 5 percent

Landform: Deltas, kames, eskers, outwash plains

Landform position (two-dimensional): Backslope, shoulder, summit

Landform position (three-dimensional): Head slope, crest, side slope, nose slope, rise

Down-slope shape: Convex

Across-slope shape: Convex, linear

Sudbury

Percent of map unit: 5 percent

Landform: Outwash plains, deltas, terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread, dip

Down-slope shape: Concave

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Across-slope shape: Linear

Windsor

Percent of map unit: 5 percent

Landform: Outwash plains, dunes, deltas, outwash terraces

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Tread, riser

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

430B—Barnstable sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 98ps

Elevation: 0 to 1,000 feet

Mean annual precipitation: 40 to 50 inches

Mean annual air temperature: 48 to 54 degrees F

Frost-free period: 160 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Barnstable and similar soils: 75 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barnstable

Setting

Landform: Ground moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Friable loamy ablation till over reworked sandy glaciofluvial deposits

Typical profile

H1 - 0 to 1 inches: sandy loam

H2 - 1 to 23 inches: sandy loam

H3 - 23 to 64 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Minor Components

Plymouth

Percent of map unit: 8 percent

Nantucket

Percent of map unit: 7 percent

Merrimac

Percent of map unit: 5 percent

Carver

Percent of map unit: 5 percent

430C—Barnstable sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 98pt

Elevation: 0 to 1,000 feet

Mean annual precipitation: 40 to 50 inches

Mean annual air temperature: 48 to 54 degrees F

Frost-free period: 160 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Barnstable and similar soils: 70 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barnstable

Setting

Landform: Ground moraines

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Friable loamy ablation till over reworked sandy glaciofluvial deposits; loamy ablation till over reworked sandy outwash

Typical profile

H1 - 0 to 1 inches: sandy loam

H2 - 1 to 23 inches: sandy loam

H3 - 23 to 64 inches: coarse sand

Properties and qualities

Slope: 8 to 15 percent

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Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Minor Components

Nantucket

Percent of map unit: 10 percent

Plymouth

Percent of map unit: 10 percent

Carver

Percent of map unit: 5 percent

Merrimac

Percent of map unit: 5 percent

431B—Barnstable sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 98pv
Elevation: 0 to 1,000 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Barnstable and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barnstable

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Custom Soil Resource Report

Parent material: Friable loamy ablation till over reworked sandy glaciofluvial deposits; loamy ablation till over reworked sandy outwash

Typical profile

H1 - 0 to 1 inches: sandy loam
H2 - 1 to 23 inches: sandy loam
H3 - 23 to 64 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 2.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Plymouth

Percent of map unit: 10 percent

Nantucket

Percent of map unit: 8 percent

Carver

Percent of map unit: 7 percent

431C—Barnstable sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 98pw
Elevation: 0 to 1,000 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Barnstable and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barnstable

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy ablation till over reworked sandy glaciofluvial deposits; loamy ablation till over reworked sandy outwash

Typical profile

H1 - 0 to 1 inches: sandy loam
H2 - 1 to 23 inches: sandy loam
H3 - 23 to 64 inches: coarse sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 2.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Nantucket

Percent of map unit: 10 percent

Plymouth

Percent of map unit: 10 percent

Carver

Percent of map unit: 10 percent

431D—Barnstable sandy loam, 15 to 25 percent slopes, very stony

Map Unit Setting

National map unit symbol: 98px
Elevation: 0 to 1,000 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 45 to 55 degrees F

Custom Soil Resource Report

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Barnstable and similar soils: 65 percent

Minor components: 35 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barnstable

Setting

Landform: Ground moraines

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Friable loamy ablation till over reworked sandy glaciofluvial deposits; loamy ablation till over reworked sandy outwash

Typical profile

H1 - 0 to 1 inches: sandy loam

H2 - 1 to 23 inches: sandy loam

H3 - 23 to 64 inches: coarse sand

Properties and qualities

Slope: 15 to 25 percent

Percent of area covered with surface fragments: 2.0 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Minor Components

Plymouth

Percent of map unit: 10 percent

Nantucket

Percent of map unit: 9 percent

Carver

Percent of map unit: 8 percent

Hinckley

Percent of map unit: 8 percent

435B—Plymouth loamy coarse sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 98rs
Elevation: 0 to 1,000 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Plymouth and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plymouth

Setting

Landform: Outwash plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits and/or loose sandy ablation till; loose sandy ablation till and/or loose sandy glaciofluvial deposits; loose sandy ablation till and/or loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 3 inches: loamy coarse sand
H2 - 3 to 29 inches: gravelly loamy coarse sand
H3 - 29 to 64 inches: gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A

Minor Components

Hinckley

Percent of map unit: 8 percent

Carver

Percent of map unit: 8 percent

Barnstable

Percent of map unit: 6 percent

Nantucket

Percent of map unit: 6 percent

Merrimac

Percent of map unit: 2 percent

435C—Plymouth loamy coarse sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 98rt

Elevation: 0 to 1,000 feet

Mean annual precipitation: 35 to 50 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Plymouth and similar soils: 65 percent

Minor components: 35 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plymouth

Setting

Landform: Ice-contact slopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Convex

*Parent material: Loose sandy glaciofluvial deposits and/or loose sandy ablation till;
loose sandy ablation till and/or loose sandy glaciofluvial deposits*

Typical profile

H1 - 0 to 3 inches: loamy coarse sand

H2 - 3 to 29 inches: gravelly loamy coarse sand

H3 - 29 to 64 inches: gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Custom Soil Resource Report

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: A

Minor Components

Carver

Percent of map unit: 15 percent

Hinckley

Percent of map unit: 8 percent

Barnstable

Percent of map unit: 6 percent

Nantucket

Percent of map unit: 6 percent

435D—Plymouth loamy coarse sand, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 98rv

Elevation: 0 to 1,000 feet

Mean annual precipitation: 35 to 50 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Plymouth and similar soils: 65 percent

Minor components: 35 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plymouth

Setting

Landform: Ice-contact slopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Loose sandy glaciofluvial deposits and/or loose sandy ablation till;
loose sandy glaciofluvial deposits and/or loose sandy ablation till

Custom Soil Resource Report

Typical profile

H1 - 0 to 3 inches: loamy coarse sand
H2 - 3 to 29 inches: gravelly loamy coarse sand
H3 - 29 to 64 inches: gravelly coarse sand

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Minor Components

Carver

Percent of map unit: 15 percent

Hinckley

Percent of map unit: 10 percent

Barnstable

Percent of map unit: 5 percent

Nantucket

Percent of map unit: 5 percent

483C—Plymouth-Barnstable complex, rolling, very bouldery

Map Unit Setting

National map unit symbol: 98rz
Elevation: 0 to 1,000 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Plymouth and similar soils: 55 percent
Barnstable and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plymouth

Setting

Landform: Moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loose sandy glaciofluvial deposits and/or loose sandy ablation till;
loose sandy glaciofluvial deposits and/or loose sandy ablation till

Typical profile

H1 - 0 to 3 inches: loamy coarse sand

H2 - 3 to 29 inches: gravelly loamy coarse sand

H3 - 29 to 64 inches: gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 2.0 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00
to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Description of Barnstable

Setting

Landform: Moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Friable loamy ablation till over reworked sandy glaciofluvial
deposits; loamy ablation till over reworked sandy outwash

Typical profile

H1 - 0 to 1 inches: sandy loam

H2 - 1 to 23 inches: sandy loam

H3 - 23 to 64 inches: coarse sand

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 1.6 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Custom Soil Resource Report

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Carver

Percent of map unit: 10 percent

Hinckley

Percent of map unit: 10 percent

Nantucket

Percent of map unit: 5 percent

484C—Plymouth-Barnstable complex, rolling, extremely bouldery

Map Unit Setting

National map unit symbol: 98s1
Elevation: 0 to 1,000 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Plymouth and similar soils: 55 percent
Barnstable and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plymouth

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits and/or loose sandy ablation till;
loose sandy glaciofluvial deposits and/or loose sandy ablation till

Typical profile

H1 - 0 to 3 inches: loamy coarse sand
H2 - 3 to 29 inches: gravelly loamy coarse sand

Custom Soil Resource Report

H3 - 29 to 64 inches: gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 9.0 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Description of Barnstable

Setting

Landform: Moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Friable loamy ablation till over reworked sandy glaciofluvial deposits; loamy ablation till over reworked sandy outwash

Typical profile

H1 - 0 to 1 inches: sandy loam

H2 - 1 to 23 inches: sandy loam

H3 - 23 to 64 inches: coarse sand

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 9.0 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Minor Components

Carver

Percent of map unit: 10 percent

Hinckley

Percent of map unit: 10 percent

Nantucket

Percent of map unit: 5 percent

484D—Plymouth-Barnstable complex, hilly, extremely bouldery

Map Unit Setting

National map unit symbol: 98s2

Elevation: 0 to 1,000 feet

Mean annual precipitation: 40 to 50 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Plymouth and similar soils: 55 percent

Barnstable and similar soils: 20 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plymouth

Setting

Landform: Moraines

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Convex

*Parent material: Loose sandy glaciofluvial deposits and/or loose sandy ablation till;
loose sandy glaciofluvial deposits and/or loose sandy ablation till*

Typical profile

H1 - 0 to 3 inches: loamy coarse sand

H2 - 3 to 29 inches: gravelly loamy coarse sand

H3 - 29 to 64 inches: gravelly coarse sand

Properties and qualities

Slope: 15 to 25 percent

Percent of area covered with surface fragments: 9.0 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Runoff class: Very high

*Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00
to 20.00 in/hr)*

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Custom Soil Resource Report

Available water storage in profile: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Description of Barnstable

Setting

Landform: Moraines

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Friable loamy ablation till over reworked sandy glaciofluvial deposits; loamy ablation till over reworked sandy outwash

Typical profile

H1 - 0 to 1 inches: sandy loam

H2 - 1 to 23 inches: sandy loam

H3 - 23 to 64 inches: coarse sand

Properties and qualities

Slope: 15 to 25 percent

Percent of area covered with surface fragments: 9.0 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Minor Components

Nantucket

Percent of map unit: 10 percent

Hinckley

Percent of map unit: 5 percent

Carver

Percent of map unit: 5 percent

Merrimac

Percent of map unit: 5 percent

600—Pits, sand and gravel

Map Unit Setting

National map unit symbol: 98rq
Frost-free period: 120 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Parent material: Loose sandy and gravelly glaciofluvial deposits

652—Dumps, landfill

Map Unit Setting

National map unit symbol: 98qm
Frost-free period: 120 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Dumps: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

665—Udipsamments, smoothed

Map Unit Setting

National map unit symbol: 98s6
Mean annual precipitation: 41 to 48 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udipsamments and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udipsamments

Setting

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy excavated or filled land

Properties and qualities

Depth to restrictive feature: More than 80 inches

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

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Attachment G – Wildlife Observations

Attachment G - Wildlife Observations

Bourne ISWM, Map 32, Lot 5, Bourne, MA

Common Name	Scientific Name	HABITAT TYPE
		Pitch Pine/ Mixed Oak Forest
<u>Birds</u>		
American crow	<i>Corvus brachyrhynchos</i>	x
American goldfinch	<i>Carduelis tristis</i>	x
American robin	<i>Turdus migratorius</i>	x
Baltimore Oriole	<i>Icterus galbula</i>	x
Black-capped chickadee	<i>Cyanocitta cristata</i>	x
Blue Jay	<i>Parus atricapillus</i>	x
Brown-headed Cowbird	<i>Molothrus ater</i>	x
Canada goose	<i>Branta canadensis</i>	o
Carolina wren	<i>Thryothorus ludovicianus</i>	o
Catbird	<i>Dumetella carolinensis</i>	x
Chipping sparrow	<i>Spizella passerina</i>	x
Common Grackle	<i>Quiscalus quiscula</i>	x
Common Yellowthroat	<i>Geothlypis trichas</i>	x
Dark-eyed junco	<i>Junco hyemalis</i>	x
Downy woodpecker	<i>Picoides pubescens</i>	x
Eastern towhee	<i>Pipilo erythrophthalmus</i>	x
Eastern wood-pewee	<i>Contopus virens</i>	x
Field Sparrow	<i>Spizella pusilla</i>	x
Hairy woodpecker	<i>Picoides villosus</i>	x
Herring Gull	<i>Larus argentatus</i>	x
House Wren	<i>Troglodytes aedon</i>	x
Great Blue Heron	<i>Ardea herodias</i>	x
Morning dove	<i>Zenaida macroura</i>	o
Northern cardinal	<i>Cardinalis cardinalis</i>	x
Northern flicker	<i>Colaptes auratus</i>	x
Ovenbird	<i>Seiurus aurocapilla</i>	x
Pine warbler	<i>Dendroica pinus</i>	x
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	o
Red-breasted Nuthatch	<i>Sitta canadensis</i>	x
Red-winged blackbird	<i>Agelaius phoeniceus</i>	o
Song sparrow	<i>Melospiza melodia</i>	x
Tufted titmouse	<i>Parus bicolor</i>	x
Turkey Vulture	<i>Cathartes aura</i>	x
Wild Turkey	<i>Meleagris gallopavo</i>	x
White-breasted nuthatch	<i>Sitta carolinensis</i>	x
Wood Thrush	<i>Hylocichla mustelina</i>	x
<u>Mammals</u>		
White-tailed deer	<i>Odocoileus virginianus</i>	x
Common raccoon	<i>Procyon lotor</i>	o
Eastern gray squirrel	<i>Sciurus carolinensis</i>	x
Northern short-tailed Shrew	<i>Blarina brevicauda</i>	o
Eastern Chipmunk	<i>Tamias striatus</i>	o
Virginia Opossum	<i>Didelphis virginiana</i>	o
Woodland Vole	<i>Microtus pinetorum</i>	o
Rabbit	<i>Sylvilagus sp.</i>	x
Grey Fox	<i>Urocyon cinereoargenteus</i>	x
Striped skunk	<i>Mephitis mephitis</i>	o
Fisher	<i>Martes pennanti</i>	o
Coyote	<i>Canis latrans</i>	x
<u>Reptiles/Amphibians</u>		
Eastern Box Turtle	<i>Terrapene carolina</i>	o
Eastern Red-backed Salamander	<i>Plethodon cinereus</i>	o
Eastern Racer	<i>Coluber constrictor</i>	o
Eastern Ribbon Snake	<i>Thamnophis sauritus</i>	o
Gray Tree Frog	<i>Hyla versicolor</i>	x
Common Garter Snake	<i>Thamnophis sirtalis</i>	o
Key		
x = species observed or heard during site visits		
o = species anticipated to occur, or with the potential to occur, in habitat		

Attachment H – Conservation Commission Correspondence



TOWN OF BOURNE CONSERVATION COMMISSION

24 Perry Avenue
Buzzards Bay, MA 02532



April 21, 2021

Re: ISWM facility Development of Regional Impact (DRI) application

Dear members of the Cape Cod Commission,

In 2016 the Town purchased approximately 12 acres of land adjacent to the existing site assigned parcel at the southern end of the ISWM facility, expressly for the purpose of facilitating future development at the site which would maximize landfill capacity and provide an area to relocate displaced facilities such as solid waste transfer operations, offices and maintenance facilities.

Natural Heritage and Endangered Species Program (NHESP) has designated the parcel as priority habitat (14th Edition Natural Heritage Atlas, August 1, 2017) for the Eastern Box turtle (*Terrapene carolina*). Subsequently, the Cape Cod Commission updated its Regional Policy Plan which characterized the parcel as a Natural Area Placetype.

The staff at the ISWM Department (ISWM) reached out to the Bourne Conservation Department to assist them in locating a suitable parcel or parcels that would meet NHESP land mitigation requirements. A review of existing town-land revealed no suitable parcels which met these requirements. Finding such a parcel that does not already have an existing conservation restriction on it and an owner that does not have development plans or is willing to sell, has been a challenge. After an extensive search the Town identified a 17-acre parcel (subsequently divided into two lots) south of the facility on Route 28 in Bourne that if put into the care and custody of the Conservation Commission, would further expand a mosaic of town-owned open space and meet the NHESP mitigation requirements. Both the Conservation Department and NHESP staff agree that this land is ideal for conserving habitat for the state listed turtle.

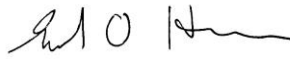
Town meeting has authorized ISWM funds for the purchase of the two lots and the owners have positively responded to a Request for Proposals (RFP) looking for suitable land. The Town is in the process of awarding the procurement to these owners and completing the sale. ISWM has also consulted the Bourne Conservation Commission at a public meeting and the Commission was supportive of the process.

This department has further reviewed the inventory of unrestricted town-owned land that could be utilized to meet the RPP Open Space requirement of three to one mitigation, however, the Town has very little undeveloped public land and what land the town does have is generally earmarked future development by the Town.

I am aware that ISWM is proposing a waiver under Section 9 of the RPP that would reduce the Open Space requirement by fifty percent to match the ratio established by NHESP. I have no objection to this waiver request given the high quality of the proposed mitigation land, its location in an area that would connect already protected town-owned land creating a valuable wildlife corridor, the efforts of ISWM to find parcels in trying to meet changing regulatory requirements and the fact that as ISWM closes areas of the landfill, new minimally managed grasslands are being created. Eventually, this area will total several dozen acres as shown in a figure in the application.

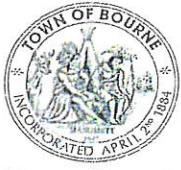
Please contact me if you have any questions.

Sincerely,

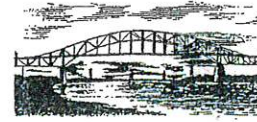
A handwritten signature in black ink, appearing to read 'S O Haines', with a stylized flourish at the end.

Samuel O. Haines
Bourne Conservation Agent
shaines@townofbourne.com
508.759.0600 x1344

Attachment I – Special Town Warrant Articles



Town Clerk
24 Perry Avenue
Buzzards Bay, MA 02532
(508) 759-0600 Ext 1505



Barry H. Johnson
Town Clerk

Wendy J. Chapman
Asst. Town Clerk

At a legal meeting of Town of Bourne held October 28, 2019, a quorum being present, the following business was transacted under Article 15:

ARTICLE 15: To see if the Town will vote to authorize the Board of Selectmen to acquire by purchase or gift, a parcel of land in the Town of Bourne shown as Lot 1 on the plan recorded in the Barnstable County Registry of Deeds in Plan Book 675, Page 72 entitled "Plan on Land of Assessor's Map 52, Parcel 41, MacArthur Boulevard, Bourne, MA prepared for Flyover Nominee Trust, Prepared by Green Seal Environmental, Inc. Scale 1"=80', dated May 30, 2018", a copy of which is on file at the Office of the Town Clerk, consisting of approximately 11 acres in total, owned by Mac Hunter, LLC, and designated by Bourne Assessors Map 52, Parcel 41, for conservation and wildlife habitat protection under the provisions of M.G.L. Ch. 40, and Article 97 of the Articles of Amendment of the Massachusetts Constitution, and for mitigation purposes for the Town of Bourne, Department of Integrated Solid Waste Management Facility, with the care, custody, control and management of such parcel to be vested with the Bourne Conservation Commission, pursuant to M.G.L. Chapter 40, Section 8C, and to appropriate or transfer available funds from the Integrated Solid Waste Management Enterprise Fund retained earnings, or borrow a sum of money, for the purposes of this article, and, if necessary, to authorize the Bourne Board of Selectmen and Bourne Conservation Commission to grant a qualified organization a perpetual conservation restriction pursuant to the provisions of M.G.L. Chapter 184, Sections 31-33, protecting the property for the purposes for which it is acquired, or act on anything in relation thereto.

Sponsor – Board of Selectmen

MOTION: We move that the Town vote to authorize the Board of Selectmen to acquire by purchase or gift, a parcel of land in the Town of Bourne shown as Lot 1 on the plan recorded in the Barnstable County Registry of Deeds in Plan Book 675, Page 72 and on file at the Office of the Bourne Town Clerk, entitled "Plan on Land of Assessor's Map 52, Parcel 41, MacArthur Boulevard, Bourne, MA prepared for Flyover Nominee Trust, Prepared by Green Seal Environmental, Inc. Scale 1"=80', dated May 30, 2018", consisting of approximately 11 acres in total, owned by Mac Hunter, LLC, and designated by Bourne Assessors Map 52, Parcel 41, for conservation and wildlife habitat protection under the provisions of M.G.L. Ch. 40, Section 8C, and Article 97 of the Articles of Amendment of the Massachusetts Constitution, and for mitigation purposes for the Town of Bourne, Department of Integrated Solid Waste Management Facility, with the care, custody, control and management of such parcel to be vested with the Bourne Conservation Commission, on terms and conditions deemed by the Selectmen to be in the best interest of the Town, and to appropriate or transfer from available funds from the Integrated Solid Waste Management Enterprise Fund retained earnings, or borrow a sum of money, not to exceed the appraised value of \$175,000.00, for the purposes of this article and if necessary, to authorize the Bourne Board of Selectmen and Bourne Conservation Commission to grant to a qualified organization a perpetual conservation restriction pursuant to the provisions of M.G.L. Chapter 184, Sections 31-33, protecting the property for the purposes for which it is acquired.

Voted: Ayes 684; Nays 62, Declared a 2/3rd vote, Motion Passes

A true copy,
Attest:

Barry H. Johnson
Barry H. Johnson
Town Clerk



Town Clerk,
24 Perry Avenue
Buzzards Bay, MA 02532
(508) 759-0600 Ext 1505



Barry H. Johnson
Town Clerk

Wendy J. Chapman
Asst. Town Clerk

At a legal meeting of the Town of Bourne held October 28, 2019, a quorum being present, the following business was transacted under Article 16:

ARTICLE 16: To see if the Town will vote to authorize the Board of Selectmen to acquire by purchase or gift a parcel of land in the Town of Bourne shown as Lot 2 on the plan recorded in the Barnstable County Registry of Deeds in Plan Book 675, Page 72 entitled "Plan of Land of Assessor's Map 52, Parcel 41, MacArthur Boulevard, Bourne, MA prepared for Flyover Nominee Trust, Prepared by Green Seal Environmental, Inc., Scale 1"=80', dated May 30, 2018," a copy of which is on file at Office of The Town Clerk, consisting of approximately 6.5 acres, owned by Flyover Nominee Trust, Kathryn L. Harding Trustee, and designated by Bourne Assessors Map 52, Parcel 96, for conservation and wildlife habitat protection under the provisions of M.G.L. Ch. 40, and Article 97 of the Articles of Amendment of the Massachusetts Constitution, and for mitigation purposes for the Town of Bourne, Department of Integrated Solid Waste Management Facility, with the care, custody, control and management of such parcel to be vested with the Bourne Conservation Commission, pursuant to M.G.L. Chapter 40, Section 8C, and to appropriate or transfer from funds from the Integrated Solid Waste Management Enterprise Fund retained earnings, or borrow a sum of money, for the purposes of this article, and, if necessary, to authorize the Bourne Board of Selectmen and Bourne Conservation Commission to grant to a qualified organization a perpetual conservation restriction pursuant to the provisions of M.G.L. Ch. 184, Sections 31-33, protecting the property for the purposes for which it is acquired, or act on anything in relation thereto.

Sponsor – Board of Selectmen

MOTION: We move that the Town vote to authorize the Board of Selectmen to acquire by purchase or gift a parcel of land in the Town of Bourne shown as Lot 2 on the plan recorded in the Barnstable County Registry of Deeds in Plan Book 675, Page 72, and on file at the office of the Bourne Town Clerk entitled "Plan of Land of Assessor's Map 52, Parcel 41, MacArthur Boulevard, Bourne, MA prepared for Flyover Nominee Trust prepared by Green Seal Environmental, Inc. Scale 1" = 80', dated May 30, 2018", consisting of approximately 6.5 acres, owned by Flyover Nominee Trust, Kathryn L. Harding Trustee, and designated by Bourne Assessors Map 52, Parcel 96, for conservation and wildlife habitat protection under the provision of M.G.L. Ch. 40, Section 8C, and Article 97 of the Articles of the Amendment of the Massachusetts Constitution, and for mitigation purposes for the Town of Bourne, Department of Integrated Solid Waste Management Facility, with the care, custody, control and management of such parcel to be vested with the Bourne Conservation Commission, on the terms and conditions deemed by the Selectmen to be in the best interest of the Town, and to raise, appropriate or transfer from the Integrated Solid Waste Management Enterprise Fund retained earnings, or borrow a sum of money, not to exceed the appraised value of \$105,000.00, for the purposes of this article, and, if necessary, to authorize the Bourne Board of Selectmen and Bourne Conservation Commission to grant to a qualified organization a perpetual conservation restriction pursuant to the provisions of M.G.L. Chapter 184, Sections 31-33, protecting the property for the purposes for which it is acquired.

Voted : Ayes 595, Nays 60, Declared a 2/3rd vote, Motion Passes

A true copy,

Attest:

Barry H. Johnson

Barry H. Johnson
Town Clerk



Barry H. Johnson
Town Clerk

Town Clerk
24 Perry Avenue
Buzzards Bay, MA 02532
(508) 759-0600 Ext 1505



Wendy J. Chapman
Asst. Town Clerk

At a legal meeting of the Town of Bourne held November 16, 2020, a quorum being present the following business was transacted under Article 11:

ARTICLE 11: To see if the Town will vote to transfer from available funds a sum of money for the purpose of funding an amendment to ***Article 16*** voted at the October 28, 2019 Special Town Meeting authorizing the Board of Selectmen to acquire by purchase or gift a certain ***6.5 acre parcel of land in the Town of Bourne designated on Bourne Assessors Map 52, Parcel 96, on file at the office of the Town Clerk,*** or take any other action in relation thereto: Sponsor – Board of Selectmen

MOTION: *We move that the Town vote to appropriate the sum of \$25,000 for the purposes of this Article and to meet this appropriation to transfer the sum of \$25,000 from the ISWM Enterprise Fund Retained Earnings.*

Voted: Ayes have it, motion passes, declared and unanimous vote

A true copy,

Attest:

Wendy J. Chapman
Wendy J. Chapman
Asst., Town Clerk

Attachment J – Mitigation Parcel Baseline Report and Plan

Conservation Restriction Baseline Assessment

MacArthur Boulevard, Bourne, MA
Assessor's Map 52, Parcel 041.00

INTRODUCTION AND OVERVIEW

The Town of Bourne Department of Integrated Solid Waste Management (ISWM) proposes a planned expansion of the existing Integrated Solid Waste Management Facilities within a ~11.7-acre parcel to the south of the existing facility. The proposed expansion includes relocating the residential recycling area, residential transfer station, a future sedimentation basin area, brush and composing area and an office building.

The entire ISWM parcel is mapped as *Priority Habitat of Rare Species* (PH 490), and activities proposed at the site will require review and permitting by Massachusetts Division of Fisheries & Wildlife, the Massachusetts Natural Heritage and Endangered Species Program (NHESP). As the 11.7-acre parcel is mapped as habitat for the Eastern Box Turtle (*Terrapene carolina*), its alteration will require the filing of a Conservation and Management Permit application with NHESP, and the provision of mitigation to off-set impacts to state-listed species habitat. In accordance with the MESA regulations at 321 CMR 10.23(7)(a)3., the mitigation ratio for a state-listed Species of Special Concern is 1.5:1. The Town has identified a 17.8 acre parcel located nearby that is also mapped within the same Priority Habitat area. ISWM is investigating this as potential mitigation for the alteration of the ISWM land.

Horsley Witten Group, Inc. (HW) was retained by the Town (ISWM) to conduct a baseline inventory of the natural resources on the undeveloped parcel located south of the proposed project site that will serve as mitigation for developing the 11.7-acre parcel. Through the Town of Bourne, ISWM is pursuing a conservation restriction (CR) for this mitigation parcel.

This report provides a brief site overview; describes the soils, plant communities, and wildlife habitat present within the site; and discusses the potential for this site to provide wildlife habitat as mitigation for the expansion of the ISWM facility. Based on our assessments, HW believes that this parcel would provide suitable habitat to mitigate for the development of the ISWM parcel.

SITE VISIT

HW field ecologists conducted a site visit on April 10, 2018, accompanied by Mr. Phil Goddard, Manager of Facility Compliance and Technology Development for ISWM, and Mr. Mark Robinson, Executive Director of The Compact of Cape Cod Conservation Trusts, Inc., who will assist the Town with the preparation of the CR documentation.

Prior to conducting the field assessment, HW reviewed existing source data, including USGS topographic map, Massachusetts Natural Heritage and Endangered Species Program (NHESP) Natural Heritage Atlas and common and rare species lists, the USDA Natural Resources Conservation Service (NRCS) Soils Survey for Barnstable County, MA, and available source data from the Massachusetts Geographic Information Service (MassGIS) to identify the presence of natural resources within the project area.

For the purpose of an existing conditions assessment, HW generally followed the requirements for providing a Natural Resources Inventory (NRI) in accordance with the guidelines developed by the Cape Cod Commission in Technical Bulletin 92-002 entitled *Development of Regional Impact Guidelines for Natural Resources Inventory (Plant and Wildlife Habitat Assessment)*. During our initial site visit, we were able to find two of the four property boundaries that were later confirmed to be associated with the parcel directly to the north of the intended CR Site. Mr. Mark Robinson returned to the general area later and located the bounds for the CR Parcel, and confirmed that the group had traversed a portion of both properties at the initial site visit, and further confirmed that the site characteristics, plant communities and habitat are similar at both. Photos and site maps included with this report are from the intended CR Site.

EXISTING CONDITIONS

The proposed CR site at 0 MacArthur Boulevard is on a 17.8 acre rectangle lot located along the east side of MacArthur Boulevard (Route 28) (latitude: 41° 40' 05.5" N; longitude: -70° 35' 52.9" W) (Figures 1 and 2). According to the Plan of Land, the parcel is Lot 41 from plan book 593, page 85, with 17.8 acres, dated October 21, 1982. The property is defined by the Bourne Assessors Department as Map 52 Parcel 5 and is within a Zone II and the Residential 40 (R40) zoning district under the Bourne Zoning Bylaw. The parcel is an undeveloped wooded lot with a plant community indicative of a typical Cape Cod pine/oak forest habitat. The terrain is very hilly with depressions and steep slopes rising to a mid-parcel ridgeline. Several large and small boulders and glacial erratics are dispersed throughout the site.

The CR Site directly abuts undeveloped forested parcels to the north, east, and south. The parcel to the east is the Federal Regional National Cemetery, on the Joint Base Cape Cod (BJCC). An approximately 200-foot wide strip of forested land buffers this parcel from the northbound lane of Route 28 (MacArthur Blvd) to the west.

The parcel is depicted on the "Plan of Land" as Lot 41 from plan book 593, page 85, with 17.8 acres, dated October 21, 1982. Three of the four bounds were located and their GIS coordinates documented by Mark Robinson (Figure 6). Additionally, a Massachusetts Highway Bound (MHB) was found between the two bike trails that ran roughly parallel to Route 28 on the western edge of the property.

No encroachments were noted, however there was evidence of current land use activities, namely well-established pathways that are likely used by mountain bikers and hikers.



Photo 1. Aerial image of parcel and surrounding land (Google Earth). Yellow box is approximate location of the parcel proposed for conservation restriction.

Plant Community

The site is generally forested, undeveloped, and undisturbed (Photos 1 & 2). The predominant terrestrial plant community type is Pitch Pine – Oak Forest/Woodland, a widespread plant community in southeastern Massachusetts (Swain 2016). The tree canopy is primarily composed of pitch pine (*Pinus rigida*) and eastern white pine (*Pinus strobus*), white oak (*Quercus alba*), and black oak (*Quercus velutina*). Less commonly observed trees species include American holly (*Ilex opaca*). Trees are generally between seven and twelve inches in diameter at breast height, and the canopy provides nearly complete cover across the site. There are numerous standing snags, fallen dead trees, and occasional boulders and erratics, with some evidence of past land-use activity (i.e., cart paths or informal paths).



Photo 2 and 3. Typical Pitch Pine-Oak Forest/Woodland plant community at the proposed CR site. Example of large boulder near ridgeline on right.

The patchy understory ranges from densely vegetated to sparse with very little groundcover. Commonly observed species include black huckleberry (*Gaylussacia baccata*), sheep-laurel (*Kalmia angustifolia*), highbush blueberry (*Vaccinium corymbosum*), along with seedlings from the shrub and canopy communities.



Photo 4. Typical understory consisting of black huckleberry and wintergreen.

Groundcover consists primarily of patches of wintergreen (*Gaultheria procumbens*), tree-clubmoss (*Dendrolycopodium obscurum*), Pennsylvania sedge (*Carex pensylvanica*) and bracken fern (*Pteridium aquilinum*). HW also observed occasional dense patches of scrub oak (*Quercus ilicifolia*).

[FEMA Designation](#)

According to the most recent FEMA National Flood Hazard Layer, this zone area is not included on the maps, as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel Number 25001C0512J revised July 16, 2014 (Figure 3).

[State-listed Rare Species Habitat](#)

According to the most recent version of the *Massachusetts Natural Heritage Atlas* (14th Edition, August 1, 2017), the CR parcel occurs entirely within *Priority Habitat of Rare Species* (PH 490) and within *Estimated Habitat of Rare Wildlife and Certified Vernal Pools* (EH 435) as designated by the Massachusetts Natural Heritage and Endangered Species Program (NHESP) (Figure 4).

There are no certified or potential vernal pools at this site. Likewise, HW did not observe any wetlands, streams or ponds on or near the project site. HW also did not observe any federally or state-listed species during the site visit.

However, given the open woods and sandy soil nature of this site and that it is surrounding on the north, east and south by undeveloped forested land, this parcel has the potential to provide suitable for the Eastern Box Turtle. The eastern box turtle is listed in Massachusetts as a species of "Special Concern." This species has no Federal status under the Endangered Species Act.

Eastern Box Turtle is a small to mid-sized terrestrial turtle ranging from 4.5 to 6.6 inches (11-17 cm). Box turtles have an oval, high-domed shell with variable black and yellow or orange coloration and markings. They live in open woods, wet meadows, pastures, and brushy fields and are commonly found near ponds, streams and wetlands. During hibernation season (roughly late October until April), box turtles burrow into the earth, stump holes, and stream bottoms. Females nest in June and early July and can travel as much as one mile to find appropriate nesting habitat. Nesting areas vary widely and include fields, meadows, utility right-of-ways, woodland openings, roadsides and abandoned gravel pits.

[Soils](#)

According to the USDA NRCS Barnstable County custom soil report this site is located on a moraine with Plymouth-Barnstable complex (484C & 484D), soils consisting of loose sandy glaciofluvial deposits and/or loose sandy ablation till (Figure 5). As indicated above, site topography consists of rolling hills, and steep slopes with numerous boulders. The runoff class is high and it is characterized as excessively drained with very high runoff potential. Based on the soil types the area does not frequently flood or pond.

SUMMARY

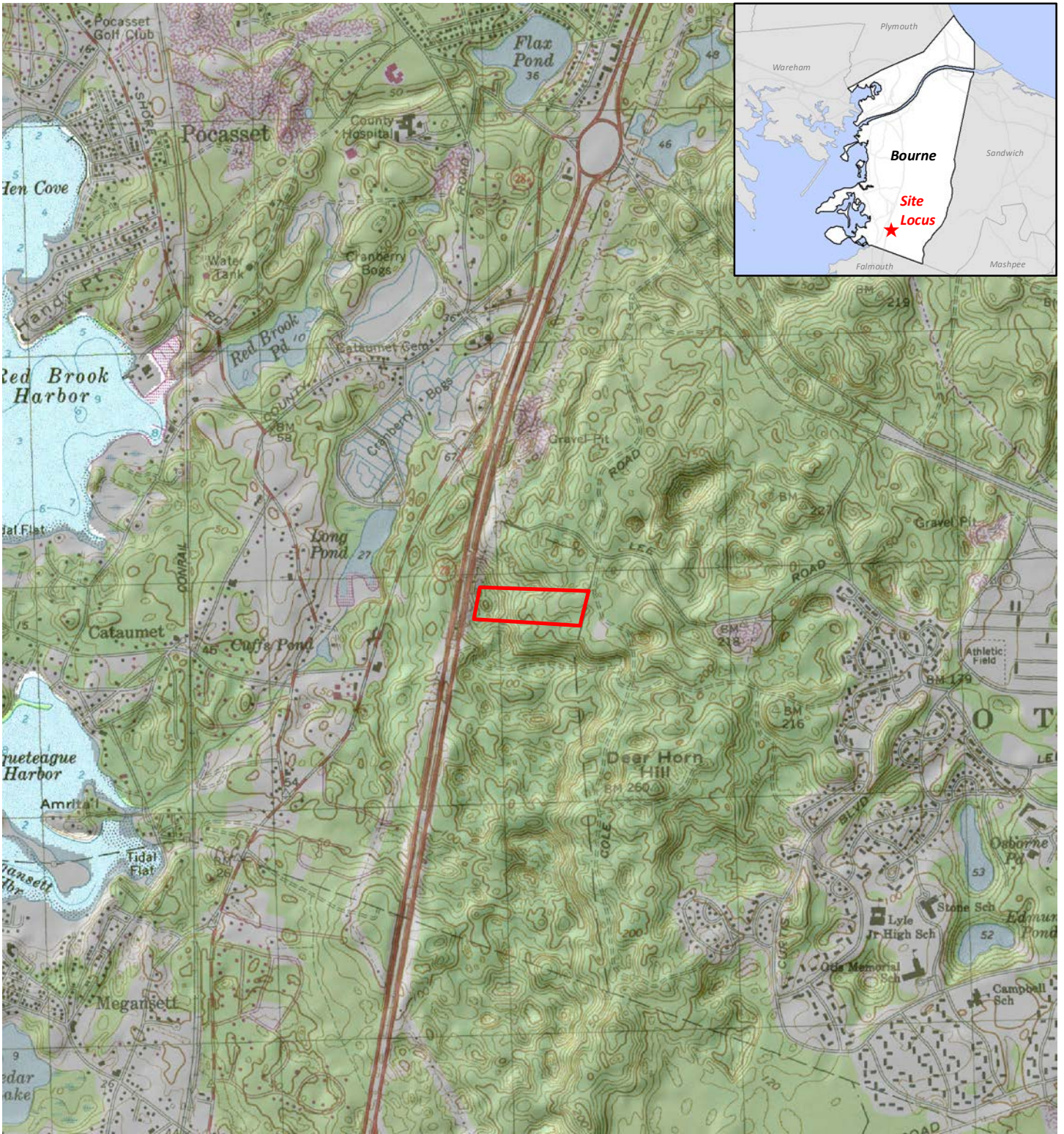
The CR site consists of approximately 17.8 acres of undeveloped, forested land that supports a pitch pine-mixed oak community typical of Cape Cod. No wetland resource areas are located at the site or within close proximity, and no unique features or specimen trees were encountered.

Overall, the undeveloped condition and the site context adjacent to undeveloped land bordering on the north, east and south consisting of similarly vegetated plant community increases the ability of this parcel to provide habitat providing a large swath of undeveloped open space which allows for maintaining contiguous wildlife habitat. The parcel would likely serve as good habitat for a variety of species including the state listed eastern box turtle.

The subject site is located within NHESP mapped priority habitats of rare species and estimated habitats for rare wildlife. Additionally, the subject site is located within an area designated on the Cape Cod Significant Natural Resource Areas (SNRA) Map as Public Land Acquisition Assessment Project (PLAAP) and zoned by the Town of Bourne as a Zone II area of drinking water contribution. Its protection under a CR would further the interests of habitat protection and contribute to the protection of Eastern Box Turtle habitat.

REFERENCES

- DeGraaf, R.M., and D.A. Richard. Forest Wildlife of Massachusetts: Cover Type, Size Class, and Special Habitat Relationships. Cooperative Extension, University of Massachusetts, Amherst, Massachusetts.
- DeGraaf, R.M. and D.D. Rudis. September 1983. New England Wildlife: Habitat, Natural History, and Distribution. United States Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. General Technical Report NE-108.
- Development of Regional Impact Guidelines for Natural Resources Inventory (Plant and Wildlife Habitat Assessment), Technical Bulletin 92-002, Cape Cod Commission (Revised 4/24/03).
<http://www.capecodcommission.org/resources/regulatory/NRItechbulletin0403.pdf>
- Plan of Land survey plan – as surveyed for Jennie R. Riggs in Cataumet, Bourne. October 1982. Plan Book 593 Page 85, Lot 41.
- Swain, P.C. and J.B. Kearsley. 2011. Classification of the Natural Communities of Massachusetts. Version 1.4. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries and Wildlife. Westborough, MA. URL:
<http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/natural-communities/classification-of-natural-communities.html#>
- Woolsey, H., A. Finton, J. DeNormandie. 2010. BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World. MA Department of Fish and Game/Natural Heritage & Endangered Species Program and The Nature Conservancy/Massachusetts Program.
http://www.mass.gov/dfwele/dfw/nhesp/land_protection/biomap/biomap2_summary_report.pdf



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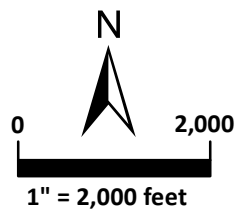
Legend

 Site Parcel

*Pocasset Topographic Quadrangle

Horsley Witten Group
Sustainable Environmental Solutions

90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com



USGS Locus
Harding Parcel
Off of Route 28
Bourne, MA

Date: 5/4/2018

Figure 1



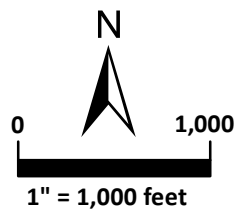
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Legend

-  Site Parcel
-  Parcels

*Aerial Imagery - ESRI

Horsley Witten Group
 Sustainable Environmental Solutions
 90 Route 6A • Unit 1 • Sandwich, MA 02563
 508-833-6600 • horsleywitten.com

Aerial Photo
 Harding Parcel
 Off of Route 28
 Bourne, MA

Date: 5/4/2018





Figure 2

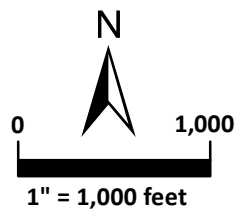


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*FEMA's National Flood Hazard Layer, MassGIS 2017

Legend

-  Site Parcel
-  Parcels
-  AE - 1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard



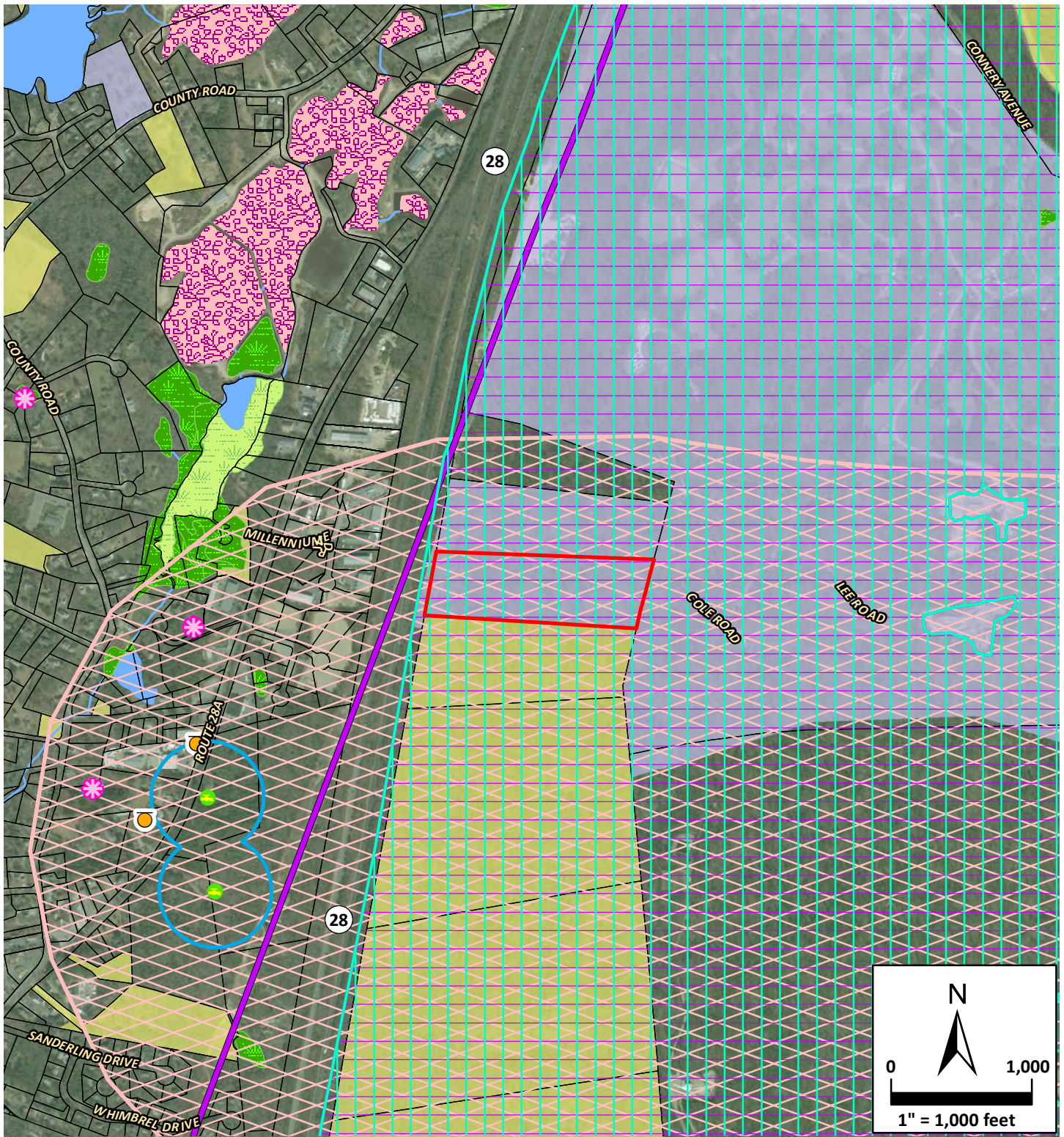
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 Sustainable Environmental Solutions
 90 Route 6A • Unit 1 • Sandwich, MA 02563
 508-833-6600 • horsleywitten.com



FEMA's National Flood Hazard Layer
 Harding Parcel
 Off of Route 28
 Bourne, MA

Date: 5/4/2018

Figure 3



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Legend

- | | | | |
|---|----------------------|------------------------------|-----------------------|
| Site Parcel | Conservation | Community Groundwater Source | DEP Wetlands |
| Parcels | Historical/Cultural | DEP Approved Zone I | Hydrologic Connection |
| Potential Vernal Pools | DEP Approved Zone II | Marsh/Bog | Wooded marsh |
| NHESP Priority Habitats of Rare Species | Powerline | Cranberry Bog | Open Water |
| NHESP Estimated Habitats of Rare Wildlife | | | |
| Underground Storage Tanks | | | |

*GIS Data - MassGIS

Horsley Witten Group
 Sustainable Environmental Solutions
 90 Route 8A • Unit 1 • Sandwich, MA 02563
 508-833-6600 • horsleywitten.com



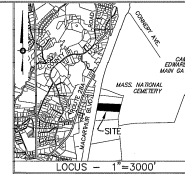
Existing Constraints
 Harding Parcel
 Off of Route 28
 Bourne, MA

Date: 5/4/2018

Figure 4

675-72

RECEIVED AND REGISTERED
JUN 25 11 A 11:35
REGISTRY OF DEEDS
JOHN F MEADE



LOCUS = 1 = 3000'

Current Zoning:
R-40 & Water Resource District (See Note 4)
Min. Lot Area: 40,000 s.f. (Single Family)
80,000 s.f. (Two Family)
Min. Frontage: 150'
Min. Front Yard: 30'
Min. Side Yard: 15'
Min. Rear Yard: 15'
Max. Off-Street Parking: 20%
Max. Lot Coverage: 20%
Max. Lot Slope Factor: 30

THE BELOW ENDORSEMENTS NOT A DETERMINATION AS TO CONFORMANCE WITH ZONING REGULATIONS.

APPROVAL UNDER THE SUBDIVISION CONTROL LAW NOT REQUIRED
John Meade
Bourne Planning Board
DATE: 6/29/2018
PLANNING BOARD ENDORSEMENT IS NOT A DETERMINATION AS TO CONFORMANCE WITH ZONING REGULATIONS

N/E
UNITED STATES OF AMERICA
MAP 46 PARCELS 22
BOOK 2363 PAGE 306

- This survey and plan are based on a field survey performed on May 17, 2018.
- The bearings on this plan are referenced to NAD27.
- The purpose of this plan is to divide Parcel 41 on Map 52 into two lots.
- The property lies within the Flight Path Height Restriction area shown on Section 3485 of the Bourne Zoning Bylaw. No WECS located in the flight path as shown on a map entitled USCG Air Station Cape Cod Emergency Visual Routes is indicated. Weather Bourne, Massachusetts, dated January 25, 2007 shall be erected or altered to a height, which would exceed one hundred (100) feet. WECS erected between 80 to 100 feet within the USCG flight path shall include a flood warning light.
- Lot 1 is not a buildable lot under current zoning due to the fact that MacArthur Blvd is a State Highway laid out with Limited Access Provisions and right of access has not been granted across the Right of Way line along the frontage of Lot 1.

The following plans were used in the preparation of this survey:

- Unrecorded: Plan of Land Prepared for Fred A. and Susan S. Abbe, Stephen J. Doyle and Associates, Bourne MA, March 17, 2012. Scale 1" = 20'
- Barnstable County Registry of Deeds: Plan Book 300 Page 56
Plan Book 250 Page 147

RESERVED FOR REGISTRY USE

THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTRY OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.



TIMOTHY R. BENNETT, PLS
MASSACHUSETTS REG. NO. 18552

CURRENT OWNER:
FLYOVER NOMINEE TRUST,
JOHN HARDING, TR.
Assessor's Map 52 Parcel 41
Deed Book 19474 Pages 287

THIS MAPPING IS MADE FOR THE PARTY NAMED HERON, HIS OR HER MORTGAGEE AND GUARANTY EXCLUSIVELY. NO FURTHER LIABILITY IS ASSUMED.

© 2018 GREEN SEAL ENVIRONMENTAL, INC.

REVISIONS		
DATE	DESCRIPTION	BY
6/18/18	Note 5, Lot 1 not buildable	TBR

PLAN OF LAND
of
ASSESSOR'S MAP 52
PARCEL 41
MACARTHUR BLVD.
BOURNE, Mass
prepared for
FLYOVER NOMINEE TRUST

Green Seal Environmental, Inc.
114 Stone Rd., Higg. St
Sageamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gsecon.com

PLS: T. Bennett CAD: B.Hood

JOB NO: FLYO-2499 SHEET: 1 of 1

SCALE: 1" = 80' DATE: May 30, 2018

675-72

ROUTE 28 STATE HIGHWAY
500' WIDE
STATE HIGHWAY (UNIMPROVED)

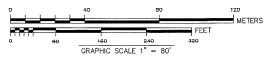


N/E
TOWN OF BOURNE
24 PERRY AVENUE
MAP 52 PARCEL 40
BOOK 13127 PAGE 238

LOT 1
11.04 AC ± or 479,160 SF ±
Shape Factors: 18.21
NOT A BUILDABLE LOT

LOT 2
6.5 AC ± or 283,140 SF ±
Shape Factors: 18.37
NOT A BUILDABLE LOT

N/E
TOWN OF BOURNE
24 PERRY AVENUE
MAP 52 PARCEL 42
BOOK 8306 PAGE 243



ATTACHMENT 4

Stormwater Management Plan

**STORMWATER MANAGEMENT PLAN
FULL BUILDOUT LANDFILL EXPANSION
BOURNE INTEGRATED SOLID WASTE MANAGEMENT FACILITY
BOURNE, MASSACHUSETTS**

Prepared For:

**TOWN OF BOURNE
DEPARTMENT OF INTEGRATED SOLID WASTE MANAGEMENT
24 Perry Avenue
Bourne, Massachusetts 02532**

Prepared By

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769 Plain Street, Unit C
Marshfield, Massachusetts 02050**



April 15, 2021

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STORMWATER MANAGEMENT PLAN FULL SITE BUILDOUT

BOURNE INTEGRATED SOLID WASTE MANAGEMENT FACILITY BOURNE, MASSACHUSETTS

1.0 INTRODUCTION

1.1 Purpose

This Stormwater Management Plan (SMP) addresses the construction of the proposed full site buildout of the Bourne Landfill located in Bourne, Massachusetts. The proposed full buildout includes the development of Phase 7, Phase 8 and Phase 9 landfill expansions and the relocation of the Large Handling Facility (LHF) that includes a C&D Transfer Station, a Residential Recycling Center and a Single Stream Recyclables Transfer Station, which will result in the full utilization of the site's acreage, including land that has been acquired since 2001, which now totals 111 acres. The construction of Phases 7 and 8 will occur on the 25-acre parcel that is immediately south of the existing Phase 6 Landfill. Phase 9 will be a vertical expansion over the area of the existing landfill. The existing LHF will be relocated from the 25-acre parcel to the immediate south, to the currently undisturbed 12-acre parcel.

This SMP addresses the proposed full buildout condition, which is foreseen to occur in the 2040s. The stormwater management for intermediate conditions will be addressed in the phased site permitting (ATCs and ATOs) for those development stages.

2.0 STORMWATER MANAGEMENT SYSTEM

2.1 General

The Town of Bourne Department of Integrated Solid Waste Management (ISWM or Proponent or Town) is proposing a vertical and horizontal landfill expansion and the relocation of the solid waste handling facility and other offices and facilities on the property. The proposed vertical expansion, designated as Phase 9, involves placing waste vertically over previously landfilled areas including Phase 2, 2A/3A, 3, 4, 5, and 6. Phase 9 would increase the maximum height of the landfill from elevation 185 ft MSL to elevation 225 ft MSL and would provide approximately 1,255,000 cubic yards of additional air space. The proposed horizontal expansion, designated as Phase 7 and Phase 8, involves the development of new landfill cells in an area located south of the existing Phase 6 landfill, within the 25-acre parcel that is currently site-assigned for solid waste handling. The Phase 7 and Phase 8 expansions would provide approximately 3,920,000 cubic yards of additional airspace. The development of Phase 7 and Phase 8 requires the relocation of the existing solid waste handling

facility and other offices and facilities, including the existing Stormwater Basin No. 2, currently located on the 25-acre parcel. The Town has acquired a 12-acre parcel of undeveloped land, located south of the existing facility, and is proposing to use the land to develop a solid waste transfer station, residential recycling area, and other facilities, including the construction of a replacement for Stormwater Basin No. 2, which will be designated herein as Stormwater Basin No. 3.

The existing stormwater management facilities have been designed and constructed for conditions that will occur through the Phase 6 No Further Expansion scenario. The sub-catchment or tributary areas, along with reaches and ponds for these existing conditions are shown on the attached sketch titled *No Further Expansion Drainage Areas*. Also attached is a sketch titled *Full Buildout Drainage Areas*, which identifies the proposed tributary areas, reaches and ponds for the Full Buildout scenario.

The future development of Phase 7 and Phase 8 will result in the abandonment of Stormwater Basin No. 2, the extension of the existing drainage interceptor along the eastern edge of the Landfill to the south, and the construction of a new sedimentation basin on the currently undeveloped 12-acre parcel, located immediately to the south of the 25-acre parcel (Stormwater Basin No. 3), which will be dedicated to flows from the tributary area of the Landfill and the eastern third of the 12-acres of the LHF. The stormwater flows tributary to the remaining two thirds, or eight acres of the 12-acre LHF portion of the site will be tributary to a sediment forebay that will discharge to a bioretention area (Stormwater Basin No. 4) located to the south of the LHF. Control of stormwater runoff along the western side of the Landfill will be managed by existing facilities that discharge to Stormwater Basin No. 1, located in the northwest corner of the property. The construction of Phase 9 and the increase in maximum elevation to 225 will divert a relatively small area between the two basin's tributary areas.

In its February 17, 2000 Development of Regional Impact (DRI) the Cape Cod Commission (CCC) evaluated the compliance of the facility to the CCC's then Regional Policy Plan standards for water resources and determined, that as conditioned, the Application for the Bourne Landfill was approved. Since that time site development has provided an approved, continuous, environmental monitoring plan for groundwater quality and improved structural stormwater management facilities. In addition, the May 2006 Massachusetts Estuaries Project Report on nitrogen loading threshold modeling for the Phinney's Harbor area in Bourne, noted that "the Landfill is contributing negligible nitrogen to the Phinney's Harbor System". It also noted that the flow path of nitrogen enriched groundwater was from the historic septage lagoons, which flows toward the Cape Cod Canal. These lagoons were excavated and taken out of service over twenty years ago and groundwater monitoring has shown an improvement in groundwater quality downgradient from the former lagoons' locations.

The following sections describe the proposed Full Buildout stormwater management controls, including the two stormwater retention basins and the bioretention area

considered in this SMP. The referenced drainage area sketches are included in Appendix 1. The design buildout stormwater flow rates have been analyzed for the stormwater retention basins utilizing the HydroCAD Stormwater Modeling program. The program utilizes the TR-20 method for run-off calculations. Storm rainfall, run-off curve numbers and other site characteristics are input into the program. Results of calculations are output into tables for each drainage area and control structure. The Full Buildout Conditions Stormwater Calculations for the 25-year and 100-year storm events are included in Appendix 2.

2.2 Stormwater Basin No. 1

Stormwater Basin No. 1 is an existing retention/infiltration pond located in the northwest corner of the property. This basin currently, and under Full Buildout conditions, will receive stormwater runoff from the northerly and westerly sideslopes and plateau areas of the Landfill. Stormwater run-off from the site's access road areas also drain into Stormwater Basin No. 1. The two Drainage Areas sketches included in Appendix 1 show the contributing areas from the Phase 6 No Further Expansion and the Full Buildout scenarios that will discharge to this retention pond. The construction of the Full Buildout scenario will increase the contributory area and consequently the volume of stormwater discharging into Stormwater Basin No. 1. This increase in contributory area generally corresponds to the area that will be diverted from the west sides and plateau of the proposed Phase 7 and Phase 8 landfills when they have reached their final grades. Stormwater Basin No. 1 was enlarged as part of the Phase 4 Landfill construction project, taking into account the flows that will be diverted by the final buildout of the site. A perimeter drainage channel, or swale, has been constructed along the western toe of the Phase 4 and most of the Phase 6 sideslope, as part of the Phase 4 and Phase 6 site construction work. A series of water quality swales that cross the closed sideslopes conveys run-off from the sideslopes and plateaus of the Landfill to let-down channels that discharge into the perimeter drainage channel. The perimeter drainage channel then conveys the run-off from these tributary areas to Stormwater Basin No. 1.

Stormwater Basin No. 1 has been designed to accommodate the run-off from the 25 year-24 hour rainfall event for the Full Buildout scenario. Stormwater run-off discharging to this basin will infiltrate to groundwater. Existing soils throughout this site area are comprised of highly permeable sands and gravels. The design capacity of the stormwater basins is based on an infiltration rate of 8.27 inches per hour which is an average rate for Hydrologic Group A soils, which are the soil types that occur throughout the Landfill, according to the Massachusetts Stormwater Handbook (Volume 3, Table 2.3.3). Basin No. 1 provides approximately 613,000 cubic feet of storage capacity, between elevations 70 and 94. This available storage volume exceeds the storage volume required for the 25 year-24 hour storm, which is approximately 234,000 cubic feet, for the Full Buildout scenario. This basin will also accommodate the run-off from greater magnitude storms (a 100-year storm will require approximately 393,000

cubic feet of storage) or from back-to-back rainfall events and for the containment of run-off during winter weather and frost conditions.

Stormwater Basin No. 1 is a two stage pond with a forebay and a large infiltration basin. Potential improvements that could be made include the modification of the forebay and the lower portion of the large drainage channel that enters the forebay, to allow for additional bioretention and total suspended solids (TSS) removal capacity.

2.3 Stormwater Basin No. 2 and Stormwater Basin No. 3

Stormwater Basin No. 2 is an existing retention basin located at the southwestern corner of the 25-acre parcel that is site assigned for solid waste handling. Currently, drainage from that 25-acre area, including the C&D Transfer Station, the Residential Recycling Center, the Single Stream Recycling facility and the surrounding materials storage and staging areas, flow into Stormwater Basin No. 2 through a constructed drainage system. Runoff from the Landfill's eastern side and plateau areas of Phase 2, Phase 3, Phase 2A/3A and Phase 6 have been diverted to Stormwater Basin No. 2 by the construction of a drainage interceptor line along the eastern toe of the landfill area. The interceptor has been constructed and is fully operational.

The proposed Phase 7 and Phase 8 Landfill expansions will eliminate the existing Stormwater Basin No. 2, which will be replaced by Stormwater Basin No. 3. The proposed Stormwater Basin No. 3 will be located on the 12-acre parcel and will receive runoff from the tributary landfill area through the extension of the drainage interceptor pipe, from the eastern third of the 12-acre parcel and overflow from the bioretention area of Stormwater Basin No. 4, as described below. There will be a sediment forebay formed with rip rap or by grading at the influent end of the basin, to provide sediment removal pretreatment to the basin. Stormwater Basin No. 3 will be designed with adequate volume and surface area to accommodate a 25 year-24 hour design condition storm event based on an infiltration rate of 8.27 inches per hour which is an average rate for Hydrologic Group A soils, which are the soil types that occur throughout the Landfill area, according to the Massachusetts Stormwater Handbook (Volume 3, Table 2.3.3). The design will provide about 1,575,000 cubic feet of storage capacity from the bottom of the basin at elevation 80 to the top of the basin at elevation 106. The available capacity within the basin exceeds the storage volume required to accommodate the run-off from a 25 year-24 hour storm event, which has been calculated to be approximately 302,000 cubic feet. The excess capacity will be sufficient for managing the stormwater run-off from a greater magnitude event (a 100-year storm will require 512,000 cubic feet of storage) or from back-to-back rainfall events and for the containment of run-off during winter weather and frost conditions.

2.4 Stormwater Basin No. 4

Runoff from the western two thirds of the 12-acre LHF are tributary to Stormwater Basin

No. 4, which is located along the southern property boundary. Runoff will be directed to Stormwater Basin No. 4 by designed overland flow patterns and drainage structures. The basin will be comprised of a sediment forebay, with a broad crested weir outlet that discharges to a bioretention area, which has an overflow to Stormwater Basin No. 3. See Appendix 1 for plan and section views of Stormwater Basin No. 4. The forebay will provide velocity reduction of the incoming runoff to promote gravity separation of TSS as pretreatment for the bioretention area. Runoff in the forebay will overflow a 100 foot weir and discharge into a bioretention area, which will provide treatment and groundwater infiltration of the runoff. The bioretention area will be an excavated basin backfilled with a mixture of sand, topsoil and compost and will be planted with appropriate vegetation. The backfilled soils and the vegetation will provide treatment of TSS, nutrients and metals. Accumulating flows within the bioretention area will infiltrate and recharge the groundwater through the excavated bottom and sideslopes. The design discharge capacity of Stormwater Basin No. 4 is based on an infiltration rate of 8.27 inches per hour which is an average rate for Hydrologic Group A soils, which are the soil types that occur throughout the Landfill, according to the Massachusetts Stormwater Handbook (Volume 3, Table 2.3.3). The void space within the backfilled soils has an adequate volume (14,760 cubic feet) to contain a two year storm event. For greater storm conditions, there will be a 36 inch stand pipe that will be an overflow to Stormwater Basin No. 3, when the water level in the bioretention area exceeds the top elevation of the stand pipe.

3.0 STORMWATER PERFORMANCE STANDARDS

3.1 MassDEP Stormwater Management Standards

The MassDEP Stormwater Management Policy includes ten Stormwater Management Standards. The Standards were established to provide clear and consistent guidelines for stormwater management projects. The Standards address water quality (pollutants) and water quantity (flooding, low base flow and recharge) by establishing standards that require the implementation of a wide variety of stormwater management strategies. These strategies include environmentally sensitive site design and low impact development (LID) techniques to minimize impervious surface and land disturbance, source control and pollution prevention, structural BMPs, construction period erosion and sedimentation control, and the long-term operation and maintenance of stormwater management systems.

Each of the standards were evaluated for their applicability to the Bourne Landfill taking into consideration the proposed Full Buildout scenario, which includes the Phase 7, Phase 8 and Phase 9 Landfill Expansions along with the relocation of the Large Handling Facility (LHF). The site-wide stormwater and sediment control facilities were designed to conform to these standards. Each of the ten Standards are addressed below.

- 1. No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.**

All stormwater discharges from the Bourne Landfill site shall be treated by the existing and proposed on-site facilities, which will not allow any off-site discharge of stormwater. Storm flows from the landfill area, as well as the LHF, the perimeter access roads and facilities are and will be collected by a system of drainage pipes, channels and swales which will direct all site runoff to either one of three stormwater basin systems. The stormwater basins have been sized to contain stormwater runoff for design condition storm events and will infiltrate runoff to the groundwater table and not allow discharge to wetlands or surface waters.

- 2. Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.**

A comparison of pre-development to post-development peak discharge rates is not applicable because the proposed stormwater management system directs runoff to one of three on-site stormwater basin systems and there will be no discharge of flows to surface waters or to off-site locations. Consequently, no pre-development peak discharge rates were calculated. SITEC Environmental has prepared stormwater discharge calculations for post-development Full Buildout conditions after the final capping system has been constructed. These calculations have been performed for 25-year and 100-year, 24 hour storm events. These calculations demonstrate that the proposed stormwater control facilities will be capable of handling the calculated storm conditions. The calculated peak discharge rates into the stormwater basins are summarized on the following table. Appendix 1 contains a Drainage Area sketch showing the tributary sub-basins and Appendix 2 contains HydroCAD Stormwater Calculations.

	PEAK STORMWATER DISCHARGE RATES INTO SEDIMENTATION BASINS (cfs)	
	25-Year, 24 Hour Storm Event (5.60")	100-Year, 24 Hour Storm Event (7.10")
Stormwater Basin No. 1	115.25	174.84
Stormwater Basin No. 3	159.43	221.57
Stormwater Basin No. 4	39.39	51.75

3. **Loss of annual recharge to ground water should be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.**

Existing and proposed stormwater control facilities at the Bourne Landfill site will convey stormwater runoff to stormwater basins which will infiltrate, or recharge, all runoff to the groundwater table. This is consistent with the pre-construction conditions at the Landfill. During the operations life of the Landfill, runoff from the active area is contained on the Landfill. Any stormwater that contacts waste or daily cover materials is considered to be leachate and infiltrates to the leachate collection system and not the groundwater. As intermediate and final cover is applied to the Landfill, runoff will be diverted to the stormwater controls and the stormwater basin systems, where it will infiltrate.

4. **Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:**
 - (a) **Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;**
 - (b) **Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and**
 - (c) **Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.**

The required water quality volume is calculated as:

- One inch of runoff times the total impervious area of the post-development project site for a discharge:
 1. from a land use with a higher potential pollutant load;
 2. within an area with a rapid infiltration rate (greater than 2.4 inches per hour);
 3. within a Zone II, or Interim Wellhead Protection Area;
 4. near to a critical area including outstanding resource waters, special resource waters, bathing beaches, shellfish growing areas, and

cold water fisheries.

- 0.5 inches of runoff times the total impervious area of the post-development project site for all other discharges.

Based on the rapid infiltration rate of the existing on-site soils, which consist of sand and gravel deposits, the volume of stormwater that is to be treated will be calculated as 1.0 inches of runoff times the total impervious area of the project site. The stormwater basins have been designed to contain all of the runoff from their respective tributary areas. No runoff will be discharged off-site or to any wetland resource areas.

BMPs that will be incorporated into facilities and their operations include water quality swales, sediment forebays and infiltration basins. MassDEP has developed a standard methodology for calculating TSS removal rates. This methodology has been applied to the proposed Full Buildout Stormwater Management Plan that will be incorporated into the facilities, with a resultant calculated TSS removal rate of approximately 95.5 % for Stormwater Basin No. 1 and Stormwater Basin No. 3 and 92.5% for Stormwater Basin No. 4. These calculations are presented on MassDEP'S "TSS Removal Calculation Worksheet", which is included in Appendix 3.

- 5. For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.**

Areas where solid waste handling and disposal operations are conducted are considered to be "hot spots" and relevant BMPs should be used for source reduction and adequate treatment of stormwater runoff from these areas. Since all handling and disposal of solid waste is to be conducted within the lined landfill area and all runoff that contacts the solid waste is to be retained within the landfill and leachate collection systems, source reduction will effectively be implemented. Also, the BMPs that are to be incorporated into the project, as

described above, are appropriate to the application of sites with higher potential pollutant loadings, thus compliance with this Standard will be achieved. Additionally, the facility will be regularly inspected by an independent engineer, in accordance with MassDEP's Solid Waste Regulations. These BMPs, which are specific to solid waste facility operations, along with the existing and proposed structural BMPs that control the site's runoff and sediment, demonstrate that the Full Buildout scenario will comply with this standard.

- 6. Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.**

Since all stormwater will recharge the groundwater and not discharge to surface waters, this standard is not applicable. If surface water was to discharge from the Bourne Landfill, it would not be toward an Outstanding Resource Water (ORW) area. This aside, the structural BMPs which are proposed for the site conform to the requirements of this standard.

- 7. A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.**

The proposed construction and operation of the Full Buildout scenario does not constitute a redevelopment project, thus this standard does not apply to this project.

8. **A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.**

"Construction phase" activities of the Full Buildout scenario will include site grading and construction of the Landfill and the LHF. During the construction phase non-structural BMPs will be utilized to mitigate possible short term sedimentation. These temporary non-structural BMPs will include the use of haybales and silt fences around construction areas. These measures are intended to reduce sediment loadings to the structural BMPs. As part of the Facility's standard construction contract documents, the Contractor will be required to submit an Erosion Control Plan to the Town of Bourne, for review and approval prior to the start of construction.

9. **A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.**

A stormwater management system operation and maintenance plan is part of the Facility's overall Operation & Maintenance Plan, which is part of its Operating Permit, as approved by MassDEP. The relevant portion (Section 6.0 - Storm Water Management) of the Operation & Maintenance Plan is included as Appendix 4.

10. **All illicit discharges to the stormwater management system are prohibited.**

To the best of our professional knowledge and belief, no illicit discharges exist on or are proposed on the site.

3.2 Cape Cod Commission Minimum Performance Standards

The Cape Cod Commission's *Cape Cod Regional Policy Plan* (2012) includes twelve Stormwater Quality Minimum Performance Standards. The Standards were established to provide guidelines for stormwater management projects within the Commission's jurisdiction. The Standards address water quality standards that require the implementation of a wide variety of stormwater management strategies. These strategies include elimination of untreated discharges of stormwater, requirements for on-site infiltration, promotion of biofiltration practices, environmentally sensitive site design to minimize impervious surface and land disturbance, source control and pollution prevention, structural BMPs, construction period erosion and sedimentation control, and the long-term operation and maintenance of stormwater management systems.

Each of the standards were evaluated for their applicability to the Bourne Landfill taking into consideration the proposed Full Buildout scenario. The site-wide stormwater and sediment control facilities were designed to conform to these standards. Each of the twelve Standards are addressed below.

WR7.1 - No New Direct Discharges of Untreated Stormwater: *New direct discharge of untreated stormwater, parking-lot runoff, and/or wastewater into marine and fresh surface water and natural wetlands shall not be permitted.*

All stormwater discharges from the Bourne Landfill site receive treatment and are retained on site by the existing and proposed facilities. Storm flows from the landfill area as well as the perimeter access roads and the LHF will be collected by a system of water quality swales, drainage pipes and channels which direct all of the site's runoff to one of three stormwater basin systems. The stormwater basins have been sized to contain stormwater runoff for major storm events and will infiltrate all runoff to the groundwater table and not allow any discharge to wetlands or surface waters.

WR7.2 - On-Site Infiltration: *Stormwater for all roadways and parking areas shall be managed and infiltrated on site, close to the source, to minimize runoff and maximize water quality treatment. Stormwater water quality treatment shall be provided for the first inch of rainfall (25-year 24-hour storm) consistent with 310 CMR 10 and the Massachusetts Stormwater Management Handbook to attain 80-percent total suspended solids removal and to reduce nutrients. All designs shall provide for at least 44-percent total suspended solids removal shall be designed prior to discharge into structured infiltration systems.*

All stormwater generated on the site is managed and infiltrates on site to minimize runoff and maximize water quality treatment. Stormwater water quality treatment does provide for the first inch of rainfall (25-year 24-hour storm) consistent with 310 CMR 10 and the Massachusetts Stormwater Management Handbook to attain 80-percent total suspended solids removal and to reduce nutrients. The existing and future conditions provide for at least 44-percent total suspended solids removal prior to discharge into the structured infiltration systems. See the attached Total Suspended Solid Removal Calculation Worksheets in Appendix 3, which is consistent with 310 CMR 10 and the Massachusetts Stormwater Management Handbook. The Worksheet demonstrates that initial treatment on the Landfill with water quality swales provides a total suspended solids (TSS) removal rate of 70% and that the bioretention area in the LHF provide a 90% removal rate, with the the final TSS removal rates being between 95.5 % and 92.5, demonstrating that the proposed design will meet required performance criteria. In addition, total nitrogen loadings were calculated, using the Cape Cod Commission's *Technical Bulletin*

91-001 Nitrogen Loading and its Draft Water Resources Nitrogen Loading and Mitigation Worksheet, which is included in Appendix 4. It can be noted that the calculated nitrogen loading concentration for the final buildout of the Bourne Landfill site is 0.46 ppm-N, which is well below the guideline target concentration of 5 ppm-N.

WR7.3 - Roof Runoff: *Roof runoff shall be managed separately and directly infiltrated unless there is an identified rooftop water quality concern that requires additional treatment or management.*

There will be new buildings, which are replacing existing buildings. Roof drainage will be either directed to individual infiltration structures located in the vicinity of the buildings or to Stormwater Basin No. 4. As a third alternative, roof drainage can be directed to the proposed Stormwater Basin No. 3 through the designed area drainage system. In general, all roof drainage will be infiltrated to the groundwater.

WR7.4 - Biofiltration Practices: *Stormwater design for the first inch of stormwater flow from development parking and roadways shall use biofiltration practices including, but not limited to, vegetated swales and filter strips, constructed wetlands, tree box filters, bio-retention basins and rain gardens for treatment of stormwater runoff. Bioretention areas shall be constructed in accordance with the Massachusetts Storm Water Management Volume One: Stormwater Policy Handbook, March 1997. Approved biofiltration areas may be counted as open space within Wellhead Protection Areas.*

Existing and future conditions will provide vegetated water quality swales that collect the majority of the stormwater runoff from the closed landfill sideslopes and plateau areas. That runoff is transported through a system of pipes, or drainage channels and forebay systems to one of the stormwater basins. The facilities, as they relate to the western side of the Landfill will continue to discharge through existing structures and to Sedimentation Basin No.1, which have been previously approved, therefore this Standard may not be applicable to this area. The facilities for Phases 7 and 8 and the relocated LHF will be new and be subject to additional review. Improvements for stormwater control of the full build out of the site will include adding bioretention capacity to the drainage channel and forebay of Stormwater Basin No. 1 and will include a bioretention area for runoff generated in the LHF area for sediment and nutrient removal.

WR7.5 - Structured Infiltration Devices: *Structured infiltration devices shall be used to accommodate frozen flow conditions and storms that exceed 25-year 24-hour storm and designed to be consistent with the Massachusetts Stormwater Standards under 310 CMR 10 and the Massachusetts Storm Water Management Handbook.*

The Stormwater Basin Nos. 1, 3 and 4 (infiltration devices) as a site wide system, can accommodate frozen flow conditions and storms that exceed 25-year 24-hour storm, as described above and demonstrated in Appendix 2 – Stormwater Calculations. They are designed to be consistent with the Massachusetts Stormwater Standards under 310 CMR 10 and the Massachusetts Storm Water Management Handbook.

WR7.6 - Impervious Surfaces: Roadway and parking design shall limit impervious surfaces. Parking lots shall be designed for the minimum required by the town in accordance with MPS TR2.9. Overflow peak parking design shall be constructed from pervious materials such as porous pavement, permeable pavers, or biomaterial such as grass pavers unless inconsistent with local bylaws. Bioretention shall be incorporated into parking islands and roadway perimeters. Permeable paving shall be encouraged where appropriate.

Because of the industrial nature of site activities and the use of heavy equipment on site, access roads and parking areas are limited to impervious asphalt paving. Permeable paving is not appropriate for much of the site's operations activities. The Full Buildout scenario operations will utilize the existing and replacement impervious surfaces, which will be designed to be the minimum needed for those operations, and will utilize pervious surfaces, where possible.

WR7.7 - Structured Infiltration Devices in Designated Mapped Areas: Structured detention basins, infiltration basins and galleries may be used for redevelopment in Impaired Areas, Economic Centers, Industrial and Service Trade Areas, Villages, and Growth Incentive Zones. In towns without a Land Use Vision Map, this MPS shall only apply to redevelopment in Impaired Areas.

Stormwater Basin Nos. 1, 3 and 4 (infiltration devices) are used in this "Industrial and Service Trade Area".

WR7.8 - Minimum Two-foot Separation to Groundwater: New infiltration basins or other stormwater leaching structures shall maintain a minimum two-foot separation between points of infiltration and maximum high water table except as required under MPS CR3.4. Guidance on the high groundwater adjustment methodology can be found in Estimation of High Groundwater Levels for Construction and Land Use Planning, Technical Bulletin 92-001, as amended.

Stormwater Basin Nos. 1 and 2 are existing and have been previously approved. The replacement basins, Stormwater Basin Nos. 3 and 4, will meet this Standard. Historically high groundwater elevations in the area of the replacement basins are projected to be in the range of 47 to 48 feet. The ground surface elevations in the area of Stormwater Basin Nos. 3 and 4 are in the range of 90 feet to 110

feet, with a design low point bottom elevation of 80 feet. There is more than sufficient depth to maintain a minimum two feet separation between the bottom of future Stormwater Basin Nos. 3 and 4 and maximum high groundwater elevations.

WR7.9 - Best Management Practices during Construction: *Construction best management practices for erosion and sedimentation controls shall be specified on project plans to prevent erosion, control sediment movement and stabilize exposed soils.*

"Construction phase" activities for the Full Buildout scenario will include site grading and construction of the Landfill and the relocated LHF. During the construction phase non-structural BMPs will be utilized to mitigate possible short term sedimentation. These temporary non-structural BMPs will include the use of haybales and silt fences around construction areas. These measures are intended to reduce sediment loadings to the structural BMPs. As part of all ISWM construction contract documents, the Contractor is required to submit an Erosion Control Plan to the Town of Bourne, for review and approval prior to the start of construction. In addition, the contract documents have erosion control requirements that the Contractor must meet.

WR7.10 - Stormwater Maintenance and Operation Plan: *Development and redevelopment shall submit a Professional Engineer-certified stormwater maintenance and operation plan demonstrating compliance with the Massachusetts Stormwater Guidelines including a schedule for inspection, monitoring, and maintenance. The plan shall identify the parties responsible for plan implementation, operation and maintenance. The identified responsible party shall keep documentation of the maintenance and inspection records and make these available to the Commission or local board of health upon request. One year from completion of the system, a Professional Engineer shall inspect the system and submit a letter certifying that the system was installed and functions as designed.*

A stormwater management system operation and maintenance plan is part of the Facility's overall Operation & Maintenance Plan, which is part of its Operating Permit, as approved by MassDEP. The relevant portion (Section 6.0 - Storm Water Management) of the current Operation & Maintenance Plan is included as Appendix 5.

WR7.11 - Shut-off Valve in Wellhead Protection Areas: *In Wellhead Protection Areas, stormwater Systems for land uses that have a high risk of contaminating groundwater, such as vehicle maintenance areas and loading docks, shall install*

a mechanical shut-off valve or other flow-arresting device between the catch basin or other stormwater-capture structure draining this area and the leaching structures.

This Standard is not applicable, since the site is not in a Wellhead Protection Area.

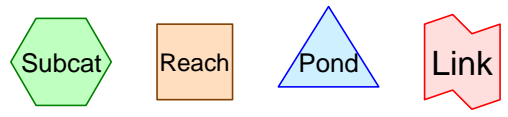
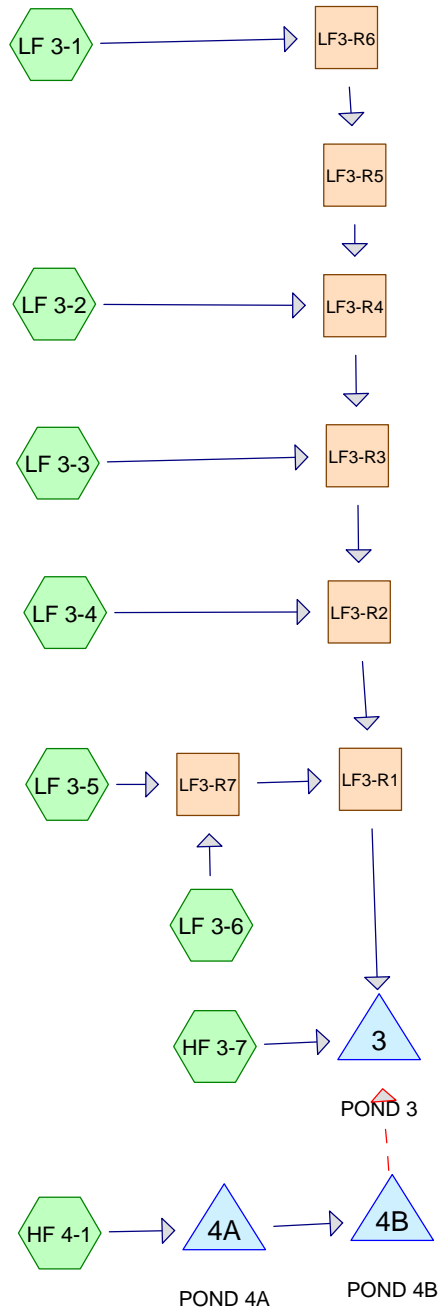
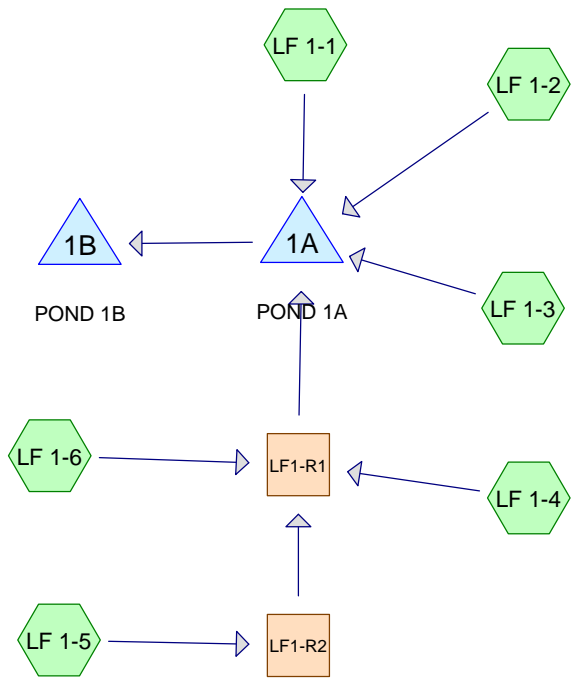
WR7.12 - Road Widths: DRIs are encouraged to limit roadway lane widths to 9 feet (18 feet total for two-lane roadways) to minimize runoff from impervious surfaces.

Road widths cannot be limited to 18 feet because of the industrial nature of site activities, the relatively frequent public use and the heavy equipment that operates on the site's access roads. This Standard is aimed at residential roads.

APPENDIX 1
DRAINAGE AREA SKETCHES

APPENDIX 2
DRAINAGE CALCULATIONS

25 YEAR STORM EVENT



Routing Diagram for BOURNE-SITE-BUILD-OUT-MAR 4 2021 CONCEPT-THRU PH 9+LHF
 Prepared by {enter your company name here}, Printed 4/12/2021
 HydroCAD® 10.00-22 s/n 07502 © 2018 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment HF 3-7: Runoff Area=177,370 sf 46.33% Impervious Runoff Depth>3.62"
Flow Length=470' Slope=0.0200 '/' Tc=2.7 min CN=82 Runoff=18.75 cfs 1.228 af

Subcatchment HF 4-1: Runoff Area=355,570 sf 68.20% Impervious Runoff Depth>4.35"
Flow Length=940' Slope=0.0180 '/' Tc=5.8 min CN=89 Runoff=39.39 cfs 2.956 af

Subcatchment LF 1-1: Runoff Area=451,000 sf 0.00% Impervious Runoff Depth>2.40"
Flow Length=1,800' Tc=9.9 min CN=69 Runoff=24.93 cfs 2.070 af

Subcatchment LF 1-2: Runoff Area=152,500 sf 0.00% Impervious Runoff Depth>2.40"
Flow Length=795' Tc=1.6 min CN=69 Runoff=10.71 cfs 0.701 af

Subcatchment LF 1-3: Runoff Area=253,000 sf 0.00% Impervious Runoff Depth>2.40"
Flow Length=800' Tc=9.1 min CN=69 Runoff=14.27 cfs 1.162 af

Subcatchment LF 1-4: Runoff Area=331,400 sf 0.00% Impervious Runoff Depth>2.40"
Flow Length=810' Tc=6.9 min CN=69 Runoff=20.26 cfs 1.522 af

Subcatchment LF 1-5: Runoff Area=475,600 sf 0.00% Impervious Runoff Depth>2.40"
Flow Length=970' Tc=7.7 min CN=69 Runoff=28.27 cfs 2.184 af

Subcatchment LF 1-6: Runoff Area=486,400 sf 31.87% Impervious Runoff Depth>3.23"
Flow Length=1,200' Slope=0.0375 '/' Tc=5.1 min CN=78 Runoff=42.18 cfs 3.002 af

Subcatchment LF 3-1: Runoff Area=418,600 sf 0.00% Impervious Runoff Depth>2.49"
Flow Length=1,625' Tc=3.0 min CN=70 Runoff=30.30 cfs 1.995 af

Subcatchment LF 3-2: Runoff Area=646,400 sf 0.00% Impervious Runoff Depth>2.40"
Flow Length=1,470' Tc=8.9 min CN=69 Runoff=36.62 cfs 2.968 af

Subcatchment LF 3-3: Runoff Area=451,200 sf 2.22% Impervious Runoff Depth>2.49"
Flow Length=915' Tc=6.4 min CN=70 Runoff=29.13 cfs 2.148 af

Subcatchment LF 3-4: Runoff Area=257,600 sf 0.00% Impervious Runoff Depth>2.49"
Flow Length=590' Tc=3.9 min CN=70 Runoff=18.04 cfs 1.227 af

Subcatchment LF 3-5: Runoff Area=147,000 sf 0.00% Impervious Runoff Depth>2.40"
Flow Length=510' Tc=0.6 min CN=69 Runoff=10.63 cfs 0.676 af

Subcatchment LF 3-6: Runoff Area=338,000 sf 12.13% Impervious Runoff Depth>2.76"
Flow Length=1,675' Tc=4.2 min CN=73 Runoff=26.06 cfs 1.784 af

Reach LF1-R1: Avg. Flow Depth=1.96' Max Vel=4.84 fps Inflow=79.84 cfs 6.701 af
n=0.033 L=900.0' S=0.0089 '/' Capacity=343.97 cfs Outflow=75.00 cfs 6.678 af

Reach LF1-R2: Avg. Flow Depth=0.74' Max Vel=6.63 fps Inflow=28.27 cfs 2.184 af
n=0.033 L=970.0' S=0.0474 '/' Capacity=794.49 cfs Outflow=26.48 cfs 2.177 af

Reach LF3-R1: Avg. Flow Depth=3.27' Max Vel=8.49 fps Inflow=115.66 cfs 10.773 af
60.0" Round Pipe n=0.010 L=155.0' S=0.0020 '/' Capacity=151.42 cfs Outflow=115.24 cfs 10.770 af

Reach LF3-R2: Avg. Flow Depth=3.17' Max Vel=7.28 fps Inflow=95.82 cfs 8.323 af
60.0" Round Pipe n=0.010 L=420.0' S=0.0015 '/' Capacity=131.13 cfs Outflow=93.58 cfs 8.314 af

Reach LF3-R3: Avg. Flow Depth=2.82' Max Vel=9.12 fps Inflow=87.26 cfs 7.103 af
48.0" Round Pipe n=0.010 L=540.0' S=0.0030 '/' Capacity=102.28 cfs Outflow=84.60 cfs 7.096 af

Reach LF3-R4: Avg. Flow Depth=2.33' Max Vel=9.05 fps Inflow=62.64 cfs 4.960 af
42.0" Round Pipe n=0.010 L=570.0' S=0.0036 '/' Capacity=79.01 cfs Outflow=59.93 cfs 4.955 af

Reach LF3-R5: Avg. Flow Depth=1.56' Max Vel=7.67 fps Inflow=28.82 cfs 1.993 af
36.0" Round Pipe n=0.010 L=140.0' S=0.0039 '/' Capacity=53.85 cfs Outflow=28.04 cfs 1.993 af

Reach LF3-R6: Avg. Flow Depth=1.63' Max Vel=7.61 fps Inflow=30.30 cfs 1.995 af
36.0" Round Pipe n=0.010 L=247.0' S=0.0036 '/' Capacity=52.05 cfs Outflow=28.82 cfs 1.993 af

Reach LF3-R7: Avg. Flow Depth=1.28' Max Vel=16.39 fps Inflow=34.94 cfs 2.460 af
24.0" Round Pipe n=0.010 L=320.0' S=0.0256 '/' Capacity=47.08 cfs Outflow=34.22 cfs 2.459 af

Pond 1A: POND 1A Peak Elev=92.59' Storage=71,885 cf Inflow=115.25 cfs 10.611 af
Outflow=74.85 cfs 10.225 af

Pond 1B: POND 1B Peak Elev=85.70' Storage=276,244 cf Inflow=74.85 cfs 10.225 af
Outflow=5.68 cfs 6.171 af

Pond 3: POND 3 Peak Elev=91.19' Storage=329,103 cf Inflow=158.01 cfs 12.923 af
Outflow=8.58 cfs 8.766 af

Pond 4A: POND 4A Peak Elev=105.27' Storage=31,853 cf Inflow=39.39 cfs 2.956 af
Outflow=38.82 cfs 2.291 af

Pond 4B: POND 4B Peak Elev=103.07' Storage=19,199 cf Inflow=38.82 cfs 2.291 af
Discarded=2.13 cfs 1.382 af Secondary=33.83 cfs 0.925 af Outflow=35.96 cfs 2.307 af

Total Runoff Area = 113.444 ac Runoff Volume = 25.623 af Average Runoff Depth = 2.71"
89.26% Pervious = 101.262 ac 10.74% Impervious = 12.183 ac

Summary for Subcatchment HF 3-7:

Runoff = 18.75 cfs @ 12.05 hrs, Volume= 1.228 af, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
49,920	98	Paved roads w/curbs & sewers, HSG B
95,200	69	50-75% Grass cover, Fair, HSG B
32,250	98	Roofs, HSG A
177,370	82	Weighted Average
95,200		53.67% Pervious Area
82,170		46.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	470	0.0200	2.87		Shallow Concentrated Flow, PAVED SURFACE Paved Kv= 20.3 fps

Summary for Subcatchment HF 4-1:

Runoff = 39.39 cfs @ 12.09 hrs, Volume= 2.956 af, Depth> 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
23,200	98	Roofs, HSG A
219,300	98	Paved roads w/curbs & sewers, HSG A
113,070	69	50-75% Grass cover, Fair, HSG B
355,570	89	Weighted Average
113,070		31.80% Pervious Area
242,500		68.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	940	0.0180	2.72		Shallow Concentrated Flow, PAVED Paved Kv= 20.3 fps

Summary for Subcatchment LF 1-1:

Runoff = 24.93 cfs @ 12.15 hrs, Volume= 2.070 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
405,100	69	50-75% Grass cover, Fair, HSG B
45,900	72	Dirt roads, HSG A
451,000	69	Weighted Average
451,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
1.6	150	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.7	165	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.5	355	0.0620	12.39	266.47	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.033
0.1	130	0.3300	23.27	488.59	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.028
2.1	950	0.0150	7.61	91.34	Channel Flow, DRAINAGE SWALE Area= 12.0 sf Perim= 10.0' r= 1.20' n= 0.027
9.9	1,800	Total			

Summary for Subcatchment LF 1-2:

Runoff = 10.71 cfs @ 12.03 hrs, Volume= 0.701 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
152,500	69	50-75% Grass cover, Fair, HSG B
152,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	190	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.6	410	0.0300	10.54	226.55	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.2	195	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
1.6	795	Total			

Summary for Subcatchment LF 1-3:

Runoff = 14.27 cfs @ 12.14 hrs, Volume= 1.162 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
253,000	69	50-75% Grass cover, Fair, HSG B
253,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
3.8	360	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.2	200	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.2	190	0.2900	18.51	388.62	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
9.1	800	Total			

Summary for Subcatchment LF 1-4:

Runoff = 20.26 cfs @ 12.11 hrs, Volume= 1.522 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
331,400	69	50-75% Grass cover, Fair, HSG B
331,400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
1.4	130	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.4	340	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.2	290	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
6.9	810	Total			

Summary for Subcatchment LF 1-5:

Runoff = 28.27 cfs @ 12.12 hrs, Volume= 2.184 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
475,600	69	50-75% Grass cover, Fair, HSG B
475,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
1.5	145	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.3	75	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.9	630	0.0500	11.13	239.30	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.033
0.1	70	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
7.7	970	Total			

Summary for Subcatchment LF 1-6:

Runoff = 42.18 cfs @ 12.08 hrs, Volume= 3.002 af, Depth> 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
331,400	69	50-75% Grass cover, Fair, HSG B
155,000	98	Paved parking, HSG A
486,400	78	Weighted Average
331,400		68.13% Pervious Area
155,000		31.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	1,200	0.0375	3.93		Shallow Concentrated Flow, ACCESS ROAD Paved Kv= 20.3 fps

Summary for Subcatchment LF 3-1:

Runoff = 30.30 cfs @ 12.05 hrs, Volume= 1.995 af, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
268,600	69	50-75% Grass cover, Fair, HSG B
150,000	72	Dirt roads, HSG A
418,600	70	Weighted Average
418,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	180	0.2400	3.43		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.5	440	0.0540	14.14	303.95	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.1	90	0.2330	16.59	348.34	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
1.5	915	0.0076	9.98	479.05	Channel Flow, DRAINAGE SWALE Area= 48.0 sf Perim= 16.0' r= 3.00' n= 0.027
3.0	1,625	Total			

Summary for Subcatchment LF 3-2:

Runoff = 36.62 cfs @ 12.13 hrs, Volume= 2.968 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
586,000	69	50-75% Grass cover, Fair, HSG B
60,400	72	Dirt roads, HSG A
646,400	69	Weighted Average
646,400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
3.0	280	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.3	70	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.2	155	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.5	900	0.0710	30.50	1,464.22	Channel Flow, DRAINAGE SWALE Area= 48.0 sf Perim= 16.0' r= 3.00' n= 0.027
0.0	15	0.2000	20.29	15.93	Pipe Channel, DRAIN PIPE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
8.9	1,470	Total			

Summary for Subcatchment LF 3-3:

Runoff = 29.13 cfs @ 12.10 hrs, Volume= 2.148 af, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
388,200	69	50-75% Grass cover, Fair, HSG B
53,000	72	Dirt roads, HSG A
10,000	98	Paved parking & roofs
451,200	70	Weighted Average
441,200		97.78% Pervious Area
10,000		2.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
0.5	50	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.2	60	0.3330	4.04		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.6	530	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.2	225	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
6.4	915	Total			

Summary for Subcatchment LF 3-4:

Runoff = 18.04 cfs @ 12.06 hrs, Volume= 1.227 af, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
211,400	69	50-75% Grass cover, Fair, HSG B
46,200	72	Dirt roads, HSG A
257,600	70	Weighted Average
257,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.0500	0.15		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
0.3	260	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.3	300	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
3.9	590	Total			

Summary for Subcatchment LF 3-5:

Runoff = 10.63 cfs @ 12.01 hrs, Volume= 0.676 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
147,000	69	50-75% Grass cover, Fair, HSG B
147,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	60	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.2	200	0.0500	13.57	298.54	Channel Flow, DIVERSION BERM Area= 22.0 sf Perim= 19.0' r= 1.16' n= 0.027
0.2	250	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
0.6	510	Total			

Summary for Subcatchment LF 3-6:

Runoff = 26.06 cfs @ 12.07 hrs, Volume= 1.784 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
297,000	69	50-75% Grass cover, Fair, HSG B
41,000	98	Paved parking & roofs
338,000	73	Weighted Average
297,000		87.87% Pervious Area
41,000		12.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	50	0.3300	0.36		Sheet Flow, SIDESLOPE FLOW Grass: Short n= 0.150 P2= 2.00"
0.3	205	0.0500	13.57	298.54	Channel Flow, DIVERSION BERM Area= 22.0 sf Perim= 19.0' r= 1.16' n= 0.027
1.1	910	0.0150	14.02	673.01	Channel Flow, DRAINAGE SWALE Area= 48.0 sf Perim= 16.0' r= 3.00' n= 0.027
0.5	510	0.0200	16.19	777.13	Channel Flow, DRAINAGE SWALE Area= 48.0 sf Perim= 16.0' r= 3.00' n= 0.027
4.2	1,675	Total			

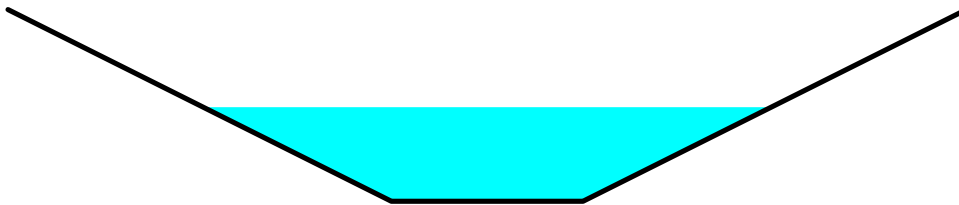
Summary for Reach LF1-R1:

Inflow Area = 29.692 ac, 11.98% Impervious, Inflow Depth > 2.71" for 25 Year Storm event
 Inflow = 79.84 cfs @ 12.11 hrs, Volume= 6.701 af
 Outflow = 75.00 cfs @ 12.20 hrs, Volume= 6.678 af, Atten= 6%, Lag= 5.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.84 fps, Min. Travel Time= 3.1 min
 Avg. Velocity = 1.78 fps, Avg. Travel Time= 8.4 min

Peak Storage= 13,983 cf @ 12.15 hrs
 Average Depth at Peak Storage= 1.96'
 Bank-Full Depth= 4.00' Flow Area= 48.0 sf, Capacity= 343.97 cfs

4.00' x 4.00' deep channel, n= 0.033
 Side Slope Z-value= 2.0 '/' Top Width= 20.00'
 Length= 900.0' Slope= 0.0089 '/'
 Inlet Invert= 98.00', Outlet Invert= 90.00'



Summary for Reach LF1-R2:

Inflow Area = 10.918 ac, 0.00% Impervious, Inflow Depth > 2.40" for 25 Year Storm event
 Inflow = 28.27 cfs @ 12.12 hrs, Volume= 2.184 af
 Outflow = 26.48 cfs @ 12.19 hrs, Volume= 2.177 af, Atten= 6%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 6.63 fps, Min. Travel Time= 2.4 min
 Avg. Velocity = 2.27 fps, Avg. Travel Time= 7.1 min

Peak Storage= 3,945 cf @ 12.15 hrs
 Average Depth at Peak Storage= 0.74'
 Bank-Full Depth= 4.00' Flow Area= 48.0 sf, Capacity= 794.49 cfs

4.00' x 4.00' deep channel, n= 0.033
 Side Slope Z-value= 2.0 '/' Top Width= 20.00'
 Length= 970.0' Slope= 0.0474 '/'
 Inlet Invert= 144.00', Outlet Invert= 98.00'



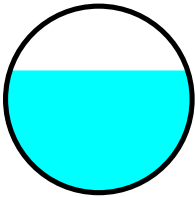
Summary for Reach LF3-R1:

Inflow Area = 51.855 ac, 2.26% Impervious, Inflow Depth > 2.49" for 25 Year Storm event
Inflow = 115.66 cfs @ 12.15 hrs, Volume= 10.773 af
Outflow = 115.24 cfs @ 12.16 hrs, Volume= 10.770 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.49 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.49 fps, Avg. Travel Time= 0.7 min

Peak Storage= 2,111 cf @ 12.16 hrs
Average Depth at Peak Storage= 3.27'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 151.42 cfs

60.0" Round Pipe
n= 0.010
Length= 155.0' Slope= 0.0020 '/'
Inlet Invert= 91.80', Outlet Invert= 91.49'



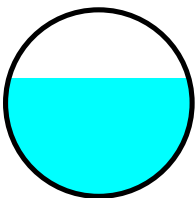
Summary for Reach LF3-R2:

Inflow Area = 40.721 ac, 0.56% Impervious, Inflow Depth > 2.45" for 25 Year Storm event
Inflow = 95.82 cfs @ 12.15 hrs, Volume= 8.323 af
Outflow = 93.58 cfs @ 12.18 hrs, Volume= 8.314 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.28 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.99 fps, Avg. Travel Time= 2.3 min

Peak Storage= 5,508 cf @ 12.16 hrs
Average Depth at Peak Storage= 3.17'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 131.13 cfs

60.0" Round Pipe
n= 0.010
Length= 420.0' Slope= 0.0015 '/'
Inlet Invert= 92.33', Outlet Invert= 91.70'



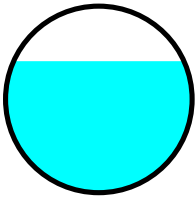
Summary for Reach LF3-R3:

Inflow Area = 34.807 ac, 0.66% Impervious, Inflow Depth > 2.45" for 25 Year Storm event
Inflow = 87.26 cfs @ 12.12 hrs, Volume= 7.103 af
Outflow = 84.60 cfs @ 12.16 hrs, Volume= 7.096 af, Atten= 3%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.12 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 3.74 fps, Avg. Travel Time= 2.4 min

Peak Storage= 5,107 cf @ 12.14 hrs
Average Depth at Peak Storage= 2.82'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 102.28 cfs

48.0" Round Pipe
n= 0.010
Length= 540.0' Slope= 0.0030 '/'
Inlet Invert= 95.05', Outlet Invert= 93.43'



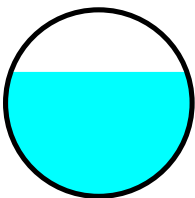
Summary for Reach LF3-R4:

Inflow Area = 24.449 ac, 0.00% Impervious, Inflow Depth > 2.43" for 25 Year Storm event
Inflow = 62.64 cfs @ 12.11 hrs, Volume= 4.960 af
Outflow = 59.93 cfs @ 12.14 hrs, Volume= 4.955 af, Atten= 4%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.05 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 3.67 fps, Avg. Travel Time= 2.6 min

Peak Storage= 3,877 cf @ 12.12 hrs
Average Depth at Peak Storage= 2.33'
Bank-Full Depth= 3.50' Flow Area= 9.6 sf, Capacity= 79.01 cfs

42.0" Round Pipe
n= 0.010
Length= 570.0' Slope= 0.0036 '/'
Inlet Invert= 97.56', Outlet Invert= 95.48'



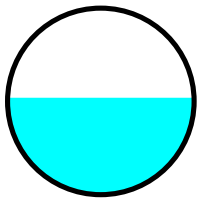
Summary for Reach LF3-R5:

Inflow Area = 9.610 ac, 0.00% Impervious, Inflow Depth > 2.49" for 25 Year Storm event
Inflow = 28.82 cfs @ 12.07 hrs, Volume= 1.993 af
Outflow = 28.04 cfs @ 12.08 hrs, Volume= 1.993 af, Atten= 3%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.67 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.92 fps, Avg. Travel Time= 0.8 min

Peak Storage= 519 cf @ 12.07 hrs
Average Depth at Peak Storage= 1.56'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 53.85 cfs

36.0" Round Pipe
n= 0.010
Length= 140.0' Slope= 0.0039 '/'
Inlet Invert= 98.55', Outlet Invert= 98.01'



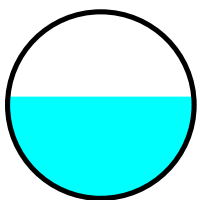
Summary for Reach LF3-R6:

Inflow Area = 9.610 ac, 0.00% Impervious, Inflow Depth > 2.49" for 25 Year Storm event
Inflow = 30.30 cfs @ 12.05 hrs, Volume= 1.995 af
Outflow = 28.82 cfs @ 12.07 hrs, Volume= 1.993 af, Atten= 5%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.61 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.85 fps, Avg. Travel Time= 1.4 min

Peak Storage= 971 cf @ 12.06 hrs
Average Depth at Peak Storage= 1.63'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 52.05 cfs

36.0" Round Pipe
n= 0.010
Length= 247.0' Slope= 0.0036 '/'
Inlet Invert= 99.34', Outlet Invert= 98.45'



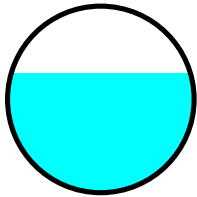
Summary for Reach LF3-R7:

Inflow Area = 11.134 ac, 8.45% Impervious, Inflow Depth > 2.65" for 25 Year Storm event
 Inflow = 34.94 cfs @ 12.05 hrs, Volume= 2.460 af
 Outflow = 34.22 cfs @ 12.06 hrs, Volume= 2.459 af, Atten= 2%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.39 fps, Min. Travel Time= 0.3 min
 Avg. Velocity = 6.25 fps, Avg. Travel Time= 0.9 min

Peak Storage= 680 cf @ 12.06 hrs
 Average Depth at Peak Storage= 1.28'
 Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 47.08 cfs

24.0" Round Pipe
 n= 0.010
 Length= 320.0' Slope= 0.0256 '/
 Inlet Invert= 102.00', Outlet Invert= 93.80'



Summary for Pond 1A: POND 1A

Inflow Area = 49.355 ac, 7.21% Impervious, Inflow Depth > 2.58" for 25 Year Storm event
 Inflow = 115.25 cfs @ 12.18 hrs, Volume= 10.611 af
 Outflow = 74.85 cfs @ 12.37 hrs, Volume= 10.225 af, Atten= 35%, Lag= 11.5 min
 Primary = 74.85 cfs @ 12.37 hrs, Volume= 10.225 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Starting Elev= 82.00' Surf.Area= 0 sf Storage= 0 cf
 Peak Elev= 92.59' @ 12.37 hrs Surf.Area= 14,289 sf Storage= 71,885 cf
 Flood Elev= 93.50' Surf.Area= 16,300 sf Storage= 85,275 cf

Plug-Flow detention time= 34.1 min calculated for 10.204 af (96% of inflow)
 Center-of-Mass det. time= 14.4 min (858.0 - 843.5)

Volume	Invert	Avail.Storage	Storage Description
#1	84.00'	106,825 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
84.00	2,500	0	0
86.00	5,500	8,000	8,000
88.00	8,000	13,500	21,500
90.00	10,400	18,400	39,900
92.00	13,000	23,400	63,300
93.50	16,300	21,975	85,275
94.00	69,900	21,550	106,825

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	18.0" Round Culvert X 4.00 L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 87.00' / 86.00' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Primary	93.50'	170.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=74.71 cfs @ 12.37 hrs HW=92.57' (Free Discharge)

- 1=Culvert (Inlet Controls 74.71 cfs @ 10.57 fps)
- 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 1B: POND 1B

Inflow Area = 49.355 ac, 7.21% Impervious, Inflow Depth > 2.49" for 25 Year Storm event
 Inflow = 74.85 cfs @ 12.37 hrs, Volume= 10.225 af
 Outflow = 5.68 cfs @ 16.23 hrs, Volume= 6.171 af, Atten= 92%, Lag= 231.4 min
 Discarded = 5.68 cfs @ 16.23 hrs, Volume= 6.171 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Starting Elev= 74.00' Surf.Area= 12,000 sf Storage= 36,600 cf
 Peak Elev= 85.70' @ 16.23 hrs Surf.Area= 29,656 sf Storage= 276,244 cf (239,644 cf above start)
 Flood Elev= 93.50' Surf.Area= 63,075 sf Storage= 585,175 cf (548,575 cf above start)

Plug-Flow detention time= 337.6 min calculated for 5.331 af (52% of inflow)
 Center-of-Mass det. time= 95.1 min (953.0 - 858.0)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	613,300 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	5,900	0	0
72.00	9,350	15,250	15,250
74.00	12,000	21,350	36,600
76.00	14,750	26,750	63,350
78.00	17,500	32,250	95,600
80.00	20,400	37,900	133,500
82.00	23,500	43,900	177,400
84.00	26,800	50,300	227,700
86.00	30,150	56,950	284,650
88.00	33,750	63,900	348,550
90.00	37,950	71,700	420,250
92.00	42,600	80,550	500,800
94.00	69,900	112,500	613,300

Device	Routing	Invert	Outlet Devices
#1	Discarded	70.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=5.68 cfs @ 16.23 hrs HW=85.70' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 5.68 cfs)

Summary for Pond 3: POND 3

Inflow Area = 55.927 ac, 5.47% Impervious, Inflow Depth > 2.77" for 25 Year Storm event
 Inflow = 158.01 cfs @ 12.16 hrs, Volume= 12.923 af
 Outflow = 8.58 cfs @ 15.25 hrs, Volume= 8.766 af, Atten= 95%, Lag= 185.4 min
 Discarded = 8.58 cfs @ 15.25 hrs, Volume= 8.766 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Starting Elev= 81.00' Surf.Area= 16,200 sf Storage= 23,600 cf
 Peak Elev= 91.19' @ 15.25 hrs Surf.Area= 44,833 sf Storage= 329,103 cf (305,503 cf above start)
 Flood Elev= 96.00' Surf.Area= 60,600 sf Storage= 580,000 cf (556,400 cf above start)

Plug-Flow detention time= 320.3 min calculated for 8.207 af (64% of inflow)

Center-of-Mass det. time= 157.3 min (992.2 - 834.9)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	580,000 cf	Custom Stage Data (Prismatic) Listed below

Primary OutFlow Max=38.40 cfs @ 12.10 hrs HW=105.27' (Free Discharge)
 ↗1=**Broad-Crested Rectangular Weir** (Weir Controls 38.40 cfs @ 1.41 fps)

Summary for Pond 4B: POND 4B

Inflow Area = 8.163 ac, 68.20% Impervious, Inflow Depth > 3.37" for 25 Year Storm event
 Inflow = 38.82 cfs @ 12.10 hrs, Volume= 2.291 af
 Outflow = 35.96 cfs @ 12.16 hrs, Volume= 2.307 af, Atten= 7%, Lag= 3.4 min
 Discarded = 2.13 cfs @ 12.16 hrs, Volume= 1.382 af
 Secondary = 33.83 cfs @ 12.16 hrs, Volume= 0.925 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Starting Elev= 97.00' Surf.Area= 3,250 sf Storage= 2,110 cf
 Peak Elev= 103.07' @ 12.16 hrs Surf.Area= 11,151 sf Storage= 19,199 cf (17,089 cf above start)
 Flood Elev= 106.00' Surf.Area= 25,000 sf Storage= 61,100 cf (58,990 cf above start)

Plug-Flow detention time= 65.9 min calculated for 2.259 af (99% of inflow)
 Center-of-Mass det. time= 39.1 min (879.6 - 840.5)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	61,100 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

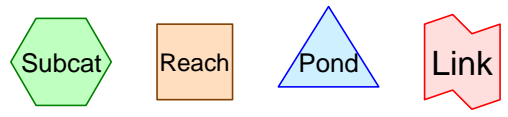
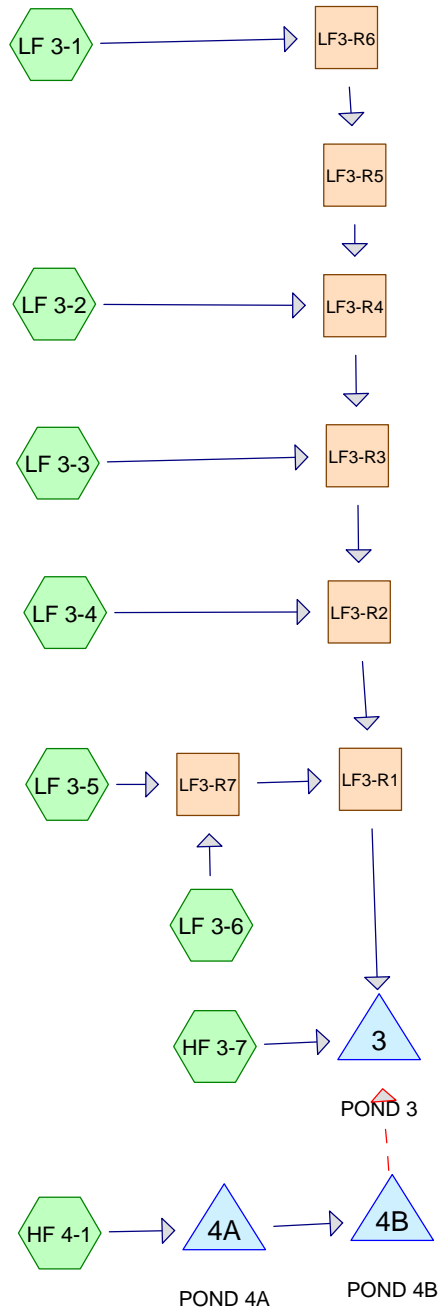
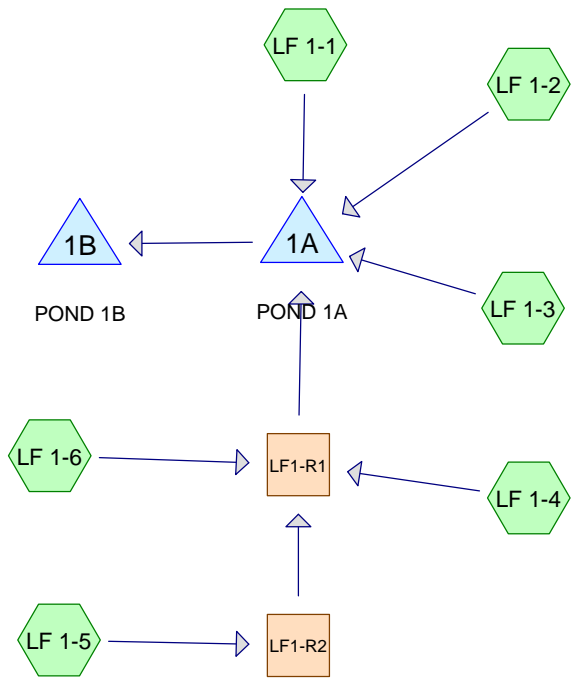
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	500	0.0	0	0
96.00	2,100	40.0	1,040	1,040
98.00	4,400	40.0	2,600	3,640
100.00	6,900	40.0	4,520	8,160
102.00	9,600	40.0	6,600	14,760
104.00	12,500	40.0	8,840	23,600
106.00	25,000	100.0	37,500	61,100

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.00'	8.270 in/hr Exfiltration over Horizontal area
#2	Secondary	102.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=2.13 cfs @ 12.16 hrs HW=103.04' (Free Discharge)
 ↗1=**Exfiltration** (Exfiltration Controls 2.13 cfs)

Secondary OutFlow Max=32.49 cfs @ 12.16 hrs HW=103.04' (Free Discharge)
 ↗2=**Orifice/Grate** (Weir Controls 32.49 cfs @ 3.33 fps)

100 YEAR STORM EVENT



Routing Diagram for BOURNE-SITE-BUILD-OUT-MAR 4 2021 CONCEPT-THRU PH 9+LHF
 Prepared by {enter your company name here}, Printed 4/12/2021
 HydroCAD® 10.00-22 s/n 07502 © 2018 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment HF 3-7: Runoff Area=177,370 sf 46.33% Impervious Runoff Depth>5.01"
Flow Length=470' Slope=0.0200 '/' Tc=2.7 min CN=82 Runoff=25.63 cfs 1.700 af

Subcatchment HF 4-1: Runoff Area=355,570 sf 68.20% Impervious Runoff Depth>5.80"
Flow Length=940' Slope=0.0180 '/' Tc=5.8 min CN=89 Runoff=51.75 cfs 3.947 af

Subcatchment LF 1-1: Runoff Area=451,000 sf 0.00% Impervious Runoff Depth>3.59"
Flow Length=1,800' Tc=9.9 min CN=69 Runoff=37.72 cfs 3.097 af

Subcatchment LF 1-2: Runoff Area=152,500 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=795' Tc=1.6 min CN=69 Runoff=16.14 cfs 1.049 af

Subcatchment LF 1-3: Runoff Area=253,000 sf 0.00% Impervious Runoff Depth>3.59"
Flow Length=800' Tc=9.1 min CN=69 Runoff=21.58 cfs 1.738 af

Subcatchment LF 1-4: Runoff Area=331,400 sf 0.00% Impervious Runoff Depth>3.59"
Flow Length=810' Tc=6.9 min CN=69 Runoff=30.65 cfs 2.277 af

Subcatchment LF 1-5: Runoff Area=475,600 sf 0.00% Impervious Runoff Depth>3.59"
Flow Length=970' Tc=7.7 min CN=69 Runoff=42.79 cfs 3.268 af

Subcatchment LF 1-6: Runoff Area=486,400 sf 31.87% Impervious Runoff Depth>4.56"
Flow Length=1,200' Slope=0.0375 '/' Tc=5.1 min CN=78 Runoff=59.27 cfs 4.246 af

Subcatchment LF 3-1: Runoff Area=418,600 sf 0.00% Impervious Runoff Depth>3.70"
Flow Length=1,625' Tc=3.0 min CN=70 Runoff=45.35 cfs 2.963 af

Subcatchment LF 3-2: Runoff Area=646,400 sf 0.00% Impervious Runoff Depth>3.59"
Flow Length=1,470' Tc=8.9 min CN=69 Runoff=55.40 cfs 4.440 af

Subcatchment LF 3-3: Runoff Area=451,200 sf 2.22% Impervious Runoff Depth>3.70"
Flow Length=915' Tc=6.4 min CN=70 Runoff=43.62 cfs 3.192 af

Subcatchment LF 3-4: Runoff Area=257,600 sf 0.00% Impervious Runoff Depth>3.70"
Flow Length=590' Tc=3.9 min CN=70 Runoff=27.05 cfs 1.823 af

Subcatchment LF 3-5: Runoff Area=147,000 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=510' Tc=0.6 min CN=69 Runoff=16.09 cfs 1.011 af

Subcatchment LF 3-6: Runoff Area=338,000 sf 12.13% Impervious Runoff Depth>4.02"
Flow Length=1,675' Tc=4.2 min CN=73 Runoff=38.09 cfs 2.599 af

Reach LF1-R1: Avg. Flow Depth=2.38' Max Vel=5.38 fps Inflow=118.51 cfs 9.782 af
n=0.033 L=900.0' S=0.0089 '/' Capacity=343.97 cfs Outflow=111.73 cfs 9.754 af

Reach LF1-R2: Avg. Flow Depth=0.93' Max Vel=7.50 fps Inflow=42.79 cfs 3.268 af
n=0.033 L=970.0' S=0.0474 '/' Capacity=794.49 cfs Outflow=39.95 cfs 3.259 af

BOURNE-SITE-BUILD-OUT-MAR 4 2021 CONC Type III 24-hr 100 Year Storm Rainfall=7.10"

Prepared by {enter your company name here}

Printed 4/12/2021

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Page 3

Reach LF3-R1: Avg. Flow Depth=4.59' Max Vel=8.77 fps Inflow=165.47 cfs 15.998 af
60.0" Round Pipe n=0.010 L=155.0' S=0.0020 '/ Capacity=151.42 cfs Outflow=162.64 cfs 15.994 af

Reach LF3-R2: Avg. Flow Depth=3.87' Max Vel=7.59 fps Inflow=123.96 cfs 12.400 af
60.0" Round Pipe n=0.010 L=420.0' S=0.0015 '/ Capacity=131.13 cfs Outflow=121.38 cfs 12.389 af

Reach LF3-R3: Avg. Flow Depth=4.00' Max Vel=9.23 fps Inflow=121.64 cfs 10.586 af
48.0" Round Pipe n=0.010 L=540.0' S=0.0030 '/ Capacity=102.28 cfs Outflow=102.28 cfs 10.576 af

Reach LF3-R4: Avg. Flow Depth=3.50' Max Vel=9.36 fps Inflow=94.33 cfs 7.401 af
42.0" Round Pipe n=0.010 L=570.0' S=0.0036 '/ Capacity=79.01 cfs Outflow=79.24 cfs 7.394 af

Reach LF3-R5: Avg. Flow Depth=2.03' Max Vel=8.42 fps Inflow=43.30 cfs 2.962 af
36.0" Round Pipe n=0.010 L=140.0' S=0.0039 '/ Capacity=53.85 cfs Outflow=42.28 cfs 2.961 af

Reach LF3-R6: Avg. Flow Depth=2.15' Max Vel=8.28 fps Inflow=45.35 cfs 2.963 af
36.0" Round Pipe n=0.010 L=247.0' S=0.0036 '/ Capacity=52.05 cfs Outflow=43.30 cfs 2.962 af

Reach LF3-R7: Avg. Flow Depth=2.00' Max Vel=17.03 fps Inflow=51.43 cfs 3.610 af
24.0" Round Pipe n=0.010 L=320.0' S=0.0256 '/ Capacity=47.08 cfs Outflow=49.75 cfs 3.609 af

Pond 1A: POND 1A Peak Elev=93.78' Storage=97,410 cf Inflow=174.84 cfs 15.638 af
Outflow=151.73 cfs 15.244 af

Pond 1B: POND 1B Peak Elev=90.34' Storage=434,096 cf Inflow=151.73 cfs 15.244 af
Outflow=7.42 cfs 7.921 af

Pond 3: POND 3 Peak Elev=95.12' Storage=529,654 cf Inflow=220.62 cfs 19.404 af
Outflow=11.01 cfs 11.356 af

Pond 4A: POND 4A Peak Elev=105.33' Storage=32,552 cf Inflow=51.75 cfs 3.947 af
Outflow=51.20 cfs 3.281 af

Pond 4B: POND 4B Peak Elev=103.55' Storage=21,407 cf Inflow=51.20 cfs 3.281 af
Discarded=2.27 cfs 1.563 af Secondary=42.36 cfs 1.711 af Outflow=44.63 cfs 3.273 af

Total Runoff Area = 113.444 ac Runoff Volume = 37.350 af Average Runoff Depth = 3.95"
89.26% Pervious = 101.262 ac 10.74% Impervious = 12.183 ac

Summary for Subcatchment HF 3-7:

Runoff = 25.63 cfs @ 12.05 hrs, Volume= 1.700 af, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
49,920	98	Paved roads w/curbs & sewers, HSG B
95,200	69	50-75% Grass cover, Fair, HSG B
32,250	98	Roofs, HSG A
177,370	82	Weighted Average
95,200		53.67% Pervious Area
82,170		46.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	470	0.0200	2.87		Shallow Concentrated Flow, PAVED SURFACE Paved Kv= 20.3 fps

Summary for Subcatchment HF 4-1:

Runoff = 51.75 cfs @ 12.09 hrs, Volume= 3.947 af, Depth> 5.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
23,200	98	Roofs, HSG A
219,300	98	Paved roads w/curbs & sewers, HSG A
113,070	69	50-75% Grass cover, Fair, HSG B
355,570	89	Weighted Average
113,070		31.80% Pervious Area
242,500		68.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	940	0.0180	2.72		Shallow Concentrated Flow, PAVED Paved Kv= 20.3 fps

Summary for Subcatchment LF 1-1:

Runoff = 37.72 cfs @ 12.14 hrs, Volume= 3.097 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
405,100	69	50-75% Grass cover, Fair, HSG B
45,900	72	Dirt roads, HSG A
451,000	69	Weighted Average
451,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
1.6	150	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.7	165	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.5	355	0.0620	12.39	266.47	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.033
0.1	130	0.3300	23.27	488.59	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.028
2.1	950	0.0150	7.61	91.34	Channel Flow, DRAINAGE SWALE Area= 12.0 sf Perim= 10.0' r= 1.20' n= 0.027
9.9	1,800	Total			

Summary for Subcatchment LF 1-2:

Runoff = 16.14 cfs @ 12.03 hrs, Volume= 1.049 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
152,500	69	50-75% Grass cover, Fair, HSG B
152,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	190	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.6	410	0.0300	10.54	226.55	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.2	195	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
1.6	795	Total			

Summary for Subcatchment LF 1-3:

Runoff = 21.58 cfs @ 12.13 hrs, Volume= 1.738 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
253,000	69	50-75% Grass cover, Fair, HSG B
253,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
3.8	360	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.2	200	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.2	190	0.2900	18.51	388.62	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
9.1	800	Total			

Summary for Subcatchment LF 1-4:

Runoff = 30.65 cfs @ 12.10 hrs, Volume= 2.277 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
331,400	69	50-75% Grass cover, Fair, HSG B
331,400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
1.4	130	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.4	340	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.2	290	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
6.9	810	Total			

Summary for Subcatchment LF 1-5:

Runoff = 42.79 cfs @ 12.11 hrs, Volume= 3.268 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
475,600	69	50-75% Grass cover, Fair, HSG B
475,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
1.5	145	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.3	75	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.9	630	0.0500	11.13	239.30	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.033
0.1	70	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033

7.7 970 Total

Summary for Subcatchment LF 1-6:

Runoff = 59.27 cfs @ 12.08 hrs, Volume= 4.246 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
331,400	69	50-75% Grass cover, Fair, HSG B
155,000	98	Paved parking, HSG A
486,400	78	Weighted Average
331,400		68.13% Pervious Area
155,000		31.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	1,200	0.0375	3.93		Shallow Concentrated Flow, ACCESS ROAD Paved Kv= 20.3 fps

Summary for Subcatchment LF 3-1:

Runoff = 45.35 cfs @ 12.05 hrs, Volume= 2.963 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
268,600	69	50-75% Grass cover, Fair, HSG B
150,000	72	Dirt roads, HSG A
418,600	70	Weighted Average
418,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	180	0.2400	3.43		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.5	440	0.0540	14.14	303.95	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.1	90	0.2330	16.59	348.34	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
1.5	915	0.0076	9.98	479.05	Channel Flow, DRAINAGE SWALE Area= 48.0 sf Perim= 16.0' r= 3.00' n= 0.027
3.0	1,625	Total			

Summary for Subcatchment LF 3-2:

Runoff = 55.40 cfs @ 12.13 hrs, Volume= 4.440 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
586,000	69	50-75% Grass cover, Fair, HSG B
60,400	72	Dirt roads, HSG A
646,400	69	Weighted Average
646,400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
3.0	280	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.3	70	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.2	155	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.5	900	0.0710	30.50	1,464.22	Channel Flow, DRAINAGE SWALE Area= 48.0 sf Perim= 16.0' r= 3.00' n= 0.027
0.0	15	0.2000	20.29	15.93	Pipe Channel, DRAIN PIPE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
8.9	1,470	Total			

Summary for Subcatchment LF 3-3:

Runoff = 43.62 cfs @ 12.10 hrs, Volume= 3.192 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
388,200	69	50-75% Grass cover, Fair, HSG B
53,000	72	Dirt roads, HSG A
10,000	98	Paved parking & roofs
451,200	70	Weighted Average
441,200		97.78% Pervious Area
10,000		2.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0500	0.17		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
0.5	50	0.0500	1.57		Shallow Concentrated Flow, PLATEAU FLOW Short Grass Pasture Kv= 7.0 fps
0.2	60	0.3330	4.04		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.6	530	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.2	225	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
6.4	915	Total			

Summary for Subcatchment LF 3-4:

Runoff = 27.05 cfs @ 12.06 hrs, Volume= 1.823 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
211,400	69	50-75% Grass cover, Fair, HSG B
46,200	72	Dirt roads, HSG A
257,600	70	Weighted Average
257,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.0500	0.15		Sheet Flow, PLATEAU FLOW Grass: Short n= 0.150 P2= 2.00"
0.3	260	0.0500	13.60	292.48	Channel Flow, DIVERSION BERM Area= 21.5 sf Perim= 18.5' r= 1.16' n= 0.027
0.3	300	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
3.9	590	Total			

Summary for Subcatchment LF 3-5:

Runoff = 16.09 cfs @ 12.01 hrs, Volume= 1.011 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
147,000	69	50-75% Grass cover, Fair, HSG B
147,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	60	0.3300	4.02		Shallow Concentrated Flow, SIDESLOPE FLOW Short Grass Pasture Kv= 7.0 fps
0.2	200	0.0500	13.57	298.54	Channel Flow, DIVERSION BERM Area= 22.0 sf Perim= 19.0' r= 1.16' n= 0.027
0.2	250	0.3300	19.74	414.56	Channel Flow, LET DOWN CHANNEL Area= 21.0 sf Perim= 31.5' r= 0.67' n= 0.033
0.6	510	Total			

Summary for Subcatchment LF 3-6:

Runoff = 38.09 cfs @ 12.06 hrs, Volume= 2.599 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
297,000	69	50-75% Grass cover, Fair, HSG B
41,000	98	Paved parking & roofs
338,000	73	Weighted Average
297,000		87.87% Pervious Area
41,000		12.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	50	0.3300	0.36		Sheet Flow, SIDESLOPE FLOW Grass: Short n= 0.150 P2= 2.00"
0.3	205	0.0500	13.57	298.54	Channel Flow, DIVERSION BERM Area= 22.0 sf Perim= 19.0' r= 1.16' n= 0.027
1.1	910	0.0150	14.02	673.01	Channel Flow, DRAINAGE SWALE Area= 48.0 sf Perim= 16.0' r= 3.00' n= 0.027
0.5	510	0.0200	16.19	777.13	Channel Flow, DRAINAGE SWALE Area= 48.0 sf Perim= 16.0' r= 3.00' n= 0.027
4.2	1,675	Total			

Summary for Reach LF1-R1:

Inflow Area = 29.692 ac, 11.98% Impervious, Inflow Depth > 3.95" for 100 Year Storm event
 Inflow = 118.51 cfs @ 12.11 hrs, Volume= 9.782 af
 Outflow = 111.73 cfs @ 12.19 hrs, Volume= 9.754 af, Atten= 6%, Lag= 5.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 5.38 fps, Min. Travel Time= 2.8 min
 Avg. Velocity = 1.94 fps, Avg. Travel Time= 7.7 min

Peak Storage= 18,800 cf @ 12.15 hrs
 Average Depth at Peak Storage= 2.38'
 Bank-Full Depth= 4.00' Flow Area= 48.0 sf, Capacity= 343.97 cfs

4.00' x 4.00' deep channel, n= 0.033
 Side Slope Z-value= 2.0 '/' Top Width= 20.00'
 Length= 900.0' Slope= 0.0089 '/'
 Inlet Invert= 98.00', Outlet Invert= 90.00'



Summary for Reach LF1-R2:

Inflow Area = 10.918 ac, 0.00% Impervious, Inflow Depth > 3.59" for 100 Year Storm event
 Inflow = 42.79 cfs @ 12.11 hrs, Volume= 3.268 af
 Outflow = 39.95 cfs @ 12.18 hrs, Volume= 3.259 af, Atten= 7%, Lag= 4.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 7.50 fps, Min. Travel Time= 2.2 min
 Avg. Velocity = 2.53 fps, Avg. Travel Time= 6.4 min

Peak Storage= 5,306 cf @ 12.14 hrs
 Average Depth at Peak Storage= 0.93'
 Bank-Full Depth= 4.00' Flow Area= 48.0 sf, Capacity= 794.49 cfs

4.00' x 4.00' deep channel, n= 0.033
 Side Slope Z-value= 2.0 '/' Top Width= 20.00'
 Length= 970.0' Slope= 0.0474 '/'
 Inlet Invert= 144.00', Outlet Invert= 98.00'



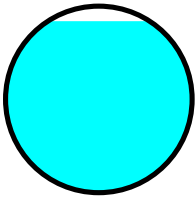
Summary for Reach LF3-R1:

Inflow Area = 51.855 ac, 2.26% Impervious, Inflow Depth > 3.70" for 100 Year Storm event
Inflow = 165.47 cfs @ 12.11 hrs, Volume= 15.998 af
Outflow = 162.64 cfs @ 12.12 hrs, Volume= 15.994 af, Atten= 2%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.77 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.79 fps, Avg. Travel Time= 0.7 min

Peak Storage= 2,938 cf @ 12.12 hrs
Average Depth at Peak Storage= 4.59'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 151.42 cfs

60.0" Round Pipe
n= 0.010
Length= 155.0' Slope= 0.0020 '/'
Inlet Invert= 91.80', Outlet Invert= 91.49'



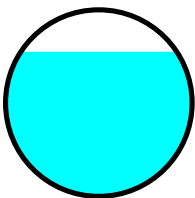
Summary for Reach LF3-R2:

Inflow Area = 40.721 ac, 0.56% Impervious, Inflow Depth > 3.65" for 100 Year Storm event
Inflow = 123.96 cfs @ 12.11 hrs, Volume= 12.400 af
Outflow = 121.38 cfs @ 12.15 hrs, Volume= 12.389 af, Atten= 2%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.59 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 3.26 fps, Avg. Travel Time= 2.1 min

Peak Storage= 6,853 cf @ 12.12 hrs
Average Depth at Peak Storage= 3.87'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 131.13 cfs

60.0" Round Pipe
n= 0.010
Length= 420.0' Slope= 0.0015 '/'
Inlet Invert= 92.33', Outlet Invert= 91.70'



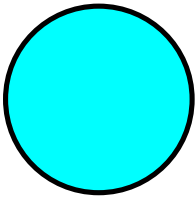
Summary for Reach LF3-R3:

Inflow Area = 34.807 ac, 0.66% Impervious, Inflow Depth > 3.65" for 100 Year Storm event
Inflow = 121.64 cfs @ 12.11 hrs, Volume= 10.586 af
Outflow = 102.28 cfs @ 12.15 hrs, Volume= 10.576 af, Atten= 16%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.23 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 4.07 fps, Avg. Travel Time= 2.2 min

Peak Storage= 6,786 cf @ 12.10 hrs
Average Depth at Peak Storage= 4.00'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 102.28 cfs

48.0" Round Pipe
n= 0.010
Length= 540.0' Slope= 0.0030 '/'
Inlet Invert= 95.05', Outlet Invert= 93.43'



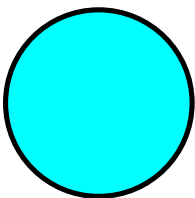
Summary for Reach LF3-R4:

Inflow Area = 24.449 ac, 0.00% Impervious, Inflow Depth > 3.63" for 100 Year Storm event
Inflow = 94.33 cfs @ 12.10 hrs, Volume= 7.401 af
Outflow = 79.24 cfs @ 12.18 hrs, Volume= 7.394 af, Atten= 16%, Lag= 4.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.36 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 4.00 fps, Avg. Travel Time= 2.4 min

Peak Storage= 5,484 cf @ 12.10 hrs
Average Depth at Peak Storage= 3.50'
Bank-Full Depth= 3.50' Flow Area= 9.6 sf, Capacity= 79.01 cfs

42.0" Round Pipe
n= 0.010
Length= 570.0' Slope= 0.0036 '/'
Inlet Invert= 97.56', Outlet Invert= 95.48'



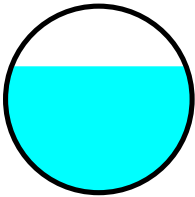
Summary for Reach LF3-R5:

Inflow Area = 9.610 ac, 0.00% Impervious, Inflow Depth > 3.70" for 100 Year Storm event
Inflow = 43.30 cfs @ 12.07 hrs, Volume= 2.962 af
Outflow = 42.28 cfs @ 12.07 hrs, Volume= 2.961 af, Atten= 2%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.42 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.19 fps, Avg. Travel Time= 0.7 min

Peak Storage= 712 cf @ 12.07 hrs
Average Depth at Peak Storage= 2.03'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 53.85 cfs

36.0" Round Pipe
n= 0.010
Length= 140.0' Slope= 0.0039 '/'
Inlet Invert= 98.55', Outlet Invert= 98.01'



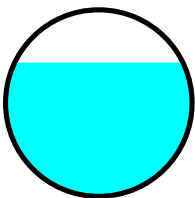
Summary for Reach LF3-R6:

Inflow Area = 9.610 ac, 0.00% Impervious, Inflow Depth > 3.70" for 100 Year Storm event
Inflow = 45.35 cfs @ 12.05 hrs, Volume= 2.963 af
Outflow = 43.30 cfs @ 12.07 hrs, Volume= 2.962 af, Atten= 5%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.28 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.12 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,337 cf @ 12.06 hrs
Average Depth at Peak Storage= 2.15'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 52.05 cfs

36.0" Round Pipe
n= 0.010
Length= 247.0' Slope= 0.0036 '/'
Inlet Invert= 99.34', Outlet Invert= 98.45'



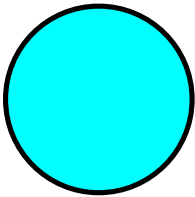
Summary for Reach LF3-R7:

Inflow Area = 11.134 ac, 8.45% Impervious, Inflow Depth > 3.89" for 100 Year Storm event
 Inflow = 51.43 cfs @ 12.05 hrs, Volume= 3.610 af
 Outflow = 49.75 cfs @ 12.08 hrs, Volume= 3.609 af, Atten= 3%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 17.03 fps, Min. Travel Time= 0.3 min
 Avg. Velocity = 6.79 fps, Avg. Travel Time= 0.8 min

Peak Storage= 1,013 cf @ 12.06 hrs
 Average Depth at Peak Storage= 2.00'
 Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 47.08 cfs

24.0" Round Pipe
 n= 0.010
 Length= 320.0' Slope= 0.0256 '/'
 Inlet Invert= 102.00', Outlet Invert= 93.80'



Summary for Pond 1A: POND 1A

Inflow Area = 49.355 ac, 7.21% Impervious, Inflow Depth > 3.80" for 100 Year Storm event
 Inflow = 174.84 cfs @ 12.17 hrs, Volume= 15.638 af
 Outflow = 151.73 cfs @ 12.27 hrs, Volume= 15.244 af, Atten= 13%, Lag= 5.9 min
 Primary = 151.73 cfs @ 12.27 hrs, Volume= 15.244 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Starting Elev= 82.00' Surf.Area= 0 sf Storage= 0 cf
 Peak Elev= 93.78' @ 12.27 hrs Surf.Area= 46,483 sf Storage= 97,410 cf
 Flood Elev= 93.50' Surf.Area= 16,300 sf Storage= 85,275 cf

Plug-Flow detention time= 27.6 min calculated for 15.244 af (97% of inflow)
 Center-of-Mass det. time= 13.4 min (845.5 - 832.1)

Volume	Invert	Avail.Storage	Storage Description
#1	84.00'	106,825 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
84.00	2,500	0	0
86.00	5,500	8,000	8,000
88.00	8,000	13,500	21,500
90.00	10,400	18,400	39,900
92.00	13,000	23,400	63,300
93.50	16,300	21,975	85,275
94.00	69,900	21,550	106,825

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	18.0" Round Culvert X 4.00 L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 87.00' / 86.00' S= 0.0200 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Primary	93.50'	170.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=145.04 cfs @ 12.27 hrs HW=93.76' (Free Discharge)

1=Culvert (Inlet Controls 83.46 cfs @ 11.81 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 61.58 cfs @ 1.38 fps)

Summary for Pond 1B: POND 1B

Inflow Area = 49.355 ac, 7.21% Impervious, Inflow Depth > 3.71" for 100 Year Storm event
 Inflow = 151.73 cfs @ 12.27 hrs, Volume= 15.244 af
 Outflow = 7.42 cfs @ 16.38 hrs, Volume= 7.921 af, Atten= 95%, Lag= 247.0 min
 Discarded = 7.42 cfs @ 16.38 hrs, Volume= 7.921 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Starting Elev= 74.00' Surf.Area= 12,000 sf Storage= 36,600 cf
 Peak Elev= 90.34' @ 16.38 hrs Surf.Area= 38,749 sf Storage= 434,096 cf (397,496 cf above start)
 Flood Elev= 93.50' Surf.Area= 63,075 sf Storage= 585,175 cf (548,575 cf above start)

Plug-Flow detention time= 343.6 min calculated for 7.066 af (46% of inflow)

Center-of-Mass det. time= 130.8 min (976.3 - 845.5)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	613,300 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	5,900	0	0
72.00	9,350	15,250	15,250
74.00	12,000	21,350	36,600
76.00	14,750	26,750	63,350
78.00	17,500	32,250	95,600
80.00	20,400	37,900	133,500
82.00	23,500	43,900	177,400
84.00	26,800	50,300	227,700
86.00	30,150	56,950	284,650
88.00	33,750	63,900	348,550
90.00	37,950	71,700	420,250
92.00	42,600	80,550	500,800
94.00	69,900	112,500	613,300

Device	Routing	Invert	Outlet Devices
#1	Discarded	70.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=7.42 cfs @ 16.38 hrs HW=90.34' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 7.42 cfs)

Summary for Pond 3: POND 3

Inflow Area = 55.927 ac, 5.47% Impervious, Inflow Depth > 4.16" for 100 Year Storm event
 Inflow = 220.62 cfs @ 12.12 hrs, Volume= 19.404 af
 Outflow = 11.01 cfs @ 15.51 hrs, Volume= 11.356 af, Atten= 95%, Lag= 203.6 min
 Discarded = 11.01 cfs @ 15.51 hrs, Volume= 11.356 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Starting Elev= 81.00' Surf.Area= 16,200 sf Storage= 23,600 cf
 Peak Elev= 95.12' @ 15.51 hrs Surf.Area= 57,514 sf Storage= 529,654 cf (506,054 cf above start)
 Flood Elev= 96.00' Surf.Area= 60,600 sf Storage= 580,000 cf (556,400 cf above start)

Plug-Flow detention time= 331.8 min calculated for 10.814 af (56% of inflow)
 Center-of-Mass det. time= 180.3 min (1,003.6 - 823.3)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	580,000 cf	Custom Stage Data (Prismatic) Listed below

Primary OutFlow Max=50.65 cfs @ 12.10 hrs HW=105.33' (Free Discharge)
 ↖1=**Broad-Crested Rectangular Weir** (Weir Controls 50.65 cfs @ 1.55 fps)

Summary for Pond 4B: POND 4B

Inflow Area = 8.163 ac, 68.20% Impervious, Inflow Depth > 4.82" for 100 Year Storm event
 Inflow = 51.20 cfs @ 12.10 hrs, Volume= 3.281 af
 Outflow = 44.63 cfs @ 12.15 hrs, Volume= 3.273 af, Atten= 13%, Lag= 2.8 min
 Discarded = 2.27 cfs @ 12.15 hrs, Volume= 1.563 af
 Secondary = 42.36 cfs @ 12.15 hrs, Volume= 1.711 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Starting Elev= 97.00' Surf.Area= 3,250 sf Storage= 2,110 cf
 Peak Elev= 103.55' @ 12.15 hrs Surf.Area= 11,847 sf Storage= 21,407 cf (19,297 cf above start)
 Flood Elev= 106.00' Surf.Area= 25,000 sf Storage= 61,100 cf (58,990 cf above start)

Plug-Flow detention time= 54.3 min calculated for 3.225 af (98% of inflow)
 Center-of-Mass det. time= 31.6 min (857.9 - 826.3)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	61,100 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	500	0.0	0	0
96.00	2,100	40.0	1,040	1,040
98.00	4,400	40.0	2,600	3,640
100.00	6,900	40.0	4,520	8,160
102.00	9,600	40.0	6,600	14,760
104.00	12,500	40.0	8,840	23,600
106.00	25,000	100.0	37,500	61,100

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.00'	8.270 in/hr Exfiltration over Horizontal area
#2	Secondary	102.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=2.27 cfs @ 12.15 hrs HW=103.54' (Free Discharge)
 ↖1=**Exfiltration** (Exfiltration Controls 2.27 cfs)

Secondary OutFlow Max=42.29 cfs @ 12.15 hrs HW=103.54' (Free Discharge)
 ↖2=**Orifice/Grate** (Orifice Controls 42.29 cfs @ 5.98 fps)

APPENDIX 3

TOTAL SUSPENDED SOLIDS REMOVAL CALCULATION
WORKSHEET

Total Suspended Solid Removal Calculation Worksheet Stormwater Basin No. 1

Location: Town of Bourne ISWM - Bourne Landfill

Bourne, MA

TSS Removal
Calculation Worksheet

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Water Quality Swale	70%	1.00*	0.700	0.300
Forebay	25%	0.300	0.075	0.225
Infiltration Basin	80%	0.225	0.180	0.045
Total TSS Removal=			95.5%	

Project: Full Buildout Scenario Landfill Expansion

Prepared By: ARQ

Date: 4/12/2021

* Equals remaining load from previous BMP (E) which enters the BMP

Total Suspended Solid Removal Calculation Worksheet Stormwater Basin No. 3

Location: Town of Bourne ISWM - Bourne Landfill

Bourne, MA

TSS Removal
Calculation Worksheet

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Water Quality Swale	70%	1.00*	0.700	0.300
Forebay	25%	0.300	0.075	0.225
Infiltration basin	80%	0.225	0.180	0.045

Total TSS Removal=

95.5%

Project: Full Buildout Scenario Landfill Expansion

Prepared By: ARQ

Date: 4/12/2021

* Equals remaining load from previous BMP (E) which enters the BMP

Total Suspended Solid Removal Calculation Worksheet Stormwater Basin No. 4

Location: Town of Bourne ISWM - Bourne Landfill

Bourne, MA

TSS Removal
Calculation Worksheet

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Forebay	25%	1.00*	0.250	0.750
Bioretention Area	90%	0.750	0.675	0.075

Total TSS Removal=

92.5%

Project: Full Buildout Scenario Landfill Expansion

Prepared By: ARQ

Date: 4/12/2021

* Equals remaining load from previous
BMP (E) which enters the BMP

APPENDIX 4

WATER RESOURCES NITROGEN LOADING AND MITIGATION WORKSHEET

DRAFT

Water Resources Nitrogen Loading and Mitigation Worksheet

See Technical Bulletin 91-001 for further details: <http://www.capecodcommission.org/regulatory/NitrogenLoadTechbulletin.pdf>

Project Nitrogen Load	Wastewater	Proposed development	Existing (if redevelopment)															
<p>1. Place <input checked="" type="checkbox"/> in applicable box:</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Will the project be connected to sewer ?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> Is project Title-5 wastewater flow 10,000 gpd or greater ? <i>(If 'Yes', then the project must be reviewed for consistency with Additional Methods under Objective WR1)</i></p> <p>Place <input checked="" type="checkbox"/> in applicable box and multiply unsewered wastewater flow by applicable conversion factor:</p> <table style="width:100%; border: none;"> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Standard Title-5 System (35-ppm-N)</td> <td style="border: none; text-align: center;">x</td> <td style="border: none; text-align: center;">0.048359</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> DEP-approved I/A System (25-ppm-N)</td> <td style="border: none; text-align: center;">x</td> <td style="border: none; text-align: center;">0.034542</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> DEP-approved I/A System (19-ppm-N)</td> <td style="border: none; text-align: center;">x</td> <td style="border: none; text-align: center;">0.026252</td> <td style="border: none;">} Type of system: _____</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Groundwater Discharge (10-ppm-N)</td> <td style="border: none; text-align: center;">x</td> <td style="border: none; text-align: center;">0.013817</td> <td style="border: none;"></td> </tr> </table>	<input checked="" type="checkbox"/> Standard Title-5 System (35-ppm-N)	x	0.048359		<input type="checkbox"/> DEP-approved I/A System (25-ppm-N)	x	0.034542		<input type="checkbox"/> DEP-approved I/A System (19-ppm-N)	x	0.026252	} Type of system: _____	<input type="checkbox"/> Groundwater Discharge (10-ppm-N)	x	0.013817		<p>Project Title-5 wastewater flows: <input type="text" value="1125.0"/> gpd (a)</p> <p>Actual wastewater flows: <input type="text" value="1125.0"/>* (b)</p> <p>Average wastewater flows: <input type="text" value="1125.0"/> gpd (a)+(b) ÷2= (A)</p> <p><small>* Title-5 flows prescribed by TB91-001 for commercial uses</small></p>	<p>Calculate (A') through (P') as w/ (A) through (P):</p> <p>Title-5 wastewater flows: <input type="text"/> gpd</p> <p>Actual wastewater flows: <input type="text"/>* (A')</p> <p>Ave. wastewater flows: <input type="text"/> gpd</p> <p>Place <input checked="" type="checkbox"/> in applicable box:</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is existing development on sewer ? <i>(If 'Yes', then go to line 2.)</i></p> <p><input type="checkbox"/> Standard Title-5 System</p> <p><input type="checkbox"/> DEP-approved I/A System (commercial)</p> <p><input type="checkbox"/> DEP-approved I/A System (residential)</p> <p><input type="checkbox"/> Wastewater Treatment Facility (GWDP)</p>
<input checked="" type="checkbox"/> Standard Title-5 System (35-ppm-N)	x	0.048359																
<input type="checkbox"/> DEP-approved I/A System (25-ppm-N)	x	0.034542																
<input type="checkbox"/> DEP-approved I/A System (19-ppm-N)	x	0.026252	} Type of system: _____															
<input type="checkbox"/> Groundwater Discharge (10-ppm-N)	x	0.013817																
	<p>Wastewater nitrogen load (Title-5 flows) = <input type="text" value="54.40"/> kg-N/yr (B)</p> <p>Wastewater nitrogen load (Actual flows) = <input type="text" value="54.40"/> kg-N/yr (C)</p>	<p><input type="text"/> kg-N/yr (B')</p> <p><input type="text"/> kg-N/yr (C')</p> <p>wastewater offsets</p>																
Stormwater Runoff																		
<p>Town: _____ Recharge rate for town (inches; for natural areas from Technical Bulletin 91-001): <input type="text" value="21"/> (RECH)</p>																		
<p>Project site area: <input type="text" value="111.000"/> acres (D)</p> <p>Project site wetland area: <input type="text" value="0.000"/> acres (E)</p> <p>Project site upland area: <input type="text" value="111.000"/> acres (F)</p> <p>Pervious unpaved upland: <input type="text" value="98.925"/> acres (G)</p> <p><input type="text" value="11"/>% using LID Paved area: <input type="text" value="466.000"/> s.f. (H) <i>Factor may be adjusted for employment of LID →</i> x 1.3780E-04 = <input type="text" value="64.2132286"/> kg-N/yr (I)</p> <p>Roof area: <input type="text" value="60.000"/> s.f. (J) x 7.0792E-05 = <input type="text" value="4.2475"/> kg-N/yr (K)</p>			<p>Project site area: <input type="text" value="111.000"/> acres (D)</p> <p>Project site wetland area: <input type="text" value="0.000"/> acres (E)</p> <p>Project site upland area: <input type="text" value="111.000"/> acres (F)</p> <p>Pervious unpaved upland: <input type="text" value="111.000"/> acres (G')</p> <p>Paved area: <input type="text"/> s.f. (H')</p> <p>Paving runoff offset: <input type="text"/> kg-N/yr (I')</p> <p>Roof area: <input type="text"/> s.f. (J')</p> <p>Roof runoff offset: <input type="text"/> kg-N/yr (K')</p>															
Fertilizer																		
<p>Managed turf: <input type="text" value="0"/> s.f. (L) x 3.4019E-04 = <input type="text" value="0.000"/> kg-N/yr</p>			<p>Managed turf: <input type="text"/> s.f. (L')</p> <p>Fertilizer offset: <input type="text"/> kg-N/yr (L')</p>															
Total Nitrogen Load																		
<p>Total project nitrogen load (Title-5 flows): <input type="text" value="122.86"/> kg-N/yr (M)= (B)+(I)+(K)+(L)</p> <p>Total project nitrogen load (Actual flows): <input type="text" value="122.86"/> kg-N/yr (N)= (C)+(I)+(K)+(L)</p> <p>Nitrogen load per acre (Average): <input type="text" value="1.11"/> kg-N/yr/acre (O)= (M)+(N) ÷2 ÷(F)</p>			<p>Existing nitrogen load (Title-5 flows): <input type="text"/> kg-N/yr (M')</p> <p>Existing nitrogen load (Actual flows): <input type="text"/> kg-N/yr (N')</p> <p>Nitrogen offset per acre: <input type="text"/> kg-N/yr/acre (O')</p>															
Nitrogen Loading Concentration																		
<p>Project nitrogen loading concentration (Title-5 flows): <input type="text" value="0.46"/> ppm-N (P)= $\frac{(a) \div 723.76 + (G) \times (RECH) \div 9.7286 + (H) \div 10,594 + (K) \div 0.75}{(M)}$</p> <p>Project nitrogen loading concentration (Actual flows): <input type="text" value="0.46"/> ppm-N (Q)= $\frac{(b) \div 723.76 + (G) \times (RECH) \div 9.7286 + (H) \div 10,594 + (K) \div 0.75}{(N)}$</p> <p>Project nitrogen loading concentration (Average): <input type="text" value="0.46"/> ppm-N (R)= (P)+(Q) ÷2</p>			<p>Existing nitrogen loading concentrations:</p> <p>Title-5 flows <input type="text"/> ppm-N (P')</p> <p>Actual flows <input type="text"/> ppm-N (Q')</p> <p>Average <input type="text"/> ppm-N (R')</p>															

Resource/ Impact Based Criteria

Marine Water Recharge Areas

2. Yes No
 Is the project in Marine Water Recharge Area (MWRA) with a nitrogen-loading limit OR in a MWRA that discharges to coastal waters with documented impaired water quality** ?
(If 'No', then go to line 3.)
- Name of Marine Water Recharge Area sub-embayment
(from RPP Data Viewer):
- Nitrogen-loading limit** : kg-N/year/acre (S)
- Does project's nitrogen load (O) exceed the existing load (O') AND the critical nitrogen load (S) ?
(If 'No', then go to line 3.)
- Excess project nitrogen load to be mitigated: kg-N/yr (T)= LESSER OF (O)-(S) x(F) AND (O)-(O') x(F)
 x \$8,290 /kg/yr
 = \$ (U)
- Place in box if applicant intends to make this payment (S)
(If not checked, then the project must provide an alternative strategy for meeting its nitrogen load requirement pursuant to Objective WR3)

**** When a nitrogen-loading limit has been determined through either a Total Maximum Daily Load (TMDL), a Massachusetts Estuaries Project-accepted technical report, or specified by a Commission-approved comprehensive wastewater management plan pursuant to Objective WR3, or if impaired water quality has been documented for the receiving coastal waters, the nitrogen loading limit shall be 0 kg-N/yr per acre pursuant to Objective WR3.**

Groundwater Quality

3. Yes No
 Does the project's nitrogen loading concentration in groundwater (R) exceed the greater of 5 ppm or the existing concentration (R') ?
(If 'Yes' and the project is not located in an Impaired Area, the project will need to provide an alternative strategy for meeting Objective WR1)

Potential Public Water Supply Areas

4. Yes No
 Is project in a Potential Public Water Supply Area (PPWSA) ?
(If 'No', then go to line 5.)
- Does the project's nitrogen loading concentration (R) exceed the greater of 1 ppm or the existing concentration (R') ?
(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)
- Does the project use, treat, generate, store or dispose of hazardous materials in excess of the greater of a) household quantities or b) existing quantities ?
(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)

Wellhead Protection Areas

5. Yes No
 Is project in a Wellhead Protection Area (WHPA) ?
(If 'No', then go to line 6.)
- Does the project's nitrogen loading concentration (R) exceed the greater of 5 ppm or the existing concentration (R') ?
(If 'Yes' and the project is not located in an Impaired Area, the project must provide an alternative strategy for meeting Objective WR1)
- Does the project use, treat, generate, store or dispose of hazardous materials in excess of the greater of a) household quantities or b) existing quantities ?
(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)

Fresh Water Recharge Areas

6. Yes No
 Is project wastewater disposed of within 300 feet of a stream or fresh surface water body?
(If 'No', then go to line 7.)
- Is the project located in a freshwater recharge area (FWRA) hydraulically upgradient of a stream or fresh surface water body?
(If 'Yes', the project must provide an alternative strategy for meeting Objective WR2)

Other Potential Impacts

7. Yes No
 Will the project withdraw more than 20,000 gallons of water per day ?
(If 'Yes', then the project must provide documentation demonstrating that there will not be significant impacts to water levels, surface waters and wetlands)
8. ***The project must demonstrate compliance with Objective WR4, including use of Low Impact Development to mitigate impacts of stormwater runoff and O & M plans for maintaining stormwater infrastructure and landscaping.***

APPENDIX 5

STORMWATER MANAGEMENT EXCERPTS FROM THE FACILITY'S OPERATION & MAINTENANCE PLAN

6.0 STORM WATER MANAGEMENT

6.1 Active Area Controls

Storm water management in active landfill areas requires that intermediate operations ensure that run-off, which has contacted solid waste (contact run-off), does not mix with non-contact run-off. The following are the storm water management measures that are to be taken in landfill areas that have not been furnished with final cover.

Non-Contact Run-off

Non-contact run-off is the storm water run-off from the active portion of the landfill, which has had no contact with landfilled waste or daily cover materials. This run-off should be directed away from the active landfill face by grading the surfaces of the landfill to direct runoff away from uncovered waste. Active areas in the central portion of the landfill should be provided with temporary surface swales to allow non-contact run-off to move to the perimeter of the landfill. Runoff will then be directed to the stormwater retention basins via drainage swales around the landfill perimeter.

Side Slope Drainage

Landfill side slopes will have intermediate cover placed as they reach their subgrade elevations. Storm water runoff from side slopes will flow to drainage swales (constructed along the side slopes), that direct the runoff to let-down channels. The let-down channels empty into swales at the base of the side slopes, which carry the water to retention basins. As landfill operations get progressively higher in elevation, side slopes will be provided with a quick-growing vegetative cover to slow run-off and minimize erosion. Areas experiencing repeated erosion problems will be covered with mulch and/or provided with hay bales and/or siltation fences installed perpendicular to the slope to further slow run-off and reduce erosion.

Top Slope Drainage

Top slope areas in the active portion of the landfill will be graded to drain away from the active landfill face. Normally, intermediate grades of two to five percent are adequate to ensure that ponding and excess infiltration of storm water into the landfill is avoided. Top slopes that have reached final elevations will be graded at a minimum of five percent. Intermediate and final top slopes will be shaped and groomed to prevent the concentrated flow of run-off to one location, unless a means is available to prevent erosion.

Contact Run-off

Contact run-off is the fraction of run-off that has had direct contact with waste or daily cover materials. This runoff will be collected in the landfill leachate collection and removal system. The active face is graded to direct run-off to a central location, near the active face, where the run-off can infiltrate to the leachate collection system

6.2 Completed Area Controls

Once landfilled areas have reached final grades, the final cover system will be constructed to serve as an infiltration barrier to minimize further leachate production from the Landfill. The final cover

system for the Landfill includes the following storm water control components:

- Permanent vegetative cover will be established on all surfaces of the final cover. A seed mixture of grasses suitable for the application should be used.
- Permanent earthen diversion berms, lined with erosion mat, will be installed on the final cover to divert slope run-off to let-down channels. The berms will be used to reduce unmanaged sheet flow and, thereby, minimize slope erosion. Sub-drains will be constructed beneath the berm within the drainage layer to intercept flow and discharge it into the let-down channels.
- Permanent stone-lined, side slope let-down channels will be constructed to capture run-off from several diversion berms and subdrains and direct the run-off to swales along the perimeter of the landfill.
- Perimeter stone-lined or grass lined drainage swales, will be constructed along the perimeter of the landfill and landfill access roads.

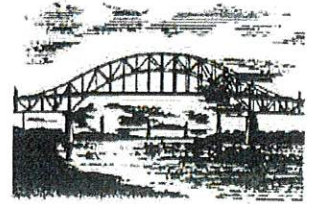
All final cover runoff will be diverted, via drainage swales, into storm water basins around the perimeter of the Landfill. The storm water control system has been constructed prior to the operation of the Landfill.

ATTACHMENT 5

Water Resources Communications



**TOWN OF BOURNE
BOARD OF HEALTH**
24 Perry Avenue
Buzzards Bay, MA 02532



Terri A. Guarino
Health Agent

June 6, 2020

C/O Mr. Phil Goddard
Manager of Facility Compliance & Technology Development
Town of Bourne Dept. of Integrated Solid Waste Management
201 MacArthur Blvd.
Bourne, MA 02532

Dear Mr. Goddard:

Section 5.3 of the existing local Health Regulations indicates that "No well, private or public, will be allowed to be constructed, for human consumption, if its placement is hydraulically down-gradient of the Bourne Integrated Solid Waste Management Facility consisting of approximately 103 acres located at 201 MacArthur Boulevard, Bourne, as delineated on the Town of Bourne Assessor's maps as map 28, parcel 13 and map 32, parcel 9. Said down-gradient area shall be delineated by the particle tracking maps created by the United States Geological Survey (USGS) on file with the Board of Health office."

The Bourne Health Department does not permit the construction of potable wells downgradient from the Bourne Landfill and these areas are connected to the public water system. If you have any concerns please feel free to contact me at 508-759-0600 ext. 1513.

Sincerely,

Terri Guarino

Terri Guarino, RS, CHO
Health Agent

C.C. Board of Health



BOURNE WATER DISTRICT

211 Barlow's Landing Road, P.O. Box 1447
Pocasset, Massachusetts 02559
508-563-2294 FAX Number 508-564-4661

26 May, 2020

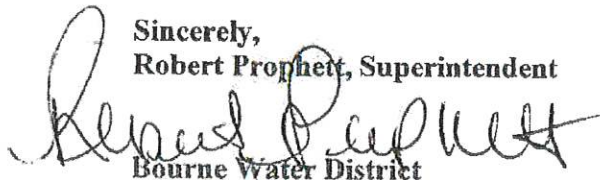
To: Phil Goddard
Manager of Facility Compliance and Technology Development
Town of Bourne, ISWM Department
24 Perry Avenue
Buzzards Bay, MA 02532
p. 508-759-0600, ext. 4241

Re: Bourne Landfill build-out

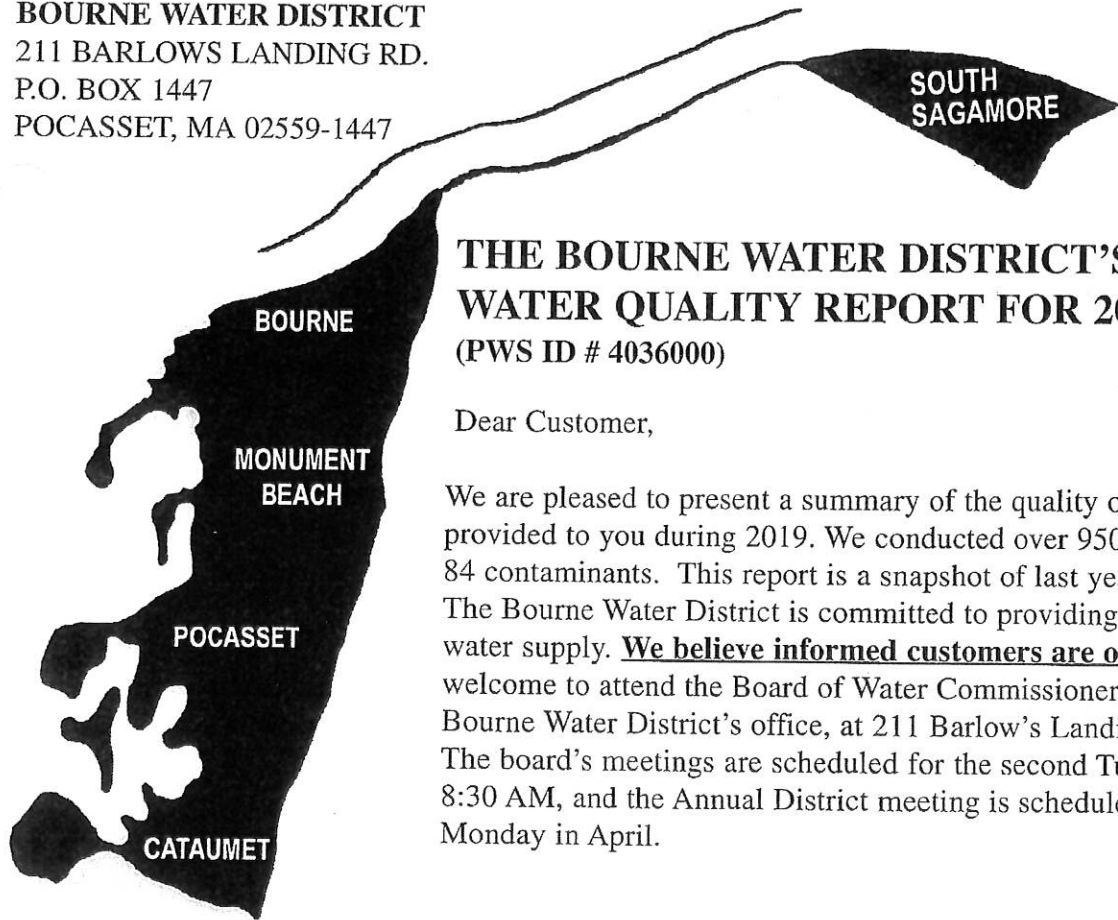
Gentlemen:

Bourne Water District does not have a wellfield downgradient from the Bourne Sanitary Landfill. Bourne Water District would not be permitted by Mass Department of Environmental Protection to put a new production well downgradient of a Landfill. Bourne Water District has no objection to the build-out proposed by the I.S.W.M. Dept... If you have any questions or concerns please feel free to contact me at 508-563-2294.

**Sincerely,
Robert Prophet, Superintendent**


Bourne Water District

BOURNE WATER DISTRICT
211 BARLOWS LANDING RD.
P.O. BOX 1447
POCASSET, MA 02559-1447



THE BOURNE WATER DISTRICT'S WATER QUALITY REPORT FOR 2019

(PWS ID # 4036000)

Dear Customer,

We are pleased to present a summary of the quality of the drinking water provided to you during 2019. We conducted over 950 tests for more than 84 contaminants. This report is a snapshot of last year's water quality. The Bourne Water District is committed to providing you with a reliable water supply. **We believe informed customers are our best allies.** You are welcome to attend the Board of Water Commissioners meetings held at the Bourne Water District's office, at 211 Barlow's Landing Road in Pocasset. The board's meetings are scheduled for the second Tuesday of the month at 8:30 AM, and the Annual District meeting is scheduled on the fourth Monday in April.

WATER SOURCES AND TREATMENT

The Bourne Water District is supplied by 10 different sources, 7 of our own gravel packed well sites and 3 gravel packed sites from the Upper Cape Regional Water Supply Cooperative. Four of our well sites are in the Monument Beach area of the Town Forest. The other two wells are in the Cataumet area of the Town of Bourne. One well is on Joint Base Cape Cod and we have one transfer station on Connery Ave. The Bourne Water District treats all supplies with lime slurry for corrosion control. The lime slurry is used to raise the pH of the water. This makes the water less aggressive to the copper pipe and lead joints in your homes to prevent exposure to lead and copper.

WHAT DOES THE FOLLOWING TABLE MEAN?

Action Level (AL) The concentration of a contaminant which if exceeded triggers treatment or other requirements.

Maximum Contaminant Level (MCL) The highest level of a contaminant that is allowed in the drinking water. The MCL is set as close to the MCLG as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG) The level of a contaminant in the drinking water below which there is no known or expected risk to health. The MCLG allow for a margin of safety.

90th Percentile Out of every 10 houses sampled, 9 were below this level.

KEY TO TABLE

AL = Action Level

MCL = Maximum Contaminant Level

MCLG = Maximum Contaminant Level Goal

MFL = million fibers per liter

Mrem/year = millirem per year (a measure of radiation absorbed by the body)

NTU = Nephelometric Turbidity Units

pci/l = picocuries per liter (a measurement of radioactivity)

ppm = parts per million, or milligrams per liter (mg/l)

µg/l = parts per billion, or micrograms per liter (ug/l)

ppt = parts per trillion, or nanograms per liter

ppq = parts per quadrillion, or picograms per liter

TT = Treatment Technique

DISTRIBUTION SYSTEM WATER QUALITY This report summarizes only those items detected during Sampling-not all contaminants that are monitored						
Microbial Results	Highest Detected	Range Detected	MCL	MCLG	Violation	Possible Source of Contamination
Total Coliform Bacteria**	0	0	0	0	No	Naturally present in the environment
Fecal Coliform or E. Coli	0	0	0	0	No	Human and Animal Fecal Waste

*Compliance with the Fecal Coliform/E.Coli MCL is determined upon additional repeat testing

**Total Coliform:Coliform are bacteria that are naturally present in the environment and are used as an indicator that other potentially harmful bacteria may be present

Lead and Copper	Dates collected	90th Percentile	Action Level	MCGL	# of sites sampled	# Sites above Action Level	Violation	Possible Source of Contamination
Lead (ppb)	9/1/2019 thru 12/31/2019	0.0028	15	0	30	0	No	Corrosion of household plumbing systems; Erosion of natural deposits
Copper (ppm)	9/1/2019 thru 12/31/2019	0.179	1.3	1.3	30	0	No	Corrosion of household plumbing systems; Erosion of natural deposits

TESTING FOR LEAD - If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Bourne Water District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information about lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

SUMMARY OF FINISHED WATER CHARACTERISTICS

Regulated Contaminants	Date(s) collected	Highest Detect Value	Range Detected	MCL	MCGL	Violation	
Inorganic Contaminants:							
Barium (ppm)	2018	0.009	0.002-0.009	2	2	No	Discharge of drilling waste; discharge from metal refineries; erosion of natural deposits
Nitrate * (ppm)	2019 2018	0.71 0.35	0.06-0.71	10	10	No	Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits
Perchlorate ** (ppb)	2019 2018	0 0	0-0.23	2	-	No	Rocket propellants, fireworks, munitions, flares, blasting agents* (see note below)
*Nitrate	Nitrate in drinking water at levels above 10ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask advise from your health care provider.						
**Perchlorate (Various Chemical Abstract Service Registry Numbers (CASRN) for different chemical species)	Perchlorate interferes with the normal function of the thyroid gland and thus has the potential to affect growth and development, causing brain damage and other adverse effects, particularly in fetuses and infants. Pregnant women, the fetus, infants and children up to the age of 12, and people with hypothyroid condition are particularly susceptible to perchlorate toxicity. "J" values are required when the results are above the MDL(0.012) and below the MRL(0.05)						

Organic Contaminants

Tetrachloroethylene(PCE)(ppb)	2019	1.64	0-1.64	5	-	No	Discharge from factories and dry cleaners
Chloroform (ppb)	2019	1.21	0-1.21	ORSG 70	NA	No	By-product of drinking water chlorination
CIS-3,2 Dichloroethylene (ppb)	2019	1.26	0-1.26	70	NA	No	Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits
Secondary Contaminants	Date(s) collected	Highest Detect Value	Range Detected	SMCL	OSRG		Possible Source of Contamination
Magnesium (ppm)	2019	3	1.1-3.0	-	-		Natural Mineral and Organic Matter
Chloride (ppm)	2019	40	7.2-40	250	NA		Natural Mineral, Road Salt
Calcium (ppm)	2019	14	3.0-14	-	-		Natural Mineral and Organic Matter
Iron (ppb)	2019	0.08	0-0.08	300	NA		Erosion of Natural Deposits and oxidation of iron components
Manganese (ppb)*	2019	0.012	0-0.012	50	NA		Erosion of Natural Deposits
Sodium(ppm)**	2019	28**	5.7-28	-	20		Road Salting; erosion of natural deposits
Potassium (ppm)	2019	1.2	0.6-1.2	-	-		Natural Mineral and Organic Matter
Sulfate (ppm)	2019	7.2	5.1-7.2	250	250		Natural Sources
Zinc (ppm)	2019	0.014	0-0.014	5	NA		Erosion of Natural Deposits and industrial discharge

*EPA has established a lifetime health advisory (HA) for Manganese at 300ppb and an acute at 1000ppb

**Sodium is a naturally-occurring element found in soil and water. It is necessary for the normal functioning of regulating fluids in human systems. Some people, however, have difficulty regulating fluid volume as a result of several diseases, including congestive heart failure and hypertension. The guideline of 20mg/L for sodium represents a level in water that physicians and sodium sensitive individuals should be aware of in cases where sodium exposures are being carefully controlled. For additional information, contact your health care provider, your local Board of Health or the Massachusetts Dept. of Public Health, Bureau of Environmental Health Assessment at 617-624-5757.

NATIONAL PRIMARY DRINKING WATER REGULATION COMPLIANCE

The Total Coliform rule requires water systems to meet a stricter limit for Coliform bacteria. Coliform bacteria are harmless, but the presence in water can be an indication of disease-causing bacteria. When Coliform bacteria is found, special follow up tests are done to determine if harmful bacteria are present in the water supply. Over 500 Coliform samples were taken throughout the Bourne Water District in the year 2019.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead and copper in drinking water is primarily from materials and components associated with service lines and home plumbing. The Bourne Water District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead and copper exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead and copper in your water, you may wish to have your water tested. Information on lead and copper in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

Sodium; ORSG = 20 Sodium sensitive individuals, such as those experiencing hypertension, kidney failure or congestive heart failure, should be aware of the levels of sodium in their drinking water where exposures are carefully being controlled.

Massachusetts Office of Research and Standard Guidelines (ORSG): This is the concentration of a chemical in drinking water, at or below which, adverse health effects are likely to occur after chronic (lifetime) exposure, with a margin of safety. If exceeded, it serves as an indicator of the potential need for further action.

If you are interested in a more detailed report, contact Robert Prophett at 508-563-2294.

REQUIRED ADDITIONAL HEALTH INFORMATION:

To insure that tap water is safe to drink, Department of Environmental Protection (DEP) and Environmental Protection Agency (EPA) prescribes limits on the amounts of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) and the Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency Safe Drinking Water Hotline (1-800-426-4791). The sources of drinking water (both tap and bottled) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in the sources include:

- (A) Microbial contaminants such as viruses and bacteria which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- (B) Inorganic contaminants such as salts and metals which can be naturally-occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- (C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm water runoff and residential uses.
 -) Organic chemical contaminants, including synthetic and volatile organics which are by-products of industrial processes and petroleum production and can also come from gas stations, urban storm water runoff and septic systems.
- (E) Radioactive contaminants, which can be naturally occurring or be the results of oil and gas production and mining activities. In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infections by *Cryptosporidium* are available from the Safe Drinking Water Hotline (1-800-426-4791).

SOURCE WATER ASSESSMENT

The Bourne Water District had a source water assessment performed by the MA. Department of Environmental Protection in 2002. The Source Water Assessment and Protection (SWAP) program, established under the Federal Safe Drinking Water Act requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources.
- Assess the susceptibility of drinking water sources to contamination from these land uses.
- Publicize the results to provide support for improved protection.

A susceptibility ranking of high was assigned to the Bourne Water District using the information collected during the assessment by the DEP. The high ranking was due to the potential contamination from land uses such as auto repair shops, truck terminal, furniture refinishing, auto salvage operation, an industrial park and activities in the recharge area (Zone II's) of some of the wells. The complete SWAP report is available at the Bourne Water District's office. For more information contact Robert Prophett at 508-563-2294.

CROSS CONNECTION

A cross connection is a connection between a drinking water pipe and a polluted source. The pollution can come from your own home. For instance, you're going to spray fertilizer on your lawn, and you hook up your hose to the sprayer that contains the fertilizer. If the water pressure drops (say because of a fire hydrant being used or water main break) when the hose is connected to the fertilizer sprayer, the fertilizer may be sucked back into the drinking water pipes through your hose. Using an anti-siphon backflow-prevention device on your sprayer or hose bib can prevent this problem. The Bourne Water District recommends using devices with an anti-siphon feature or equipping hose bibs with hose bib vacuum breakers to prevent against back flow. For additional information on cross connections and on the status of your water system's cross connection program, please contact Robert Prohett at 508-563-2294.

**UPPER CAPE REGIONAL WATER SUPPLY COOPERATIVE
2019 Consumer Confidence Report (PWS ID # 4261024)**

The Upper Cape Regional Drinking Water Supply Cooperative consists of three groundwater supply wells located in Sandwich, MA on Joint Base Cape Cod (JBCC). A Board of Managers representing four-member public water supply systems manages the Cooperative. The Cooperative has the capacity to provide a supplemental supply of water to its member public water systems, which include the Town of Falmouth, the Bourne Water District, the Mashpee Water District and the Sandwich Water District. The Cooperative also supplies water to the Otis Air National Guard public water system on JBCC and the Barnstable County Jail.

Wells #1, #2 and #3 are located in a forested area of the northeastern portion of the JBCC. In July 2004, the Department of Environmental Protection completed a source water assessment (SWAP) report for the Cooperative water supply wells. A SWAP report is a planning tool to support local and state efforts to improve water supply protection by identifying land uses within water supply protection areas that may be potential sources of contamination. The report identifies potential sources of contamination including a gas station, a medical facility and a military facility, and helps focus protection efforts on appropriate Best Management Practices. A susceptibility ranking of high was assigned to the Cooperative using information that was collected during the assessment. A copy of the report is available, upon request, from the Cooperative. JBCC has adopted a Groundwater Protection Plan to prohibit inappropriate activities on JBCC property within the Zone II areas of community public water supply wells. In addition, the Environmental Management Commission provides oversight over activities on the northern portion of the JBCC. For information regarding the Groundwater Protection Plan call Elizabeth Kirkpatrick at 508-968-6487. For information regarding the Environmental Management Commission call Len Pinaud at 508-946-2871. For questions regarding SWAP or other information contained within this document call Marisa Picone-Devine at 508-888-7262.

Our system, out of an abundance of caution and concerns about PFAS, sampled for PFAS compounds (PFBS, PFHpA, PFHxS, PFNA, PFOA, and PFOS) at all three wells in 2019; there were no detections of any of the analytes in any of the samples.

2019 WATER QUALITY DATA

Listed below are the substances detected in water samples collected during the most recent sampling period from the three (3) wells that comprise the Upper Cape Drinking Water Supply Cooperative.

Inorganic Contaminants	Year Sampled	Highest Result	Range of Detections	MCL	MCLG	Violation (Y / N)	Possible Sources
Nitrate	2019	0.08 ppm	0.08 ppm	10 ppm	10 ppm	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Radioactive Contaminants	Year Sampled	Amount Detected	Range of Detections	MCL	MCLG	Violation	Possible Sources
Radium 228	2015	0.623 pCi/L	NA	5 pCi/L	0	No	Erosion of natural deposits
Combined Radium	2015	0.623 pCi/L	NA	5 pCi/L	0	No	Erosion of natural deposits
Unregulated and Secondary Contaminants	Year Sampled	Amount Detected	Range of Detections	SMCL	ORSG	Violation	Possible Sources
Chloroform	2019	2.08 ppb	1.09 -2.08 ppb	NA	70 ppb	No	Trihalomethane: by-product of drinking water chlorination. In non-chlorinated sources, chloroform may be naturally occurring
Chloride	2019	9.1 ppm	8.0 -9.1 ppm	250 ppm	--	NO	Runoff and leaching from natural deposits; seawater influence
Copper	2019	0.015 ppm	.009 ppm -- 0.015 ppm	1 ppm	--	No	Internal corrosion of household plumbing; erosion of natural deposits
Iron	2019	10 ppb	ND -- 10 ppb	300 ppb	--	No	Natural and industrial sources as well as aging and corroding distribution systems and household pipes
Sodium	2018	5.8 ppm	5.8 ppm	--	20 ppm	No	Natural erosion, road salt
Sulfate	2019	5.6 ppm	5.1 -- 5.6 ppm	250 ppm	--	No	Runoff and leaching from natural deposits; industrial wastes



BOURNE WATER DISTRICT

211 Barlow's Landing Road, P.O. Box 1447
Pocasset, Massachusetts 02559
508-563-2294 FAX Number 508-564-4661

November 4, 2002

Phil Goddard, Environmental Manager
I.S.W.M. Dept.
24 Perry Ave.
Buzzards Bay, 02532

Gentlemen,

First, I would like to state that the Bourne Water District does not have any water supplies downgradient of the present Bourne Landfill, or any plans to look for potential supplies in that area. The Bourne Water District presently has 6 water supply wells. 3 of the wells are presently shutdown as a precaution to a perchlorate issue. The MCL for perchlorate has yet to be set. The EPA is working on this issue and looks to set a MCL in the near future.

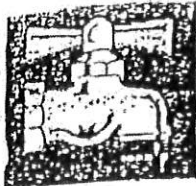
The Bourne Water District is a member of the Upper Cape Water Supply Cooperative and can and has bought water from the Cooperative. We are also looking at a potential water source on the MMR known as WS-4 for a future emergency water supply with the potential for a permanent site in the future.

In conclusion, we have no intention of looking in the Bourne Water District boundaries for new well sites. We will be looking at different treatment processes for our affected wells if we must treat for the perchlorate. We will continue to use Cooperative water as needed with our 3 other sources to meet our daily demands.

If you have any questions please contact me at 508-563-2294

Sincerely,

Ralph M. Marks
Superintendent of Operations

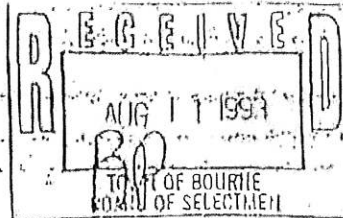


BOURNE WATER DISTRICT

211 Barlow's Landing Road, P.O. Box 1447

Plymouth, Massachusetts 02559

508-563-2294 FAX Number: 508-564-4661



August 6, 1993

Town of Bourne
Office of the Selectmen
24 Perry Avenue
Buzzards Bay MA 02532

Re: Re-permit for the Bourne Sanitary Landfill

Gentlemen:

The Bourne Water District does not have a wellfield downgradient from the Bourne Sanitary landfill and although we are beginning to look for additional wellfield sites the State Department of Environmental Protection would not permit us to use a site that is downgradient of the landfill.

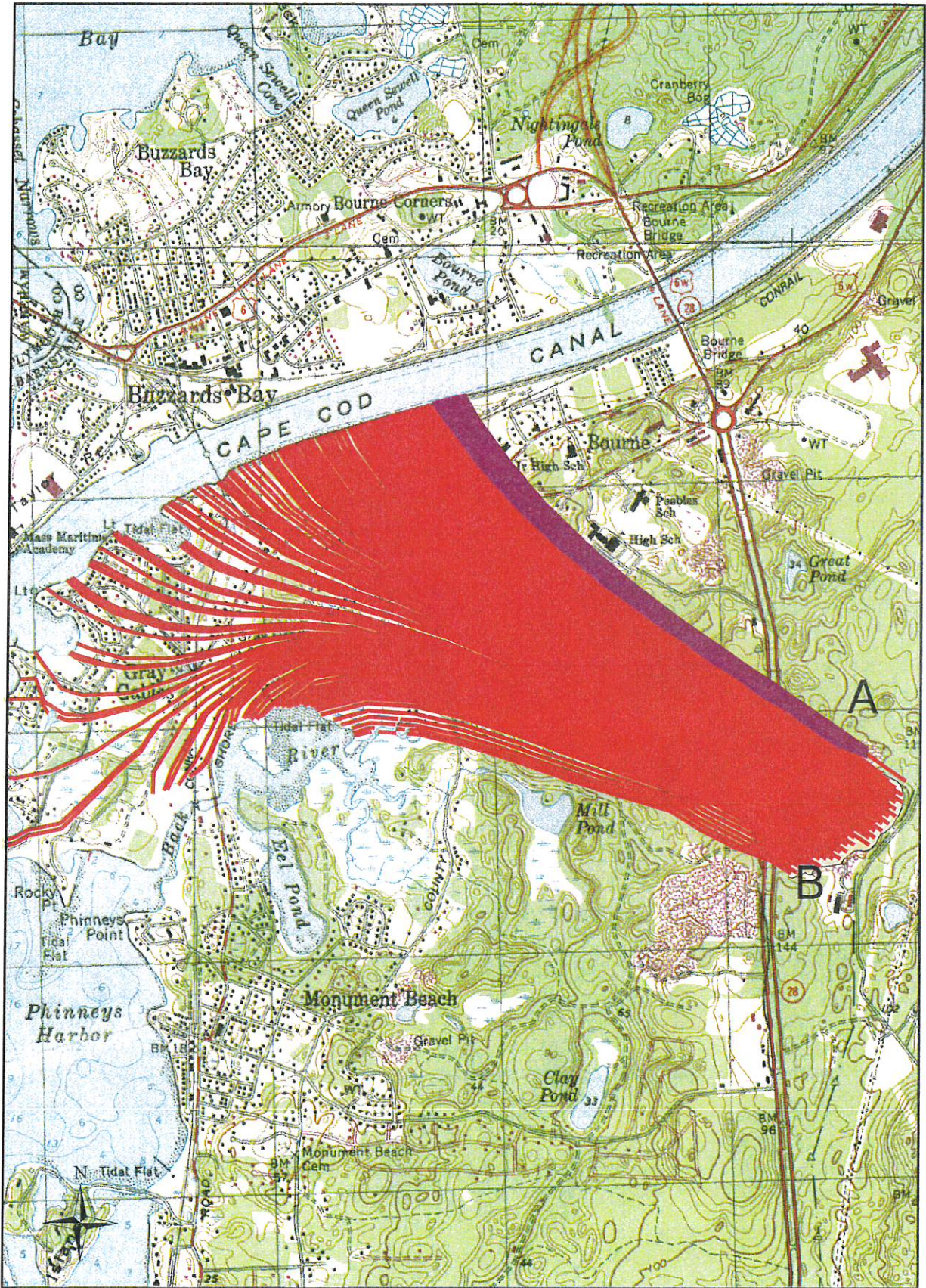
The District has no objection to the renewal of the landfill permit.

Sincerely,

Ann C. Candrilli

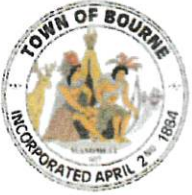
Ann C. Candrilli
Treasurer

DEIR Dec 88



ATTACHMENT 6

Abutters List
Title Information



TOWN OF BOURNE

Board of Assessors
24 Perry Avenue
Buzzards Bay, MA 02532
(508) 759-0600 Ext. 1510 ♦ Fax (508) 759-8026



Michael Leitzel, Chairperson
Ellen Doyle Sullivan, Clerk
Donna Barakauskas, Member

Rui Pereira, MAA
Director of Assessing

April 27, 2021

Phil Goddard
Manager of Facility Compliance & Technology Development
Town of Bourne, ISWM Dept.
24 Perry Ave
Bourne, MA 02532

Reference: Abutters List for Map 28 Parcel 13, Map 32 Parcels 5 and 9
Subject Property: 201 MacArthur Blvd, 325 MacArthur Blvd & 0 MacArthur Blvd

This is to certify that the enclosed list of names and addresses constitutes all of the abutters as defined in 310 CMR 16.02 of the subject property on the most recent tax list of the Town of Bourne. The purpose of the abutters list is for a filing with the MA Environmental Policy Act Office (MEPA) of the MA Executive Office of Energy and Environmental Affairs for the Bourne Landfill on Map 28 Parcel 13 and Map 32 Parcels 5 and 9.

Abutting properties are: Map 27 Parcels 86, 87, 153, 184 and 186; Map 28 Parcel 12; Map 31 Parcels 8, 31, 33.01, 37 and 124; Map 31.4 Parcel 15; Map 32 Parcel 6.01; Map 44 Parcel 50.

See enclosed Data Base Inquiry Forms for abutters mailing addresses.

Board of Assessors

List Enclosed

*Ellen Doyle Sullivan -
Donna Barakauskas
Michael Leitzel*

Report #24: Owner Listing Report
Fiscal Year 2022

1 Abutters List
LIVE
Key IN
5832,5836,5939,16423,16425,5967,6601,6682,6685,6686,16478,696
3,7041,9709

Extract: Database: Filter:
Sort: Parcel ID
Owner
SJC PROPERTIES LLC
RAPONI FRANCO TRS OF
PAESANO REALTY TRUST
WATERHOUSE PROPERTIES LLC
FLETCHER JOHN P TRS BOURNE
TECHNOLOGY PARK REALTY TRUST
FLETCHER JOHN P TRS BOURNE
TECHNOLOGY PARK REALTY TRUST
MONUMENT BEACH SPORTSMAN CLUB
JMM REAL ESTATE LLC
MACGREGOR MOLLY TRS WAREHOUSE
CORPORATION HYANNIS REALTY TR
JMM REAL ESTATE LLC
BAY VIEW CAMPGROUNDS INC
MACGREGOR MOLLY TRS WAREHOUSE
CORPORATION HYANNIS REALTY TR
CIRCLE O LLC & MACARTHUR
PARK PLACE LLC
NSTAR ELECTRIC CO
COMMONWEALTH OF MASSACHUSETTS
MASS MILITARY RESERVATION

Key	Parcel ID	Owner	Location	LCU/Ct	Blk/Pct/Cont/Dt	Mailing Street	Mailing City	ST	Zp	Ctl/County
5832	27.0-86-0	SJC PROPERTIES LLC	170 MACARTHUR BLVD N	3380	26838/263	170 MACARTHUR BLVD	BOURNE	MA	02532	MA 02532
5836	27.0-87-0	RAPONI FRANCO TRS OF PAESANO REALTY TRUST	119-123 WATERHOUSE RD N	3420	22975/95 6/12/2008	PO BOX 3139	POCASSET	MA	02559	MA 02559
5839	27.0-153-0	WATERHOUSE PROPERTIES LLC	124 WATERHOUSE RD N	3300	28584/56 12/23/2014	124 WATERHOUSE RD	BOURNE	MA	02532	MA 02532
16423	27.0-184-0	FLETCHER JOHN P TRS BOURNE TECHNOLOGY PARK REALTY TRUST	7 TECHNOLOGY PARK DR Y	3400	161440 10/6/2009	46 STRATFORD RIDGE	MASPHEE	MA	02649	MA 02649
16425	27.0-186-0	FLETCHER JOHN P TRS BOURNE TECHNOLOGY PARK REALTY TRUST	2 TECHNOLOGY PARK DR Y	3420	161440 10/6/2009	C/O MERCANTILE PROP MGMT PO BOX 790	BUZZARDS BAY	MA	02532	MA 02532
5867	28.0-12-0	MONUMENT BEACH SPORTSMAN CLUB	0 MACARTHUR BLVD N	0380	1969/51 5/17/1967	P O BOX 331	MONUMENT BEACH	MA	02553-0331	MA 02553-0331
6601	31.0-8-0	JMM REAL ESTATE LLC	280 MACARTHUR BLVD N	3370	28703/259 2/26/2015	290 MACARTHUR BLVD	BOURNE	MA	02532	MA 02532
6682	31.0-31-0	MACGREGOR MOLLY TRS WAREHOUSE CORPORATION HYANNIS REALTY TR	1 MOTOR WAY N	3900	32310/317 9/19/2019	270 COMMUNICATION WAY UNIT 7B	HYANNIS	MA	02601	MA 02601
6685	31.0-33-1	JMM REAL ESTATE LLC	290 MACARTHUR BLVD N	3300	28703/259 2/26/2015	290 MACARTHUR BLVD	BOURNE	MA	02532	MA 02532
6686	31.0-37-0	BAY VIEW CAMPGROUNDS INC	260-270 MACARTHUR BLVD N	3960	32592/21 12/31/2019	260 MACARTHUR BOULEVARD	BOURNE	MA	02532	MA 02532
16478	31.0-124-0	MACGREGOR MOLLY TRS WAREHOUSE CORPORATION HYANNIS REALTY TR	2 MOTOR WAY N	3900	32310/317 9/19/2019	270 COMMUNICATION WAY UNIT 7B	HYANNIS	MA	02601	MA 02601
6963	31.4-15-0	CIRCLE O LLC & MACARTHUR PARK PLACE LLC	340 MACARTHUR BLVD N	3880	677/6 9/24/2007	C/O COASTAL MANAGEMENT 270 COMMUNICATION WAY UT 7B	HYANNIS	MA	02601	MA 02601
7041	32.0-6-1	NSTAR ELECTRIC CO	0 MACARTHUR BLVD N	4400	N/A/N/A 1/3/2007	PO BOX 270	HARTFORD	CT	06141-0270	CT 06141-0270
9709	44.0-50-0	COMMONWEALTH OF MASSACHUSETTS MASS MILITARY RESERVATION	0 OTIS A F BASE N	5160	N/A/N/A	C/O COMMANDER 158 REILLY ST, BOX 3	OTIS ANGB	MA	02542-1330	MA 02542-1330

Total Records 14



To: Phil Goddard - ISWM

From: Bruce Cabral – Assessor’s Office X1328

Date: 09/05/2018

Re: ISWM / Town Ownership - Map – Parcels 28.0-13, 32.0-5 & 32.0-9

Phil,

These pages (2 copies) relate to the ISWM parcels and their deed references.
Thanks for your patience on this.

Let me know if anything else is needed.

Thanks, Bruce

bcabral@townofbourne.com

Extract: ISWM- TOWN OWNERSHIP REFS
 Database: LIVE
 Filter: Key/IN 5968,7039,15727
 Sort: Key ASC

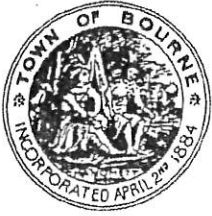
Report #24: Owner Listing Report
 Fiscal Year 2019

Bourne MA

Key	Parcel ID	Owner	Location	L/C/U/C	Bk-Pd(Cert)/Dt	Mailing Street	Mailing City	ST	Zip Cd/County
5968	28-0-13-0	TOWN OF BOURNE DUMP & HIGHWAY DEPT	201 MACARTHUR BLVD	N	1357/456 9970	24 PERRY AVE	BUZZARDS BAY	MA	02532
7039	32-0-5-0	TOWN OF BOURNE	325 MACARTHUR BLVD	N	29639/278 5/10/2016	24 PERRY AVE	BUZZARDS BAY	MA	02532
15727	32-0-9-0	TOWN OF BOURNE	0 MACARTHUR BLVD	N	13637/54 9970	24 PERRY AVENUE	BUZZARDS BAY	MA	02532
Total Records		3							

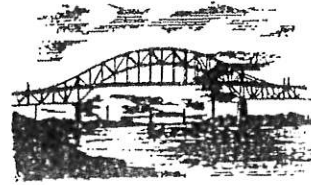
ATTACHMENT 7

Bourne Board of Selectmen Vote



**TOWN OF BOURNE
BOARD OF SELECTMEN**

24 Perry Avenue
Buzzards Bay, MA 02532
Phone 508-759-0600 ext. 1503 - Fax 508-759-0620



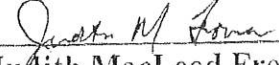
CERTIFICATE OF VOTE


At a meeting of the Board of Selectmen of the Town of Bourne, held on November 5, 2019, at the Bourne Veterans' Memorial Community Center a quorum being present and voting throughout, upon a Motion duly made by Selectman Jared MacDonald, Seconded by Selectman Peter Meier, and unanimously voted 5-0-0.


VOTED:

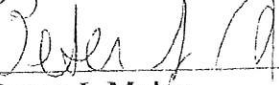
To allow ISWM to pursue the expansion of Bourne's landfill facility as presented at the Joint meeting of the Board of Selectmen, Board of Health, Finance Committee and the Energy Advisory Committee on August 12, 2019.

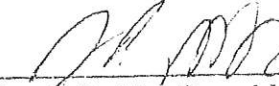
BOARD OF SELECTMEN


Judith MacLeod Froman, Chair


James L. Potter, Vice Chair

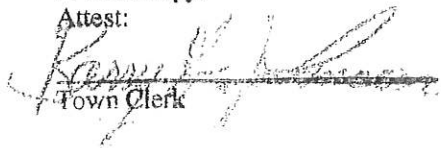

George G. Slade, Jr., Clerk


Peter J. Meier


Jared P. MacDonald

A True Copy.

Attest:


Town Clerk

ATTACHMENT 8

Traffic Assessment Memorandum

MEMORANDUM

93 Stiles Road, Suite 201, Salem, New Hampshire 03079 USA
800 Turnpike Street, Suite 300, North Andover, Massachusetts 01845 USA
Phone (603) 212-9133 and Fax (603) 226-4108
Email tepp@teppllc.com and Web www.teppllc.com

Ref: 789
Subject: Traffic Assessment
Integrated Solid Waste Management Facility
Bourne, Massachusetts
From: Kim Eric Hazarvartian, Ph.D., P.E., PTOE
Principal
Date: July 16, 2020



INTRODUCTION

TEPP LLC has prepared this traffic-assessment memorandum (TAM) at the request of the Town of Bourne Department of Integrated Solid Waste Management (ISWM). ISWM and TEPP LLC have thoroughly considered traffic safety and operations of the ISWM in conjunction with multiple permitting processes that have involved the Town, the Cape Cod Commission and the Commonwealth of Massachusetts.

These efforts have led to the following findings:

- substantial infrastructure improvements completed during 2012, including the driveway and gate area, have significantly enhanced traffic safety and operations
- traffic management has been significantly improved at the site since 1999
- waste delivery has shifted to denser materials being delivered in larger-capacity vehicles, resulting in less truck traffic per ton
- traffic operations and safety are appropriate for multiple operations scenarios, including ash waste and solid waste
- crash history near the ISWMF facility, for January 1, 2013 to June 4, 2020, confirms that traffic operations will not constitute a danger to public safety

TEPP LLC and staff have been involved with ISWMF since the 1990s and has prepared a number of documents and analysis regarding traffic safety, operations and design. TEPP LC has reviewed this body of work and confirms its validity and applicability going forward. This is especially so considering the substantial infrastructure improvements and significantly improved traffic management.

In conclusion:

- traffic safety and operations have been considered over many years
- substantial infrastructure improvements have enhanced traffic safety and operations
- crash history confirms that traffic operations will not constitute a danger to public safety

TEPP LLC INVOLVEMENT WITH THE ISWMF

TEPP LLC has for many years:

- been involved with transportation engineering for the Integrated Solid Waste Management Facility (ISWMF)
- analyzed traffic operations related to the ISWMF
- participated in the development of extensive infrastructure improvements at the ISWMF

COMPLETED INFRASTRUCTURE IMPROVEMENTS

Substantial on-site infrastructure improvements were completed in 2012. SITEC Environmental, Inc. has prepared a graphic, attached to this memorandum, which shows site infrastructure configurations at the driveway and scale area both before and after the improvements.

The infrastructure improvements include:

- eliminating opposing-traffic conflicts inside and outside the scale area
- designing and constructing a new residential recycling center in a new location
- designing and constructing new incoming and outgoing landfill-truck scales in new locations
- designing and constructing a new central scale house in a new location
- providing about 1,000 feet of inbound driveway length from MacArthur Boulevard northbound to the scale
- providing one landfill-truck lane each, for both incoming and outgoing directions
- providing one landfill-truck surge lane to accommodate additional queuing each, for both incoming and outgoing directions
- providing one residential drop-off/employee traffic lane each, that bypasses the scales, for both incoming and outgoing directions

These infrastructure improvements have made the driveway and scale area significantly more safe, efficient, simple and attractive. A graphic is attached that shows the traffic layout before and after the improvements were made.

The infrastructure improvements provide for operations of at least 1,500 tons per day (TPD). However, ISWM is limiting operation to 825 TPD, with the reserve capacity enhancing operational flexibility and quality.

IMPETUS FOR THE INFRASTRUCTURE IMPROVEMENTS

The ISWMF was permitted during 1999 by the Commonwealth of Massachusetts to operate at 825 TPD. The permitting process did not require the infrastructure improvements described above.

The infrastructure improvements came after the permitting process, at the volition of ISWM. ISWM recognized the potential benefits of infrastructure improvement and took proactive advantage of the opportunity for infrastructure improvements that was created by:

- acquiring the abutting 25-acre parcel located south of the landfill in 2001
- relocating the residential recycling center from just inside the scale area onto that parcel
- completion of the Phase 1D landfill reclamation, part of which was underneath the former residential recycling center, in 2011

OPERATIONAL SCENARIO 1—EXISTING MUNICIPAL-COMBUSTOR ASH AND MUNICIPAL-SOLID WASTE

In recent years, ISWM has changed the incoming waste stream for deposition into the landfill. As a result of a contract with Covanta SEMASS, located in Rochester, Massachusetts, ISWM now accepts approximately 85 percent of its permitted annual tonnage at the landfill as municipal-waste combustor ash. The ash is delivered via 30-ton transfer trailers, as opposed to municipal-solid waste (MSW), which is delivered in packer trucks that have a capacity of 12 to 15 tons. This results in less truck traffic per ton delivered. ISWM intends to continue this arrangement through 2021 and is considering the possibility of extending the arrangement further.

OPERATIONAL SCENARIO 2—ALL MSW

The Town has also considered an incoming waste scenario whereby it no longer has a contract for municipal-combustor ash and instead envisions utilizing 100 percent of its permitted capacity for MSW deposition. For many years dating to 1999, the ISWMF received MSW, which required a greater number of truck-trips per ton than waste ash, as described above.

POTENTIAL FUTURE LEACHATE

In addition, ISWM is evaluating options for processing and treating leachate from the landfill at an on-site wastewater-treatment works. The clean, treated effluent would be then discharged to a

pipeline and associated infrastructure located at the abutting Joint Base Cape Cod, as further described in another section of this filing. Currently, ISWM has a contractor remove leachate by tanker truck to a variety of off-site treatment facilities. Constructing the on-site treatment facility could, depending on annual precipitation, reduce the number of truckloads by approximately 1,000 to 2,000 per year.

CRASH HISTORY

TEPP LLC obtained crash data from the Massachusetts Department of Transportation (MassDOT) from January 1, 2013 to June 4, 2020 for locations near the facility. Analysis of the data confirms that traffic operations of the facility will not constitute a danger to public safety. The locations were:

- the driveway
- the MacArthur Boulevard northbound/driveway intersection
- the MacArthur Boulevard northbound/U-turn intersection
- the MacArthur Boulevard southbound/U-turn intersection

Table 1 shows relevant crash history:

- about 67 percent of crashes were property-damage only
- the remainder involved personal injury
- no crash showed a fatality
- each location showed an average of less than one crash per year
- each intersection showed a crash rate below MassDOT averages
- one crash involved a heavy vehicle

CONCLUSION

TEPP LLC and staff have been involved with ISWMF since the 1990s and has prepared a number of documents and analysis regarding traffic safety, operations and design. TEPP LC has reviewed this body of work and confirms its validity and applicability going forward. This is especially so considering the substantial infrastructure improvements and significantly improved traffic management.

TEPP LLC concludes that:

- traffic safety and operations have been considered over many years
- substantial infrastructure improvements have enhanced traffic safety and operations

- crash history confirms that traffic operations will not constitute a danger to public safety

attachments: table, SITEC Environmental, Inc. graphic

Table 1. Crash history.

Years	Number of Crashes ^a and Crash Rates			
	Driveway	MacArthur Boulevard Northbound Driveway Intersection	MacArthur Boulevard Northbound/U-Turn Intersection	MacArthur Boulevard Southbound/U-Turn Intersection
2013	0	0	0	0
2014	1	0	0	0
2015	1	1	0	0
2016	0	2	0	0
2017	0	0	1	0
2018	0	1	1	0
2019	0	0	1	0
2020	0	0	0	0
Total	2	4	3	0
Average Per Year	0.31	0.62	0.47	0
This Location ^b	---	0.17	0.13	0
MassDOT District 5 Average ^c	---	0.57	0.57	0.57
MassDOT State Average ^c	---	0.57	0.57	0.57
Severity	1	3	2	0
Personal Injury	1	1	1	0
Angle	0	0	2	0
Rear-End	0	4	1	0
Single-Vehicle	2	0	0	0
Road Surface	1	4	3	0
Dry	1	0	0	0
Wet	1	0	0	0
Clear	0	3	3	0
Cloudy	1	0	0	0
Rain	1	0	0	0
Not Reported	0	1	0	0
Light	2	4	1	0
Daylight	0	0	2	0
Dusk	0	1	0	0
Heavy Vehicle	2	3	3	0
Yes	0	1	0	0
No	2	3	3	0

^a From MassDOT, accessed June 4, 2020. For January 1, 2013 to June 4, 2020. Crash information after December 31, 2017 is subject to change, per MassDOT.

^b Estimated entering vehicles = 10,000 per day. MEV = 1,000,000 entering vehicles.

^c From <https://www.mass.gov/service-details/intersection-and-roadway-crash-rate-data-for-analysis>, accessed June 8, 2020. MEV = 1,000,000 entering vehicles.

ATTACHMENT 9

MA Historical Commission Information

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A

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

PROJECT NOTIFICATION FORM

Project Name: Bourne Integrated Solid Waste Management Facility

Location / Address: 201 MacArthur Boulevard

City / Town: Bourne, MA

Project Proponent

Name: Town of Bourne, Department of Integrated Solid Waste Management

Address: 24 Perry Avenue

City/Town/Zip/Telephone: Buzzards Bay, MA 02532, 508-759-0600, extension 4

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies). No funding is requested.

Agency Name

MEPA
MA DEP

Type of License or funding (specify)

Environmental Impact Review certificate
Construction and Operation permits, Site Suitability Review

Project Description (narrative):

Expansion plans for the Bourne landfill. Further details are included in the attached Expanded Notice of Project Change being submitted to MEPA.

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

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

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

Yes. The project includes construction of new landfill phases and potential new solid waste handling facilities, as well as offices and maintenance facilities over the course of time as the facility is filled. Further details are included in the attached Expanded Notice of Project Change being submitted to MEPA.

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify. No.

What is the total acreage of the project area? 112

Woodland	<u>12</u>	acres	Productive Resources:	
Wetland		acres	Agriculture	_____ acres
Floodplain		acres	Forestry	_____ acres
Open space	<u>approx. 3.5</u>	acres	Mining/Extraction	<u>approx. 18</u> acres for new landfill capacity
Developed	<u>approx. 100</u>	acres	Total Project Acreage	<u>112</u> acres

What is the acreage of the proposed new construction? Approximately 35 acres

What is the present land use of the project area? Landfilling and other solid waste handling activities.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location. See the enclosed Expanded Notice of Project Change being submitted to MEPA.

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

Signature of Person submitting this form:  Date: 2/24/20

Name: Daniel T. Barrett

Address: Bourne, ISWM Department, 24 Perry Avenue

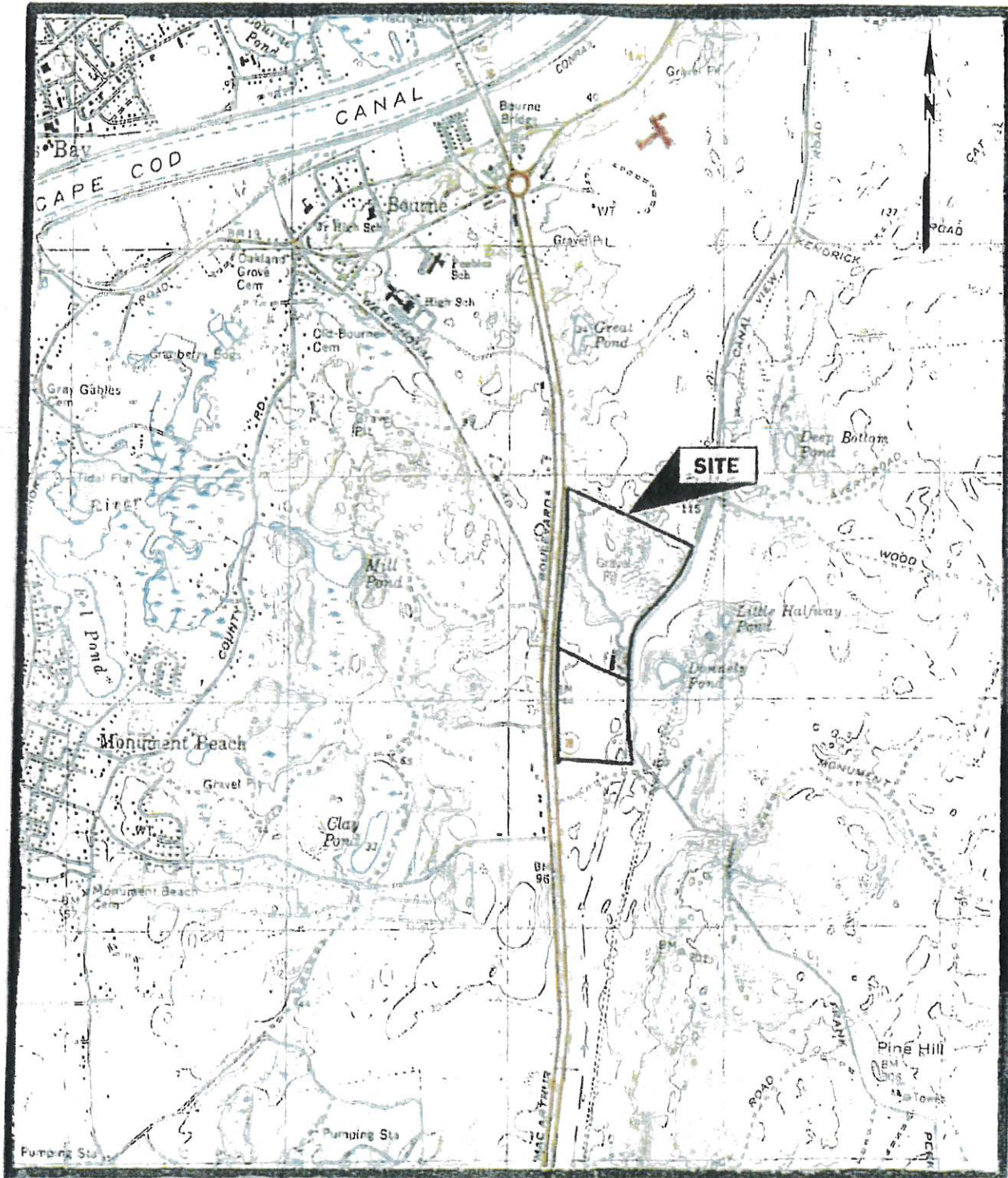
City/Town/Zip: Buzzards Bay, MA 02532

Telephone: 508-759-0600, extension 4

REGULATORY AUTHORITY

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

USGS SITE LOCUS MAP



Town of Bourne
Bourne Landfill Expansion
Bourne, MA

SCALE 1:25,000

1 centimeter on the map represents
250 meters on the ground.

1 inch on the map represents
2,083 feet on the ground.

Contour Interval 10 feet

RECEIVED

FEB 08 2017

MASS. HIST. COM
RC. 61744

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

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

PROJECT NOTIFICATION FORM

Project Name: Bourne Landfill - Expansion of Solid Waste Handling Facilities

Location / Address: 201 MacArthur Blvd

City / Town: Bourne, MA

Project Proponent

Name: Daniel Barrett, General Manager

Address: Town of Bourne Dept. of Solid Waste Management, 24 Perry Avenue

City/Town/Zip/Telephone: Buzzards Bay, MA 02532 / 508-759-0600

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

<u>Agency Name</u>	<u>Type of License or funding (specify)</u>
N/A	

Project Description (narrative):

Proposed expansion of solid waste handling facilities for materials storage and transfer operations within a 12 acre wooded parcel.

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

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


Does the project include new construction? If so, describe (attach plans and elevations if necessary).

Not initially. Project will involve clearing only to accommodate storage of sand/gravel and drainage structures.

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources. 950 CMR - 275

5/31/96 (Effective 7/1/93) - corrected

RC. 61744


Jonathan K. Patton
Archaeologist / Preservation Planner
Massachusetts Historical Commission

2/28/17
Date

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify. NO

What is the total acreage of the project area?

Woodland	~12	acres	Productive Resources:		
Wetland	0	acres	Agriculture	0	acres
Floodplain	0	acres	Forestry	0	acres
Open space	0	acres	Mining/Extraction	0	acres
Developed	0	acres	Total Project Acreage	~12	acres

What is the acreage of the proposed new construction? 0 acres

What is the present land use of the project area?

Undisturbed wooded land with an abandoned paved roadway traversing the southeastern corner.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

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

Signature of Person submitting this form: *Amy Ball* Date: 3 February 2017
Name: Amy Ball, Senior Ecologist, Horsley Witten Group, Inc.
Address: 90 Route 6A
City/Town/Zip: Sandwich, MA 02563
Telephone: 508-833-6600

REGULATORY AUTHORITY

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

RICHARD W. KELLER, P.E.
P.O. Box 1265, Middleboro, MA 02346
508-947-6618

September 17, 1997

Ms. Judy McDonough
Executive Director
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

RECEIVED
SEP 19 1997
MASS. HIST. COMM

RE: Bourne - Solid Waste - Regional Sanitary Landfill off MacArthur
Boulevard (Route 28)

Dear Ms. McDonough:

As a result of my recent telephone conversation with Mr. Gary Hammer of your office, please find attached a Locus Map for the referenced project.

Since an ENF on the project will be submitted shortly, a response with respect to the site's historical or archaeological significance is requested.

The ENF is being filed for the construction and operation of a regional non-MSW solid waste facility at the site of the existing municipal landfill, which will accept increased tonnage for proposed processing in addition to landfilling.

If there are any questions, please contact me by phone or fax at 508-947-6618.

Very truly yours,




Richard W. Keller, P.E.

Encl.

c: Board of Selectmen, Bourne

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.



MHC #20113 Sept. 29, 1997

Constance A. Crosby Date
Archaeologist/Preservation Planner
Massachusetts Historical Commission

ATTACHMENT 10

Excerpts from:
Cape Cod Commission Act
Cape Cod Commission Regional Policy Plan
Bourne Local Comprehensive Plan

3225 MAIN STREET • P.O. BOX 226
BARNSTABLE, MASSACHUSETTS 02630



CAPE COD
COMMISSION

(508) 362-3828 • Fax (508) 362-3136 • www.capecodcommission.org

The Cape Cod Commission Act

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Eighty-nine
[as amended by St. 1990, c. 2; and St. 2014, c. 259]

AN ACT ESTABLISHING THE CAPE COD COMMISSION.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. The general court hereby finds and declares that:

- (a) The region commonly known as Cape Cod, comprised of Barnstable county, including all geographic areas to the jurisdictional limit of the commonwealth, possesses unique natural, coastal, scientific, historical, cultural, architectural, archaeological, recreational, and other values; there is a regional, state and national interest in protecting, preserving and enhancing these values; and these values are being threatened and may be irreparably damaged by uncoordinated or inappropriate uses of the region's land and other resources.
- (b) In order to protect these values and promote the public health, safety and general welfare, to maintain and enhance sound local and regional economies, and to ensure balanced economic development, this act creates the Cape Cod commission as the regional planning and land use commission with authority to prepare and oversee the implementation of a regional land-use policy plan for all of Cape Cod, to recommend for designation specific areas of Cape Cod as districts of critical planning concern, and to review and regulate developments of regional impact.
- (c) The purpose of the Cape Cod commission shall be to further: the conservation and preservation of natural undeveloped areas, wildlife, flora and habitats for endangered species; the preservation of coastal resources including aquaculture; the protection of groundwater, surface water and ocean water quality, as well as the other natural resources of Cape Cod; balanced economic growth; the provision of adequate capital facilities, including transportation, water supply, and solid, sanitary and hazardous waste disposal facilities; the coordination of the provision of adequate capital facilities with the achievement of other goals; the development of an adequate supply of fair affordable housing; and the preservation of historical, cultural, archaeological, architectural, and recreational values.

CAPE COD COMMISSION ACT GOALS

1. **Protect public health, safety, and general welfare**
2. **Protect, enhance and preserve the following unique values and resources of Cape Cod: natural, coastal, scientific, historical, cultural, architectural, archaeological, and recreational.** The RPP must include Identification of critical resources and management needs including the values and resource listed above as well as aesthetic and economic resources, groundwater and surface water supplies, available open space, and available regions for agriculture, aquaculture and development activity. The RPP must include a growth policy including guidelines for the protection of resources. The RPP must include regional goals for the provision of open space, recreation, coastal resources and historic preservation.
3. **Maintain and enhance sound local and regional economies by promoting the expansion of employment opportunities; ensuring balanced and sustainable economic growth and development capable of absorbing the effects of seasonal fluctuations in economic activity; and implement a balanced and sustainable economic development strategy for Cape Cod.** The RPP must include regional goals for the provision of job creation and economic development.
4. **Identify and protect areas whose characteristics make them particularly vulnerable to adverse effects of development.**
5. **Coordinate appropriate uses of the region's land and other resources.** The RPP must include a growth policy including guidelines for the protection of resources.
6. **Anticipate, guide and coordinate the rate and location of development with the capital facilities necessary to support such development.** The RPP must include a growth policy including guidelines and regional goals for the provision of capital facilities necessary to meet current and anticipated needs
7. **Further the provision of adequate capital facilities, including transportation, water supply, and solid, sanitary and hazardous waste disposal facilities, coordinated with the achievement of other goals.** The RPP must include regional goals for the provision of capital facilities, including waste disposal. The Cape Cod Commission Act defines capital facilities as public facilities and services necessary to support development, including but not limited to roads, water, sewers, waste disposal, affordable housing, schools, police and fire protection facilities.
8. **Promote and further the development of an adequate supply of fair affordable housing for low-income and moderate-income persons, preserving the social diversity of Cape Cod.** The RPP must include regional goals for the provision of fair affordable housing.

CAPE COD
REGIONAL
POLICY PLAN

FRAMING THE FUTURE

CAPE COD COMMISSION | 2018



PROVISION OF ADEQUATE INFRASTRUCTURE

The existing infrastructure fundamentally limits the region's ability to grow in a way that balances economic and social wellbeing with the protection of natural and cultural resources. The region's rural and suburban development patterns make providing adequate infrastructure more expensive on a per-unit or per-user

basis as networks are typically more spread out, with fewer users able to utilize and pay for the same systems or materials. These development patterns also require greater development and disturbances of natural resources. However, directed, improved, and expanded transportation, water, wastewater, electric, and broadband infrastructure that mitigates and adapts to climate change will be necessary to support long-term regional economic

stability. These regional networks must be resilient and provide last-mile connectivity, bringing the benefits of the regional investments to the people, businesses, and institutions that are the backbone of the economy.

Implementing these large-scale infrastructure improvements requires significant community dialog to determine the most effective, efficient solutions that are consistent with

community values including its plan for growth, equity, cost sharing, climate change response, and environmental benefit. The environmental and public health imperatives requiring timely investment in water quality infrastructure across Cape Cod offer this region an opportunity to reset, change the paradigm, and to develop a coordinated plan to direct growth to areas that can support it.



Built Systems

To protect and enhance the built environment and infrastructure necessary to support the region and healthy activity centers.

COMMUNITY-DESIGN

GOAL | To protect and enhance the unique character of the region's built and natural environment based on the local context.

OBJECTIVES

1. Promote context-sensitive building and site design
2. Minimize the amount of newly disturbed land and impervious surfaces
3. Avoid adverse visual impacts from infrastructure to scenic resources

COASTAL RESILIENCY

GOAL | To prevent or minimize human suffering and loss of life and property or environmental damage resulting from storms, flooding, erosion, and relative sea level rise.

OBJECTIVES

1. Minimize development in the floodplain
2. Plan for sea level rise, erosion, and floods
3. Reduce vulnerability of built environment to coastal hazards

CAPITAL FACILITIES & INFRASTRUCTURE

GOAL | To guide the development of capital facilities and infrastructure necessary to meet the region's needs while protecting regional resources.

OBJECTIVES

1. Ensure capital facilities and infrastructure promote long-term sustainability and resiliency
2. Coordinate the siting of capital facilities and infrastructure to enhance the efficient provision of services and facilities that respond to the needs of the region

TRANSPORTATION

GOAL | To provide and promote a safe, reliable, and multi-modal transportation system.

OBJECTIVES

1. Improve safety and eliminate hazards for all users of Cape Cod's transportation system
2. Provide and promote a balanced and efficient transportation system that includes healthy transportation options and appropriate connections for all users
3. Provide an efficient and reliable transportation system that will serve the current and future needs of the region and its people

ENERGY

GOAL | To provide an adequate, reliable, and diverse supply of energy to serve the communities and economies of Cape Cod.

OBJECTIVES

1. Support renewable energy development that is context-sensitive
2. Increase resiliency of energy generation and delivery
3. Minimize energy consumption through planning and design (including energy efficiency and conservation measures)

WASTE MANAGEMENT

GOAL | To promote a sustainable solid waste management system for the region that protects public health, safety, and the environment and supports the economy.

OBJECTIVES

1. Reduce waste and waste disposal by promoting waste diversion and other Zero Waste initiatives
2. Support an integrated solid waste management system



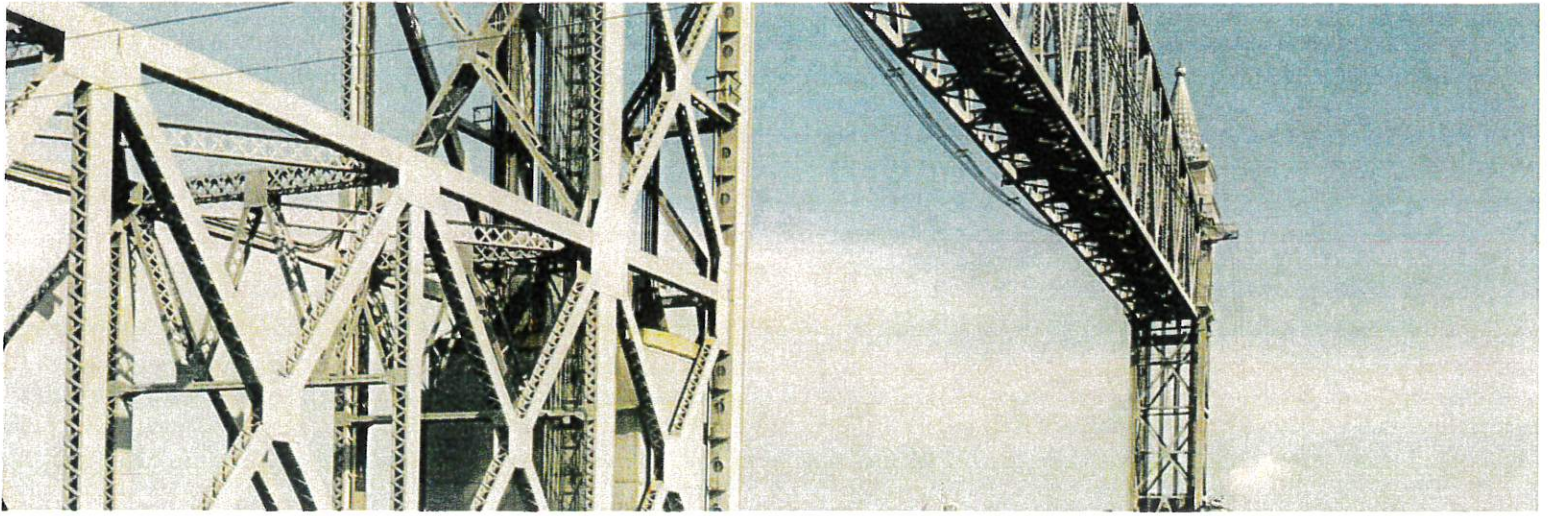
Waste Management

This guidance is intended to clarify how the Waste Management Goal and Objectives of the Regional Policy Plan (RPP) are to be applied and interpreted in Cape Cod Commission Development of Regional Impact (DRI) project review. This technical bulletin presents specific methods by which a project can meet these goals and objectives.

Waste Management Goal: To promote a sustainable solid waste management system for the region that protects public health, safety, and the environment and supports the economy.

- ***Objective WM1 – To reduce waste and waste disposal by promoting waste diversion and other Zero Waste initiatives***
 - ***Objective WM2 – Support an integrated solid waste management system***
-

The applicability and materiality of these goals and objectives to a project will be determined on a case-by-case basis considering a number of factors including the location, context (as defined by the Placetype of the location), scale, use, and other characteristics of a project.



Capital Facilities and Infrastructure

This guidance is intended to clarify how the Capital Facilities and Infrastructure Goal and Objectives of the Regional Policy Plan (RPP) are to be applied and interpreted in Cape Cod Commission Development of Regional Impact (DRI) project review. This technical bulletin presents specific methods by which a project can meet these goals and objectives.

Capital Facilities and Infrastructure Goal: To guide the development of capital facilities and infrastructure necessary to meet the region's needs while protecting regional resources

- *Objective CAP1 – Ensure capital facilities and infrastructure promote long-term sustainability and resiliency*
- *Objective CAP2 – Coordinate the siting of capital facilities and infrastructure to enhance the efficient provision of services and facilities that respond to the needs of the region*

The applicability and materiality of these goals and objectives to a project will be determined on a case-by-case basis considering a number of factors including the location, context (as defined by the Placetype of the location), scale, use, and other characteristics of a project.

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December 5, 2019

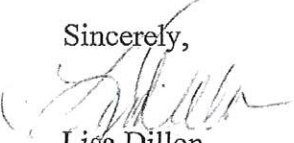
Steven Strojny, Chairman
Bourne Local Comprehensive Plan Committee
Town of Bourne
Town Hall
24 Perry Avenue
Buzzards Bay, MA 02532

Re: Town of Bourne Local Comprehensive Plan Certification

Dear Mr. Strojny,

This letter is to confirm that at its meeting on December 5, 2019, the Cape Cod Commission certified the 2019 Bourne Comprehensive Plan as consistent with the Regional Policy and Cape Cod Commission Local Comprehensive Plan regulations by unanimous vote of its members.

Sincerely,


Lisa Dillon
Commission Clerk

Cc: Coreen Moore, Bourne Town Planner

RECEIVED
DEC 10 2019
TOWN PLANNER
TOWN OF BOURNE

Waste Management Goal

The Waste Management goal of the Bourne Local Comprehensive Plan is to continue to maximize recycling and composting of solid waste; to recycle or compost more than 60 percent of all solid waste by 2030; and to dispose of the waste that cannot be recycled in an economical and environmentally sound manner.

Waste Management Policies

- Minimize the amount of solid waste that is generated.
- Maximize the amount of solid waste that is recycled.
- Reduce financial dependency on landfill operations and extend the life of the landfill facility, while assuring that long-term environmental safety remains an overriding concern.

Waste Management Actions

- Plan for long-term sustainable development of the ISWM facility and its integrated approach to solid waste management, including potential operations utilizing innovative technologies that can manage materials beyond the closure of the landfill.
- Monitor developing waste reduction programs and adopt successful models to reduce volumes of waste being generated by residents and businesses.
- Reach out to the business community and multi-family residential developments to encourage compliance with the mandatory recycling bylaw.
- Work with and support the Recycling Committee and the Bourne DPW on ways to expand public space recycling initiatives.
- Educate Bourne residents about the operations of ISWM and improving the quality of single stream recycling through public speaking engagements, site tours, and open houses.
- Work with the Bourne DPW to review and improve curbside collection efficiencies, identify problems and enhance enforcement of the mandatory recycling bylaw.
- Continue Bourne's participation in regional household hazardous waste management collection programs in order to prevent hazardous waste from entering the landfill or otherwise being disposed of improperly.
- Support initiatives at the state level to create a circular economy through programs such as extended producer responsibility.
- Continue to explore more economical or efficient options for disposing of non-recyclable wastes in an environmentally sound manner.
- Explore adoption of a toxic and hazardous materials bylaw or regulation based on the Cape Cod Commission's model.

WASTE MANAGEMENT

Solid waste in Bourne is managed by two departments, the Department of Public Works (DPW) and the Department of Integrated Solid Waste Management (ISWM.). The DPW provides weekly curbside collection of both household trash and mixed single-stream recyclables, using town staff and semi-automated collection vehicles that lift empty large bins owned by the town.

ISWM was created in 1998 in order to modernize operation of the landfill, generate revenues and meet new State regulations for management of solid waste. Bourne's 74-acre site was permitted by the State for a regional landfill operation accepting only non-MSW (municipal solid waste), primarily construction and demolition (C&D) debris, with the understanding that the town would invest in a major C&D processing facility by the end of 2003.

After analyzing market conditions and the changing regulatory situation, however, the Board of Selectmen chose not to construct this facility. Instead, they instructed ISWM to seek permits to allow disposal of MSW and municipal waste combustor ash. Currently the landfill accepts MSW from the Town of Falmouth under contract, MSW from Bourne, and municipal waste combustor ash under contract from the SEMASS waste-to-energy facility in Rochester.

In May 2005, Town Meeting authorized ISWM to spend one million dollars of net assets from the enterprise fund to construct a permanent enclosed C&D transfer station on the abutting 25-acre parcel of town-owned land. This facility has been in operation since 2009.

ISWM is operated as an Enterprise Fund, separate from the tax levy. All operations and debt services for ISWM are paid for by revenue from customers. ISWM also pays for the curbside collection program of the DPW and pays a host fee to the General Fund for every ton it manages.

ISWM manages the landfill, a construction and demolition materials transfer station, a single-stream recyclables transfer station, and a residential recycling center. The residential recycling center manages all of the materials that are collected at the curb as well as yard waste and brush, textiles, scrap metal, construction and demolition materials, electronic waste, tires, white goods such as refrigerators, and items that are diverted from the landfill such as waste oil. ISWM also manages a very popular Swap Shop where useable items can be left for others to take.

Bourne's recycling program began in 1989 when volunteers set up a drop-off area at the landfill. The following year biweekly curbside recycling began, one of the first such services in southeastern Massachusetts. A composting program also began in 1989, collecting leaves, grass and Christmas trees. Over the years the program has expanded to include brush and stumps as well. Material for composting is ground up and placed in windrows, where it is converted to compost for use by Bourne residents and is used as a vegetative support layer when closing sections of the landfill that have reached final grade.

Bourne continually looks for ways to improve and expand recycling and composting operations with the most recent major initiative being the distribution of curbside collect carts to all residential properties. Bourne currently has a curbside recycling rate of 30% and is evaluating ways to ensure that quality is the highest it can be.