

**SECTION 411.6**  
**GROUNDWATER**

**Groundwater**

**A. Narrative**

The proposed project should not impact groundwater quantity or quality. As presented in “Section 411.5, Stormwater Management” of this application, stormwater runoff from the majority of the site will be directed into a grassed Underdrained Soil Filter (USF) and an existing infiltration basin for water quality treatment and runoff control. In addition, the outlet of the USF will be connected to an existing storm drain system which conveys the stormwater to Mare Brook. The USF will be lined with a non-pervious membrane preventing the degradation of the existing groundwater quality.

The project boundaries have been delineated on the attached map entitled “Figure 3.11-1, Town of Brunswick Aquifer protection Zones, NAS Brunswick, Maine”, as found in the EIS. Also attached are maps of: Significant Sand and Gravel Aquifers, the Bedrock Geology of the Bath 1:1000,000 Quadrangle, Maine and the Surficial Geology map.

No groundwater will be used, discharged or otherwise extracted by this development.

The solid waste deposited at the facility will be handled in a manner that will contain the material on paved surfaces and will collect the solid waste in subsurface enclosed tanks prior to processing. There will be no other sources of potential contamination including hazardous materials, fuel, solvents or other chemicals handled, stored or disposed of on site.

Dewatering activities during construction are the responsibility of the contractor conducting the work. Any dewatering will be directed to temporary sedimentation basins established throughout the construction site.

**B. Groundwater Protection Plan**

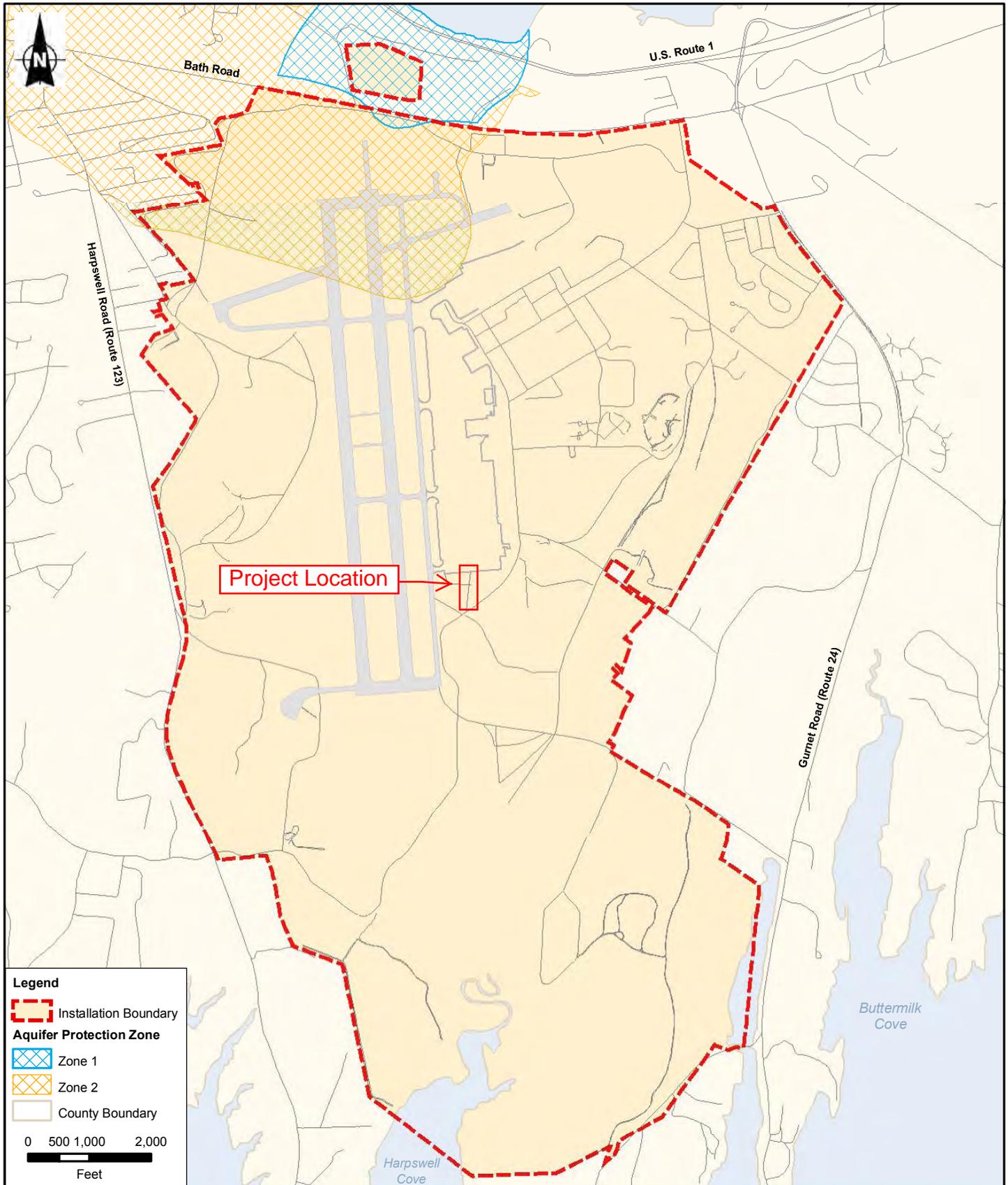
Not applicable.

**C. Monitoring Plan**

Not applicable.

**D. Monitoring Well Installation Report**

Not applicable.



Source: Town of Brunswick 2009a.

**Figure 3.11-1**  
**Town of Brunswick Aquifer Protection Zones**  
**NAS Brunswick, Maine**

# Brunswick Quadrangle, Maine

Compiled by

Craig D. Neil

Preliminary aquifer boundaries mapped by:

Daniel R. Locke

Digital cartography by:  
Michael E. Foley

Robert G. Marvinney  
State Geologist

Cartographic design and editing by:  
Robert D. Tucker  
Bennett J. Wilson, Jr.

Funding for the preparation of this map was provided in part by the  
Maine Department of Environmental Protection.

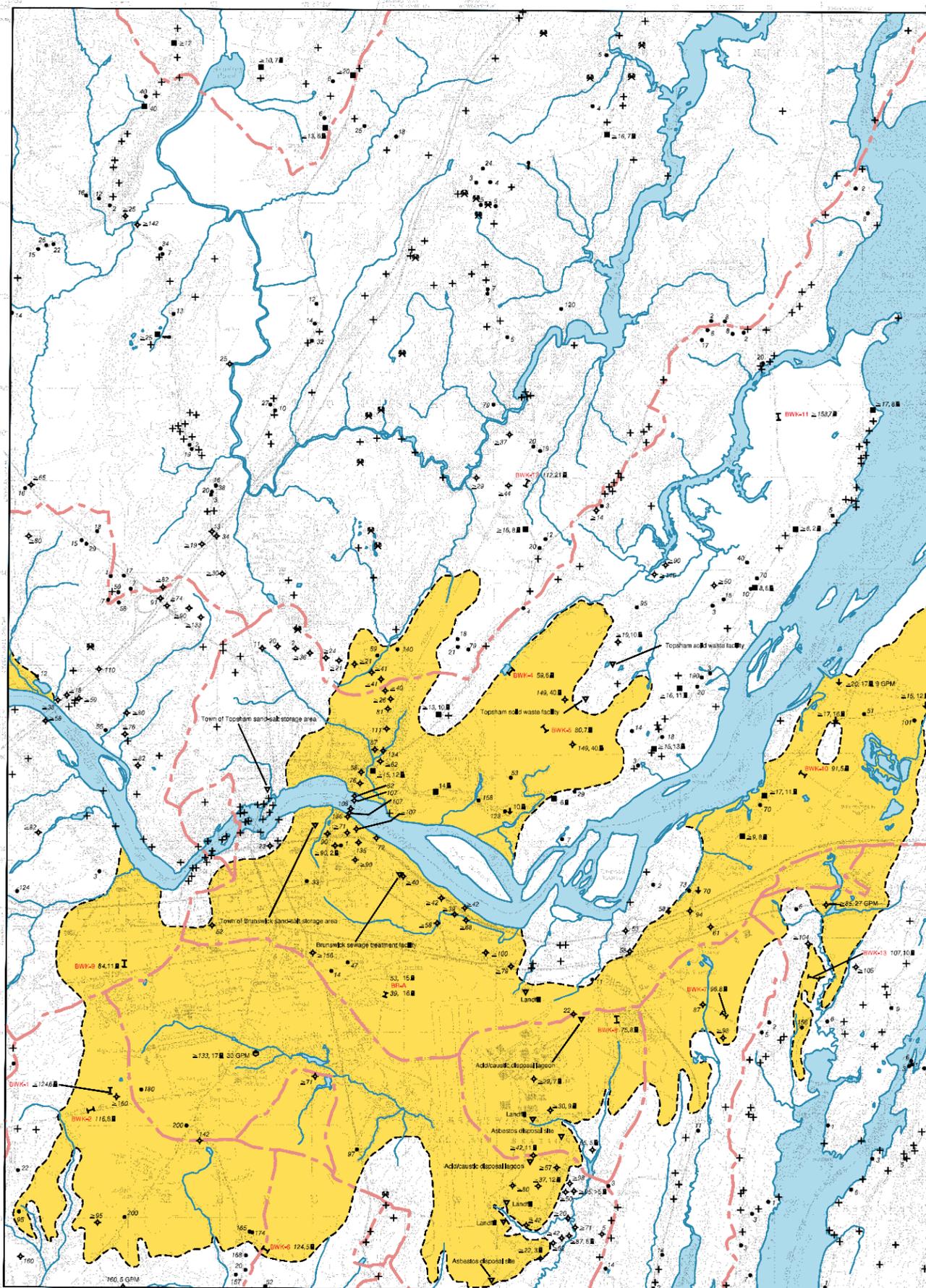


**Maine Geological Survey**

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Open-File No. 99-18  
1999

## Significant Sand and Gravel Aquifers



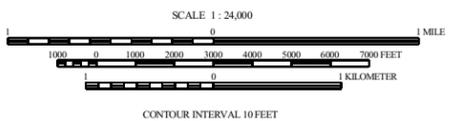
Graphic boundaries modified from Williams, J. S., and Laroche, L. M. (1985). Hydrogeology and water quality of significant sand and gravel aquifers in parts of Androscoggin, Umbagog, Franklin, Kennebec, Lincoln, Oxford, Sagadahoc, and Somerset Counties, Maine. Maine Geological Survey, Open-File Report 85-24, scale 1:50,000.

Well locations from U.S. Geological Survey, Maine State Department of Environmental Protection, and Maine Geological Survey field observations. Well identifiers are as shown on the map.

Source: Data for aquifer boundaries compiled by U.S. Geological Survey, Water Resources Division, in cooperation with the Maine Geological Survey, under contract to the U.S. Geological Survey, under contract to the U.S. Geological Survey, under contract to the U.S. Geological Survey.



Quadrangle Location



TRUE NORTH

Reprinted by permission of the U.S. Geological Survey, from the Maine Geological Survey, Open-File Report 99-18, scale 1:24,000. The U.S. Geological Survey is not responsible for any errors or omissions in this map or its use.

### SIGNIFICANT SAND AND GRAVEL AQUIFERS (yields greater than 10 gallons per minute)

- Approximate boundary of surficial deposits with significant saturated thickness where potential groundwater yield is moderate to excellent.
- Surficial deposits with good to excellent potential groundwater yield. Yields generally greater than 50 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and clayey silt. Yields are based on subsurface data where available, and may vary from mapped extent in areas where data are unavailable.
- Surficial deposits with moderate to good potential groundwater yield. Yields generally greater than 10 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and clayey silt. Yields may exceed 50 gallons per minute in deposits that are hydraulically connected with surficial water bodies, or in extensive deposits where subsurface data are available.

### SURFICIAL DEPOSITS WITH LESS FAVORABLE AQUIFER CHARACTERISTICS (yields less than 10 gallons per minute)

- Areas with moderate to low or no potential groundwater yield (includes areas underlain by till, marine deposits, cotton deposits, alluvium, some thin glacial sand and gravel deposits, or bedrock). Yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well.

### SEISMIC-LINE INFORMATION

Profiles for 12-channel seismic lines may be viewed at the Maine Geological Survey. Length of 12-channel seismic lines as shown on the map fit to scale. All single-channel lines ranged from 80 to 300 feet long and are not shown to scale.

- Depth to bedrock, in feet below land surface.
- Depth to bedrock exceeds depth shown (based on calculations).
- Depth to water level, in feet below land surface.
- Twelve-channel seismic line, with depth to bedrock and depth to water shown at the midpoint of the line, in feet below land surface.
- Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface.

The 3-letter identifier for a line is an abbreviation for the topographic quadrangle. If the 3-letter identifier for the line is followed by a number (ex. MAP-7, MAP-4), the line is a 12-channel line. If the identifier is followed by a letter (ex. MAP-8, MAP-P), the line is a single-channel line. Twelve-channel seismic interpretations by C. D. Neil.

### GEOLOGIC AND WELL INFORMATION

- Depth to bedrock, in feet below land surface.
- Position depth of bottom of sand and gravel to minimum depth to bedrock based on boring depth or refusal.
- Depth to water level in feet below land surface, observed in well, spring, test being run or seismic line.
- Gravel pit or embankment thickness in feet, ex. 5-12".
- Quarry.
- Yield (flow) of well or spring in gallons per minute (GPM).
- Spring with general direction of flow.
- Drilled overboard well.
- Dry well.
- Observation well/project well if labeled; nonproject well if unlabeled.
- Test boring (project boring if labeled; nonproject boring if unlabeled).
- Dry cop point.
- Test pit.
- Drilled bedrock well.
- Potential point source of groundwater contamination.
- Bedrock outcrop.



Surface-water drainage-basin boundary; surface-water divides generally correspond to groundwater divides. Horizontal direction of groundwater flow generally is away from divides and toward surface-water bodies.

### OTHER SOURCES OF INFORMATION

1. Topp, D. H., Williams, J. S., Tolman, A. L., and Prescott, G. C., Jr. 1985. Hydrogeology and water quality of significant sand and gravel aquifers in parts of Androscoggin, Umbagog, Franklin, Kennebec, Lincoln, Oxford, Sagadahoc, and Somerset Counties, Maine. Maine Geological Survey, Open-File Report 85-24, 16 pp.
2. Locke, D. B. 1999. Surficial water resources of the Bath quadrangle, Maine. Maine Geological Survey, Open-File Map 99-54.
3. Smith, G. W. 1977. Reconnaissance surficial geology of the Bath quadrangle, Maine. Maine Geological Survey, Open-File Map 77-58.

4. Corwell, W. B. 1987. Ground-water handbook for the state of Maine. Second Edition. Maine Geological Survey, Bulletin 99-135A.
5. Thompson, W. B. 1979. Surficial geology handbook for coastal Maine. Maine Geological Survey, 68 p. (out of print).
6. Kendall, D. L. 1987. Glaciers and glacial. A guide to Maine's landscape and geology. Down East Books, Chumley, Maine, 240 pp.
7. Thompson, W. B., and Bous, D. W., Jr. 1985. Surficial geologic map of Maine. Maine Geological Survey, scale 1:50,000.



# Brunswick Quadrangle, Maine

Surficial geologic mapping by  
Thomas K. Weddle

Digital cartography by:  
Susan S. Tolman

Robert G. Marvinney  
State Geologist

Cartographic design and editing by:  
Robert D. Tucker

Funding for the preparation of this map was provided in part by the U.S. Geological Survey STATEMAP Program, Cooperative Agreement No. 00HQMG007.

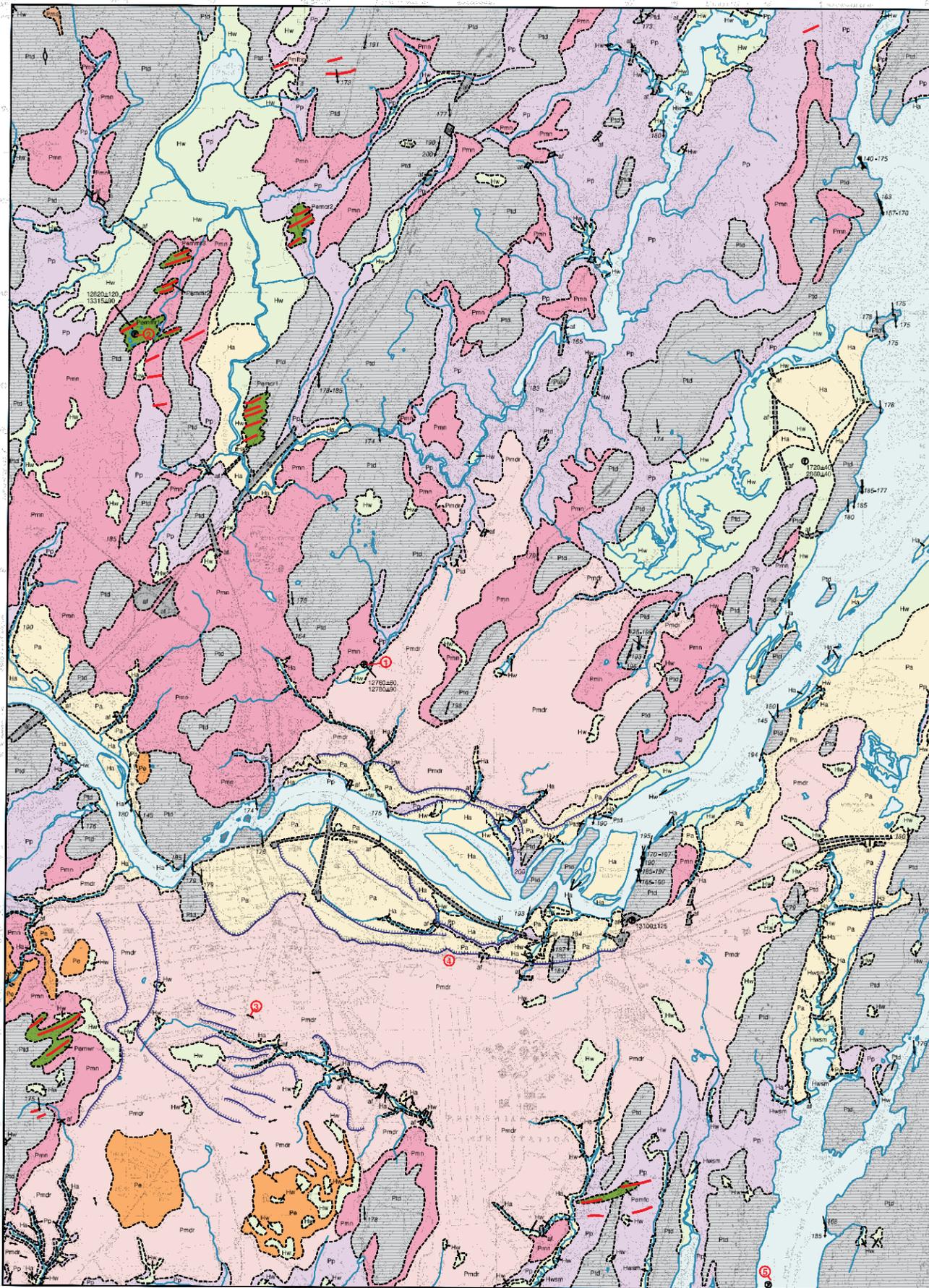


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Open-File No. 01-484  
2001

## Surficial Geology



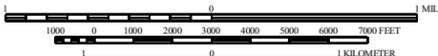
### SOURCES OF INFORMATION

Surficial geologic mapping by Thomas K. Weddle, completed during 1992-1994. 2001 field revision by T.K.W. of the work provided by the U.S. Geological Survey, StateMAP Program.



Quadrangle Location

SCALE 1:24,000



CONTOUR INTERVAL 10 FEET

### USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river or floodplain, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes on the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for any one wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

### OTHER SOURCES OF INFORMATION

- Locke, D. B., and Weddle, T. K., 2001, Surficial materials of the Brunswick quadrangle, Maine, Maine Geological Survey, Open-File Map 01-485.
- Neil, C. D., 1999, Significant sand and gravel aquifers of the Brunswick quadrangle, Maine, Maine Geological Survey, Open-File Map 99-18.
- Thompson, W. B., 1979, Surficial geology handbook for coastal Maine, Maine Geological Survey, 68 p. (out of print).
- Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine, Maine Geological Survey, scale 1:500,000.
- Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, in Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine, Maine Geological Survey, Bulletin 40, p. 43-67.

- af** Artificial fill - Includes landfills, highway and railroad embankments, and dredge spoil areas. These units are mapped only where they are resolvable using the contour lines on the map, or where they define the limits of wetland units. Minor artificial fill is present in virtually all developed areas of the quadrangle.
- Ha** Stream alluvium - Gray to brown fine sand and silt with some gravel. Comprises flood plains along present streams and rivers. Extent of alluvium approximates areas of potential flooding.
- Hw** Freshwater wetlands - Muck, peat, silt, and sand. Poorly drained areas, often with standing water.
- Hwm** Saltmarsh wetlands - Peat, muck, silt, and clay. Coastal marsh, subject to tidal flooding. Thin, non-commercial peat layers are present atop a mineral substrate consisting of estuarine sands and muds.
- Pe** Eolian deposits - Pleistocene eolian deposits comprised of mantle of wind-blown sand and dunes formed following the marine regression. Found often as a blanket deposit, too thin to show on map.
- Pa** Braided-stream alluvium - Pleistocene alluvium consisting of fluviually deposited sand and gravel; trough-crossbedded with rare mud drapes and intraclasts are representative of braided streams and coastal braided-delta environment formed during the marine regression.
- Pmrd** Regressive marine delta - Pleistocene marine delta formed during regression of the sea due to isostatic emergence of the land. Very low-angle sand and silt forest bedding is mantled by trough cross-bedded sand, deposited by braided streams which flowed over the delta top as it prograded seaward. In places, may be mantled with unmapable thin eolian deposits.
- Pms** Marine shoreline - Pleistocene beach and dune sands deposited during regressive phase of marine submergence. Beach morphology is poorly preserved, but sand and gravel are present along the ridge crest.
- Pmn** Marine nearshore deposits - Pleistocene gravel, sand, and mud deposited as a result of wave activity in nearshore or shallow-marine environments, not associated with beach morphology.
- Pp** Presumpscot Formation - Massive to laminated silty clays with rare dropstones and occasional shell horizons, which overlie rock and till, and are interbedded with and overlie end moraines and marine fan deposits; includes sand deposited as a distal unit of submarine fans.

- Pem** End moraines - Linear ridges consisting of bedded sand and gravel interbedded with Presumpscot Formation silty clays and overlain by fill on the ice-proximal faces of the moraines. Some moraines, or groups of moraines, have been assigned a unique geographic name listed below:  
Pemcrs - Cuthance Road moraines 1 to 2  
Pemmrs - Meadow Road moraines 1 to 3  
Pemwr - Woodside Road moraines  
Pemfc - First Church moraine
- Pmrf** Submarine outwash fans - Thick sand and gravel accumulations formed at the mouth of subglacial tunnels along the receding late Pleistocene ice margin. The sand and gravel is interbedded with and overlain by Presumpscot Formation clays at the distal edges of the fans, and interbedded with and overlain by till at their ice-contact faces. Some fans, or group of fans have been assigned a unique geographic name listed below:  
Pmrfpb - Brandy Pond fan
- Ptd** Thin-drift areas - Areas with generally less than ten feet of drift covering bedrock. Till overlies bedrock on hillslopes and ridge crests, Presumpscot Formation silty clays are present in depressions; and nearshore deposits overlie till, Presumpscot Formation, and bedrock on hillslopes and at the base of these slopes. Small rock outcrops, and areas of numerous small outcrops are shown as solid gray areas.
- Contact between units, dashed where inferred.
- Striations - observations made at dot. Number indicates azimuth (in degrees) of ice-flow direction. Where two directions are observed in the same outcrop, flags indicate older trends where discerned.
- End moraine crests.
- Scarp.
- Drumlin.
- Marine fossil locality (may be from natural exposure or subsurface core). Numbers are radiocarbon-age estimates.
- Non-marine fossil locality (may be from natural exposure or subsurface core). Numbers are radiocarbon-age estimates.
- Dip direction of fluvial cross-bedding.
- Photo or other image locality - Location of site shown and described in map legend.

## **SECTION 411.7**

### **EROSION CONTROL**

#### **Erosion Control**

##### **A. Narrative**

A narrative addressing the measures and practices for the project's erosion and sedimentation control measures has been attached to this section. Also included in this section as attachments to the erosion and sedimentation control measures are the maintenance and housekeeping practices for the stormwater facilities.

##### **B. Implementation Schedule**

The implementation schedule is hinged on the construction start date and a detailed schedule from that date is provided within the Erosion and Sediment Control Notes provided on the plans.

##### **C. Plan of Existing Conditions and Plan of Proposed Conditions**

See drawings C-2 and C-3 depicting all existing and proposed site features, respectively.

##### **D. Plan of Locations of Erosion Control BMPs**

See drawing C-4 depicting the locations of all proposed temporary and permanent erosion control measures to be installed on the site.

##### **E. Plan of Limits of Areas to be Disturbed by Construction**

See drawing C-4 depicting the limits of areas to be disturbed by construction activities.

##### **F. Plan of Details and Specifications of Erosion and Sediment Control Measures**

See drawing C-6 for Notes and Details of Erosion and Sediment Control Measures.

##### **G. Design Calculations**

The erosion and sediment control measures to be implemented have been designed considering the peak flows presented in "Section 411.5, Stormwater Management" of this application and in accordance with the guidelines presented in the Maine Erosion and Sediment Control handbook for Construction: Best Management Practices (BMPs).

Permanent measures such as Riprap outlet aprons were designed using the chart and guidelines provided in Section E-3 Pipe Outlet Protection. Emergency spillway riprap was sized considering the flows resulting from the spillway operating as the only outlet and computing a depth of flow over a typical spillway section.

##### **H. Third Party Inspection - Not applicable.**

## SECTION 411.7A

### EROSION AND SEDIMENTATION CONTROL PLAN

**Anaerobic Digester/Energy Production Facility  
Village Green Maine, LLC  
Brunswick Landing  
Brunswick, Maine**

#### INTRODUCTION

This Erosion and Sedimentation Control Plan (E&S Plan) has been developed to provide a strategy to prevent unreasonable erosion of soil and sediment transport beyond the project site or into a protected natural resource. These strategies apply to the proposed development immediately prior to soil disturbing activities on the site and shall remain in place until the site is permanently stabilized.

The information presented in this E&S Plan is provided as an overview of the anticipated measures to be used on this site. In some instances, additional measures may be required due to unexpected conditions that arise during construction. Also, specific detail on the application of a recommended practice for an unexpected instance may not be covered in this E&S Plan. For additional detail on any of the erosion and sedimentation control measures discussed in this E&S Plan or for further recommendations of applicable practices, refer to the "Maine Erosion and Sedimentation Control BMP" manual published by the Maine Department of Environmental Protection (MDEP) dated March 2003, as revised.

#### 1.0 PLAN IMPLEMENTATION PHASES

Generally, the implementation of this plan occurs in three distinct phases as described below:

##### 1.1 Pre-construction Phase

Prior to the beginning of any construction, perimeter sediment barriers (i.e. silt fence, erosion control mix berm, etc...) shall be installed at, or just below, the limits of clearing or grubbing, and/or just above any adjacent property line or protected natural resource. Prior to any clearing or grubbing, a construction entrance shall be constructed at the intersection with the proposed access drive and the existing roadway to avoid tracking of mud, dust and debris from the site.

##### 1.2 Construction Phase

Areas undergoing actual construction shall only expose that amount of mineral soil necessary for progressive and efficient site construction. Any area that has been disturbed and is not "permanently stabilized" (as described by this E&S Plan) shall be considered "open." Open areas shall be protected and stabilized with temporary erosion and sedimentation control measures as shown on the project plans and as described within this E&S Plan.

Preparation for winter stabilization applies to some disturbed areas that are open on or after September 15th of the construction season (refer to the Winter Construction Section of this E&S Plan, Paragraph B – Overwinter Stabilization Timeframe). Any areas that remain open after November 1 or new soil disturbance that occurs after November 1, but before April 15, must be protected by additional measures as described in the Winter Construction section of this E&S Plan. The recommendations outlined in the Winter Construction section of this E&S Plan shall supersede other conflicting recommendations.

### 1.3 Post-construction phase

Once the site has reached permanent stabilization, remove any temporary sediment control measures, such as silt fence, within 30 days. All accumulated sediment/debris in the permanent stormwater management system, ditches, swales, paved surfaces, and/or any other location that has accumulated sediment/debris during construction shall be removed and disposed of in an approved manner.

## 2.0 PERMANENT STABILIZATION

The strategies outlined in this E&S Plan shall be in effect until the site reaches permanent stabilization. Newly seeded or sodded areas must be protected from vehicle traffic, excessive pedestrian traffic, and concentrated runoff until the vegetation is well established. If necessary, areas must be seeded and mulched again if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. The following list defines permanent stabilization for applicable situations.

- 2.1 **Seeded Areas:** For seeded areas, permanent stabilization means a 90% cover of vigorous perennial growth with no evidence of washing or rilling of the topsoil.
- 2.2 **Sodded Areas:** For sodded areas, permanent stabilization means the complete binding of the sod roots into the underlying soil with no slumping of the sod or die-off.
- 2.3 **Permanent Mulch:** For mulched areas, permanent mulching means total coverage of the exposed area with an approved mulch material. Erosion control mix may be used as mulch for permanent stabilization according to approved application rates and limitations.
- 2.4 **Riprap:** For areas stabilized with riprap, permanent stabilization means that slopes stabilized with riprap have an appropriate backing of well-graded gravel or approved geotextile to prevent soil movement from behind the riprap.
- 2.5 **Paved Areas:** For paved areas, permanent stabilization means the placement of compacted gravel subbase is completed.
- 2.6 **Ditches, channels, and swales:** For open channels, permanent stabilization means the channel is stabilized with a 90% cover of vigorous perennial growth, a well-graded riprap lining, or with another non-erosive lining such as specified. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

## 3.0 TEMPORARY EROSION AND SEDIMENTATION CONTROL BMPS

The placement/use of the following erosion and sedimentation control measures shall be in accordance with the "Maine Erosion and Sedimentation Control BMP" manual published by the Maine Department of Environmental Protection (MDEP) dated March 2003, as revised.

- 3.1 **Sediment Barriers:** Prior to the beginning of any construction, sediment barriers (i.e. silt fence, erosion control mix berms, etc...) shall be installed across the slope(s), on the contour, at or just below the limits of clearing or grubbing, and/or just above any adjacent property line or watercourse to protect against construction related erosion. Sediment barriers shall be maintained until all tributary open areas have been permanently stabilized. The following are recommended perimeter sediment barriers:

- **Silt fence:** Shall be installed per the detail on the plans. The effective height of the fence shall not exceed 36 inches. It is recommended that silt fence be removed by cutting the fence materials at ground level so as to avoid additional soil disturbance.
- **Staked hay bales:** Shall be installed per the detail on the plans. Bales shall be wire-bound or string-tied and these bindings must remain parallel with the ground surface during installation to prevent deterioration of the bindings. Bales shall be installed within a minimum four (4) inch deep trench line with ends of adjacent bales tightly abutting another.
- **Erosion control mix berm:** Shall be installed per the detail on the plans. The mix shall consist primarily of organic material and contain a well-graded mixture of particle sizes. The mix must meet the most recent composition specifications published by the MDEP. No trenching is required for installation of this barrier.

**3.2 Surface Stabilization:** All disturbed areas that will not be worked for more than 7 days shall be protected and stabilized with mulch or other non-erodible cover. Areas located within 75 feet of a wetland or waterbody must be protected and stabilized within 48 hours of the initial disturbance of the soil or prior to any storm event, whichever comes first. Areas that have been seeded (temporary or permanent) shall be stabilized immediately. The following are recommended practices for surface stabilization:

- **Hay or straw Mulch:** Organic mulches including hay and straw need to be air-dried, free of undesirable seeds and coarse materials. Application rate shall be 2 bales (70-90 lbs) per 1000 square feet or 1.5 to 2 tons (90-100 bales) per acre. This type of mulch must be anchored with a tackifier amendment and/or via physical means (i.e. vehicle tracking, jute netting, etc...) to avoid displacement by wind or water.
- **Erosion control mix:** Erosion Control Mix can be manufactured on or off the site. It is composed primarily of shredded bark, stump grindings, composted bark, or other acceptable products based on a similar raw source. The mix must meet the most recent composition specifications published by the MDEP. The mix shall be placed evenly and must provide 100% soil coverage. Erosion control mix shall be applied such that the thickness on slopes 3:1 or less is 2 inches plus ½ inch per 20 feet of slope up to 100 feet. The thickness on slopes between 3:1 and 2:1 is 4 inches plus ½ inch per 20 feet of slope up to 100 feet. This shall not be used on slopes greater than 2:1.
- **Erosion control blankets:** Erosion Control Blankets are used on steep slopes (greater than 3H:1V) and also areas that will receive concentrated stormwater flows. Blankets aid in controlling erosion on disturbed soils and critical areas during the establishment period of vegetation. Various forms of erosion control blankets are commercially available, each with different advantages for different applications. The type of blanket to be used for individual applications shall be as indicated on the development plan set or via the use of an approved equivalent blanket. In all applications, the blanket manufacturer's specifications and installation methods shall be referenced and adhered to.

**3.3 Soil Stockpiles:** All topsoil shall be stockpiled for future use on the project at a stable location on-site. Structural measures, such as sediment barriers, may be warranted for additional sediment control of the stockpile areas. Stockpiles of soil or subsoil shall be mulched with hay or straw or with erosion control mix. This must be done within 24 hours of stocking and re-established prior to any rainfall. Any soil stockpile will not be placed (even covered with hay or straw) within 75 feet from any protected natural resources.

**3.4 Stabilized Construction Entrance/Exit:** Prior to any clearing or grubbing, a stabilized construction entrance/exit shall be constructed wherever traffic will exit the construction site onto a paved roadway in order to minimize the tracking of sediment and debris from the construction site onto public roadways. The entrances and adjacent roadway areas shall be periodically swept or washed to further minimize the tracking of mud, dust or debris from the construction area.

When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment trapping device. Stabilized construction exits shall be constructed in areas as specified and detailed on the plans.

- 3.5 Stone Check Dams:** Stone check dams are generally temporary devices, which are constructed across a swale or drainage ditch. Their purpose is to reduce the velocity of concentrated stormwater flows, thereby reducing erosion of the swale or ditch. These devices will also trap small amounts of sediment generated in the ditch itself, however, they are not an effective sediment trapping device and should not be used as such. Stone check dams are typically constructed of 2"-3" crushed stone and stand 24 inches in height.
- 3.6 Storm Drain Inlet Protection:** Storm drains are typically operational prior to permanent stabilization of tributary areas. In these instances hay bales, crushed stone barriers, and/or silt sacks shall be used within a catch basin or prior to a pipe entrance. This temporary protection will assist in the removal of sediment prior to entrance into a storm drainage system and the prevention of clogging and/or loss of capacity. These devices alone will not prevent all sediment from entering the stormwater system and should be used in conjunction with other devices to achieve desired sediment removal levels.
- 3.7 Dewatering:** Water from construction dewatering will pass first through a filter bag or secondary containment structure (e.g. hay bale lined pool) prior to discharge. The discharge site shall be selected to avoid flooding, icing and sediment discharges to a protected natural resource. Discharge is permitted within the filter basin locations prior to the installation of the filter media.
- 3.8 Dust Control:** Dust control during construction shall be achieved by the use of a watering truck to periodically sprinkle the exposed roadway areas as necessary to reduce dust during the dry months. Applying other dust control products such as calcium chloride or other manufactured products are allowed if authorized by the proper local, state and/or federal regulating agencies. However, it is the contractor's ultimate responsibility to mitigate dust and soil loss from the site.

**4.0 VEGETATIVE MEASURES**

- 4.1 Temporary Vegetation:** If any disturbed area of soil will be left bare for more than 7 days, or if construction is to be completed in phases over an extended duration, temporary seeding and mulching shall commence immediately following initial fine grading of the site. In sensitive areas (within 75 feet of protected natural resources) temporary mulch must be applied within 48 hours or prior to any storm event on all disturbed surfaces. It shall be maintained and reseeded, as necessary, to ensure good vegetative cover for the entire duration of construction. Seed will be selected from the following table (Table 1 - Temporary Seed Mixture) according to the time of year or via an approved equivalent method.

**TABLE 1  
TEMPORARY SEED MIXTURE**

<b>Seed</b>	<b>Lbs./Acre</b>	<b>Lbs./1000s.f.</b>	<b>Recommended Seeding Date</b>
Winter Rye	112	2.6	8/15 thru 10/1
Oats	80	1.8	4/1 thru 7/1 8/15 thru 9/15
Annual Ryegrass	40	0.9	4/1 thru 7/1
Sudangrass	40	0.9	5/15 thru 8/15
Perennial	40	0.9	8/15 thru 9/15

Note:

Some tree and shrub species may be desirable for sites primarily covered with sand and gravel. These methods shall be approved by the appropriate regulatory authority prior to use.

**4.2 Permanent Vegetation:** Revegetation measures shall commence immediately upon completion of final grading of areas to be loamed and seeded. Revegetation measures shall consist of the following:

**4.2.1 Seedbed Preparation**

- Four (4) inches of loam will be spread over disturbed areas and smoothed to a uniform surface. Loam shall be free of subsoil, clay lumps, stones and other objects over 2" in any dimension, and without weeds, roots or other objectionable material.
- Soil tests shall be taken at the time of soil stripping to determine fertilization requirements. Soil tests shall be taken promptly as to not interfere with the 7-day limit on soil exposure (48-hours adjacent to a protected natural resource). Based upon test results, soil amendments shall be incorporated into the soil prior to final seeding. In lieu of soil tests, soil amendments may be applied as shown below in Table 2:

**TABLE 2  
RECOMMENDED SOIL AMENDMENTS**

<b>Item</b>	<b>Application Rate</b>
10-20-20 Fertilizer (N-P205-K20 or equal)	18.4lbs./1,000 s.f.
Ground Limestone (50% calcium and magnesium oxide)	138-lbs./1,000 s.f.

- Work lime and fertilizer into the soil as nearly as practical to a depth of four (4) inches with proper equipment. Roll the area to firm the seedbed except on clay, silty soils or coarse sand.

**4.2.2 Application of Seed**

- **Seeding:** The seed mixture shown below in Table 3 shall be utilized for permanent seeding applications. Alternate seed mixtures may be utilized as approved. Refer to Appendix A of the MDEP Erosion and Sedimentation Control BMP manual for additional seed mixture options.

**TABLE 3  
PERMANENT SEED MIXTURE**

<b>Seed Type</b>	<b>Application Rate</b>
Creeping Red Fescue	0.46 lbs/1,000 s.f. (20 lbs/acre)
Red Top	0.05 lbs/1,000 s.f. (2 lbs/acre)
Tall Fescue	0.46 lbs/1,000 s.f. (20 lbs/acre)
Total:	0.97 lbs/1,000 s.f. (42 lbs/acre)

- **Hydroseeding:** Shall be conducted on prepared areas as described above. Hydroseeding shall not be done on slopes steeper than 2H:1V. Lime and fertilizer may be applied simultaneously with the seed. Recommended seeding rates must be increased by 10% when hydroseeding.

- **Surface Stabilization:** Mulching or other approved surface stabilization methods shall commence immediately after seed is applied. Refer to the surface stabilization section of this plan for more information.

#### 4.2.3. Sodding

Following seedbed preparation, sod can be applied in lieu of seeding in areas where immediate vegetation is most beneficial such as ditches, around stormwater drop inlets and areas of aesthetic value. Sod should be laid at right angles to the direction of flow starting at the lowest elevation. Sod should be rolled or tamped down to even out the joints once laid down. Where flow is prevalent the sod must be properly anchored down. Irrigate the sod immediately after installation. In most cases, sod can be best established between April 1 and November 15 of the construction year.

### 5.0 WINTER CONSTRUCTION

The winter construction period is from November 1 through April 15. If the construction site is not permanently stabilized by November 15 then the site needs to be protected with over-winter stabilization.

Winter excavation and earthwork shall be completed such that no more than 1 acre of the site is without stabilization at any one time. Limit the exposed area to those areas in which work is expected to be under taken during the proceeding 15 days and that can be mulched in one day prior to any snow event. All areas shall be considered to be denuded until the subbase gravel is installed in roadway areas or the areas of future loam and seed have been loamed, seeded and mulched.

Any added measures, which may be necessary to control erosion/sedimentation from the site dependent upon the actual site and weather conditions, must be installed. Continuation of earthwork operations on additional areas shall not begin until the exposed soil surface on the area being worked has been stabilized, in order to minimize areas without erosion control protection.

#### 5.1 Winter Construction BMP Adjustments

- 1) **Sediments Barriers:** During frozen conditions, sediment barriers shall consist of erosion control mix berms as frozen soil prevents the proper installation of hay bales and silt fences.
- 2) **Mulching:** Between the dates of November 1 and April 15, all mulch shall be anchored by either mulch netting, asphalt emulsion chemical, track or weed cellulose fiber. When the ground surface is not visible through the mulch then cover is sufficient. After November 1st, mulch and anchoring of all exposed soil shall occur at the end of each final grading workday.
  - **Open Surfaces (flatter than 8%):** Hay and straw mulch shall be applied at a rate of 150 lb. per 1,000 square feet or 3 tons/acre (twice the normal accepted rate of 75-lbs./1,000 square feet or 1.5 tons/acre) and shall be properly anchored. Mulch shall not be spread on top of snow. The snow will be removed down to one-inch depth or less prior to application. After each day of final grading, the area will be properly stabilized with anchored hay or straw or erosion control matting. An area shall be considered to have been stabilized when exposed surfaces have been either mulched with straw or hay at a rate of 150 lb. per 1,000 square feet (3 tons/acre) and adequately anchored that ground surface is not visible through the mulch.

- **Open Slopes (8% or steeper) and Drainage Ways:** Slopes shall not be left exposed for any extended time of work suspension unless fully mulched and anchored with netting or erosion control blankets. Mulching shall be applied at a rate of 230-lbs/1,000 square feet on all slopes steeper than 8%. Mulch netting shall be used to anchor mulch in all drainage ways with a slope steeper than 3% for slopes exposed to direct winds and for all other slopes steeper than 8%. Erosion control blankets shall be used in lieu of mulch in all drainage ways. Erosion control mix can be used to substitute erosion control blankets on slopes that do not exceed 2H:1V. In this case, the erosion control mix shall be spread out, not placed in a berm as it is installed as a sedimentation barrier.
- 3) **Soil Stockpiles:** Stockpiles of soil or subsoil shall be mulched for over winter protection with hay or straw at twice the normal rate or at 150-lbs/1,000 square feet (3 tons per acre) or with a four-inch layer of wood waste erosion control mix. This will be done within 24 hours of stocking and re-established prior to any rainfall or snowfall. Any soil stockpile will not be placed (even covered with hay or straw) within 100 feet from any natural resources.
  - 4) **Natural Resources Protection:** Any areas within 100 feet from any protected natural resources, if not stabilized with a minimum of 90% mature vegetation catch, shall be mulched by December 1 and anchored with plastic netting or protected with erosion control mats. During winter construction, a double line of sediment barriers (i.e. silt fence backed with hay bales or erosion control mix) will be placed between any natural resource and the disturbed area. Projects crossing the natural resource shall be protected a minimum distance of 100 feet on either side from the resource. Existing projects not stabilized by December 1 shall be protected with the second line of sediment barrier to ensure functionality during the spring thaw and rains.
  - 5) **Seeding:** Between the dates of October 15 and April 1st, loam or seed will not be required. During periods of above freezing temperatures finished areas shall be fine graded and either protected with mulch or temporarily seeded and mulched until such time as the final treatment can be applied. If the date is after November 1st and if the exposed area has been loamed, final graded with a uniform surface, then the area may be dormant seeded at a rate of 3 times higher than specified for permanent seed and then mulched.

Dormant seeding may be selected to be placed prior to the placement of mulch and fabric netting anchored with staples. If dormant seeding is used for the site, all disturbed areas shall receive 4" of loam and seed at an application rate of 5-lbs/1000 square feet. All areas seeded during the winter will be inspected in the spring for adequate catch. All areas insufficiently vegetated (less than 90% catch) shall be revegetated by replacing loam, seed and mulch. If dormant seeding is not used for the site, all disturbed areas shall be revegetated in the spring.

## 5.2 Overwinter Stabilization Timeframe

- 1) **Ditches and Channels:** All stone-lined ditches and channels must be constructed and stabilized on the site by November 15. All grass-lined ditches and channels must be constructed and stabilized by September 15. If a ditch or channel is not grass-lined by September 15, then one of the following actions must be taken to stabilize the ditch for late fall and winter.

- **Install a sod lining in the ditch:** A ditch must be lined with properly installed sod by October 1. Proper installation includes the contractor pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, watering the sod to promote root growth into the disturbed soil, and anchoring the sod with jute or plastic mesh to prevent the sod strips from sloughing during flow conditions.
  - **Install a stone lining in the ditch:** A ditch must be lined with stone riprap by November 15. A registered professional engineer must be hired to determine the stone size and lining thickness needed to withstand the anticipated flow velocities and flow depths within the ditch. If necessary, the ditch must be regraded prior to placing the stone lining to prevent the stone lining from reducing the ditch's cross-sectional area.
- 2) **Disturbed Slopes:** All stone-covered slopes must be constructed and stabilized by November 15. All slopes to be vegetated must be seeded by September 15. The MDEP will consider any area having a grade greater than 15% (10H:1V) to be a slope. If a slope to be vegetated is not stabilized by September 1, then one of the following actions must be taken to stabilize the slope for late fall and winter.
- **Stabilize the soil with temporary vegetation and erosion control blankets:** By October 1 the disturbed slope must be seeded with winter rye at a seeding rate of 3 pounds per 1,000 square feet and apply erosion control blankets over the mulched slope. If the rye fails to grow at least three inches or cover at least 90% of the disturbed slope by November 1, the slope will be covered with a layer of erosion control mix or stone riprap as described in the following standards.
  - **Stabilize the slope with sod:** The disturbed slope must be stabilized with properly installed sod by October 1. Proper installation includes pinning the sod onto the slope with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil. Slopes steeper than 33% (3H:1V) or having groundwater seeps on the slope face, may not use late-season sod installation for stabilization.
  - **Stabilize the slope with erosion control mix:** A six-inch layer of erosion control mix must be spread over the slope by November 15. Prior to placing the erosion control mix, any snow accumulation on the disturbed slope must be removed. Slopes steeper than 50% (2H:1V) or having groundwater seeps on the slope face can not use erosion control mix to stabilize slopes.
  - **Stabilize the slope with stone riprap:** A layer of stone riprap can be placed on the slope by November 15. A registered professional engineer must be hired to determine the stone size needed for stability and to design a filter layer for underneath the riprap.
- 3) **Other Disturbed Soils:** By September 15, all disturbed soils on areas having a slope flatter than 15% (10H:1V) must receive seed and mulch. If disturbed areas are not stabilized by this date, then one of the following actions must be taken to stabilize the soil for late fall and winter.
- **Stabilize the soil with temporary vegetation:** By October 1, seed the disturbed soil with winter rye at a seeding rate of 3 pounds per 1,000 square feet, lightly mulch the seeded soil with hay or straw at 75 pounds per 1000 square feet, and

anchor the mulch with plastic netting. Monitor growth of the rye over the next 30 days. If the rye fails to grow at least three inches or cover at least 90% of the disturbed soil before November 1, then mulch the area for over-winter protection as described in the following “Stabilize the soil with mulch” standard.

- **Stabilize the soil with sod:** Stabilize the disturbed soil with properly installed sod by October 1. Proper installation includes pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil.
- **Stabilize the soil with mulch:** By November 15, mulch the disturbed soil by spreading hay or straw at a rate of at least 150 pounds per 1000 square feet on the area so that no soil is visible through the mulch. Prior to applying the mulch, any snow accumulation on the disturbed area must be removed. Immediately after applying the mulch, anchor the mulch with plastic netting to prevent wind from moving the mulch off the disturbed soil.

## 6.0 INSPECTION AND MAINTENANCE

Inspection and maintenance are required of all erosion and sedimentation control measures outlined in this plan. Refer to the Inspection, Maintenance, and Housekeeping plan for this project (provided under separate cover) for an outline of the associated inspection and maintenance requirements.

## SECTION 411.7B

### INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

**Anaerobic Digester/Energy Production Facility  
Village Green Maine, LLC  
Brunswick Landing  
Brunswick, Maine**

#### **Introduction**

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

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

#### **During Construction**

1. **Inspection:** During the construction process, it is the Contractor’s responsibility to comply with the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, material storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.
2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (rainfall).
3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, material storage areas,

and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request.

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

A. Sediment Barriers:

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

B. Erosion Control Blankets:

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

C. Temporary Storm Drain Inlet Protection:

- The inlet protection structure shall be inspected before each rain event and repaired as necessary.
- Sediment shall be removed and the storm drain sediment barrier restored to its original dimensions when the sediment has accumulated to half of the design depth of the trap.
- Barriers shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the barrier, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

D. Stabilized Construction Entrances/Exits:

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

E. Temporary Seed and Mulch:

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

F. Stabilized Temporary Drainage Swales:

- Sediment accumulation in the swale shall be removed once the cross section of the swale is reduced by 25%.
- The swales shall be inspected after rainfall events. Any evidence of sloughing of the side slopes or channel erosion shall be repaired and corrective action should be taken to prevent reoccurrence of the problem.
- In addition to the stabilized lining of the channel (i.e. erosion control blankets), stone check dams may be needed to further reduce channel velocity.

**After Construction**

1. **Inspection:** After construction, it is the responsibility of the owner or assigned heirs to comply with the inspection and maintenance procedures outlined in this section. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in all applicable permits, shall conduct the inspections.
2. **Specific Inspection and Maintenance Tasks:** The following is a list of permanent erosion control and stormwater management measures and the inspection and maintenance tasks to be performed after construction.

A. Vegetated Areas:

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

B. Catch Basins:

- Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring.
- Clean out must include the removal and legal disposal of accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins.
- If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).

C. Winter Sanding:

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

D. Grassed Underdrained Soil Filters (USF1 & USF2)

- Check the pond embankments for sloughing or erosion. The vegetation should be well established and maintained. Remove any trees or shrubs growing in the pond or on the inside of the pond embankments.
- Check the outlet control structure for sediment accumulation or other blockages.
- Look for sediment deposits in the sediment forebays of the ponds. If the sediments leave less than 1 foot to the top of the berm between the forebay and the pond, remove the sediments and reline the forebay with stones.
- Monitor the time it takes for the stormwater to drain from the pond. For a 1 inch or larger rainfall event, the pond should be drained in 24 to 48 hours. If the timeframe to drain the pond approaches 48 hours, the filter media should be replaced.

3. **Duration of Maintenance:** Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system.

### **Housekeeping**

The following general performance standards apply to the proposed project both during and after construction.

- A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials and equipment on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.
- B. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.
- C. Fugitive sediment and dust: Actions must be taken to insure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.
- D. Debris and other materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.
- E. Trench or foundation dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

# Project Construction Erosion Control BMPs Inspection Maintenance Tasks Log

Anaerobic Digester/Energy Production Facility  
Brunswick Landing  
Brunswick, Maine  
W-P 12600

## Village Green Maine, LLC

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Maintenance Personnel: \_\_\_\_\_

Erosion Control BMPs	Inspection		Maintenance	
	Date	Comments	Date	Corrective Action
Silt Fence/Hay Bales/Mulch				
Soil stockpiles				
Construction Site Entrance				
Cut/Fill Slopes Protection				
Vegetated/Riprap Ditches				
Stone Check Dams				
Catch Basins/Manholes Inlet Protection				
Road Sideslopes Protection				
Outfall Condition				
Soil Filter Embankments Stability				
General Site Stability				
Riprap Condition				
Culvert Conditions				
Erosion Control Blankets				
Temporary Seeding & Mulch				

### Sediment/Debris Disposal

Location of Sediment/Debris Accumulation	Location of Sediment/Debris Disposal	Date of Disposal

# Post Project Construction Erosion Control Inspection and Maintenance Tasks Log

Anaerobic Digester/Energy Production Facility  
Brunswick Landing  
Brunswick, Maine  
W-P 12600

## Village Green Maine, LLC

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Maintenance Personnel: \_\_\_\_\_

Permanent Erosion Control Measures	Inspection				Maintenance			
	Date	Comments			Date	Corrective Action		
Repair Eroded Vegetated Slopes								
Replant Bare or Sparsely Vegetated Areas								
Remove Accumulated Sediment in Catch Basin								
Remove Winter Sand and Debris								
Repair Soil Filter Embankments								
Remove Sediment at Soil Filter Outlet								
Remove Sediment from Soil Filter Forebays								
Remove Sediment on Soil Filter Surface								
Replant Soil Filter Vegetation								
Remove Sediment and Debris from Ditches								
Remove Woody Growth from Ditches								
Remove Obstructions from Culvert Inlets-Outlets								
Repair Any Other Site Stability Problem Areas								

### Sediment/Debris Disposal

Location of Sediment/Debris Accumulation	Location of Sediment/Debris Disposal	Date of Disposal

## **SECTION 411.8**

### **SEWAGE DISPOSAL**

#### **Sewage Disposal**

##### **A. On-site Subsurface Wastewater Disposal Systems**

Not applicable.

##### **B. Nitrate-Nitrogen Impact Assessment**

Not applicable.

##### **C. Municipal Facility or Utility Company Letter**

The proposed Anerobic Digester/Energy Production Facility is designed to anaerobically digest a mixture of pumpable organics and site macerated solid organics to produce electricity and stabilized digestate effluent that will be land-applied. Effluent liquids from the system and the minimal amount of wastewater discharged from the proposed 50' x 50' operator's station, housing an office area, bathroom, pumps and heat exchanger, will be directed to the Brunswick Sewer District (BSD). It is proposed that the facility will tie into the BSD system through the existing Brunswick Landing wastewater disposal infrastructure. The facility has an anticipated average daily flow of 35,000 gal./day of liquid effluent per day.

The Brunswick Sewer District has provided the attached letter stating their ability to serve the project's anticipated demands.

##### **D. Wastewater Discharge Information.**

The development will not discharge any liquid waste into any stream, river, pond, lake or other body of water including tidal waters.

##### **E. Storage or Treatment Lagoons**

Not applicable.

## Brunswick Sewer District

10 PINE TREE ROAD  
BRUNSWICK, MAINE 04011  
[bsd@brunswicksewer.org](mailto:bsd@brunswicksewer.org)

TELEPHONE (207) 729-0148

FAX (207) 729-0149

February 12, 2013

Dave Weyburn  
President / Managing Director  
Village Green Ventures  
243 13<sup>th</sup> Street Suite 24  
Brooklyn, NY 11215

Re: Proposed Anaerobic Digester  
Brunswick Landing  
Brunswick, Maine

Dear David:

This letter is to acknowledge receipt of your request of February 6, 2013 for confirmation of the District's willingness and capacity to serve the above referenced project.

It is my understanding the Village Green Ventures proposes to construct an anaerobic digester at Brunswick Landing in Brunswick, Maine. The project's average daily flow (ADF) is anticipated to be 35,000 gpd.

I have reviewed the material provided and conclude that proposed flows will not adversely affect facilities of the District. The necessary willingness and capacity to serve the project exists throughout all affected components of the District's system. Please note that any flows which exceed 300m/L of BOD or TSS may be subject to surcharge rates as determined in the District rules and regulations.

It will be necessary for the project to secure an entrance permit from the District. That permit will be issued upon receipt of application for the project and following our review of construction details proposed. The project will not be subject to the District's entrance charge program. However, flows originating from Brunswick Landing are subject to the entrance charge program, once the benchmark flow is exceeded. The benchmark flow for Brunswick Landing is 288,428 gpd. Flow for 2012 averaged 142,279 gpd. I do not anticipate this project causing Brunswick Landing to exceed its permitted flows. Any entrance charge assessed to you will be through the Midcoast Regional Redevelopment Authority.

Upon review of the Site Layout and Utility Plan provided, I have the following comments:

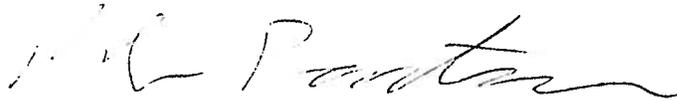
1. Project sanitary sewer service line will be privately owned and maintained in accordance with provisions of District Rules & Regulations. The District does not anticipate taking ownership of any of the proposed lines.
2. The project, prior to any sewer facility construction, will require a sanitary sewer entry permit to discharge to District facilities.

3. All sewer-related construction will be performed to District standards.
4. All sanitary sewer construction will comply with provisions of the Maine State Plumbing Code.
5. Design and construction of project sanitary sewers will exclude all non-sanitary ground, surface, foundation drain, floor drain, sump pump, and roof drain waters.
6. Horizontal clearance between utility infrastructures will be sufficient to allow future utility maintenance operations without disturbance to adjacent utility infrastructure.

If you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,

BRUNSWICK SEWER DISTRICT

A handwritten signature in cursive script, appearing to read "R. A. Pontau Jr.", written in black ink.

Robert A. Pontau Jr., PE  
Assistant General Manager

CC: Darcy Dutton, Brunswick Sewer District  
Leonard Blanchette, General Manager, Brunswick Sewer District  
Jeremy Doxsee, Town Planner, Brunswick, Maine  
Tom Brubaker, Public Works and Utilities Manager, MRRA

## **SECTION 411.9**

### **WATER SUPPLY**

#### **Water Supply**

##### **A. Water Supply Method**

The water supply for the proposed facility will be provided by MRRA which operates the water distribution system at Brunswick Landing. MRRA obtains the water from the Brunswick and Topsham Water District through a connection to the existing Brunswick Landing water supply infrastructure.

Reference is made to the attached letter from the Brunswick and Topsham Water District confirming that it has the capacity to server the proposed facility.

##### **B. Subsurface Wastewater Disposal Systems**

Sewer services will be provided by the Brunswick Sewer District.

##### **C. Total Usage**

Water usage at the proposed facility will be minimal and will be limited to that needed to supply the small operations office on site, typically in the order of 200 gallons per day.



BRUNSWICK & TOPSHAM  
WATER DISTRICT

PO Box 489  
Topsham, Maine 04086  
Telephone (207) 729-9956  
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**Alan J. Frasier, PE**  
General Manager

**Craig W. Douglas, PE**  
District Engineer

**Daniel O. Knowles, CPA**  
Director of Finance and  
Data Management Systems

**William G. Alexander, Jr.**  
Operations Manager

December 17, 2012

Jan B.S. Wiegman PE  
Wright-Pierce  
99 Main Street  
Topsham, ME 04086  
Via email: [jan.wiegman@wright-pierce.com](mailto:jan.wiegman@wright-pierce.com)

RE: Proposed Brunswick Landing Phase 1 Subdivision Project, Brunswick

Dear Mr. Wiegman:

This letter is to inform you that the District has the ability to serve the referenced project, and will provide service in accordance with Maine Public Utilities Commission and Brunswick & Topsham Water District Rules and Regulations.

Your previous correspondence acknowledge that the flow requirements of the proposed project are not known at this time, but generally anticipate that the requirements would be of a scale similar to the former naval air station. Given this, the District is capable of taking on this additional use. Also, it is not clear if this project obtains service from a private main. Please be advised we cannot ensure the reliability of the infrastructure beyond the connections made directly to our system. We will gladly discuss the options for service and main extensions when the project is ready to proceed.

Please keep us informed as this project progresses. If you have any questions, please call.

Yours truly,

Craig Douglas PE  
District Engineer

Cc: Eric Gagnon



PAUL R. LEPAGE  
GOVERNOR

STATE OF MAINE  
DEPARTMENT OF  
INLAND FISHERIES & WILDLIFE  
284 STATE STREET  
41 STATE HOUSE STATION  
AUGUSTA, MAINE  
04333-0041

CHANDLER E. WOODCOCK  
COMMISSIONER

October 19, 2012

Jan Wiegman, P.E.  
Wright-Pierce  
99 Main Street  
Topsham, ME 04086

**RE: Information Request, Anaerobic Digester/Energy Production Facility**

Dear Jan:

Per your request received October 19 we have searched current Department records for known occurrences of Rare, Threatened, and Endangered species, designated Essential and Significant Wildlife Habitats, and fisheries habitat concerns within the vicinity of the proposed anaerobic digester/energy production facility at Brunswick Landing in Brunswick.

Our records indicate no occurrences of rare, threatened, or endangered animal species within the project area. Additionally, our department has not mapped any Essential or Significant Wildlife Habitats or Fisheries Habitats that would be directly impacted by your project.

This consultation review has been conducted specifically for known MDIF&W jurisdictional features and should not be interpreted as a comprehensive review for the presence of all regulated features that may occur on site. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

A handwritten signature in black ink, appearing to read "Steve Walker", written over a horizontal line.

Steve Walker  
Acting Environmental Review Coordinator

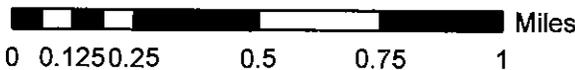


## Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: Brunswick Landing Anaerobic Digester (Version 1)



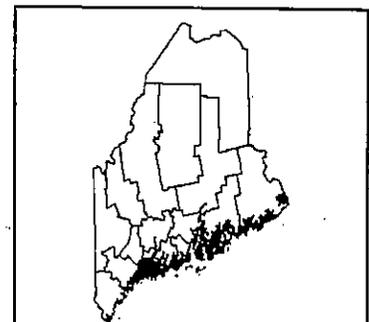
Maine Department of  
Inland Fisheries and Wildlife



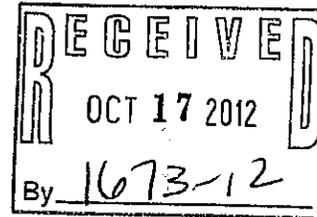
Projection: UTM, NAD83, Zone 19N

Date: 10/19/2012

Project Points	Deer Winter Area	Roseate Tern
Project Lines	LWRC p-fw	Piping Plover/Least Tern
Project Polys	Cooperative DWAs	Aquatic ETSc (2.5 mi review)
Project Search Areas	Seabird Nesting Islands	Rare Mussels (5 mi review)
	Shorebird Areas	A and B List Ponds
	Inland Waterfowl/Wading Bird	Arctic Charr Habitat
	Shoreland Zoning_lwwh	E. Brook Trout Joint Venture Subwatershed Classification
	Tidal Waterfowl/Wading Bird	Redfin Pickerel/Swamp Darter Habitats (buffer 100ft)
	Significant Vernal Pools	Special Concern-occupied habitats (100ft buffer)
	Environmental Review Polygons	Wild Lake Trout Habitats



October 15, 2012  
W-P Project No. 12600A



Mr. Earle G. Shettleworth, Jr.  
Maine Historic Preservation Commission  
55 Capital Street  
State House Station 65  
Augusta, Maine 04333

Subject: Village Green Maine, LLC  
Anaerobic Digester/Energy Production Facility  
Brunswick Landing, Brunswick, Maine

Dear Mr. Shettleworth:

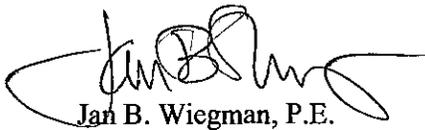
Wright-Pierce, at the direction of Village Green Maine, LLC, is preparing a Site Location of Development permit application for a proposed anaerobic digester/energy production facility at the former Naval Air Station Brunswick, now Brunswick Landing. The project site is located on the southerly end of the existing tarmac at the airport. Access to the site will be provided by upgrading an existing roadway leading northerly from the existing Brunswick Landing road system. The project will involve amending an existing Maine Department of Environmental Protection (DEP) Site Location of Development permit covering numerous projects undertaken at the airport facility. We would like to take this opportunity to solicit comments from the Maine Historic Preservation Commission regarding the potential impacts the project might have on historical resources in the vicinity of the project.

We are planning to submit a Site Location of Development Permit application in November 2012 and anticipate that construction will be underway in early 2013.

We are enclosing a location map and a conceptual site plan showing the proposed facility in relation to the greater Brunswick Landing property. Please let us know if you require any additional materials to properly carry out your evaluation of this site.

Very truly yours,

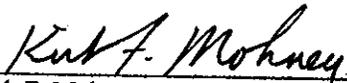
WRIGHT-PIERCE

  
Jan B. Wiegman, P.E.  
Project Manager

JBW/  
Enclosures

cc: David Weyburn – Village Green Maine, LLC and Alan Johnson – Quasar Energy Group

Based on the information submitted, I have concluded that there will be no historic properties affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act. Consequently, pursuant to 36 CFR 800.4(d)(1), no further Section 106 consultation is required unless additional resources are discovered during project implementation pursuant to 36 CFR 800.13.

  
Kirk F. Mohney,  
Deputy State Historic Preservation Officer  
Maine Historic Preservation Commission

10/23/12  
Date



STATE OF MAINE  
DEPARTMENT OF CONSERVATION  
93 STATE HOUSE STATION  
AUGUSTA, MAINE  
04333-0093

PAUL R. LEPAGE  
GOVERNOR

WILLIAM H. BEARDSLEY  
COMMISSIONER

October 19, 2012

Jan Wiegman  
Wright-Pierce  
99 Main Street  
Topsham, ME 04086

Re: Rare and exemplary botanical features in proximity to: W-P Project #12600A, Village Green  
Maine LLC, Anaerobic Digester, Brunswick, Maine

Dear Ms. Wiegman:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request received October 18, 2012 for information on the presence of rare or unique botanical features documented from the vicinity of the project site in Brunswick, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

Letter to Wright-Pierce  
Comments RE: Anaerobic Digester, Brunswick  
October 19, 2012  
Page 2 of 2

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$150.00 for two hours of our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



Don Cameron  
Ecologist  
Maine Natural Areas Program  
207-287-8041  
[don.s.cameron@maine.gov](mailto:don.s.cameron@maine.gov)

# Rare and Exemplary Botanical Features in the Project Vicinity

Documented within a four-mile radius of the proposed W-P Project #12600A, Village Green Maine LLC, Anaerobic Digester, Brunswick, Maine.

Feature Name	Global Rank	State Rank	State Status	EO Number	Last Seen	Habitat
<i>Suaeda calceoliformis</i>	G5	S2	T	4	1899	Tidal wetland (non-forested, wetland)
<i>Carex vestita</i>	G5	S1	E	4	1999-08-05	Dry barrens (partly forested, upland)
<i>Cypripedium reginae</i>	G4	S3	T	38	1907-07-09	Forested wetland
<i>Aletris farinosa</i>	G5	SX	PE	1	1884	Dry barrens (partly forested, upland)
<i>Carex vestita</i>	G5	S1	E	1	1898-06-15	Dry barrens (partly forested, upland)
<i>Sassafras albidum</i>	G5	S2	SC	10	1906	Old field/roadside (non-forested, wetland or upland)
<i>Lonicera dioica</i>	G5	S2	E	4	1933-09	Dry barrens (partly forested, upland)
<i>Mikania scandens</i>	G5	SH	PE	1	1916-08	Dry barrens (partly forested, upland)
<i>Obelia siphilitica</i>	G5	SX	PE	2	1900	Non-tidal rivershore (non-forested, seasonally wet)
<i>Sparganium angustifolium</i>	G2G3	S2	SC	5	1921-09-17	Tidal wetland (non-forested, wetland)
<i>Lonicera dioica</i>	G5	S2	E	3	1912-06	Dry barrens (partly forested, upland)
Silver maple floodplain forest	GNR	S3		1	2005-06-23	Forested wetland
Pitch pine - heath barren	G3G5	S1		1	2002-09-26	Dry barrens (partly forested, upland)
<i>Agrostis calycina</i> var. <i>spongiosa</i>	G5T4	S3	SC	28	2008-08-29	Tidal wetland (non-forested, wetland)
<i>Agrostis calycina</i> var. <i>spongiosa</i>	G5T4	S3	SC	33	1992-07-30	Tidal wetland (non-forested, wetland)
<i>Claytonia parkeri</i>	G3	S3	SC	28	1990-09-25	Tidal wetland (non-forested, wetland)

# Rare and Exemplary Botanical Features in the Project Vicinity

Documented within a four-mile radius of the proposed W-P Project #12600A, Village Green Maine LLC, Anaerobic Digester, Brunswick, Maine.

Feature Name	Global Rank	State Rank	State Status	EO Number	Last Seen	Habitat
Spartina saltmarsh						Tidal wetland (non-forested, wetland)
	G5	S3		48	2011-10-30	
Silver maple floodplain forest						Forested wetland
	GNR	S3		39	2011-07-07	

Print Date 10/19/2012; For more information visit our website <http://www.maine.gov/doc/nrimc/mnap> Page 3

## STATE RARITY RANKS

- S1** Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- S2** Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3** Rare in Maine (20-100 occurrences).
- S4** Apparently secure in Maine.
- S5** Demonstrably secure in Maine.
- SH** Known historically from the state, not verified in the past 20 years.
- SX** Apparently extirpated from the state, loss of last known occurrence has been documented.
- SU** Under consideration for assigning rarity status; more information needed on threats or distribution.
- S#?** Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).
- SNR** State rank not yet assessed.

**Note:** **State Rarity Ranks** are determined by the Maine Natural Areas Program.

## GLOBAL RARITY RANKS

- G1** Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
- G2** Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3** Globally rare (20-100 occurrences).
- G4** Apparently secure globally.
- G5** Demonstrably secure globally.
- GNR** Global rank not yet assessed.

**Note:** **Global Ranks** are determined by NatureServe, for more information see <http://www.natureserve.org/explorer/ranking.htm>.

## STATE LEGAL STATUS

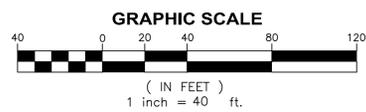
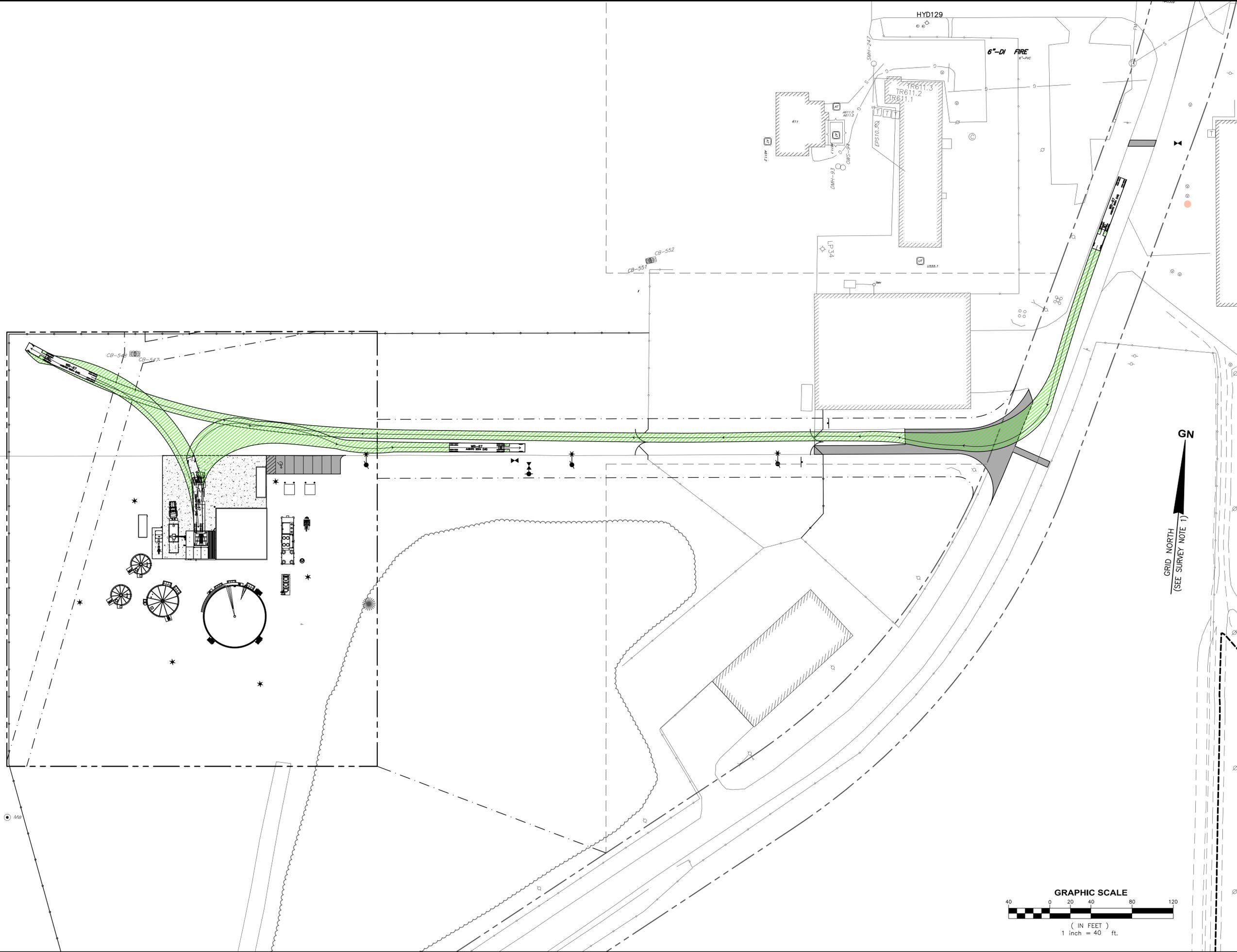
**Note:** State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered** and **Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

- E** ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- T** THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

## NON-LEGAL STATUS

- SC** SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
- PE** Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

Visit our website for more information on rare, threatened, and endangered species!  
<http://www.maine.gov/doc/nrimc/mnap>



GRID NORTH  
(SEE SURVEY NOTE 1)

<b>VILLAGE GREEN BRUNSWICK LANDING LLC</b> <b>VILLAGE GREEN MAINE LLC</b> <b>DIGESTER/GENERATION</b> <b>BRUNSWICK, ME</b>		<b>WRIGHT-PIERCE</b> Engineering a Better Environment Offices Throughout New England 888.621.8156   www.wright-pierce.com	
<b>DRAWING</b> AT-1		<b>SITE LAYOUT</b>	
DESIGNED BY: JCE	DATE: 5-7-13	APPROVED BY: JCE	DATE: 5-7-13
CAD COORD: MRL	CHECKED BY: JCE	PROJECT NO: 12601A	
CAD: MRL	DATE: 5-7-13		
SUBMISSIONS/REVISIONS		APPR'D DATE	
NO			
SITE PLAN APPROVAL		JOBW 5/13	



Scale: SEE DETAIL

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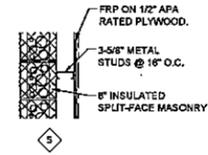
BUILDING  
DEPARTMENT  
SUBMISSION

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0	ISSUED FOR BUILDING DEPT.	3/1/13
Rev.	ECN Number	Date

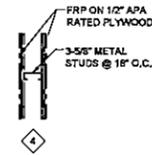
Drawing Name:  
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Project Name and Address:  
0062-BRU-ME-12  
Brunswick Landing  
ADS Facility  
  
Orion Street  
Brunswick, ME 04011

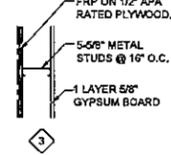
Author: RAMII	Sheet Number: A-1
Checked: RN	



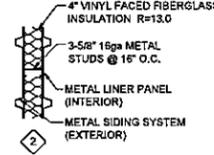
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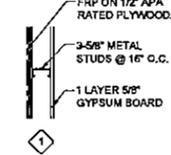
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SCALE: 3/4"=1'-0"



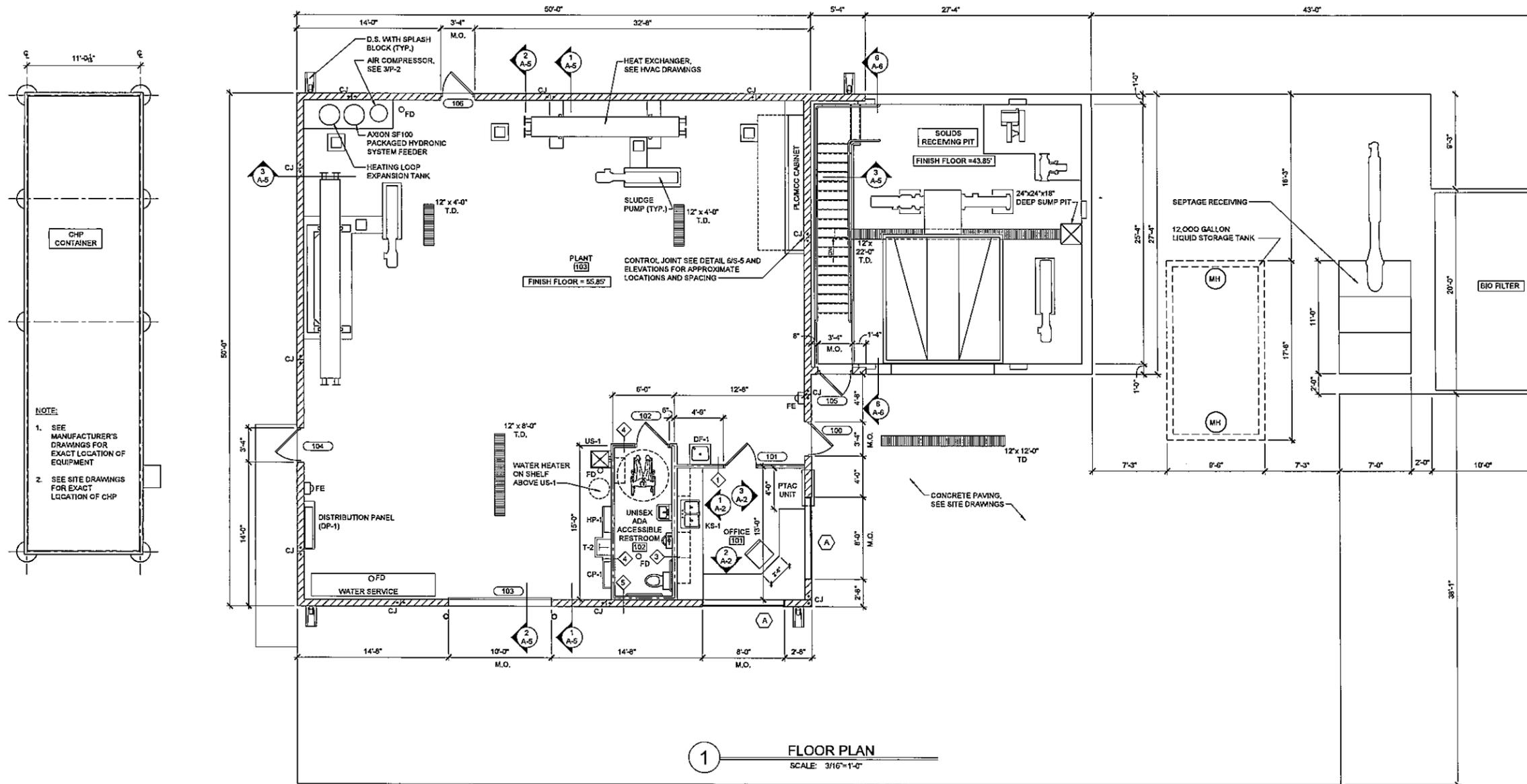
**FULL HEIGHT PARTITION**  
SCALE: 3/4"=1'-0"



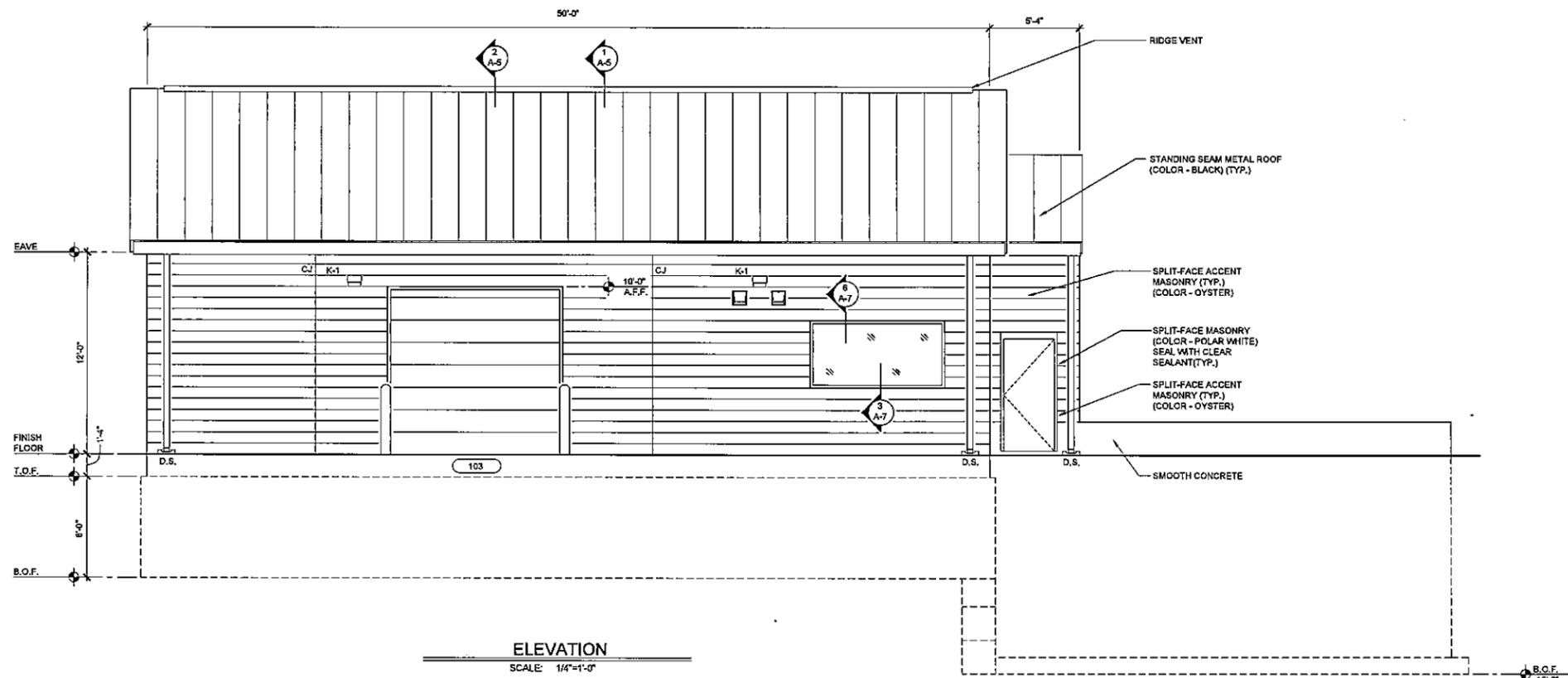
**SOLIDS RECEIVING PIT STAIR WELL**  
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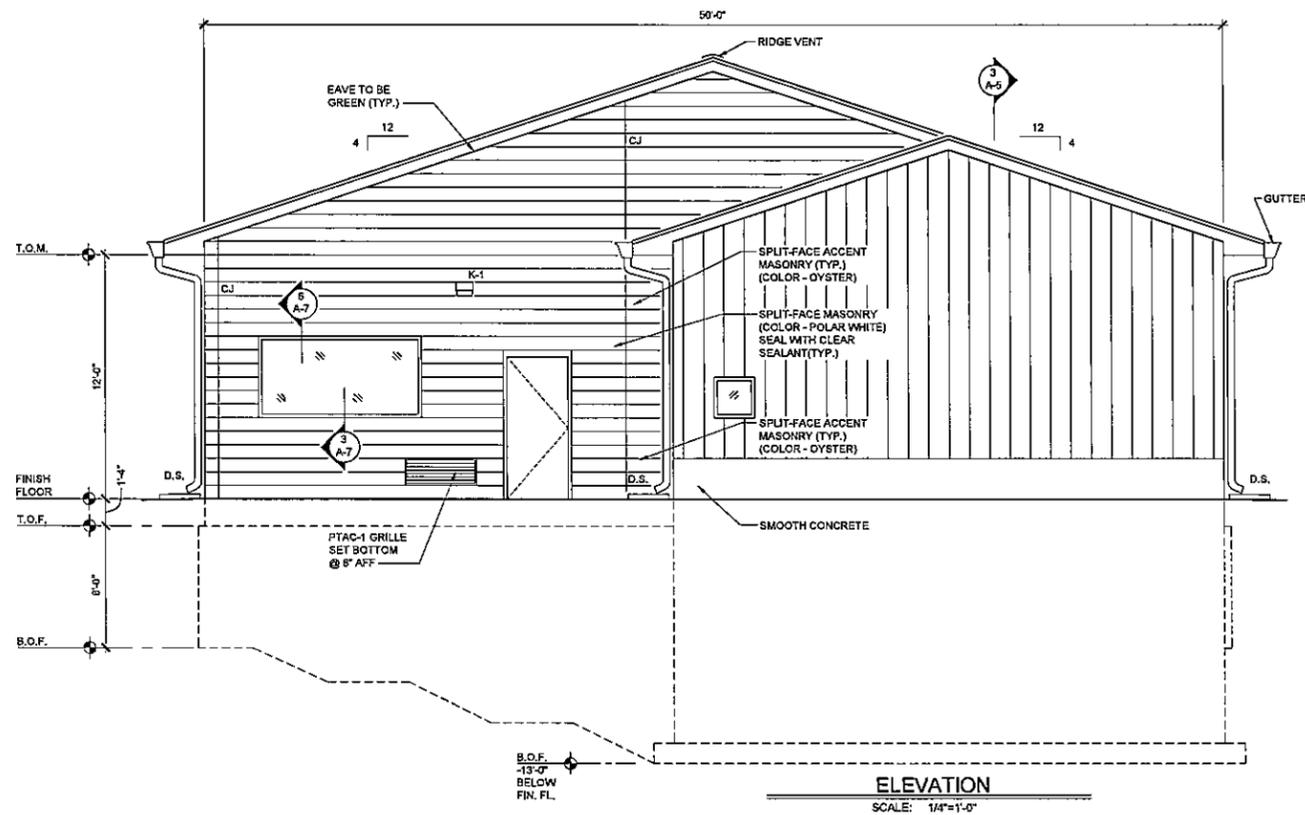
**FULL HEIGHT PARTITION**  
SCALE: 3/4"=1'-0"



**1 FLOOR PLAN**  
SCALE: 3/16"=1'-0"



ELEVATION  
SCALE: 1/4"=1'-0"



ELEVATION  
SCALE: 1/4"=1'-0"

**quasar**  
energy group

quasar energy group  
7624 Riverview Road  
PO Box 31023  
Cleveland OH 44141  
Phone: 216.986.9999

Drawn: \_\_\_\_\_  
Checked: \_\_\_\_\_  
Date: \_\_\_\_\_

Scale: SEE DETAIL

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BUILDING  
DEPARTMENT  
SUBMISSION

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1		
0	ISSUED FOR BUILDING DEPT.	3/1/13
Rev.	ECN Number	Date

ELEVATIONS

Project Name and Address:  
0082-BRU-ME-12  
Brunswick Landing  
ADS Facility  
  
Orion Street  
Brunswick, ME 04011

Author:	Drawn:
RAMJI	A-3
Checked:	Checked:
	RN



quasar energy group  
 7624 Riverview Road  
 PO Box 31023  
 Cleveland OH 44141  
 Phone: 216.988.9999

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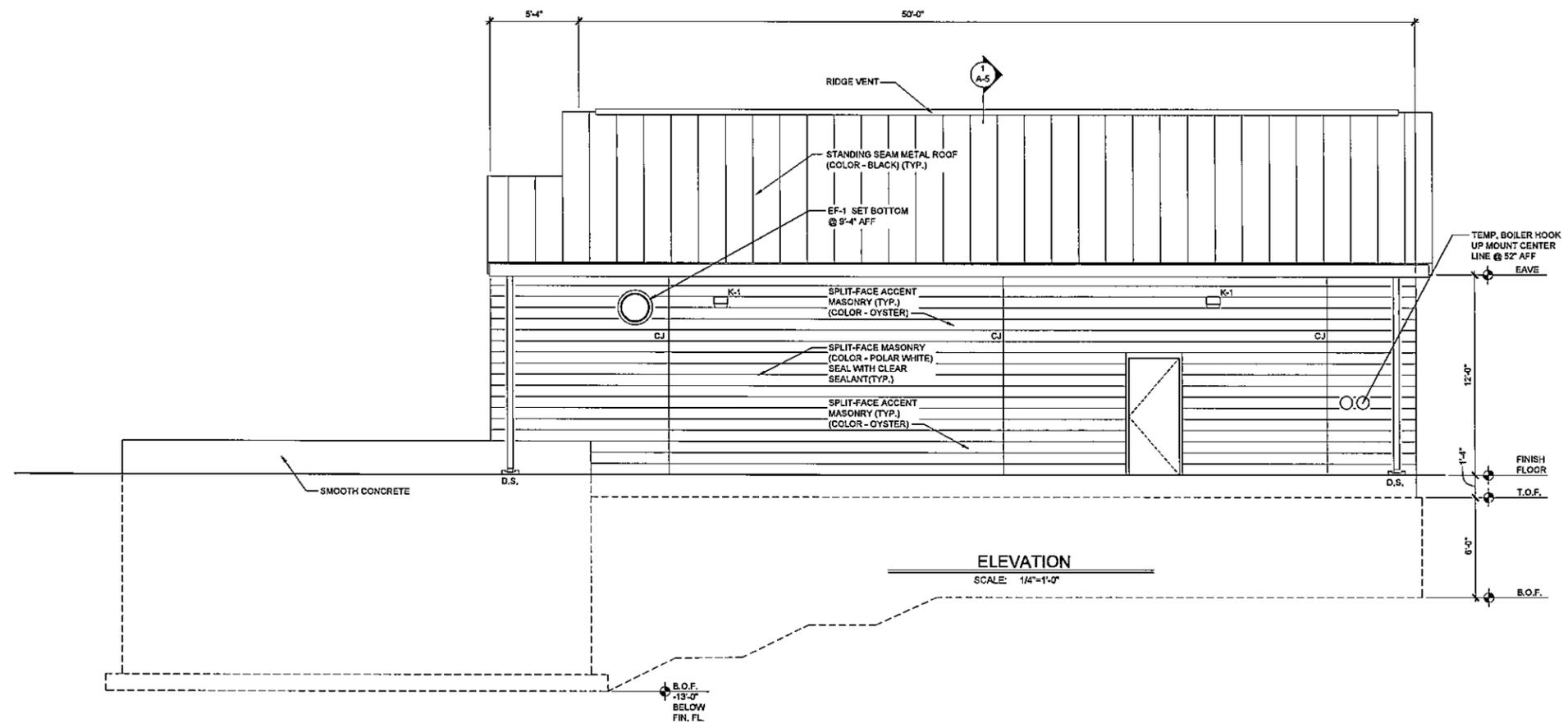
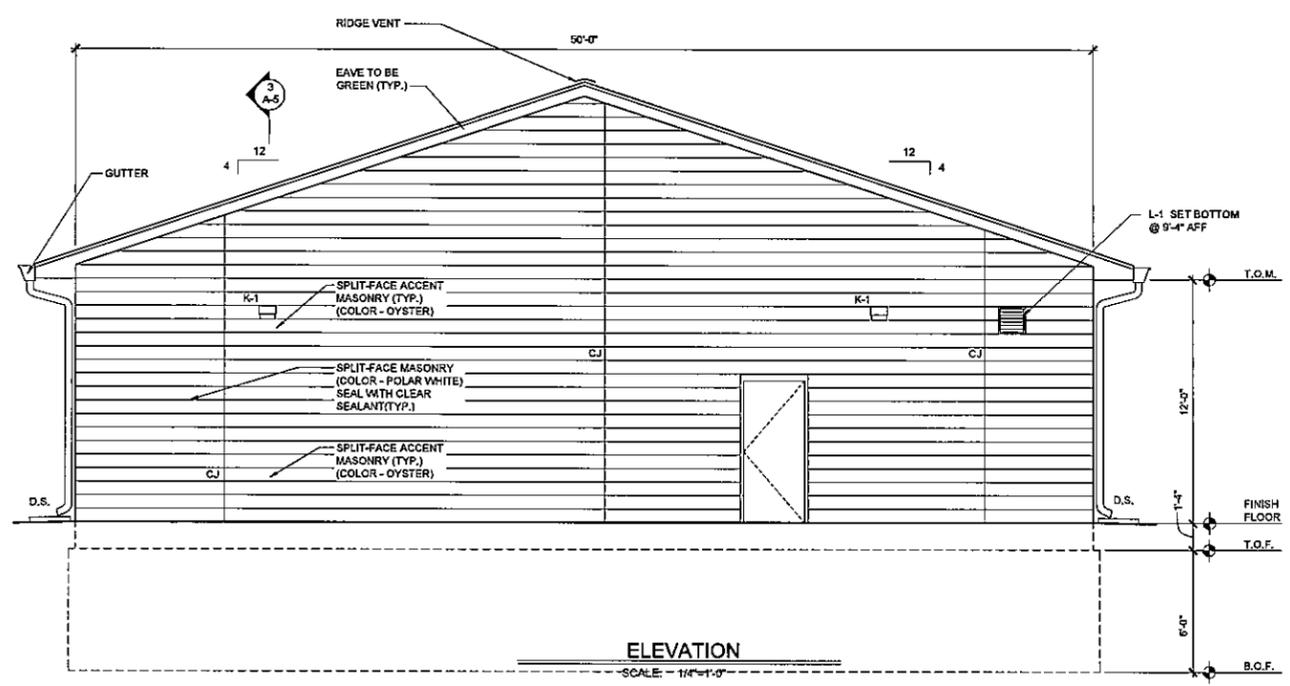
BUILDING DEPARTMENT SUBMISSION

2		
1		
0	ISSUED FOR BUILDING DEPT.	3/1/13
Rev.	ECN Number	Date

Drawing Name:  
**ELEVATIONS**

Project Name and Address:  
 0062-BRU-ME-12  
 Brunswick Landing  
 ADS Facility  
  
 Orion Street  
 Brunswick, ME 04011

Asst:	Sheet Number:
RAMII	A-4
Checked:	Checked:
	RN





36 Water Street  
P.O. Box 268  
Wiscasset, Maine 04578

*Creating opportunities for people and places since 1977*

207.882.7552

877.340.2649

fax 207.882.7308

cei@ceimaine.org

www.ceimaine.org

February 21, 2013

Maine Department of Environmental Protection  
17 State House Station  
Augusta, ME 04333-0017

RE: Site Location of Development and Solid Waste Processing Facility Permits, Village Green Brunswick Landing, LLC.

Dear DEP Staff,

Coastal Enterprises, Inc. (CEI) has been working with the principals of Village Green Brunswick Landing, LLC (VGBL) on development of the proposed anaerobic digester project at Brunswick Landing, Brunswick, ME since 2011. CEI has an institutional commitment to further development of renewable energy technologies in Maine, especially those such as anaerobic digestion that simultaneously address solid waste storage issues. We have been impressed by the capacity of VGBL's principals to steadily move this complex project forward. Later this month, CEI Lending will consider an initial six-figure loan to VGBL for pre-development activities. As the project moves ahead, CEI expects to consider a construction funding request from VGBL and to play a central role in the larger lending consortium necessary to bring the development to completion. This letter is not a commitment to lend on CEI's part, but does represent our active engagement with this development project.

Sincerely,

A handwritten signature in black ink that reads 'Michael Finnegan'. The signature is written in a cursive, flowing style.

Michael Finnegan  
Senior Vice President, Lending  
Senior Loan & Investment Officer

## General Land Lease Term Sheet

**Date:** June 28, 2012

**Lessor:** Midcoast Regional Redevelopment Authority

**Lessee:** Village Green Maine, LLC

**Address:** 243 13<sup>th</sup> St. # 24  
Brooklyn, NY 11215

**Premises:** Approximately 1.99+/- acres (approximately 87,120ft<sup>2</sup>). The property is identified as property within the airport boundary and bounded on Orion Drive south, building 153 and airport apron and taxiways.

**Lease Rate:** \$ [REDACTED] /ft<sup>2</sup>

**Collateral Assignment Of Lease:** Collateral assignment of the lease is subject to restrictions of the Federal Aviation Administration.

**Term:** Fifteen year initial lease term.

**Lease Execution Date:** To be established, but in any event no later than July, 1, 2013 unless closing is delayed by actions of the Lessor.

**Conditions Precedent To Lease:** Standard lease provisions.  
Lessee will be responsible for obtaining all licenses, permits from Federal, State, and Local Governments to the satisfaction of the Lessor.

**Costs:** All Lessor cost to be borne by the Lessee, including but not limited to: any required appraisals, survey and legal fees. Lessee will pay for the cost of all infrastructure including, but not limited to: site improvements, road, drainage, water, sewer, power line, and natural gas including hook up and interconnects.

**Taxes:** All federal state and local taxes are the responsibility of the Lessee

**Use:** Construction and operation of a commercial anaerobic digester.



**Executed Lease:**

The parties will not execute a lease, until completing their due diligence, including Lessor's obtaining sufficient comfort that all preconditions noted above are satisfied, and financial due diligence proves to the Lessor's satisfaction at its sole discretion that the Lessee has the capacity to undertake, complete and operate the facility or that sufficient liquidity coverage is provided to address the Lessor's risk concerns and Lessee's obtaining sufficient comfort that Lessor has title adequate to convey an unencumbered leasehold interest in the premises, and that the premises are fit for the intended use and free from environmental hazards and potential liabilities. The parties do not intend to create an enforceable lease until they negotiate a formal lease agreement.

**Subleasing:**

The Lessee will not be permitted to sublease or transfer its interest in the leased property for its current or any other use without the consent of MARRA and the Federal Aviation Administration.

**Signage:**

Consistent with Brunswick Landing Design guidelines and Town Zoning.

**Brokerage Commission:**

No brokerage commission is paid on the Leasing of this property.

**Good Faith Deposit:**

The Lessee will remit with the acceptance of this Term Sheet a deposit of \$[REDACTED] which shall be applied to the transaction and/or closing cost. Any balance is nonrefundable if this transaction does not close.

**Expiration:**

This Term Sheet expires on July 31, 2012 unless executed.

**Seen and agreed:**

*[Signature]*  
Village Green Maine, LLC

Its: *Chief Executive Manager*

Date: 7/8/2012

From: "Tom Brubaker" <[tomb@mrra.us](mailto:tomb@mrra.us)>  
Date: Feb 20, 2013 11:25 AM  
Subject: Update on Leasehold Expansion Approval  
To: "David Weyburn" <[dw@villagegreenventures.com](mailto:dw@villagegreenventures.com)>

Dave,

As initially proposed to MRRRA by VGV, your anaerobic digester project would have developed two acres of raw land that included the necessary infrastructure to install and connect a biogas energy plant capable of delivering between 750kW and 1MW of electrical power output to the MRRRA grid. MRRRA's Airport Committee approved the issuance of a term sheet to VGV for the lease of approximately 2 acres of land on the Brunswick Executive Airport for the purpose of constructing facilities to produce gas, electricity, and heat byproduct in June 2012 and VGV executed this term sheet in July 2012. This first step secured your interest in the parcel of land on which you propose to build the anaerobic digester.

As we have been discussing over the past several weeks, through your on-going planning, engineering, and permitting processes, you have determined that required buffers from any of your installed equipment and the abutters have increased the size of the parcel you need to support your project. The inclusion of the additional area to accommodate this buffer space has increased the size of your proposed lease parcel to 4 acres.

The additional acreage required to support your project is available at the originally approved location. The increase in the acreage you now propose to lease will require a revision to your existing term sheet. MRRRA's property protocols require any lease greater than 2 acres be approved by the full MRRRA Board.

MRRRA staff has recommended that this new proposed lease be submitted to the MRRRA Board for approval as soon as possible. This proposed revision to your existing term sheet has been placed on the agenda for a special meeting of the MRRRA Board to be held on March 6, 2013. We have recommended that the MRRRA Board authorize the issuance of a revised term sheet to Village Green Ventures to secure your interest in the larger parcel upon which to construct your proposed anaerobic digester.

Thank you for your on-going interest in the development of an anaerobic digester and associated "green energy" generation facility at Brunswick Landing. MRRRA remains committed to working with you to bring this project to fruition. This is an exciting concept and consistent with MRRRA's mission and redevelopment plan for a renewable energy center at the Brunswick Landing campus. The MRRRA Board has been extremely supportive of your proposed project and I am confident that they will approve this requested revision to your term sheet to enlarge your project site.

Please let me know if you have any questions or if you need any additional information.

Regards,

Tom Brubaker

Thomas E. Brubaker, PE, CEM  
Public Works and Utilities Manager  
2 Pegasus Street, Suite 1, Unit 200, Brunswick, Maine 04011  
Tel: [207-607-4189](tel:207-607-4189) ~ Fax: [207-798-6510](tel:207-798-6510) ~ [www.mrra.us](http://www.mrra.us)



 Please consider the environment before printing

## **SCHEDULE A**

A certain lot or parcel of land with the improvements thereon situate northwesterly of Orion Street at Brunswick Landing, so-called, in the Town of Brunswick, Cumberland County, State of Maine, and being bounded and described as follows:

BEGINNING at the intersection of the proposed northwesterly right-of-way line of Orion Street with the westerly line of land of Midcoast Regional Redevelopment Authority (MRRA), reference deed recorded in Cumberland County Registry of Deeds (CCRD) in Book 29438, Page 1, said land being described as parcel "AIR-9" in said deed, said intersection being shown on a plan entitled "Boundary Survey of a Portion of Land of U.S. Navy at Naval Air Station Brunswick, Maine to be Conveyed to the Midcoast Regional Redevelopment Authority, Brunswick, Maine (Cumberland County)", dated January 14, 2011, by Sitelines, PA, Brunswick, Maine (Sitelines Plan), all as shown on a plan entitled "Existing Conditions & Boundary Plan, Village Green Brunswick Landing LLC, Village Green Maine LLC, Digester/Generation, Brunswick, Maine", dated April 12, 2013, revised May, 2013, by Wright-Pierce (VGM Plan);

Thence N 74°33'02" E crossing other land of MRRA, reference deed recorded in CCRD in Book 28607, Page 1 (28607/1), a distance of 237.60 feet to the TRUE BEGINNING POINT of the parcel hereinafter described;

Thence S 84° 46' 49" W crossing said other land of MRRA a distance of 360.00 feet;

Thence N 5° 13' 13" W crossing said other land of MRRA a distance of 420.00 feet;

Thence N 84° 39' 42" E crossing said other land of MRRA a distance of 360.00 feet;

Thence S 5° 13' 13" E crossing said other land of MRRA a distance of 420.74 feet to the TRUE BEGINNING POINT, containing 3.47 acres, more or less.

Also granting an EASEMENT for the drainage of stormwater as it will exist after construction of the proposed improvements on the hereinabove described parcel, said EASEMENT to allow for the drainage of stormwater over, and across said other land of MRRA (28607/1) and for the drainage of stormwater into the existing storm drain system of MRRA, a portion of which storm drain system passes under and through the hereinabove described parcel.

Also granting an ACCESS & UTILITY EASEMENT, to be used in common with others, to allow for the construction, use, maintenance, replacement, and reconstruction of a driveway and for the use and maintenance of the southerly 35 feet of the existing concrete tarmac adjoining the easterly line of the hereinabove described parcel, and to allow for the installation, construction, use, maintenance, replacement and reconstruction of utility services and appurtenances, including a sewer force main, a gas line, water lines and electrical and communications lines, from the proposed westerly right-of-way line of Orion Street in a general westerly direction in, on, over or under said first-mentioned land of MRRA (29534/1) and said other land of MRRA (28607/1), to the easterly line of the hereinabove described parcel, said ACCESS & UTILITY EASEMENT area being shown on said VGM Plan, and is further bounded and described as follows:

BEGINNING at a point on the easterly line of the hereinabove described parcel, said point being S 5° 13' 13" E and 85.16 feet as measured along said easterly line from the northeasterly corner of the hereinabove described parcel;

Thence N 84° 37' 23" E crossing said other land of MRRA (28607/1) a distance of 574.26 feet to a point of curvature;

Thence in a general northeasterly direction crossing said other land of MRRA (28607/1) along a curve to the left having a radius of 50.00 feet through a central angle of 69° 36' 27" an arc distance of 60.74 feet to a point and the proposed westerly right-of-way line of Orion Street, said point being N 49° 49' 10" E a chord distance of 57.08 feet from the last-mentioned point;

Thence S 15° 00' 56" W along the proposed westerly right-of-way line of Orion Street a distance of 66.96 feet to a point of curvature;

Thence in a general southwesterly direction along the proposed northwesterly right-of-way line of Orion Street, along a curve to the right having a radius of 615.00 feet through a central angle of 4° 52' 31" an arc distance of 52.33 feet to a point of reverse curvature, said point being S 17° 27' 11" W a chord distance of 52.31 feet from the last-mentioned point;

Thence in a general northwesterly direction crossing said first-mentioned land of MRRA (29534/1), along a curve to the left having a radius of 15.00 feet through a central angle of 115° 16' 04" an arc distance of 30.18 feet to a point, said point being N 37° 44' 35" W a chord distance of 25.34 feet from the last-mentioned point of reverse curvature;

Thence N 84° 37' 23" E crossing said first-mentioned land of MRRA (29534/1) and said other land of MRRA (28607/1) a distance of 564.09 feet to the easterly line of the hereinabove described parcel;

Thence N 5° 13' 13" E the easterly line of the hereinabove described parcel a distance of 57.00 feet to the point of beginning, containing 34,454 square feet, more or less.

Reserving to the Midcoast Regional Redevelopment Authority (MRRA), a 20-foot wide STORM DRAIN EASEMENT, within the hereinabove first-described parcel, to allow for the use, maintenance, replacement, and reconstruction of an existing storm drain system and appurtenances thereof, said STORM DRAIN EASEMENT area to be centered on the existing storm drain pipes, and is as shown on the VGM Plan.

Bearings are oriented to Grid North, Maine State Plane Coordinate System, West Zone, (NAD 83), as referenced on said Sitelines Plan.

Being a portion of the premises described by Quitclaim Deed of the United States of America, acting by and through the Secretary of the Navy, Base Closure Program Management Office Northeast, Philadelphia, PA, to the Midcoast Regional Redevelopment Authority, dated September 30, 2011, recorded in Cumberland County Registry of Deeds in Book 28607, Page 1.

May 6, 2013

Mr. David Weyburn  
Managing Director  
Village Green Maine, LLC  
Village Green Brunswick Landing, LLC  
1090 Pacific Street #3  
Brooklyn, NY 11238

Re: Pavement Removal and Stormdrain Connection, Land Lease Term Sheet – Village Green Maine

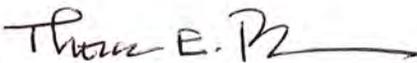
Dear David,

As an extension of the initial General Land Lease Term Sheet that was approved in June 2012, Village Green Maine, LLC and Village Green Brunswick Landing, LLC are granted the following in support of your proposed anaerobic digester project at Brunswick Landing:

1. Permission to remove approximately 3,270 square feet of pavement outside the lease area as depicted on the site drawings to comply with the Maine Stormwater Law requirements for Urban Impaired Stream watershed Credits. The area will be loamed and seeded once the pavement is removed.
2. Permission to attach the stormwater discharge from the underdrained soil filter of your proposed anaerobic digester project to the existing storm drain line crossing the lease area.

Thank you for your continued interest in bringing this exciting project to Brunswick Landing. Please let me know if you have any questions or if you need any additional information to proceed with your project development.

Regards,



Thomas E. Brubaker, PE, CEM  
Public Works and Utility Manager

Cc: Robert Green (Maine DEP)



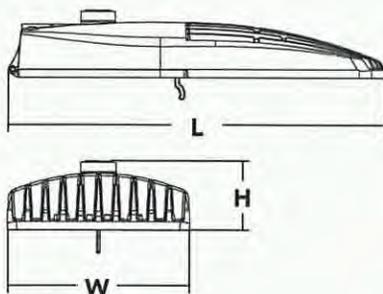
# D-Series Size 1 Mast Arm Mount LED Area Luminaire



d"series

## Specifications

<b>EPA:</b>	0.9 ft <sup>2</sup> (0.08 m <sup>2</sup> )
<b>Length:</b>	27" (68.6 cm)
<b>Width:</b>	13" (33.0 cm)
<b>Height:</b>	5" (12.7 cm)
<b>Weight (max):</b>	26 lbs (11.8 kg)



Catalog Number
Notes
Type

For the Table of Mounts, see the complete acuity lighting website.

## Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing 100 – 400W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

## Ordering Information

**EXAMPLE: DSX1 LED 2 30B700/40K SR3 MVOLT MA DDBXD**

Series	Light Engines	Performance Package <sup>1</sup>	Distribution	Voltage	Mounting	Options	Finish (required)
DSX1 LED	1 One engine (30 LEDs) 2 Two engines (60 LEDs)	<b>530 mA options:</b> 30B530/30K 3000K 30B530/40K 4000K 30B530/50K 5000K  <b>700 mA options:</b> 30B700/30K 3000K 30B700/40K 4000K 30B700/50K 5000K	SR2 Type II SR3 Type III SR4 Type IV SR5 Type V FT Forward throw	MVOLT <sup>2</sup> 120 <sup>2</sup> 208 <sup>2</sup> 240 <sup>2</sup> 277 <sup>2</sup> 347 <sup>3</sup> 480 <sup>1</sup>	MA Mast arm mounting	<b>Shipped included</b> (blank) No NEMA twist-lock receptacle (decorative cover), wildlife shield, trigger latch, and bridge fitter. DMG 0-10V dimming driver (no controls) <sup>4</sup> PER NEMA twist-lock receptacle only (no controls) DCR Dimmable and controllable via ROAM <sup>®</sup> (no controls) <sup>5</sup> HS House-side shield <sup>6</sup> WTB Utility terminal block DS Dual switching <sup>7,8</sup> BUBLVL External bubble level	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

## Accessories

Ordered and shipped separately.

SBOR 10 ODP BZ 1V	Pole-mounted motion/ambient sensor, 8-15' mounting height, MVOLT (specify finish)
SBOR 6 ODP BZ 1V	Pole-mounted motion/ambient sensor, 15-30' mounting height, MVOLT (specify finish)
DSS124F 1.5TJE U	Photocell - SSL twist-lock, MVOLT <sup>9</sup>
DLL347 1.5 CUL JU	Photocell - SSL twist-lock (347V) <sup>9</sup>
DLL480 1.5 CUL JU	Photocell - SSL twist-lock (480V) <sup>9</sup>
SC U	Shorting cap <sup>9</sup>
DSX1HS U	House-side shield (one per light engine)

For more control options, visit [Sensor Switch](#), [DTI](#) and [ROAM](#) online.

Visit Lithonia Lighting's [POLES CENTRAL](#) to see our wide selection of poles, accessories and educational tools.

## NOTES

- Configured with 4000K (40K) provides the shortest lead times. Consult factory for 3000K (30K) and 5000K (50K) lead times.
- MVOLT driver operates on any line voltage from 120-277V (50/60Hz).
- Not available with single board, 530 mA product (1 30B530).
- Not available with 347 or 480V.
- Specifies a ROAM<sup>®</sup> enabled luminaire with 0-10V dimming capability; requires NEMA twist-lock receptacle. Not available with 347 or 480V. Additional hardware and services required for ROAM<sup>®</sup> deployment; must be purchased separately. Call 1-800-442-6745 or email: [sales@roamservices.net](mailto:sales@roamservices.net).
- Also available as a separate accessory; see Accessories information at left.
- Requires two light engines. Provides 50% dimming capability via two independent drivers, each operating half the luminaire. N/A with PER, DCR, DMG, WTB or 530mA with 347v or 480v.
- Requires an additional switched line.
- Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item.



## Performance Data

### Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual performance may differ as a result of end-user environment and application. Contact factory for performance data on any configurations not shown here.

Light Engines	Drive Current (mA)	Performance Package	System Watts	Dist. Type	40K (4000K, 67 CRI)					50K (5000K, 67 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
					1	530	30B530/-K	55W	SR2	4634	1	0	1	84
(30 LEDs)	700	30B700/-K	73W	SR3	4695	1	0	2	85	5123	1	0	2	93
				SR3 HS	3425	0	0	1	61	3737	0	0	1	68
				SR4	4694	1	0	2	85	5122	1	0	2	93
				SR4 HS	3459	0	0	1	62	3774	0	0	2	69
				SR5	4696	3	0	1	85	5124	3	0	1	93
				FT	4694	1	0	1	85	5122	1	0	2	93
				SR2	5679	1	0	1	77	6223	2	0	2	85
				SR3	5835	1	0	2	79	6394	2	0	2	88
				SR3 HS	4239	0	0	2	58	4645	0	0	2	64
				SR4	5798	1	0	2	79	6354	1	0	2	87
SR4 HS	4294	0	0	2	58	4706	0	0	2	64				
SR5	5769	3	0	1	79	6322	3	0	2	87				
FT	5820	1	0	2	79	6378	1	0	2	87				
2	530	30B530/-K	106W	SR2	9109	2	0	2	86	9929	2	0	2	93
				SR3	9257	2	0	2	87	10,010	2	0	3	94
				SR3 HS	6717	0	0	2	64	7302	0	0	2	69
				SR4	9204	2	0	2	87	10,010	2	0	2	94
				SR4 HS	6800	0	0	2	64	7446	0	0	2	70
				SR5	9223	4	0	2	87	10,198	4	0	2	96
				FT	9183	2	0	2	87	10,020	2	0	2	95
				SR2	11,170	2	0	2	78	12,312	3	0	3	86
				SR3	11,391	2	0	3	80	12,462	2	0	3	87
				SR3 HS	8285	0	0	2	58	9047	0	0	2	63
SR4	11,332	2	0	2	79	12,368	2	0	3	86				
SR4 HS	8318	0	0	2	58	9149	0	0	2	64				
SR5	11,723	4	0	2	82	12,455	4	0	2	87				
FT	11,662	2	0	3	82	12,531	2	0	3	87				
(60 LEDs)	700	30B700/-K	143W	SR2	11,170	2	0	2	78	12,312	3	0	3	86
				SR3	11,391	2	0	3	80	12,462	2	0	3	87
				SR3 HS	8285	0	0	2	58	9047	0	0	2	63
				SR4	11,332	2	0	2	79	12,368	2	0	3	86
				SR4 HS	8318	0	0	2	58	9149	0	0	2	64
				SR5	11,723	4	0	2	82	12,455	4	0	2	87
				FT	11,662	2	0	3	82	12,531	2	0	3	87

### Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient	Lumen Multiplier	
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	77°F	1.00
30°C	86°F	1.00
40°C	104°F	0.99

### Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the DSX1 LED 2 30B700 platform in a 40°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.95	0.92	0.87

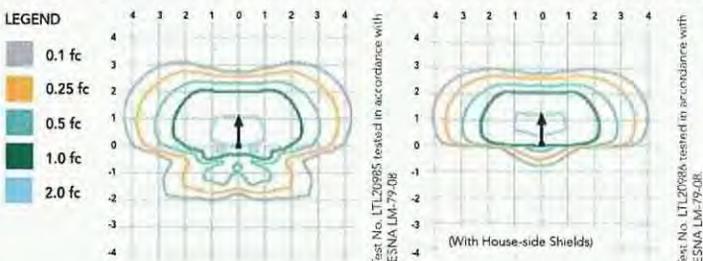
### Electrical Load

Light Engines	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
1	530	55W	0.46	0.26	0.23	0.20	0.16	0.11
	700	73W	0.61	0.35	0.30	0.26	0.21	0.15
2	530	106W	0.89	0.51	0.44	0.38	0.31	0.22
	700	143W	1.19	0.69	0.60	0.52	0.41	0.30

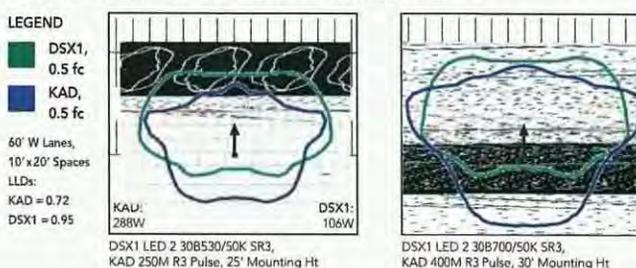
## Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area Size 1 homepage.

Isofootcandle plots for the DSX1 LED 2 30B700/50K SR3. Distances are in units of mounting height (20').



Distribution overlay comparisons to 250W and 400W metal halide.



## FEATURES & SPECIFICATIONS

### INTENDED USE

The sleek design of the D-Series Size 1 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

### CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (1.2 ft<sup>2</sup>) for optimized pole wind loading.

### FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

### OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in standard 4000K (67 CRI) or optional 3000K (80 CRI) or 5000K (67 CRI) configurations. The D-Series Size 1 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

### ELECTRICAL

Light engine(s) consist of 30 high-efficacy LEDs mounted to a metal-core circuit board to maximize heat dissipation and promote long life (100,000 hrs at 40°C, L87). Class 1 electronic driver has a power factor >90%, THD <20%, and has an expected life of 100,000 hours with <1% failure rate. Easily-serviceable surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

### INSTALLATION

Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 1 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 1 utilizes the AERIS™ series pole drilling pattern. Optional terminal block, tool-less entry, and NEMA photocontrol receptacle are also available.

### LISTINGS

CSA certified to U.S. and Canadian standards. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

### WARRANTY

Five year limited warranty. Full warranty terms located at [www.acuitybrands.com/CustomerResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx).

**Note:** Specifications subject to change without notice.





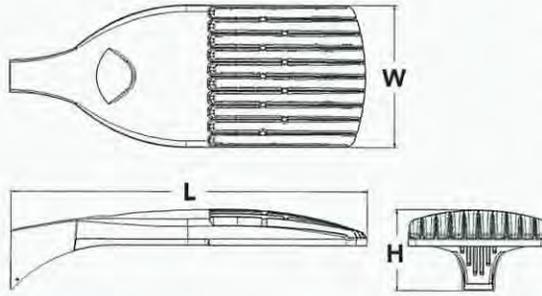
# D-Series Size 1 LED Area Luminaire



d<sup>series</sup>

## Specifications

<b>EPA:</b>	1.2 ft <sup>2</sup> (0.11 m <sup>2</sup> )
<b>Length:</b>	33" (83.8 cm)
<b>Width:</b>	13" (33.0 cm)
<b>Height:</b>	7-1/2" (19.0 cm)
<b>Weight (max):</b>	27 lbs (12.2 kg)



Catalog  
Number

Notes

Type

For the full line of options, see the page(s) for all product families.

## Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

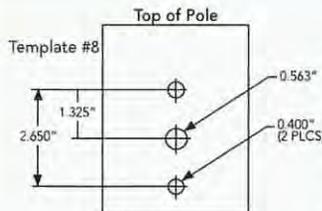
The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing 100 – 400W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

## Ordering Information

**EXAMPLE: DSX1 LED 2 30B700/40K SR3 MVOLT SPA DDBXD**

Series	Light Engines	Performance Package <sup>1</sup>	Distribution	Voltage	Mounting	Options	Finish (required)
DSX1 LED	1 One engine (30 LEDs) 2 Two engines (60 LEDs)	<b>530 mA options:</b> 30B530/30K 3000K 30B530/40K 4000K 30B530/50K 5000K  <b>700 mA options:</b> 30B700/30K 3000K 30B700/40K 4000K 30B700/50K 5000K	SR2 Type II SR3 Type III SR4 Type IV SR5 Type V FT Forward throw	MVOLT <sup>2</sup> 120 <sup>2</sup> 208 <sup>2</sup> 240 <sup>2</sup> 277 <sup>2</sup> 347 <sup>1</sup> 480 <sup>1</sup>	<b>Shipped included</b> SPA Square pole mounting RPA Round pole mounting WBA Wall bracket	<b>Shipped installed</b> PER NEMA twist-lock receptacle only (no controls) DMG 0-10V dimming driver (no controls) <sup>4</sup> DCR Dimmable and controllable via ROAM® (no controls) <sup>5</sup> HS House-side shield <sup>9</sup> SF Single fuse (120, 277, 347V) <sup>7</sup> DF Double fuse (208, 240, 480V) <sup>7</sup> WTB Utility terminal block TLS Tool-less entry trigger latch DS Dual switching <sup>8,9</sup> PIR Motion sensor, <15' mounting height <sup>10</sup> PIRH Motion sensor, 15-30' mounting height <sup>10</sup>	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

## Drilling



DSX1 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

DM19AS	Single unit	DM29AS	2 at 90°
DM28AS	2 at 180°	DM39AS	3 at 90°
DM49AS	4 at 90°	DM32AS	3 at 120°*

**Example: SSA 20 4C DM19AS DDBXD**

Visit Lithonia Lighting's POLES CENTRAL to see our wide selection of poles, accessories and educational tools.

## Tenon Mounting Slipfitter \*

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

\* For round pole mounting (RPA) only.

## NOTES

- 1 Configured with 4000K (40K) provides the shortest lead times. Consult factory for 3000K (30K) and 5000K (50K) lead times.
- 2 MVOLT driver operates on any line voltage from 120-277V (50/60Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options).
- 3 Not available with single board, 530 mA product (1 30B530).
- 4 Not available with 347 or 480V.
- 5 Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Not available with 347 or 480V. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net.
- 6 Also available as a separate accessory; see Accessories information at left.
- 7 Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
- 8 Provides 50% dimming capability via two independent drivers, each operating half the luminaire. N/A with PER, DCR, DMG or WTB.
- 9 Requires an additional switched line.
- 10 PIR specifies the SensorSwitch SBR-10-ODP control; PIRH specifies the SensorSwitch SBR-6-ODP control; see Motion Sensor Guide for details. Dimming driver standard. Not available with DCR or WTB.
- 11 Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item.

## Accessories

Ordered and shipped separately.

DSX124N 1.5 TIJE U	Photocell - SSL twist-lock (120-277V) <sup>11</sup>
DLL347 1.5 CULJU	Photocell - SSL twist-lock (347V) <sup>11</sup>
DLL480 1.5 CULJU	Photocell - SSL twist-lock (480V) <sup>11</sup>
SCU	Shunting cap <sup>11</sup>
DSX1HS U	House-side shield (one per light engine)
SPA19/MR2 DDBXD U	Square pole DM19 to DM19AS adapter (specify finish)
RPA19/MR2 DDBXD U	Round pole DM19 to DM19AS adapter (specify finish)

For more control options, visit DFI and ROAM online.



## Performance Data

### Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual performance may differ as a result of end-user environment and application. Contact factory for performance data on any configurations not shown here.

Light Engines	Drive Current (mA)	Performance Package	System Watts	Dist. Type	40K (4000K, 67 CRI)					50K (5000K, 67 CRI)																																																																																																																																																																																																																																																																																																																																											
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW																																																																																																																																																																																																																																																																																																																																							
					<table border="1"> <tr> <td rowspan="10">1 (30 LEDs)</td> <td rowspan="5">530</td> <td rowspan="5">30B530/-K</td> <td rowspan="5">55W</td> <td>SR2</td><td>4634</td><td>1</td><td>0</td><td>1</td><td>84</td><td>5056</td><td>1</td><td>0</td><td>1</td><td>92</td> </tr> <tr> <td>SR3</td><td>4695</td><td>1</td><td>0</td><td>2</td><td>85</td><td>5123</td><td>1</td><td>0</td><td>2</td><td>93</td> </tr> <tr> <td>SR3 HS</td><td>3425</td><td>0</td><td>0</td><td>1</td><td>61</td><td>3737</td><td>0</td><td>0</td><td>1</td><td>68</td> </tr> <tr> <td>SR4</td><td>4694</td><td>1</td><td>0</td><td>2</td><td>85</td><td>5122</td><td>1</td><td>0</td><td>2</td><td>93</td> </tr> <tr> <td>SR4 HS</td><td>3459</td><td>0</td><td>0</td><td>1</td><td>62</td><td>3774</td><td>0</td><td>0</td><td>2</td><td>69</td> </tr> <tr> <td>SR5</td><td>4696</td><td>3</td><td>0</td><td>1</td><td>85</td><td>5124</td><td>3</td><td>0</td><td>1</td><td>93</td> </tr> <tr> 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</tr> <tr> <td>FT</td><td>5820</td><td>1</td><td>0</td><td>2</td><td>79</td><td>6378</td><td>1</td><td>0</td><td>2</td><td>87</td> </tr> <tr> <td colspan="10"> <table border="1"> <tr> <td rowspan="10">2 (60 LEDs)</td> <td rowspan="5">530</td> <td rowspan="5">30B530/-K</td> <td rowspan="5">106W</td> <td>SR2</td><td>9109</td><td>2</td><td>0</td><td>2</td><td>86</td><td>9929</td><td>2</td><td>0</td><td>2</td><td>93</td> </tr> <tr> <td>SR3</td><td>9257</td><td>2</td><td>0</td><td>2</td><td>87</td><td>10,010</td><td>2</td><td>0</td><td>3</td><td>94</td> </tr> <tr> <td>SR3 HS</td><td>6717</td><td>0</td><td>0</td><td>2</td><td>64</td><td>7302</td><td>0</td><td>0</td><td>2</td><td>69</td> </tr> <tr> <td>SR4</td><td>9204</td><td>2</td><td>0</td><td>2</td><td>87</td><td>10,010</td><td>2</td><td>0</td><td>2</td><td>94</td> </tr> <tr> <td>SR4 HS</td><td>6800</td><td>0</td><td>0</td><td>2</td><td>64</td><td>7446</td><td>0</td><td>0</td><td>2</td><td>70</td> </tr> <tr> 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### Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient	Lumen Multiplier	
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	77°F	1.00
30°C	86°F	1.00
40°C	104°F	0.99

### Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the DSX1 LED 2 30B700 platform in a 40°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.95	0.92	0.87

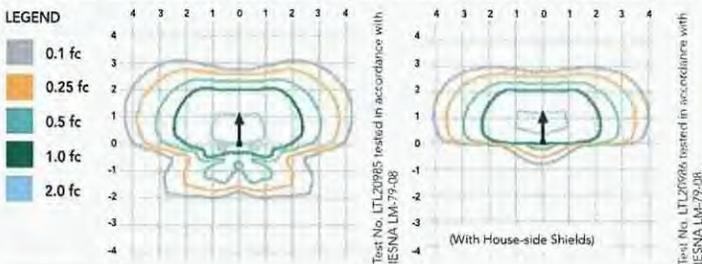
### Electrical Load

Light Engines	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
1	530	55W	0.46	0.26	0.23	0.20	0.16	0.11
	700	73W	0.61	0.35	0.30	0.26	0.21	0.15
2	530	106W	0.89	0.51	0.44	0.38	0.31	0.22
	700	143W	1.19	0.69	0.60	0.52	0.41	0.30

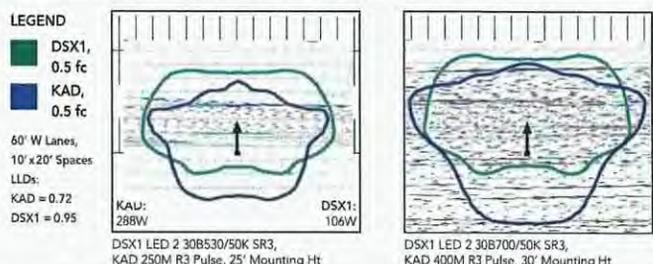
## Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area Size 1 homepage.

Isofootcandle plots for the DSX1 LED 2 30B700/50K SR3. Distances are in units of mounting height (20').



Distribution overlay comparisons to 250W and 400W metal halide.



## FEATURES & SPECIFICATIONS

### INTENDED USE

The sleek design of the D-Series Size 1 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

### CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Low EPA (0.9 ft) for optimized pole wind loading.

### FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

### OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in 3000K (80 CRI), 4000K (67 CRI) or 5000K (67 CRI) configurations. The D-Series Size 1 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

### ELECTRICAL

Light engine(s) consist of 30 high-efficacy LEDs mounted to a metal-core circuit board to maximize heat dissipation and promote long life (100,000 hrs at 40°C, L87). Class 1 electronic driver has a power factor >90%, THD <20%, and has an expected life of 100,000 hours with <1% failure rate. Easily-serviceable surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

### INSTALLATION

Four-bolt mast arm mount provides easy, secure installation for nominal 1-1/4" to 2" diameter arms (1-5/8" to 2-3/8" O.D.) and enables the D-Series Size 1 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. Housing includes cast-in wildlife shield. Die-cast trigger latch on door provides tool-less entry for easy and secure opening with one hand; top-side leveling crosshairs and internal bubble level assist with installation.

### LISTINGS

CSA certified to U.S. and Canadian standards. Light engines are IP66 rated. Rated for -40°C minimum ambient. U.S. D663,462 S. International patents pending.

### WARRANTY

Five year limited warranty. Full warranty terms located at [www.acuitybrands.com/CustomerResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx).

**Note:** Specifications subject to change without notice.





d<sup>series</sup>

# D-Series Size 3 LED Flood Luminaire



Catalog  
Number

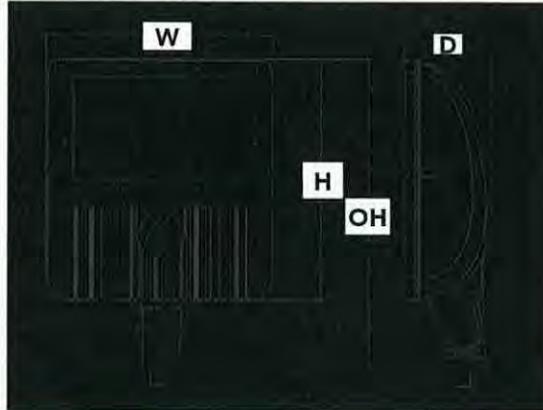
Notes

Type

For this Type, keep at least one spare luminaire for use as a backup for all other luminaire.

## Specifications

<b>EPA:</b>	1.4 ft <sup>2</sup> (0.13 m <sup>2</sup> )
<b>Depth:</b>	5" (12.7 cm)
<b>Width:</b>	13" (33.0 cm)
<b>Height:</b>	13-5/8" (34.6 cm)
<b>Overall Height:</b>	17-1/2" (44.5 cm)
<b>Weight:</b>	21 lbs (9.5 kg)



## Introduction

The D-Series Size 3 Flood features precision optics to beautifully illuminate a variety of applications as its sleek, compact styling blends seamlessly with its environment.

The D-Series Flood reflector systems and cutting-edge chip-on-board LED technology produce low field-to-beam ratios for minimal spill light and incredible photometric performance. It's the ideal long-life replacement for 250 - 400W metal halide floods, with typical energy savings of 67% and expected service life of over 100,000 hours.

## Ordering Information

EXAMPLE: DSXF3 LED 8 A530/40K FL MVOLT THK DDBXD

Series	Light Engines	Performance Package	Distribution	Voltage	Mounting	Options	Finish (required)
DSXF3 LED	6 Six COB engines 8 Eight COB engines	<b>530 mA options:</b> A530/30K 3000K A530/40K 4000K A530/50K 5000K	NSP Narrow spot MSP Medium spot MFL Medium flood FL Flood WFL Wide flood WFR Wide flood, rectangular HMF Horizontal medium flood	MVOLT <sup>1</sup> 120 <sup>1</sup> 208 <sup>1</sup> 240 <sup>1</sup> 277 <sup>1</sup> 347 480	<b>Shipped included</b> THK Knuckle with 3/4" NPT threaded pipe YKC62 Yoke with 16-3 SO cord  <b>Shipped separately<sup>2</sup></b> AFTS Tenon slipfitter (2-3/8" O.D. THK required) FTS CG6 Tenon slipfitter (2-3/8" to 2-7/8" O.D. YKC62 required)	<b>Shipped installed</b> PER NEMA twist-lock receptacle only (no controls) DMG 0-10V dimming driver (no controls) DCR Dimmable and controllable via ROAM <sup>®</sup> (no controls) <sup>3</sup> SF Single fuse (120, 277, 347V) <sup>4</sup> DF Double fuse (208, 240, 480V) <sup>4</sup> WTB Utility terminal block <b>Shipped separately<sup>2</sup></b> UBV Upper/bottom visor (universal) FV Full visor VG Vandal guard WG Wire guard SC Shorting cap <sup>5</sup> DSS124N 1.5 TJJE Photocell - SSL twist-lock (120-277V) <sup>5</sup> REN277-NM1 U ROAM <sup>®</sup> node (277V) <sup>5</sup> DLL347 1.5 CUL JU Photocell - SSL twist-lock (347V) <sup>5</sup> DLL480 1.5 CUL JU Photocell - SSL twist-lock (480V) <sup>5</sup>	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White

## Accessories

Ordered and shipped separately.

AFTS DDBXD U	Slipfitter for 2-3/8" OD tenon, mates with 3/4" threaded knuckle (specify finish)	DSXF3UBV DDBXD U	Upper/bottom visor accessory (specify finish)
FTS CG6 DDBXD U	Slipfitter for 2-3/8" to 2-7/8" OD tenons; mates with yoke mount (specify finish)	DSXF3FV DDBXD U	Full visor accessory (specify finish)
FRWB DDBXD U	Radius wall bracket, 2-3/8" OD tenon (specify finish)	DSXF3VG U	Vandal guard accessory
FSPB DDBXD U	Steel square pole bracket, 2-3/8" OD tenon (specify finish)	DSXF3WG U	Wire guard accessory

For more mounting options, visit our [Floodlighting Accessories](#) pages.  
For more control options, visit [DCL](#) and [ROAM](#) online.

## NOTES

- MVOLT driver operates on any line voltage from 120-277V. Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options).
- Also available as separate accessories; see Accessories information at left.
- Specifies a ROAM<sup>®</sup> enabled luminaire with 0-10V dimming capability; PER option required. Not available with 347 or 480V. Additional hardware and services required for ROAM<sup>®</sup> deployment; must be purchased separately. Call 1-800-442-6745 or email: [sales@roamservices.net](mailto:sales@roamservices.net).
- Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
- Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item.



## Performance Data

### Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual performance may differ as a result of end-user environment and application. Contact factory for performance data on any configurations not shown here.

Light Engines	Drive Current (mA)	Performance Package	System Watts	Dist. Type	Field Angle		Beam Angle		40K (4000K, 70 CRI)			50K (5000K, 67 CRI)			
					°H	°V	°H	°V	Max Cd	Lumens	LPW	Max Cd	Lumens	LPW	
															°H
6	530	A530/-K	115W	NSP	48	49	19	19	39,299	7471	65	39,177	7448	65	
					MSP	50	48	24	23	36,284	8373	73	36,171	8347	73
					MFL	60	60	47	46	15,104	8948	78	15,057	8920	78
					FL	85	84	63	62	9985	9730	85	9954	9700	84
					WFL	106	106	71	72	7488	10,230	89	7465	10,199	89
					WFR	107	88	85	64	7460	10,461	91	7436	10,429	91
					HMF	100	62	80	13	6779	3301	29	6758	3290	29
8	530	A530/-K	158W	NSP	48	49	19	19	51,658	9820	62	51,496	9790	62	
					MSP	50	48	24	23	47,694	11,006	70	47,546	10,971	69
					MFL	60	60	47	46	19,854	11,761	74	19,792	11,725	74
					FL	85	84	63	62	13,125	12,790	81	13,084	12,750	81
					WFL	106	106	71	72	9843	13,448	85	9812	13,406	85
					WFR	107	88	85	64	9805	13,751	87	9775	13,708	87
					HMF	100	62	80	13	8911	4338	27	8883	4325	27

### Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient	Lumen Multiplier
0°C	1.05
10°C	1.03
20°C	1.01
25°C	1.00
30°C	0.99
40°C	0.97

### Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the DSXF LED 8 A530 platform in a 25°C ambient, based on 8400 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

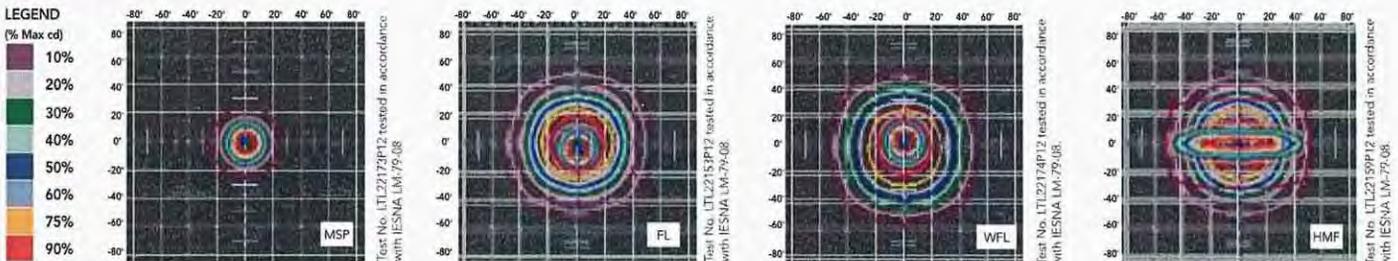
Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.94	0.90	0.84

### Electrical Load

Light Engines	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
6	530	115W	1.06	0.61	0.53	0.46	0.37	0.27
8	530	158W	1.46	0.84	0.73	0.63	0.51	0.37

## Photometric Diagrams

Iscandela plots for the DSXF3 LED 8 A530/40K.



## FEATURES & SPECIFICATIONS

### INTENDED USE

The sleek design of the D-Series Size 3 Flood reflects the embedded high performance LED technology. It is ideal for wallwash, security and general area lighting in many commercial and institutional applications.

### CONSTRUCTION

Die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (1.4 ft<sup>2</sup>) for optimized wind loading.

### FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling.

### OPTICS

A variety of precision-molded vacuum-metallized specular reflectors are engineered for superior field-to-beam ratios, uniformity and spacing. Light engines are available in 3000K (80 CRI min.), 4000K (70 CRI min.) or 5000K (67 CRI min.) configurations. Optional visors offer additional versatility.

### ELECTRICAL

Light engines consist of chip-on-board (COB) LEDs directly coupled to the housing to maximize heat dissipation and promote long life (100,000 hrs at 25°C, L84). Class 1 electronic driver has a power factor >90%, THD <20%, and has an expected life of 100,000 hours with <1% failure rate. (Eight-engine unit uses two drivers.) Surge protection meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

### INSTALLATION

Integral adjustable knuckle with 3/4-14 NPT threaded pipe, or yoke mounting, facilitates quick and easy installation to a variety of mounting accessories. This secure connection enables the D-Series Size 3 to withstand up to a 1.5 G vibration load rating per ANSI C136.31.

### LISTINGS

CSA certified to U.S. and Canadian standards. Luminaire is IP65 rated. Rated for -40°C minimum ambient.

### WARRANTY

Five year limited warranty. Full warranty terms located at [www.acuitybrands.com/CustomerResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx).

**Note:** Specifications subject to change without notice.

