# ENVIRONMENTAL ASSESSMENT

PROPOSED OLD AMSTON ROAD TWO

FUEL CELL POWER PLANT

OLD AMSTON ROAD

COLCHESTER, CONNECTICUT

**Prepared for:**

**ReNew Developers, LLC**
**103 South Main Street, #734**
**Colchester, CT 06415**

**Prepared by:**

**All-Points Technology Corporation, P.C.**
**567 Vauxhall Street Extension – Suite 311**
**Waterford, CT 06385**

**June 2023**

# Table of Contents


**1 INTRODUCTION ..... 1**

**2 PROPOSED PROJECT ..... 3**

2.1 PROJECT SETTING ..... 3
2.2 PROJECT DEVELOPMENT AND OPERATION ..... 5
*2.2.1 Access ..... 5*
*2.2.2 Public Health and Safety ..... 6*
*2.2.3 Land Use Plans ..... 6*

**3 ENVIRONMENTAL CONDITIONS ..... 7**

3.1 AIR QUALITY ..... 9
3.2 WATER RESOURCES ..... 10
*3.2.1 Wetlands and Watercourses ..... 10*
*3.2.2 Wetland Impacts ..... 11*
*3.2.3 Floodplain Areas ..... 11*
3.3 WATER QUALITY ..... 12
*3.3.1 Groundwater ..... 12*
*3.3.2 Surface Water ..... 12*
*3.3.3 Stormwater Management ..... 13*
3.4 HABITAT AND WILDLIFE ..... 15
*3.4.1 Core Forest Determination ..... 16*
*3.4.2 Wildlife ..... 16*
3.5 RARE SPECIES ..... 17
*3.5.1 Natural Diversity Data Base ..... 17*
*3.5.2 USFWS Consultation ..... 18*
3.6 SOILS AND GEOLOGY ..... 19
*3.6.1 Prime Farmland Soils ..... 20*
3.7 HISTORIC AND ARCHAEOLOGICAL RESOURCES ..... 20
3.8 SCENIC AND RECREATIONAL AREAS ..... 21
3.9 NOISE ..... 23

**4 CONCLUSION ..... 24**

# Figures

FIGURE 1 SITE LOCATION MAP ..... 2
FIGURE 2 EXISTING CONDITIONS MAP ..... 4
FIGURE 3 PROPOSED CONDITIONS MAP ..... 8
FIGURE 4 SURROUNDING FEATURES MAP ..... 22

# Table

TABLE 1 GREENHOUSE GAS EMISSIONS ..... 9
TABLE 2 HABITAT ASSESSMENT & IMPACTS ..... 16

# Appendices

APPENDIX A – PROJECT PLANS
APPENDIX B – PRODUCT INFORMATION SHEETS
APPENDIX C – STORMWATER MANAGEMENT REPORT
APPENDIX D - USFWS AND NDDB COMPLIANCE STATEMENT
APPENDIX E - CULTURAL RESOURCES REVIEW
APPENDIX F – VISIBILITY DOCUMENTATION
APPENDIX G – SOUND EVALUATION

# 1 Introduction

All-Points Technology Corporation, P.C. ("APT") prepared this Environmental Assessment ("EA") on behalf of ReNew Developers, LLC (hereinafter referred to as "ReNew") for the proposed installation and utility interconnection of a fuel cell electric generating facility (collectively, the "Site" or "Project"), with output of approximately 18 megawatts[1] ("MW") located in the Town of Colchester, Connecticut ("Town"). This EA has been completed to support ReNew's submission to the Connecticut Siting Council ("Council") of a petition for declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the construction, maintenance, and operation of the electric generating facility.

The results of this assessment demonstrate that the proposed development will comply with the Connecticut Department of Energy and Environmental Protection's ("DEEP") air and water quality standards and will not have an adverse effect on the existing environment and ecology of the Site or the surrounding area. Further, the proposed Project is neither defined as an "affecting facility"[2] nor located within an "environmental justice community"[3] under Connecticut General Statutes § 22a-20a.

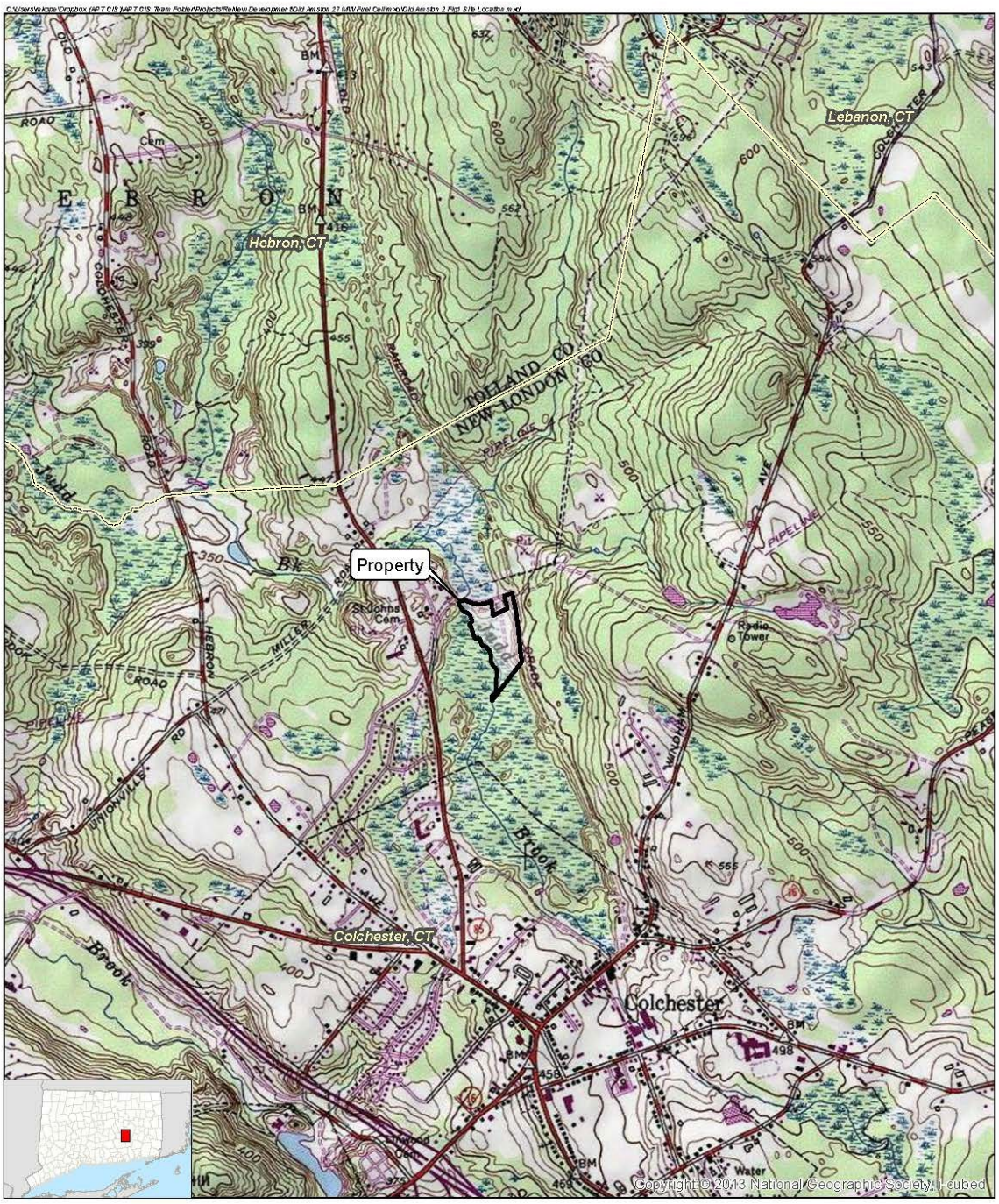
The Site will be developed on a privately owned, 16.16-acre property south of Old Amston Road in Colchester, Connecticut (the "Property") within the Town's Suburban zoning district. The Property, which formerly housed an automotive salvage yard, is vacant and cleared.

Figure 1, *Location Map*, depicts the location of the Property and the immediate surrounding area.

[1] The output referenced is Alternating Current (AC).

[2] "Affecting facility" is defined, in part, as any electric generating facility with a capacity of more than ten megawatts.

[3] "Environmental justice community" means (A) a United States census block group, as determined in accordance with the most recent United States census, for which thirty per cent or more of the population consists of low income persons who are not institutionalized and have an income below two hundred per cent of the federal poverty level, or (B) a distressed municipality, as defined in subsection (b) of § 32-9p.




**Legend**

Property

Municipal Boundary

**Figure 1**
**Location Map**
Proposed Fuel Cell Facility
Old Amston 2
Old Amston Road
Colchester, Connecticut

*Map Notes:*
*Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps, Colchester, CT (1984)*
*Map Scale: 1 inch = 2,000 feet*
*Map Date: May 2023*

2,000 1,000 0 2,000 Feet

ALL-POINTS TECHNOLOGY CORPORATION

# 2 Proposed Project

## 2.1 Project Setting

The Site will occupy ±3.03 acres (the "Project Area") on the ±16.16-acre Property and will consist of the fuel cell facility (the "Facility"), an electrical service interconnection line, stormwater management features, and vehicular and utility access. The Facility will be located in the southeast corner of the Property, with an access drive extending south to the Site from Old Amston Road along an existing access drive route near the eastern Property boundary. Underground gas and water service connections will be from mains within the Air Line State Park Trail north of the Property; the gas main will be a dedicated line for the Facility. The interconnection line will extend out to Old Amston Road from the northern end of the gravel-surfaced equipment area.

The Property's existing topography is generally level, ranging from approximately 404 feet to 429 feet above mean sea level ("AMSL"). The Site slopes gently downward from east to west.

Figure 2, *Existing Conditions*, depicts current conditions within the Project Area.

The surrounding area includes tracts of vacant land, with sparse residential development to the west beyond Judd Brook. The Air Line State Park Trail is to the east, with an Eversource substation and an existing fuel cell facility beyond the Trail to the northeast. Town land, including the municipal transfer station and the Town dog park, is north of Old Amston Road.

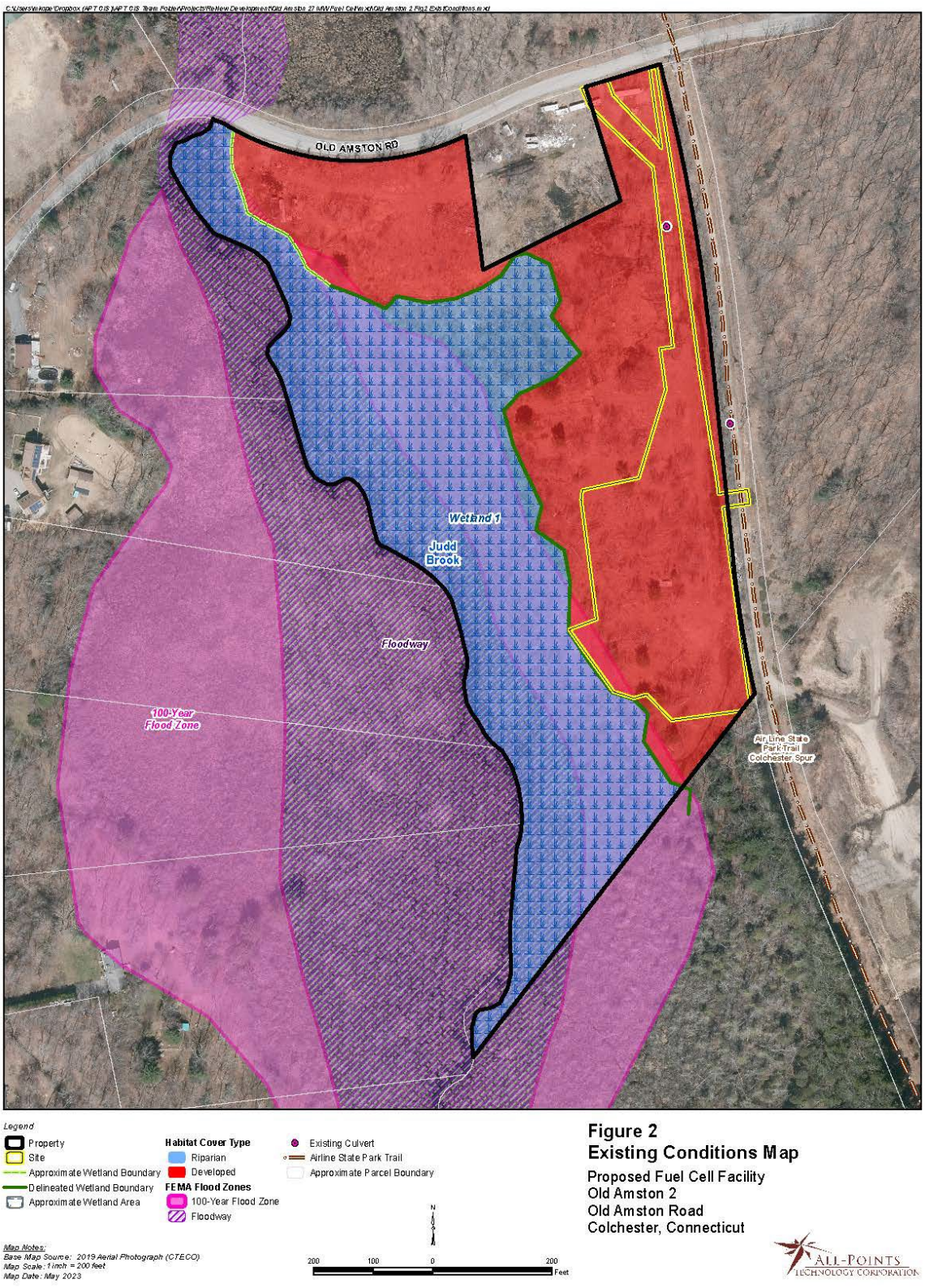



**Figure 2**
**Existing Conditions Map**
Proposed Fuel Cell Facility
Old Amston 2
Old Amston Road
Colchester, Connecticut

## 2.2 Project Development and Operation

The Facility will consist of a total of 60 Bloom Energy Servers, 40 325-kW units and 20 250-kW units, and associated equipment including utility cabinets, water deionizers, telemetry cabinets and disconnect switches. The Facility will be installed within an approximately 125'9" by 347'9", gravel-surfaced compound. The compound will be surrounded by an eight (8)-foot tall chain link fence. The Project will also require one (1) overhead electrical service and underground service connections to water and natural gas. A grass-lined stormwater management basin with a low flow orifice and rip-rap lined overflow weir will be located west of the fence. Once complete, the Project Area will occupy approximately 3.03 acres.

Proposed development drawings are provided in Appendix A, *Project Plans*. Product Information Sheets for the Bloom Energy Servers are provided in Appendix B.

Construction activities within the Project Area will require the following:

- installing erosion and sedimentation control measures;
- creating one (1) stormwater management basin and associated grading;
- creating the gravel-based compound;
- constructing a retaining wall, during which a temporary dewatering area will be utilized;
- trenching for natural gas and water service; and
- installing one (1) new overhead utility pole for interconnection to the existing electrical distribution system.

Earthwork is required for creation of the compound, retaining wall and access drive, and grading is associated with the required stormwater and erosion and sedimentation control features.

The Facility is unstaffed; after construction is complete and the Facility is operable, traffic at the Site will be minimal.

### 2.2.1 Access

The Facility will be accessed from Old Amston Road via an existing gravel drive.

### 2.2.2 Public Health and Safety

The Project will meet applicable local, state, national and industry health and safety standards and requirements related to electric power generation. The Facility will not consume any raw materials, will not produce any by-products and will be unstaffed during normal operating conditions.

The Facility will be enclosed by an eight (8)-foot tall chain link fence with anti-climb mesh. The entrance to the Facility will be gated, limiting access to authorized personnel only. All Town emergency response personnel will be provided access via a Knox padlock, and ReNew will offer to provide training. The Facility will be remotely monitored and will have the ability to remotely de-energize in the case of an emergency.

### 2.2.3 Land Use Plans

The Project is consistent with state and federal policies and will support the state's energy goals by developing a renewable energy resource while not having a substantial adverse environmental effect. Although local land use requirements do not apply, the Project has been designed to comply with the Town's Zoning Regulations to the extent feasible.

The Site is located in the Town's Suburban Zoning District. The Town's Zoning Regulations include a finding that "alternative energy sources are important" in the context of wind powered devices, but are otherwise silent on alternative energy technologies, including fuel cells. Zoning Regulations, Town of Colchester, effective January 15, 2015, revised to February 1, 2023, Section 8.11.13.A.1.

The Town's Plan of Conservation and Development ("POCD"), adopted in 2015, encouraged evaluation by the Town of "alternative energy approaches" for municipal facilities.

ReNew believes the Project will benefit the local community by improving electrical service for existing and future development through the availability of enhanced local, renewable generating capacity.

# 3 Environmental Conditions

This section provides an overview of the current environmental conditions at the Site and an evaluation of the Project's potential impacts on the environment. The results of this assessment demonstrate that the Project will comply with the DEEP air and water quality standards and will not have an undue adverse effect on the existing environment and ecology.

Please refer to Figure 3, *Proposed Conditions* for a depiction of the Project and its relationship with the resources discussed herein.

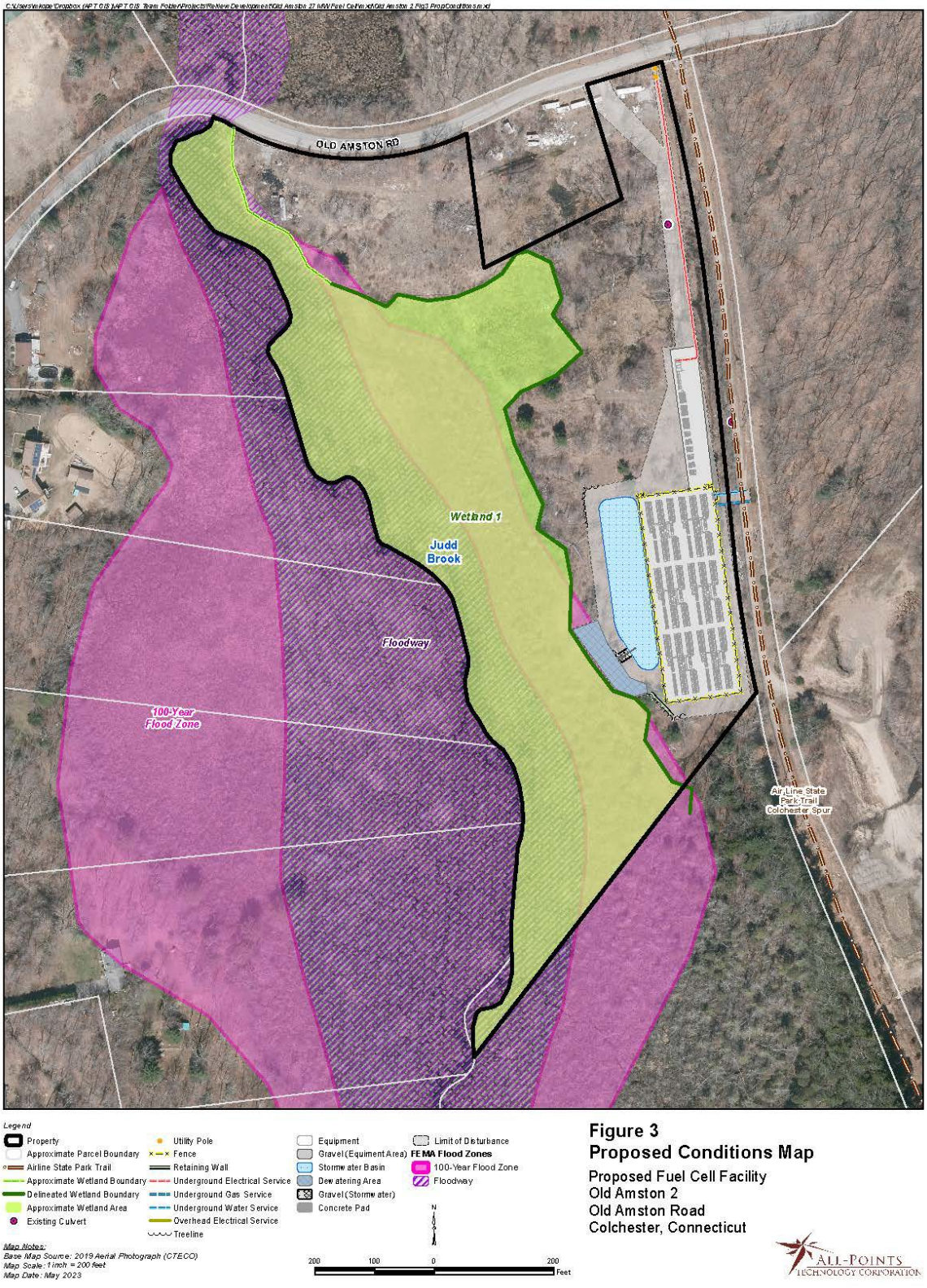



**Figure 3**
**Proposed Conditions Map**
Proposed Fuel Cell Facility
Old Amston 2
Old Amston Road
Colchester, Connecticut

## 3.1 Air Quality

Conn. Agencies Regs. § 22a-174-42 exempts fuel cells from air permitting requirements. Accordingly, no permits, registrations, or applications are required based on the actual emissions from the Facility.[4] It should be noted, however, that Bloom Energy fuel cells do meet the emissions standards of Section 22a-174-42. Table 1 lists emissions generated by Bloom equipment. The Bloom Energy fuel cells virtually eliminate NOx, SOx, CO, VOCs and particulate matter emissions from the energy production process. Similarly, there are no $CH_4$, $SF_6$, HFC or PFC emissions.

**Table 1: Greenhouse Gas Emissions**

| Emission Type | Bloom Output |
|---|---|
| Nitrous Oxides (NOx) | <0.01 lbs/MWh |
| Carbon Monoxide (CO) | <0.05 lbs/MWh |
| Sulfur Oxides (SOx) | Negligible |
| Volatile Organic Compounds (VOCs) | <0.02 lbs/MWh |
| Carbon Dioxide (CO2)[5] | 679-833 lbs/MWh |

The proposed Facility will ultimately displace less efficient fossil fueled marginal generation on the ISO New England system. Based upon the most recent US Environmental Protection Agency (EPA) "eGrid" data (2021), the proposed Facility is expected to reduce carbon emissions by approximately 13.6% while essentially eliminating local air pollutants like NOx, SOx, and particulate matter.

Temporary, potential, construction-related mobile source emissions will include those associated with construction vehicles and equipment. Any potential air quality impacts related to construction activities can be considered de minimis. Such emissions will be mitigated using available measures, including limiting idling times of equipment; proper maintenance of all vehicles and equipment; and watering/spraying to minimize dust and particulate releases. In

[4] See Conn. Agencies Regs. §§ 22a-174-42(b) and (e).

[5] Carbon dioxide is measured at Bloom's stated lifetime efficiency level of 53-60%.

addition, all on-site and off-road equipment will meet the latest standards for diesel emissions, as prescribed by the United States Environmental Protection Agency.

## 3.2 Water Resources

### 3.2.1 Wetlands and Watercourses

APT Registered Soil Scientists identified portions of one (1) wetland on the Property during field inspections and wetland delineations completed on October 13, 2022. The location of this resource is depicted on Figure 2, *Existing Conditions*. The results of the field delineation are summarized below.

The wetland, located on the western portion of the Property, consists of a large complex wetland and floodplain system with a diversity of hydrological conditions, vegetation communities, and morphologies. Boundaries to this wetland are generally well-defined, with a distinct change in soil drainage classifications that coincides with a vegetative community break. The wetland habitat is characterized by seasonally saturated seeps and semi-permanent flooding from Judd Brook, which is located to the west within the wetland. The wetland generally drains west toward Judd Brook, with interior pockets of seasonally flooded and/or semi-permanently flooded depressional areas. A high groundwater table also contributes to the hydrology of this wetland complex. Evidence of both historic and more recent anthropogenic (man-made) influence is present in the form of filled/altered soil profiles along the jurisdictional wetland boundary in proximity to the Project Area. Additional anthropogenic influences include two cut drainage swales that convey flows from off-Site wetland resources and roadway drainage to the north.

A majority of the wetland is dominated by emergent vegetation along the wetland boundaries that transitions to a dense shrub layer bordering the floodplain in the wetland interior. Some wetland disturbance has occurred, particularly along the northern wetland edge, in association with the previous automotive salvage yard activities. Dominant vegetation throughout the wetland includes red maple, purple loosestrife[6], sensitive fern, silky dogwood, soft rush, Northern arrowwood, specked alder, pussywillow, green bulrush, meadowsweet, and tussock sedge.

[6] Connecticut Invasive Species Council invasive plant species

### 3.2.2 Wetland Impacts

The Project will not result in any direct impacts to the wetland. The nearest permanent point of the Project will be a grass lined stormwater management basin at the southwest corner of the Project Area, located approximately 22 feet east of the wetland. A modular block retaining wall is proposed in this corner of the Project Area to maximize the distance of all permanent components from the wetland boundary. During construction of the retaining wall, temporary impacts will occur in adjacent upland areas within approximately 1.5 feet of the wetland. The impacts are associated with the installation of the retaining wall and dewatering activities. All proposed Project activities will entirely occur within existing disturbed surfaces associated with historic filling/grading and more recent restoration efforts. Although construction activities are proposed in proximity to the wetland, Project development is within a disturbed area and does not entail clearing of mature vegetation[7] or significant grading. Thus, the Project would not be expected to result in an adverse impact to the Site's wetland resources due to the existing disturbed nature of the Site and the minimal clearing and grading required.

Nonetheless, as a precaution, the Petitioner will implement a Resource Protection Program. See Appendix A, Project Plans, Sheet No. GN-2.

### 3.2.3 Floodplain Areas

The Facility will not be located within a 100- or 500-year flood zone. APT reviewed the United States Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") covering the Site. A FIRM is the official map of a community on which FEMA has delineated both the special hazard areas and risk premium zones applicable to the community. The northern portion of the Site, including a portion of the access drive, is mapped on FIRM PANEL #09011C 0152 G, dated July 18, 2011. The southern portion of the Property, including the location of the Facility, is mapped on FIRM PANEL #09011C 0152 G, dated July 18, 2011. Based upon the reviewed FIRM Maps, the Project Area is located in an area designated as Zone X, which is defined as an area of minimal flooding, typically above the 500-year flood level. Higher risk flood areas associated with Judd Brook are located west of the Site.

[7] Most of the site consists of either typical lawn species, exposed fill or gravel surfaces.

No special design considerations or precautions relative to flooding are required for the Facility. As no portion of the Project Area is proposed to be located in the 100- or 500-year flood zones, no impacts are anticipated to floodplain or downstream areas.

## 3.3 Water Quality

As discussed in this section, the Project will comply with DEEP's water quality standards. Once operative, the Facility will be unstaffed, and no potable water uses or sanitary discharges are associated with it. The Facility is designed to operate without water discharge under normal operating conditions, and uses no water after start-up, which requires an 18,000-gallon injection. No liquid fuels are associated with the operation of the Facility. Stormwater generated by the proposed development will be properly handled and treated in accordance with the 2004 *Connecticut Stormwater Quality Manual*.

### 3.3.1 Groundwater

Groundwater underlying the Site is classified by publicly available DEEP mapping as "GA, GAA may not meet current standards".[8] This classification indicates groundwater within the area is located within a GA- or GAA-classified area, but that it may be degraded and not meet current standards. Based upon a review of available DEEP mapping, the Site is not located within a mapped (preliminary or final) DEEP Aquifer Protection Area. However, the Site is located within a Town-designated Aquifer Protection Zone.

The Project will have no adverse environmental effect on ground water quality.

### 3.3.2 Surface Water

The Project will have no adverse environmental effect on surface water quality. Based upon DEEP mapping, the Site is located in Major Drainage Basin 4 (Connecticut River Basin), Regional Drainage Basin 47 (Salmon River), Subregional Drainage Basin 4702 (Judd Brook), and Local Drainage Basin 4702-00 (Judd Brook above unnamed brook). The nearest mapped waterbody is Judd Brook, which is located on the western portion of the Property and is classified by DEEP as

[8] Designated uses in GA classified areas include existing private and potential public or private supplies of drinking water and base flow for hydraulically connected surface water bodies. Designated uses in GAA classified areas include existing or potential public supply of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies.

a Class A surface waterbody[9]. At its nearest point Judd Brook is located approximately 195 feet west of the Project Area. The Project is expected to have no effect on this surface waterbody.

Based upon the reviewed DEEP mapping, the Site is not located within a mapped Public Drinking Supply Watershed.

During construction, erosion and sediment ("E&S") controls will be installed and maintained in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. Once operative, stormwater will be managed in accordance with the 2004 *Connecticut Stormwater Quality Manual*.

### 3.3.3 Stormwater Management

The Project has been designed to meet the 2004 Connecticut Stormwater Quality Manual and 2002 Connecticut Guidelines for Soil Erosion and Sediment Control and the requirements of DEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ("GP"). Combined, these address three (3) main concerns: stormwater runoff peak attenuation, water quality volume treatment, and E&S control during construction. ReNew will apply for a General Permit from DEEP. Technical details, mapping, and HydroCAD modeling results are provided in a Stormwater Management Report that will be provided to DEEP and is attached hereto as Appendix C. A summary of the results is provided below.

**Stormwater Runoff Peak Attenuation**

The Project will require the installation of fuel cell equipment and associated fencing, gravel access drive, and utility and stormwater management features. An increase in runoff is attributed to the installation of the Facility's gravel pad, concrete equipment pads and gravel surfacing of the access drive.

To manage the increase in post-development runoff, one (1) grass-lined stormwater management basin with a low flow outlet pipe and rip-rap lined overflow weir is proposed. This basin will collect surface runoff from within the Facility, thus managing the timing and release of flow from the Project Area.

[9] Designated uses for A classified waterbodies include potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply and other legitimate uses including navigation.

The stormwater calculations for the Project predict that the proposed basin will reduce post-development peak discharges to the waters of the State of Connecticut for the 2-, 25-, 50- and 100- year storm events compared to the pre-development peak discharges. Therefore, the Project is not anticipated to result in any adverse conditions to the surrounding areas and properties.

**Water Quality Volume Treatment**

The basin design also provides for adequate treatment of water quality volume associated with effective impervious cover, which includes the proposed gravel pad, access drive and concrete equipment pads. The proposed basin is designed to provide the requisite water quality volume.

**Erosion and Sediment Control During Construction**

To safeguard water resources from potential impacts during construction, ReNew is committed to implementing protective measures in the form of a Stormwater Pollution Control Plan ("SWPCP"), subject to approval by DEEP Stormwater Management. The SWPCP will include monitoring of established E&S controls that are to installed and maintained in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control.*

Perimeter erosion controls (silt fence with 12" compost filter sock) will encircle the Project Area to capture sediment potentially mobilized during Site work. Sedimentation and erosion control notes and phasing plans are incorporated in the Project plans (see Appendix A).

Open areas will be temporarily stabilized with quick growing annual seed during construction. Upon completion of construction, the Project Area outside the fenced Facility and the stormwater management basin will be seeded with a permanent New England semi-shade grass and forbs mix.

With the incorporation of these protective measures, stormwater runoff from Project development is not anticipated to result in an adverse impact to water quality associated with nearby surface water bodies.

## 3.4 Habitat and Wildlife

Two (2) distinct habitat types (vegetative communities), Developed and Riparian, are located on the Site. These habitats were first assessed using remote sensing and publicly available datasets and subsequently verified during the October 2022 field inspection.

### Developed

The Project will be located entirely within the Developed habitat area. The Developed habitat is characterized by disturbed, level and graded areas that include fill material and altered soil profiles. Site work has historically and more recently occurred throughout the Project Area resulting in exposed filled soils with generally level topography. Adjacent surrounding areas are also developed along Old Amston Road with a fuel cell facility to the north, a dirt access road and the Air Line Trail to the east, and maintained lawn to the west. The Facility will redevelop limited areas within the Developed habitat; no significant negative impact to this habitat type will result.

### Riparian

The Riparian habitat (the wetland) consists of open water, emergent, and scrub/shrub vegetative communities associated with and bordering Judd Brook. This large complex wetland and floodplain system contains a diversity of hydrological conditions, vegetation communities, and morphologies. Hydrology within this habitat is characterized by seasonally saturated seeps and semi-permanent flooding from Judd Brook. Historic disturbance and more recent anthropogenic (man-made) influence are present in the form of filled/altered soils along the jurisdictional boundary within proximity to the Project Area. As such, the Project is not anticipated to result in a likely adverse impact The Project will not result in any direct impacts to the Riparian habitat area. Potential secondary impacts are mitigated by the proposed sedimentation and erosion control plan and Resource Protection Plan. to the Riparian habitat.

Table 1, *Habitat Assessment and Impacts Table* provides calculations of the total on-Site areas for each of the referenced habitat types and the area proposed to be impacted by the Project.

**Table 2: Habitat Assessment and Impacts**

| Habitat Type | Total Area On-Property (+/- ac.) | Area Affected by Site (+/- ac.) |
|---|---|---|
| Developed | 8.30 | 3.00 |
| Riparian | 7.85 | 0.00 |

### 3.4.1 Core Forest Determination

APT evaluated the size and extent of the contiguous interior forest block present in proximity to the Site using two (2) publicly available GIS-based datasets designed to assess impacts to core forest habitat. In addition, an independent evaluation was performed (based on GIS analysis of 2019 leaf-off aerial photography, field observations and professional experience). The results of these analyses demonstrate no core forest exists on the Site or within the immediate surrounding area.

The majority of the Site is cleared; only minimal clearing of edge forest at the eastern Project boundary in the area abutting the Air Line Trail will be required. Therefore, the Project is not anticipated to result in a significant negative impact to forested habitat or core forest resources.

### 3.4.2 Wildlife

The Project will occupy an existing Developed habitat area that currently provides limited value from a wildlife utilization standpoint due to the lack of vegetation and the Site's current disturbed condition. Project-related impacts will be minimal and therefore wildlife is not anticipated to be adversely affected by the Project.

The disturbed areas located in proximity to the Project Area are likely utilized by species that are tolerant of human disturbance and habitat fragmentation. Generalist wildlife species common to the region, including several development-tolerant common resident and migratory bird species as well as mammals such as raccoon, striped skunk, grey squirrel, Virginia opossum, white-tailed deer, and eastern chipmunk, could be expected to traverse this area. However, the abundance of higher quality habitat in the surrounding area is more likely to be used by wildlife.

The Project Area will not encroach into the adjacent higher quality Riparian habitat. As a result, wildlife utilization within these nearby aquatic habitats is expected to continue relatively uninterrupted. Noise and associated human activities during construction of the Project Area may result in limited temporary disruption to wildlife using the nearby wetland habitat. Any possible wildlife displaced during construction would be expected to temporarily disperse deeper into the wetland and nearby edge forest habitats, with limited disruption to breeding or foraging activities. Post construction, operation of the Facility will not result in a likely adverse effect to wildlife using the nearby habitats since the Facility will be unoccupied and does not generate any significant noise, traffic, or high level of human activity.

## 3.5 Rare Species

APT reviewed publicly available information to determine the potential presence of state/federally listed species and critical habitat on or proximate to the Site. A discussion is provided in the following sections.

### 3.5.1 Natural Diversity Data Base

The DEEP Natural Diversity Data Base ("NDDB") program performs hundreds of environmental reviews each year to determine the impact of proposed development projects on state-listed species and to help landowners conserve the state's biodiversity. In furtherance of this endeavor, the DEEP also developed maps to serve as a pre-screening tool to help determine if there is the potential for project-related impact to state-listed species.

The NDDB maps represent approximate locations of (i) endangered, threatened and special concern species and (ii) significant natural communities in Connecticut. The locations of species and natural communities depicted on the maps are based on data collected over the years by DEEP staff, scientists, conservation groups, and landowners. In some cases, an occurrence represents a location derived from literature, museum records and/or specimens. These data are compiled and maintained in the NDDB. The general locations of species and communities are symbolized as shaded (or cross-hatched) polygons on the maps. Exact locations have been masked to protect sensitive species from collection and disturbance and to protect landowners' rights whenever species occur on private property.

At the onset of this Project, APT reviewed the most recent DEEP NDDB mapping (December 2022), which revealed that an NDDB polygon extends onto the Property and a portion of the

Site. As a result, a request for NDDB review was submitted on March 26, 2023 through the eNDDB system; APT included a Resource Protection Program similar to the plan prepared for the adjacent fuel cell and approved by DEEP. NDDB responded with a Determination Letter on April 11, 2023 (NDDB Determination No. 202302692; see Appendix D). The response letter identified two State-listed Special Concern Species: wood turtle and spotted turtle and concurred with the proposed protection program. No impacts from the Project would be anticipated provided work is performed during the turtles' dormant season (November 1 – March 15). If work is to be performed during the turtles' active season (March 16 – October 31), the following protection measures are recommended during construction to ensure the continued conservation of these species and avoid incidental mortality:

- Installing isolation measures (exclusionary fencing) to prevent any turtle access into the construction area and ensuring that no equipment, vehicles or construction materials are stored outside of the exclusionary fencing;
- Removal of any turtles prior to construction activities;
- Conducting a pre-construction contractor educational session by a qualified biologist and the posting of educational poster materials that will be displayed at all times throughout the duration of construction activities; and
- Reporting any observations of the species directly to DEEP and providing a final report to the agency upon completion of construction.

Protection measures have been incorporated in a Rare Species Protection Program as provided in the Project site plans. See Appendix A, Sheet GN-2.

### 3.5.2 USFWS Consultation

Federal consultation was completed in accordance with Section 7 of the Endangered Species Act through the U.S. Fish and Wildlife Service's ("USFWS") Information, Planning, and Conservation System ("IPaC"). Based on the results of the IPaC review, federally-listed[10] endangered species, northern long-eared bat ("NLEB"; *Myotis septentrionalis*), does not occur within 150 feet of the Site.

[10] Listing under the federal Endangered Species Act

The NLEB's range encompasses the entire State of Connecticut and suitable NLEB roost habitat includes trees (live, dying, dead, or snag) with a diameter at breast height ("DBH") of three (3) inches or greater. The Project Area is clear except for several scattered trees and a narrow area adjacent to the Air Line State Park Trail.

APT reviewed the DEEP's publicly available *Northern long-eared bat areas of concern in Connecticut to assist with Federal Endangered Species Act Compliance* map (February 1, 2016) to determine the locations of any known maternity roost trees or hibernaculum in the state. This map reveals that there are currently no known NLEB maternity roost trees within 0.25 mile of the Site. The nearest NLEB habitat resource to the Site is located in North Branford, approximately 27.2 miles to the southwest.

Effective March 31, 2023 the NLEB is classified as Endangered under the ESA. The reclassification eliminates use of the previous 4(d) rule for the NLEB, which is applicable only to Threatened species. An NLEB Interim Consultation Framework has been developed by USFWS to facilitate transition from the 4(d) rule to typical Endangered species consultation procedures for activities that are reasonably certain to occur before April 1, 2024 (date on which the NLEB Interim Consultation Framework expires). APT reviewed the new NLEB Determination Key for this Project and determined the Project will not likely result in an adverse effect or incidental take of NLEB and does not require a permit from USFWS. A USFWS letter dated May 10, 2023 confirmed the "No Effect" determination.

A full review of the Endangered Species Act (ESA) Compliance Determination and USFWS's Response Letter is provided in Appendix D, *USFWS and NDDB Compliance Statement*.

## 3.6 Soils and Geology

The construction and grading of the gravel pads within and outside of the fenced compound, retaining wall, and stormwater management basin will generate some excess material that will be redistributed on Site. See Appendix A, Project Plans.

All exposed soils resulting from construction activities will be properly and promptly treated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

Surficial materials within the Project Area are classified as deposits of sand and gravel and swamp deposits. Bedrock beneath the Subject Property is identified as Hebron Gneiss. Hebron

Gneiss is described as an interlayered dark-gray, medium to coarse-grained schist, composed of andesine, quartz, biotite, and local K-feldspar, and greenish-gray, fine to medium-grained calc-silicate rock, composed of labradorite, quartz, biotite, actinolite, hornblende, and diopside, and locally scapolite.[11]

ReNew does not anticipate encountering bedrock during Project development.

### 3.6.1 Prime Farmland Soils

Pursuant to the Code of Federal Regulations, CFR Title 7, part 657, farmland soils include land that is defined as prime, unique, or farmlands of statewide or local importance based on soil type. They represent the most suitable land for producing food, feed, fiber, forage, and oilseed crops.

According to the Connecticut Environmental Conditions Online Resource Guide[12], no Prime Farmland Soils are found within the Property. See Figure 2, *Existing Conditions Map.* Approximately 700 sq. ft. of prime farmland soils are mapped in the area of the water and gas connections that extend off-Property to the north. That limited area crosses the Air Line State Park Trail, which historically was a rail line and is not utilized as farmland.

## 3.7 Historic and Archaeological Resources

At the request of APT, and on behalf of ReNew, Heritage Consultants, LLC ("Heritage") reviewed relevant historic and archaeological information to determine whether the Site holds potential historic or cultural resource significance. Their review of historic maps and aerial images of the Site, examination of files maintained by the Connecticut State Historic Preservation Office ("SHPO"), and a pedestrian survey of the Site revealed no National Register of Historic Places ("NRHP") located within 1.0 mile of the Site. Two (2) State Register of Historic Places properties and one (1) previously identified archaeological site are within 1.0 mile of the Site. Those resources will not be impacted by the Project. In a letter dated April 18, 2023, the SHPO determined that no additional archaeological investigation is warranted, and concurred that neither archaeological nor historic resources will be impacted by the Project.

[11] Connecticut Natural Resources Atlas Series: Bedrock Geological map, cteco.uconn.edu/maps/state/Bedrock_Geologic_Map_of_Connecticut.pdf

[12] Connecticut Environmental Conditions Online (CTECO) Resource Guide, www.cteco.uconn.edu.

The Phase 1A report and the SHPO determination are included in Appendix E.

## 3.8 Scenic and Recreational Areas

The Air Line State Park Trail runs to the east of the Facility, and proposed utility connections will extend under the Trail. There will be no permanent impact to the Trail once construction of the Project is complete. The proposed Facility will not reflect a significant change in the character of the views experienced from the surrounding area, including the Trail; the Project Area until recently contained an automotive salvage yard and is now cleared. As shown on the photo-simulations included as Appendix F, direct, open views will be experienced from nearby vantage points along Old Amston Road and the Trail, some of which will also include views of the fuel cell approved in Petition No. 1533.

No state or local designated scenic roads, scenic areas or CT Blue Blaze Hiking Trails are located near the Site and therefore none will be physically or visually impacted by development of the Project.

See Figure 4, *Surrounding Features Map,* for resources located within one mile of the Project Area.

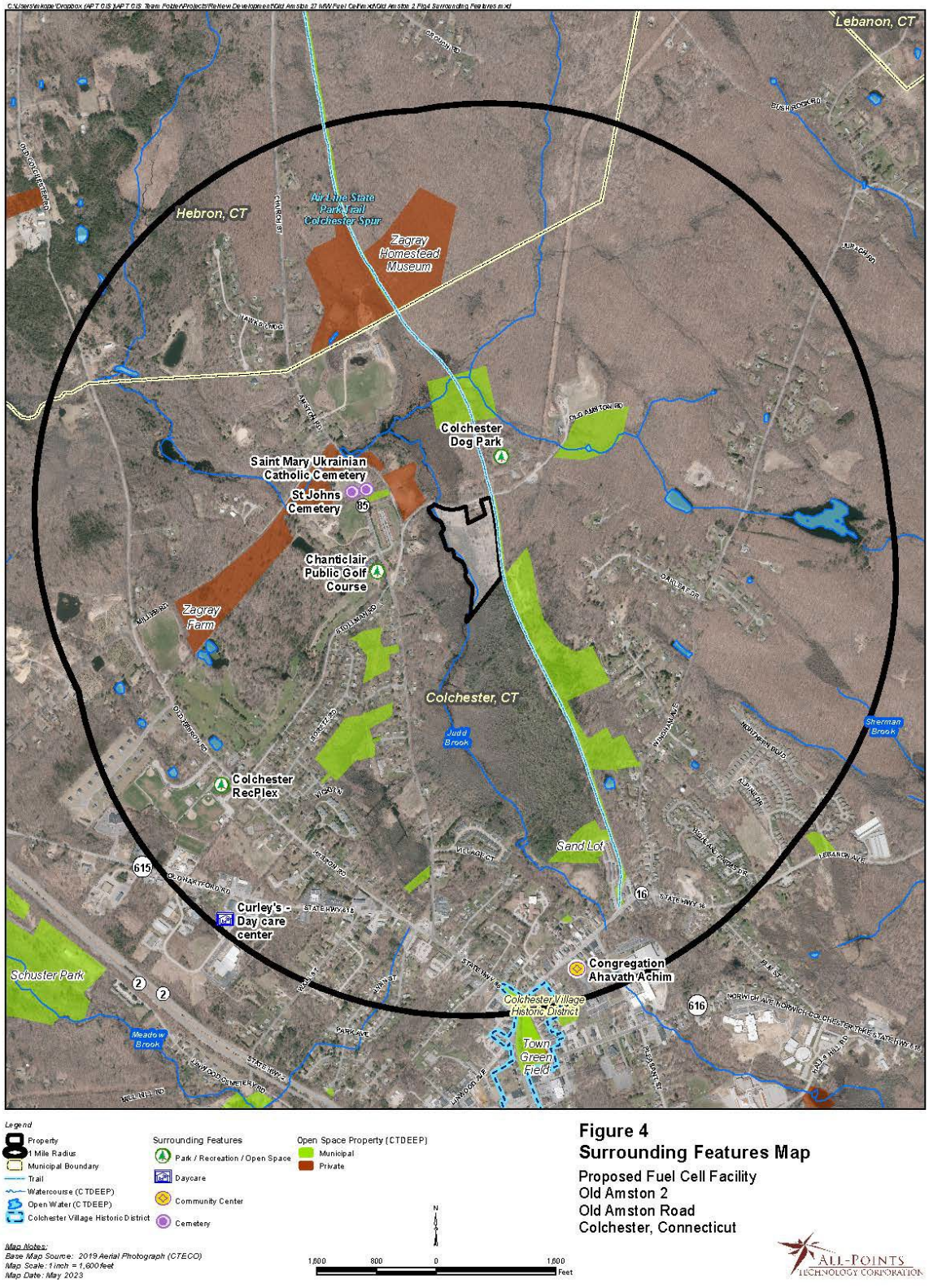



**Figure 4**
**Surrounding Features Map**
Proposed Fuel Cell Facility
Old Amston 2
Old Amston Road
Colchester, Connecticut

ALL-POINTS TECHNOLOGY CORPORATION

## 3.9 Noise

ReNew retained Cavanaugh Tocci to evaluate the acoustic impact of noise from the proposed Facility in the surrounding community. The report discusses the Project in the context of the State of Connecticut Noise Regulations (R.C.S.A Sections 22a-69-1 to 22a-69-7.4). See Appendix G, Cavanaugh Tocci Environmental Sound Evaluation, January 6, 2023.[13]

The nearest residential receptors, defined under the regulations as Class A, are approximately 300 feet west of the Facility. The property to the east, which is the site of an electric substation and an existing fuel cell facility, is considered to be a Class C receptor, generally categorized as industrial in nature. Other nearby properties are considered to be Class B receptors, generally categorized as commercial or agricultural in nature. The report concludes that "sound produced by the proposed project will comply with the most stringent requirements of the state noise regulations" and that it "will not produce a noticeable impact on the acoustic environment at existing nearby residences and will not have an unreasonable adverse effect at all surrounding properties."

Construction noise is exempted under State of Connecticut regulations for the control of noise, RCSA 22a-69-1.8(h).

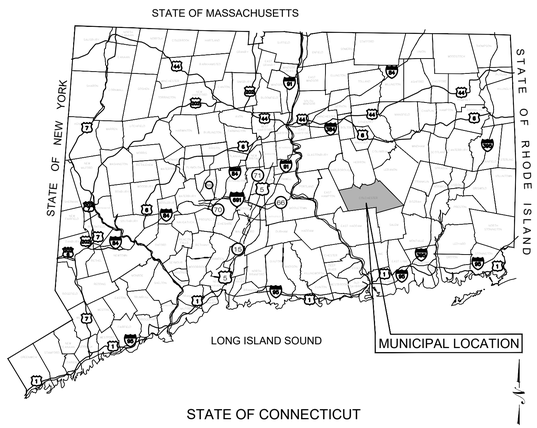
[13] The report considers both the proposed Project and the project previously approved by the CSC in Petition No. 1533.

# 4 Conclusion

As demonstrated in this Environmental Assessment, the Project will comply with the DEEP air and water quality standards. Further, it will not have an undue adverse effect on the existing environment and ecology; nor will it affect the scenic, historic and recreational resources in the vicinity of the Project.

# APPENDIX A

PROJECT PLANS




# ReNew DEVELOPERS, LLC

# "OLD AMSTON ROAD FUEL CELL POWER PLANT 2"

# 42 OLD AMSTON ROAD COLCHESTER, CT 06415

## LIST OF DRAWINGS


**T-1 TITLE SHEET**

**1 OF 1 PROPERTY SURVEY, MAP 26 LOT 17 OLD AMSTON ROAD (PROVIDED BY DUTTON ASSOCIATES, LLC)**

**GN-1 GENERAL NOTES**

**GN-2 ENVIRONMENTAL NOTES RESOURCE PROTECTION MEASURES**

**OP-1 OVERALL LOCUS MAP**

**EC-1 SEDIMENTATION & EROSION CONTROL NOTES**

**EC-2 SEDIMENTATION & EROSION CONTROL DETAILS**

**EC-3 SEDIMENTATION & EROSION CONTROL PLAN**

**GD-1 GRADING & DRAINAGE PLAN**

**SP-1 SITE & UTILITY PLAN**

**DN-1 SITE DETAILS**

**DN-2 SITE DETAILS**


**FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION**

## SITE INFORMATION

SITE NAME: "OLD AMSTON ROAD FUEL CELL POWER PLANT 2"

LOCATION: 42 OLD AMSTON ROAD
COLCHESTER, CT 06415

SITE TYPE/DESCRIPTION: ADD (1) GROUND MOUNTED FUEL CELL FACILITY W/ ASSOCIATED EQUIPMENT, GRAVEL ACCESS ROAD, AND STORMWATER MANAGEMENT.

PROPERTY OWNER: RENEW DEVELOPERS, LLC
103 SOUTH MAIN ST. #734
COLCHESTER, CT 06415

APPLICANT: RENEW DEVELOPERS, LLC
103 SOUTH MAIN ST. #734
COLCHESTER, CT 06415

ENGINEER CONTACT: ROBERT C. BURNS, P.E.
(860) 552-2036

LATITUDE: 41° 35' 31.70" N
LONGITUDE: 72° 20' 00.49" W

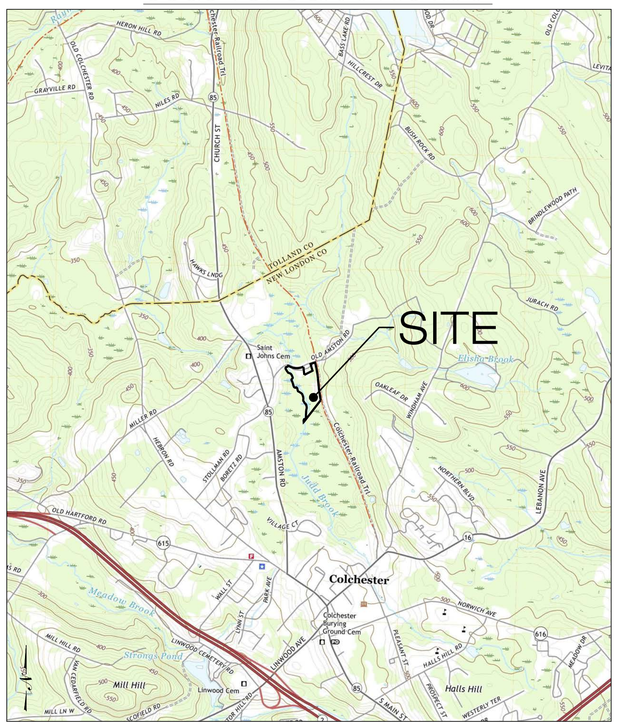
MBLU: 06-06-017-000
ZONE: SUBURBAN DISTRICT

TOTAL SITE ACREAGE: 16.16± AC.
TOTAL DISTURBED AREA: 3.03± AC.

APPROX. VOLUME OF CUT: 80± CY
APPROX. VOLUME OF FILL: 5390± CY
APPROX. NET VOLUME: 5310± CY OF FILL

NOTE:
CUT/FILL NUMBERS DO NOT INCLUDE EXCAVATION ASSOCIATED WITH THE INSTALLATION OF THE GRAVEL FUEL CELL COMPOUND.

## USGS TOPOGRAPHIC MAP




SCALE : 1" = 2000'± SOURCE: NRCS NEW LONDON CT DIGITAL RASTER GRAPHIC COUNTY MOSAIC, 2001


**ReNew DEVELOPERS, LLC**
103 SOUTH MAIN ST. #734
COLCHESTER, CT 06415
OFFICE: (860) 303-5726

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

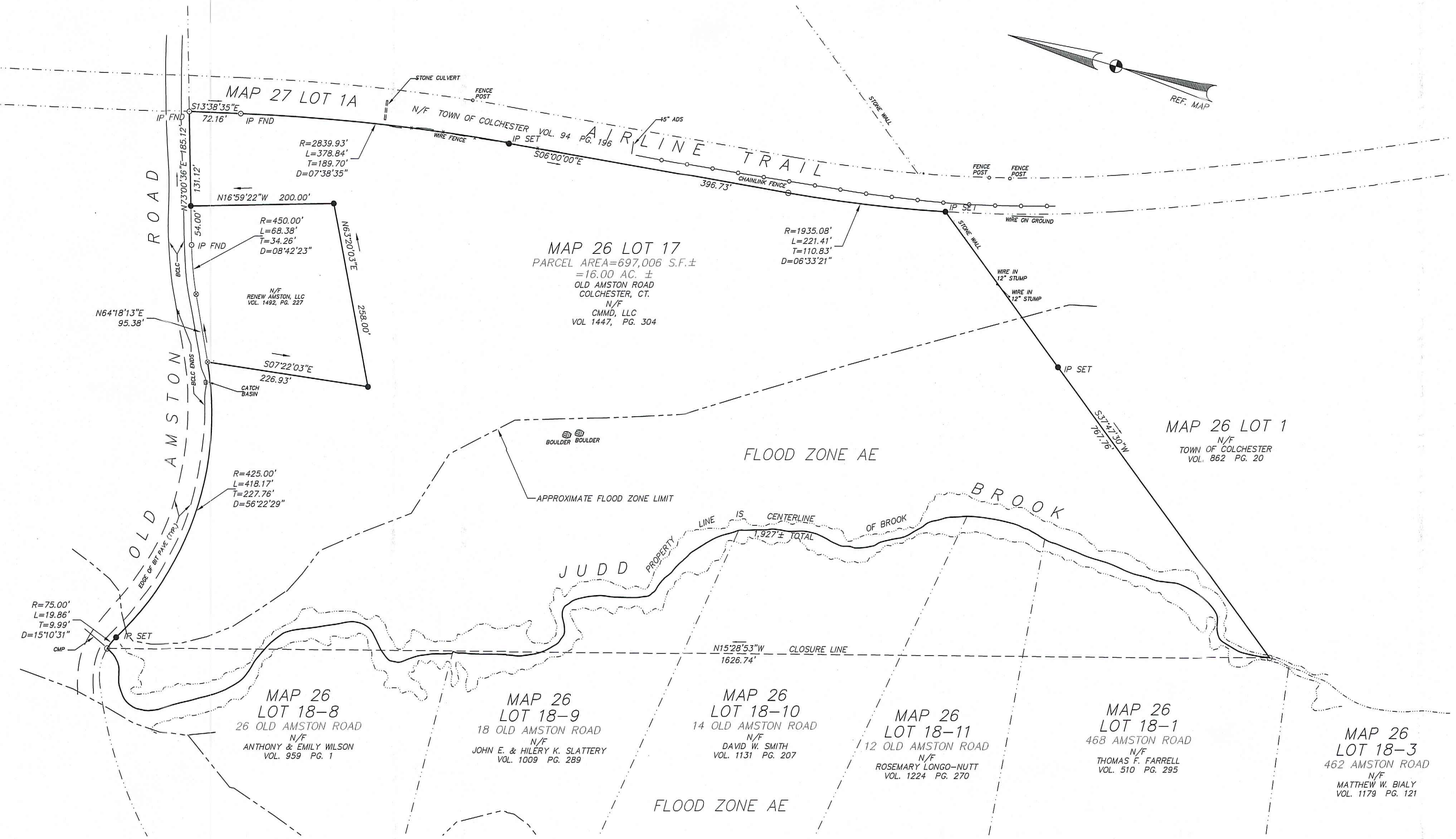
APT FILING NUMBER: CT716130

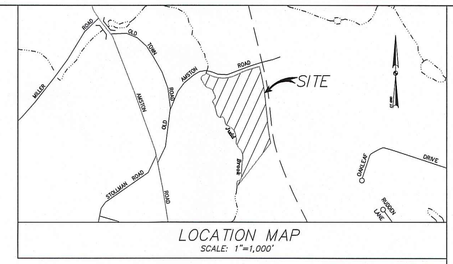
DRAWN BY: CSH
DATE: 06/08/23
CHECKED BY: RCB

SHEET TITLE:
**TITLE SHEET**

SHEET NUMBER:
**T-1**

STATE OF CONNECTICUT · ROBERT CHARLES BURNS · 20071 · LICENSED PROFESSIONAL ENGINEER




LEGEND:

- PROPERTY LINE
- ○ IRON PIN
- ● IRON PIN TO BE SET
- ⊗ ANGLE POINT

SCALE IN FEET: 200' 100' 0' 100' 200'

REFERENCE IS MADE TO MAPS TITLED:

"IMPROVEMENT LOCATION/TOPOGRAPHIC SURVEY, MBL 6-6-17, OLD AMSTON ROAD, COLCHESTER, CT, PREPARED FOR RENEW AMSTON, LLC, P.O. BOX 784, COLCHESTER, CT, SCALE 1"=30', SHEET 1 OF 1, JOB NO.20-115, DATE 1/18/2022, REVISED 7/3/2022, BY REYNOLDS ENGINEERING SERVICES, LLC

"PLAN, PREPARED BY GEORGE E. PITCHER & SON, SCALE: 1"=60', DATED: OCT. 31, 1907."

"MAPS NO. 1 OF 2 AND 2 OF 2, SHOWING LAND OF THE TOWN OF COLCHESTER, COLCHESTER, CONN., SCALE: 1"=100', DATED: OCT. 23, 1975, PREPARED BY C. ROGER FERGUSON – LAND SURVEYOR, MANSFIELD CENTER, CONN."

"THE CONNECTICUT LIGHT & POWER COMPANY, BERLIN, CONNECTICUT, JOB: JUDD BROOK SUB-STATION, TITLE: PLAN SHOWING LAND TO BE ACQUIRED FROM DANIEL GOLDBERG, TOWN OF COLCHESTER, SCALE: 1"=100', DATED: 11-12-70, PREPARED BY WILLIAM E. RICHARD, LAND SURVEYOR."

"DOLGRYN ESTATES, SUBDIVISION PLAN, ROUTE 85 & OLD AMSTON ROAD, COLCHESTER, CT., PREPARED BY TOWNE ENGINEERING, INC., DATED: 7-31-86, SCALE: 1"=100', REVISED THROUGH 10-1-86, SHEET 1 OF 2."

"DOLGRYN ESTATES, RESUBDIVISION PLAN, ROUTE 85 & OLD AMSTON ROAD, COLCHESTER, CT., PREPARED BY TOWNE ENGINEERING, INC., DATED: 10-29-86, SCALE: 1"=50', REVISED THROUGH 2-12-87, SHEET 1 OF 2."

"RIGHT OF WAY MAP, TOWN OF COLCHESTER, HEBRON-COLCHESTER ROAD, FROM THE HEBRON TOWN LINE, SOUTHERLY TO HARTFORD-NEW LONDON ROAD, ROUTE NO. 366, PREPARED BY CONNECTICUT STATE HIGHWAY DEPARTMENT, SCALE: 1"=40', DATED: 1932, JOB NO. 28-01, SHEETS 1 OF 3 AND 2 OF 3."

"RIGHT OF WAY AND TRACK MAPS, THE NEW YORK NEW HAVEN AND HARTFORD R.R. CO., OPERATED BY THE NEW YORK NEW HAVEN AND HARTFORD R.R. CO., FROM COLCHESTER TO AMSTON, STA. 0+00 TO 105+60, TOWN OF COLCHESTER, SCALE: 1"=100', DATED: JUNE 30, 1915, SHEETS 1 AND 2."

THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.

THE TYPE OF SURVEY PERFORMED IS A PROPERTY SURVEY.

THE BOUNDARY DETERMINATION CATEGORY IS RESURVEY.

THIS SURVEY CONFORMS TO HORIZONTAL ACCURACY CLASS A-2.

THIS MAP WAS PREPARED FOR THE PURPOSE OF BOUNDARY DEFINITION.

"TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON"

THIS MAP IS NOT VALID UNLESS IT BEARS THE LIVE SIGNATURE AND SEAL OF THE UNDERSIGNED SURVEYOR.


DUTTON ASSOCIATES, LLC
LAND SURVEYORS AND CIVIL ENGINEERS
67 EASTERN BOULEVARD
GLASTONBURY, CONNECTICUT 06033
TEL: 860-633-9401 FAX: 860-633-8851
EMAIL: JIM@DUTTONASSOCIATESLLC.COM


STATE OF CONNECTICUT JAMES W. DUTTON No. 70074 LICENSED LAND SURVEYOR

JAMES W. DUTTON, L.S. #70074



PROPERTY SURVEY
MAP 26 LOT 17 OLD AMSTON ROAD
PREPARED FOR
RENEW DEVELOPERS, LLC
COLCHESTER, CONNECTICUT

REVISIONS:

DATE: 05/22/2023
SCALE: 1" = 100'
SHEET 1 OF 1
A-20-070-BND
FILE: 20-070.DWG

# GENERAL NOTES

1. ALL CONSTRUCTION SHALL COMPLY WITH PROJECT DEVELOPER STANDARDS, TOWN OF COLCHESTER STANDARDS, STATE OF CONNECTICUT STANDARDS AND SPECIFICATIONS IN THE ABOVE REFERENCED INCREASING HIERARCHY. IF SPECIFICATIONS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION SHALL APPLY.

2. IF NO PROJECT CONSTRUCTION SPECIFICATION PACKAGE IS PROVIDED BY THE PROJECT DEVELOPER OR THEIR REPRESENTATIVE, THE CONTRACTOR SHALL COMPLY WITH THE MANUFACTURER, TOWN OF COLCHESTER, OR CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AND BE IN ACCORDANCE WITH ALL APPLICABLE OSHA, FEDERAL, STATE AND LOCAL REGULATIONS.

3. THE PROJECT DEVELOPER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY ZONING AND STORMWATER PERMITS REQUIRED BY GOVERNMENT AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN ALL TOWN OF COLCHESTER CONSTRUCTION PERMITS. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK.

4. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS IN THE FIELD AND CONTACT THE PROJECT DEVELOPER IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING/CONSTRUCTION. ANY CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONFIRMED WITH THE PROJECT DEVELOPERS CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.

5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL PRODUCTS, MATERIALS PER PLANS, AND SPECIFICATIONS TO THE PROJECT DEVELOPER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR DELIVERY TO THE SITE. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.

6. SHOULD ANY UNKNOWN OR INCORRECTLY LOCATED EXISTING PIPING OR OTHER UTILITY BE UNCOVERED DURING EXCAVATION, CONSULT THE PROJECT DEVELOPER IMMEDIATELY FOR DIRECTIONS BEFORE PROCEEDING FURTHER WITH WORK IN THIS AREA.

7. DO NOT INTERRUPT EXISTING UTILITIES SERVICING FACILITIES OCCUPIED AND USED BY THE PROJECT DEVELOPER OR OTHERS DURING OCCUPIED HOURS, EXCEPT WHEN SUCH INTERRUPTIONS HAVE BEEN AUTHORIZED IN WRITING BY THE PROJECT DEVELOPER AND THE LOCAL MUNICIPALITY. INTERRUPTIONS SHALL ONLY OCCUR AFTER ACCEPTABLE TEMPORARY SERVICE HAS BEEN PROVIDED.

8. THE CONTRACT LIMIT IS THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE CONTRACT DRAWINGS.

9. THE CONTRACTOR SHALL ABIDE BY ALL OSHA, FEDERAL, STATE AND LOCAL REGULATIONS WHEN OPERATING CRANES, BOOMS, HOISTS, ETC. IN CLOSE PROXIMITY TO OVERHEAD ELECTRIC LINES. IF CONTRACTOR MUST OPERATE EQUIPMENT CLOSE TO ELECTRIC LINES, CONTACT POWER COMPANY TO MAKE ARRANGEMENTS FOR PROPER SAFEGUARDS. ANY UTILITY COMPANY FEES SHALL BE PAID FOR BY THE CONTRACTOR.

10. THE CONTRACTOR SHALL COMPLY WITH OSHA CFR 29 PART 1926 FOR EXCAVATION TRENCHING AND TRENCH PROTECTION REQUIREMENTS.

11. THE ENGINEER IS NOT RESPONSIBLE FOR SITE SAFETY MEASURES TO BE EMPLOYED DURING CONSTRUCTION. THE ENGINEER HAS NO CONTRACTUAL DUTY TO CONTROL THE SAFEST METHODS OR MEANS OF THE WORK, JOB SITE RESPONSIBILITIES, SUPERVISION OF PERSONNEL OR TO SUPERVISE SAFETY AND DO NOT VOLUNTARILY ASSUME ANY SUCH DUTY OR RESPONSIBILITY.

12. THE CONTRACTOR SHALL RESTORE ANY DRAINAGE STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, LANDSCAPED AREAS OR SIGNAGE DISTURBED DURING CONSTRUCTION TO THEIR ORIGINAL CONDITION OR BETTER, AS APPROVED BY THE PROJECT DEVELOPER OR TOWN OF COLCHESTER.

13. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORDS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES) TO THE PROJECT DEVELOPER AT THE END OF CONSTRUCTION.

14. ALTERNATIVE METHODS AND PRODUCTS, OTHER THAN THOSE SPECIFIED, MAY BE USED IF REVIEWED AND APPROVED BY THE PROJECT DEVELOPER, ENGINEER, AND APPROPRIATE REGULATORY AGENCY PRIOR TO INSTALLATION DURING THE BIDDING/CONSTRUCTION PROCESS.

15. NO CONSTRUCTION OR DEMOLITION SHALL BEGIN UNTIL APPROVAL OF THE FINAL PLANS AND PERMITS ARE GRANTED BY ALL GOVERNING AND REGULATORY AGENCIES.

# SITE PLAN NOTES

1. THE SURVEY WAS PROVIDED BY DUTTON ASSOCIATES, LLC, DATED 05/22/23. THE VERTICAL DATUM IS ASSUMED.

2. WETLAND BOUNDARIES WERE FLAGGED AND LOCATED BY ALL-POINTS TECHNOLOGY CORPORATION, IN OCTOBER 2022.

3. A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY DOWN TO EARTH CONSULTING, LLC, DATED APRIL 2023. THE CONTRACTOR SHALL ENSURE THAT ALL RECOMMENDATIONS AND SPECIFICATIONS OUTLINED WITHIN THE GEOTECHNICAL REPORT ARE FOLLOWED THROUGHOUT CONSTRUCTION

4. THE CONTRACTOR SHALL FOLLOW THE SUGGESTED SEQUENCE OF CONSTRUCTION NOTES PROVIDED ON THE EROSION CONTROL PLAN OR SUBMIT AN ALTERNATE PLAN FOR APPROVAL BY THE ENGINEER AND/OR PERMITTING AGENCIES PRIOR TO THE START CONSTRUCTION. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.

5. PROPER CONSTRUCTION PROCEDURES SHALL BE FOLLOWED ON ALL IMPROVEMENTS WITHIN THIS PARCEL SO AS TO PREVENT THE SILTING OF ANY WATERCOURSE OR WETLANDS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. IN ADDITION, THE CONTRACTOR SHALL ADHERE TO THE "SEDIMENTATION & EROSION CONTROL PLAN" CONTAINED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE TO POST ALL BONDS AS REQUIRED BY GOVERNMENT AGENCIES WHICH WOULD GUARANTEE THE PROPER IMPLEMENTATION OF THE PLAN.

6. ALL SITE WORK, MATERIALS OF CONSTRUCTION, AND CONSTRUCTION METHODS FOR EARTHWORK AND STORM DRAINAGE WORK, SHALL CONFORM TO THE SPECIFICATIONS AND DETAILS AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS MANUAL. OTHERWISE THIS WORK SHALL CONFORM TO THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION AND PROJECT GEOTECHNICAL REPORT IF THERE IS NO PROJECT SPECIFICATIONS MANUAL. ALL FILL MATERIAL UNDER STRUCTURES AND PAVED AREAS SHALL BE PER THE PROJECT GEOTECHNICAL REPORT, AND SHALL BE PLACED IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER.

7. ALL DISTURBANCE INCURRED TO PUBLIC, MUNICIPAL, COUNTY, STATE PROPERTY DUE TO CONSTRUCTION SHALL BE RESTORED TO ITS PREVIOUS CONDITION OR BETTER, TO THE SATISFACTION OF THE TOWN OF COLCHESTER AND STATE OF CONNECTICUT.

8. IF IMPACTED OR CONTAMINATED SOIL IS ENCOUNTERED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUSPEND EXCAVATION WORK OF IMPACTED SOIL AND NOTIFY THE PROJECT DEVELOPER AND/OR PROJECT DEVELOPERS ENVIRONMENTAL CONSULTANT PRIOR TO PROCEEDING WITH FURTHER WORK IN THE IMPACTED SOIL LOCATION UNTIL FURTHER INSTRUCTED BY THE PROJECT DEVELOPER AND/OR PROJECT DEVELOPERS ENVIRONMENTAL CONSULTANT.

# UTILITY NOTES

1. CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE TOWN OF COLCHESTER TO SECURE CONSTRUCTION PERMITS AND FOR PAYMENT OF FEES FOR STREET CUTS AND CONNECTIONS TO EXISTING UTILITIES.

2. REFER TO DRAWINGS BY PROJECT DEVELOPER FOR THE ONSITE ELECTRICAL DRAWINGS AND INTERCONNECTION TO EXISTING ELECTRICAL GRID. THESE DETAILS ARE NOT INCLUDED IN THESE PLANS.

3. UTILITY LOCATIONS ARE SHOWN FOR THE CONTRACTOR'S INFORMATION AND SHALL BE VERIFIED WITH THE ELECTRICAL ENGINEER AND THE PROJECT DEVELOPER'S CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.

4. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE PROP. SANITARY SEWERS AND WHERE PROP. STORM PIPING WILL CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE PROJECT DEVELOPER IN THE EVENT OF ANY DISCOVERED OR UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED SANITARY SEWERS, STORM PIPING AND UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.

5. UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY PROVIDER AND GOVERNING AUTHORITY STAFF REVIEW.

6. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY PROVIDERS AND GOVERNING AUTHORITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY PROVIDER.

7. THE CONTRACTOR SHALL ARRANGE FOR AND COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS FOR SERVICE INSTALLATIONS AND CONNECTIONS. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY PROVIDERS AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATIONS MANUAL AND/OR GENERAL CONDITIONS OF THE CONTRACT.

8. ALL PIPES SHALL BE LAID ON STRAIGHT ALIGNMENTS AND EVEN GRADES USING A PIPE LASER OR OTHER ACCURATE METHOD.

9. RELOCATION OF UTILITY PROVIDER FACILITIES, SUCH AS POLES, SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY PROVIDER.

10. THE CONTRACTOR SHALL COMPACT PIPE BACKFILL IN 8" LIFTS ACCORDING TO THE PIPE BEDDING DETAILS. TRENCH BOTTOM SHALL BE STABLE IN HIGH GROUNDWATER AREAS. A PIPE FOUNDATION SHALL BE USED PER THE TRENCH DETAILS AND IN AREAS OF ROCK EXCAVATION.

11. ALL UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION FOR APPROVAL PRIOR TO BACKFILLING, IN ACCORDANCE WITH THE APPROPRIATE UTILITY PROVIDER REQUIREMENTS.

12. A ONE-FOOT MINIMUM VERTICAL CLEARANCE BETWEEN WATER, GAS, ELECTRICAL, AND TELEPHONE LINES AND STORM PIPING SHALL BE PROVIDED. A SIX-INCH MINIMUM CLEARANCE SHALL BE MAINTAINED BETWEEN STORM PIPING AND SANITARY SEWER. A 6-INCH TO 18-INCH VERTICAL CLEARANCE BETWEEN SANITARY SEWER PIPING AND STORM PIPING SHALL REQUIRE CONCRETE ENCASEMENT OF THE SANITARY PIPING.

13. THE CONTRACTOR SHALL RESTORE ANY UTILITY STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, DRAINAGE STRUCTURE, SWALE OR LANDSCAPED AREAS DISTURBED DURING CONSTRUCTION, TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE PROJECT DEVELOPER AND TOWN OF COLCHESTER.

14. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE SYSTEMS HAS BEEN COMPILED FROM A FIELD SURVEY PROVIDED BY THE PROJECT DEVELOPER, AND IS NOT GUARANTEED CORRECT OR COMPLETE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STORM DRAINAGE SYSTEMS. PRIOR TO DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" 72 HOURS BEFORE COMMENCEMENT OF WORK AT "811" AND VERIFY ALL UTILITY AND STORM DRAINAGE SYSTEM LOCATIONS.

15. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY PROVIDER AND MUNICIPAL RECORD MAPS AND/OR FIELD SURVEY, AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STORM DRAINAGE INCLUDING SERVICES. CONTACT "CALL BEFORE YOU DIG" AT 811 72 HOURS PRIOR TO CONSTRUCTION AND VERIFY ALL UNDERGROUND AND OVERHEAD UTILITY AND STORM DRAINAGE LOCATIONS. THE CONTRACTOR SHALL EMPLOY THE USE OF A UTILITY LOCATING COMPANY TO PROVIDE SUBSURFACE UTILITY ENGINEERING CONSISTING OF DESIGNATING UTILITIES AND STORM PIPING ON PRIVATE PROPERTY WITHIN THE CONTRACT LIMIT AND CONSISTING OF DESIGNATING AND LOCATING WHERE PROP. UTILITIES AND STORM PIPING CROSS EXISTING UTILITIES AND STORM PIPING WITHIN THE CONTRACT LIMITS.

16. THE CONTRACTOR SHALL ARRANGE AND COORDINATE WITH UTILITY PROVIDERS FOR WORK TO BE PERFORMED BY UTILITY PROVIDERS. THE CONTRACTOR SHALL PAY ALL UTILITY FEES UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATION MANUAL AND GENERAL CONDITIONS, AND REPAIR PAVEMENTS AS NECESSARY.

17. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE PROJECT DEVELOPER, ENGINEER, AND APPROPRIATE REGULATORY AGENCIES PRIOR TO INSTALLATION.

18. THE CONTRACTOR SHALL MAINTAIN ALL FLOWS AND UTILITY CONNECTIONS TO EXISTING BUILDINGS WITHOUT INTERRUPTION UNLESS/UNTIL AUTHORIZED TO DISCONNECT BY THE PROJECT DEVELOPER, TOWN OF COLCHESTER, UTILITY PROVIDERS AND GOVERNING AUTHORITIES.

## GENERAL LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| PROPERTY LINE | | |
| EASEMENT | | |
| TREE LINE | | |
| WETLAND | | |
| MAJOR CONTOUR | | |
| MINOR CONTOUR | | |
| UNDERGROUND ELECTRIC | E E | E E |
| OVERHEAD ELECTRIC | OH OH | OH OH |
| GAS LINE | G G | GAS |
| WATER LINE | W W | W W |
| BASIN | | |
| FENCE | | X X X |
| LIMIT OF DISTURBANCE | | LOD |
| SILT FENCE | | SF SF |
| FILTER SOCK | | FS FS |

**FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION**


**ReNew DEVELOPERS, LLC**
**103 SOUTH MAIN ST. #734**
**COLCHESTER, CT 06415**
**OFFICE: (860) 303-5726**

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

APT FILING NUMBER: CT716130

DRAWN BY: CSH
DATE: 06/08/23 CHECKED BY: RCB

SHEET TITLE:
**GENERAL NOTES**

SHEET NUMBER:
**GN-1**

STATE OF CONNECTICUT · ROBERT CHARLES BURNS · 21071 · LICENSED PROFESSIONAL ENGINEER

# ENVIRONMENTAL NOTES
# RESOURCE PROTECTION MEASURES

ENVIRONMENTAL NOTES - RESOURCE PROTECTION PROGRAM

THE PROPOSED FUEL CELL ELECTRIC GENERATING FACILITY IS LOCATED IN THE VICINITY OF KNOWN OCCURRENCES OF TWO STATE-LISTED RARE SPECIES: WOOD TURTLE (GLYPTEMYS INSCULPTA) AND SPOTTED TURTLE (CLEMMYS GUTTATA). AS A RESULT, THE FOLLOWING PROTECTIVE MEASURES SHALL BE FOLLOWED TO HELP AVOID INCIDENTAL IMPACT TO THESE RARE TURTLE SPECIES DURING CONSTRUCTION.

WOOD TURTLE AND SPOTTED TURTLE ARE STATE SPECIAL CONCERN SPECIES AFFORDED PROTECTION UNDER THE CONNECTICUT ENDANGERED SPECIES ACT. THESE RARE SPECIES PROTECTION MEASURES ARE SIMILAR TO PROTECTION MEASURES PREVIOUSLY APPROVED BY THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION ("DEEP") WILDLIFE DIVISION ON OTHER SIMILAR PROJECTS.

AS A RESULT OF THE PROJECT'S LOCATION WITHIN A TOWN-DESIGNATED AQUIFER PROTECTION ZONE, THE FOLLOWING BEST MANAGEMENT PRACTICES ("BMPS") SHALL BE IMPLEMENTED BY THE CONTRACTOR TO AVOID UNINTENTIONAL IMPACTS TO POSSIBLE PUBLIC DRINKING WATER RESOURCES DURING CONSTRUCTION ACTIVITIES. BMPS ASSOCIATED WITH THIS RESOURCE WILL BE IMPLEMENTED REGARDLESS OF THE TIME OF YEAR.

THE TOWN-DESIGNATED AQUIFER PROTECTION ZONE PROTECTION MEASURES INCLUDED HEREIN SATISFY TYPICAL BMPS RECOMMENDED BY THE DRINKING WATER SECTION OF THE CONNECTICUT DEPARTMENT OF PUBLIC HEALTH.

IT IS OF THE UTMOST IMPORTANCE THAT THE CONTRACTOR COMPLIES WITH THE REQUIREMENT FOR IMPLEMENTATION OF THESE PROTECTIVE MEASURES AND THE EDUCATION OF ITS EMPLOYEES AND SUBCONTRACTORS PERFORMING WORK ON THE PROJECT SITE. THE RESOURCE PROTECTION MEASURES WITHIN THIS PLAN SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE PLAN DETAILS BELOW.

ALL-POINTS TECHNOLOGY CORPORATION, P.C. ("APT") WILL SERVE AS THE ENVIRONMENTAL MONITOR FOR THIS PROJECT TO ENSURE THAT THESE PROTECTION MEASURES ARE IMPLEMENTED PROPERLY. APT WILL PROVIDE AN EDUCATION SESSION FOR THE CONTRACTOR PROTECTION MEASURES FOR THE TOWN DESIGNATED AQUIFER PROTECTION ZONE AND RARE SPECIES THAT MAY BE ENCOUNTERED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONTACT DEAN GUSTAFSON, SENIOR BIOLOGIST AT APT, AT LEAST 5 BUSINESS DAYS PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITIES TO SCHEDULE A PRE-CONSTRUCTION MEETING. MR. GUSTAFSON CAN BE REACHED BY PHONE AT (860) 552-2033 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.

THIS PROTECTION PROGRAM CONSISTS OF SEVERAL COMPONENTS: EDUCATION OF ALL CONTRACTORS AND SUB-CONTRACTORS PRIOR TO INITIATION OF WORK ON THE SITE; PROTECTIVE MEASURES; PERIODIC INSPECTION OF THE CONSTRUCTION PROJECT; AND REPORTING.

1. CONTRACTOR EDUCATION

a. PRIOR TO WORK ON SITE, THE CONTRACTOR SHALL ATTEND AN EDUCATIONAL SESSION AT THE PRE-CONSTRUCTION MEETING WITH APT. THIS ORIENTATION AND EDUCATIONAL SESSION WILL CONSIST OF AN INTRODUCTORY MEETING WITH APT TO EMPHASIZE THE ENVIRONMENTALLY SENSITIVE NATURE OF THE PROJECT AND RARE SPECIES RESOURCES, AND THE REQUIREMENT TO DILIGENTLY FOLLOW THE PROTECTIVE MEASURES AS DESCRIBED IN SECTIONS BELOW. WORKERS WILL BE PROVIDED INFORMATION REGARDING THE IDENTIFICATION OF THE TWO RARE TURTLES THAT COULD BE ENCOUNTERED. THE MEETING WILL FURTHER EMPHASIZE THE NON- AGGRESSIVE NATURE OF THESE SPECIES, THE ABSENCE OF NEED TO DESTROY SUCH ANIMALS AND THE NEED TO FOLLOW PROTECTIVE MEASURES AS DESCRIBED IN FOLLOWING SECTIONS. THE CONTRACTOR WILL DESIGNATE ONE OF ITS WORKERS AS THE "PROJECT MONITOR", WHO WILL RECEIVE MORE INTENSE TRAINING ON THE IDENTIFICATION AND PROTECTION OF THE RARE TURTLES.

b. THE CONTRACTOR WILL BE PROVIDED WITH PHONE (24 HOUR CONTACT) AND EMAIL FOR TOWN OF COLCHESTER PERSONNEL TO IMMEDIATELY REPORT ANY RELEASES OF SEDIMENT, FUEL OR HAZARDOUS MATERIALS.

c. THE CONTRACTOR'S PROJECT MONITOR WILL BE PROVIDED WITH CELL PHONE AND EMAIL CONTACTS FOR APT PERSONNEL TO IMMEDIATELY REPORT ANY RELEASES FROM THE PROJECT DURING CONSTRUCTION.

d. THE EDUCATION SESSION WILL ALSO FOCUS ON MEANS TO DISCRIMINATE BETWEEN THE SPECIES OF CONCERN AND OTHER NATIVE SPECIES TO AVOID UNNECESSARY "FALSE ALARMS". ENCOUNTERS WITH ANY SPECIES OF TURTLES, SNAKES AND AMPHIBIANS SHALL BE DOCUMENTED.

e. THE CONTRACTOR WILL DESIGNATE A MEMBER OF ITS CREW AS THE PROJECT MONITOR TO BE RESPONSIBLE FOR THE PERIODIC "SWEEPS" FOR TURTLES WITHIN THE CONSTRUCTION ZONE EACH MORNING AND PRIOR TO INITIATION OF ANY GROUND DISTURBANCE WORK. THIS INDIVIDUAL WILL RECEIVE MORE INTENSE TRAINING FROM APT ON THE IDENTIFICATION AND PROTECTION OF THE TWO RARE TURTLE SPECIES IN ORDER TO PERFORM SWEEPS. ANY TURTLES DISCOVERED WOULD BE TRANSLOCATED OUTSIDE THE WORK ZONE IN THE GENERAL DIRECTION THE ANIMAL WAS ORIENTED.

f. THE CONTRACTOR WILL BE PROVIDED WITH CELL PHONE AND EMAIL CONTACTS FOR APT PERSONNEL TO IMMEDIATELY REPORT ANY ENCOUNTERS WITH ANY RARE SPECIES. EDUCATIONAL POSTER MATERIALS WILL BE PROVIDED BY APT AND DISPLAYED ON THE JOB SITE TO MAINTAIN WORKER AWARENESS AS THE PROJECT PROGRESSES.

g. APT WILL ALSO POST CAUTION SIGNS THROUGHOUT THE PROJECT SITE FOR THE DURATION OF THE CONSTRUCTION PROJECT PROVIDING NOTICE OF THE ENVIRONMENTALLY SENSITIVE NATURE OF THE WORK AREA, THE POTENTIAL FOR ENCOUNTERING THE TWO RARE TURTLES AND PRECAUTIONS TO BE TAKEN TO AVOID INJURY TO OR MORTALITY OF THESE ANIMALS.

h. IF ANY RARE TURTLES (OR OTHER SPECIES) ARE ENCOUNTERED, THE CONTRACTOR SHALL IMMEDIATELY CEASE ALL WORK, AVOID ANY DISTURBANCE TO THE SPECIES, AND CONTACT APT.

2. ISOLATION MEASURES & SEDIMENTATION AND EROSION CONTROLS

a. PLASTIC NETTING USED IN A VARIETY OF EROSION CONTROL PRODUCTS (I.E., EROSION CONTROL BLANKETS, FIBER ROLLS [WATTLES], REINFORCED SILT FENCE) HAS BEEN FOUND TO ENTANGLE WILDLIFE, INCLUDING REPTILES, AMPHIBIANS, BIRDS, AND SMALL MAMMALS, BUT PARTICULARLY SNAKES. NO PERMANENT EROSION CONTROL PRODUCTS OR REINFORCED SILT FENCE WILL BE USED ON THE PROJECT. TEMPORARY EROSION CONTROL PRODUCTS WILL USE EITHER EROSION CONTROL BLANKETS AND FIBER ROLLS COMPOSED OF PROCESSED FIBERS MECHANICALLY BOUND TOGETHER TO FORM A CONTINUOUS MATRIX (NETLESS) OR NETTING COMPOSED OF PLANAR WOVEN NATURAL BIODEGRADABLE FIBER TO AVOID/MINIMIZE WILDLIFE ENTANGLEMENT.

b. INSTALLATION OF SEDIMENTATION AND EROSION CONTROLS, REQUIRED FOR EROSION CONTROL COMPLIANCE AND CREATION OF A BARRIER TO POSSIBLE MIGRATING/DISPERSING TURTLES, SHALL BE PERFORMED BY THE CONTRACTOR FOLLOWING CLEARING ACTIVITIES AND PRIOR TO ANY EARTHWORK. THE ENVIRONMENTAL MONITOR WILL INSPECT THE WORK ZONE AREA PRIOR TO AND FOLLOWING EROSION CONTROL BARRIER INSTALLATION TO ENSURE THE AREA IS FREE OF WOOD TURTLES AND SPOTTED TURTLES (ALONG WITH OTHER AMPHIBIANS AND REPTILES THAT MAY BE ENCOUNTERED) AND DOCUMENT BARRIERS HAVE BEEN SATISFACTORILY INSTALLED. THE INTENT OF THE BARRIER IS TO SEGREGATE THE MAJORITY OF THE WORK ZONE AND ISOLATE IT FROM NESTING/FORAGING/MIGRATING/DISPERSING TURTLES, SNAKES AND OTHER HERPETOFAUNA. OFTENTIMES COMPLETE ISOLATION OF A WORK ZONE IS NOT FEASIBLE DUE TO ACCESSIBILITY NEEDS AND LOCATIONS OF STAGING/MATERIAL STORAGE AREAS, ETC. ALTHOUGH THE BARRIERS MAY NOT COMPLETELY ISOLATE THE WORK ZONE, THEY WILL BE POSITIONED TO DEFLECT MIGRATING/DISPERSAL ROUTES AWAY FROM THE WORK ZONE TO MINIMIZE POTENTIAL ENCOUNTERS WITH TURTLES, SNAKES AND OTHER HERPETOFAUNA.

c. EXCLUSIONARY FENCING SHALL BE AT LEAST 20 INCHES TALL AND MUST BE SECURED TO AND REMAIN IN CONTACT WITH THE GROUND AND BE REGULARLY MAINTAINED BY THE CONTRACTOR (AT LEAST BI-WEEKLY AND AFTER MAJOR WEATHER EVENTS) TO SECURE ANY GAPS OR OPENINGS AT GROUND LEVEL THAT MAY LET ANIMAL PASS THROUGH.

d. THE CONTRACTOR IS RESPONSIBLE FOR DAILY INSPECTIONS OF THE SEDIMENTATION AND EROSION CONTROLS FOR TEARS OR BREECHES AND ACCUMULATION LEVELS OF SEDIMENT, PARTICULARLY FOLLOWING STORM EVENTS THAT GENERATE A DISCHARGE, AS DEFINED BY AND IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THE CONTRACTOR SHALL NOTIFY THE APT ENVIRONMENTAL MONITOR WITHIN 24 HOURS OF ANY BREECHES OF THE SEDIMENTATION AND EROSION CONTROLS AND ANY SEDIMENT RELEASES BEYOND THE PERIMETER CONTROLS THAT IMPACT WETLANDS, WATERCOURSES OR WITHIN 100 FEET OF WETLANDS AND WATERCOURSES. THE APT ENVIRONMENTAL MONITOR WILL PROVIDE PERIODIC INSPECTIONS OF THE SEDIMENTATION AND EROSION CONTROLS THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES ONLY AS IT PERTAINS TO THEIR FUNCTION AS ISOLATION MEASURES FOR THE PROTECTION OF RARE SPECIES. SUCH INSPECTIONS WILL GENERALLY OCCUR ONCE PER MONTH. THE FREQUENCY OF MONITORING MAY INCREASE DEPENDING UPON SITE CONDITIONS, LEVEL OF CONSTRUCTION ACTIVITIES IN PROXIMITY TO SENSITIVE RECEPTORS, OR AT THE REQUEST OF THE PERMITTEE. IF THE COMPLIANCE MONITOR IS NOTIFIED BY THE CONTRACTOR OF A SEDIMENT RELEASE, AN INSPECTION WILL BE SCHEDULED SPECIFICALLY TO INVESTIGATE AND EVALUATE POSSIBLE IMPACTS TO WETLAND AND/OR WATERCOURSE RESOURCES.

e. THIRD PARTY MONITORING OF SEDIMENTATION AND EROSION CONTROLS WILL BE PERFORMED BY OTHER PARTIES, AS NECESSARY, UNDER APPLICABLE LOCAL, STATE AND/OR FEDERAL REGULATIONS AND PERMIT CONDITIONS.

f. THE EXTENT OF THE SEDIMENTATION AND EROSION CONTROLS WILL BE AS SHOWN ON THE SITE PLANS. THE CONTRACTOR SHALL HAVE ADDITIONAL SEDIMENTATION AND EROSION CONTROLS STOCKPILED ON SITE SHOULD FIELD OR CONSTRUCTION CONDITIONS WARRANT EXTENDING THE CONTROLS AS DIRECTED BY THE APT ENVIRONMENTAL MONITOR OR OTHER REGULATORY AGENCIES.

g. NO EQUIPMENT, VEHICLES OR CONSTRUCTION MATERIALS SHALL BE STORED OUTSIDE OF THE SEDIMENTATION AND EROSION CONTROLS WITHIN 100 FEET OF WETLANDS OR WATERCOURSES.

h. ALL TEMPORARY SEDIMENTATION AND EROSION CONTROLS SHALL BE REMOVED WITHIN 30 DAYS OF COMPLETION OF WORK AND PERMANENT STABILIZATION OF SITE SOILS SO THAT REPTILE AND AMPHIBIAN MOVEMENT BETWEEN UPLANDS AND WETLANDS IS NOT RESTRICTED.

3. PETROLEUM MATERIALS STORAGE AND SPILL PREVENTION

a. CERTAIN PRECAUTIONS ARE NECESSARY TO STORE PETROLEUM MATERIALS, REFUEL AND CONTAIN AND PROPERLY CLEAN UP ANY INADVERTENT FUEL OR PETROLEUM (I.E., OIL, HYDRAULIC FLUID, ETC.) SPILL TO AVOID POSSIBLE IMPACT TO NEARBY RESOURCES.

b. A SPILL CONTAINMENT KIT CONSISTING OF A SUFFICIENT SUPPLY OF ABSORBENT PADS AND ABSORBENT MATERIAL WILL BE MAINTAINED BY THE CONTRACTOR AT THE CONSTRUCTION SITE THROUGHOUT THE DURATION OF THE PROJECT. IN ADDITION, A WASTE DRUM WILL BE KEPT ON SITE TO CONTAIN ANY USED ABSORBENT PADS/MATERIAL FOR PROPER AND TIMELY DISPOSAL OFF SITE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL LAWS.

c. SERVICING OF MACHINERY SHALL NOT BE PERFORMED ON THE PROJECT SITE AND SHALL ONLY BE COMPLETED OUTSIDE OF THE AQUIFER PROTECTION ZONE.

d. THE FOLLOWING PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING RESTRICTIONS AND SPILL RESPONSE PROCEDURES WILL BE ADHERED TO BY THE CONTRACTOR.

i. PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING

1. REFUELING OF VEHICLES OR MACHINERY SHALL OCCUR A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES AND SHALL TAKE PLACE ON AN IMPERVIOUS PAD WITH SECONDARY CONTAINMENT DESIGNED TO CONTAIN FUELS.
2. ANY FUEL OR HAZARDOUS MATERIALS THAT MUST BE KEPT ON SITE SHALL BE STORED ON AN IMPERVIOUS SURFACE UTILIZING SECONDARY CONTAINMENT A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES.
3. THE CONTRACTOR SHALL INSPECT ALL EQUIPMENT AT THE BEGINNING AND END OF EACH DAY FOR ANY FUEL OR HYDRAULIC LEAKS AND IF DISCOVERED SHALL TAKE IMMEDIATE STEPS TO MAKE REPAIRS AND CLEAN UP ANY DISCHARGES AS DETAILED IN THE FOLLOWING SECTIONS.

ii. INITIAL SPILL RESPONSE PROCEDURES

1. STOP OPERATIONS AND SHUT OFF EQUIPMENT.
2. REMOVE ANY SOURCES OF SPARK OR FLAME.
3. CONTAIN THE SOURCE OF THE SPILL.
4. DETERMINE THE APPROXIMATE VOLUME OF THE SPILL.
5. IDENTIFY THE LOCATION OF NATURAL FLOW PATHS TO PREVENT THE RELEASE OF THE SPILL TO SENSITIVE NEARBY WATERWAYS OR WETLANDS.
6. ENSURE THAT FELLOW WORKERS ARE NOTIFIED OF THE SPILL.

iii. SPILL CLEAN UP & CONTAINMENT

1. OBTAIN SPILL RESPONSE MATERIALS FROM THE ON-SITE SPILL RESPONSE KIT. PLACE ABSORBENT MATERIALS DIRECTLY ON THE RELEASE AREA.
2. LIMIT THE SPREAD OF THE SPILL BY PLACING ABSORBENT MATERIALS AROUND THE PERIMETER OF THE SPILL.
3. ISOLATE AND ELIMINATE THE SPILL SOURCE.
4. CONTACT THE APPROPRIATE LOCAL, STATE AND/OR FEDERAL AGENCIES, AS NECESSARY.
5. CONTACT A DISPOSAL COMPANY TO PROPERLY DISPOSE OF CONTAMINATED MATERIALS IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

iv. REPORTING

1. COMPLETE AN INCIDENT REPORT.
2. SUBMIT A COMPLETED INCIDENT REPORT TO THE CONNECTICUT SITING COUNCIL, AND OTHER APPLICABLE LOCAL, STATE, AND FEDERAL OFFICIALS.

4. HERBICIDE AND PESTICIDE RESTRICTIONS

a. THE USE OF HERBICIDES AND PESTICIDES AT THE FACILITY SHALL BE AVOIDED WHEN POSSIBLE. IN THE EVENT HERBICIDES AND/OR PESTICIDES ARE REQUIRED AT THE FACILITY, THEIR USE WILL BE IN ACCORDANCE WITH CURRENT INTEGRATED PEST MANAGEMENT ("IPM") PRINCIPLES WITH PARTICULAR ATTENTION TO MINIMIZE APPLICATIONS WITHIN 100 FEET OF WETLAND OR WATERCOURSE RESOURCES. NO APPLICATIONS OF HERBICIDES OR PESTICIDES ARE ALLOWED WITHIN ACTUAL WETLAND OR WATERCOURSE RESOURCES.

5. TURTLE PROTECTION MEASURES - CONSTRUCTION PHASE

a. PRIOR TO CONSTRUCTION AND FOLLOWING INSTALLATION OF ISOLATION BARRIERS, THE CONSTRUCTION AREA WILL BE SWEPT BY APT AND ANY TURTLES OCCURRING WITHIN THE WORK AREA WILL BE RELOCATED TO SUITABLE HABITAT OUTSIDE OF THE ISOLATION BARRIERS.

b. PRIOR TO THE START OF CONSTRUCTION EACH DAY, THE CONTRACTOR SHALL SEARCH THE ENTIRE WORK AREA FOR TURTLES.

c. IF A TURTLE IS FOUND DURING THE ACTIVE PERIOD, IT SHALL BE IMMEDIATELY MOVED, UNHARMED, BY BEING CAREFULLY GRASPED IN BOTH HANDS, ONE ON EACH SIDE OF THE SHELL, BETWEEN THE TURTLE'S FORELIMBS AND THE HIND LIMBS, AND PLACED JUST OUTSIDE OF THE ISOLATION BARRIER IN THE SAME APPROXIMATE DIRECTION IT WAS HEADING. WOOD TURTLES AND SPOTTED TURTLES ARE PROTECTED BY LAW AND NO TURTLES SHOULD BE RELOCATED FROM THE PROPERTY.

d. SPECIAL CARE SHALL BE TAKEN BY THE CONTRACTOR DURING EARLY MORNING AND EVENING HOURS SO THAT POSSIBLE BASKING OR FORAGING TURTLES ARE NOT HARMED BY CONSTRUCTION ACTIVITIES.

e. THE CONTRACTOR SHALL BE PARTICULARLY DILIGENT DURING THE MONTHS OF MAY AND JUNE WHEN TURTLES ARE ACTIVELY SELECTING NESTING SITES WHICH RESULTS IN AN INCREASE IN TURTLE MOVEMENT ACTIVITY.

f. NO HEAVY MACHINERY OR VEHICLES MAY BE PARKED IN ANY TURTLE HABITAT.

g. AVOID AND LIMIT ANY EQUIPMENT USE WITHIN 100 FEET OF WETLANDS AND NO HEAVY MACHINERY OR VEHICLES MAY BE PARKED IN ANY TURTLE HABITAT OR WITHIN 100 FEET OF WETLANDS.

h. SPECIAL PRECAUTIONS MUST BE TAKEN TO AVOID DEGRADATION OF WETLAND HABITATS, PARTICULARLY ALONG ANY PERENNIAL STREAM RIPARIAN CORRIDORS.

6. REPORTING

a. A COMPLIANCE MONITORING REPORT (BRIEF NARRATIVE AND APPLICABLE PHOTOS) DOCUMENTING EACH APT INSPECTION WILL BE SUBMITTED BY APT TO THE CONTRACTOR AND PERMITTEE FOR COMPLIANCE VERIFICATION. THESE REPORTS ARE NOT TO BE USED TO DOCUMENT COMPLIANCE WITH ANY OTHER PERMIT AGENCY APPROVAL CONDITIONS (I.E., DEEP STORMWATER PERMIT MONITORING, ETC.). ANY NON-COMPLIANCE OBSERVATIONS OF EROSION CONTROL MEASURES OR EVIDENCE OF EROSION OR SEDIMENT RELEASE WILL BE IMMEDIATELY REPORTED TO THE PERMITTEE AND ITS CONTRACTOR AND INCLUDED IN THE REPORTS.

b. ANY OBSERVATIONS OF RARE SPECIES OR CORRECTIVE ACTIONS WILL BE INCLUDED IN THE REPORTS.

c. FOLLOWING COMPLETION OF THE CONSTRUCTION PROJECT, APT WILL PROVIDE A FINAL COMPLIANCE MONITORING REPORT TO THE PERMITTEE DOCUMENTING IMPLEMENTATION OF THIS RESOURCE PROTECTION PROGRAM, MONITORING AND ANY SPECIES OBSERVATIONS. THE PERMITTEE SHALL PROVIDE A COPY OF THE FINAL COMPLIANCE MONITORING REPORT TO THE CONNECTICUT SITING COUNCIL AND TOWN OF COLCHESTER FOR COMPLIANCE VERIFICATION.

d. ANY OBSERVATIONS OF RARE SPECIES WILL BE REPORTED TO DEEP BY APT ON THE APPROPRIATE SPECIAL ANIMAL REPORTING FORM, WITH PHOTO-DOCUMENTATION (IF POSSIBLE) AND SPECIFIC INFORMATION ON THE LOCATION AND DISPOSITION OF THE ANIMAL.

**FOR PERMITTING PURPOSES ONLY.**
**NOT FOR CONSTRUCTION**


**ReNew**
**DEVELOPERS, LLC**

**103 SOUTH MAIN ST. #734**
**COLCHESTER, CT 06415**
**OFFICE: (860) 303-5726**

ALL-POINTS TECHNOLOGY CORPORATION

567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

APT FILING NUMBER: CT716130

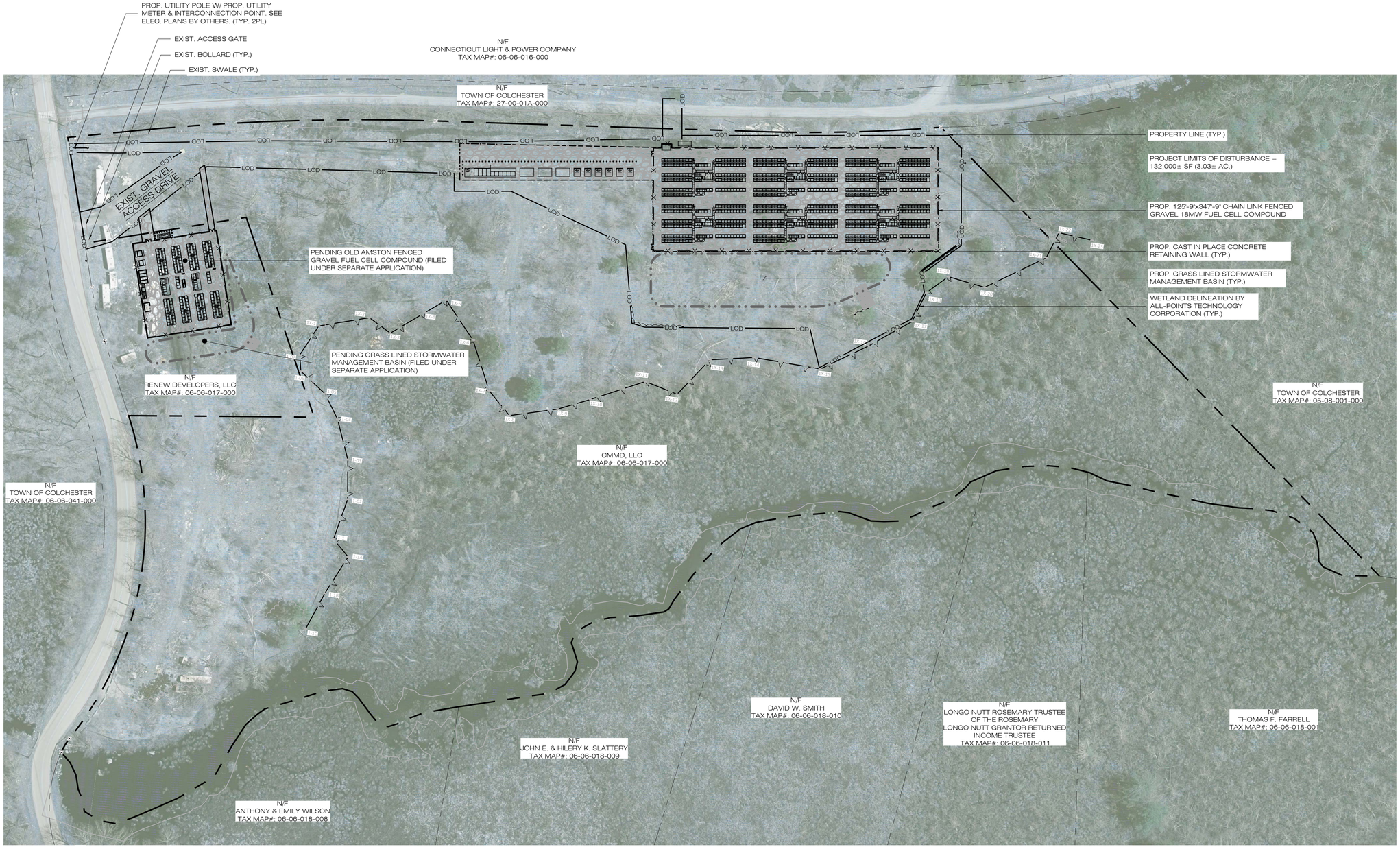
DRAWN BY: CSH

DATE: 06/08/23 CHECKED BY: RCB

SHEET TITLE:
**ENVIRONMENTAL NOTES RESOURCE PROTECTION MEASURES**

SHEET NUMBER:
**GN-2**

STATE OF CONNECTICUT · ROBERT C. BURNS · 20071 · LICENSED PROFESSIONAL ENGINEER




1 OP-1 **OVERALL LOCUS MAP**
SCALE : 1" = 60'-0"

60 0 30 60 120
( IN FEET ) 1 inch = 60 ft.

**FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION**


**ReNew DEVELOPERS, LLC**
**103 SOUTH MAIN ST. #734**
**COLCHESTER, CT 06415**
**OFFICE: (860) 303-5726**

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

APT FILING NUMBER: CT716130

DRAWN BY: CSH

DATE: 06/08/23 CHECKED BY: RCB

SHEET TITLE:
**OVERALL LOCUS MAP**

SHEET NUMBER:
**OP-1**

STATE OF CONNECTICUT · ROBERT C. BURNS · 20071 · LICENSED PROFESSIONAL ENGINEER

# EROSION CONTROL NOTES

EROSION AND SEDIMENT CONTROL PLAN NOTES

1. THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE TOWN OF COLCHESTER, PERMITTEE, AND/OR SWPCP MONITOR. ALL PERIMETER SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.

2. THESE DRAWINGS ARE ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL MEASURES FOR THIS SITE. SEE CONSTRUCTION SEQUENCE FOR ADDITIONAL INFORMATION. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN ARE SHOWN AS REQUIRED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EROSION CONTROL MEASURES ARE CONFIGURED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION OF SOILS AND PREVENT THE TRANSPORT OF SEDIMENTS AND OTHER POLLUTANTS TO STORM DRAINAGE SYSTEMS AND/OR WATERCOURSES. ACTUAL SITE CONDITIONS OR SEASONAL AND CLIMATIC CONDITIONS MAY WARRANT ADDITIONAL CONTROLS OR CONFIGURATIONS, AS REQUIRED, AND AS DIRECTED BY THE PERMITTEE AND/OR SWPCP MONITOR. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.

3. A BOND OR LETTER OF CREDIT MAY BE REQUIRED TO BE POSTED WITH THE GOVERNING AUTHORITY FOR THE EROSION CONTROL INSTALLATION AND MAINTENANCE.

4. THE CONTRACTOR SHALL APPLY THE MINIMUM EROSION & SEDIMENT CONTROL MEASURES SHOWN ON THE PLAN IN CONJUNCTION WITH CONSTRUCTION SEQUENCING, SUCH THAT ALL ACTIVE WORK ZONES ARE PROTECTED. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, SITE ENGINEER, MUNICIPAL OFFICIALS, OR ANY GOVERNING AGENCY. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED BY THE CONTRACTOR.

5. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CONSTRUCTION SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR INSTALLED SEDIMENTATION AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS WEEKLY AND WITHIN 24 HOURS OF A STORM WITH A RAINFALL AMOUNT OF 0.25 INCHES OR GREATER TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS AS NECESSARY IN A TIMELY MANOR.

6. THE CONTRACTOR SHALL KEEP A SUPPLY OF EROSION CONTROL MATERIAL (SILT FENCE, COMPOST FILTER SOCK, EROSION CONTROL BLANKET, ETC.) ON-SITE FOR PERIODIC MAINTENANCE AND EMERGENCY REPAIRS.

7. ALL FILL MATERIAL PLACED ADJACENT TO ANY WETLAND AREA SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN), SHALL BE PLACED IN MAXIMUM ONE FOOT LIFTS, AND SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS.

8. PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING, ORANGE SAFETY FENCE, CONSTRUCTION TAPE, OR EQUIVALENT FENCING/TAPE. ANY LIMB TRIMMING SHOULD BE DONE AFTER CONSULTATION WITH AN ARBORIST AND BEFORE CONSTRUCTION BEGINS IN THAT AREA; FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION.

9. CONSTRUCTION ENTRANCES (ANTI-TRACKING PADS) SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR CONSTRUCTION ACTIVITY AND SHALL BE MAINTAINED THROUGHOUT THE DURATION OF ALL CONSTRUCTION IF REQUIRED. THE LOCATION OF THE TRACKING PADS MAY CHANGE AS VARIOUS PHASES OF CONSTRUCTION ARE COMPLETED. CONTRACTOR SHALL ENSURE THAT ALL VEHICLES EXITING THE SITE ARE PASSING OVER THE ANTI-TRACKING PADS PRIOR TO EXITING.

10. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SEDIMENT BARRIER UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE BARRIER.

11. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS. ALL SLOPES SHALL BE SEEDED AND BANKS WILL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.

12. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE CONFORMING TO THE GUIDELINES WITHIN THE APPROVED LIMIT OF DISTURBANCE IF REQUIRED. DISCHARGE TO STORM DRAINS OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR AND APPROVED BY THE PERMITTEE OR MUNICIPALITY.

13. THE CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AND SHALL NOT ALLOW THE ACCUMULATION OF RUBBISH OR CONSTRUCTION DEBRIS ON THE SITE. PROPER SANITARY DEVICES SHALL BE MAINTAINED ON-SITE AT ALL TIMES AND SECURED APPROPRIATELY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID THE SPILLAGE OF FUEL OR OTHER POLLUTANTS ON THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL APPLICABLE POLICIES AND REGULATIONS RELATED TO SPILL PREVENTION AND RESPONSE/CONTAINMENT.

14. MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (2 WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE. IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.

15. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. FOR DUST CONTROL, PERIODICALLY MOISTEN EXPOSED SOIL SURFACES WITH WATER ON UNPAVED TRAVELWAYS TO KEEP THE TRAVELWAYS DAMP. CALCIUM CHLORIDE MAY ALSO BE APPLIED TO ACCESS ROADS. DUMP TRUCK LOADS EXITING THE SITE SHALL BE COVERED.

16. VEGETATIVE ESTABLISHMENT SHALL OCCUR ON ALL DISTURBED SOIL, UNLESS THE AREA IS UNDER ACTIVE CONSTRUCTION, IT IS COVERED IN STONE OR SCHEDULED FOR PAVING WITHIN 30 DAYS. TEMPORARY SEEDING OR NON-LIVING SOIL PROTECTION OF ALL EXPOSED SOILS AND SLOPES SHALL BE INITIATED WITHIN THE FIRST 7 DAYS OF SUSPENDING WORK IN AREAS TO BE LEFT LONGER THAN 30 DAYS.

17. MAINTAIN ALL PERMANENT AND TEMPORARY SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP CONCRETE PADS, CLEAN THE STORMWATER MANAGEMENT SYSTEMS AND REMOVE ALL TEMPORARY SEDIMENT CONTROLS ONCE THE SITE IS FULLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM PERMITTEE OR THE MUNICIPALITY.

18. THE SITE WAS DESIGNED TO COMPLY WITH FEDERAL, STATE, AND, IF APPLICABLE, LOCAL STANDARDS, PLUS CURRENT ACCEPTED PRACTICES FOR THE INDUSTRY. ADDITIONAL CONTROLS AND ACTIVITIES MAY BE DEEMED NECESSARY BY THE SWPCP MONITOR DURING CONSTRUCTION AS A RESULT OF UNFORESEEN CONDITIONS AND/OR MEANS AND METHODS. SUCH ITEMS MAY INCLUDE, BUT ARE NOT LIMITED TO: ADDITIONAL FOREBAYS, BASINS, OR UPSTREAM STRUCTURAL CONTROLS, THE USE OF FLOCCULANTS OF FLOCK LOGS TO DECREASE SEDIMENT, DISCHARGE MANAGEMENT SUCH AS ADDITIONAL ARMORING AND FILTERING MEASURES (I.E. STRAW BALES, WATTLES, ETC.), AND HYDROSEEDING WITH RAPIDLY GERMINATING SEED.

19. SEEDING MIXTURES SHALL BE NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX & NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES, OR APPROVED EQUAL BY OWNER. SEE 4/DN-2 FOR SEE MIXTURES.

CONSTRUCTION OPERATION AND MAINTENANCE PLAN - BY CONTRACTOR

| E&S MEASURE | INSPECTION SCHEDULE | MAINTENANCE REQUIRED |
|---|---|---|
| CONSTRUCTION ENTRANCE | DAILY | PLACE ADDITIONAL STONE, EXTEND THE LENGTH OR REMOVE AND REPLACE THE STONE. CLEAN PAVED SURFACES OF TRACKED SEDIMENT. |
| COMPOST FILTER SOCK | WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25" | REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED. |
| SILT FENCE | WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25" | REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE FENCE. |
| TOPSOIL/BORROW STOCKPILES | DAILY | REPAIR/REPLACE SEDIMENT BARRIERS AS NECESSARY. |
| TEMPORARY SOIL PROTECTION | WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25" | REPAIR ERODED OR BARE AREAS IMMEDIATELY. RESEED AND MULCH. |

SEDIMENT & EROSION CONTROL NARRATIVE

1. THE PROJECT INVOLVES THE CONSTRUCTION OF A GROUND MOUNTED FUEL CELL FACILITY WITH ASSOCIATED EQUIPMENT AND STORMWATER MANAGEMENT FACILITIES.

THE PROPOSED PROJECT INVOLVES THE FOLLOWING CONSTRUCTION:

A. CONSTRUCTION OF A 125'-9"x347'-9" GRAVEL FUEL CELL COMPOUND AND ASSOCIATED EQUIPMENT.
B. THE STABILIZATION OF DISTURBED AREAS WITH PERMANENT VEGETATIVE TREATMENTS.

2. FOR THIS PROJECT, THERE IS APPROXIMATELY 3.03± ACRES OF THE SITE BEING DISTURBED.

3. THE PROJECT SITE, AS MAPPED IN THE SOIL SURVEY OF STATE OF CONNECTICUT (NRCS, VERSION 18, DEC 6, 2018), CONTAINS TYPE 38E & 38C (HYDROLOGIC SOIL GROUP A), 306 & 61B (HYDROLOGIC SOIL GROUP B), 701B (HYDROLOGIC SOIL GROUP C) & 17 & 18 (HYDROLOGIC SOIL GROUP B/D) SOILS.

4. A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY DOWN TO EARTH CONSULTING, LLC, DATED APRIL 2023. THE CONTRACTOR SHALL ENSURE THAT ALL RECOMMENDATIONS AND SPECIFICATIONS OUTLINED WITHIN THE GEOTECHNICAL REPORT ARE FOLLOWED THROUGHOUT CONSTRUCTION.

5. IT IS ANTICIPATED THAT CONSTRUCTION WILL BE COMPLETED IN APPROXIMATELY 3-4 MONTHS.

6. REFER TO THE CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES FOR INFORMATION REGARDING SEQUENCING OF MAJOR OPERATIONS IN THE ON-SITE CONSTRUCTION PHASES.

7. STORMWATER MANAGEMENT DESIGN CRITERIA UTILIZES THE APPLICABLE SECTIONS OF THE 2004 CONNECTICUT STORMWATER QUALITY MANUAL AND THE TOWN OF COLCHESTER STANDARDS, TO THE EXTENT POSSIBLE AND PRACTICABLE FOR THIS PROJECT ON THIS SITE. EROSION AND SEDIMENTATION MEASURES ARE BASED UPON ENGINEERING PRACTICE, JUDGEMENT AND THE APPLICABLE SECTIONS OF THE CONNECTICUT EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, LATEST EDITION.

8. DETAILS FOR THE TYPICAL STORMWATER MANAGEMENT AND EROSION AND SEDIMENTATION MEASURES ARE SHOWN ON THE PLAN SHEETS OR PROVIDED AS SEPARATE SUPPORT DOCUMENTATION FOR REVIEW IN THIS PLAN.

9. CONSERVATION PRACTICES TO BE USED DURING CONSTRUCTION:
   A. STAGED CONSTRUCTION;
   B. MINIMIZE THE DISTURBED AREAS TO THE EXTENT PRACTICABLE DURING CONSTRUCTION;
   C. STABILIZE DISTURBED AREAS WITH TEMPORARY OR PERMANENT MEASURES AS SOON AS POSSIBLE, BUT NO LATER THAN 7-DAYS FOLLOWING DISTURBANCE;
   D. MINIMIZE IMPERVIOUS AREAS;
   E. UTILIZE APPROPRIATE CONSTRUCTION EROSION AND SEDIMENTATION MEASURES.

9. THE FOLLOWING SEPARATE DOCUMENTS ARE TO BE CONSIDERED A PART OF THE EROSION AND SEDIMENTATION PLAN:
   A. STORMWATER MANAGEMENT REPORT DATED JUNE 2023.

SUGGESTED CONSTRUCTION SEQUENCE

THE FOLLOWING SUGGESTED SEQUENCE OF CONSTRUCTION ACTIVITIES IS PROJECTED BASED UPON ENGINEERING JUDGEMENT AND BEST MANAGEMENT PRACTICES. THE CONTRACTOR MAY ELECT TO ALTER THE SEQUENCING TO BEST MEET THE CONSTRUCTION SCHEDULE, THE EXISTING SITE ACTIVITIES AND WEATHER CONDITIONS. SHOULD THE CONTRACTOR ALTER THE CONSTRUCTION SEQUENCE OR ANY EROSION AND SEDIMENTATION CONTROL MEASURES THEY SHALL MODIFY THE STORMWATER POLLUTION CONTROL PLAN ("SWPCP") AS REQUIRED BY THE GENERAL PERMIT. MAJOR CHANGES IN SEQUENCING AND/OR METHODS MAY REQUIRE REGULATORY APPROVAL PRIOR TO IMPLEMENTATION.

1. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING. PHYSICALLY FLAG THE LIMITS OF DISTURBANCE IN THE FIELD AS NECESSARY TO FACILITATE THE PRE-CONSTRUCTION MEETING.

2. CONDUCT A PRE-CONSTRUCTION MEETING TO DISCUSS THE PROPOSED WORK AND EROSION AND SEDIMENTATION CONTROL MEASURES. THE MEETING SHOULD BE ATTENDED BY THE OWNER, THE OWNERS REPRESENTATIVE(S), THE GENERAL CONTRACTOR, DESIGNATED SUB-CONTRACTORS AND THE PERSON, OR PERSONS, RESPONSIBLE FOR THE IMPLEMENTATION, OPERATION, MONITORING AND MAINTENANCE OF THE EROSION AND SEDIMENTATION MEASURES. THE CONSTRUCTION PROCEDURES FOR THE ENTIRE PROJECT SHALL BE REVIEWED AT THIS MEETING.

3. NOTIFY CALL BEFORE YOU DIG AT 811, AS REQUIRED, PRIOR TO THE START OF CONSTRUCTION.

4. REMOVE EXISTING IMPEDIMENTS AS NECESSARY TO INSTALL THE REQUIRED CONSTRUCTION ENTRANCE/S.

5. INSTALL PERIMETER EROSION CONTROL.

6. INSTALL STORMWATER MANAGEMENT BASIN.

7. TEMPORARILY SEED DISTURBED AREAS NOT UNDER CONSTRUCTION.

8. INSTALL UTILITY CONDUITS.

9. INSTALL GRAVEL EQUIPMENT COMPOUND & ACCESS DRIVE.

10. INSTALL CONCRETE EQUIPMENT PADS.

11. INSTALL FUEL CELLS & ASSOCIATED EQUIPMENT. COMPLETE UTILITY INSTALLATION.

12. AFTER SUBSTANTIAL COMPLETION OF THE INSTALLATION OF THE FUEL CELL COMPLETE REMAINING SITE WORK, INCLUDING CHAIN LINK FENCE, ANY REQUIRED LANDSCAPE SCREENING, AND STABILIZE ALL DISTURBED AREAS.

13. FINE GRADE, RAKE, SEED AND MULCH ALL REMAINING DISTURBED AREAS.

14. AFTER THE SITE IS STABILIZED AND WITH THE APPROVAL OF THE PERMITTEE AND TOWN OF COLCHESTER AGENT, REMOVE PERIMETER EROSION AND SEDIMENTATION CONTROLS.

**FOR PERMITTING PURPOSES ONLY.**
**NOT FOR CONSTRUCTION**


**ReNew**
**DEVELOPERS, LLC**

**103 SOUTH MAIN ST. #734**
**COLCHESTER, CT 06415**
**OFFICE: (860) 303-5726**

ALL-POINTS TECHNOLOGY CORPORATION

567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

APT FILING NUMBER: CT716130

DRAWN BY: CSH

DATE: 06/08/23 CHECKED BY: RCB

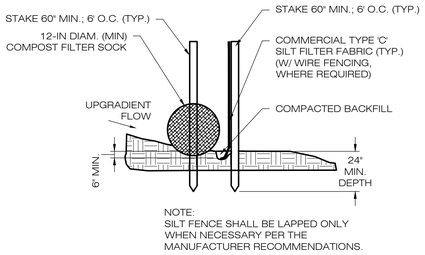
SHEET TITLE:

**SEDIMENTATION & EROSION CONTROL NOTES**

SHEET NUMBER:

**EC-1**

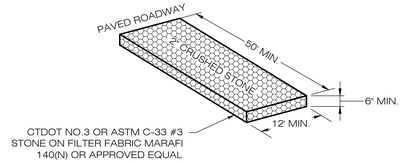
STATE OF CONNECTICUT · ROBERT C. BURNS · 20071 · LICENSED PROFESSIONAL ENGINEER




NOTE:
SILT FENCE SHALL BE LAPPED ONLY WHEN NECESSARY PER THE MANUFACTURER RECOMMENDATIONS.

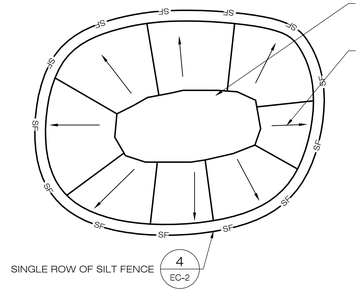
## SILT FENCE W/ COMPOST FILTER SOCK DETAIL

1 / EC-2 **SCALE : N.T.S.**




## CONSTRUCTION ENTRANCE DETAIL

2 / EC-2 **SCALE : N.T.S.**




NOTES:
1. ALL EXISTING EXCAVATED MATERIAL THAT IS NOT TO BE REUSED IN THE WORK IS TO BE IMMEDIATELY REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.

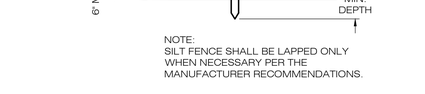
2. SOIL/AGGREGATE STOCKPILE SITES TO BE WHERE SHOWN ON THE DRAWINGS.

3. RESTORE STOCKPILE SITES TO PRE-EXISTING PROJECT CONDITION AND RESEED AS REQUIRED.

4. STOCKPILE HEIGHTS MUST NOT EXCEED 35'. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

## MATERIALS STOCKPILE DETAIL

3 / EC-2 **SCALE : N.T.S.**




NOTE:
SILT FENCE SHALL BE LAPPED ONLY WHEN NECESSARY PER THE MANUFACTURER RECOMMENDATIONS.

## SILT FENCE DETAIL

4 / EC-2 **SCALE : N.T.S.**

**FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION**


**ReNew DEVELOPERS, LLC**
**103 SOUTH MAIN ST. #734**
**COLCHESTER, CT 06415**
**OFFICE: (860) 303-5726**

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

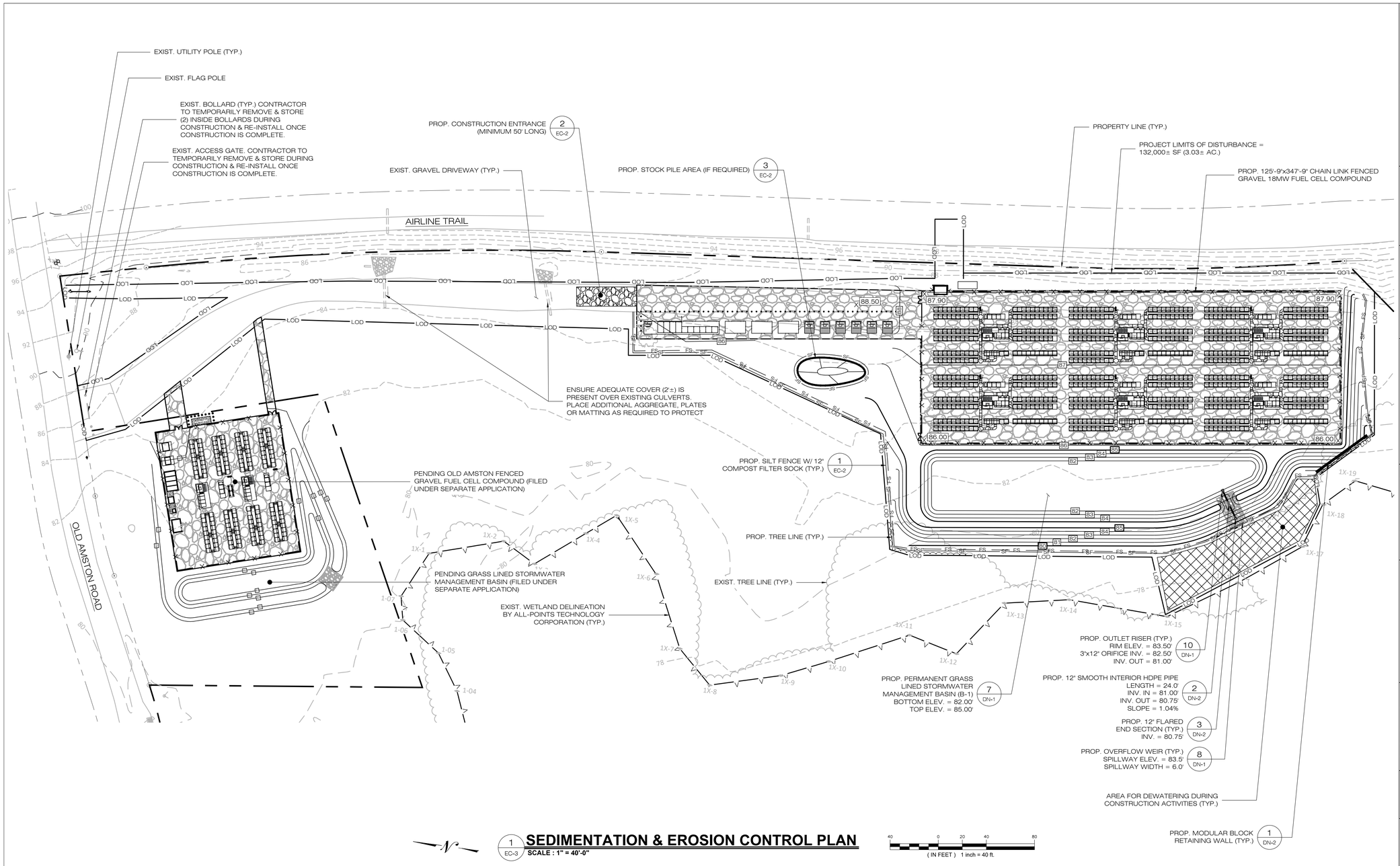
APT FILING NUMBER: CT716130

DRAWN BY: CSH
DATE: 06/08/23 CHECKED BY: RCB

SHEET TITLE:
**SEDIMENTATION & EROSION CONTROL DETAILS**

SHEET NUMBER:
**EC-2**

STATE OF CONNECTICUT · ROBERT CHARLES BURNS · 20071 · LICENSED PROFESSIONAL ENGINEER




1 EC-3 **SEDIMENTATION & EROSION CONTROL PLAN**
**SCALE : 1" = 40'-0"**

40 0 20 40 80
( IN FEET ) 1 inch = 40 ft.

GRADING & DRAINAGE NOTES:
1. THE SURVEY WAS PROVIDED BY DUTTON ASSOCIATES, LLC, DATED 05/22/23. THE VERTICAL DATUM IS ASSUMED.
2. REFER TO GEOTECHNICAL ENGINEERING REPORT, PREPARED BY DOWN TO EARTH CONSULTING, LLC, DATED APRIL 2023, FOR ALL SOIL & SITE PREPARATION RECOMMENDATIONS.

**FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION**


**ReNew DEVELOPERS, LLC**
103 SOUTH MAIN ST. #734
COLCHESTER, CT 06415
OFFICE: (860) 303-5726

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

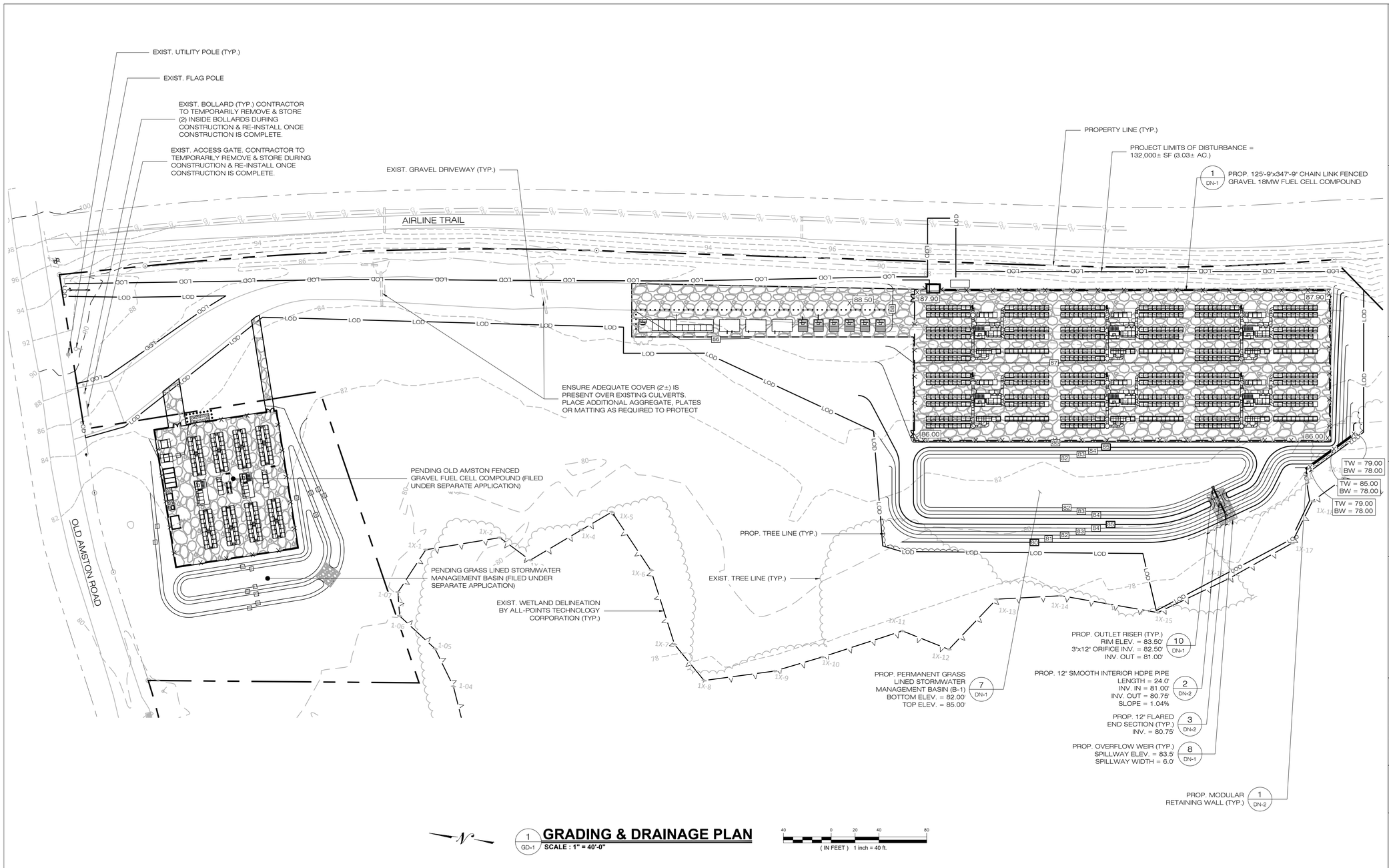
APT FILING NUMBER: CT716130

DRAWN BY: CSH
DATE: 06/08/23
CHECKED BY: RCB

**SHEET TITLE:**
**SEDIMENTATION & EROSION CONTROL PLAN**

**SHEET NUMBER:**
**EC-3**

STATE OF CONNECTICUT · ROBERT CHARLES BURNS · 20071 · LICENSED PROFESSIONAL ENGINEER




1 GD-1 **GRADING & DRAINAGE PLAN**
**SCALE : 1" = 40'-0"**

40 0 20 40 80
( IN FEET ) 1 inch = 40 ft.

GRADING & DRAINAGE NOTES:
1. THE SURVEY WAS PROVIDED BY DUTTON ASSOCIATES, LLC, DATED 05/22/23. THE VERTICAL DATUM IS ASSUMED.
2. REFER TO GEOTECHNICAL ENGINEERING REPORT, PREPARED BY DOWN TO EARTH CONSULTING, LLC, DATED APRIL 2023, FOR ALL SOIL & SITE PREPARATION RECOMMENDATIONS.

**FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION**


**ReNew DEVELOPERS, LLC**
103 SOUTH MAIN ST. #734
COLCHESTER, CT 06415
OFFICE: (860) 303-5726

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

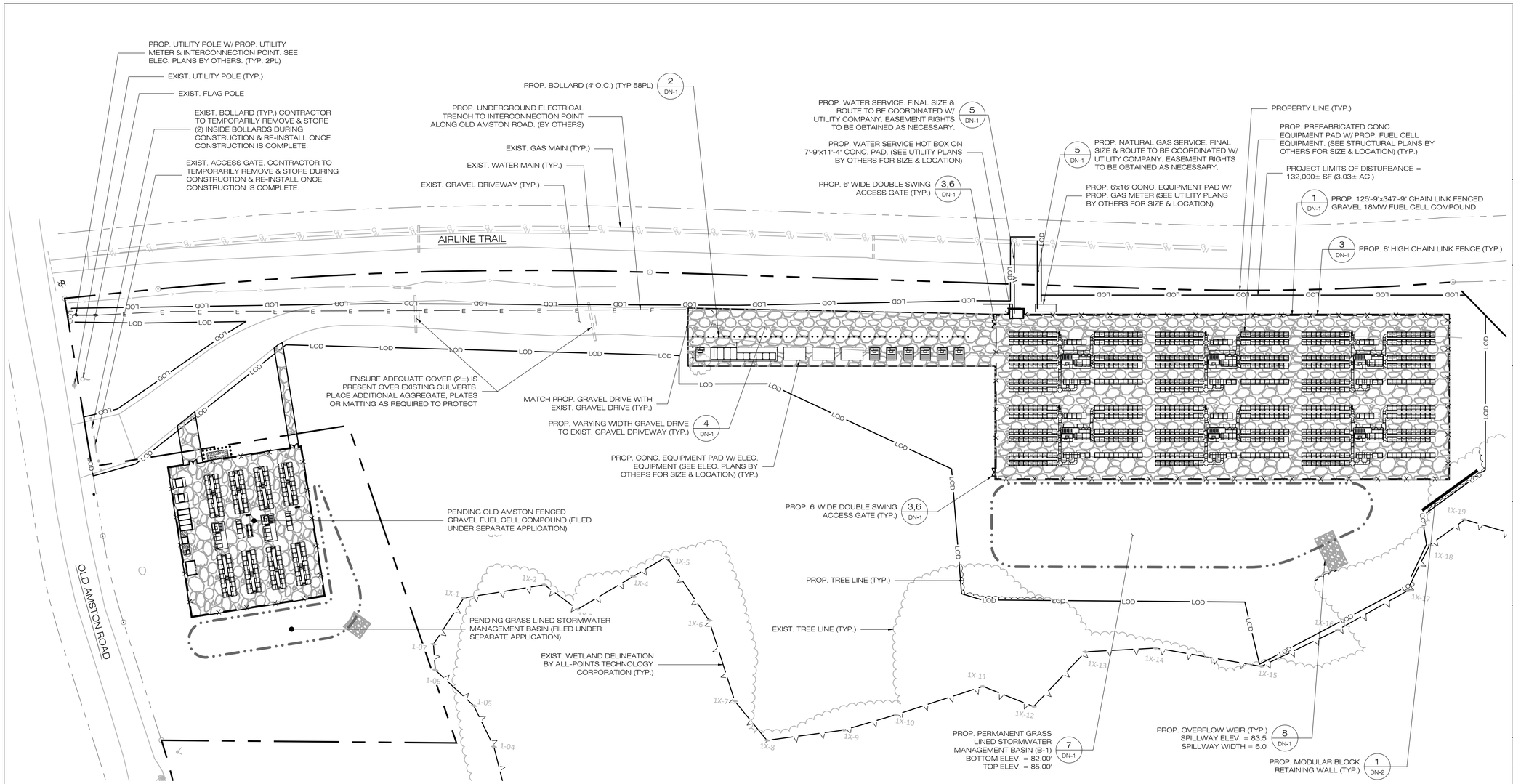
APT FILING NUMBER: CT716130

DRAWN BY: CSH
DATE: 06/08/23
CHECKED BY: RCB

SHEET TITLE:
**GRADING & DRAINAGE PLAN**

SHEET NUMBER:
**GD-1**

STATE OF CONNECTICUT ROBERT CHARLES BURNS 20071 LICENSED PROFESSIONAL ENGINEER




1 SP-1 **SITE & UTILITY PLAN**
**SCALE : 1" = 40'-0"**

40 0 20 40 80
( IN FEET ) 1 inch = 40 ft.

SITE UTILITY NOTES:
1. CONTRACTOR SHALL ENGAGE THE SERVICES OF AN UNDERGROUND UTILITY LOCATING COMPANY TO LOCATE ALL UNDERGROUND EQUIPMENT IN THE TRENCHING AREA TO AVOID ANY DAMAGE.
2. HAND EXCAVATE WITHIN 5' OF EXIST. UNDERGROUND UTILITIES (V.I.F.) MAINTAIN 18" MIN. CLEARANCE.
3. CONTRACTOR TO COORDINATE TRENCHING OPERATIONS w/ OWNER AND/OR MANAGEMENT COMPANY SO AS TO MINIMIZE DISRUPTIONS TO THE EXIST. PROPERTY OPERATIONS. REINSTATE FINISHED GRADE TO PRE-CONSTRUCTION CONDITIONS & STANDARDS.
4. REFER TO GEOTECHNICAL ENGINEERING REPORT, PREPARED BY DOWN TO EARTH CONSULTING, LLC, DATED APRIL 2023, FOR ALL SOIL & SITE PREPARATION RECOMMENDATIONS.

**FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION**


**ReNew DEVELOPERS, LLC**
103 SOUTH MAIN ST. #734
COLCHESTER, CT 06415
OFFICE: (860) 303-5726

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

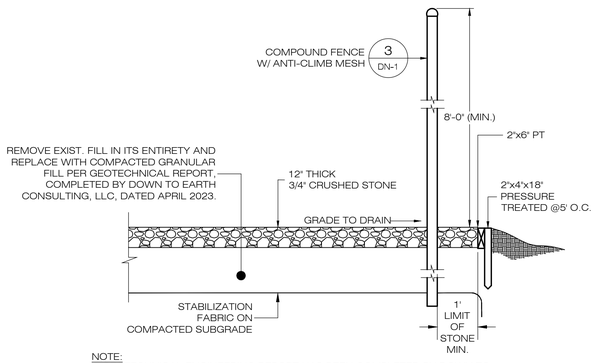
APT FILING NUMBER: CT716130

DRAWN BY: CSH
DATE: 06/08/23 CHECKED BY: RCB

SHEET TITLE:
**SITE & UTILITY PLAN**

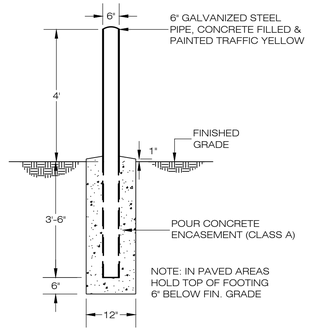
SHEET NUMBER:
**SP-1**

STATE OF CONNECTICUT · ROBERT CHARLES BURNS · 20071 · LICENSED PROFESSIONAL ENGINEER

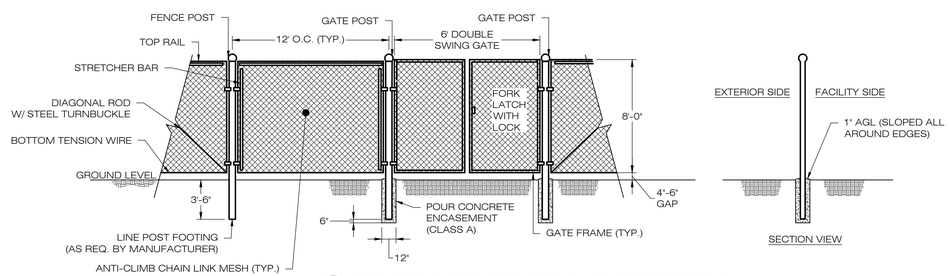



NOTE:
A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY DOWN TO EARTH CONSULTING, LLC, DATED APRIL 2023. THE CONTRACTOR SHALL ENSURE THAT ALL RECOMMENDATIONS AND SPECIFICATIONS OUTLINED WITHIN THE GEOTECHNICAL REPORT ARE FOLLOWED THROUGHOUT CONSTRUCTION.

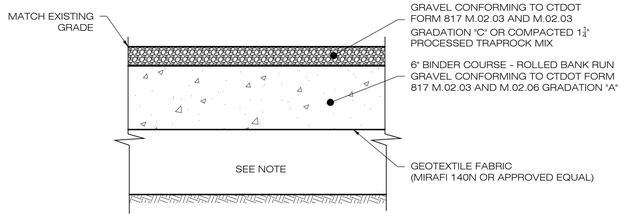
## 1 DN-1 COMPOUND DETAIL
**SCALE : N.T.S.**




## 2 DN-1 BOLLARD DETAIL
**SCALE : N.T.S.**

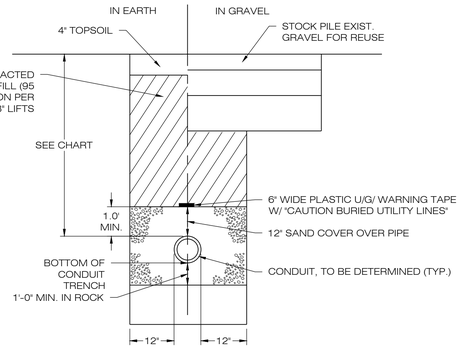



## 3 DN-1 CHAIN-LINK FENCE & GATE DETAIL
**SCALE : N.T.S.**




NOTE:
A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY DOWN TO EARTH CONSULTING, LLC, DATED APRIL 2023. THE CONTRACTOR SHALL ENSURE THAT ALL RECOMMENDATIONS AND SPECIFICATIONS OUTLINED WITHIN THE GEOTECHNICAL REPORT ARE FOLLOWED THROUGHOUT CONSTRUCTION.

## 4 DN-1 GRAVEL ACCESS DRIVE SECTION
**SCALE : N.T.S.**




BURIAL DEPTHS PER UTILITY (CONTRACTOR TO VERIFY DEPTHS W/ UTILITY COMPANIES PRIOR TO CONSTRUCTION):
- 48" FOR WATER SERVICES
- 24" FOR GAS SERVICES
- 18" FOR FOR ELECTRIC SERVICES

NOTE:
A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY DOWN TO EARTH CONSULTING, LLC, DATED APRIL 2023. THE CONTRACTOR SHALL ENSURE THAT ALL RECOMMENDATIONS AND SPECIFICATIONS OUTLINED WITHIN THE GEOTECHNICAL REPORT ARE FOLLOWED THROUGHOUT CONSTRUCTION.

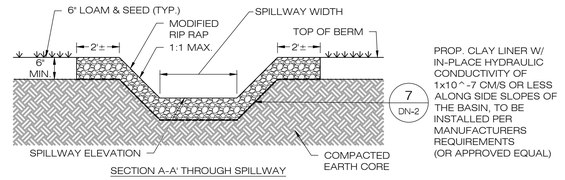
## 5 DN-1 TYPICAL UTILITY TRENCH DETAIL
**SCALE : N.T.S.**

RENEW DEVELOPERS LLC

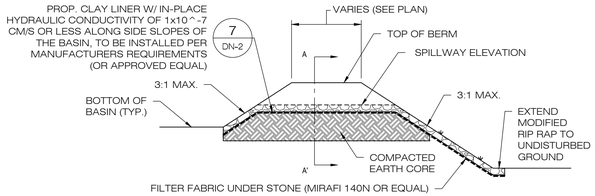
IN CASE OF EMERGENCY CALL T.B.D.

NOTES:
EMERGENCY CALL NUMBER TO BE PROVIDED ONCE DETERMINED.

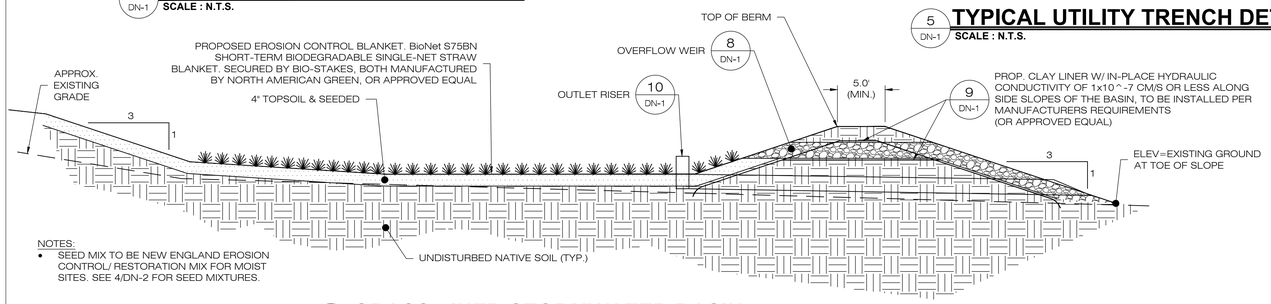
## 6 DN-1 NOTIFICATION SIGN DETAIL
**SCALE : N.T.S.**




SECTION A-A' THROUGH SPILLWAY

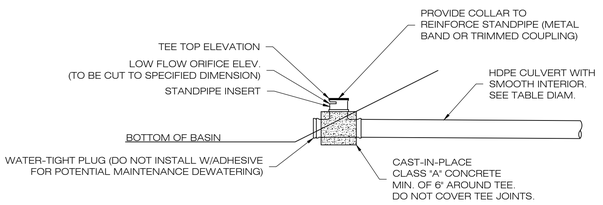



## 8 DN-1 OVERFLOW WEIR DETAIL
**SCALE : N.T.S.**



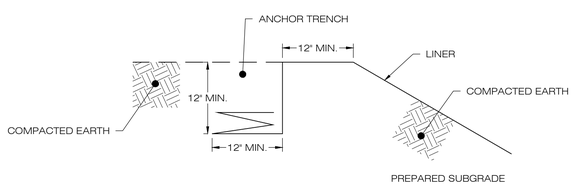

NOTES:
- SEED MIX TO BE NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR MOIST SITES. SEE 4/DN-2 FOR SEED MIXTURES.

## 7 DN-1 GRASS LINED STORMWATER BASIN
**SCALE : N.T.S.**




NOTES:
1. TEE TO BE ADS ADVANEDGE (TM) FABRICATED TEE OR APPROVED EQUAL. CONTRACTOR TO MODIFY TEE AS NEEDED.

## 10 DN-2 OUTLET RISER
**SCALE : N.T.S.**




## 9 DN-1 LINER ANCHOR DETAIL
**SCALE : N.T.S.**

HDPE OUTLET RISER SIZING TABLE

| BASIN | TEE TOP ELEV. (FT) | LOW FLOW ORIFICE ELEV. (FT) | LOW FLOW ORIFICE DIMENSION (FT) | OUTLET PIPE SIZE (IN.) | OUTLET PIPE LENGTH (FT) | OUTLET PIPE SLOPE (%) | OUTLET PIPE INV. ELEV. AT STRUCTURE (FT) | OUTLET PIPE INV. AT OUTFALL (FT) |
|---|---|---|---|---|---|---|---|---|
| B-1 | 83.50 | 82.50 | WIDTH =12.0" HEIGHT = 3.0" | 12 | 24 | 1.04 | 81.00 | 80.75 |

FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION


**ReNew DEVELOPERS, LLC**
103 SOUTH MAIN ST. #734
COLCHESTER, CT 06415
OFFICE: (860) 303-5726

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

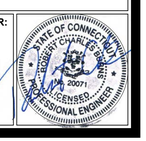
SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

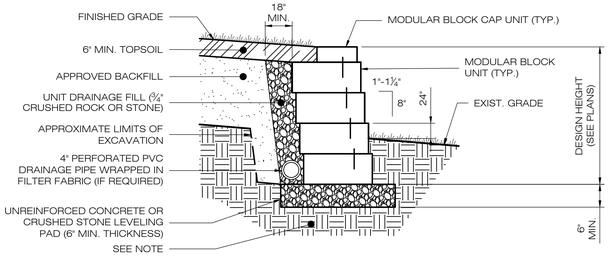
APT FILING NUMBER: CT716130

DRAWN BY: CSH
DATE: 06/08/23
CHECKED BY: RCB

SHEET TITLE:
**SITE DETAILS**

SHEET NUMBER:
**DN-1**



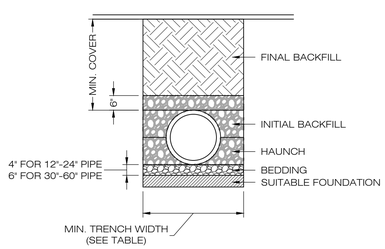



NOTE:

1. A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED BY DOWN TO EARTH CONSULTING, LLC, DATED APRIL 2023. THE CONTRACTOR SHALL ENSURE THAT ALL RECOMMENDATIONS AND SPECIFICATIONS OUTLINED WITHIN THE GEOTECHNICAL REPORT ARE FOLLOWED THROUGHOUT CONSTRUCTION.
2. CONTRACTOR TO SUBMIT SHOP DRAWINGS AND MATERIAL SPECIFICATIONS TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING.

## TYPICAL MODULAR BLOCK GRAVITY RETAINING WALL

1 / DN-2 **SCALE : N.T.S.**



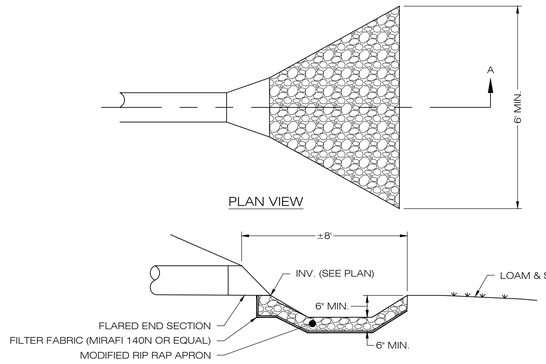

| RECOMMENDED MIN. TRENCH WIDTH | |
|---|---|
| PIPE DIA. | MIN. TRENCH WIDTH |
| 6" | 23" |
| 8" | 26" |
| 10" | 28" |
| 12" | 30" |
| 15" | 34" |
| 18" | 39" |
| 24" | 48" |
| 30" | 56" |
| 36" | 64" |
| 48" | 80" |
| 60" | 96" |

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 , "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (7S0mm-900mm).
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

## HDPE STORM DRAINAGE TRENCH DETAIL

2 / DN-2 **SCALE : N.T.S.**




## FLARED END SECTION/PLUNGE POOL

3 / DN-2 **SCALE : N.T.S.**

### New England Semi-Shade Grass and Forbs Mix

| Botanical Name | Common Name | Indicator |
|---|---|---|
| *Elymus virginicus* | Virginia Wild Rye | FACW- |
| *Elymus canadensis* | Canada Wild Rye | FACU+ |
| *Festuca rubra* | Red Fescue | FACU |
| *Chamaecrista fasciculata* | Partridge Pea | FACU |
| *Liatris spicata* | Spiked Gayfeather/Marsh Blazing Star | FAC+ |
| *Onoclea sensibilis* | Sensitive Fern | FACW |
| *Aster prenanthoides (Symphyotrichum prenanthoide* | Zigzag Aster | FAC |
| *Eupatorium fistulosum (Eutrochium fistulosum)* | Hollow-Stem Joe Pye Weed | FACW |
| *Eupatorium perfoliatum* | Boneset | FACW |
| *Juncus tenuis* | Path Rush | FAC |

PRICE PER LB. $87.00 MIN. QUANITY 1 LBS. **TOTAL:** $87.00 APPLY: 30 LBS/ACRE :1450 sq ft/lb

### New England Erosion Control/Restoration Mix For Detention Basins and Moist Sites

| Botanical Name | Common Name | Indicator |
|---|---|---|
| *Elymus riparius* | Riverbank Wild Rye | FACW |
| *Schizachyrium scoparium* | Little Bluestem | FACU |
| *Festuca rubra* | Red Fescue | FACU |
| *Andropogon gerardii* | Big Bluestem | FAC |
| *Panicum virgatum* | Switch Grass | FAC |
| *Vernonia noveboracensis* | New York Ironweed | FACW+ |
| *Agrostis perennans* | Upland Bentgrass | FACU |
| *Bidens frondosa* | Beggar Ticks | FACW |
| *Eupatorium maculatum (Eutrochium maculatum)* | Spotted Joe Pye Weed | OBL |
| *Eupatorium perfoliatum* | Boneset | FACW |
| *Aster novae-angliae (Symphyotrichum novae-anglia* | New England Aster | FACW- |
| *Scirpus cyperinus* | Wool Grass | FACW |
| *Juncus effusus* | Soft Rush | FACW+ |

PRICE PER LB. $37.00 MIN. QUANITY 3 LBS. **TOTAL:** $111.00 APPLY: 35 LBS/ACRE :1250 sq ft/lb

## SEED MIXTURES

4 / DN-2 **SCALE : N.T.S.**

**FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION**


**ReNew DEVELOPERS, LLC**

**103 SOUTH MAIN ST. #734**
**COLCHESTER, CT 06415**
**OFFICE: (860) 303-5726**

ALL-POINTS TECHNOLOGY CORPORATION

567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

APT FILING NUMBER: CT716130

DRAWN BY: CSH
DATE: 06/08/23 CHECKED BY: RCB

SHEET TITLE:

**SITE DETAILS**

SHEET NUMBER:

**DN-2**

STATE OF CONNECTICUT · ROBERT C. BURNS · 20071 · LICENSED PROFESSIONAL ENGINEER

# APPENDIX B

PRODUCT INFORMATION SHEETS

Bloomenergy



# The Bloom Energy Server 5

Using solid oxide fuel cell technology, Bloom Energy Servers convert natural gas, biogas, or hydrogen into electricity at high efficiency and without combustion, significantly reducing environmental impacts.

Bloom Energy's solid oxide fuel cell (SOFC) platform provides an electrochemical pathway to convert fuel directly to electricity without combustion. Our systems can run on natural gas, biogas, and hydrogen, and our modular platform approach provides a pathway to upgrade existing systems to align with the sustainability goals of our customers over time.

Bloom is working with two leading non-profit organizations, MiQ and Equitable Origin, to help set a responsible standard for sourcing natural gas. Responsibly sourced gas is natural gas whose production has been evaluated across a range of stringent social, environmental, and governance criteria, including climate, community, and labor issues, to ensure that the highest standards and best practices were used to minimize greenhouse gases across its entire value chain.


## Clean

Our systems produce near zero criteria pollutants (NOx, SOx, and particulate matter) and far fewer carbon emissions than legacy technologies.

## Reliable

Bloom Energy Servers are designed around a modular architecture of simple repeating elements. This enables us to generate power 24 x 7 x 365 and can be configured to eliminate the need for traditional backup power equipment.

## Resilient

Our system operates at very high availability due to their fault-tolerant design and use of the robust natural gas pipeline system. Bloom Energy Servers have survived extreme weather events and other incidences and have continued providing power to our customers.

## Simple Installation and Maintenance

Our Energy Servers are 'plug and play' and have been designed in compliance with a variety of safety standards. Bloom Energy manages all aspects of installation, operation and maintenance of the systems.

Bloomenergy

## Specifications

### Outputs

| | |
|---|---|
| Nameplate power output (net AC) | 325 kW |
| Load output (net AC) | 325 kW |
| Electrical connection | 480V, 3-phase, 60Hz |

### Inputs

| | |
|---|---|
| Fuels | Natural gas, directed biogas |
| Input fuel pressure | 10–18 psig (15 psig nominal) |
| Water | None during normal operation |

### Efficiency

| | |
|---|---|
| Cumulative electrical efficiency (LHV net AC)[1] | 65–53% |
| Heat rate (HHV) | 5,811–7,127 Btu/kWh |

### Emissions[2]

| | |
|---|---|
| NOx | 0.0017 lbs/MWh |
| SOx | Negligible |
| CO | 0.012 lbs/MWh |
| VOCs | 0.01 lbs/MWh |
| $CO_2$ @ stated efficiency | 679–833 lbs/MWh on natural gas; carbon neutral on directed biogas |

[1] 65% LHV efficiency verified by ASME PTC 50 Fuel Cell Power Systems Performance Test
[2] NOx and CO measured per CARB Method 100, VOCs measured as hexane by SCAQMD Method 25.3

### Physical Attributes and Environment

| | |
|---|---|
| Weight | 15.8 tons |
| Dimensions (variable layouts) | 17'11" x 8'8" x 6'9" or 32'3" x 4'4" x 7'2" |
| Temperature range | -20° to 45° C |
| Humidity | 0%–100% |
| Seismic vibration | IBC site class D |
| Location | Outdoor |
| Noise | <70 dBA @ 6 feet |

### Codes and Standards

Complies with Rule 21 interconnection and IEEE1547 standards.

Exempt from CA Air District permitting; meets stringent CARB 2007 emissions standards.

An Energy Server is a Stationary Fuel Cell Power System. It is Listed by Underwriters Laboratories, Inc. (UL) as a 'Stationary Fuel Cell Power System' to ANSI/CSA FC1-2014 under UL Category IRGZ and UL File Number MH45102.

### Additional Notes

Access to a secure website to monitor system performance & environmental benefits. Remotely managed and monitored by Bloom Energy. Capable of emergency stop based on input from the site.

Bloom Energy Headquarters
4353 North First Street
San Jose, CA 95134 USA

bloomenergy.com

**Flexible. Future Proof.**

Accelerate your path to a zero-carbon future.

Bloomenergy®

PRODUCT DATASHEET

# Energy Server™ 5

Always On, Clean Energy Using Patented Solid Oxide Fuel Cell Technology

*The Energy Server 5 provides combustion-free electric power with these benefits*

## Clean

Our systems produce near zero criteria pollutants (NOx, SOx, and particulate matter) and far fewer carbon emissions than legacy technologies.

## Reliable

Bloom Energy Servers are designed around a modular architecture of simple repeating elements. This enables us to generate power 24 x 7 x 365 and can be configured to eliminate the need for traditional backup power equipment.

## Resilient

Our system operates at very high availability due to its fault-tolerant design and use of the robust natural gas pipeline system. Bloom Energy Servers have survived extreme weather events and other incidences and have continued providing power to our customers.

## Simple Installation and Maintenance

Our Energy Servers are 'plug and play' and have been designed in compliance with a variety of safety standards. Bloom Energy manages all aspects of installation, operation and maintenance of the systems.

Bloom Energy
4353 North First Street
San Jose, CA 95134

T 408 543 1500
F 408 543 1501

info@bloomenergy.com
www.bloomenergy.com

| Energy Server 5 | Technical Highlights (ES5-EA2AAN) |
|---|---|
| **Outputs** | |
| Nameplate power output (net AC) | 250 kW |
| Load output (net AC) | 250 kW |
| Electrical connection | 480V, 3-phase, 60 Hz |
| **Inputs** | |
| Fuels | Natural gas, directed biogas |
| Input fuel pressure | 10-18 psig (15 psig nominal) |
| Water | None during normal operation |
| **Efficiency** | |
| Cumulative electrical efficiency (LHV net AC)[1] | 65-53% |
| Heat rate (HHV) | 5,811-7,127 Btu/kWh |
| **Emissions[2]** | |
| NOx | 0.0017 lbs/MWh |
| SOx | Negligible |
| CO | 0.034 lbs/MWh |
| VOCs | 0.0159 lbs/MWh |
| $CO_2$ @ stated efficiency | 679-833 lbs/MWh on natural gas; carbon neutral on directed biogas |
| **Physical Attributes and Environment** | |
| Weight | 13.6 tons |
| Dimensions (variable layouts) | 14'9" x 8'8" x 7'0" or 29'4" x 4'5" x 7'5" |
| Temperature range | -20° to 45° C |
| Humidity | 0% - 100% |
| Seismic vibration | IBC site class D |
| Location | Outdoor |
| Noise | < 70 dBA @ 6 feet |
| **Codes and Standards** | |
| Complies with Rule 21 interconnection and IEEE1547 standards | |
| Exempt from CA Air District permitting; meets stringent CARB 2007 emissions standards | |
| An Energy Server is a Stationary Fuel Cell Power System. It is Listed by Underwriters Laboratories, Inc. (UL) as a 'Stationary Fuel Cell Power System' to ANSI/CSA FC1-2014 under UL Category IRGZ and UL File Number MH45102. | |
| **Additional Notes** | |
| Access to a secure website to monitor system performance & environmental benefits | |
| Remotely managed and monitored by Bloom Energy | |
| Capable of emergency stop based on input from the site | |

[1] 65% LHV efficiency verified by ASME PTC 50 Fuel Cell Power Systems Performance Test
[2] NOx and CO measured per CARB Method 100, VOCs measured as hexane by SCAQMD Method 25.3

**About Bloom Energy**

Bloom Energy's mission is to make reliable, clean energy affordable for everyone in the world. The company's product, the Bloom Energy Server, delivers highly reliable and resilient, Always On electric power that is clean and sustainable. Bloom's customers include twenty-five of the Fortune 100 companies and leaders in cloud services and data centers, healthcare, retail, financial services, utilities and many other industries.

Bloom Energy
4353 North First Street
San Jose, CA 95134
T 408 543 1500
F 408 543 1501
info@bloomenergy.com
www.bloomenergy.com


DOC-1011392, Rev. A.

# APPENDIX C

STORMWATER MANAGEMENT

REPORT

# STORMWATER MANAGEMENT REPORT

PROPOSED

OLD AMSTON ROAD FUEL CELL

POWER PLANT 2 PROJECT

42 OLD AMSTON ROAD
COLCHESTER, CONNECTICUT
NEW LONDON COUNTY

**Prepared for:**

**ReNew Developers, LLC**
**103 South Main St. #734 Colchester, CT 06415**

**Prepared by:**

**All-Points Technology Corporation, P.C.**
**567 Vauxhall Street Extension, Suite 311**
**Waterford, CT 06385**

**June 2023**

# Table of Contents


INTRODUCTION .....1

EXISTING SITE CONDITIONS.....1

DEVELOPED SITE CONDITIONS .....1

STORMWATER MANAGEMENT .....1

CONCLUSION .....3


# Tables


TABLE 1 PRE-DEVELOPED PEAK STORM RUNOFF (Q), CUBIC FEET PER SECOND (CFS).....2

TABLE 2 POST-DEVELOPED PEAK STORM RUNOFF (Q), CUBIC FEET PER SECOND (CFS).....3

TABLE 3 PEAK STORM RUNOFF (Q) COMPARISON PRE- & POST-, CUBIC FEET PER SECOND (CFS) .....3


# Appendices


APPENDIX A: OVERALL SITE PLAN

APPENDIX B: NRCS SOIL SURVEY

APPENDIX C: EXISTING DRAINAGE AREA MAP (EDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)

APPENDIX D: PROPOSED DRAINAGE AREA MAP (PDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)

APPENDIX E: WATER QUALITY VOLUME CALCULATIONS

APPENDIX F: NOAA ATLAS 14 PRECIPITATION FREQUENCY TABLE

## Introduction

ReNew Developers, LLC, All-Points Technology Corporation, P.C. ("APT") is proposing to develop a fuel cell power plant facility with a combined output of approximately 18.0 megawatts (MW) alternating current (AC) herein referred to as Old Amston Road Fuel Cell Power Plant 2 (the "Project") located off of Old Amston Road, in Colchester, Connecticut (the "Site").

The purpose of this report is to provide an analysis of the potential stormwater drainage impacts, as well as a description of the mitigation measures to minimize such potential stormwater drainage impacts associated with the Project. The design is intended to be in full compliance with the State and Town regulations while taking site conditions and practical factors into account.

## Existing Site Conditions

The Site is comprised of on one (1) privately-owned 16.16± acre parcel identified as 42 Old Amston Road. The Project will be entirely located within the southern portion of the site within an existing undeveloped brushed area. Project limit of disturbance is approximately 3.03± acres of the overall site area. See Appendix A for an Overall Site Plan.

The Project area's existing topography gradually slopes between 0.5%-1% down in an east to west direction.

## Developed Site Conditions

The Project will be constructed in the southern portion of the Site, entirely within the existing brushed area. Access to the Project will be provided via new gravel drive to be extended from an existing gravel access drive on the property to the north of the Project area. The Project includes the installation of fuel cell equipment and associated fencing, access road and utility and stormwater management features, within 3.03± acres of the Site. Minor clearing and grubbing of the existing brush will be required for the development of the Project.

The proposed fuel cell equipment will be installed on concrete pads within a fenced gravel equipment compound. Fill & gravel will be imported to create the compound. Any existing ground cover outside of the gravel compound that is disturbed during construction will be reseeded utilizing a New England Semi-Shade Grass & Forbs mix, or approved equal. The stormwater management basin will be seeded with New England Erosion Control/Restoration Mix for Detention Basins and Moist Sites, or approved equal.

## Stormwater Management

*Analysis Methodology*

The hydrologic analysis was performed using the HydroCAD stormwater modeling system computer program developed by HydroCAD Software Solutions, LLC.

Hydrographs for each watershed were developed using the SCS Synthetic Unit Hydrograph Method with a Type III rainfall distribution. Hydrographs were developed for the NOAA Atlas 14,

Volume 10, Version 2 Precipitation 2-, 25-, 50-, and 100-year storm event with rainfall depths of 3.41, 6.25, 7.06, and 7.93 inches respectively.

The existing and proposed drainage areas used in the calculations are illustrated on the Existing and Proposed Drainage Area Maps (EDA-1 & PDA-1). These maps and the corresponding HydroCAD output are attached in Appendices C and D.

*Existing Drainage Patterns*

The proposed Project area drains generally from the east to the west, ultimately to a wetland system to the west of the Site. The Site was modeled to discharge at one (1) Analysis Point, "AP-1" associated with wetland system to the west. Peak discharges have been computed at the Analysis Point of study for the 2-, 25-, 50-, and 100-year storm events.

The Project area soils identified by the United States Department of Agriculture (USDA) Natural Resources Conservation Service consists of map unit symbols 38E, 38C, 306, 61B, 701B, 17 and 18. 38E is classified as "Hinckley loamy sand, 15 to 45 percent slopes" and has a HSG rating of "A". 38C is classified as "Hinckley loamy sand, 3 to 15 percent slopes" and has a HSG rating of "A". 306 is classified as "Udorthents-Urban land complex" and has a HSG rating of "B". 61B is classified as "Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony" and has a HSG rating of "B". 701B is classified as "Ninigret fine sandy loam, 3 to 8 percent slopes" and has a HSG rating of "C". 17 is classified as "Timakwa and Natchaug soils, 0 to 2 percent slopes" and has a HSG rating of "B/D". 18 is classified as "Catden and Freetown soils, 0 to 2 percent slopes" and has a HSG rating of "B/D". Specific details for each soil Map Unit Symbol are provided in Appendix B.

The pre-developed discharges at the Analysis Point are tabulated in Table 1.

**Table 1**

| ***Analysis Point*** | **Pre-developed Peak Storm Runoff (Q), cubic feet per second (cfs)** | | | |
|---|---|---|---|---|
| | **2-year** | **25-year** | **50-year** | **100-year** |
| AP-1 | 1.67 | 9.95 | 12.92 | 16.24 |

*Proposed Drainage Patterns*

The Project will require replacement of the existing fill material with compacted granular fill for the installation of the fuel cell power plant facility. Due to the high water table, the proposed basin will be installed in fill. All disturbed areas outside of the fuel cell equipment compound will be reseeded utilizing a New England semi-shade grass & forbs mix, or approved equal. The stormwater management basin will be seeded with New England Erosion Control/Restoration Mix for Detention Basins and Moist Sites, or approved equal.

Hydrologically, the post-developed condition is designed to mimic the pre-developed condition to the extent possible. To manage the increase in post-development runoff due to the change in cover type within the fenced gravel compound limits, one (1) grass-lined stormwater

management basin is proposed. Basin B-1 is located west of the fuel cell equipment compound. The fuel cell equipment compound has been graded to direct water to the basin. The basin has been designed to provide the Water Quality Volume (WQV) required due to the proposed impervious surfaces. Flow and volume control out of the basin is provided via a low flow orifice to a 12" outlet pipe and a rip-rap lined overflow weir. See attached calculations in Appendices D & E.

Since the proposed development mimics the existing conditions, the post-development condition was modeled using the same Analysis Point. Peak discharges have been computed at AP-1 for the 2-year, 25-year, 50-year, and 100-year storm events. The post-development discharges at AP-1 are tabulated in Table 2.

**Table 2**

| ***Analysis Point*** | **Post-developed Peak Storm Runoff (Q), cubic feet per second (cfs)** | | | |
|---|---|---|---|---|
| | **2-year** | **25-year** | **50-year** | **100-year** |
| AP-1 | 1.22 | 7.28 | 9.26 | 13.20 |

The reduction in runoff achieved by the post-development discharges in comparison with the pre-development discharges are tabulated in Table 3.

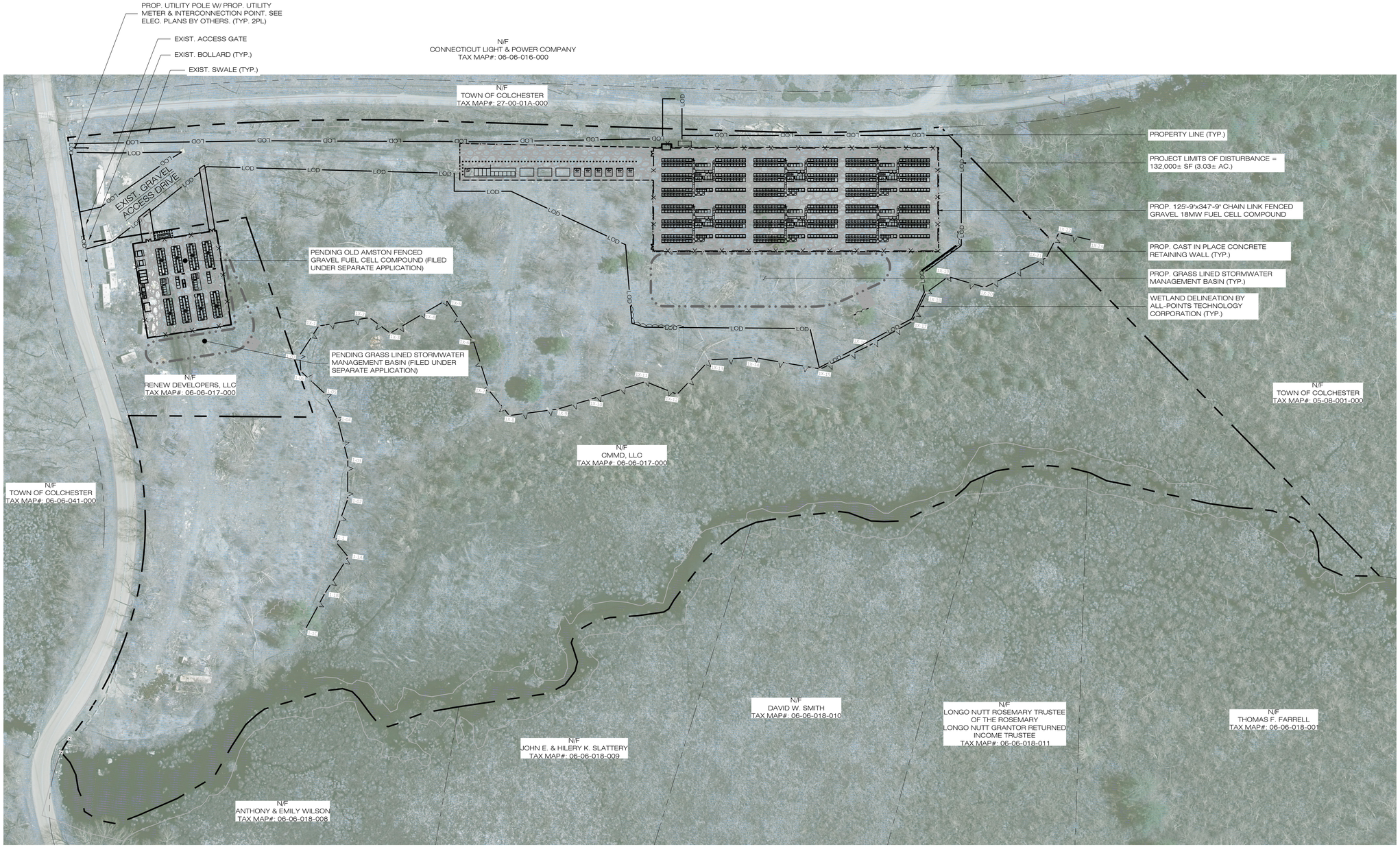
**Table 3**

| ***Analysis Point*** | **Peak Storm Runoff (Q) Comparison Pre- and Post-, Percent Reduction** | | | |
|---|---|---|---|---|
| | **2-year** | **25-year** | **50-year** | **100-year** |
| AP-1 | -27% | -27% | -28% | -19% |

## Conclusion

The stormwater management for the proposed site has been designed such that the post-development peak discharges to the waters of the State of Connecticut for the 2-, 25-, 50-, and 100- year storm events are less than the pre-development peak discharges. As a result, the proposed fuel cell power plant facility will not result in any adverse conditions to the surrounding areas and properties.

# APPENDIX A: OVERALL SITE PLAN




1 OP-1 **OVERALL LOCUS MAP**
SCALE : 1" = 60'-0"

60 0 30 60 120
( IN FEET ) 1 inch = 60 ft.

**FOR PERMITTING PURPOSES ONLY. NOT FOR CONSTRUCTION**


**ReNew DEVELOPERS, LLC**
**103 SOUTH MAIN ST. #734**
**COLCHESTER, CT 06415**
**OFFICE: (860) 303-5726**

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMITTAL: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

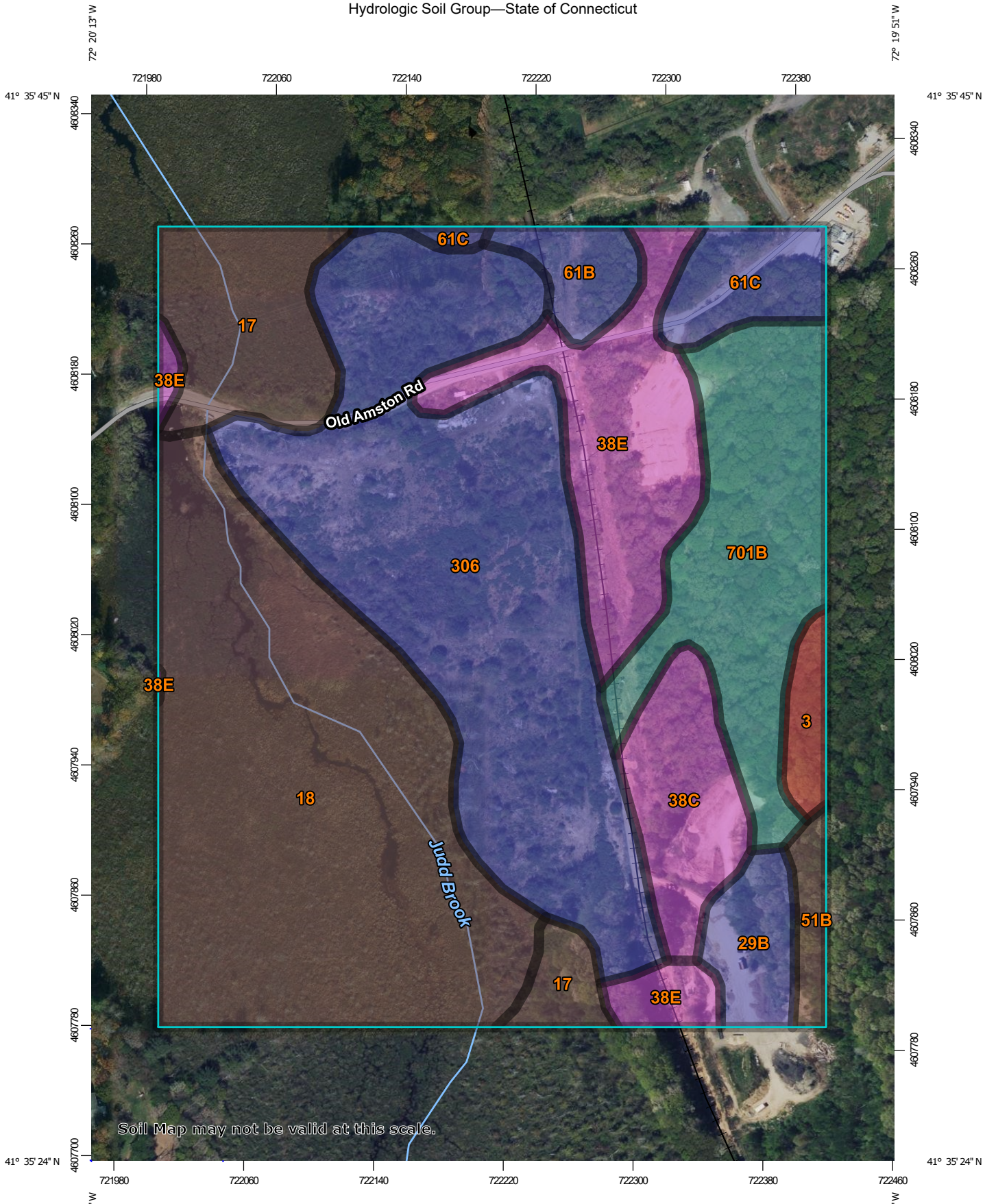
APT FILING NUMBER: CT716130

DRAWN BY: CSH
DATE: 06/08/23 CHECKED BY: RCB

SHEET TITLE:
**OVERALL LOCUS MAP**

SHEET NUMBER:
**OP-1**

# APPENDIX B: NRCS SOIL SURVEY




Map Scale: 1:3,190 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

A

A/D

B

B/D

C

C/D

D

Not rated or not available

**Soil Rating Lines**

A

A/D

B

B/D

C

C/D

D

Not rated or not available

**Soil Rating Points**

A

A/D

B

B/D

C

C/D

D

Not rated or not available

**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 1:12,000.

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: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

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

Date(s) aerial images were photographed: Mar 20, 2019—Oct 25, 2020

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.

# Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 3 | Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony | D | 0.7 | 1.4% |
| 17 | Timakwa and Natchaug soils, 0 to 2 percent slopes | B/D | 3.7 | 7.4% |
| 18 | Catden and Freetown soils, 0 to 2 percent slopes | B/D | 14.0 | 27.9% |
| 29B | Agawam fine sandy loam, 3 to 8 percent slopes | B | 1.3 | 2.6% |
| 38C | Hinckley loamy sand, 3 to 15 percent slopes | A | 2.4 | 4.8% |
| 38E | Hinckley loamy sand, 15 to 45 percent slopes | A | 5.2 | 10.3% |
| 51B | Sutton fine sandy loam, 0 to 8 percent slopes, very stony | B/D | 0.6 | 1.3% |
| 61B | Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony | B | 1.0 | 2.0% |
| 61C | Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony | B | 1.6 | 3.2% |
| 306 | Udorthents-Urban land complex | B | 14.0 | 27.8% |
| 701B | Ninigret fine sandy loam, 3 to 8 percent slopes | C | 5.6 | 11.2% |
| **Totals for Area of Interest** | | | **50.2** | **100.0%** |

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

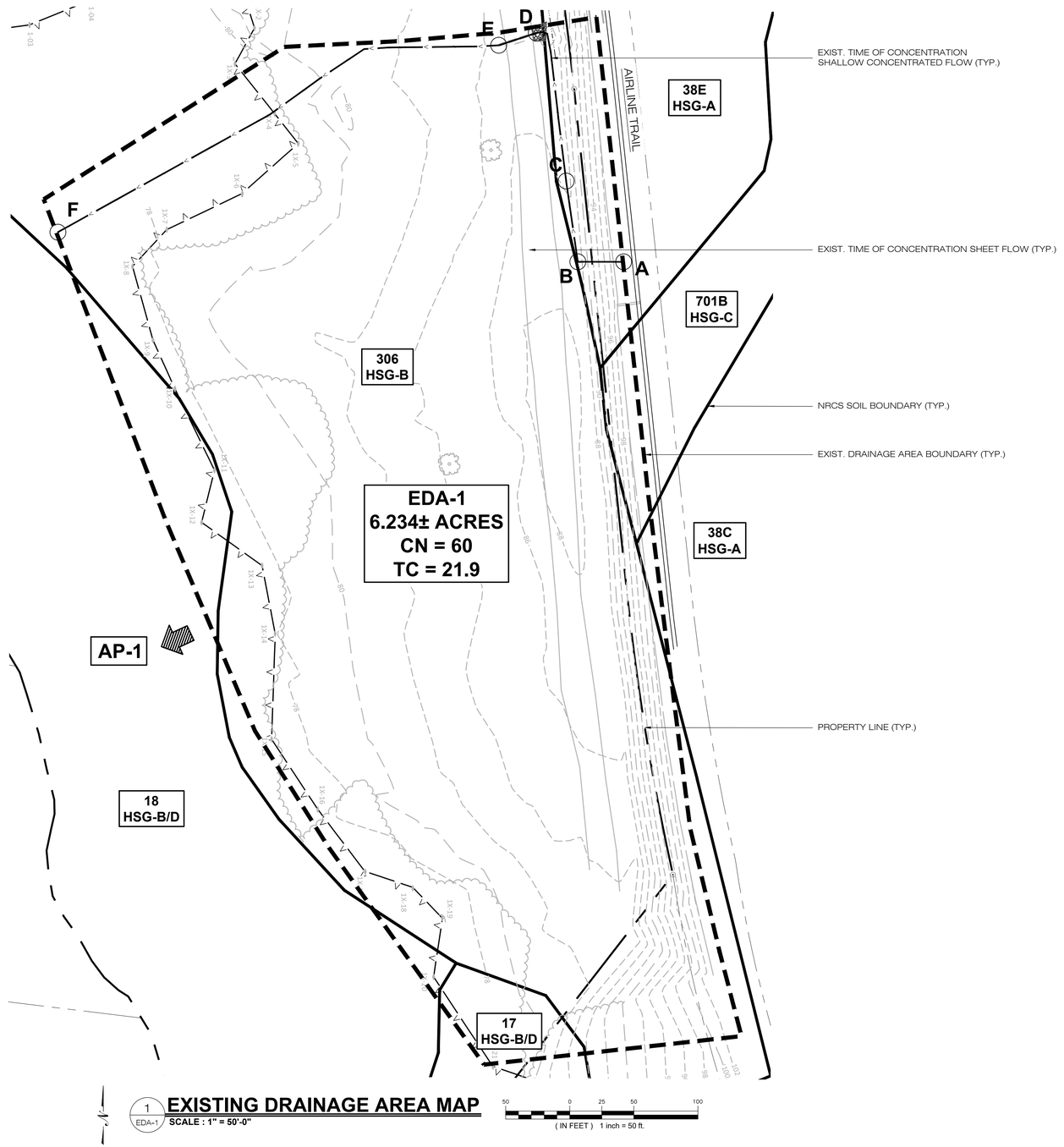
# APPENDIX C: EXISTING DRAINAGE AREA MAP (EDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)

## EXISTING DRAINAGE AREAS

| | TOTAL AREA (ACRES) | COMPOSITE CN | TC (MINS.) |
|---|---|---|---|
| EDA-1 | 6.234 | 60 | 18.7 |

## EXISTING CONDITION PEAK FLOWS

| ANALYSIS POINT | 2-YEAR (CFS) | 25-YEAR (CFS) | 50-YEAR (CFS) | 100-YEAR (CFS) |
|---|---|---|---|---|
| AP-1 | 1.67 | 9.95 | 12.92 | 16.24 |




1 EDA-1 **EXISTING DRAINAGE AREA MAP**
SCALE : 1" = 50'-0"

50 0 25 50 100
( IN FEET ) 1 inch = 50 ft.


**ReNew DEVELOPERS, LLC**
14 CHESTNUT HILL ROAD
COLCHESTER, CT 06415
OFFICE: (860) 303-5726

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMISSION: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

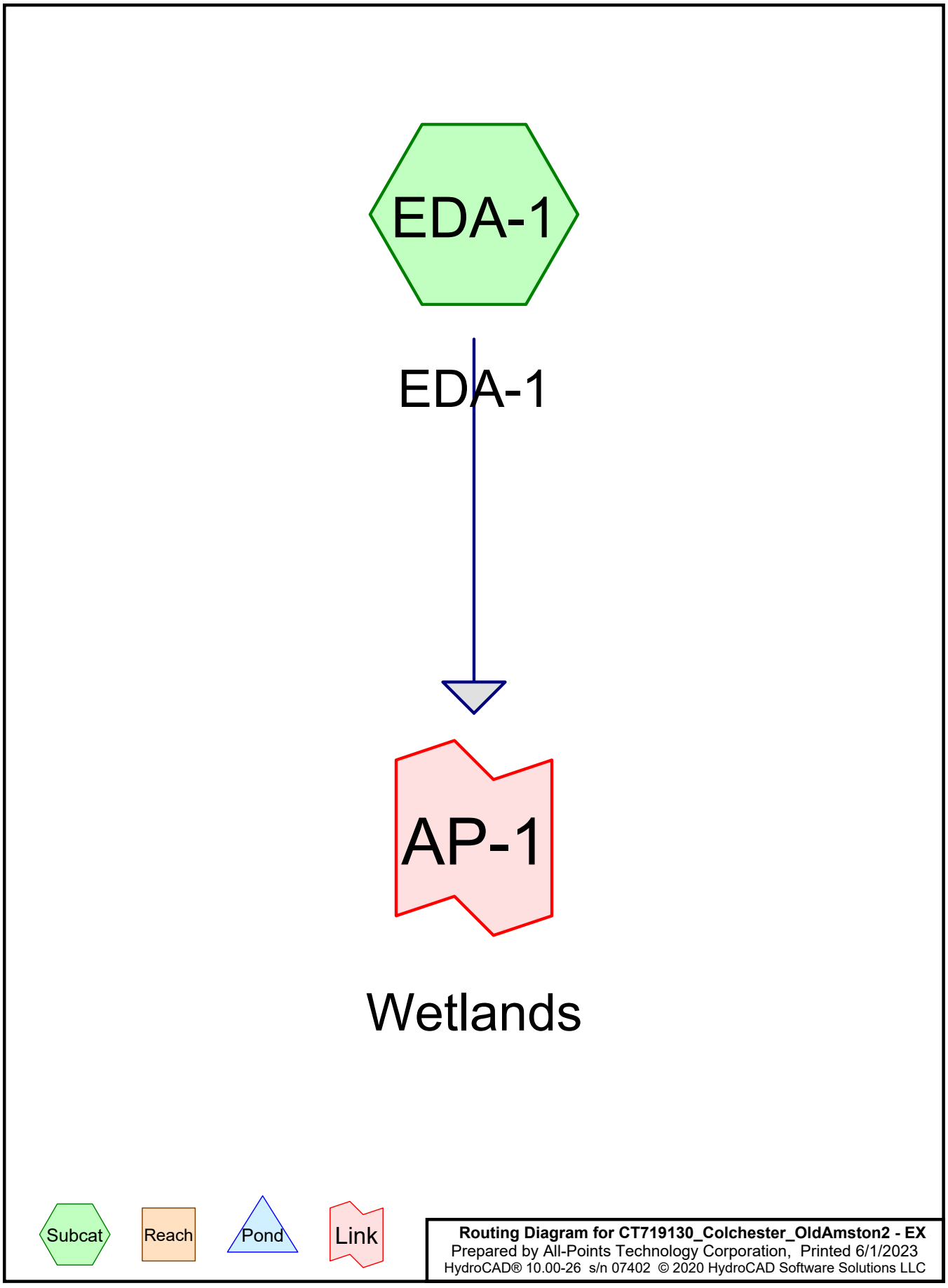
SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

APT FILING NUMBER: CT716130

DRAWN BY: CSH
DATE: 06/08/23 CHECKED BY: RCB

SHEET TITLE:
**EXISTING DRAINAGE AREA MAP**

SHEET NUMBER:
**EDA-1**




**Routing Diagram for CT719130_Colchester_OldAmston2 - EX**
Prepared by All-Points Technology Corporation, Printed 6/1/2023

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.193 | 35 | Brush, Fair, HSG A (EDA-1) |
| 5.107 | 56 | Brush, Fair, HSG B (EDA-1) |
| 0.046 | 70 | Brush, Fair, HSG C (EDA-1) |
| 0.372 | 77 | Brush, Fair, HSG D (EDA-1) |
| 0.062 | 96 | Gravel surface, HSG A (EDA-1) |
| 0.424 | 96 | Gravel surface, HSG B (EDA-1) |
| 0.030 | 96 | Gravel surface, HSG C (EDA-1) |
| **6.234** | **60** | **TOTAL AREA** |

## Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.255 | HSG A | EDA-1 |
| 5.531 | HSG B | EDA-1 |
| 0.076 | HSG C | EDA-1 |
| 0.372 | HSG D | EDA-1 |
| 0.000 | Other | |
| **6.234** | | **TOTAL AREA** |

## Ground Covers (all nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|---|---|---|---|---|---|---|---|
| 0.193 | 5.107 | 0.046 | 0.372 | 0.000 | 5.718 | Brush, Fair | EDA-1 |
| 0.062 | 0.424 | 0.030 | 0.000 | 0.000 | 0.516 | Gravel surface | EDA-1 |
| **0.255** | **5.531** | **0.076** | **0.372** | **0.000** | **6.234** | **TOTAL AREA** | |

## Pipe Listing (all nodes)

| Line# | Node Number | In-Invert (feet) | Out-Invert (feet) | Length (feet) | Slope (ft/ft) | n | Diam/Width (inches) | Height (inches) | Inside-Fill (inches) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EDA-1 | 0.00 | 0.00 | 30.0 | 0.0150 | 0.013 | 12.0 | 0.0 | 0.0 |

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment EDA-1: EDA-1** Runoff Area=6.234 ac 0.00% Impervious Runoff Depth=0.49"
Flow Length=640' Tc=18.7 min CN=60 Runoff=1.67 cfs 0.256 af

**Link AP-1: Wetlands** Inflow=1.67 cfs 0.256 af
Primary=1.67 cfs 0.256 af

**Total Runoff Area = 6.234 ac Runoff Volume = 0.256 af Average Runoff Depth = 0.49"**
**100.00% Pervious = 6.234 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment EDA-1: EDA-1

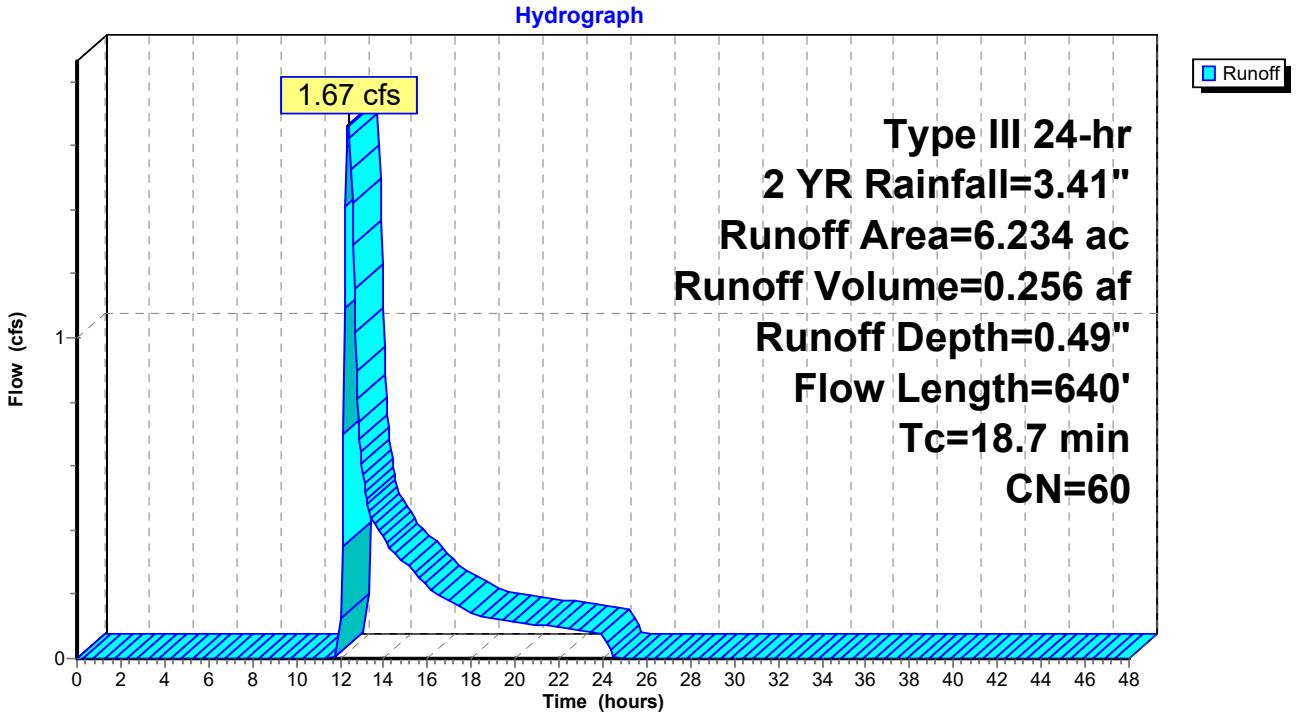
Runoff = 1.67 cfs @ 12.37 hrs, Volume= 0.256 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.41"

| Area (ac) | CN | Description |
|---|---|---|
| 0.193 | 35 | Brush, Fair, HSG A |
| 5.107 | 56 | Brush, Fair, HSG B |
| 0.046 | 70 | Brush, Fair, HSG C |
| 0.372 | 77 | Brush, Fair, HSG D |
| 0.062 | 96 | Gravel surface, HSG A |
| 0.424 | 96 | Gravel surface, HSG B |
| 0.030 | 96 | Gravel surface, HSG C |
| 6.234 | 60 | Weighted Average |
| 6.234 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.2 | 36 | 0.3060 | 0.19 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 9.1 | 64 | 0.0100 | 0.12 | | **Sheet Flow, B-C**<br>Grass: Short n= 0.150 P2= 3.18" |
| 1.1 | 125 | 0.0160 | 1.90 | | **Shallow Concentrated Flow, C-D**<br>Grassed Waterway Kv= 15.0 fps |
| 0.1 | 30 | 0.0150 | 5.56 | 4.36 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 Corrugated PE, smooth interior |
| 5.2 | 385 | 0.0307 | 1.23 | | **Shallow Concentrated Flow, E-F**<br>Short Grass Pasture Kv= 7.0 fps |
| 18.7 | 640 | Total | | | |

## Subcatchment EDA-1: EDA-1

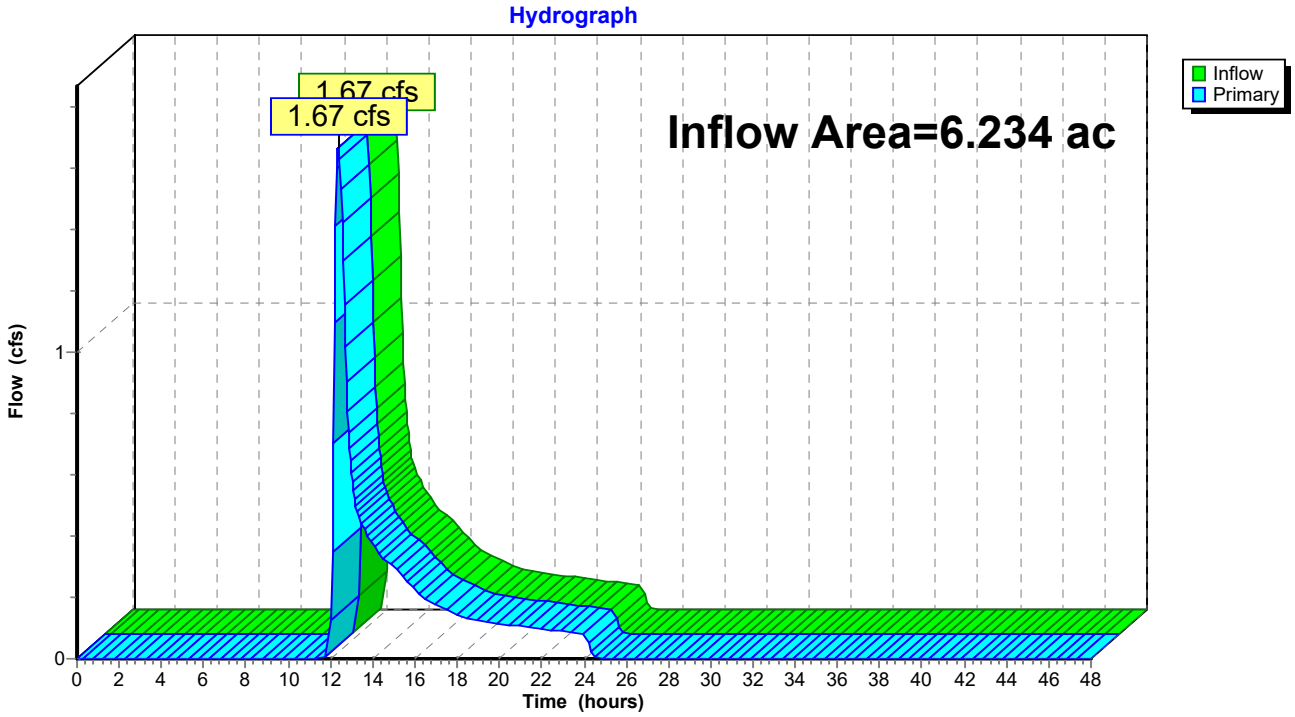


## Summary for Link AP-1: Wetlands

Inflow Area = 6.234 ac, 0.00% Impervious, Inflow Depth = 0.49" for 2 YR event
Inflow = 1.67 cfs @ 12.37 hrs, Volume= 0.256 af
Primary = 1.67 cfs @ 12.37 hrs, Volume= 0.256 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

## Link AP-1: Wetlands



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment EDA-1: EDA-1** Runoff Area=6.234 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=640' Tc=18.7 min CN=60 Runoff=9.95 cfs 1.084 af

**Link AP-1: Wetlands** Inflow=9.95 cfs 1.084 af
Primary=9.95 cfs 1.084 af

**Total Runoff Area = 6.234 ac Runoff Volume = 1.084 af Average Runoff Depth = 2.09"**
**100.00% Pervious = 6.234 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment EDA-1: EDA-1

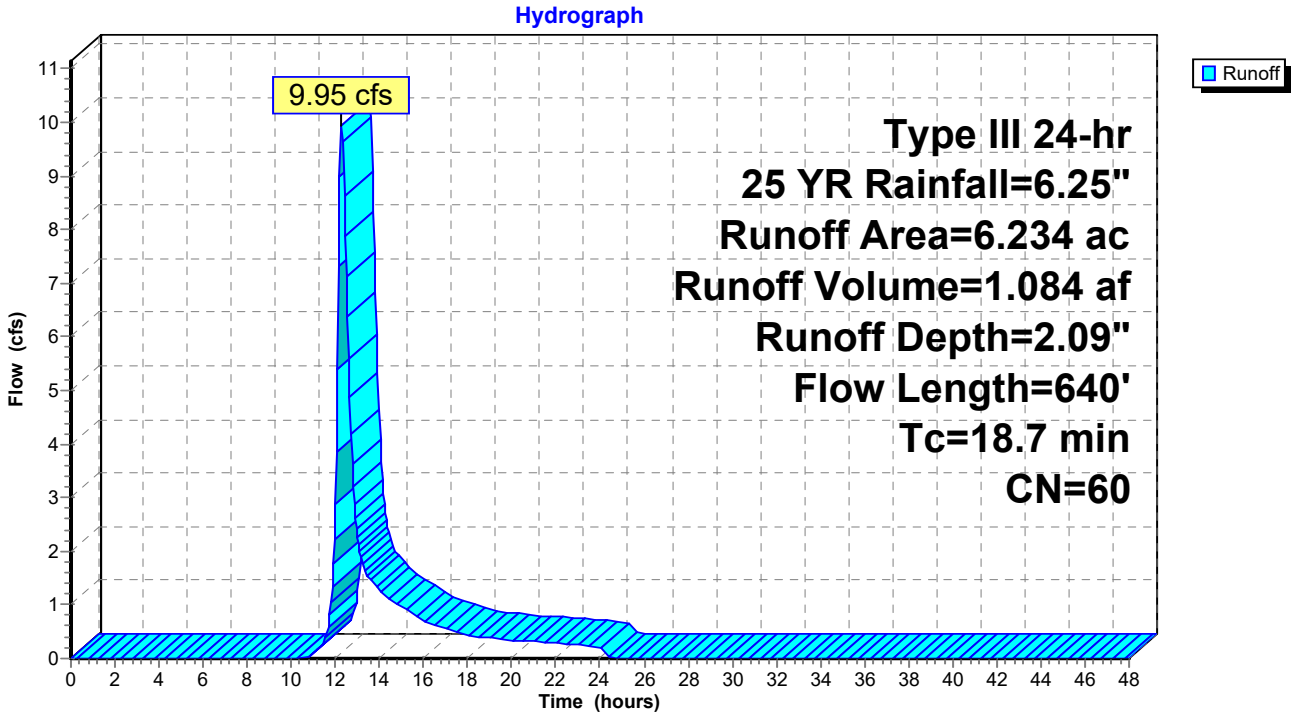
Runoff = 9.95 cfs @ 12.28 hrs, Volume= 1.084 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.25"

| Area (ac) | CN | Description |
|---|---|---|
| 0.193 | 35 | Brush, Fair, HSG A |
| 5.107 | 56 | Brush, Fair, HSG B |
| 0.046 | 70 | Brush, Fair, HSG C |
| 0.372 | 77 | Brush, Fair, HSG D |
| 0.062 | 96 | Gravel surface, HSG A |
| 0.424 | 96 | Gravel surface, HSG B |
| 0.030 | 96 | Gravel surface, HSG C |
| 6.234 | 60 | Weighted Average |
| 6.234 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.2 | 36 | 0.3060 | 0.19 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 9.1 | 64 | 0.0100 | 0.12 | | **Sheet Flow, B-C**<br>Grass: Short n= 0.150 P2= 3.18" |
| 1.1 | 125 | 0.0160 | 1.90 | | **Shallow Concentrated Flow, C-D**<br>Grassed Waterway Kv= 15.0 fps |
| 0.1 | 30 | 0.0150 | 5.56 | 4.36 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 Corrugated PE, smooth interior |
| 5.2 | 385 | 0.0307 | 1.23 | | **Shallow Concentrated Flow, E-F**<br>Short Grass Pasture Kv= 7.0 fps |
| 18.7 | 640 | Total | | | |

## Subcatchment EDA-1: EDA-1

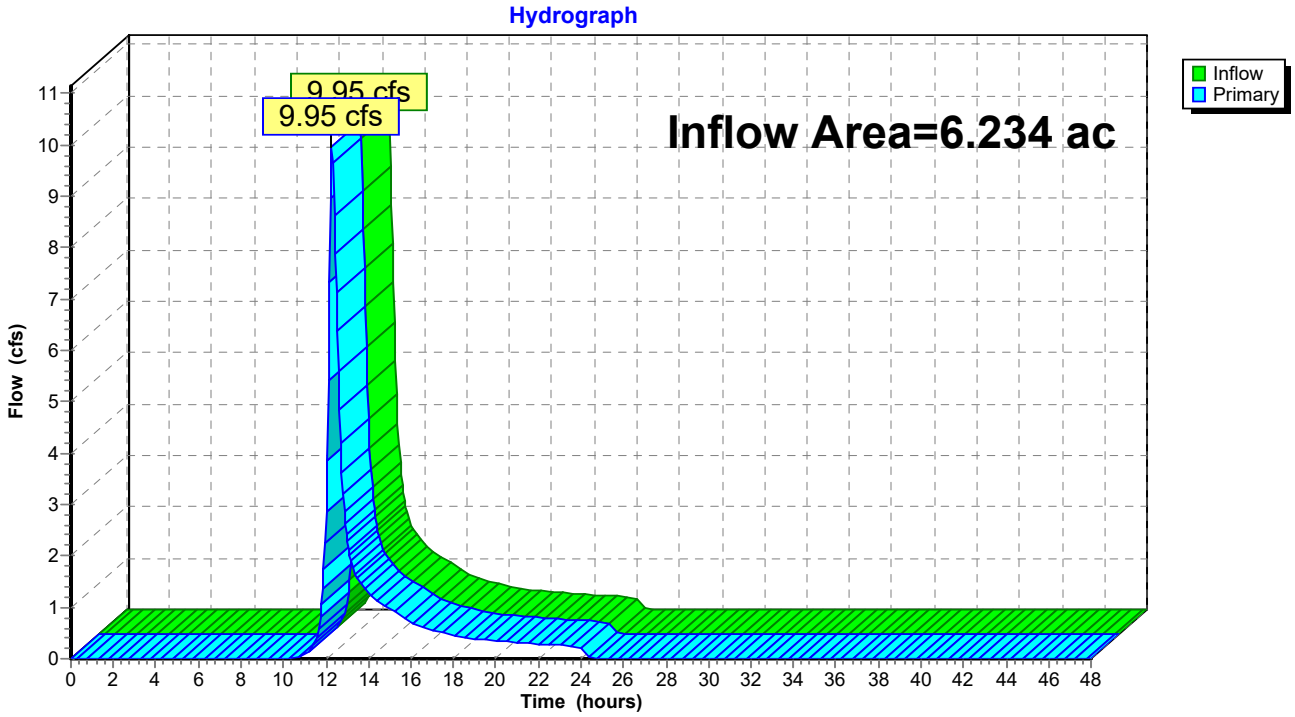


## Summary for Link AP-1: Wetlands

Inflow Area = 6.234 ac, 0.00% Impervious, Inflow Depth = 2.09" for 25 YR event
Inflow = 9.95 cfs @ 12.28 hrs, Volume= 1.084 af
Primary = 9.95 cfs @ 12.28 hrs, Volume= 1.084 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

## Link AP-1: Wetlands



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment EDA-1: EDA-1** Runoff Area=6.234 ac 0.00% Impervious Runoff Depth=2.65"
Flow Length=640' Tc=18.7 min CN=60 Runoff=12.92 cfs 1.375 af

**Link AP-1: Wetlands** Inflow=12.92 cfs 1.375 af
Primary=12.92 cfs 1.375 af

**Total Runoff Area = 6.234 ac Runoff Volume = 1.375 af Average Runoff Depth = 2.65"**
**100.00% Pervious = 6.234 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment EDA-1: EDA-1

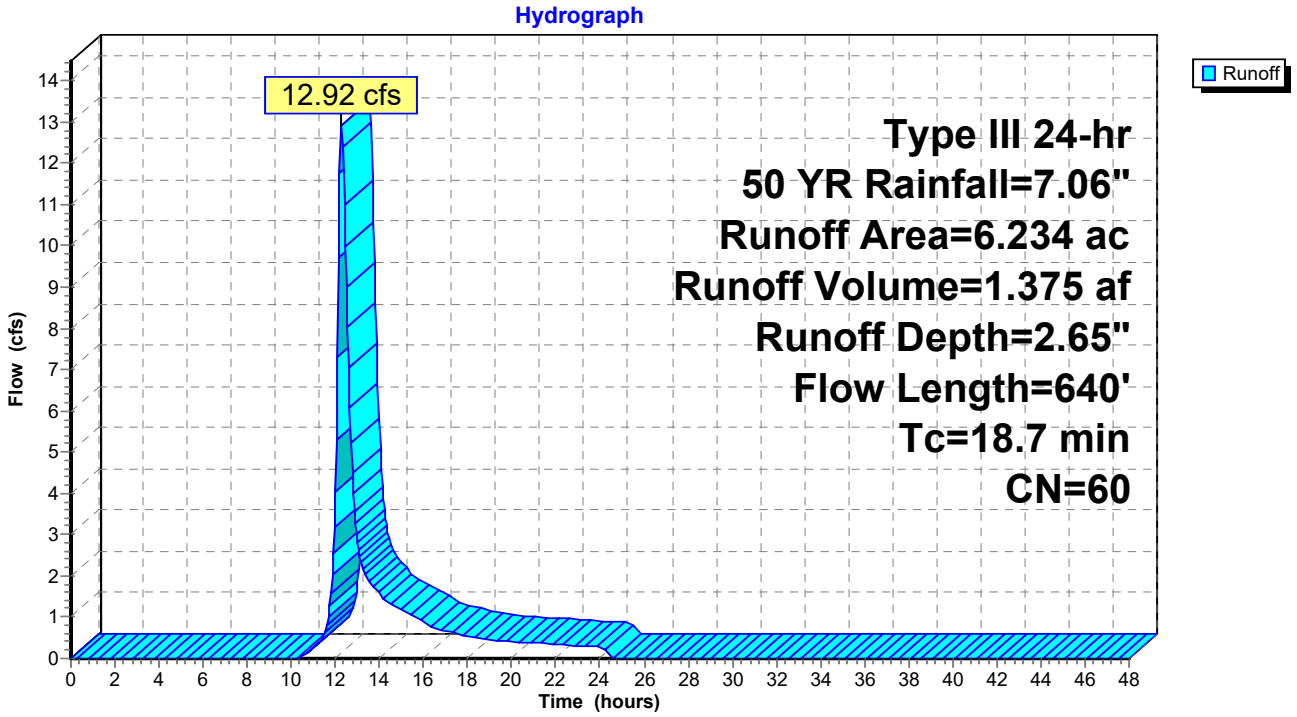
Runoff = 12.92 cfs @ 12.27 hrs, Volume= 1.375 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=7.06"

| Area (ac) | CN | Description |
|---|---|---|
| 0.193 | 35 | Brush, Fair, HSG A |
| 5.107 | 56 | Brush, Fair, HSG B |
| 0.046 | 70 | Brush, Fair, HSG C |
| 0.372 | 77 | Brush, Fair, HSG D |
| 0.062 | 96 | Gravel surface, HSG A |
| 0.424 | 96 | Gravel surface, HSG B |
| 0.030 | 96 | Gravel surface, HSG C |
| 6.234 | 60 | Weighted Average |
| 6.234 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.2 | 36 | 0.3060 | 0.19 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 9.1 | 64 | 0.0100 | 0.12 | | **Sheet Flow, B-C**<br>Grass: Short n= 0.150 P2= 3.18" |
| 1.1 | 125 | 0.0160 | 1.90 | | **Shallow Concentrated Flow, C-D**<br>Grassed Waterway Kv= 15.0 fps |
| 0.1 | 30 | 0.0150 | 5.56 | 4.36 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 Corrugated PE, smooth interior |
| 5.2 | 385 | 0.0307 | 1.23 | | **Shallow Concentrated Flow, E-F**<br>Short Grass Pasture Kv= 7.0 fps |
| 18.7 | 640 | Total | | | |

## Subcatchment EDA-1: EDA-1

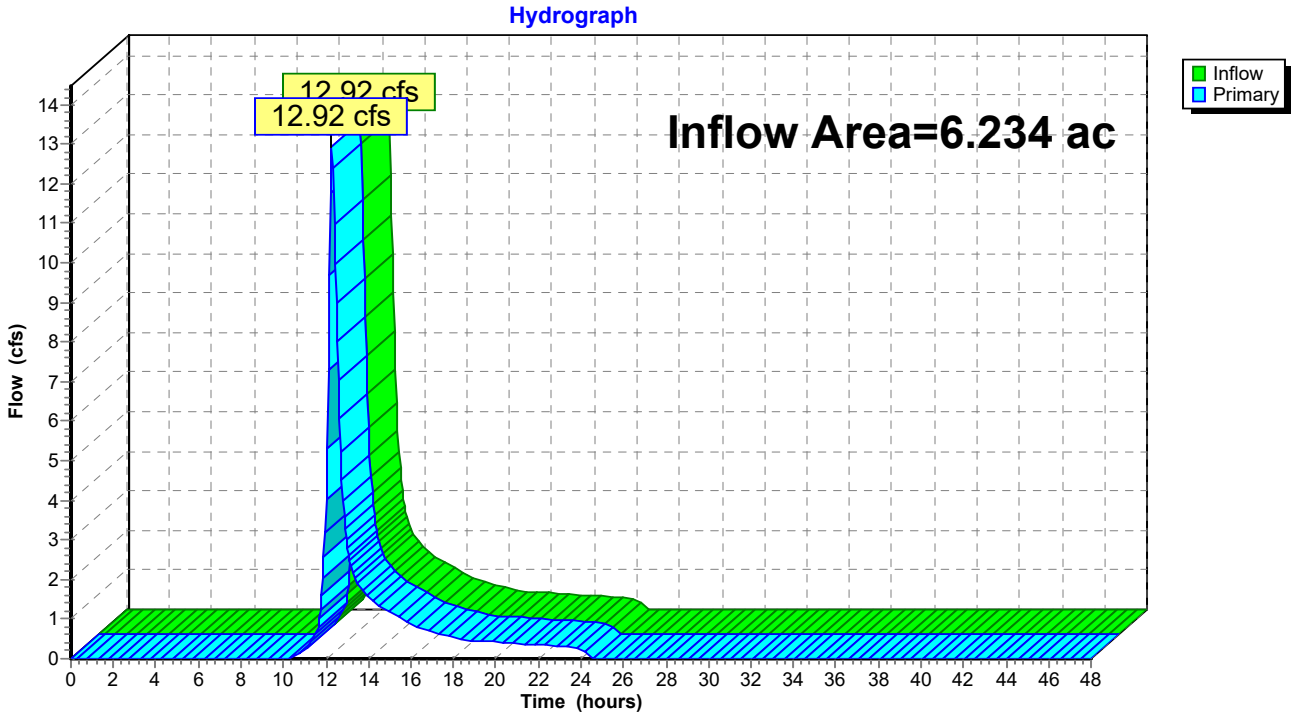


## Summary for Link AP-1: Wetlands

Inflow Area = 6.234 ac, 0.00% Impervious, Inflow Depth = 2.65" for 50 YR event
Inflow = 12.92 cfs @ 12.27 hrs, Volume= 1.375 af
Primary = 12.92 cfs @ 12.27 hrs, Volume= 1.375 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

## Link AP-1: Wetlands



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment EDA-1: EDA-1** Runoff Area=6.234 ac 0.00% Impervious Runoff Depth=3.28"
Flow Length=640' Tc=18.7 min CN=60 Runoff=16.24 cfs 1.704 af

**Link AP-1: Wetlands** Inflow=16.24 cfs 1.704 af
Primary=16.24 cfs 1.704 af

**Total Runoff Area = 6.234 ac Runoff Volume = 1.704 af Average Runoff Depth = 3.28"**
**100.00% Pervious = 6.234 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment EDA-1: EDA-1

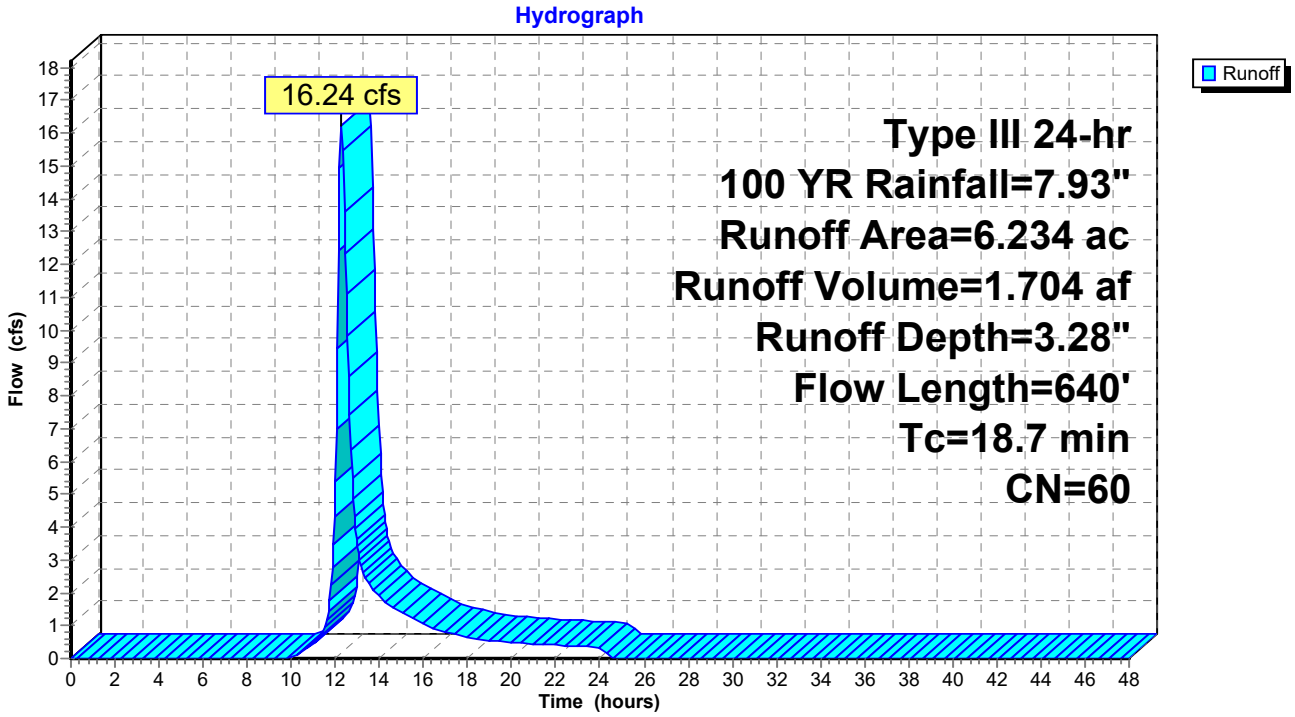
Runoff = 16.24 cfs @ 12.27 hrs, Volume= 1.704 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.93"

| Area (ac) | CN | Description |
|---|---|---|
| 0.193 | 35 | Brush, Fair, HSG A |
| 5.107 | 56 | Brush, Fair, HSG B |
| 0.046 | 70 | Brush, Fair, HSG C |
| 0.372 | 77 | Brush, Fair, HSG D |
| 0.062 | 96 | Gravel surface, HSG A |
| 0.424 | 96 | Gravel surface, HSG B |
| 0.030 | 96 | Gravel surface, HSG C |
| 6.234 | 60 | Weighted Average |
| 6.234 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.2 | 36 | 0.3060 | 0.19 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 9.1 | 64 | 0.0100 | 0.12 | | **Sheet Flow, B-C**<br>Grass: Short n= 0.150 P2= 3.18" |
| 1.1 | 125 | 0.0160 | 1.90 | | **Shallow Concentrated Flow, C-D**<br>Grassed Waterway Kv= 15.0 fps |
| 0.1 | 30 | 0.0150 | 5.56 | 4.36 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 Corrugated PE, smooth interior |
| 5.2 | 385 | 0.0307 | 1.23 | | **Shallow Concentrated Flow, E-F**<br>Short Grass Pasture Kv= 7.0 fps |
| 18.7 | 640 | Total | | | |

## Subcatchment EDA-1: EDA-1

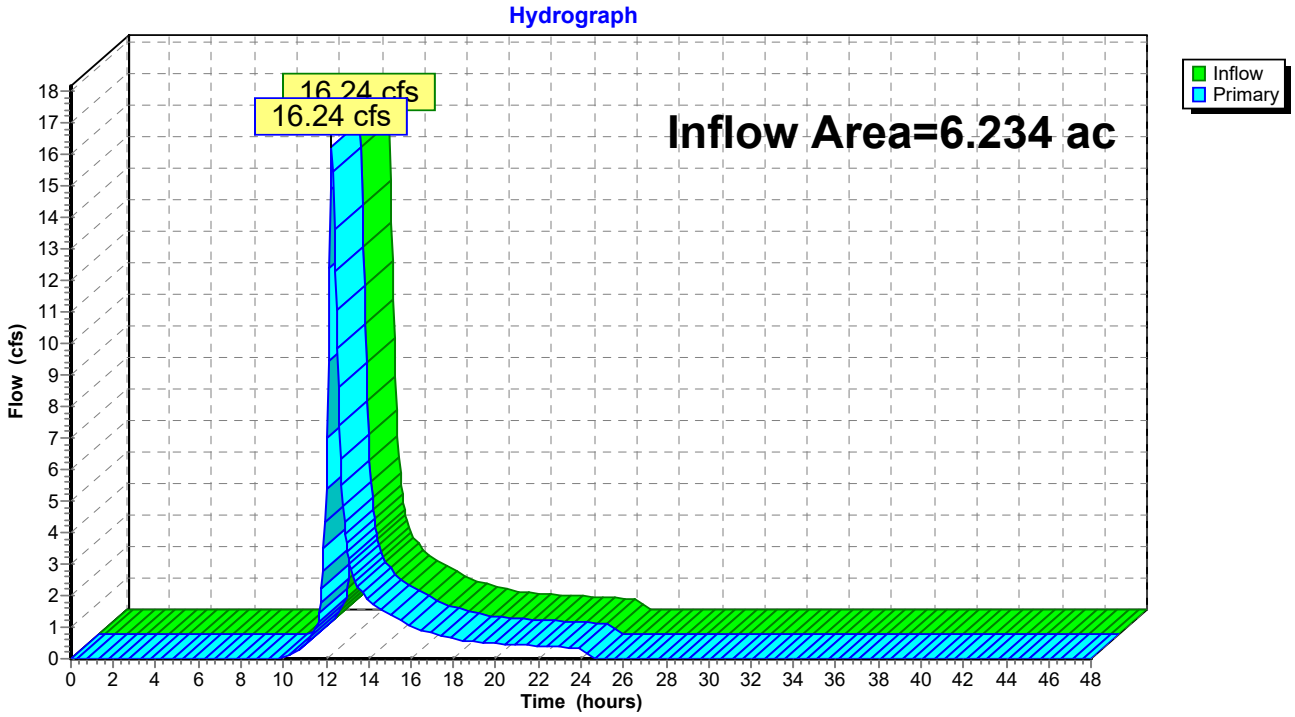


## Summary for Link AP-1: Wetlands

Inflow Area = 6.234 ac, 0.00% Impervious, Inflow Depth = 3.28" for 100 YR event
Inflow = 16.24 cfs @ 12.27 hrs, Volume= 1.704 af
Primary = 16.24 cfs @ 12.27 hrs, Volume= 1.704 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

## Link AP-1: Wetlands



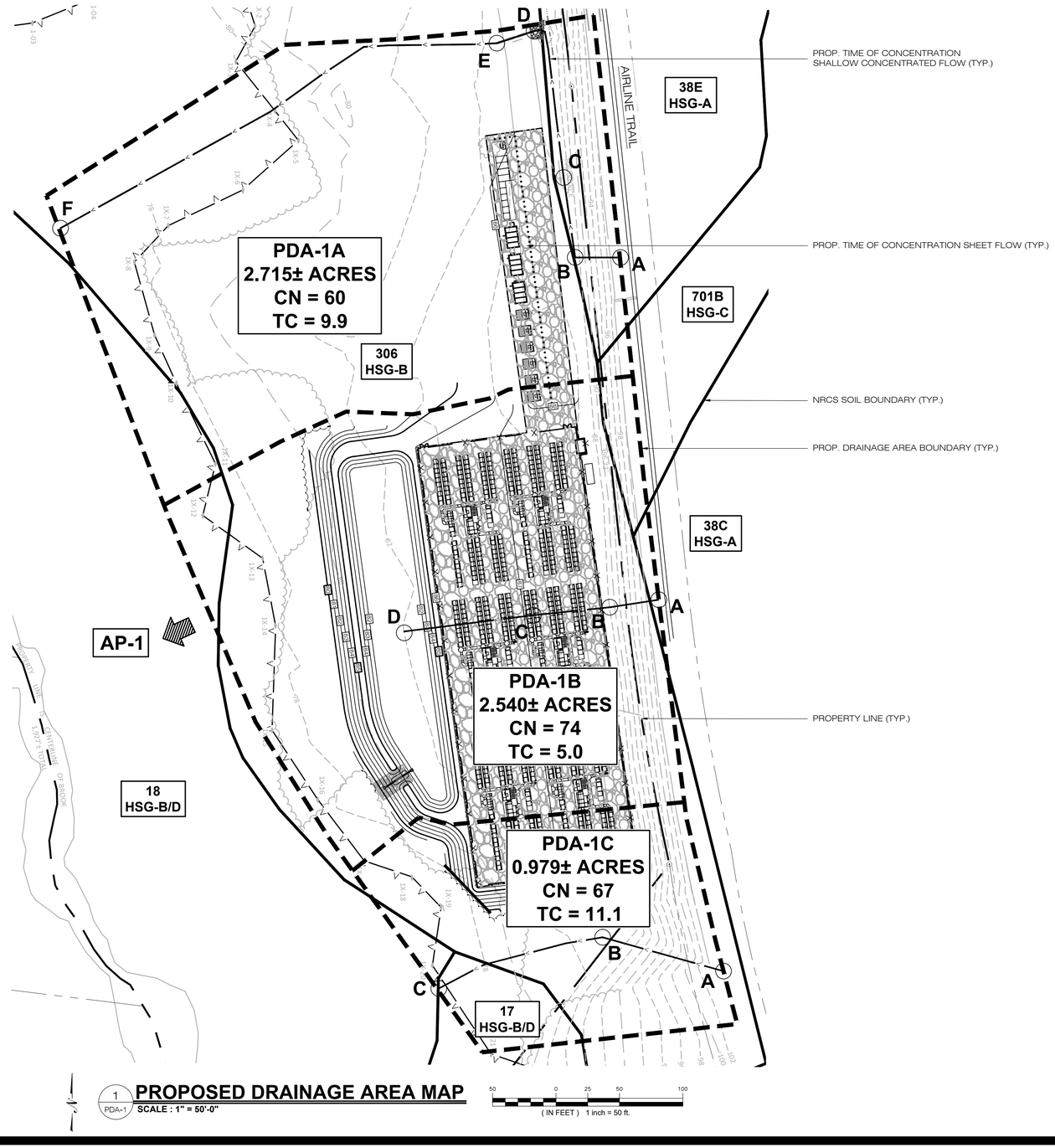
# APPENDIX D: PROPOSED DRAINAGE AREA MAP (PDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)

## PROPOSED DRAINAGE AREAS

| | TOTAL AREA (ACRES) | COMPOSITE CN | TC (MINS.) |
|---|---|---|---|
| PDA-1A | 2.715 | 60 | 18.7 |
| PDA-1B | 2.540 | 74 | 5.0 |
| PDA-1C | 0.979 | 67 | 11.1 |

## PROPOSED CONDITION PEAK FLOWS

| ANALYSIS POINT | 2-YEAR (CFS) | 25-YEAR (CFS) | 50-YEAR (CFS) | 100-YEAR (CFS) |
|---|---|---|---|---|
| AP-1 | 1.22 | 7.28 | 9.26 | 13.20 |




1 PDA-1 **PROPOSED DRAINAGE AREA MAP**

SCALE : 1" = 50'-0"


**ReNew DEVELOPERS, LLC**

14 CHESTNUT HILL ROAD
COLCHESTER, CT 06415
OFFICE: (860) 303-5726

ALL-POINTS TECHNOLOGY CORPORATION

567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935


**CSC PERMIT SET**

| NO | DATE | REVISION |
|---|---|---|
| 0 | 06/08/23 | INITIAL SUBMISSION: RCB |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

**DESIGN PROFESSIONAL OF RECORD**

PROF: ROBERT C. BURNS, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: RENEW DEVELOPERS, LLC
ADDRESS: 103 SOUTH MAIN ST. #734 COLCHESTER, CT 06415

**OLD AMSTON ROAD FUEL CELL POWER PLANT 2**

SITE ADDRESS: 42 OLD AMSTON ROAD COLCHESTER, CT 06415

APT FILING NUMBER: CT716130

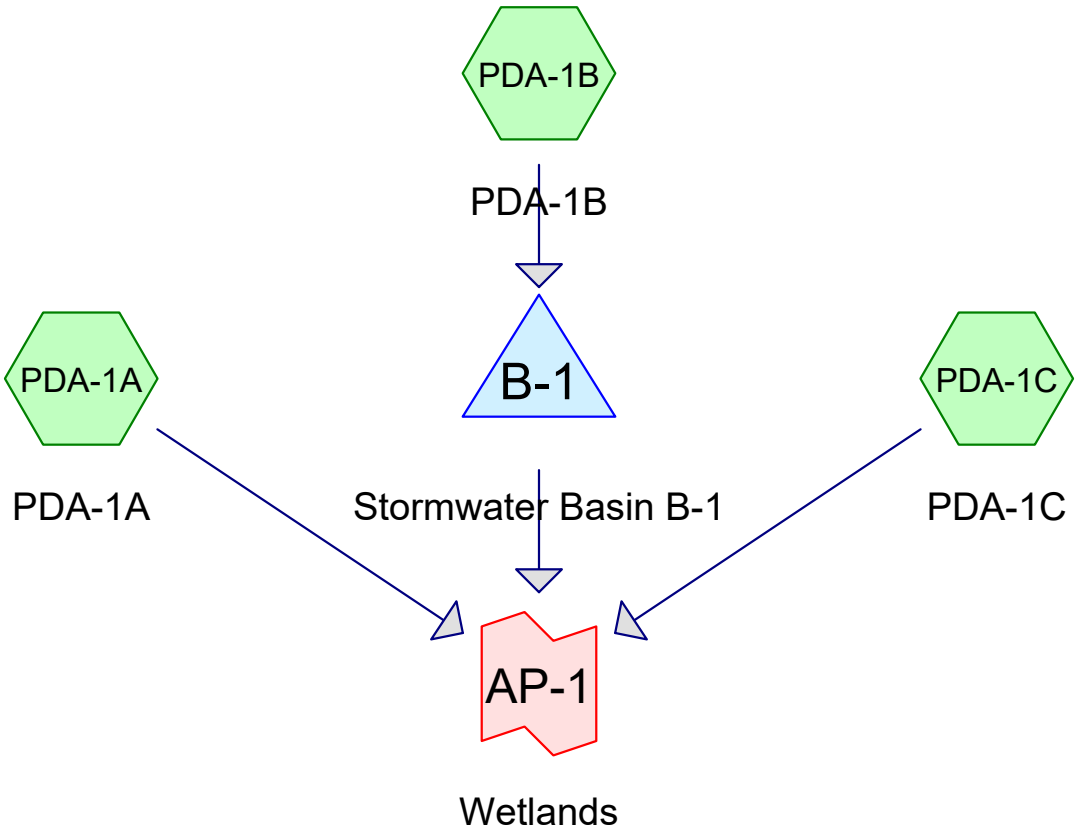
DRAWN BY: CSH
DATE: 06/08/23
CHECKED BY: RCB

SHEET TITLE:

**PROPOSED DRAINAGE AREA MAP**

SHEET NUMBER:

**PDA-1**




Subcat Reach Pond Link

**Routing Diagram for CT719130_Colchester_OldAmston2 - PR rev1**
Prepared by All-Points Technology Corporation, Printed 6/8/2023
HydroCAD® 10.00-26 s/n 07402 © 2020 HydroCAD Software Solutions LLC

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.958 | 61 | >75% Grass cover, Good, HSG B (PDA-1A, PDA-1B, PDA-1C) |
| 0.193 | 35 | Brush, Fair, HSG A (PDA-1A, PDA-1B) |
| 3.220 | 56 | Brush, Fair, HSG B (PDA-1A, PDA-1B, PDA-1C) |
| 0.046 | 70 | Brush, Fair, HSG C (PDA-1A, PDA-1B) |
| 0.373 | 77 | Brush, Fair, HSG D (PDA-1A, PDA-1B, PDA-1C) |
| 0.062 | 96 | Gravel surface, HSG A (PDA-1A, PDA-1B) |
| 1.352 | 96 | Gravel surface, HSG B (PDA-1A, PDA-1B, PDA-1C) |
| 0.030 | 96 | Gravel surface, HSG C (PDA-1A, PDA-1B) |
| **6.234** | **67** | **TOTAL AREA** |

## Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.255 | HSG A | PDA-1A, PDA-1B |
| 5.530 | HSG B | PDA-1A, PDA-1B, PDA-1C |
| 0.076 | HSG C | PDA-1A, PDA-1B |
| 0.373 | HSG D | PDA-1A, PDA-1B, PDA-1C |
| 0.000 | Other | |
| **6.234** | | **TOTAL AREA** |

## Ground Covers (all nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|---|---|---|---|---|---|---|---|
| 0.000 | 0.958 | 0.000 | 0.000 | 0.000 | 0.958 | >75% Grass cover, Good | PDA-1A, PDA-1B, PDA-1C |
| 0.193 | 3.220 | 0.046 | 0.373 | 0.000 | 3.832 | Brush, Fair | PDA-1A, PDA-1B, PDA-1C |
| 0.062 | 1.352 | 0.030 | 0.000 | 0.000 | 1.444 | Gravel surface | PDA-1A, PDA-1B, PDA-1C |
| **0.255** | **5.530** | **0.076** | **0.373** | **0.000** | **6.234** | **TOTAL AREA** | |

## Pipe Listing (all nodes)

| Line# | Node Number | In-Invert (feet) | Out-Invert (feet) | Length (feet) | Slope (ft/ft) | n | Diam/Width (inches) | Height (inches) | Inside-Fill (inches) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | PDA-1A | 0.00 | 0.00 | 30.0 | 0.0150 | 0.013 | 12.0 | 0.0 | 0.0 |
| 2 | B-1 | 81.00 | 80.75 | 24.0 | 0.0104 | 0.013 | 12.0 | 0.0 | 0.0 |

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment PDA-1A: PDA-1A** Runoff Area=2.715 ac 0.00% Impervious Runoff Depth=0.49"
Flow Length=640' Tc=18.7 min CN=60 Runoff=0.73 cfs 0.112 af

**Subcatchment PDA-1B: PDA-1B** Runoff Area=2.540 ac 0.00% Impervious Runoff Depth=1.18"
Flow Length=213' Tc=5.0 min CN=74 Runoff=3.38 cfs 0.249 af

**Subcatchment PDA-1C: PDA-1C** Runoff Area=0.979 ac 0.00% Impervious Runoff Depth=0.80"
Flow Length=236' Tc=11.1 min CN=67 Runoff=0.65 cfs 0.065 af

**Pond B-1: Stormwater Basin B-1** Peak Elev=82.65' Storage=6,952 cf Inflow=3.38 cfs 0.249 af
Outflow=0.18 cfs 0.126 af

**Link AP-1: Wetlands** Inflow=1.22 cfs 0.303 af
Primary=1.22 cfs 0.303 af

**Total Runoff Area = 6.234 ac Runoff Volume = 0.426 af Average Runoff Depth = 0.82"**
**100.00% Pervious = 6.234 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment PDA-1A: PDA-1A

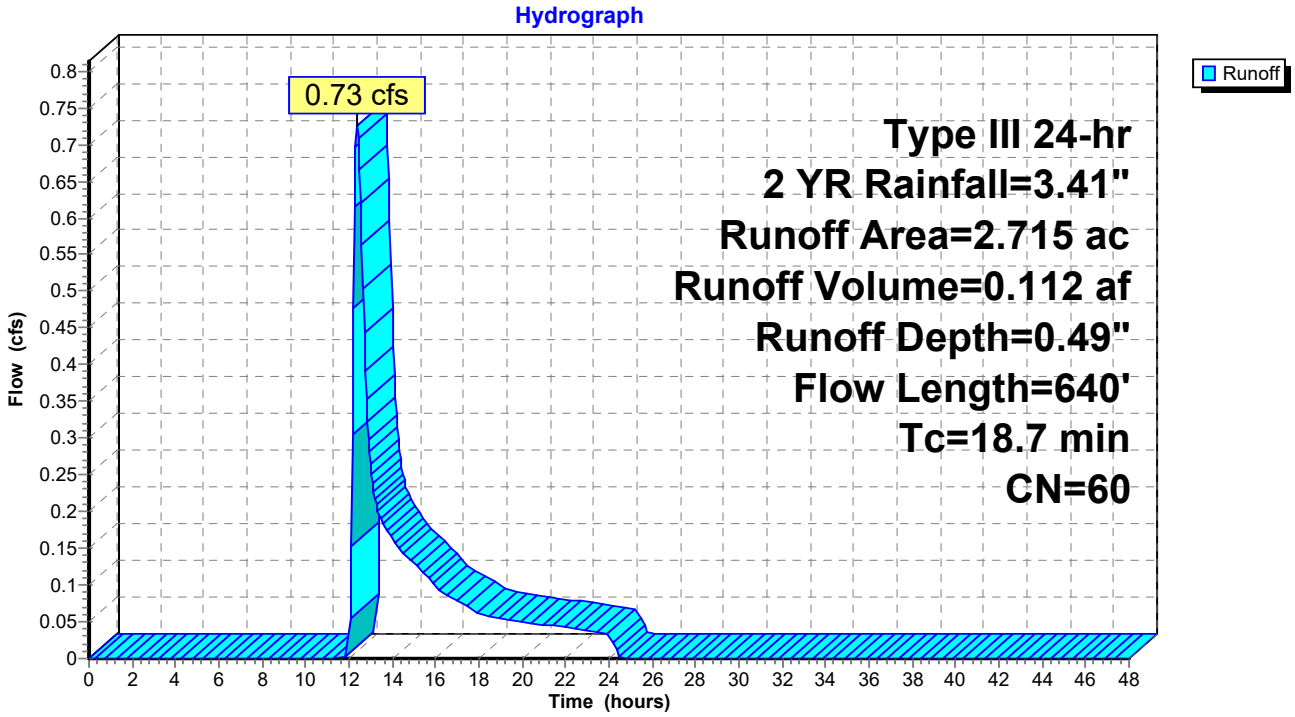
Runoff = 0.73 cfs @ 12.37 hrs, Volume= 0.112 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.41"

| Area (ac) | CN | Description |
|---|---|---|
| 0.191 | 35 | Brush, Fair, HSG A |
| 1.953 | 56 | Brush, Fair, HSG B |
| 0.009 | 70 | Brush, Fair, HSG C |
| 0.145 | 77 | Brush, Fair, HSG D |
| 0.044 | 96 | Gravel surface, HSG A |
| 0.235 | 96 | Gravel surface, HSG B |
| 0.007 | 96 | Gravel surface, HSG C |
| 0.131 | 61 | >75% Grass cover, Good, HSG B |
| 2.715 | 60 | Weighted Average |
| 2.715 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.2 | 36 | 0.3060 | 0.19 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 9.1 | 64 | 0.0100 | 0.12 | | **Sheet Flow, B-C**<br>Grass: Short n= 0.150 P2= 3.18" |
| 1.1 | 125 | 0.0160 | 1.90 | | **Shallow Concentrated Flow, C-D**<br>Grassed Waterway Kv= 15.0 fps |
| 0.1 | 30 | 0.0150 | 5.56 | 4.36 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 |
| 5.2 | 385 | 0.0307 | 1.23 | | **Shallow Concentrated Flow, E-F**<br>Short Grass Pasture Kv= 7.0 fps |
| 18.7 | 640 | Total | | | |

## Subcatchment PDA-1A: PDA-1A



## Summary for Subcatchment PDA-1B: PDA-1B

[49] Hint: Tc<2dt may require smaller dt

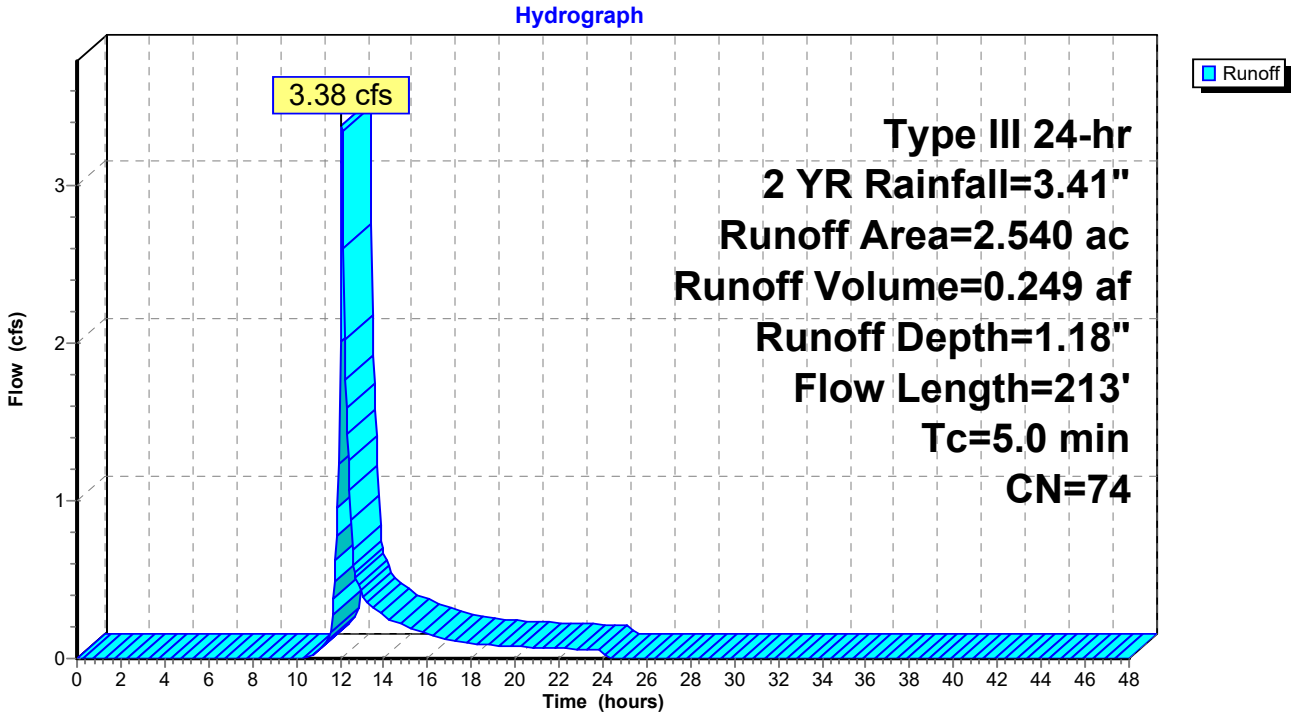
Runoff = 3.38 cfs @ 12.09 hrs, Volume= 0.249 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.41"

| Area (ac) | CN | Description |
|---|---|---|
| 0.002 | 35 | Brush, Fair, HSG A |
| 0.700 | 56 | Brush, Fair, HSG B |
| 0.037 | 70 | Brush, Fair, HSG C |
| 0.077 | 77 | Brush, Fair, HSG D |
| 0.018 | 96 | Gravel surface, HSG A |
| 0.942 | 96 | Gravel surface, HSG B |
| 0.023 | 96 | Gravel surface, HSG C |
| 0.741 | 61 | >75% Grass cover, Good, HSG B |
| 2.540 | 74 | Weighted Average |
| 2.540 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.5 | 40 | 0.3060 | 0.19 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18" |
| 0.7 | 60 | 0.0333 | 1.52 | | **Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.18" |
| 0.5 | 73 | 0.0270 | 2.65 | | **Shallow Concentrated Flow, C-D** Unpaved Kv= 16.1 fps |
| 0.3 | 40 | 0.1200 | 2.42 | | **Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps |
| 5.0 | 213 | Total | | | |

## Subcatchment PDA-1B: PDA-1B



## Summary for Subcatchment PDA-1C: PDA-1C

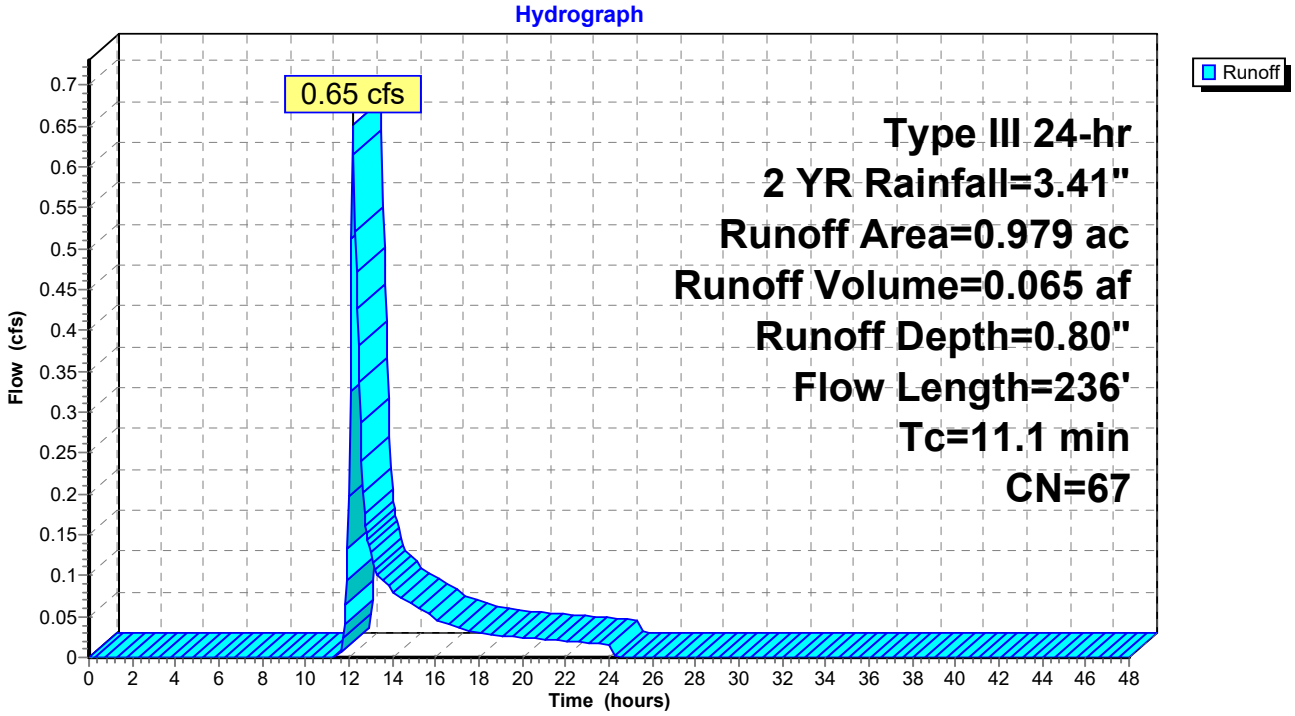
Runoff = 0.65 cfs @ 12.18 hrs, Volume= 0.065 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.41"

| Area (ac) | CN | Description |
|---|---|---|
| 0.567 | 56 | Brush, Fair, HSG B |
| 0.151 | 77 | Brush, Fair, HSG D |
| 0.175 | 96 | Gravel surface, HSG B |
| 0.086 | 61 | >75% Grass cover, Good, HSG B |
| 0.979 | 67 | Weighted Average |
| 0.979 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 8.4 | 100 | 0.2100 | 0.20 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 2.7 | 136 | 0.0290 | 0.85 | | **Shallow Concentrated Flow, B-C**<br>Woodland Kv= 5.0 fps |
| 11.1 | 236 | Total | | | |

## Subcatchment PDA-1C: PDA-1C



## Summary for Pond B-1: Stormwater Basin B-1

Inflow Area = 2.540 ac, 0.00% Impervious, Inflow Depth = 1.18" for 2 YR event
Inflow = 3.38 cfs @ 12.09 hrs, Volume= 0.249 af
Outflow = 0.18 cfs @ 15.49 hrs, Volume= 0.126 af, Atten= 95%, Lag= 204.2 min
Primary = 0.18 cfs @ 15.49 hrs, Volume= 0.126 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 82.65' @ 15.49 hrs Surf.Area= 11,330 sf Storage= 6,952 cf

Plug-Flow detention time= 433.5 min calculated for 0.126 af (51% of inflow)
Center-of-Mass det. time= 306.8 min ( 1,164.0 - 857.2 )

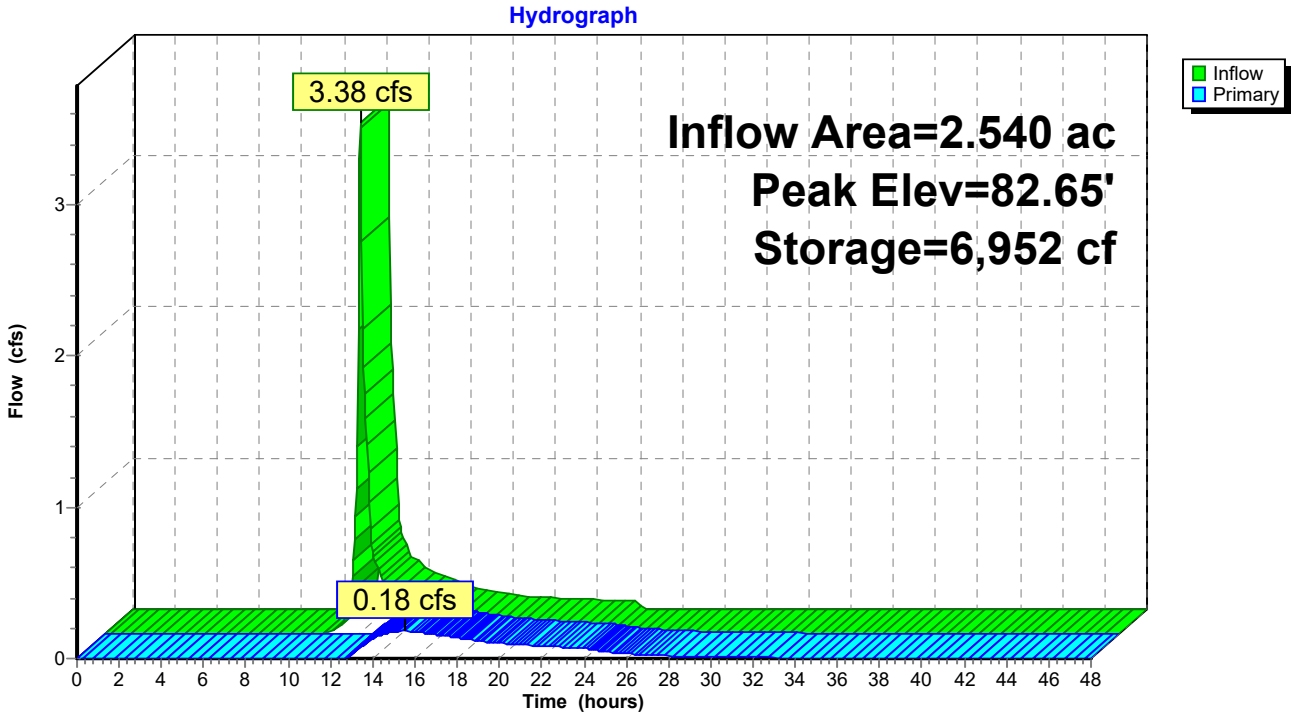
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 82.00' | 38,751 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 82.00 | 10,184 | 590.0 | 0 | 0 | 10,184 |
| 83.00 | 11,982 | 608.0 | 11,071 | 11,071 | 12,002 |
| 84.00 | 13,837 | 627.0 | 12,898 | 23,969 | 13,968 |
| 85.00 | 15,748 | 646.0 | 14,782 | 38,751 | 15,996 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 83.50' | **6.0' long x 14.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.64 2.67 2.70 2.65 2.64 2.65 2.65 2.63 |
| #2 | Primary | 81.00' | **12.0" Round Culvert**<br>L= 24.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 81.00' / 80.75' S= 0.0104 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 82.50' | **12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 2 | 83.50' | **12.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.18 cfs @ 15.49 hrs HW=82.65' TW=0.00' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)
- **2=Culvert** (Passes 0.18 cfs of 3.57 cfs potential flow)
  - **3=Orifice/Grate** (Orifice Controls 0.18 cfs @ 1.23 fps)
  - **4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond B-1: Stormwater Basin B-1

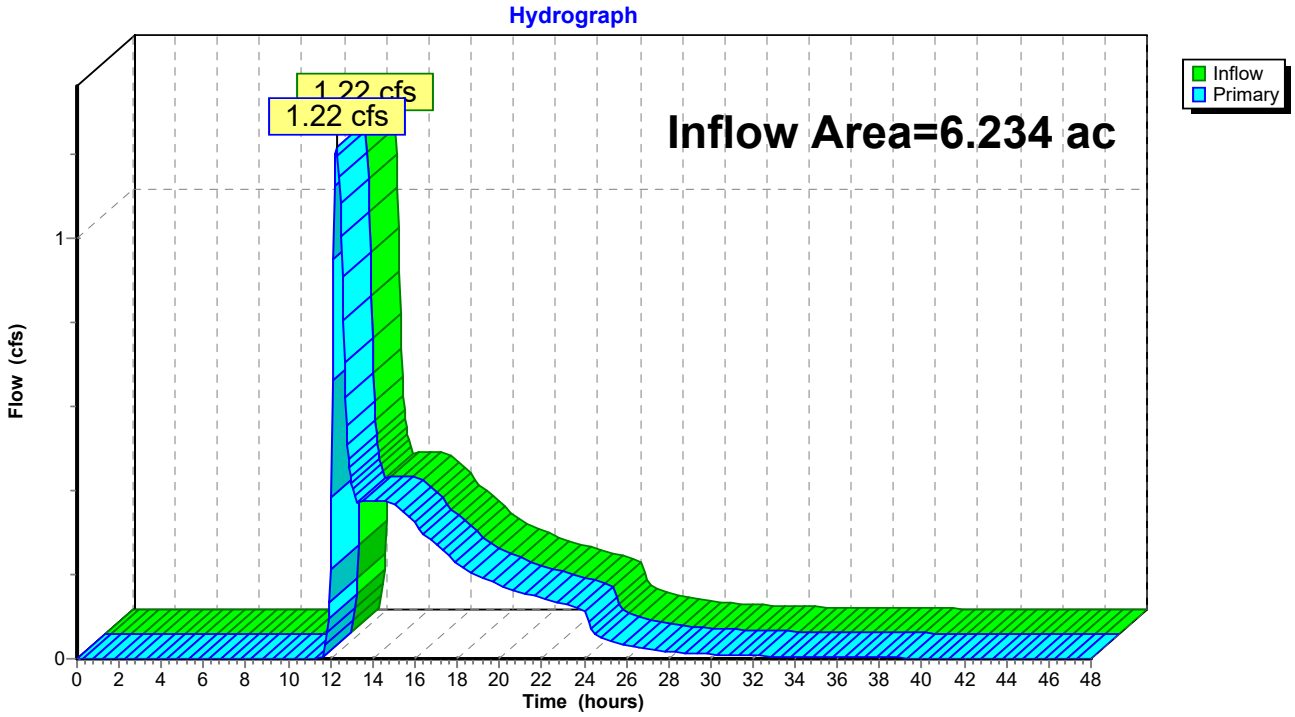


## Summary for Link AP-1: Wetlands

Inflow Area = 6.234 ac, 0.00% Impervious, Inflow Depth > 0.58" for 2 YR event
Inflow = 1.22 cfs @ 12.30 hrs, Volume= 0.303 af
Primary = 1.22 cfs @ 12.30 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

## Link AP-1: Wetlands



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment PDA-1A: PDA-1A** Runoff Area=2.715 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=640' Tc=18.7 min CN=60 Runoff=4.33 cfs 0.472 af

**Subcatchment PDA-1B: PDA-1B** Runoff Area=2.540 ac 0.00% Impervious Runoff Depth=3.40"
Flow Length=213' Tc=5.0 min CN=74 Runoff=10.12 cfs 0.719 af

**Subcatchment PDA-1C: PDA-1C** Runoff Area=0.979 ac 0.00% Impervious Runoff Depth=2.72"
Flow Length=236' Tc=11.1 min CN=67 Runoff=2.58 cfs 0.222 af

**Pond B-1: Stormwater Basin B-1** Peak Elev=83.39' Storage=15,925 cf Inflow=10.12 cfs 0.719 af
Outflow=1.05 cfs 0.596 af

**Link AP-1: Wetlands** Inflow=7.28 cfs 1.290 af
Primary=7.28 cfs 1.290 af

**Total Runoff Area = 6.234 ac Runoff Volume = 1.413 af Average Runoff Depth = 2.72"**
**100.00% Pervious = 6.234 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment PDA-1A: PDA-1A

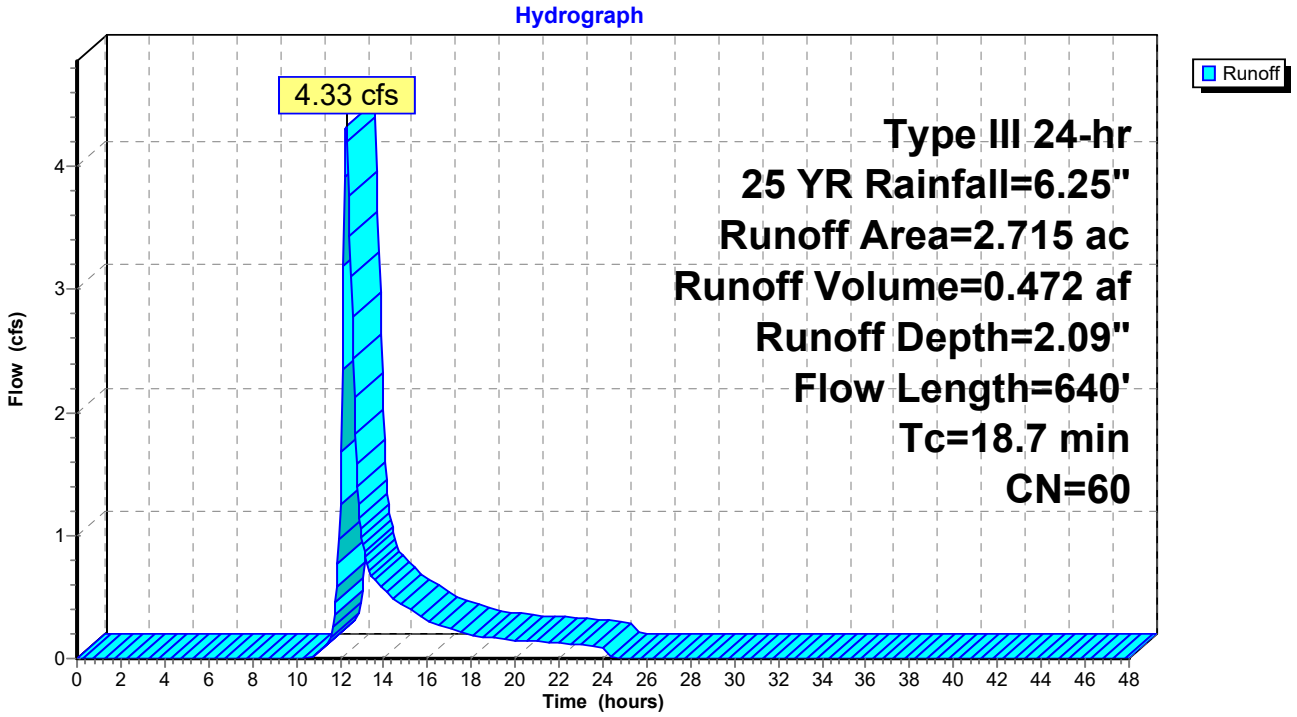
Runoff = 4.33 cfs @ 12.28 hrs, Volume= 0.472 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.25"

| Area (ac) | CN | Description |
|---|---|---|
| 0.191 | 35 | Brush, Fair, HSG A |
| 1.953 | 56 | Brush, Fair, HSG B |
| 0.009 | 70 | Brush, Fair, HSG C |
| 0.145 | 77 | Brush, Fair, HSG D |
| 0.044 | 96 | Gravel surface, HSG A |
| 0.235 | 96 | Gravel surface, HSG B |
| 0.007 | 96 | Gravel surface, HSG C |
| 0.131 | 61 | >75% Grass cover, Good, HSG B |
| 2.715 | 60 | Weighted Average |
| 2.715 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.2 | 36 | 0.3060 | 0.19 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 9.1 | 64 | 0.0100 | 0.12 | | **Sheet Flow, B-C**<br>Grass: Short n= 0.150 P2= 3.18" |
| 1.1 | 125 | 0.0160 | 1.90 | | **Shallow Concentrated Flow, C-D**<br>Grassed Waterway Kv= 15.0 fps |
| 0.1 | 30 | 0.0150 | 5.56 | 4.36 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 |
| 5.2 | 385 | 0.0307 | 1.23 | | **Shallow Concentrated Flow, E-F**<br>Short Grass Pasture Kv= 7.0 fps |
| 18.7 | 640 | Total | | | |

## Subcatchment PDA-1A: PDA-1A



## Summary for Subcatchment PDA-1B: PDA-1B

[49] Hint: Tc<2dt may require smaller dt

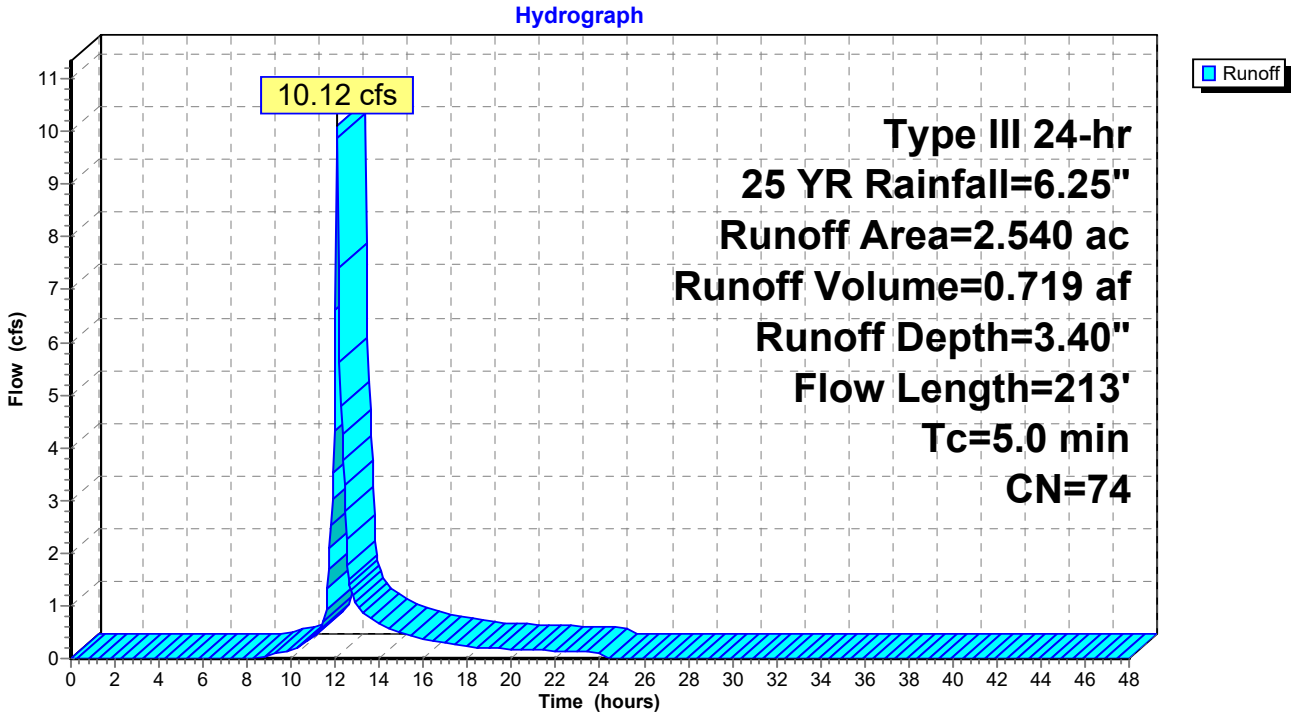
Runoff = 10.12 cfs @ 12.08 hrs, Volume= 0.719 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.25"

| Area (ac) | CN | Description |
|---|---|---|
| 0.002 | 35 | Brush, Fair, HSG A |
| 0.700 | 56 | Brush, Fair, HSG B |
| 0.037 | 70 | Brush, Fair, HSG C |
| 0.077 | 77 | Brush, Fair, HSG D |
| 0.018 | 96 | Gravel surface, HSG A |
| 0.942 | 96 | Gravel surface, HSG B |
| 0.023 | 96 | Gravel surface, HSG C |
| 0.741 | 61 | >75% Grass cover, Good, HSG B |
| 2.540 | 74 | Weighted Average |
| 2.540 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.5 | 40 | 0.3060 | 0.19 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18" |
| 0.7 | 60 | 0.0333 | 1.52 | | **Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.18" |
| 0.5 | 73 | 0.0270 | 2.65 | | **Shallow Concentrated Flow, C-D** Unpaved Kv= 16.1 fps |
| 0.3 | 40 | 0.1200 | 2.42 | | **Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps |
| 5.0 | 213 | Total | | | |

## Subcatchment PDA-1B: PDA-1B



## Summary for Subcatchment PDA-1C: PDA-1C

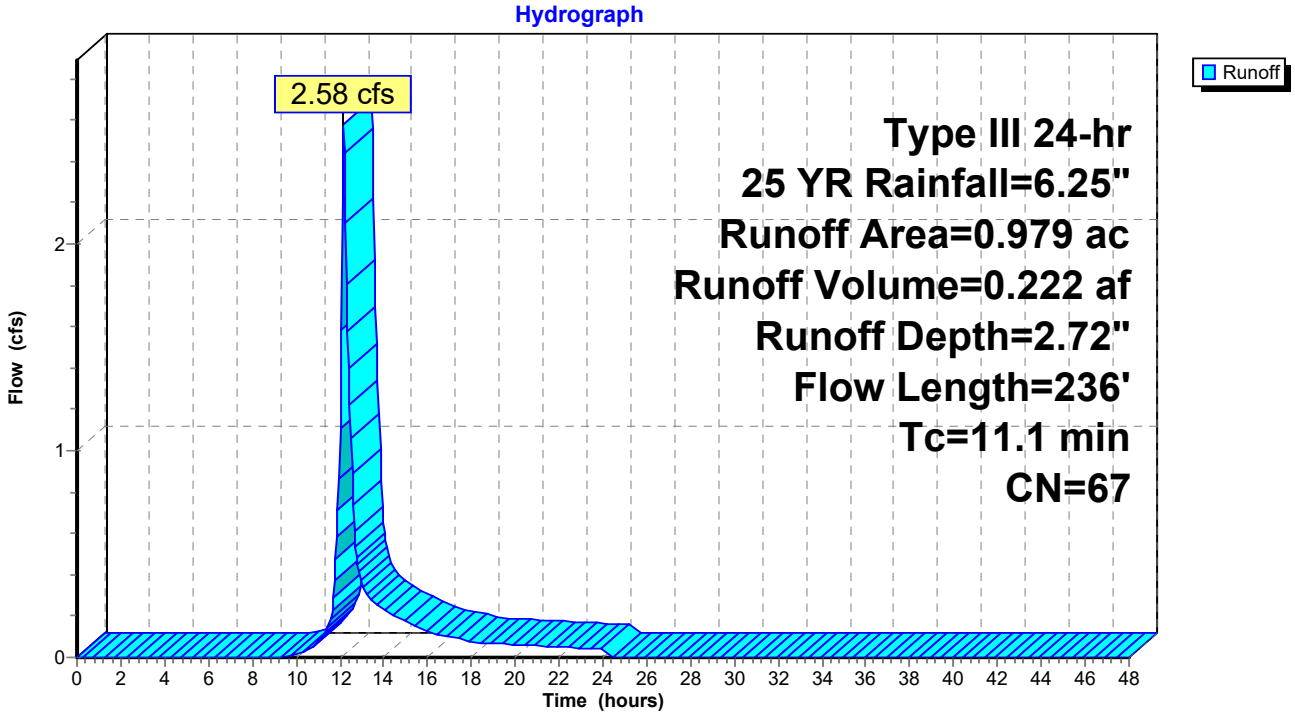
Runoff = 2.58 cfs @ 12.16 hrs, Volume= 0.222 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.25"

| Area (ac) | CN | Description |
|---|---|---|
| 0.567 | 56 | Brush, Fair, HSG B |
| 0.151 | 77 | Brush, Fair, HSG D |
| 0.175 | 96 | Gravel surface, HSG B |
| 0.086 | 61 | >75% Grass cover, Good, HSG B |
| 0.979 | 67 | Weighted Average |
| 0.979 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 8.4 | 100 | 0.2100 | 0.20 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 2.7 | 136 | 0.0290 | 0.85 | | **Shallow Concentrated Flow, B-C**<br>Woodland Kv= 5.0 fps |
| 11.1 | 236 | Total | | | |

## Subcatchment PDA-1C: PDA-1C



## Summary for Pond B-1: Stormwater Basin B-1

Inflow Area = 2.540 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25 YR event
Inflow = 10.12 cfs @ 12.08 hrs, Volume= 0.719 af
Outflow = 1.05 cfs @ 12.95 hrs, Volume= 0.596 af, Atten= 90%, Lag= 52.3 min
Primary = 1.05 cfs @ 12.95 hrs, Volume= 0.596 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.39' @ 12.95 hrs Surf.Area= 12,696 sf Storage= 15,925 cf

Plug-Flow detention time= 248.1 min calculated for 0.595 af (83% of inflow)
Center-of-Mass det. time= 178.9 min ( 1,004.9 - 826.0 )

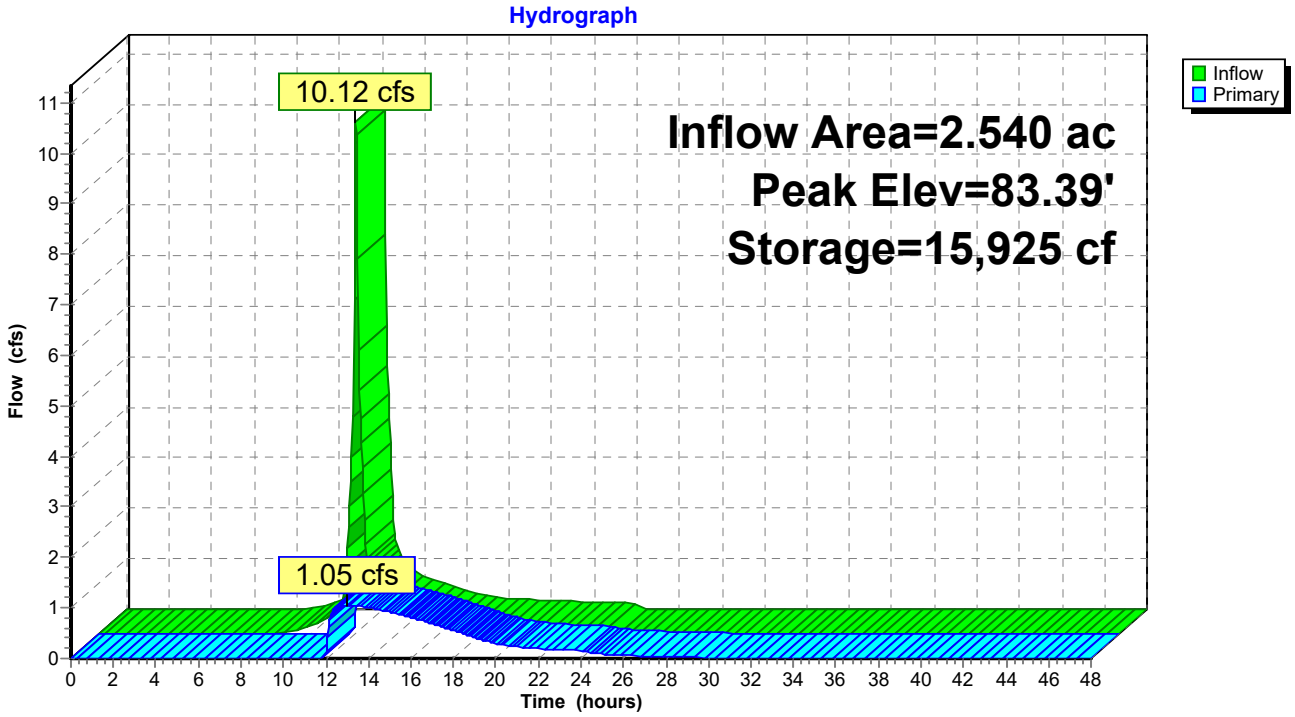
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 82.00' | 38,751 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 82.00 | 10,184 | 590.0 | 0 | 0 | 10,184 |
| 83.00 | 11,982 | 608.0 | 11,071 | 11,071 | 12,002 |
| 84.00 | 13,837 | 627.0 | 12,898 | 23,969 | 13,968 |
| 85.00 | 15,748 | 646.0 | 14,782 | 38,751 | 15,996 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 83.50' | **6.0' long x 14.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.64 2.67 2.70 2.65 2.64 2.65 2.65 2.63 |
| #2 | Primary | 81.00' | **12.0" Round Culvert**<br>L= 24.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 81.00' / 80.75' S= 0.0104 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 82.50' | **12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 2 | 83.50' | **12.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=1.05 cfs @ 12.95 hrs HW=83.39' TW=0.00' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)
- **2=Culvert** (Passes 1.05 cfs of 4.59 cfs potential flow)
  - **3=Orifice/Grate** (Orifice Controls 1.05 cfs @ 4.22 fps)
  - **4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond B-1: Stormwater Basin B-1

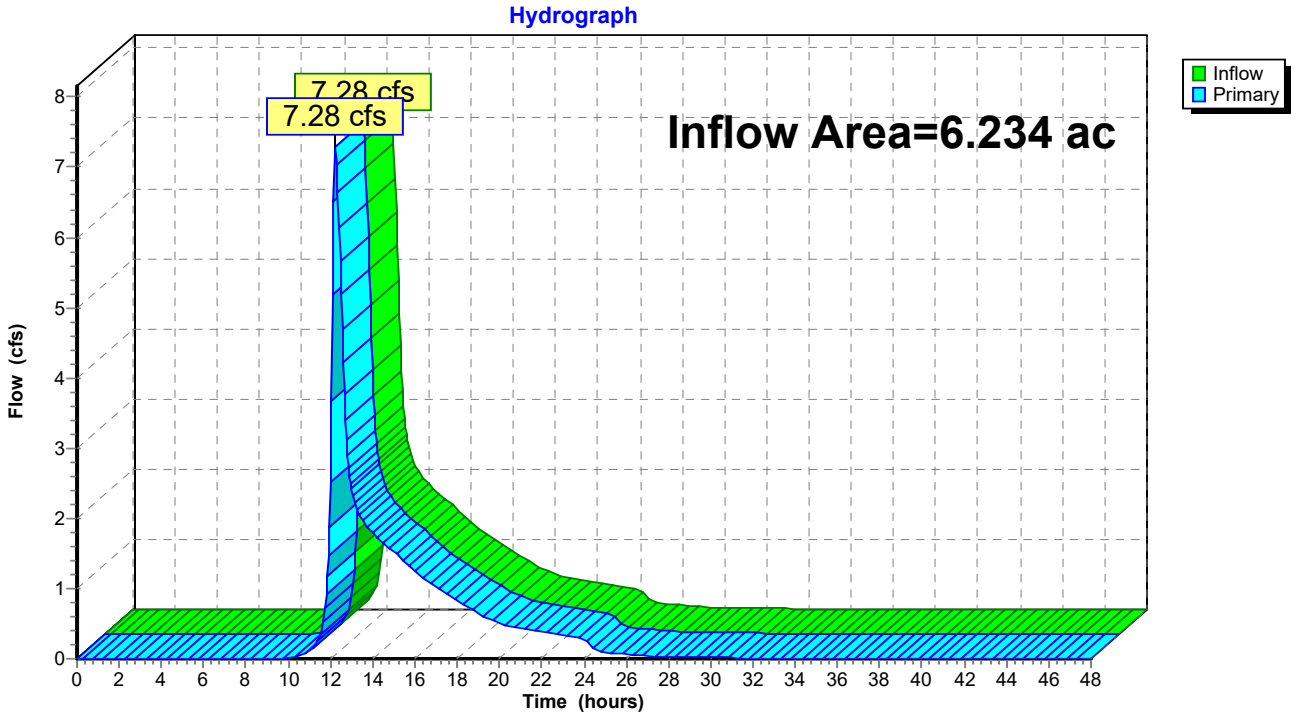


## Summary for Link AP-1: Wetlands

Inflow Area = 6.234 ac, 0.00% Impervious, Inflow Depth > 2.48" for 25 YR event
Inflow = 7.28 cfs @ 12.24 hrs, Volume= 1.290 af
Primary = 7.28 cfs @ 12.24 hrs, Volume= 1.290 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

## Link AP-1: Wetlands



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment PDA-1A: PDA-1A** Runoff Area=2.715 ac 0.00% Impervious Runoff Depth=2.65"
Flow Length=640' Tc=18.7 min CN=60 Runoff=5.63 cfs 0.599 af

**Subcatchment PDA-1B: PDA-1B** Runoff Area=2.540 ac 0.00% Impervious Runoff Depth=4.09"
Flow Length=213' Tc=5.0 min CN=74 Runoff=12.19 cfs 0.867 af

**Subcatchment PDA-1C: PDA-1C** Runoff Area=0.979 ac 0.00% Impervious Runoff Depth=3.35"
Flow Length=236' Tc=11.1 min CN=67 Runoff=3.21 cfs 0.274 af

**Pond B-1: Stormwater Basin B-1** Peak Elev=83.61' Storage=18,672 cf Inflow=12.19 cfs 0.867 af
Outflow=2.10 cfs 0.744 af

**Link AP-1: Wetlands** Inflow=9.26 cfs 1.616 af
Primary=9.26 cfs 1.616 af

**Total Runoff Area = 6.234 ac Runoff Volume = 1.739 af Average Runoff Depth = 3.35"**
**100.00% Pervious = 6.234 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment PDA-1A: PDA-1A

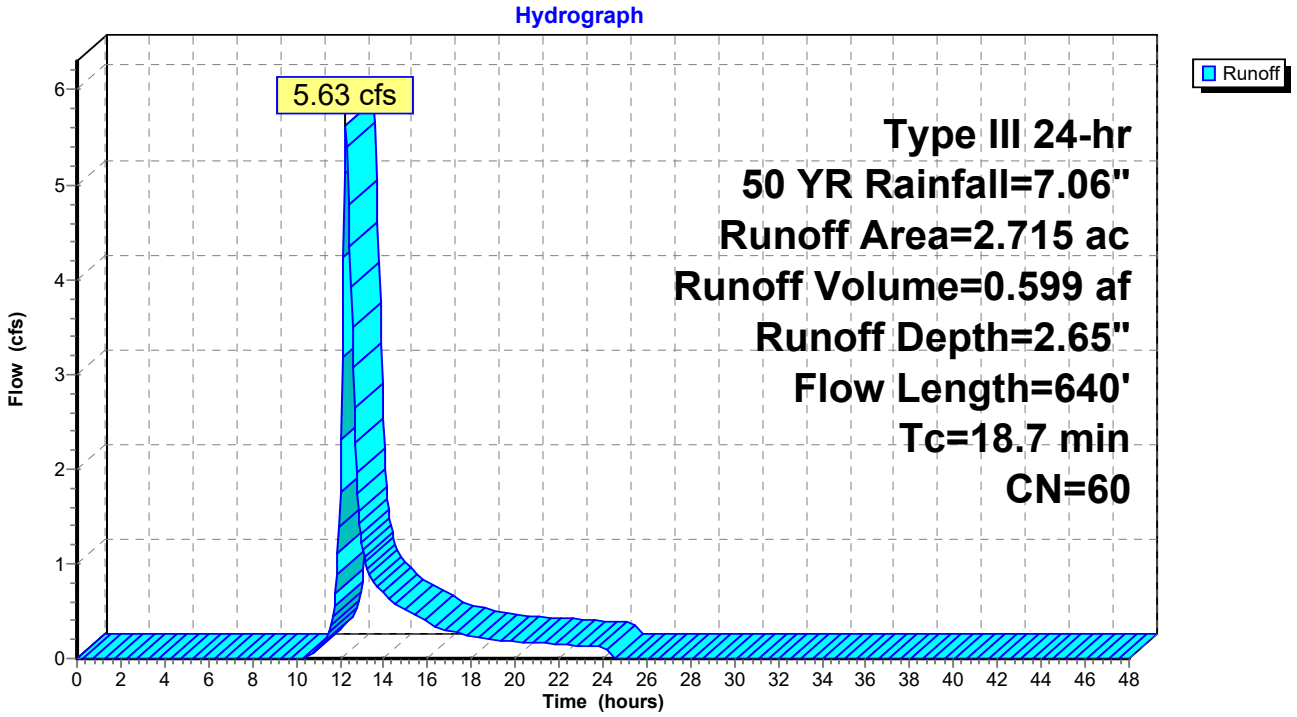
Runoff = 5.63 cfs @ 12.27 hrs, Volume= 0.599 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=7.06"

| Area (ac) | CN | Description |
|---|---|---|
| 0.191 | 35 | Brush, Fair, HSG A |
| 1.953 | 56 | Brush, Fair, HSG B |
| 0.009 | 70 | Brush, Fair, HSG C |
| 0.145 | 77 | Brush, Fair, HSG D |
| 0.044 | 96 | Gravel surface, HSG A |
| 0.235 | 96 | Gravel surface, HSG B |
| 0.007 | 96 | Gravel surface, HSG C |
| 0.131 | 61 | >75% Grass cover, Good, HSG B |
| 2.715 | 60 | Weighted Average |
| 2.715 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.2 | 36 | 0.3060 | 0.19 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 9.1 | 64 | 0.0100 | 0.12 | | **Sheet Flow, B-C**<br>Grass: Short n= 0.150 P2= 3.18" |
| 1.1 | 125 | 0.0160 | 1.90 | | **Shallow Concentrated Flow, C-D**<br>Grassed Waterway Kv= 15.0 fps |
| 0.1 | 30 | 0.0150 | 5.56 | 4.36 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 |
| 5.2 | 385 | 0.0307 | 1.23 | | **Shallow Concentrated Flow, E-F**<br>Short Grass Pasture Kv= 7.0 fps |
| 18.7 | 640 | Total | | | |

## Subcatchment PDA-1A: PDA-1A



## Summary for Subcatchment PDA-1B: PDA-1B

[49] Hint: Tc<2dt may require smaller dt

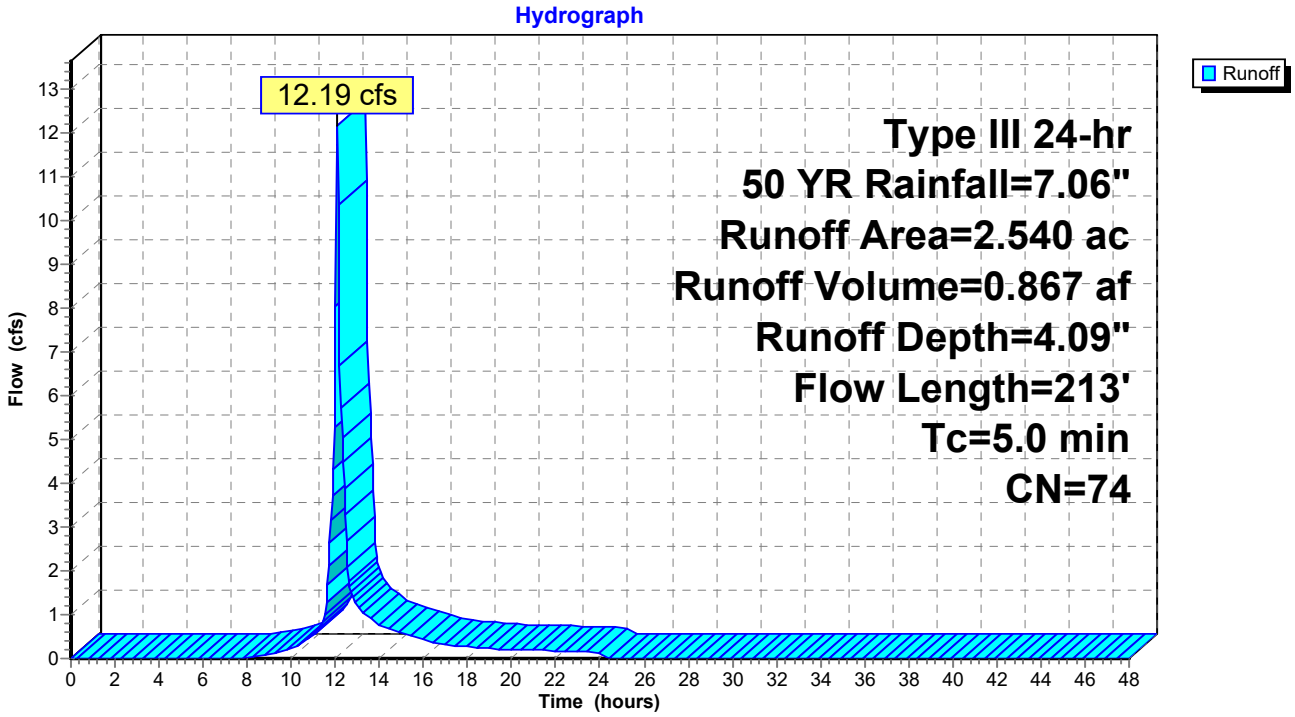
Runoff = 12.19 cfs @ 12.08 hrs, Volume= 0.867 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=7.06"

| Area (ac) | CN | Description |
|---|---|---|
| 0.002 | 35 | Brush, Fair, HSG A |
| 0.700 | 56 | Brush, Fair, HSG B |
| 0.037 | 70 | Brush, Fair, HSG C |
| 0.077 | 77 | Brush, Fair, HSG D |
| 0.018 | 96 | Gravel surface, HSG A |
| 0.942 | 96 | Gravel surface, HSG B |
| 0.023 | 96 | Gravel surface, HSG C |
| 0.741 | 61 | >75% Grass cover, Good, HSG B |
| 2.540 | 74 | Weighted Average |
| 2.540 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.5 | 40 | 0.3060 | 0.19 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18" |
| 0.7 | 60 | 0.0333 | 1.52 | | **Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.18" |
| 0.5 | 73 | 0.0270 | 2.65 | | **Shallow Concentrated Flow, C-D** Unpaved Kv= 16.1 fps |
| 0.3 | 40 | 0.1200 | 2.42 | | **Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps |
| 5.0 | 213 | Total | | | |

## Subcatchment PDA-1B: PDA-1B



## Summary for Subcatchment PDA-1C: PDA-1C

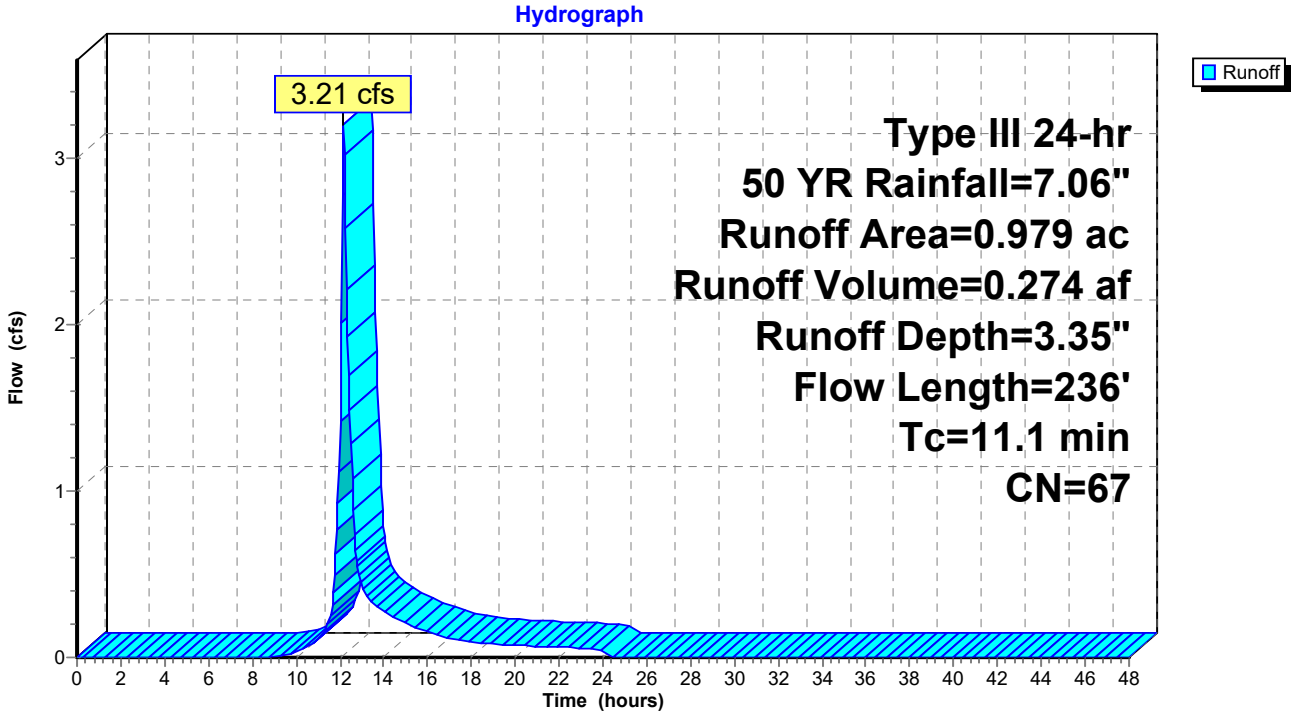
Runoff = 3.21 cfs @ 12.16 hrs, Volume= 0.274 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=7.06"

| Area (ac) | CN | Description |
|---|---|---|
| 0.567 | 56 | Brush, Fair, HSG B |
| 0.151 | 77 | Brush, Fair, HSG D |
| 0.175 | 96 | Gravel surface, HSG B |
| 0.086 | 61 | >75% Grass cover, Good, HSG B |
| 0.979 | 67 | Weighted Average |
| 0.979 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 8.4 | 100 | 0.2100 | 0.20 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 2.7 | 136 | 0.0290 | 0.85 | | **Shallow Concentrated Flow, B-C**<br>Woodland Kv= 5.0 fps |
| 11.1 | 236 | Total | | | |

## Subcatchment PDA-1C: PDA-1C



## Summary for Pond B-1: Stormwater Basin B-1

Inflow Area = 2.540 ac, 0.00% Impervious, Inflow Depth = 4.09" for 50 YR event
Inflow = 12.19 cfs @ 12.08 hrs, Volume= 0.867 af
Outflow = 2.10 cfs @ 12.56 hrs, Volume= 0.744 af, Atten= 83%, Lag= 28.9 min
Primary = 2.10 cfs @ 12.56 hrs, Volume= 0.744 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.61' @ 12.56 hrs Surf.Area= 13,091 sf Storage= 18,672 cf

Plug-Flow detention time= 235.5 min calculated for 0.744 af (86% of inflow)
Center-of-Mass det. time= 173.1 min ( 993.7 - 820.7 )

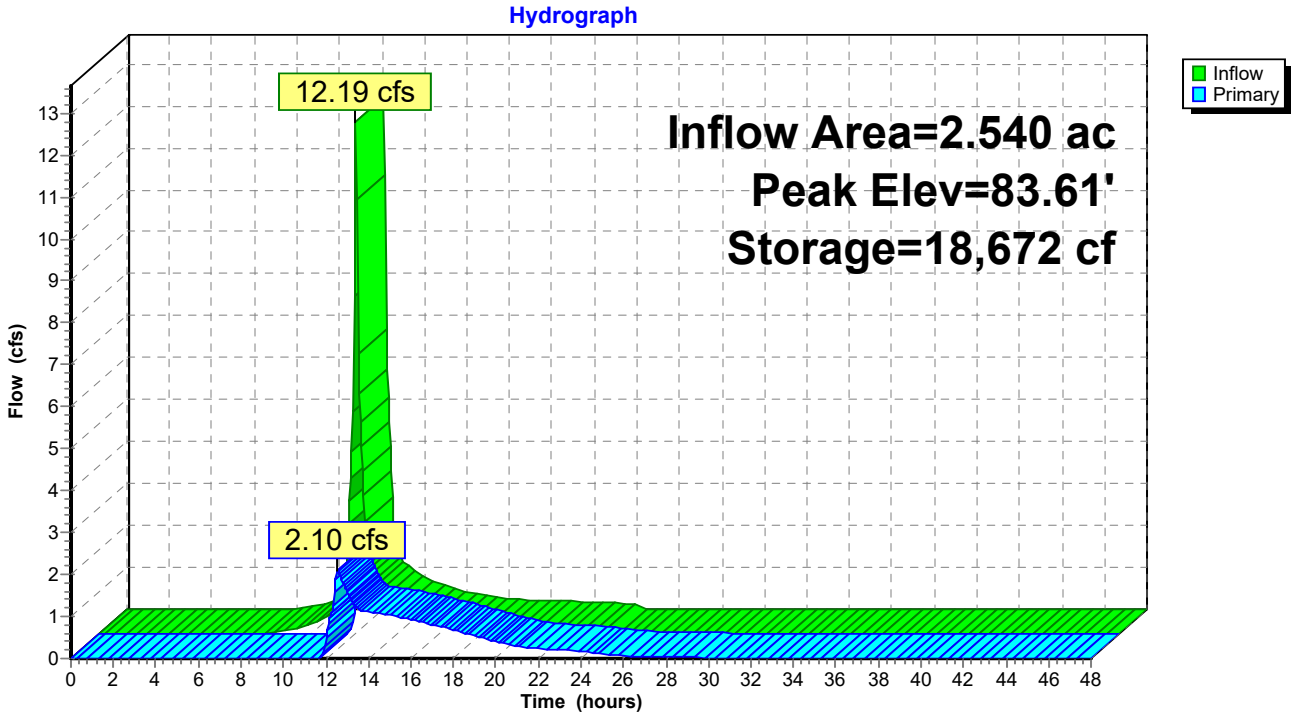
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 82.00' | 38,751 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 82.00 | 10,184 | 590.0 | 0 | 0 | 10,184 |
| 83.00 | 11,982 | 608.0 | 11,071 | 11,071 | 12,002 |
| 84.00 | 13,837 | 627.0 | 12,898 | 23,969 | 13,968 |
| 85.00 | 15,748 | 646.0 | 14,782 | 38,751 | 15,996 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 83.50' | **6.0' long x 14.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.64 2.67 2.70 2.65 2.64 2.65 2.65 2.63 |
| #2 | Primary | 81.00' | **12.0" Round Culvert**<br>L= 24.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 81.00' / 80.75' S= 0.0104 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 82.50' | **12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 2 | 83.50' | **12.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=2.09 cfs @ 12.56 hrs HW=83.61' TW=0.00' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** (Weir Controls 0.55 cfs @ 0.86 fps)
- **2=Culvert** (Passes 1.55 cfs of 4.84 cfs potential flow)
  - **3=Orifice/Grate** (Orifice Controls 1.19 cfs @ 4.77 fps)
  - **4=Orifice/Grate** (Weir Controls 0.35 cfs @ 1.06 fps)

## Pond B-1: Stormwater Basin B-1

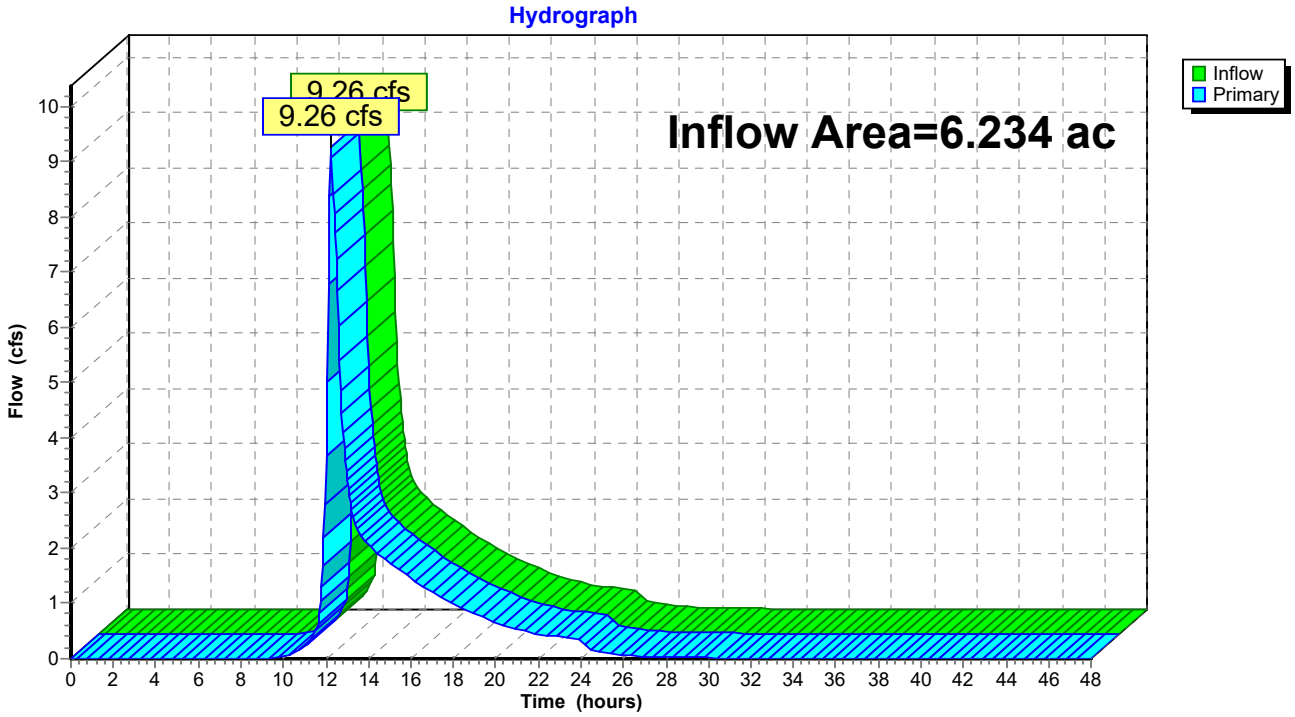


## Summary for Link AP-1: Wetlands

Inflow Area = 6.234 ac, 0.00% Impervious, Inflow Depth > 3.11" for 50 YR event
Inflow = 9.26 cfs @ 12.23 hrs, Volume= 1.616 af
Primary = 9.26 cfs @ 12.23 hrs, Volume= 1.616 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

## Link AP-1: Wetlands



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment PDA-1A: PDA-1A** Runoff Area=2.715 ac 0.00% Impervious Runoff Depth=3.28"
Flow Length=640' Tc=18.7 min CN=60 Runoff=7.07 cfs 0.742 af

**Subcatchment PDA-1B: PDA-1B** Runoff Area=2.540 ac 0.00% Impervious Runoff Depth=4.86"
Flow Length=213' Tc=5.0 min CN=74 Runoff=14.44 cfs 1.029 af

**Subcatchment PDA-1C: PDA-1C** Runoff Area=0.979 ac 0.00% Impervious Runoff Depth=4.06"
Flow Length=236' Tc=11.1 min CN=67 Runoff=3.90 cfs 0.331 af

**Pond B-1: Stormwater Basin B-1** Peak Elev=83.73' Storage=20,363 cf Inflow=14.44 cfs 1.029 af
Outflow=4.24 cfs 0.906 af

**Link AP-1: Wetlands** Inflow=13.20 cfs 1.980 af
Primary=13.20 cfs 1.980 af

**Total Runoff Area = 6.234 ac Runoff Volume = 2.103 af Average Runoff Depth = 4.05"**
**100.00% Pervious = 6.234 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment PDA-1A: PDA-1A

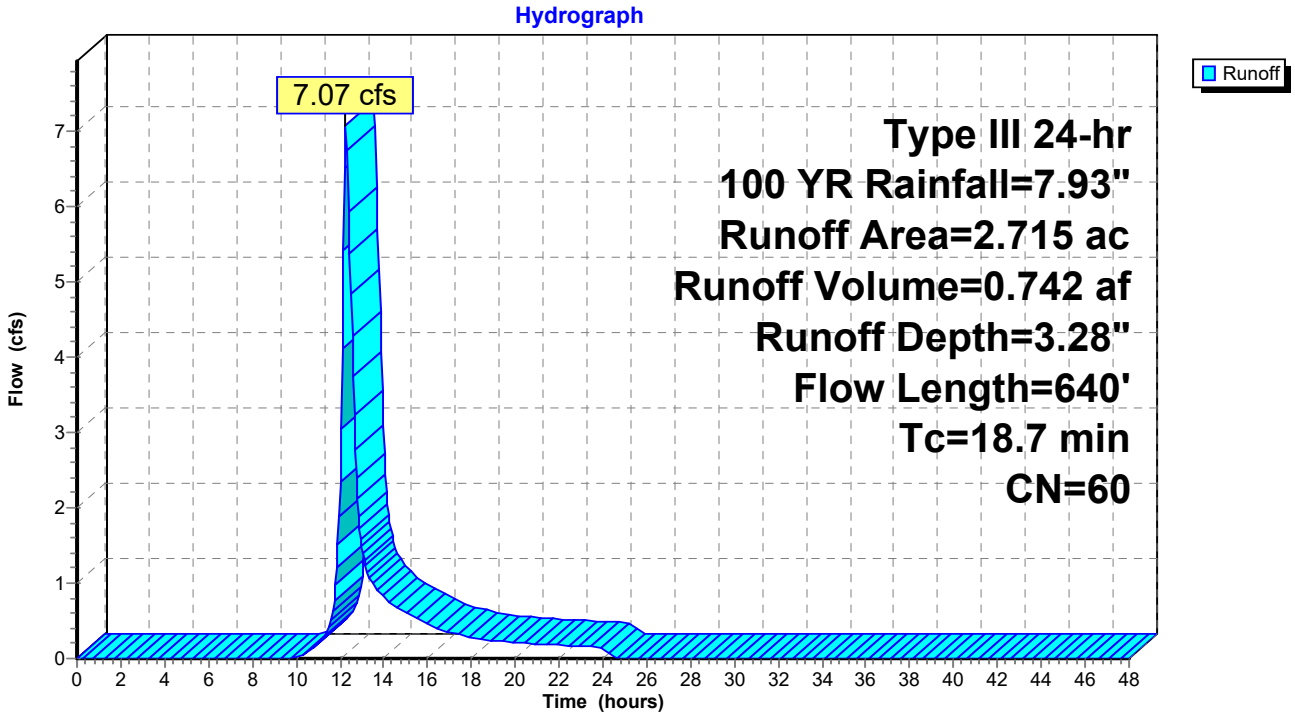
Runoff = 7.07 cfs @ 12.27 hrs, Volume= 0.742 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.93"

| Area (ac) | CN | Description |
|---|---|---|
| 0.191 | 35 | Brush, Fair, HSG A |
| 1.953 | 56 | Brush, Fair, HSG B |
| 0.009 | 70 | Brush, Fair, HSG C |
| 0.145 | 77 | Brush, Fair, HSG D |
| 0.044 | 96 | Gravel surface, HSG A |
| 0.235 | 96 | Gravel surface, HSG B |
| 0.007 | 96 | Gravel surface, HSG C |
| 0.131 | 61 | >75% Grass cover, Good, HSG B |
| 2.715 | 60 | Weighted Average |
| 2.715 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.2 | 36 | 0.3060 | 0.19 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 9.1 | 64 | 0.0100 | 0.12 | | **Sheet Flow, B-C**<br>Grass: Short n= 0.150 P2= 3.18" |
| 1.1 | 125 | 0.0160 | 1.90 | | **Shallow Concentrated Flow, C-D**<br>Grassed Waterway Kv= 15.0 fps |
| 0.1 | 30 | 0.0150 | 5.56 | 4.36 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 |
| 5.2 | 385 | 0.0307 | 1.23 | | **Shallow Concentrated Flow, E-F**<br>Short Grass Pasture Kv= 7.0 fps |
| 18.7 | 640 | Total | | | |

## Subcatchment PDA-1A: PDA-1A



## Summary for Subcatchment PDA-1B: PDA-1B

[49] Hint: Tc<2dt may require smaller dt

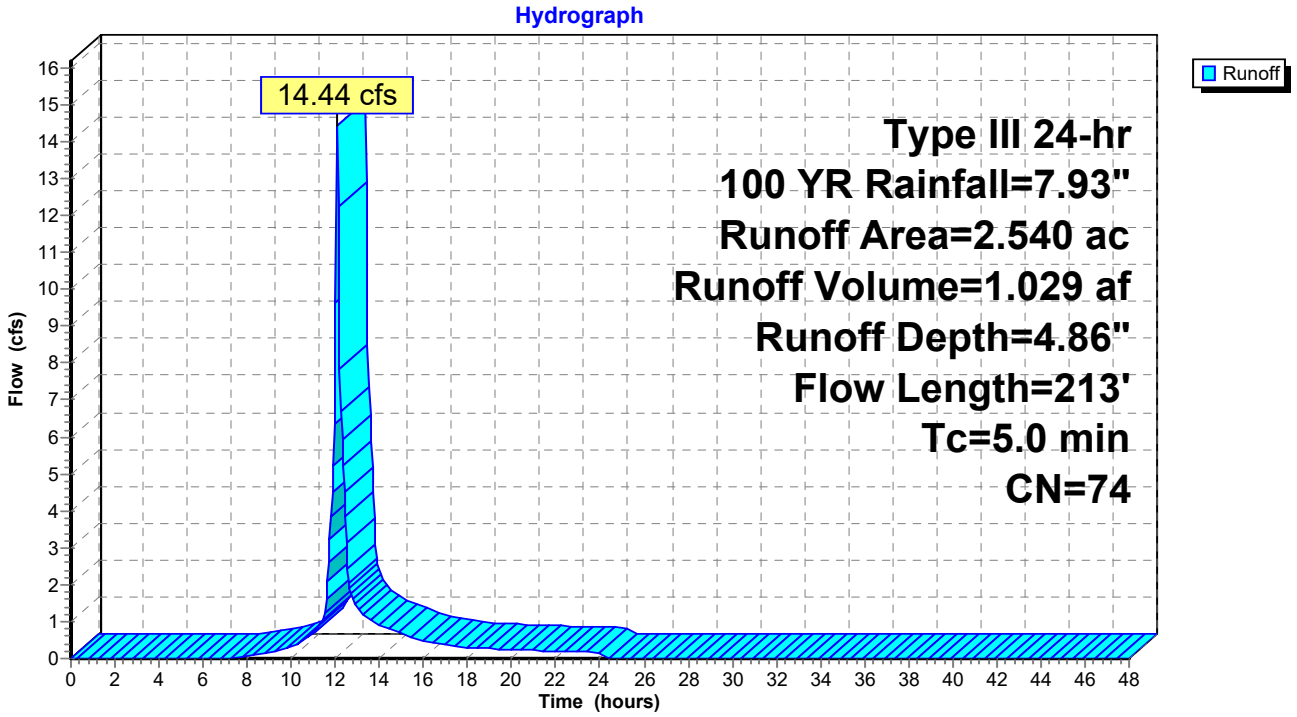
Runoff = 14.44 cfs @ 12.08 hrs, Volume= 1.029 af, Depth= 4.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.93"

| Area (ac) | CN | Description |
|---|---|---|
| 0.002 | 35 | Brush, Fair, HSG A |
| 0.700 | 56 | Brush, Fair, HSG B |
| 0.037 | 70 | Brush, Fair, HSG C |
| 0.077 | 77 | Brush, Fair, HSG D |
| 0.018 | 96 | Gravel surface, HSG A |
| 0.942 | 96 | Gravel surface, HSG B |
| 0.023 | 96 | Gravel surface, HSG C |
| 0.741 | 61 | >75% Grass cover, Good, HSG B |
| 2.540 | 74 | Weighted Average |
| 2.540 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.5 | 40 | 0.3060 | 0.19 | | **Sheet Flow, A-B**<br>Woods: Light underbrush n= 0.400 P2= 3.18" |
| 0.7 | 60 | 0.0333 | 1.52 | | **Sheet Flow, B-C**<br>Smooth surfaces n= 0.011 P2= 3.18" |
| 0.5 | 73 | 0.0270 | 2.65 | | **Shallow Concentrated Flow, C-D**<br>Unpaved Kv= 16.1 fps |
| 0.3 | 40 | 0.1200 | 2.42 | | **Shallow Concentrated Flow, D-E**<br>Short Grass Pasture Kv= 7.0 fps |
| 5.0 | 213 | Total | | | |

## Subcatchment PDA-1B: PDA-1B



## Summary for Subcatchment PDA-1C: PDA-1C

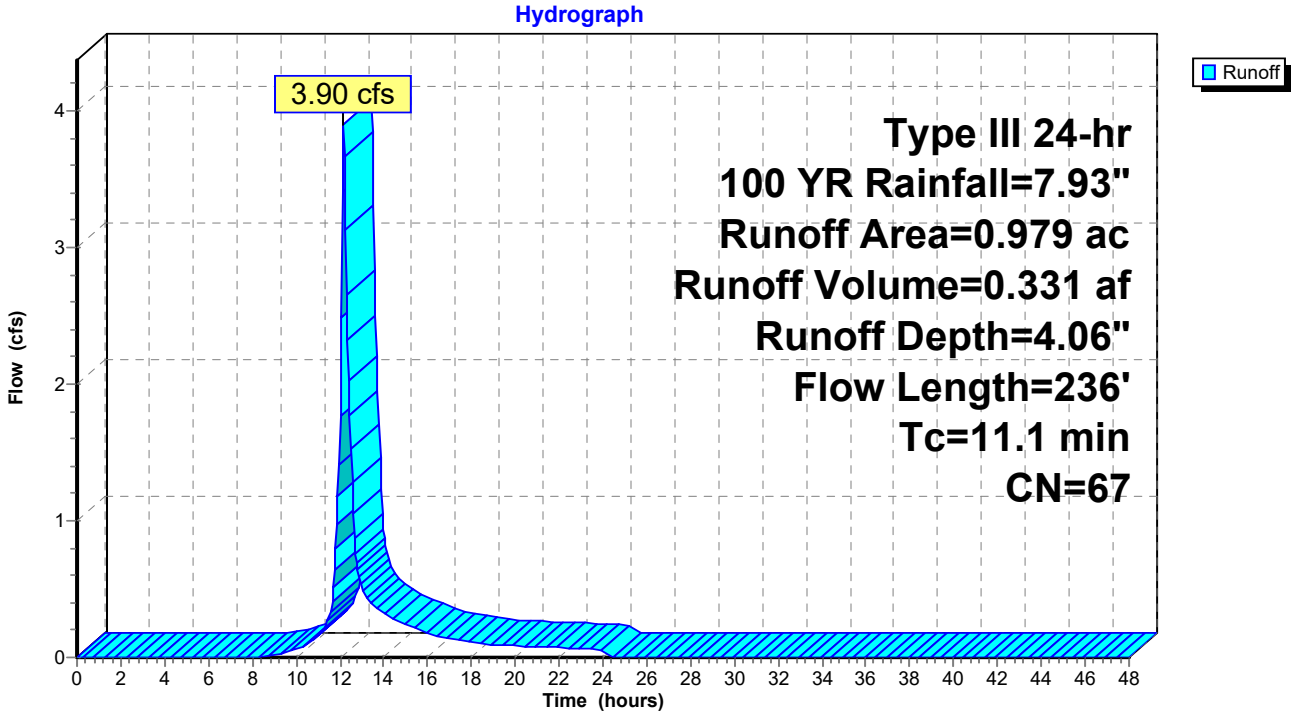
Runoff = 3.90 cfs @ 12.16 hrs, Volume= 0.331 af, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.93"

| Area (ac) | CN | Description |
|---|---|---|
| 0.567 | 56 | Brush, Fair, HSG B |
| 0.151 | 77 | Brush, Fair, HSG D |
| 0.175 | 96 | Gravel surface, HSG B |
| 0.086 | 61 | >75% Grass cover, Good, HSG B |
| 0.979 | 67 | Weighted Average |
| 0.979 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 8.4 | 100 | 0.2100 | 0.20 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18" |
| 2.7 | 136 | 0.0290 | 0.85 | | **Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps |
| 11.1 | 236 | Total | | | |

## Subcatchment PDA-1C: PDA-1C



## Summary for Pond B-1: Stormwater Basin B-1

Inflow Area = 2.540 ac, 0.00% Impervious, Inflow Depth = 4.86" for 100 YR event
Inflow = 14.44 cfs @ 12.08 hrs, Volume= 1.029 af
Outflow = 4.24 cfs @ 12.42 hrs, Volume= 0.906 af, Atten= 71%, Lag= 20.8 min
Primary = 4.24 cfs @ 12.42 hrs, Volume= 0.906 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.73' @ 12.42 hrs Surf.Area= 13,332 sf Storage= 20,363 cf

Plug-Flow detention time= 211.5 min calculated for 0.906 af (88% of inflow)
Center-of-Mass det. time= 156.2 min ( 971.9 - 815.7 )

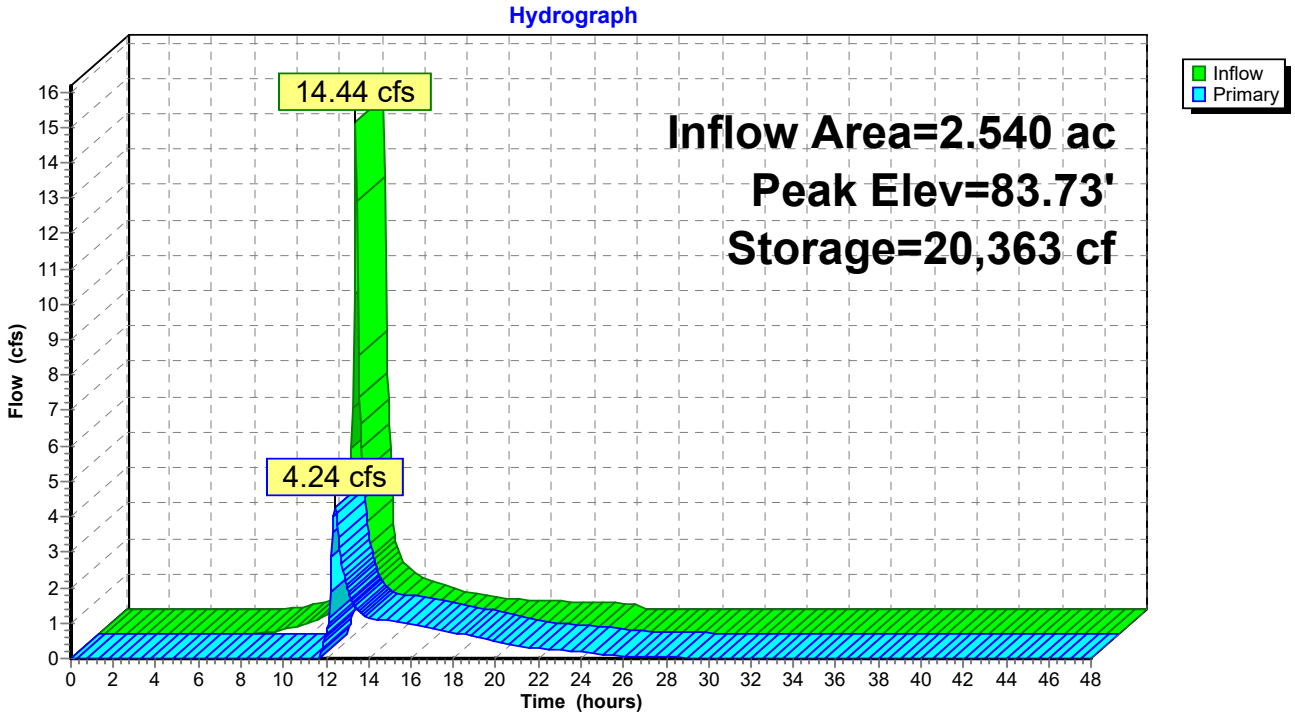
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 82.00' | 38,751 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 82.00 | 10,184 | 590.0 | 0 | 0 | 10,184 |
| 83.00 | 11,982 | 608.0 | 11,071 | 11,071 | 12,002 |
| 84.00 | 13,837 | 627.0 | 12,898 | 23,969 | 13,968 |
| 85.00 | 15,748 | 646.0 | 14,782 | 38,751 | 15,996 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 83.50' | **6.0' long x 14.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.64 2.67 2.70 2.65 2.64 2.65 2.65 2.63 |
| #2 | Primary | 81.00' | **12.0" Round Culvert**<br>L= 24.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 81.00' / 80.75' S= 0.0104 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 82.50' | **12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 2 | 83.50' | **12.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=4.21 cfs @ 12.42 hrs HW=83.73' TW=0.00' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** (Weir Controls 1.79 cfs @ 1.28 fps)
- **2=Culvert** (Passes 2.42 cfs of 4.99 cfs potential flow)
  - **3=Orifice/Grate** (Orifice Controls 1.27 cfs @ 5.07 fps)
  - **4=Orifice/Grate** (Weir Controls 1.16 cfs @ 1.58 fps)

## Pond B-1: Stormwater Basin B-1

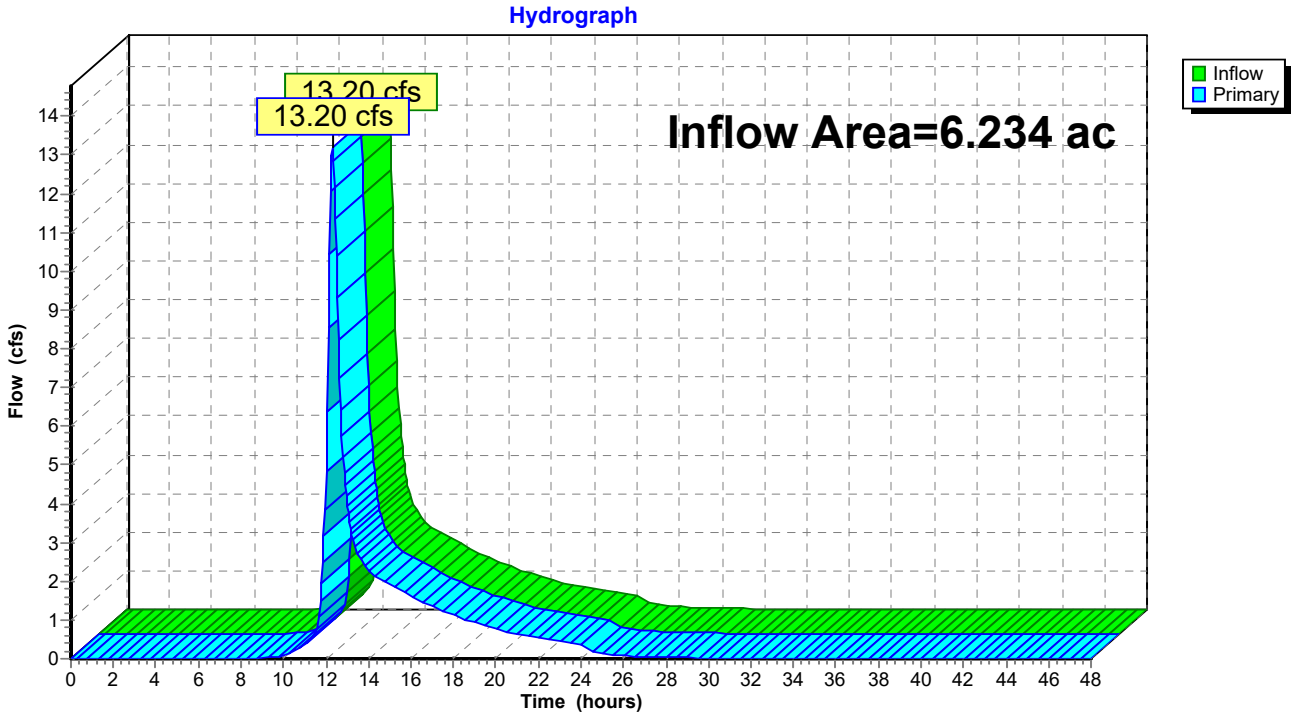


## Summary for Link AP-1: Wetlands

Inflow Area = 6.234 ac, 0.00% Impervious, Inflow Depth = 3.81" for 100 YR event
Inflow = 13.20 cfs @ 12.29 hrs, Volume= 1.980 af
Primary = 13.20 cfs @ 12.29 hrs, Volume= 1.980 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

## Link AP-1: Wetlands



# APPENDIX E: WATER QUALITY VOLUME CALCULATIONS

WATER QUALITY VOLUME CALCULATIONS
FOR
OLD AMSTON ROAD FUEL CELL POWER PLANT 2
42 OLD AMSTON ROAD, COLCHESTER, CT

$$WQV = \frac{(1")(R)(A)}{12}$$

where:
- $WQV$ = water quality volume (ac-ft)
- $R$ = volumetric runoff coefficien = 0.05+0.009(I)
- $I$ = percent impervious cover
- $A$ = site area in acres

$V=WQV+((P)(A_b)/12)$

V=required basin storage volume (ac-ft)
WQV=Water Quality Volume (ac-ft)
P= design water quality precipitation (in)
$A_b$=basin surface area (ac)

| | Area (ac) | Pervious (ac) | Imperv. (ac) | I | R | WQV (ac-ft) | P (in) | Ab (ac) | V (ac-ft) | Total V Req. (cf) | V Provided (cf) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Overall Site | 6.23 | 5.72 | 0.52 | 8% | 0.12 | 0.06 | n/a | n/a | n/a | 2,817.24 | - |
| B-1 | 2.54 | 1.56 | 0.98 | 39% | 0.40 | 0.08 | 1 | 0.266531 | 0.11 | 4,639.98 | 4,760.00 |

Overal Total V Required = 4,639.98 cf
Overal Total V Provided = 4,760.00 cf

## Stage-Area-Storage for Pond B-1: Stormwater Basin B-1

| | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|---|
| | 82.00 | 10,184 | 0 |
| | 82.05 | 10,270 | 511 |
| | 82.10 | 10,357 | 1,027 |
| | 82.15 | 10,444 | 1,547 |
| | 82.20 | 10,532 | 2,071 |
| | 82.25 | 10,620 | 2,600 |
| | 82.30 | 10,708 | 3,133 |
| | 82.35 | 10,797 | 3,671 |
| | 82.40 | 10,886 | 4,213 |
| WQV | 82.45 | 10,975 | 4,760 |
| | 82.50 | 11,065 | 5,311 |
| | 82.55 | 11,155 | 5,866 |
| | 82.60 | 11,245 | 6,426 |
| | 82.65 | 11,336 | 6,991 |
| | 82.70 | 11,427 | 7,560 |
| | 82.75 | 11,519 | 8,133 |
| | 82.80 | 11,611 | 8,712 |
| | 82.85 | 11,703 | 9,294 |
| | 82.90 | 11,796 | 9,882 |
| | 82.95 | 11,889 | 10,474 |
| | 83.00 | 11,982 | 11,071 |
| | 83.05 | 12,072 | 11,672 |
| | 83.10 | 12,161 | 12,278 |
| | 83.15 | 12,252 | 12,888 |
| | 83.20 | 12,342 | 13,503 |
| | 83.25 | 12,433 | 14,123 |
| | 83.30 | 12,524 | 14,746 |
| | 83.35 | 12,616 | 15,375 |
| | 83.40 | 12,708 | 16,008 |
| | 83.45 | 12,800 | 16,646 |
| | 83.50 | 12,893 | 17,288 |
| | 83.55 | 12,986 | 17,935 |
| | 83.60 | 13,079 | 18,587 |
| | 83.65 | 13,173 | 19,243 |
| | 83.70 | 13,266 | 19,904 |
| | 83.75 | 13,361 | 20,570 |
| | 83.80 | 13,455 | 21,240 |
| | 83.85 | 13,550 | 21,915 |
| | 83.90 | 13,645 | 22,595 |
| | 83.95 | 13,741 | 23,280 |
| | 84.00 | 13,837 | 23,969 |
| | 84.05 | 13,930 | 24,663 |
| | 84.10 | 14,023 | 25,362 |
| | 84.15 | 14,116 | 26,066 |
| | 84.20 | 14,209 | 26,774 |
| | 84.25 | 14,303 | 27,487 |
| | 84.30 | 14,397 | 28,204 |
| | 84.35 | 14,492 | 28,926 |
| | 84.40 | 14,587 | 29,653 |
| | 84.45 | 14,682 | 30,385 |
| | 84.50 | 14,777 | 31,121 |
| | 84.55 | 14,873 | 31,863 |
| | 84.60 | 14,969 | 32,609 |

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 84.65 | 15,065 | 33,360 |
| 84.70 | 15,162 | 34,115 |
| 84.75 | 15,259 | 34,876 |
| 84.80 | 15,356 | 35,641 |
| 84.85 | 15,453 | 36,411 |
| 84.90 | 15,551 | 37,186 |
| 84.95 | 15,650 | 37,966 |
| 85.00 | **15,748** | **38,751** |

# APPENDIX F: NOAA ATLAS 14 PRECIPITATION FREQUENCY TABLE

**NOAA Atlas 14, Volume 10, Version 3**
**Location name: Colchester, Connecticut, USA***
**Latitude: 41.594°, Longitude: -72.3339°**
**Elevation: 409.51 ft****
* source: ESRI Maps
** source: USGS

**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

## PF tabular

**PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]**

| Duration | Average recurrence interval (years) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | **0.337** (0.260-0.429) | **0.406** (0.313-0.517) | **0.519** (0.399-0.664) | **0.613** (0.468-0.788) | **0.743** (0.550-0.991) | **0.840** (0.611-1.14) | **0.942** (0.666-1.32) | **1.06** (0.710-1.51) | **1.22** (0.791-1.80) | **1.36** (0.860-2.04) |
| 10-min | **0.477** (0.368-0.607) | **0.575** (0.443-0.733) | **0.735** (0.565-0.939) | **0.869** (0.663-1.11) | **1.05** (0.779-1.40) | **1.19** (0.865-1.62) | **1.34** (0.944-1.88) | **1.50** (1.01-2.14) | **1.73** (1.12-2.56) | **1.93** (1.22-2.89) |
| 15-min | **0.561** (0.433-0.714) | **0.677** (0.521-0.862) | **0.866** (0.664-1.11) | **1.02** (0.780-1.31) | **1.24** (0.917-1.65) | **1.40** (1.02-1.91) | **1.57** (1.11-2.21) | **1.76** (1.18-2.52) | **2.04** (1.32-3.01) | **2.26** (1.43-3.40) |
| 30-min | **0.770** (0.594-0.980) | **0.929** (0.715-1.18) | **1.19** (0.911-1.52) | **1.40** (1.07-1.80) | **1.70** (1.26-2.27) | **1.92** (1.40-2.61) | **2.15** (1.52-3.03) | **2.42** (1.62-3.46) | **2.79** (1.81-4.12) | **3.10** (1.96-4.66) |
| 60-min | **0.979** (0.755-1.25) | **1.18** (0.909-1.50) | **1.51** (1.16-1.93) | **1.78** (1.36-2.29) | **2.16** (1.60-2.88) | **2.44** (1.77-3.32) | **2.74** (1.94-3.85) | **3.07** (2.06-4.39) | **3.55** (2.30-5.23) | **3.94** (2.49-5.92) |
| 2-hr | **1.27** (0.987-1.61) | **1.53** (1.18-1.93) | **1.94** (1.50-2.46) | **2.28** (1.75-2.91) | **2.75** (2.06-3.66) | **3.11** (2.28-4.21) | **3.48** (2.49-4.89) | **3.92** (2.64-5.57) | **4.58** (2.97-6.70) | **5.13** (3.25-7.63) |
| 3-hr | **1.48** (1.15-1.86) | **1.77** (1.38-2.23) | **2.24** (1.74-2.83) | **2.63** (2.03-3.35) | **3.17** (2.38-4.20) | **3.58** (2.63-4.83) | **4.01** (2.88-5.61) | **4.52** (3.05-6.39) | **5.29** (3.44-7.71) | **5.95** (3.78-8.81) |
| 6-hr | **1.89** (1.49-2.37) | **2.26** (1.77-2.84) | **2.86** (2.24-3.60) | **3.36** (2.61-4.25) | **4.05** (3.06-5.33) | **4.56** (3.38-6.12) | **5.11** (3.69-7.10) | **5.76** (3.91-8.08) | **6.75** (4.41-9.76) | **7.60** (4.85-11.2) |
| 12-hr | **2.38** (1.88-2.97) | **2.85** (2.25-3.55) | **3.62** (2.85-4.51) | **4.25** (3.33-5.33) | **5.13** (3.89-6.69) | **5.78** (4.30-7.69) | **6.47** (4.69-8.92) | **7.30** (4.97-10.2) | **8.53** (5.59-12.2) | **9.57** (6.13-13.9) |
| 24-hr | **2.82** (2.25-3.49) | **3.41** (2.71-4.22) | **4.37** (3.46-5.42) | **5.16** (4.06-6.43) | **6.25** (4.77-8.11) | **7.06** (5.29-9.34) | **7.93** (5.79-10.9) | **8.97** (6.14-12.4) | **10.5** (6.93-15.0) | **11.9** (7.63-17.1) |
| 2-day | **3.17** (2.54-3.89) | **3.87** (3.10-4.76) | **5.02** (4.01-6.19) | **5.98** (4.74-7.40) | **7.29** (5.62-9.42) | **8.26** (6.24-10.9) | **9.32** (6.87-12.7) | **10.6** (7.30-14.6) | **12.6** (8.33-17.8) | **14.4** (9.26-20.6) |
| 3-day | **3.43** (2.77-4.20) | **4.20** (3.38-5.15) | **5.46** (4.38-6.71) | **6.51** (5.19-8.03) | **7.95** (6.14-10.2) | **9.00** (6.83-11.8) | **10.2** (7.52-13.9) | **11.6** (7.98-15.8) | **13.8** (9.14-19.4) | **15.8** (10.2-22.4) |
| 4-day | **3.68** (2.98-4.49) | **4.50** (3.63-5.50) | **5.84** (4.69-7.15) | **6.94** (5.55-8.54) | **8.47** (6.57-10.9) | **9.59** (7.30-12.6) | **10.8** (8.02-14.7) | **12.3** (8.52-16.8) | **14.7** (9.74-20.6) | **16.8** (10.8-23.8) |
| 7-day | **4.38** (3.56-5.32) | **5.30** (4.30-6.43) | **6.79** (5.49-8.27) | **8.03** (6.46-9.82) | **9.74** (7.58-12.4) | **11.0** (8.39-14.3) | **12.4** (9.19-16.7) | **14.0** (9.72-19.0) | **16.6** (11.0-23.1) | **18.9** (12.2-26.6) |
| 10-day | **5.08** (4.15-6.15) | **6.05** (4.93-7.32) | **7.63** (6.20-9.27) | **8.95** (7.22-10.9) | **10.8** (8.40-13.6) | **12.1** (9.25-15.6) | **13.5** (10.1-18.1) | **15.3** (10.6-20.5) | **17.9** (11.9-24.7) | **20.2** (13.1-28.3) |
| 20-day | **7.26** (5.97-8.73) | **8.30** (6.82-9.99) | **10.0** (8.19-12.1) | **11.4** (9.29-13.8) | **13.4** (10.5-16.7) | **14.8** (11.4-18.9) | **16.4** (12.1-21.4) | **18.1** (12.6-24.0) | **20.5** (13.7-28.0) | **22.4** (14.6-31.2) |
| 30-day | **9.10** (7.52-10.9) | **10.2** (8.39-12.2) | **11.9** (9.81-14.3) | **13.4** (10.9-16.2) | **15.4** (12.1-19.1) | **16.9** (13.0-21.3) | **18.5** (13.6-23.9) | **20.1** (14.1-26.6) | **22.3** (15.0-30.3) | **23.9** (15.6-33.1) |
| 45-day | **11.4** (9.44-13.6) | **12.5** (10.4-14.9) | **14.3** (11.8-17.1) | **15.8** (13.0-19.0) | **17.9** (14.1-22.1) | **19.5** (15.0-24.4) | **21.1** (15.5-26.9) | **22.6** (15.9-29.8) | **24.5** (16.5-33.1) | **25.8** (16.9-35.5) |
| 60-day | **13.3** (11.1-15.8) | **14.4** (12.0-17.2) | **16.3** (13.5-19.5) | **17.9** (14.7-21.4) | **20.0** (15.8-24.5) | **21.7** (16.7-27.0) | **23.3** (17.2-29.5) | **24.8** (17.5-32.5) | **26.5** (17.9-35.6) | **27.6** (18.1-37.8) |

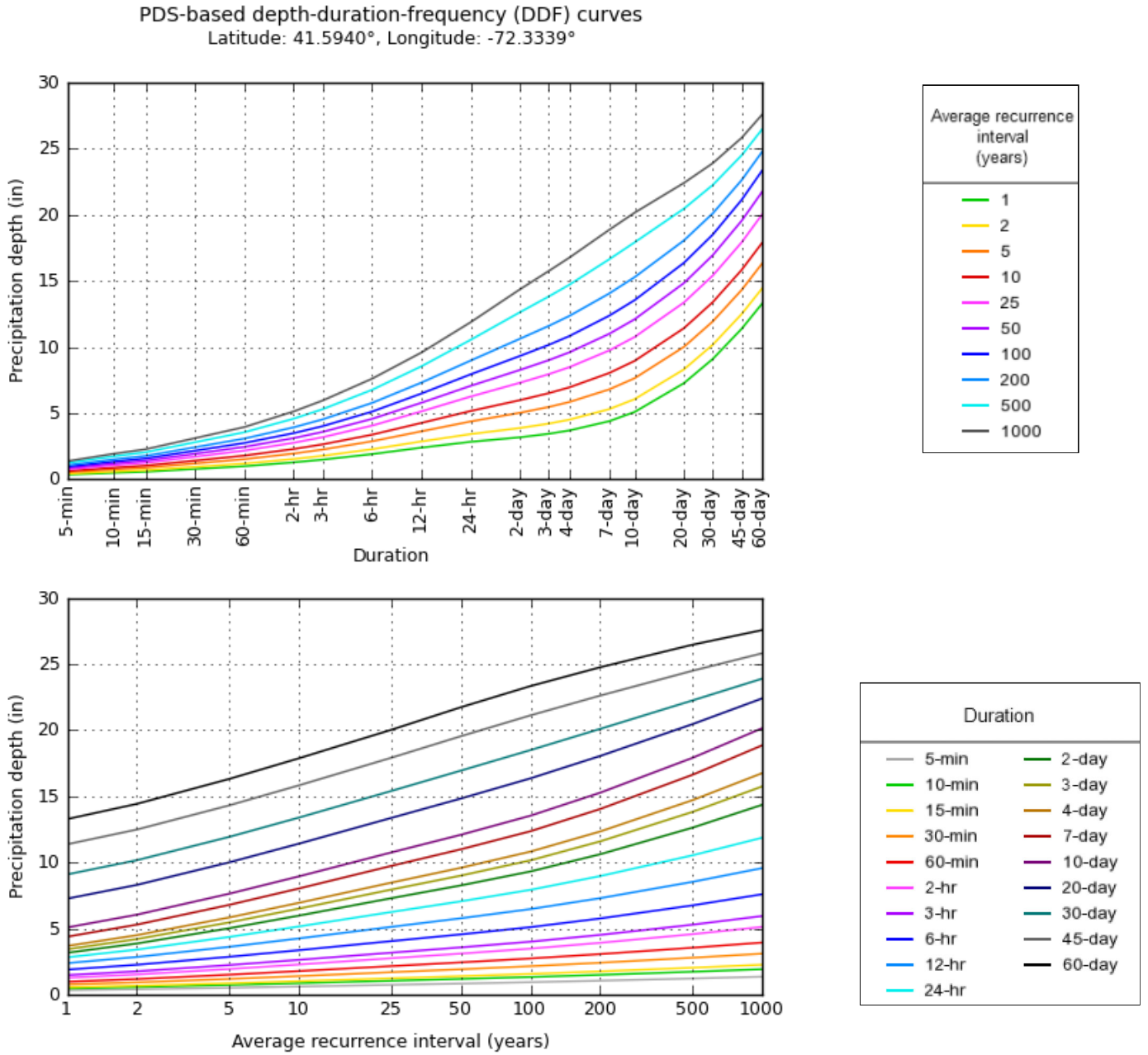
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

## PF graphical



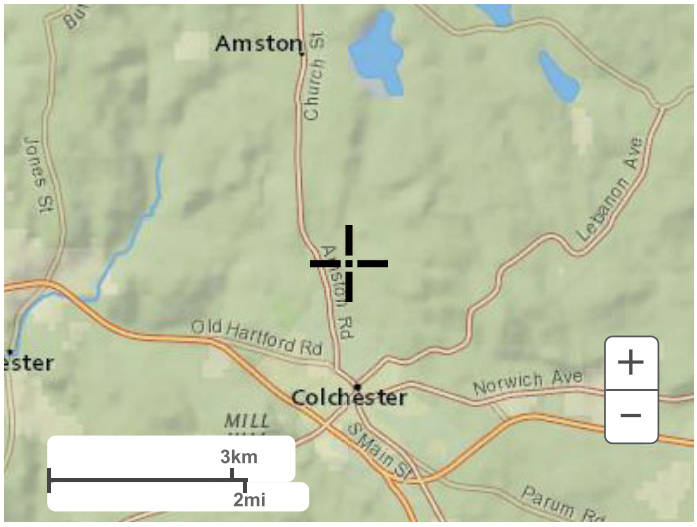

NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu Apr 7 11:13:29 2022

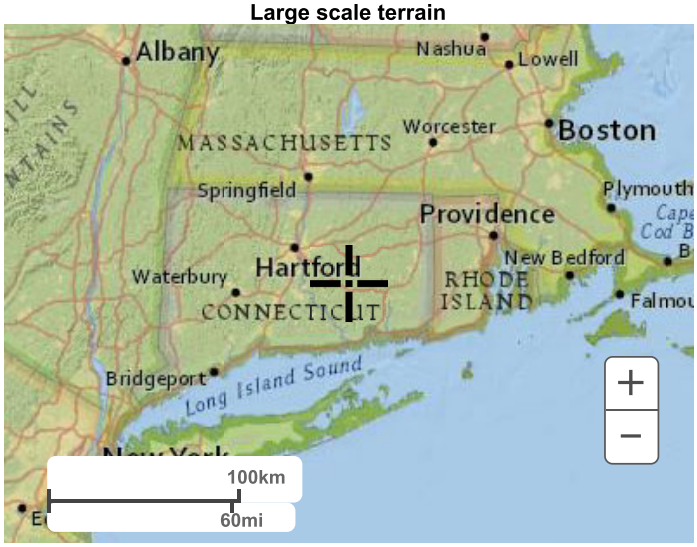
Back to Top

## Maps & aerials

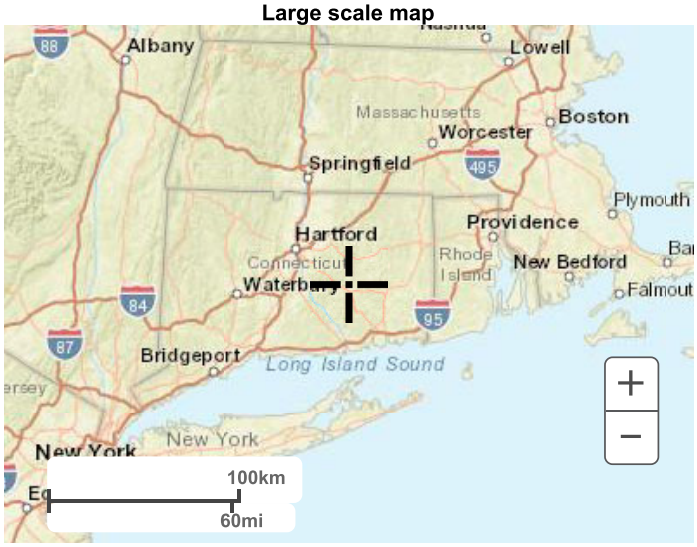
**Small scale terrain**



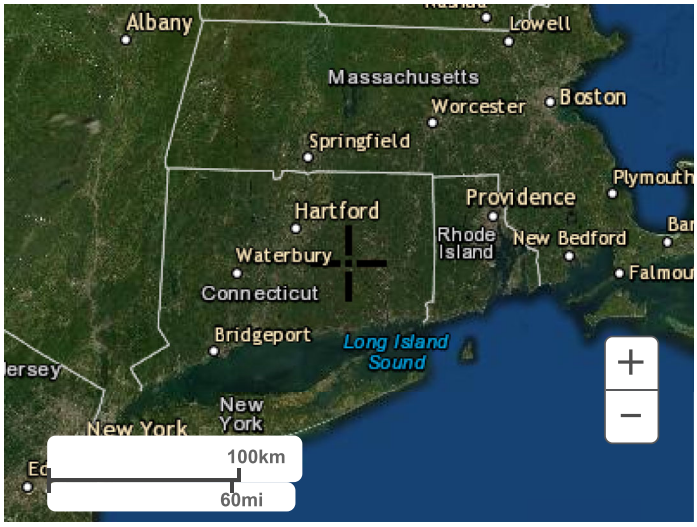

**Large scale terrain**




**Large scale map**




**Large scale aerial**




Back to Top

---

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

# APPENDIX D

USFWS AND NDDB

COMPLIANCE STATEMENT

# USFWS & NDDB COMPLIANCE

June 5, 2023

ReNew Developers LLC
103 South Main Street, Box 734
Colchester, CT 06415

Re: Old Amston 2 Fuel Cell: 42 Old Amston Road, Colchester, Connecticut
APT Job No: CT716130

On behalf of ReNew Developers LLC ("ReNew"), All-Points Technology Corporation, P.C. ("APT") performed an evaluation with respect to possible federally- and state-listed, Threatened, Endangered, or Special Concern species in order to determine if the proposed 18 megawatts ("MW") fuel cell electric generating facility (the "Facility" or "Project") would result in a potential adverse effect to listed species.

The Facility will be developed on a privately owned, ±16.16-acre property south of Old Amston Road in Colchester, Connecticut (the "Property"). The Property, which formerly housed an automotive salvage yard, is vacant with upland areas mainly cleared and generally consisting of grass cover; minimal tree removal is anticipated for development of the proposed Facility which will encompass ±3.03 acres on the Property.

## USFWS

The federal rare species consultation was completed in accordance the Endangered Species Act consultation procedures, as applicable to the proposed Facility, through the U.S. Fish and Wildlife Service's ("USFWS") Information, Planning, and Conservation System ("IPaC"). Based on the results of the IPaC review, one federally-listed[1] Endangered species is known to occur in the vicinity of the Subject Property documented as the northern long-eared bat ("NLEB"; *Myotis septentrionalis*). As a result of this preliminary finding, APT performed an evaluation to determine if the proposed referenced Facility would result in a likely adverse effect to NLEB.

The proposed Facility would be located in an existing cleared and graded area that characterizes the portion of the Subject Property anticipated for development. Only minimal tree clearing would result from the Facility; trees potentially provide NLEB habitat. Consultation with the Connecticut Department of Energy & Environmental Protection ("CTDEEP") Wildlife Division Natural Diversity Data Base ("NDDB") NLEB habitat map[2] revealed that the proposed Facility is not within 150 feet of a known occupied NLEB maternity roost tree and is not within 0.25 mile of a known NLEB hibernaculum. The nearest NLEB habitat resource to the proposed Facility is located ±27.2 miles to the southwest in North Branford.

[1] Listing under the federal Endangered Species Act

[2] *Northern long-eared bat areas of concern in Connecticut to assist with Federal Endangered Species Act Compliance* map. March 6, 2019.

Effective March 31, 2023, NLEB has been reclassified as Endangered under the ESA. The reclassification now eliminates use of the previous 4(d) rule for NLEB; 4(d) rules may only be applied to Threatened species. A NLEB Interim Consultation Framework has been developed by USFWS for projects that are reasonably certain to occur before April 1, 2024 (date on which the NLEB Interim Consultation Framework expires) to facilitate transition from the 4(d) rule to typical ESA consultation procedures for Endangered species. APT submitted the effects determination using the new NLEB Determination Key ("DKey") within the IPaC system for this Facility and determined it "may affect, not likely to adversely affect" NLEB. Unless the USFWS responds within 15 days from the date of the letter, ESA consultation is complete and no further action is required. Please refer to the enclosed USFWS March 26, 2023 letter confirming ESA compliance for NLEB.

**NDDB**

APT reviewed the most recent DEEP NDDB mapping (December 2022), which reveals that a NDDB polygon exists within the north end of the Property and a portion of the Project Area. Because state-listed species or communities are documented on the Property, consultation with NDDB is required since the Project's area of effect could potentially affect this nearby NDDB polygon. Based on APT's experience with the fuel cell facility along Old Amston Road that is adjacent to this proposed Facility, two state-listed Special Concern species wood turtle and spotted turtle are known to be associated with this NDDB polygon.

A NDDB Review Request was submitted on March 26, 2023 through the eNDDB system. Materials included in this consultation includes a protection plan for wood turtle and spotted turtle which is similar to the turtle protection plan APT prepared for the adjacent fuel cell facility and was approved by DEEP. This Resource Protection Program, which prescribes installing an isolation barrier to prevent conflicts between construction activities and turtles, routine monitoring and turtle sweeps of isolation barriers, contractor awareness training, and environmental sensitivity signage indicating sensitive rare species will be implemented during construction of the Facility. Therefore, construction activities would not be expected to result in an adverse impact to these rare turtle species based on the proposed protection measures outlined herein; the rare species protection plan is attached. NDDB responded with a Determination Letter (NDDB No. 202302692) on April 11, 2023 identifying wood turtle and spotted turtle as documented near the proposed project area and concurred with the proposed protection program. is pending and will be forwarded upon receipt. Please see attached NDDB Determination Letter.

Therefore, with the protection measures for wood turtle and spotted turtle the proposed Facility is not anticipated to adversely impact any federal or state Threatened, Endangered or Special Concern species.

Sincerely,
All-Points Technology Corporation, P.C.

Dean Gustafson
Senior Biologist

Enclosures

# USFWS NLEB DKey Letter

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: May 05, 2023
Project code: 2023-0016806
Project Name: ReNew Old Amston 2 Fuel Cell

Federal Nexus: no
Federal Action Agency (if applicable):

**Subject:** Technical assistance for 'ReNew Old Amston 2 Fuel Cell'

Dear Deborah Gustafson:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on May 05, 2023, for 'ReNew Old Amston 2 Fuel Cell' (here forward, Project). This project has been assigned Project Code 2023-0016806 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

**Ensuring Accurate Determinations When Using IPaC**

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter.

**Determination for the Northern Long-Eared Bat**

Based upon your IPaC submission and a standing analysis, your project is not reasonably certain to cause incidental take of the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

**Other Species and Critical Habitat that May be Present in the Action Area**

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Candidate

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species and/or critical habitat listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

**Next Steps**

Coordination with the Service is complete. This letter serves as technical assistance. All conservation measures should be implemented as proposed. Thank you for considering federally listed species during your project planning.

We are uncertain where the northern long-eared bat occurs on the landscape outside of known locations. Because of the steep declines in the species and vast amount of available and suitable forest habitat, the presence of suitable forest habitat alone is a far less reliable predictor of their presence. Based on the best available information, most suitable habitat is now expected to be unoccupied. During the interim period, while we are working on potential methods to address this uncertainty, we conclude take is not reasonably certain to occur in areas of suitable habitat where presence has not been documented.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the New England Ecological Services Field Office and reference Project Code 2023-0016806 associated with this Project.

**Action Description**
You provided to IPaC the following name and description for the subject Action.

**1. Name**

ReNew Old Amston 2 Fuel Cell

**2. Description**

The following description was provided for the project 'ReNew Old Amston 2 Fuel Cell':

> We understand that the Client intends to develop a portion of the ±17.77-acre Property with a ±27.0 (AC) megawatt (”MW”) fuel cell electric generating facility, incorporating technology provided by Bloom Energy Corporation. Based on a conceptual Site layout and information provided by the Client, the Project would encompass approximately 1.3 acres.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.59231375,-72.3340021084828,14z

# DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

# QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

   **Note:** Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   *No*

2. The proposed action does not intersect an area where the northern long-eared bat is not likely to occur, based on the information available to U.S. Fish and Wildlife Service as of the most recent update of this key. If you have data that indicates that northern long-eared bats <u>are</u> likely to be present in the action area, answer "NO" and continue through the key.

   Do you want to make a no effect determination?

   *No*

3. Do you have data that indicates that northern long-eared bats may be present in the action area?

   *No*

4. Does any component of the action involve construction or operation of wind turbines?

   **Note:** For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

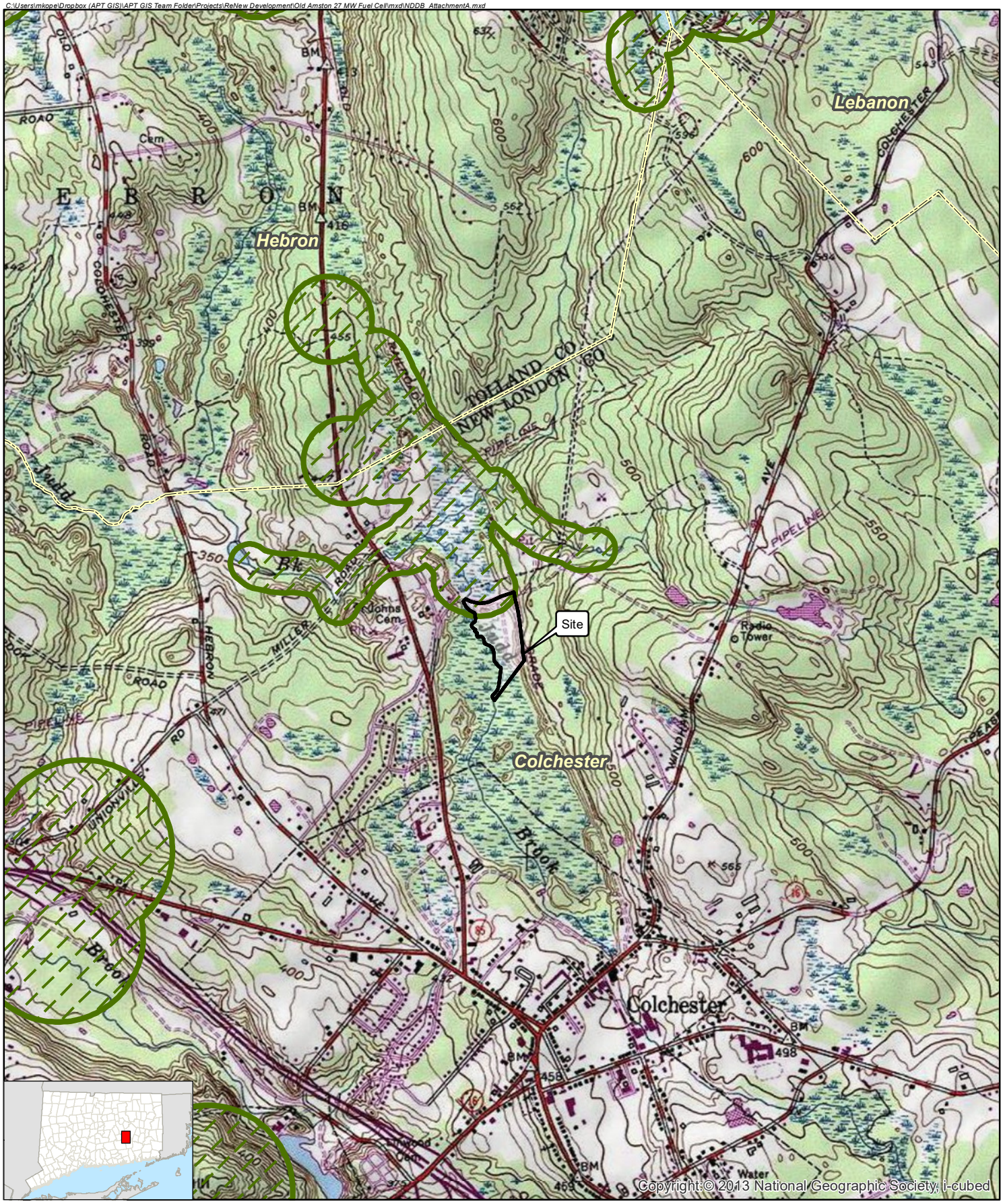
   *No*

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   *No*

# NDDB Map

C:\Users\mkope\Dropbox (APT GIS)\APT GIS Team Folder\Projects\ReNew Development\Old Amston 27 MW Fuel Cell\mxd\NDDB_AttachmentA.mxd




***Legend***

- Site
- CTDEEP Natural Diversity Database (Aug 2022)
- Municipal Boundary

## NDDB Map

Proposed Fuel Cell Facility
Old Amston Road
Colchester, Connecticut

*Map Notes:*
*Base Map Source: USGS 7.5 Minute*
*Topographic Quadrangle Map: Colchester, CT (1984)*
*Map Scale: 1:24,000*
*Map Date: November 2022*

N W E S

1,000 500 0 1,000 Feet

ALL-POINTS TECHNOLOGY CORPORATION

# NDDB Determination Letter

Connecticut
Department of Energy &
Environmental Protection

portal.ct.gov/DEEP

4/11/2023

Dean Gustafson
RENEW DEVELOPERS, LLC
103 S Main St
Colchester, CT 06420
dgustafson@allpointstech.com

Subject: Old Amston 2
Filing #: 96787
NDDB - New Determination Number: 202302692

Expiration Date: 4/11/2025

Location Description: Old amston Rd, Colchester, CT

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding this project. According to our records, there are State-listed species (RCSA Sec. 26-306) documented nearby the proposed project area.

**Wood turtle (*Glyptemys insculpta*)- State Special Concern**

**Spotted turtle (*Clemmys guttata*)- State Special Concern**

Wood turtle: Individuals of this species are riverine and riparian obligates, overwintering and mating in clear, cold, primarily sand-gravel and rock bottomed streams and foraging in riparian zones, fields and upland forests during the late spring and summer. They hibernate in the banks of the river in submerged tree roots between November 1 and March 31. Their summer habitat focuses within 90m (300ft of rivers) and they regularly travel 300m (0.2 mile) from rivers during this time. During summer they seek out early successional habitat: pastures, old fields, woodlands, powerline cuts and railroad beds bordering or adjacent to streams and rivers. Their habitat in Connecticut is already severely threatened by fragmentation of riverine, instream, riparian, and upland habitats, but is exacerbated by heavy adult mortality from machinery, cars, and collection. This is compounded by the species late maturity, low reproductive potential, and high nest and hatchling depredation rates.

Spotted turtle: Individuals of this species are associated with wetlands and vernal pools. Over the course of a season and lifetime, individuals will travel large distances (up to 1km) over upland forest and fields between multiple wetlands. They overwinter burrowed into the mud in wetlands between Nov 1- March 15. They do not begin to reproduce until 7-10 years old and adults can live at least 30 years. This species is threatened most by any activities that reduce adult survivorship including road kills, commercial and casual collection, increased predation in areas around commercial and residential development, mortality and injury from

agricultural equipment or other mechanical equipment.

- I do not anticipate impacts from work that occurs during the dormant season (November 1- March 15).

For all work conducted during the active season (March 16- Oct 31):

- **Install exclusionary practices to prevent any turtle access into disturbance areas**. These measures will need to be installed at the limits of disturbance as shown on the plans, and also include areas of staging and storage.
- Exclusionary fencing be at least 20 in tall and must be secured to and remain in contact with the ground and be regularly maintained (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through.
- All work areas including staging and storage areas, outside of previously paved locations, regardless of the duration of time they will be utilized, must be reviewed to remove individuals and exclude them from re-entry.
- All construction personnel working within the turtle habitat must be apprised of the species description and the possible presence of a listed species.
- Any turtles encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and fencing should be inspected to identify and remove access point. These animals are protected by law and no turtles should be relocated from the site.

I concur with your protection plan (attached).

Your submission information indicates that your project requires a state permit, license, registration, or authorization, or utilizes state funding or involves state agency action. This NDDB - New determination may be utilized to fulfill the Endangered and Threatened Species requirements for state-issued permit applications, licenses, registration submissions, and authorizations.

Please be aware of the following limitations and conditions:

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, land owners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as enhance existing data. Such new information is incorporated into the Database and accessed through the ezFile portal as it becomes available. New information may result in additional review, and new or modified restrictions or conditions may be necessary to remain in compliance with certain state permits.

- During your work listed species may be encountered on site. A report must be submitted by the observer to the Natural Diversity Database promptly and additional review and restrictions or conditions may be necessary to remain in compliance with certain state permits. Please fill out the appropriate survey form and follow the instructions for submittal.
- Your project involves the state permit application process or other state involvement, including state funding or state agency actions; please note that consultations with your permit analyst or the agency may result in additional requirements. In this situation, additional evaluation of the proposal by the DEEP Wildlife Division may be necessary and additional information, including but not limited to

species-specific site surveys, may be required. Any additional review may result in specific restrictions or conditions relating to listed species that may be found at or in the vicinity of the site.
- If your project involves preparing an Environmental Impact Assessment, this NDDB consultation and determination should not be substituted for biological field surveys assessing on-site habitat and species presence.
- The NDDB - New determination for the Old Amston 2 as described in the submitted information and summarized at the end of this document is valid until 4/11/2025. This determination applies only to the project as described in the submission and summarized at the end of this letter. Please re-submit an updated Request for Review if the project's scope of work and/or timeframe changes, including if work has not begun by 4/11/2025.

If you have further questions, please contact me at the following:

Shannon Kearney
CT DEEP Bureau of Natural Resources
Wildlife Division
Natural Diversity Database
79 Elm Street
Hartford, CT 06106-5127
(860) 424-3170
Shannon.Kearney@ct.gov

Please reference the Determination Number 202302692 when you e-mail or write. Thank you for consulting the Natural Diversity Data Base.

Shannon Kearney
Wildlife Division- Natural Diversity Data Base
79 Elm Street
Hartford, CT 06106-5127
(860) 424-3170
Shannon.Kearney@ct.gov

Application Details:

| | |
|---|---|
| Project involves federal funds or federal permit: | No |
| Project involves state funds, state agency action, or relates to CEPA request: | No |
| Project requires state permit, license, registration, or authorization: | Yes |
| DEEP enforcement action related to project: | |
| Project Type: | Energy and Utility Production Facilities and Distribution Infrastructure |
| Project Sub-type: | New facility construction |
| Project Name: | Old Amston 2 |
| Project Description: | |

# Rare Turtles Protection Plan

**ENVIRONMENTAL NOTES - RESOURCES PROTECTION MEASURES**

**RARE SPECIES PROTECTION PROGRAM**

The proposed fuel cell electric generating facility is located in the vicinity of known occurrences of two State-listed rare species: Wood Turtle (*Glyptemys insculpta*) and Spotted Turtle (*Clemmys guttata*). As a result, the following protective measures shall be followed to help avoid incidental impact to these rare turtle species during construction.

Wood Turtle and Spotted Turtle are State Special Concern species afforded protection under the Connecticut Endangered Species Act. These rare species protection measures are similar to protection measures previously approved by the Connecticut Department of Energy and Environmental Protection ("DEEP") Wildlife Division on other similar projects.

It is of the utmost importance that the Contractor complies with the requirement for implementation of these protective measures and the education of its employees and subcontractors performing work on the project site. The rare species protection measures within this plan shall be implemented in accordance with the plan details below.

All-Points Technology Corporation, P.C. ("APT") will serve as the Environmental Monitor for this project to ensure that these protection measures are implemented properly. APT will provide an education session for the Contractor on nearby sensitive wetland resources/vernal pools resources and rare species that may be encountered prior to the start of construction activities. The Contractor shall contact Dean Gustafson, Senior Biologist at APT, at least 5 business days prior to the start of any construction activities to schedule a pre-construction meeting. Mr. Gustafson can be reached by phone at (860) 552-2033 or via email at dgustafson@allpointstech.com.

This protection program consists of several components: education of all contractors and sub-contractors prior to initiation of work on the site; protective measures; periodic inspection of the construction project; and reporting.

1. **Contractor Education**

    a. Prior to work on site, the Contractor shall attend an educational session at the pre-construction meeting with APT. This orientation and educational session will consist of an introductory meeting with APT to emphasize the environmentally sensitive nature of the project and rare species resources, and the requirement to diligently follow the Protective Measures as described in sections below. Workers will be provided information regarding the identification of the two rare turtles that could be encountered. The meeting will further emphasize the non-aggressive nature of these species, the absence of need to destroy such animals and the need to follow Protective Measures as described in following sections. The Contractor will designate one of its workers as the "Project Monitor", who will receive more intense training on the identification and protection of the rare turtles.

    b. The importance of protecting nearby wetland resources will also be stressed as part of this educational session.

    c. The education session will also focus on means to discriminate between the species of concern and other native species to avoid unnecessary "false alarms". Encounters with any species of turtles, snakes and amphibians shall be documented.

    d. The Contractor will designate a member of its crew as the Project Monitor to be responsible for the periodic "sweeps" for turtles within the construction zone each morning and prior to initiation of any ground disturbance work. This individual will receive more intense training from APT on the identification and protection of the

two rare turtle species in order to perform sweeps. Any turtles discovered would be translocated outside the work zone in the general direction the animal was oriented.

e. The Contractor will be provided with cell phone and email contacts for APT personnel to immediately report any encounters with any rare species. Educational poster materials will be provided by APT and displayed on the job site to maintain worker awareness as the project progresses.

f. APT will also post Caution Signs throughout the project site for the duration of the construction project providing notice of the environmentally sensitive nature of the work area, the potential for encountering the two rare turtles and precautions to be taken to avoid injury to or mortality of these animals.

g. If any rare turtles (or other species) are encountered, the Contractor shall immediately cease all work, avoid any disturbance to the species, and contact APT.

**2. Isolation Measures & Sedimentation and Erosion Controls**

a. Plastic netting used in a variety of erosion control products (i.e., erosion control blankets, fiber rolls [wattles], reinforced silt fence) has been found to entangle wildlife, including reptiles, amphibians, birds, and small mammals, but particularly snakes. No permanent erosion control products or reinforced silt fence will be used on the project. Temporary erosion control products will use either erosion control blankets and fiber rolls composed of processed fibers mechanically bound together to form a continuous matrix (netless) or netting composed of planar woven natural biodegradable fiber to avoid/minimize wildlife entanglement.

b. Installation of sedimentation and erosion controls, required for erosion control compliance and creation of a barrier to possible migrating/dispersing turtles, shall be performed by the Contractor following clearing activities and prior to any earthwork. The Environmental Monitor will inspect the work zone area prior to and following erosion control barrier installation to ensure the area is free of Wood Turtles and Spotted Turtles (along with other amphibians and reptiles that may be encountered) and document barriers have been satisfactorily installed. The intent of the barrier is to segregate the majority of the work zone and isolate it from nesting/foraging/migrating/dispersing turtles, snakes and other herpetofauna. Oftentimes complete isolation of a work zone is not feasible due to accessibility needs and locations of staging/material storage areas, etc. Although the barriers may not completely isolate the work zone, they will be positioned to deflect migrating/dispersal routes away from the work zone to minimize potential encounters with turtles, snakes and other herpetofauna.

c. Exclusionary fencing shall be at least 20 inches tall and must be secured to and remain in contact with the ground and be regularly maintained by the contractor (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through.

d. The Contractor is responsible for daily inspections of the sedimentation and erosion controls for tears or breeches and accumulation levels of sediment, particularly following storm events that generate a discharge, as defined by and in accordance with applicable local, state and federal regulations. The Contractor shall notify the APT Environmental Monitor within 24 hours of any breeches of the sedimentation and erosion controls and any sediment releases beyond the perimeter controls that impact wetlands, watercourses or within 100 feet of wetlands and watercourses. The APT Environmental Monitor will provide periodic inspections of the sedimentation and erosion controls throughout the duration of construction activities only as it pertains

to their function as isolation measures for the protection of rare species. Such inspections will generally occur once per month. The frequency of monitoring may increase depending upon site conditions, level of construction activities in proximity to sensitive receptors, or at the request of the permittee. If the Compliance Monitor is notified by the Contractor of a sediment release, an inspection will be scheduled specifically to investigate and evaluate possible impacts to wetland and/or watercourse resources.

e. Third party monitoring of sedimentation and erosion controls will be performed by other parties, as necessary, under applicable local, state and/or federal regulations and permit conditions.

f. The extent of the sedimentation and erosion controls will be as shown on the site plans. The Contractor shall have additional sedimentation and erosion controls stockpiled on site should field or construction conditions warrant extending the controls as directed by the APT Environmental Monitor or other regulatory agencies.

g. No equipment, vehicles or construction materials shall be stored outside of the sedimentation and erosion controls within 100 feet of wetlands or watercourses.

h. All sedimentation and erosion controls shall be removed within 30 days of completion of work and permanent stabilization of site soils so that reptile and amphibian movement between uplands and wetlands is not restricted.

**3. Petroleum Materials Storage and Spill Prevention**

a. Certain precautions are necessary to store petroleum materials, refuel and contain and properly clean up any inadvertent fuel or petroleum (i.e., oil, hydraulic fluid, etc.) spill to avoid possible impact to nearby resources.

b. A spill containment kit consisting of a sufficient supply of absorbent pads and absorbent material will be maintained by the Contractor at the construction site throughout the duration of the project. In addition, a waste drum will be kept on site to contain any used absorbent pads/material for proper and timely disposal off site in accordance with applicable local, state, and federal laws.

c. The following petroleum and hazardous materials storage and refueling restrictions and spill response procedures will be adhered to by the Contractor.

i. Petroleum and Hazardous Materials Storage and Refueling

1. Refueling of vehicles or machinery shall occur a minimum of 100 feet from wetlands or watercourses and shall take place on an impervious pad with secondary containment designed to contain fuels.

2. Any fuel or hazardous materials that must be kept on site shall be stored on an impervious surface utilizing secondary containment a minimum of 100 feet from wetlands or watercourses.

3. The contractor shall inspect all equipment at the beginning and end of each day for any fuel or hydraulic leaks and if discovered shall take immediate steps to make repairs and clean up any discharges as detailed in the following sections.

ii. Initial Spill Response Procedures

1. Stop operations and shut off equipment.

2. Remove any sources of spark or flame.

3. Contain the source of the spill.

4. Determine the approximate volume of the spill.

5. Identify the location of natural flow paths to prevent the release of the spill to sensitive nearby waterways or wetlands.

6. Ensure that fellow workers are notified of the spill.

iii. Spill Clean Up & Containment

1. Obtain spill response materials from the on-site spill response kit. Place absorbent materials directly on the release area.

2. Limit the spread of the spill by placing absorbent materials around the perimeter of the spill.

3. Isolate and eliminate the spill source.

4. Contact the appropriate local, state and/or federal agencies, as necessary.

5. Contact a disposal company to properly dispose of contaminated materials in accordance with all local, state, and federal regulations.

iv. Reporting

1. Complete an incident report.

2. Submit a completed incident report to the Connecticut Siting Council, and other applicable local, state, and federal officials.

**4. Herbicide and Pesticide Restrictions**

a. The use of herbicides and pesticides at the Facility shall be avoided when possible. In the event herbicides and/or pesticides are required at the Facility, their use will be in accordance with current Integrated Pest Management ("IPM") principles with particular attention to minimize applications within 100 feet of wetland or watercourse resources. No applications of herbicides or pesticides are allowed within actual wetland or watercourse resources.

**5. Turtle Protection Measures – Construction Phase**

a. Prior to construction and following installation of isolation barriers, the construction area will be swept by APT and any turtles occurring within the work area will be relocated to suitable habitat outside of the isolation barriers.

b. Prior to the start of construction each day, the contractor shall search the entire work area for turtles.

c. If a turtle is found during the active period, it shall be immediately moved, unharmed, by being carefully grasped in both hands, one on each side of the shell, between the turtle's forelimbs and the hind limbs, and placed just outside of the isolation barrier in the same approximate direction it was heading. Wood Turtles and Spotted Turtles are protected by law and no turtles should be relocated from the property.

d. Special care shall be taken by the contractor during early morning and evening hours so that possible basking or foraging turtles are not harmed by construction activities.

e. The contractor shall be particularly diligent during the months of May and June when turtles are actively selecting nesting sites which results in an increase in turtle movement activity.

f. No heavy machinery or vehicles may be parked in any turtle habitat.

g. Avoid and limit any equipment use within 100 feet of wetlands and no heavy machinery or vehicles may be parked in any turtle habitat or within 100 feet of wetlands.

h. Special precautions must be taken to avoid degradation of wetland habitats, particularly along any perennial stream riparian corridors.

**6. Reporting**

a. A Compliance Monitoring Report (brief narrative and applicable photos) documenting each APT inspection will be submitted by APT to the contractor and permittee for compliance verification. These reports are not to be used to document compliance with any other permit agency approval conditions (i.e., DEEP Stormwater Permit monitoring, etc.). Any non-compliance observations of erosion control measures or evidence of erosion or sediment release will be immediately reported to the Permittee and its Contractor and included in the reports.

b. Any observations of rare species or corrective actions will be included in the reports.

c. Following completion of the construction project, APT will provide a Final Compliance Monitoring Report to the permittee documenting implementation of this rare species protection program, monitoring and any species observations. The permittee shall provide a copy of the Final Compliance Monitoring Report to the Connecticut Siting Council for compliance verification.

d. Any observations of rare species will be reported to DEEP by APT on the appropriate special animal reporting form, with photo-documentation (if possible) and specific information on the location and disposition of the animal.

# APPENDIX E

CULTURAL RESOURCES REVIEW

April 25, 2023

Mr. David George
Heritage Consultants LLC
830 Berlin Turnpike
Berlin, CT 06057
*(sent only via email to dgeorge@heritage-consultants.com)*

Subject: Phase IA Cultural Resources Assessment of a Proposed Fuel Cell Development
Old Amston Road
Colchester, Connecticut

Dear Mr. George:

The State Historic Preservation Office (SHPO) received the letter report prepared by Heritage Consultants (Heritage) titled *Preliminary Archaeological Assessment of a Proposed Fuel Cell Development Project Along Old Amston Road in Colchester, Connecticut* dated April 18, 2023. SHPO understands that the proposed project consists of the construction of a Fuel Cell facility along Old Amston Road in Colchester. Because the project will require approval from the Connecticut Siting Council, it is subject to review by this office pursuant to the Connecticut Environmental Policy Act. Based on the information submitted to our office, the completed investigation meets the standards set forth in the *Environmental Review Primer for Connecticut's Archaeological Resources*.

The archaeological assessment survey consisted of comprehensive background research that examined historic maps and aerial imagery as well as previously identified cultural resources in proximity to the proposed project area. Heritage identified a single previously recorded archaeological site and two properties listed on the State Register of Historic Places within one mile of the project area. SHPO concurs with Heritage that the proposed project will not impact previously identified cultural resources. The Phase IA assessment survey revealed that the entirety of the proposed project area was characterized by previously disturbed areas. Therefore, Heritage concluded that the project area associated with the proposed fuel cell facility has a no/low potential to yield significant archaeological deposits. Based on the information provided to our office, SHPO concurs with Heritage that no additional archeological investigations are warranted and that no historic properties will be affected by the proposed fuel cell facility.

This office appreciates the opportunity to review and comment upon this project. For additional information, please contact Cory Atkinson, Staff Archaeologist and Environmental Reviewer, at (860) 500-2458 or cory.atkinson@ct.gov.

Sincerely,

Jonathan Kinney
State Historic Preservation Officer

April 18, 2023

Ms. Jennifer Young Gaudet
All-Points Technology Corporation
567 Vauxhall Street Extension – Suite 311
Waterford, Connecticut 06385

**RE: Preliminary Archaeological Assessment of a Proposed Fuel Cell Development Project Along Old Amston Road in Colchester, Connecticut**

Heritage Consultants, LLC (Heritage), is pleased to have this opportunity to provide All-Points Technology Corporation (All-Points) with the following preliminary archaeological assessment of a proposed Fuel Cell Development project along Old Amston Road in Colchester, Connecticut (Figure 1). The current project entailed completion of a cultural resources summary based on the examination of data obtained from the Connecticut State Historic Preservation Office (CT-SHPO), as well as GIS data, including mapping, aerial photographs, and topographic quadrangles, maintained by Heritage. This investigation is based upon project location information provided to Heritage by All-Points. The objectives of this study were to gather and present data regarding previously identified cultural resources situated within 1.6 km (1 mi) of the proposed fuel cell development and to investigate the proposed project area in terms of its natural and historical characteristics so that the need for completing additional cultural resources investigations could be evaluated.

Figure 2, which is a map excerpt dating from 1854, shows that the region containing the proposed fuel cell development was only sparsely developed in the nineteenth century. Many of the current roads were already in place, however, very few residences were located nearby with the exception of property belonging to J.S. Lewis. Other residences in the area were owned by I. Fullmore, H. Foote, and G. Clark, but they were located farther away for the subject property. The 1854 map also indicates that a sawmill and a grist mill were located to the north of the project area. These were situated at a crossroads to the northwest of the project area. A subsequent map dating from 1868 shows some change in infrastructure development of the project region (Figure 3), including the addition of new roads and more houses. This indicates a general growth trend in the region during the latter half of the nineteenth century. Still the project area itself remained as an undeveloped outlying parcel of land. It was likely used for agriculture or as a woodlot.

The earliest readily available aerial image of the region containing the proposed fuel cell development dates from 1934 (Figure 4). The image shows the project region remained rural; however, a railroad had been built to the east of and immediately adjacent to the project area. The surrounding region was mostly characterized by forest and wetland, with cleared areas to the west. A subsequent 1951 aerial photo of the region shows the project area in essentially the same state as in 1934 (Figure 5). The region remained a mix of farms and forested areas, with a large wetland to the west of the project parcel. A 1970 aerial photo shows that the project area had been partially cleared in areas adjacent to the railroad corridor. This image also shows that there were dozens of vehicles parked on the land, suggesting that the area may have been used as a salvage yard (Figure 6). The 2004 aerial photo shows many more vehicles had been added to the project area and that the above-referenced salvage yard had become larger, encompassing the area to be developed into a fuel cell (Figure 7). Figure 8, a 2019 aerial

P.O. Box 310249 • Newington, Connecticut 06131
Phone (860) 860-299-6328
Email: dgeorge@heritage-consultants.com

image excerpt, shows the project area in its modern state. The salvage yard has been removed from the area and widescale disturbance is evident.

A review of previously recorded cultural resources on file with the CT-SHPO revealed that there is one previously identified archaeological site (28-1) located within 1.6 km (1 mi) of the proposed fuel cell location (Figures 9 and 10). In addition, two State Register of Historic Places listed properties are located within 1.6 km (1 mi) of the proposed fuel cell development. No National Register of Historic Places properties or districts are located within 1.6 km (1 mi) of the proposed facility. These cultural resources are discussed below.

Site 28-1

Site 28-1, which is also known as the Martell Site, is a precontact era archaeological site located in Colchester, Connecticut (Figure 9). Surface collection of the site area by Gerald Martell in 1965 yielded a single large basalt knife. The period of occupation of Site 28-1 is unknown. The Martell Site has not been assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). It is located nearly 1.6 km (1 mi) from the project area and it will not be impacted by the proposed fuel cell development.

Zagray Sawmill

The Zagray Sawmill is a State Register of Historic Places property located in Colchester, Connecticut. The sawmill was built in 1873 (Figure 10). Today it is located on the property of the Zagray Farm Museum, a former family farm now operated by the Quinebaug Valley Engineers Association, Inc. The sawmill has not been assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). It is located nearly 0.8 km (0.5 mi) from the project area and it will not be impacted by the proposed fuel cell development.

Old Railroad Station

The Old Railroad Station is a State Register of Historic Places listed property located in Colchester, Connecticut (Figure 10). The station dates from the early twentieth century. The associated tracks are no longer present and the railroad corridor has been replaced by the Airline Trail. The station is noted for unique cornice work, and is considered important to the town's economic development. The Old Railroad Station has not been assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). It is located nearly 1.6 km (0.8 mi) from the project area and it will not be impacted by the proposed fuel cell development.

Soils located within the project area are described as Carlisle muck and Udorthents-Urban Land Complex. Carlisle muck consists of very deep, very poorly drained soils that have formed in woody and herbaceous organic materials. They are located within depressions as part of lake plains, outwash plains, till plains, flood plains, and moraines. The Udorthents-Urban Land Complex consists of moderately, well drained, to excessively drained soils that have been disturbed by cutting or filling, and areas that are covered by buildings and pavement. Udorthents are found in areas that have been cut to a depth of 0.6 m (2 ft) or more or are on areas with more than 0.6 m (2 ft)of fill. Udorthents consist primarily of moderately coarse textured soil material and a few small areas of medium textured material. In some areas fill has been used to build up recreational areas and highways. Both Carlisle muck and Udorthents-

Urban Land Complex soils do not possess archaeological sensitivity either because they are nearly permanently wet or have been disturbed to a great degree.

The review of the project area as described above reveals that it has been disturbed throughout the twentieth century and contains soils that do not possess archaeological sensitivity. Based on the current condition of the project area, it is the professional opinion of Heritage that no additional archaeological examination of this area is recommended prior to development of the proposed fuel cell. If you have any questions regarding this Technical Memorandum, or if we may be of additional assistance with this or any other projects you may have, please do not hesitate to call us at 860-299-6328. or email us info@heritage-consultants.com. We are at your service.

Sincerely,

David R. George, M.A., R.P.A

P.O. Box 310249 • Newington, Connecticut 06131
Phone (860) 860-299-6328
Email: dgeorge@heritage-consultants.com


Figure 1. Excerpt from a USGS 7.5' series topographic quadrangle image showing the location of the fuel cell development in Colchester, Connecticut.

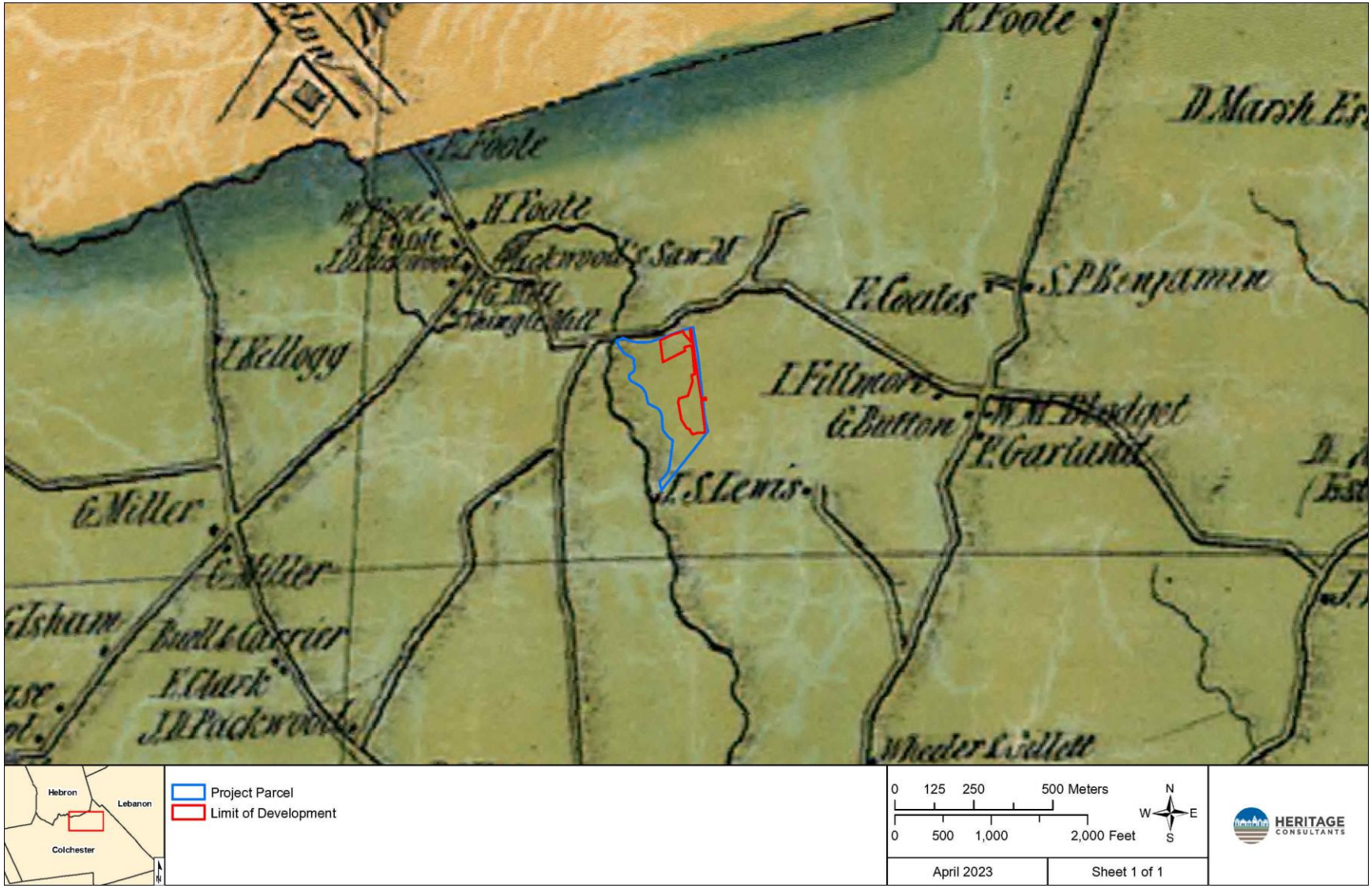



Figure 2. Excerpt from an 1854 historic map showing the location of the fuel cell development in Colchester, Connecticut.

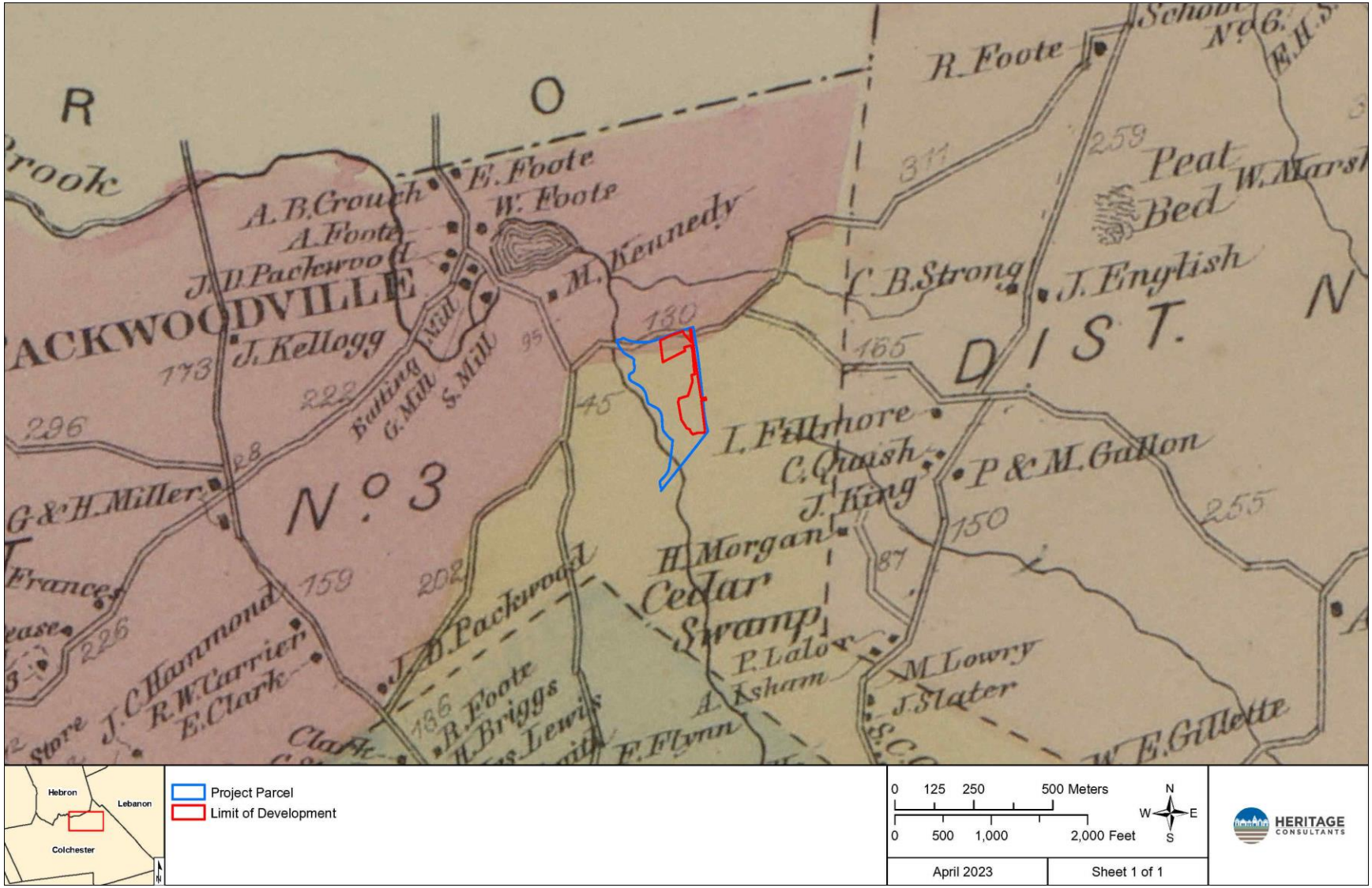



Figure 3. Excerpt from an 1868 historic map showing the location of the fuel cell development in Colchester, Connecticut.

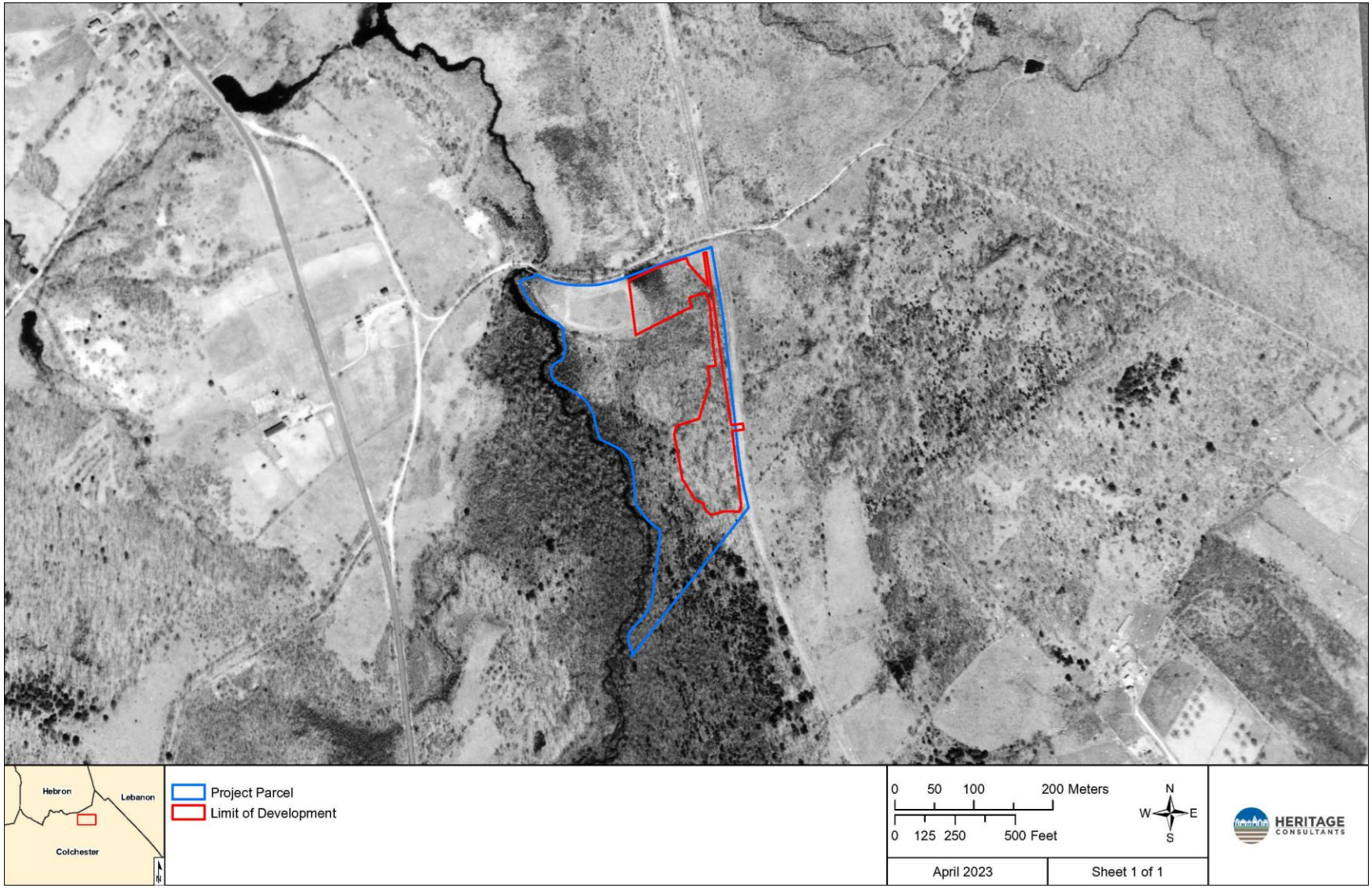



Figure 4. Excerpt from a 1934 aerial photograph showing the location of the fuel cell development in Colchester, Connecticut.

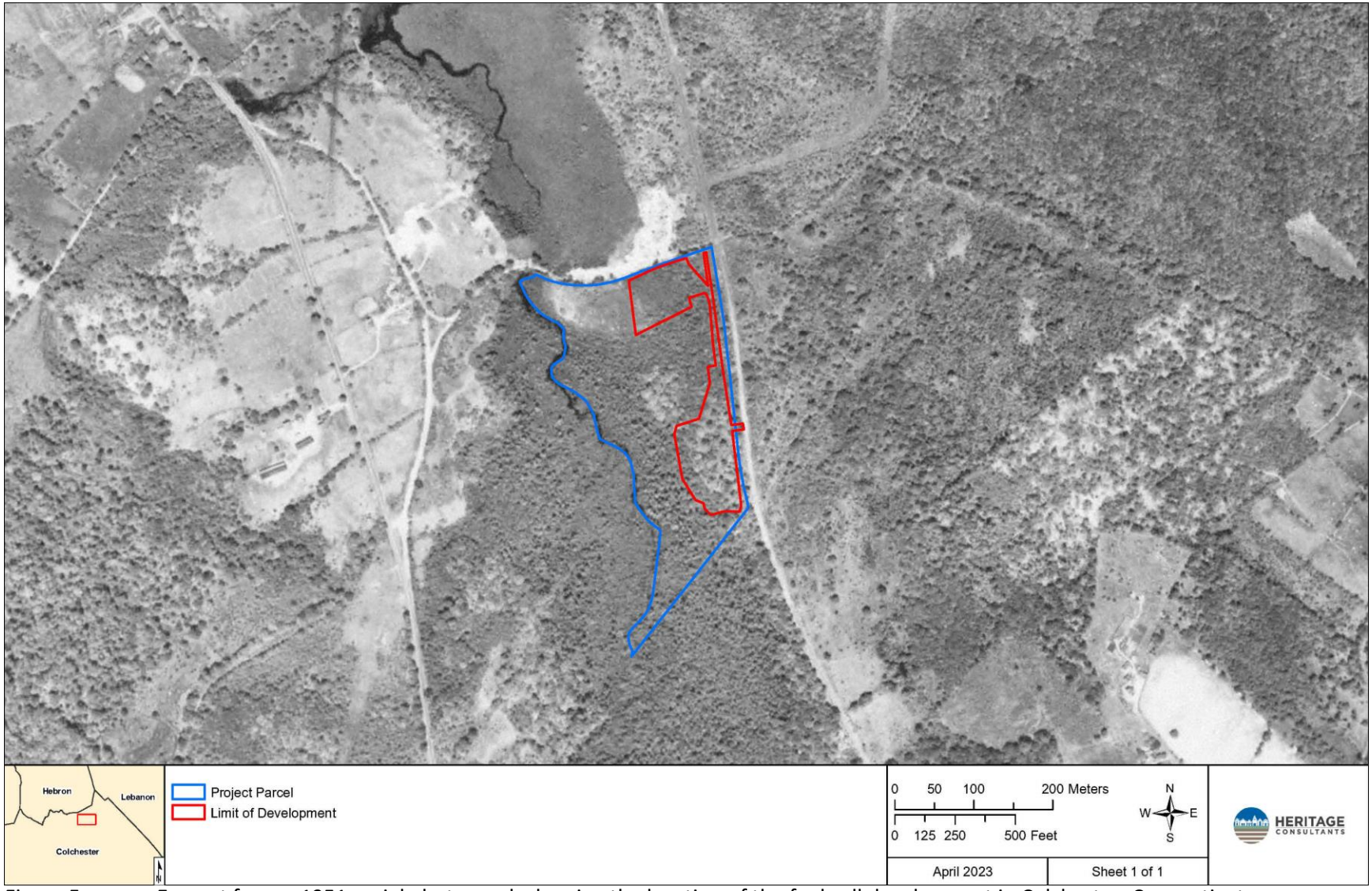



Figure 5. Excerpt from a 1951 aerial photograph showing the location of the fuel cell development in Colchester, Connecticut.

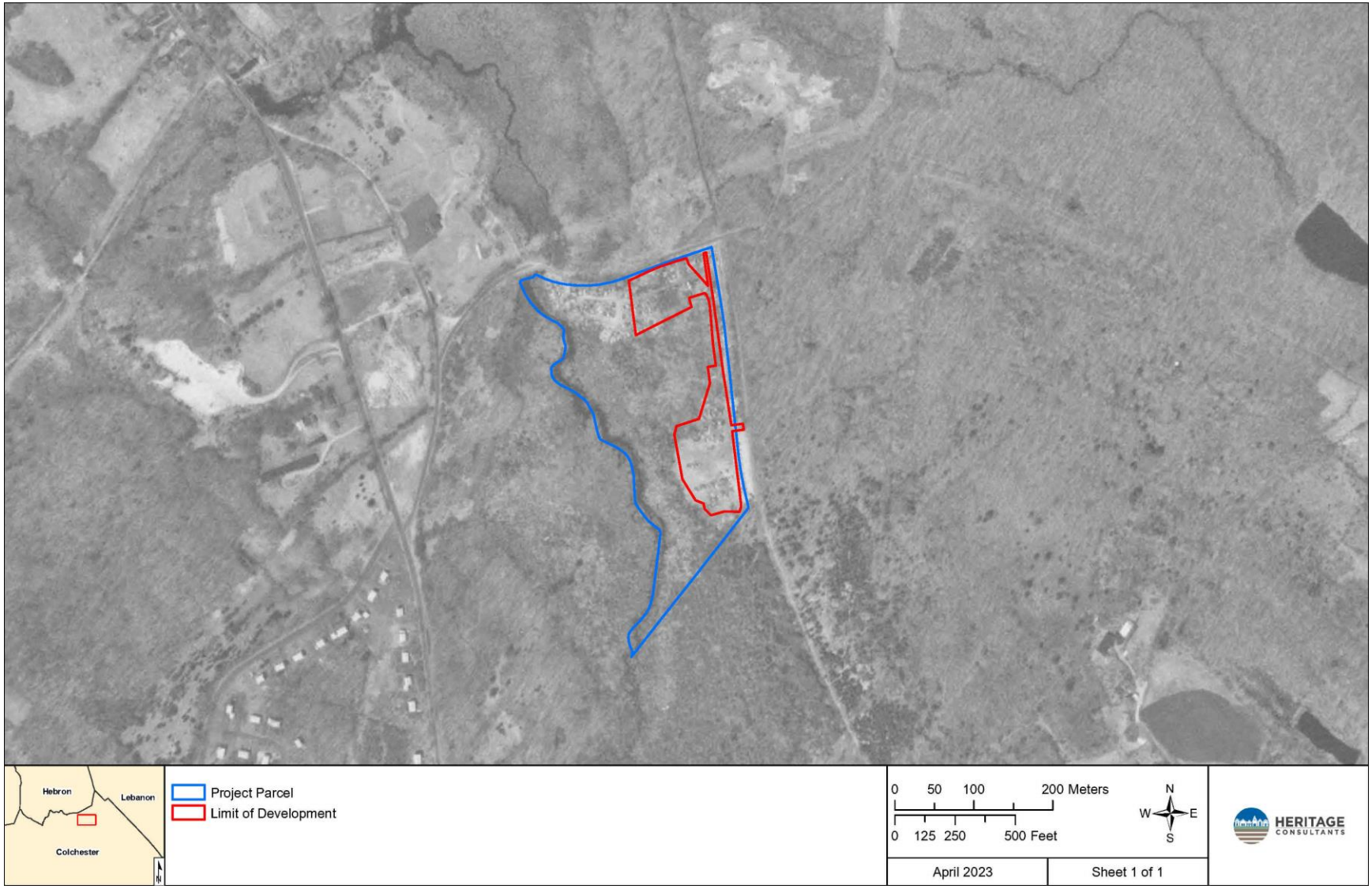



Figure 6. Excerpt from a 1970 aerial photograph showing the location of the fuel cell development in Colchester, Connecticut.

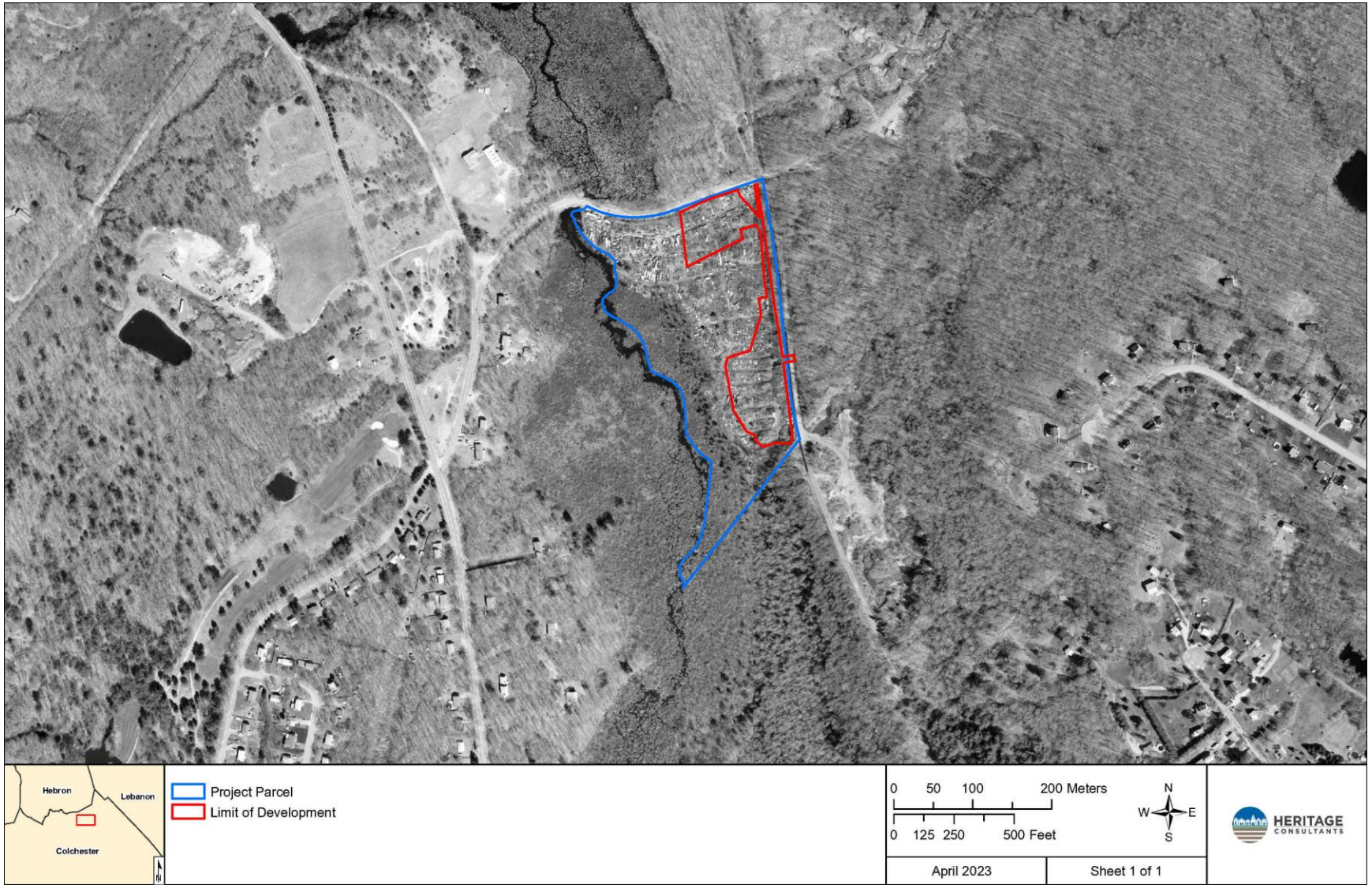



Figure 7. Excerpt from a 2004 aerial photograph showing the location of the fuel cell development in Colchester, Connecticut.

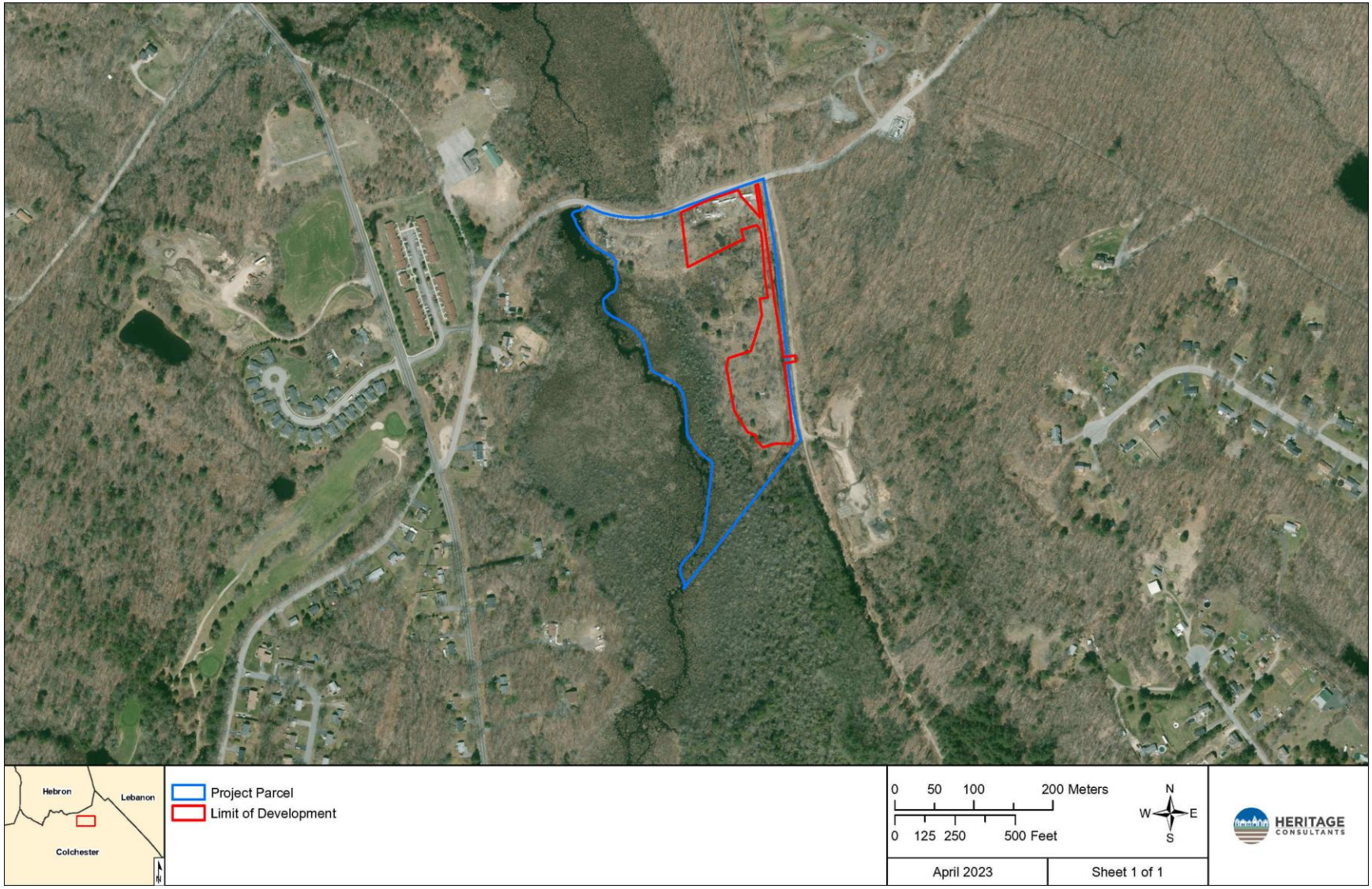



Figure 8. Excerpt from a 2019 aerial photograph showing the location of the fuel cell development in Colchester, Connecticut.

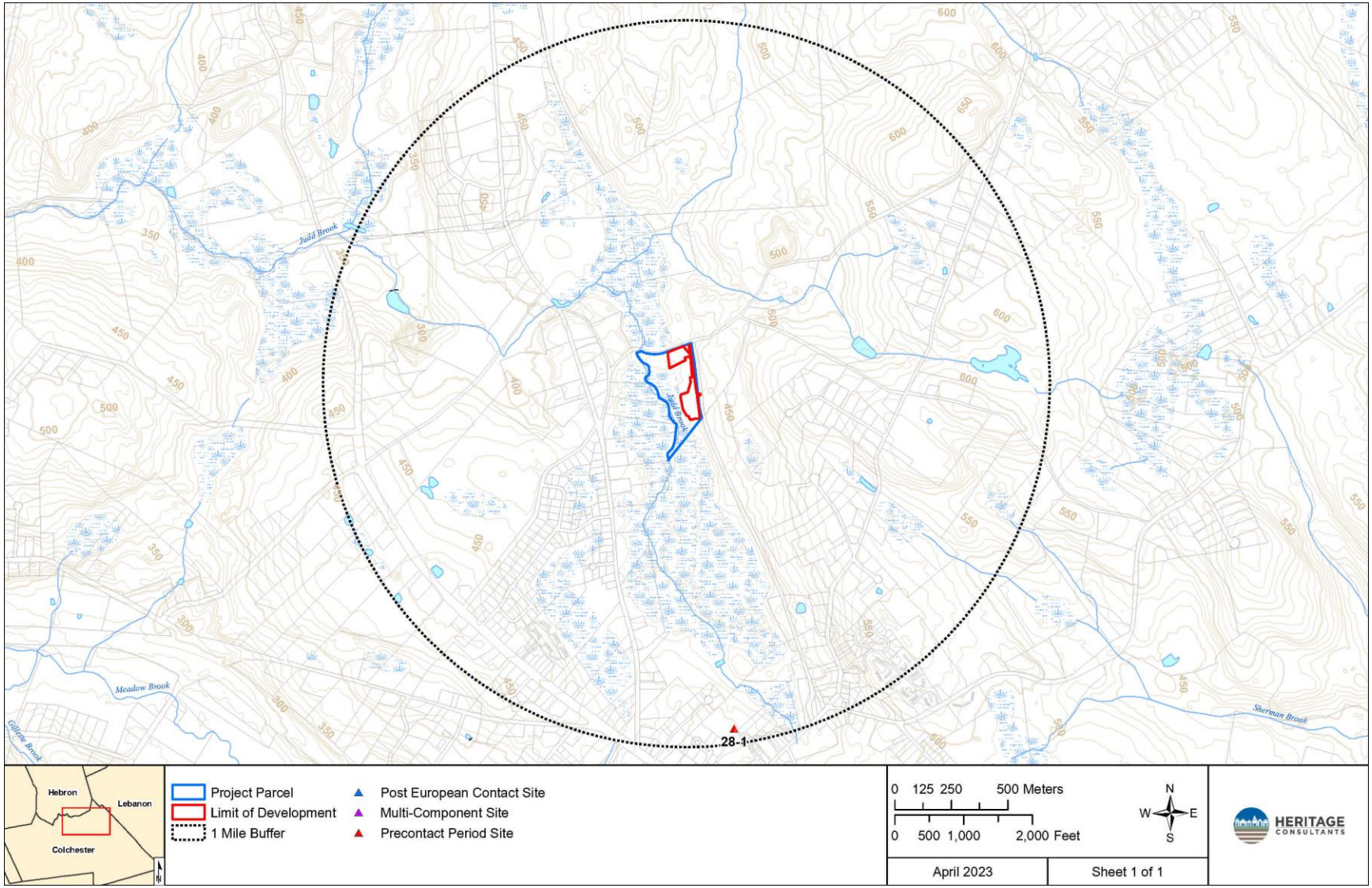



Figure 9. Digital map showing the location of previously identified archaeological sites in the vicinity of the fuel cell development in Colchester, Connecticut.

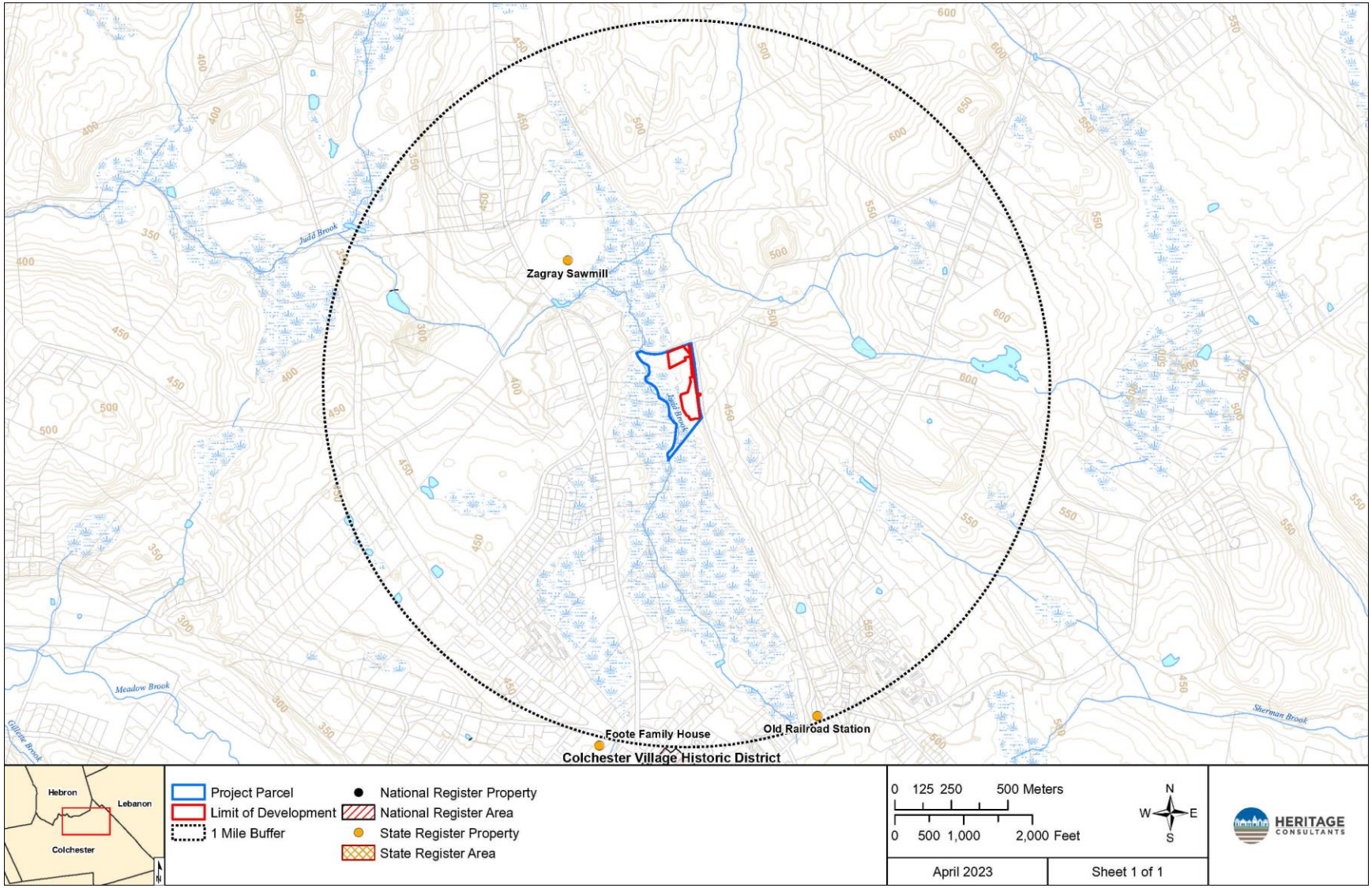



Figure 10. Digital map depicting the locations of previously identified National/State Register of Historic Places properties in the vicinity of the fuel cell development in Colchester, Connecticut.

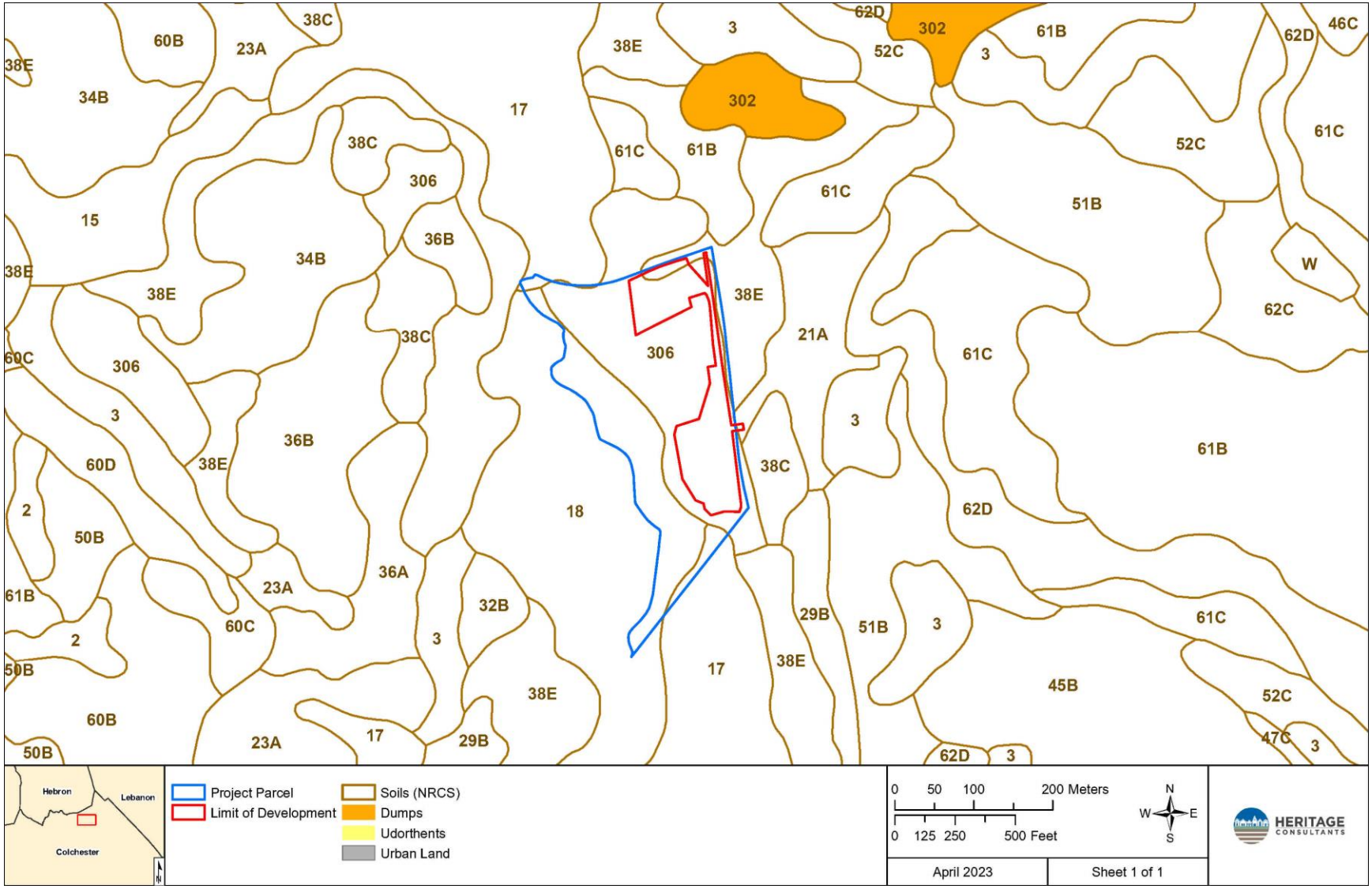



Figure 11. Map of soils located in the vicinity of the fuel cell development, Connecticut.

# APPENDIX F

VISIBILITY DOCUMENTATION

***EXISTING***

| PHOTO | LOCATION | ORIENTATION |
|---|---|---|
| **1** | **OLD AMSTON ROAD** | **NORTH** |


***PROPOSED***

| PHOTO | LOCATION | ORIENTATION |
|---|---|---|
| **1** | **OLD AMSTON ROAD** | **NORTH** |

ALL-POINTS TECHNOLOGY CORPORATION

**ReNew Developers, LLC**

***EXISTING***

| PHOTO | LOCATION | ORIENTATION |
|---|---|---|
| **1A** | **OLD AMSTON ROAD** | **NORTH** |

***PROPOSED***

| PHOTO | LOCATION | ORIENTATION |
|---|---|---|
| **1A** | **OLD AMSTON ROAD** | **NORTH** |

***EXISTING***

| PHOTO | LOCATION | ORIENTATION |
|---|---|---|
| **2** | **OLD AMSTON ROAD** | **SOUTH** |


***PROPOSED***

| PHOTO | LOCATION | ORIENTATION |
|---|---|---|
| **2** | **OLD AMSTON ROAD** | **SOUTH** |

ALL-POINTS TECHNOLOGY CORPORATION

**ReNew Developers, LLC**

# APPENDIX G

SOUND EVALUATION

January 6, 2023

Mr. Peter Carli
ReNew Developers, LLC
14 Chestnut Hill Road
Colchester, CT 06415

SUBJECT: Environmental Sound Evaluation
Old Amston Road Fuel Cell Power Plants (5 MW & 18 MW)
Colchester, CT

Dear Mr. Carli,

Cavanaugh Tocci Associates has evaluated environmental sound impacts associated with the proposed fuel cell power plants at 42 Old Amston Road in Colchester, Connecticut. The objectives of this evaluation were:

- To quantify and characterize existing background sound in the community surrounding the project,
- To define acoustic design goals,
- To estimate the acoustic impact of the proposed project in the surrounding community.

Results of the evaluation are summarized herein. Appendix A of this report is a glossary of relevant acoustic terminology.

**Existing Background Sound**

Sound is a feature of all environments. Sound is only objectionable when it is inconsistent with its environment; by being either too loud or by being distinctive in character (i.e. tonally or temporally varying). The goal of acoustical design is to render facility noise consistent with the level and character of other sounds in the environment. To this end, the following environmental noise analysis evaluates sound produced by the proposed Projects in light of existing environmental sound levels.

An environmental sound survey was conducted to quantify and characterize the existing acoustic environment in the vicinity of the project sites. To document typical background sound levels in the project area, the sound monitoring program consisted of continuous sound monitoring for approximately a weeklong period (4:00 p.m. March 30, 2022 to 12:00 noon April 6, 2022). Figure 1 is an aerial photograph of the Project area that indicates the sound monitoring location (SM-1). This location was selected to provide data that is representative of typical sound levels at the nearest residences west and southeast of the Projects.

Sound levels were monitored using a Rion NL52 sound level meter outfitted with ½ inch electret microphones and windscreen. The instrument was calibrated before the measurement period using a Larson Davis CAL-200 acoustical calibrator. These instruments and their use conform to ANSI S1.4 for Type 1 precision sound measurement instrumentation and have current calibration certificates traceable to National Institute of Standards and Technology (NIST). During the measurements, the microphone was mounted on a tree limb approximately 5 feet above the ground.

For this study, the sound monitor was programmed to record the following hourly A-weighted and one-third octave band environmental noise descriptors:

- Maximum and minimum sound levels ($L_{max}$, $L_{min}$)
- Percentile sound levels ($L_{99}$, $L_{90}$, $L_{50}$, $L_{10}$, $L_{01}$)
- Equivalent sound level ($L_{eq}$)

Figure 2 presents selected results of the environmental sound survey. To avoid sounds produced by insects and spring peepers, the data has been corrected by truncating the measured spectral data at 2,500 Hz and then calculating the A-weighted sound levels from the truncated data. The data indicates that hourly background sound levels at the nearest residences typically range between 35 dBA and 45 dBA with the lowest levels occurring during the early morning hours when local traffic is at a minimum.

**Environmental Sound Regulations**

To the best of our knowledge, the Town of Colchester Connecticut does not have a noise regulation that is applicable to the proposed projects. However, the Connecticut Regulations for the Control of Noise, which are enforced by the Connecticut Department of Energy and Environmental Protection, define limits for sound produced by the proposed projects. The following briefly discusses the applicable aspects of this regulation.

***State of Connecticut Noise Regulation***

The State of Connecticut Noise Regulation (Section 22a-69-1 to 7.4) defines sound level limits for environmental sound produced by the Project. These limits are based on both emitter and receptor land use classifications, and are listed below in Table 1:

**Table 1: Connecticut Regulations for the Control of Noise Sound Level Limits (dBA)**

| | Receptor Class | | | |
|---|---|---|---|---|
| **Emitter Class** | **C** | **B** | **A/Day** | **A/Night** |
| **C** | 70 | 66 | 61 | 51 |
| **B** | 62 | 62 | 55 | 45 |
| **A** | 62 | 55 | 55 | 45 |

*Definitions*

In the above table, day is defined as the time interval 7:00 a.m. to 10:00 p.m. Night is defined as the time interval 10:00 p.m. to 7:00 a.m. Noise Zone Classifications are based on the actual use of the land. Where multiple land uses exist on the same property, the least restrictive limits apply.

- A Class A noise zone is land generally designated for residential use or areas where serenity and tranquility are essential to the intended use.
- A Class B noise zone includes land uses generally of a commercial or agriculture nature. In addition, vacant, undeveloped land, and parks are classified as Class B noise zones.
- A Class C noise zone includes uses generally of an industrial nature. The proposed fuel cell facility is considered a Class C noise emitter.

*Exceptions and Other Limit Provisions*

*Section 22a-69-3.3 Prominent Discrete Tones*

To offset the undesirable nature of tonal sound in the environment, the regulation penalizes sources of prominent, audible discrete tones. If a facility produces such sounds, the applicable limits in Table 1 are reduced by 5 dBA. In its definitions (Section 22a-69-1.2), the regulation defines a method for identifying prominent discrete tones based on measuring one third octave band sound levels.

**Facility Acoustic Requirements**

Our interpretation of the above referenced regulations follows:

- The Fuel Cell facilities are classified as Class C emitters and are expected to produce sound continuously during daytime and nighttime hours. As such, where the regulations provide more stringent limits for nighttime operation, these will apply.
- Sound produced by the fuel cell facilities is not expected to contain prominent discrete tones as defined by the regulation.
- Land north of the proposed facilities is owned by the Town of Colchester. Since this land is currently vacant, it is classified as a Class B receptor with a limit of 66 dBA (day or night).
- Land east of the proposed facilities is owned by Connecticut Light and Power with an existing fuel cell facility in the northwest corner off the site. This land use is considered as a Class C receptor with a limit of 70 dBA (day or night).
- There are two lots south of the proposed facilities which are owned by the Town of Colchester. Since these lots are currently vacant, they are classified as a Class B receptors with a limit of 66 dBA (day or night).

- The nearest residential property boundaries are approximately 300 to 400 feet west of the fuel cell power plants. At these residential property boundaries, the most stringent limit of 51 dBA applies.

**Facility Sound Analysis**

Facility related sound impacts that are associated with equipment at the proposed Project have been calculated using CadnaA environmental sound modeling software (Version 2022 DataKustic GmbH). The CadnaA sound modeling software uses algorithms and procedures described in International Standard ISO 9613-2:1996 "Acoustics- Attenuation of sound during propagation outdoors – Part 2: General method of calculation". This standard and its associated methodology are the most universally accepted approach for environmental sound modeling of industrial and transit sound sources. The methodology described in this standard provides estimates of A-weighted and octave band sound levels for meteorological conditions that are favorable for the propagation of sound (downwind with a wind speed of 1-5 meters/sec). This methodology is also valid for sound propagation under well-developed moderate ground-based temperature profile inversions, which commonly occur on clear calm nights.

The analysis is based on source sound emission data derived from measurements performed near similar fuel cell equipment located in Cambridge, Massachusetts, and Colchester Connecticut. Figure 3 presents the results of the acoustic modeling.

**Conclusion**

Based on our review of the modeling results, it is our opinion that sound produced by the proposed fuel cell power plants will comply with the most stringent requirements of the state noise regulations. Furthermore, it is our opinion that sound produced by the proposed projects will not produce a noticeable impact on the acoustic environment at existing nearby residences and will not have an unreasonable adverse effect at all surrounding properties.

Sincerely,
*CAVANAUGH TOCCI*

Douglas Bell

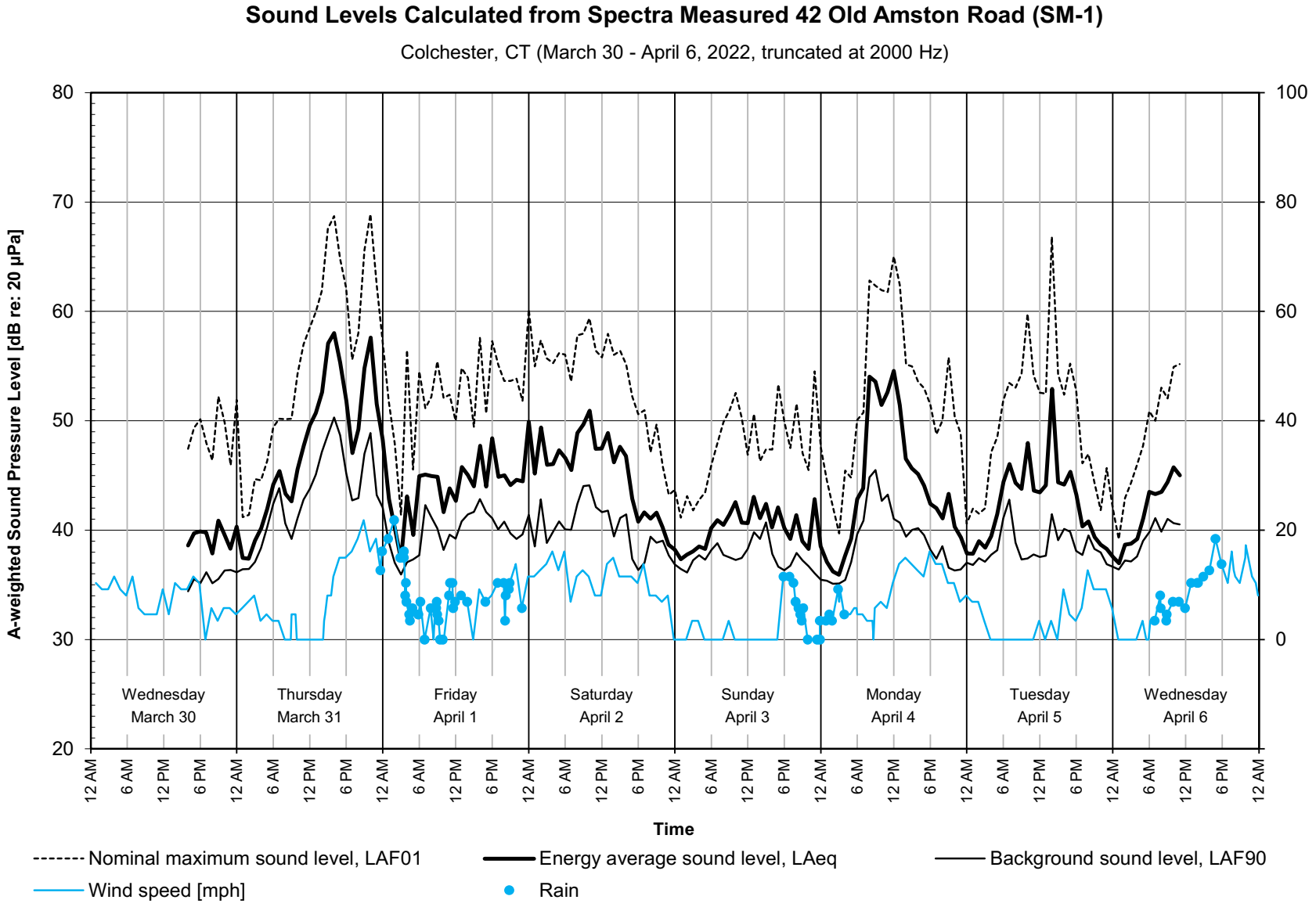
Douglas H. Bell
22248/42 Old Amston Road Fuel Cell Power Plant (5 MW and 18 MW)- Sound Evaluation.docx

# FIGURES


**Aerial Photograph of Project Area Indicating Sound Monitoring Location**

**Figure 1**

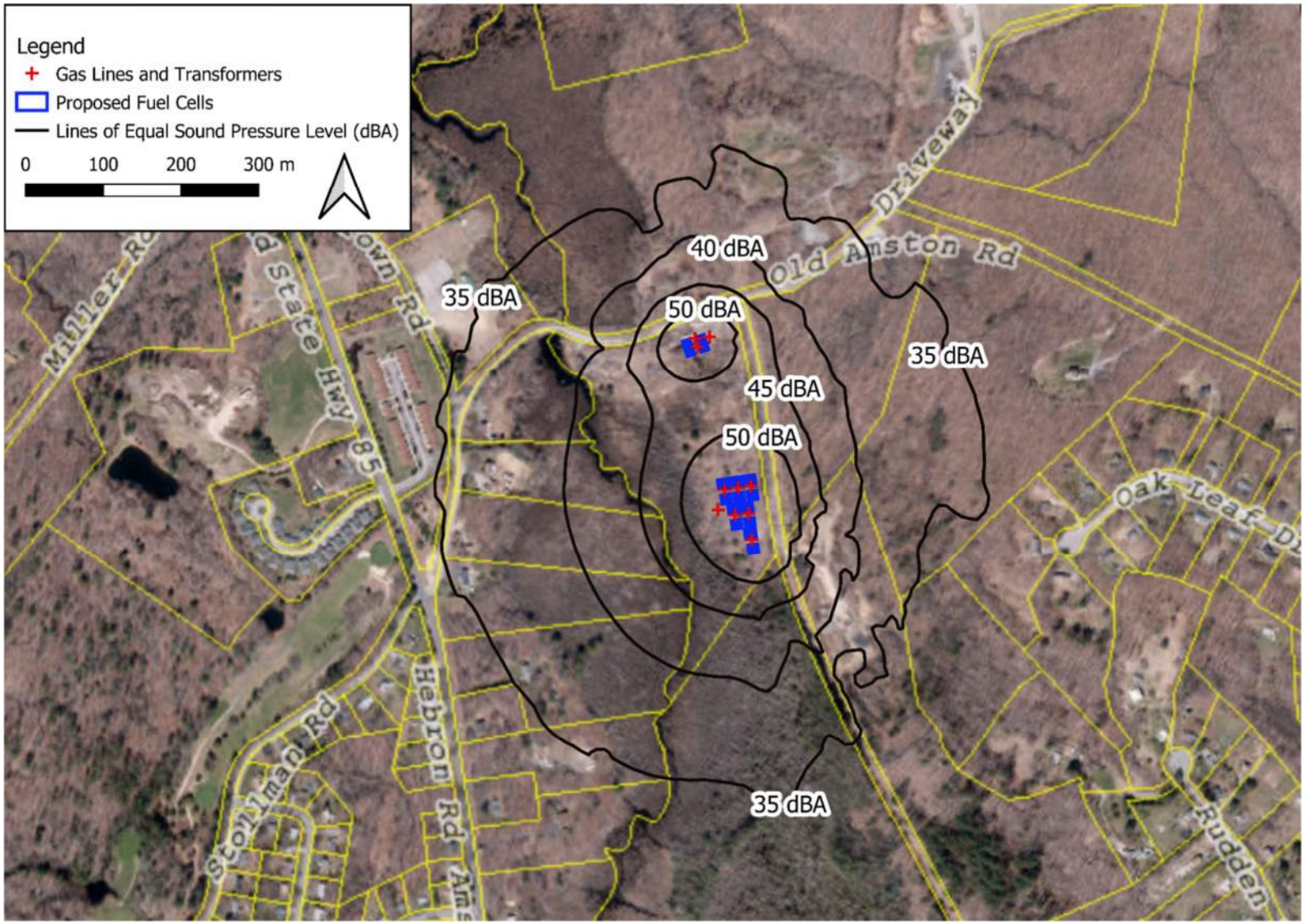
CAVANAUGHTOCCI




S10

**Figure 2**

CAVANAUGHTOCCI




**Estimates of Fuel Cell Power Plant Facility Sound**

**Figure 3**

CAVANAUGHTOCCI

# Appendix A

## Sound Measurement Terminology

# SOUND MEASUREMENT TERMINOLOGY

In order to quantify the amplitude, frequency, and temporal characteristics of sound, various acoustical descriptors are used. The following is an introduction to acoustic terminology that is used in this report.

## Sound Level

Sound levels are typically quantified using a logarithmic decibel (dB) scale. The use of a logarithmic scale helps to compress the wide range of human sensitivity to sound amplitude into a scale that ranges from approximately 0 to 180 dB. Note however, that the use of the logarithmic scale prevents simple arithmetic operations when combining the cumulative impact of sources. For example, two sources of equal sound level operated simultaneously results in a combined sound level that is only 3 dB higher than if only one source was operated alone. An important feature of the human perception of continuous sound is that an increase or decrease in sound pressure level by 3 dB or less is barely perceptible, and an increase or decrease by 10 dB is perceived as a doubling or halving of noise level.

## A-weighting

Generally, the sensitivity of human hearing is restricted to the frequency range of 20 Hz to 20,000 Hz. However, the human ear is most sensitive to sound in the 500 Hz to 5,000 Hz frequency range. Above and below this range, the ear becomes progressively less sensitive. To account for this feature of human hearing, sound level meters incorporate filtering of acoustic signals that corresponds to the varying sensitivity of the human ear to sound at different frequencies. This filtering is called A-weighting. Sound level measurements that are obtained using this filtering are referred to as A-weighted sound levels and are signified by the identifier, dBA. A-weighted sound levels are widely used for evaluating human exposure to environmental sounds. To help place A-weighted sound levels in perspective, Figure A-1 contains a scale showing typical sound levels for common interior and environmental sound sources.

## Spectral Characteristics – Octave and 1/3 Octave Band Sound Levels

To characterize a sound, it is often necessary to evaluate the frequency distribution of the sound energy. As mentioned before, the frequencies of most interest where human exposure is concerned range between 20 Hz and 20,000 Hz. This frequency range is commonly divided into octave bands, where an octave band is a range of frequencies. Each octave band is referred to by its center frequency and has a bandwidth of one octave (a doubling of frequency). To cover the full range of human hearing, it is necessary to measure sound in 10 separate octave bands. Typically, the lowest frequency band measured has a center frequency of 31.5 Hz. The next frequency band has a center frequency of 63 Hz. This geometric series continues to the highest frequency band that has a center frequency of 16,000 Hz. A set of octave band sound levels to describe a particular sound is called an octave band spectrum. Covering the full range of

hearing, an octave band spectrum would have 10 values, one for each band. Under certain circumstances, more frequency resolution in acoustical data is needed to identify the presence of tonal sounds. A 1/3 octave band spectrum uses filters that divide each octave band into 3 separate frequency bands. Note that octave band and 1/3 octave band sound levels are not usually A-weighted, with their units being dB.

**Environmental Noise Descriptors**

Sound levels in the environment are continuously fluctuating and it is difficult to quantify these time-varying levels with single number descriptors. Statistical approaches, which use *percentile sound levels* and *equivalent sound levels*, are often used to quantify the temporal characteristics of environmental sound.

Percentile sound levels ($L_n$) are the A-weighted sound levels that are exceeded for specific percentages of time within a noise measurement interval. For example if a measurement interval is one hour long, the 50th percentile sound level ($L_{50}$) is the A-weighted sound level that is exceeded for 30 minutes of that interval.

- $L_{90}$ is the sound level in dBA exceeded 90 percent of the time during the measurement period. The 90th percentile sound level represents the nominally lowest level reached during the monitoring interval and is typically influenced by sound of relatively low level, but nearly constant duration, such as distant traffic or continuously operating industrial equipment. The $L_{90}$ is often used in standards to quantify the existing background or residual sound level.

- $L_{50}$ is the median sound level: the sound level in dBA exceeded 50 percent of the time during the measurement period.

- $L_{10}$ is the sound level exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The $L_{10}$ is sometimes called the intrusive sound level because it is caused by occasional louder noises like those from passing motor vehicles or aircraft.

By using percentile sound levels, it is possible to characterize the sound environment in terms of the steady-state background sound ($L_{90}$) and occasional transient sound ($L_{10}$).

The equivalent sound level ($L_{eq}$) is the energy average of the A weighted sound level for the measurement interval. Sounds of low level and long duration, as well as sounds of high level and short duration influence this sound level descriptor.

Noise levels at night generally produce greater annoyance than do the same levels which occur during the day. It is generally agreed that a given level of environmental noise during the day would appear to be 10 dBA louder at night – at least in terms of potential for causing community concern. The day night average sound level (Ldn) is a 24 hour average A-weighted

sound level where a 10 dB "penalty" is applied to sound occurring between the hours of 10:00 p.m. and 7:00 a.m. The 10 dB penalty accounts for the heightened sensitivity of a community to noise occurring at night.

When a steady continuous sound is measured, the $L_{10}$, $L_{50}$, $L_{90}$ and $L_{eq}$ are all equal. For a constant sound level, such as from a power plant operating continuously for a 24-hour period, the $L_{dn}$ is approximately 6 dBA higher than the directly measured sound level.

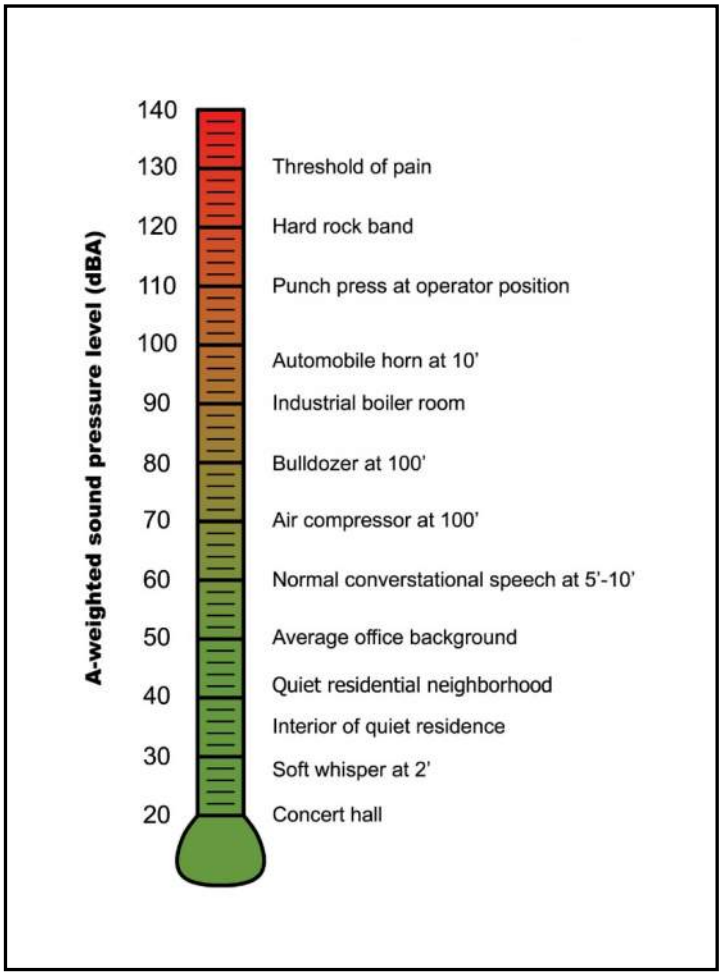



**Figure A-1**
**Typical Sound Levels for Common Interior and Environmental Sources**