
STORMWATER REPORT

Tetrahydra Agtek LLC

Property Location:

509 Quarry Road
Map #416, Lot #10
Becket, MA 01223

Applicant:

Tetrahydra Agtek, LLC
123B Seaview Avenue
South Yarmouth, MA 02664

Civil Engineer:

Foresight Land Services, Inc.
1496 West Housatonic Street
Pittsfield, MA 01201

January 2022

FORESIGHT
LAND SERVICES



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Plans: See Civil Site Plan Set, by Foresight Land Services, Dated January 21st, 2022.

STORMWATER REPORT
TETRAHYDRA AGTEK, LLC
QUARRY ROAD, MAP 416, LOT 10, BECKET, MA

In accordance with the Becket Zoning Bylaws, §6.8 Marijuana Establishments (ME) & Medical Marijuana Treatment Centers (MMYC), §9.3 Special Permit, Massachusetts DEP Stormwater Standards, and the “Guidelines for Soil and Water Conservation in Urbanizing Areas of Massachusetts”, the following narrative and compliance documentation are provided for the proposed stormwater system.

INTRODUCTION

This report accompanies an application for a Special Permit in the Town of Becket in accordance with the Becket Zoning Bylaws.

The Tetrahydra Agtek project has been designed to minimize short term and long term impacts related to erosion and stormwater. Erosion and sedimentation control measures are specified to avoid impacts to the wetland resource areas adjacent ecosystems and off site properties. The project is subject to the Wetlands Protection Act since portions of the work will be performed within the 100 foot buffer zone. A Notice of Intent will be filed separately to the Becket Conservation Commission . All stormwater will be controlled on site as required under the Becket Zoning Bylaw 9.4. *Site Plan Approval: 9.4.5 (2) Environmental (d)* stating that the proposed drainage system within and adjacent to the site must be adequate to handle the increased runoff resulting from the project. The stormwater system has been design so that the resulting stormwater conditions resemble, as nearly as possible, the existing conditions of volume, velocity, quality and location of runoff. Using MassDEP Stormwater regulations as a guide, calculations verifying that these requirements have been met are attached and are outlined within. A Stormwater Management Operation & Maintenance Plan with Long Term Pollution Prevention Plan has also been developed and can be provided upon request. Note: Complete calculations are available upon request.

A Stormwater Pollution Prevention Plan (SWPPP) and National Pollutant Discharge Elimination System (NPDES) permitting will be developed pending contractor selection.

SITE DESCRIPTION

The Tetrahydra Agtek parcel, Becket Assessors Map 416 Lot 10, is located on the north side of Quarry Road and consists of approximately 5.6± acres that has been subdivided from the original 80± acre lot.

An intermittent stream flows west to east through the parcel and bordering vegetated wetlands exist at the west edge of the parcel. The existing grades within the subject parcel are undulating and range from flat to steep. The parcel has historically been used for logging operations. Past logging operations have affected the boundaries and hydrology of resource areas on site and those boundaries are reflected by the wetland delineation flagging placed on site.

According to FEMA Flood Panel 250018 0017 A dated August 5, 1991, no portion of the property is located within the 100-year floodplain.

PROPOSED PROJECT

Tetrahydra Agtek, LLC is requesting a Special Permit from the Town of Becket, Massachusetts to construct a marijuana cultivation facility at 509 Quarry Road. This Municipal Impact Report is provided as supplemental data to the Special Permit application prepared by Tetrahydra Agtek, LLC. The facility

will consist of a greenhouse cultivation structure, “head house” outdoor cultivation area, and accessory and support spaces such as administrative offices, dedicated staff break rooms, dedicated areas for fertigation, cloning, and vegetation of marijuana plants, separate curing, drying, trimming, and packaging rooms, and secure marijuana storage room/vaults. No public access or retails sales are proposed.

The project will include the proposed 31,310 square foot footprint greenhouse building including a gravel access driveway, parking areas, drainage, septic system, roof rain water capture, waste water holding tank, fencing, overhead power supply, generators, dumpsters, propane tank, a cultivation/domestic water supply well.

Pursuant to the Massachusetts Cannabis Regulations, 935 CMR 500, the facility will cultivate, process and package marijuana, and transfer marijuana to other licensed Marijuana Establishments, but not to consumers. Activities to occur onsite include:

- A. Propagation of Marijuana Plants
- B. Flowering of Marijuana Plants
- C. Harvesting of Marijuana Flower & Byproduct (i.e. trim for extraction)
- D. Drying & Curing of Marijuana Flower & Byproduct
- E. Packaging of Dried Marijuana Flower (for retail sale off-site)
- F. Storage of Dried Marijuana Flower & Byproduct
- G. Sale & Distribution of Dried Marijuana Flower & Byproduct to licensed marijuana retailers and manufacturers/processors.

The facility will be used to cultivate, produce, and package marijuana products and will be adequately secured to prohibit public access to facility. No retail sales of marijuana will be conducted on-site. Tetrahydra Agtek and the Town signed a host community agreement on October 22, 2021, which states the requirements to be followed as a cannabis establishment in the Town and according to the Cannabis Control Commission.

As designed, the proposed cultivation facility is located in an upland area, partially within the jurisdiction of the Wetland Protection Act (Buffer Zone); however portions of the related utility work, stormwater management system, and the proposed cultivation facility driveway require replacement of an existing stream crossing.

PROPOSED STORMWATER SYSTEM

Stormwater will be conveyed to Stormwater Management Areas (SWMA) through a system of roof leaders, pipe drainage, vegetated swales, deep sump catch basins, manholes, swales, etc.

The stormwater mitigation/infiltration areas are capable of handling the 2-year, 10-year-, 25-year, and 100-year storm events through the use of outlet control structures which will have multi-stage outlets to handle the 2-year, 10-year-, 25-year, and 100-year storm events.

The Stormwater Management Areas (SWMA) proposed at the project site are as follows:

- SWMA 1 – Water Quality Swale – Dry with a multi stage outlet control structure and approximately 2,065 Cubic Feet of storage. This management area is located in the southeast corner of the lot.

- SWMA 2 – Water Quality Swale -Dry with approximately 3,014 Cubic Feet of storage. This management area is located between the proposed outdoor cultivation area and the intermittent stream that runs west to east through the lot.
- SWMA 3 – Water Quality Swale -Dry with approximately 33,541 Cubic Feet of storage. This management area is located in the northeast corner of the lot.
- SWMA 4– Subsurface infiltration system consisting of 6 rows of 11 Cultec Recharger 150XLHD chambers with an outlet control structure. This system is proposed to the north of the proposed indoor cultivation space, with a total storage of approximately 3528 Cubic Feet.

CONSTRUCTION-PHASE MITIGATING MEASURES

Erosion and sedimentation control measures shall be installed prior to the beginning of construction and in accordance with the construction and sequencing schedule. Erosion controls shall be installed as shown on the plans and shall be maintained by the Sitework Contractor through the construction period until the site is completely stabilized. Additional sedimentation and erosion control measures shall be installed and maintained as determined in the field to be necessary to control sediments from stormwater runoff from leaving the construction site or being deposited in any wetlands or watercourses. Erosion and sedimentation control measures shall be installed and maintained as indicated on the plans and specifications, as directed, and as evidently required to control sedimentation.

Erosion controls shall remain in place and shall be maintained in functional order until the construction site has vegetated and stabilized, and the Conservation Commission has authorized the removal. Erosion controls shall also be used for approximate limit of work.

A stabilized construction entrance (anti-tracking pad) will be installed and maintained to prevent tracking mud onto Quarry Road. Sweeping will be performed as needed.

Disturbed areas shall be finished graded and stabilized with vegetation, gravel, or pavement as soon in the construction schedule as possible. Stock piled material shall be protected from erosion by covering or establishing erosion controls ringing the base of temporary piles.

ESTIMATED CONSTRUCTION SCHEDULE AND SEQUENCING

(Estimated schedule to be confirmed – preliminary for permitting only)

Construction work for the Project will be undertaken in an orderly and phased manner and carried out in a way designed to avoid disruption to the area to the maximum degree possible. Construction will be phased so that, to the extent possible, construction will be completed and the area restored before commencing the next phase. At all times during construction appropriate noise, sedimentation and erosion controls shall be employed. The Project will be phased to minimize disruption and disturbance with sedimentation and erosion controls applicable to the operations being performed.

Estimated Construction Sequence (Subject to Change)

- Begin sitework
- Install erosion control barriers, stabilized construction entrance; maintain throughout construction
- Install sediment traps
- Install straw bale inlet sediment traps around catch basins as applicable
- Clear vegetation on site proposed for removal. Protect vegetation to remain

- Strip and stockpile topsoil on site; cover stockpiles with temporary vegetation, tarps, etc; ring with erosion control barriers
- Construct temporary diversion swales to direct uphill drainage away from construction site; discharge into temporary sediment traps
- Construct driveways; install temporary waterway check dams on both side of driveways as required; install straw bale check dam across upper end of existing entrance drive at end of each work day; remove sediments and maintain entrance driveway as required; sweep pavement at end of each construction day; more frequently as needed to prevent tracking onto state highway;
- Earthwork – cuts and fills; as soon as practical, stabilize disturbed slopes with temporary vegetation, erosion control fabric and/or tarps
- Install additional sediment traps as grading and drainage patterns change
- Maintain all erosion and sedimentation control measures throughout construction – typical
- Prepare and install underground infiltration areas– cap off and bypass storm drainage to temporary stilling basin(s) (do not allow runoff water to enter infiltrators until all sitework is completed)
- Install main line drainage conveyance system
- Install inlet sediment traps around all drainage structures
- Rough grade parking areas
- Pave driveways (base course)
- Construct building foundation
- Install other site utilities: sewer and water connection, electric/telephone/data, gas, etc
- Begin building construction
- Complete storm drainage and site utilities. Connect drainage system to SWMA's
- Fine grade parking areas and fine grade slopes and embankments
- Topsoil, erosion control fabric, and temporary seed slopes and embankments
- Stabilize all earth slopes with additional measures as required
- Install landscaping
- Final paving, striping, cleanup
- Complete sitework
- Complete building construction

STORMWATER COMPLIANCE

The following demonstrates that the proposed stormwater management system is in compliance to the maximum extent practicable with the performance standards as outlined in the MassDEP Stormwater Management Handbook.

- *Standard #1: No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

Standard #1 is Met (See Standards 4-6 for Additional Information) – There are no new untreated discharges to wetlands associated with the proposed work. Proposed roof drainage is treated by stormwater infiltration systems. No untreated point source discharges are proposed within the wetlands' Buffer Zone. All storm drain outlet pipes will have flared end sections and discharge onto a stone scour pad.

- *Standard #2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

Standard #2 is Met – Post-development peak discharge rates do not exceed the pre-development rates. The proposed drainage improvements do not increase the peak discharge rates for the 2-year, 10-year, 25-year, and 100-year design storm events. See the attached Drainage Analysis Summary for more information.

- *Standard #3: Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.*

Standard #3 is Met – The annual recharge from the post-development site approximates the annual recharge from pre-development conditions. The soil is classified as Hydrologic Group A by NRCS has a design recharge rate of 0.60 inches of runoff. Infiltration chambers taking roof runoff are proposed to provide annual recharge.

- *Standard #4: Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:*
 - a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;*
 - b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and*
 - c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

Standard #4 is Met – TSS removal is met through the use of a treatment chain including water quality swales, and subsurface structures/infiltration chambers. The percent of TSS removal is calculated to be greater than 80%.

- *Standard #5: For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

Standard #5 is Not Applicable – The proposed work does not constitute as an area with higher pollutant loads.

- *Standard #6: Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A*

discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

Standard #6 is Not Applicable – The proposed discharge area is not within the Zone II or an Interim Wellhead Protection Area of a public water supply, and stormwater does not discharge near or to any critical area.

- *Standard #7: A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

Standard #7 is Not Applicable – The proposed work is not considered a redevelopment project.

- *Standard #8: A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*

Standard #8 is Met – Erosion and sedimentation control measures are proposed through the use of straw wattles or coir logs, and where applicable, straw bales and silt fence. Construction Sediment Traps will be installed and maintained. All erosion and sedimentation control measures will be maintained throughout the construction stage, and shall not be removed until the site is properly stabilized. The project will be covered by a NPDES Construction General Permit and a SWPPP will be submitted before land disturbance begins.

- *Standard #9: A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

Standard #9 is Met – A long-term operation and maintenance plan has been prepared and the Stormwater system has been designed to provide ease of inspection and maintenance and protect the wetland resources.

- *Standard #10: All illicit discharges to the stormwater management system are prohibited.*

Standard #10 is Met – There are no known illicit discharges that have been observed within the proposed area of work. A sample *Illicit Discharge Compliance Statement* is attached within the Operation and Maintenance Plan.

CONCLUSION

The design of the sitework and stormwater management system has been developed to minimize impacts to the site during and after construction, to prevent erosion, capture construction sediments, and to control

stormwater runoff from the site. Erosion Control Barriers are proposed to prevent sediment from leaving the construction site and protect wetland resource areas of the project area. The proposed site work plans specify erosion and sedimentation control measures to avoid disturbance to the nearby resource areas. Stormwater management has been designed to maximize pollution removal, infiltrate stormwater to recharge groundwater, mimic existing drainage patterns, and prevent overloading of any downstream drainage facilities.

DRAINAGE ANALYSIS SUMMARY
TETRAHYDRA AGTEK
QUARRY ROAD, BECKET, MA

Basis Of Study

- 1) This storm drainage analysis is submitted for review under Becket Zoning By-Law Section 9.3 Special Permit, as an analysis of impacts on the natural environment from the proposed campground.
- 2) The stormwater management system on the project site includes the following Best Management Practices:
 - Open conveyance systems to direct flows
 - Roof drainage diverted into stone-filled infiltration galleries, and/or water quality swales to treat runoff, recharge ground water, and/or attenuate peak flows.
 - Minimizing extent of sitework by clustering development.
 - Operation and maintenance measures including catch basin sump, drainage channel, water quality swale, and infiltration chamber maintenance.
- 3) The hydrologic conditions of the site are analyzed under both the Existing (Pre-development) Conditions and Future (Post-development) Conditions for the 2, 10, 25 and 100-year design storm analysis. Design Points are chosen where the storm drainage leaves the project limits, down gradient of the proposed development. The Design Points allow comparison of the Existing and Future Conditions. These Design Points and Drainage areas (subcatchments) are shown on the Drainage Calculations.
- 4) Contributing drainage areas and vegetative cover conditions have been delineated on the basis of available topographic maps, record plans, and general field observations. Soil types underlying the various areas of the site have been identified using the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey (websoilsurvey.sc.egov.usda.gov). Hydrologic Soil Groups were then determined for each subcatchment. This data was then utilized to calculate the Runoff Curve Numbers for each subcatchment.
- 5) The Time of Concentration (T_c) of the runoff within each subcatchment is determined using TR-55 sheet flow, shallow concentrated flow, channel flow, and other conditions, based on the available topographic mapping and field observation.
- 6) Precipitation records for each design storm are taken from NOAA Atlas 14, Volume 10, Version 2, Precipitation Frequency Data Server. For project site in Lenox, the following values are listed:

2-year 24 hour storm	3.34"
10-year 24 hour storm	5.44"
25-year 24 hour storm	6.75"
100-year 24 hour storm	8.78"

- 7) Maximum flow capacities of the existing and proposed drainage structures are calculated assuming the inlet structures, piping, and discharge channels are maintained in good condition, unobstructed by sediment or debris.

- 8) Peak Rates of Runoff are calculated for the Existing and Future conditions using computerized hydrology and hydraulics programs. This study was performed utilizing "HydroCAD", v. 10.00, ©2019 HydroCAD Software Solutions LLC. This program is based on the methods promulgated by USDA Natural Resources Conservation Service (formerly known as Soil Conservation Service) in Technical Release Number 20 (TR-20) and the simplified tabular method contained in TR-55. Refer to the attached summaries.

Summary and Conclusions

The Peak Outflow at the design points analyzed will not increase as a result of the proposed project for the 2-year, 10-year, 25-year, and 100-year storm events. Refer to the following Table A, which summarize the results of the storm drainage analysis.

Table A
Summary of Storm Drainage Analysis Comparison of Peak Rates of Runoff
 24-Hour Design Storm Event (Precipitation-inches)

<u>Reach 1 (1R) Drainage Area</u>				
	2yr (3.34")	10yr (5.44")	25yr (6.75")	100yr (8.78")
Pre-Development (Q)	0.69	4.81	8.48	15.06
Post-Development (Q)	0.68	4.57	7.53	14.05
Reduction (cfs)	0.01	0.24	0.95	1.01
(%)	1.4%	5.0%	11.2%	6.7%
<u>Reach 2 (2R) Drainage Area</u>				
	2yr (3.34")	10yr (5.44")	25yr (6.75")	100yr (8.78")
Pre-Development (Q)	0.00	0.08	0.29	1.00
Post-Development (Q)	0.00	0.07	0.25	0.79
Reduction (cfs)	0.00	0.01	0.04	0.00
(%)	0.0%	12.5%	13.8%	21.0%
<u>Reach 3 (3R) Drainage Area</u>				
	2yr (3.34")	10yr (5.44")	25yr (6.75")	100yr (8.78")
Pre-Development (Q)	0.01	0.20	0.51	1.19
Post-Development (Q)	0.00	0.00	0.03	0.20
Reduction (cfs)	0.01	0.20	0.48	0.99
(%)	100%	100%	94.1%	83.2%

The design and size of the facilities are based on the anticipated runoff from a 2, 10, 25, and 100-year storm event per MassDEP Stormwater Handbook. Any new development within the watershed would require stormwater controls to mitigate for peak rates of runoff.

RECHARGE & STORMWATER SIZING WORKSHEET

**TETRAHYDRA AGTEK
QUARRY ROAD, BECKET, MA**

CALCULATE RECHARGE VOLUME

1. Total Area of Hydrological Group A soils (Aa) = 3.994 acres
2. Total Impervious Area overlaying Group A (Ia) = 0.735 acres (32015 SF)
3. Total Area of Hydrological Group B soils (Ab) = 2.787 acres
4. Total Impervious Area overlaying Group B (Ib) = 0 acres
5. Total Area of Hydrological Group C soils (Ac) = 0 acres
6. Total New Impervious Area overlaying Group C (Ic) = 0 acres
7. Total Area of Hydrological Group D soils (Ad) = 1.715 acres
8. Total Impervious Area overlaying Group D (Id) = 0 Acres

Recharge Volumes: (ReVn) where n = soil class

1. ReVa: Ia x 0.60 = 0.735 acres x 0.60 inches = 0.441 acre-inches
2. ReVb: Ib x 0.35 = 0 acres x 0.35 inches = 0 acre-inches
3. ReVc: Ic x 0.25 = 0 acres x 0.25 inches = 0 acre-inches
4. ReVd: Id x 0.10 = 0 acres x 0.10 = 0 acre-inches
5. Total Recharge Volume: (ReV = ReVa + ReVb + ReVc + ReVd)

$$\text{ReV} = \quad 0 \quad + \quad 0 \quad + \quad 0.441 \quad + \quad 0 \quad = \quad 0.441 \quad = \quad \mathbf{0.03675 \text{ acre-feet}}$$

acre-inches ÷ 12

IDENTIFY RECHARGE VOLUME TO BE INFILTRATED

ReV = **0.03675 acre-feet**

0.03675 ac-ft * 43,560SF/ac = 1600.83 CF **SAY 1601 CF required**

Total Impervious/ Impervious Directed to Recharge Facilities (SF) = 32015/ 31310 = 1.023

Total storage provided in SWMA systems (Static Method) =

1601CF (1.023)= 1637.65 CF Required

- Storage volume provided Underground Structures Chambers in stone bed: 6 Rows of 11 Chambers (Cultec R-150XLHD)= **2,352 CF Below Low-Flow Orifice**

TOTAL RECHARGE VOLUME SUPPLIED = 2,352 CF

CALCULATE DRAWDOWN TIME (72 HOURS MAXIMUM)

Drawdown time = $R_v / [(K) * (\text{Bottom Area})]$

R_v = Provided Recharge Volume

K = Saturated Hydraulic Conductivity for “Static” Method

(Table 2.3.3 – Mass Stormwater Handbook) = 0.60 inches/hour

Infiltration Chamber System Drawdown Time =

$2,352 \text{ CF} / [(0.60 \text{ inch/hr}) * (2425.5 \text{ SF BED}) * (1 \text{ ft}/12 \text{ in})] = \underline{19.4} \text{ hours}$

ANALYZE EFFECTS OF GROUNDWATER MOUNDING

A mounding analysis should be provided where infiltration (bottom of structure) occurs less than 4' from estimated seasonal high ground water and the recharge system is designed to attenuate the peak discharge from a 10-year or higher 24-hour storm.

It is not anticipated that the bottom of the infiltration stone will be less than 2' from estimated seasonal high ground water. Prior to construction, the applicant will analyze existing site soils below the proposed infiltration areas. Adjustments to the system will be made if high groundwater is encountered to avoid negative impacts due to high groundwater.

EFFECT OF INFILTRATION SYSTEM ON NEARBY WETLANDS

The following documentation is provided to show that the infiltration BMP's will not adversely affect nearby wetland resource areas.

The infiltration system will not adversely affect the nearby wetlands. The primary infiltration/ groundwater recharge for the site will be provided by the stone-filled infiltration beds which collect and mitigate stormwater runoff from the site and will recharge groundwater hydrology.

TSS Removal Calculation Sheet Instructions

Either a completed automated form or non-automated form must be submitted as part of the Stormwater Report accompanying the Wetlands NOI

Automated Version Instructions

The automated version may be used EXCEPT when a Proprietary BMP is proposed. This is because Proprietary BMPs have variable removal rates.

The only exceptions are for Proprietary BMPs reviewed through the TARP Tier II Field Protocol for which MassDEP has granted written reciprocity.

BMPs must be designed in accordance with the Design Specifications contained in Mass. Stormwater Handbook Volume II to receive the TSS Removal Rating.

Separate Excel spreadsheets must be completed for each stormwater outlet or BMP train.

E.g. if there are two separate BMP trains discharging to two separate stormwater outlets, two separate sheets must be submitted.

Separate sheets must be submitted for Pretreatment (e.g. for 44% TSS removal prior to recharge) and Treatment (e.g. 80% TSS removal for new development).

To use automated sheet:

Click on Worksheet Tab labeled Automated Sheet

Click on Cell B11 (Shaded Blue)

Carrot Appears in lower right side of Cell B11

Click on Carrot

Drop Down Menu of BMPs will open. The BMPs are those listed in Volume I. No proprietary BMPs are listed in Drop Down Menu.

BMPs are listed alphabetically

Select One BMP per block. Start with most upgradient practices.

After BMP is selected in Cell B11, Cell C11 will automatically be populated with the DEP assigned TSS Removal Rate.

If there are multiple BMPs, go to Cell B12, select BMP, and so on (i.e. select BMPs in Cell B13, B14, and B15).

Final result is returned in Cell E16

All cells are locked except for Column B (to select BMPs) and Location, Project, Prepared By, and Date blocks.

Complete Location, Project, Prepared by, and Date Blocks.

Non-automated Sheet

The non-automated version must be completed if any Proprietary BMPs or traditional non-listed BMPs are proposed.

The non-automated version is locked to prevent it from being manipulated.

The non-automated version must be printed and completed by hand or typewriter.

Write name of BMP in Column B.

Write annual TSS removal rate in Column C (written documentation must be submitted to issuing authority substantiating TSS removal claim)

Multiply Column C by Starting Load in Column D and enter Result in Column E (e.g. Deep Sump CB $0.25 \times 1 = 0.25$, Enter 0.25 in Column E).

Subtract Column E from D, Enter Result in Column F (e.g. $1.00 - 0.25 = 0.75$, Enter 0.75 in Column F).

Enter new BMP in Column B, next row down. Enter TSS Removal Rate in that same row.

In Column D, enter Starting Load from prior Row (e.g. 0.75).

Multiply Column C TSS Removal Rate by new starting load, and enter result into Column E, and so on.

Add up all the values listed in Column E.

Enter final result in Cell E16, block that is labeled Total TSS Removal.

Complete Location, Project, Prepared by, and Date Blocks.

Documentation

VERSION 1, March 4, 2008

Automated Sheet

Drop Down Menu in Column B created using "Data Validation"

Column C populated using data array from hidden table using "Vertical Lookup"

Column D values from Column F

Column E values products of Column C x Column D values

Column F values Column D - Column E

TSS Removal Efficiencies for Best Management Practices	
Best Management Practice (BMP)	TSS Removal Efficiency
Non-Structural Pretreatment BMPs	
Street Sweeping	0-10%, See Volume 2, Chapter 1.
Structural Pretreatment BMPs	
Deep Sump Catch Basins	25% only if used for pretreatment and only if off-line
Oil Grit Separator	25% only if used for pretreatment and only if off-line
Proprietary Separators	Varies – see Volume 2, Chapter 4.
Sediment Forebays	25% if used for pretreatment
Vegetated filter strips	10% if at least 25 feet wide, 45% if at least 50 feet wide
Treatment BMPs	
Bioretention Areas including rain gardens	90% provided it is combined with adequate pretreatment
Constructed Stormwater Wetlands	80% provided it is combined with a sediment forebay
Extended Dry Detention Basins	50% provided it is combined with a sediment forebay
Gravel Wetlands	80% provided it is combined with a sediment forebay
Proprietary Media Filters	Varies – see Volume 2, Chapter 4
Sand/Organic Filters	80% provided it is combined with sediment forebay
Treebox filter	80% provided it is combined with adequate pretreatment
Wet Basins	80% provided it is combined with sediment forebay
Conveyance	
Drainage Channels	For conveyance only. No TSS Removal credit.
Grass Channels (formerly biofilter swales)	50% if combined with sediment forebay or equivalent
Water Quality Swale – wet & dry	70% provided it is combined with sediment forebay or equivalent
Infiltration BMPs	
Dry Wells	80% for runoff from non-metal roofs; may also be used for runoff from metal roofs but only if metal roof is not located within a Zone II, or IWPA or at an industrial site
Infiltration Basins & Infiltration Trenches	80% provided it is combined with adequate pretreatment (sediment forebay or vegetated filter strip, grass channel, water quality swale) prior to infiltration
Leaching Catch Basins	80% provided a deep sump catch basin is used for pretreatment
Subsurface Structure	80% provided they are combined with one or more pretreatment BMPs prior to infiltration.
Other BMPs	
Dry Detention Basins	For peak rate attenuation only. No TSS Removal credit.
Green Roofs	See Volume 2, Chapter 2. May reduce required water quality volume. No TSS Removal Credit.
Porous Pavement	80% if designed to prevent runoff and with adequate storage capacity. Limited to uses identified in Volume 2, Chapter 2.
Rain Barrels and Cisterns	May reduce required water quality volume. No TSS Removal Credit.

From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Reach 1 (Roof Drainage)

TSS Removal
Calculation Worksheet

B	C	D	E	F
BMP ¹	TSS Removal Rate ¹	Starting TSS Load*	Amount Removed (C*D)	Remaining Load (D-E)
Subsurface Infiltration Structure	0.80	1.00	0.80	0.20
Water Quality Swale - Dry	0.70	0.20	0.14	0.06
	0.00	0.06	0.00	0.06
	0.00	0.06	0.00	0.06
	0.00	0.06	0.00	0.06

Total TSS Removal =

94%

Separate Form Needs to
be Completed for Each
Outlet or BMP Train

Project: E2988- Tetrahydra Agtek
Prepared By: AZM
Date: 1/22/2022

*Equals remaining load from previous BMP (E)
which enters the BMP

EXHIBIT D
TSS REMOVAL WORKSHEET

Project: Tetra Hydra Agtek
For Stormwater Water Quality - Standard 4 (0.5" water quality volume storm)

Calc by: AZM
FLS Proj. E2988
Date: 1/28/2022

WEIGHTED TSS REMOVAL CALCULATION WORKSHEET (Mass. DEP)				
Description of BMP	Volume to BMP (acre-feet)	TSS removal % (MassDEP)	TSS Volume removed by BMPs	% of Annual Volume treated by BMP
ROOF (Indoor Cultivation Roof)	0.03	94%	0.00028	0.9
P-S4 (Paved Driveway Apron)	0.0007	0%	0.00000	0.0
Totals	0.031		0.00028	

Weighted TSS % Removal = 92%

Project: E2988 - Tetrahydra Agtek
Prepared By: AZM
Date: 1/22/2022

WATER QUALITY VOLUME WORKSHEET**TETRAHYDRA AGTEK
QUARRY, BECKET MA**

WQV= water quality volume

ReV = recharge volume

I = total impervious area (including rooftop)

Ir = rooftop impervious area

RR = rooftop runoff

1. Total Contributing Site Area 8.5acres
2. Percent New Impervious 0.9 %
3. Total New Impervious Area (I) 0.735 acres (new impervious)
4. Find WQV:

(a) using 0.5" rule: $WQV = (0.5")(I) = \underline{0.3675 \text{ acre-inches}} / 12 \text{ inches} = \underline{\mathbf{0.031 \text{ Acre-feet}}}$

OR

(b) using 1.0" rule: $WQV = (1.0")(I) = \underline{\hspace{1cm} \text{acre-inches} \hspace{1cm}} / 12 \text{ inches} = \underline{\hspace{1cm} \text{Acre-feet} \hspace{1cm}}$

Determine Amount of WQV to be conveyed through water quality BMP's**=WQV = 0.032 acre-feet****0.031 ac-ft * 43,560 SF/ac = 1,350.36 CF SAY 1,375 CF required****Total storage Provided = 826 + 225 + 4,127 CF* > 1,375 CF Required**

* Storage volume provided in SWMA 1, 2, 3 below low flow outlets/ weirs.

OPERATION & MAINTENANCE PLAN
TETRAHYDRA AGTEK, LLC
QUARRY ROAD, BECKET, MA

PROJECT DATA:Name: Tetrahydra Agtek, LLCAddress: 509 Quarry Road, Becket MA**OWNER OF STORMWATER SYSTEM:**Name: Tetrahydra Agtek, LLCContact Person: Michael GoodenoughAddress: 123B Seaview Avenue, South Yarmouth, MA 02664

Phone: _____

OPERATOR RESPONSIBLE FOR OPERATION & MAINTENANCE OF SYSTEM:Name: Tetrahydra Agtek, LLC**BRIEF SUMMARY OF PROJECT**

The Tetrahydra Agtek parcel, Becket Assessors Map 416 Lot 10, is located on the north side of Quarry Road and consists of approximately 5.6± acres that has been subdivided from the original 80± acre lot.

An intermittent stream flows west to east through the parcel and bordering vegetated wetlands exist at the west edge of the parcel. The existing grades within the subject parcel are undulating and range from flat to steep. The parcel has historically been used for logging operations. Past logging operations have affected the boundaries and hydrology of resource areas on site and those boundaries are reflected by the wetland delineation flagging placed on site.

According to FEMA Flood Panel 250018 0017 A dated August 5, 1991, no portion of the property is located within the 100-year floodplain.

PROPOSED PROJECT

The project will include the proposed 31,310 square foot footprint greenhouse building including a gravel access driveway, parking areas, drainage, septic system, roof rain water capture, waste water holding tank, fencing, overhead power supply, generators, dumpsters, propane tank, a cultivation/domestic water supply well.

Pursuant to the Massachusetts Cannabis Regulations, 935 CMR 500, the facility will cultivate, process and package marijuana, and transfer marijuana to other licensed Marijuana Establishments, but not to consumers. Activities to occur onsite include:

- A. Propagation of Marijuana Plants
- B. Flowering of Marijuana Plants
- C. Harvesting of Marijuana Flower & Byproduct (i.e. trim for extraction)
- D. Drying & Curing of Marijuana Flower & Byproduct
- E. Packaging of Dried Marijuana Flower (for retail sale off-site)
- F. Storage of Dried Marijuana Flower & Byproduct
- G. Processing of marijuana

H. Sale & Distribution of Dried Marijuana Flower & Byproduct to licensed marijuana retailers and manufacturers/processors.

The facility will be used to cultivate, produce, and package marijuana products and will be adequately secured to prohibit public access to facility. No retail sales of marijuana will be conducted on-site. Tetrahydra Agtek and the Town signed a host community agreement on October 22, 2021, which states the requirements to be followed as a cannabis establishment in the Town and according to the Cannabis Control Commission.

As designed, the proposed cultivation facility is located in an upland area, partially within the jurisdiction of the Wetland Protection Act (Buffer Zone); however portions of the related utility work, stormwater management system, and the proposed cultivation facility driveway require replacement of an existing stream crossing.

WETLANDS AND RECEIVING WATERS

The site does not include wetlands, but drainage will ultimately be received by jurisdictional wetlands nearby which are protected under the Mass. Wetlands Protection Act administered by the Conservation Commission, and the Federal Clean Waters Act. These include the wetland resource areas as described in the Notice of Intent and depicted on the attached plans.

Note: Under the Mass. Wetlands Protection Act regulations (310 CMR 10.02 (3), 1997 revisions), maintenance of the stormwater management system affecting any wetland areas which were previously created for the purpose of stormwater management, does not require the filing of a Notice of Intent or a Request for Determination of Applicability. For example, assume that a water quality basin, wet detention basin, or outlet swale are constructed for the project. These drainage facilities will naturally become populated with wetland vegetation. Five years later, maintenance needs to be performed to remove accumulated sediments from the drainage basins or outlet swale. This work does not constitute alteration of wetlands, and does not require filing or approval under the WPA, as long as the work is only maintenance. (Enlargement or substantial changes to the drainage system would require approval.) However, as a matter of good communication, we recommend that the Owner or Operator notify the Conservation Commission before the maintenance work is begun. The Order of Conditions issued by the Conservation Commission may have additional conditions or requirements that continue after the Certificate of Compliance is issued for construction. A copy of the Order of Conditions and any continuing conditions should be attached to this Operation and Maintenance Plan.

Owner, Operator, Contractor(s), and other personnel who perform work on the site should become familiar with the location and characteristics of the wetland resource areas, and of the requirements under the applicable federal, state, and local laws and regulations. Wetlands in close proximity of work areas should be flagged with signage. Work within 100' of Bordering Vegetated Wetlands (BVW) or Bank (Intermittent Stream) is under the jurisdiction of the Conservation Commission and must be reviewed prior to work proposed within the 100-foot Buffer Zone.

This Operation and Maintenance Plan is an essential component of the Stormwater Management System for the Project. The Owner is ultimately responsible for assuring that the Stormwater System is operated and maintained in accordance with all applicable permits and approvals, including, but not limited to Massachusetts Wetlands Protection Act permits, Massachusetts Stormwater Management Policy, Massachusetts Groundwater or Surface Water Discharge Permits, and U.S.E.P.A. General Permit, and the Stockbridge Stormwater Management and Erosion Control Bylaw. Copies of all applicable permits and plans should be attached to this O&M plan. All Permit requirements are incorporated by reference into this Operation and Maintenance Plan whether they are attached or not.

SCHEDULE FOR INSPECTION AND ROUTINE MAINTENANCE OF STORMWATER SYSTEM:

Note: Notification of Conservation Commission is recommended before performing any excavation or major maintenance of the stormwater system, though stormwater structures are not considered wetland resources. All components of the Stormwater System shall be inspected after every major storm event for the first few months after construction to ensure proper stabilization and function.

Drainage Channels	• Inspect Bi-Annually in the Spring and Fall; • Check for sediments; remove sediments if more than 4" deep. Remove sediment and debris at least once per year. • Check inlet and outlet pipes for debris or obstructions. Clean as necessary; • Mow applicable areas at least once per year with a minimum grass length of 4", Grass height shall not exceed 6" or be cut less than 3". Mow as needed during growing season; • Inspect and maintain outlet control device as applicable; • Maintain as required with additional mowing, fertilizing, liming, watering, pruning, weeding, and pest control. Re-seed periodically to maintain dense grass growth. Plant with alternative grass species if the original grass cover is not successfully established.
Catch Basin Sumps	• Inspect quarterly and clean inlets; • Inspect or clean sump at the end of the foliage and snow-removal seasons. • Remove sediments if greater than ½ sump capacity; • Remove Sediments from sumps annually in the spring, at a minimum; • Dispose of sediments and debris off site at approved location in accordance with applicable state and federal laws and regulations.
Water Quality Swales	• For the first few months after construction and twice a year thereafter, inspect swales to make sure vegetation is adequate and slopes are not eroding and check for rilling and gullyng. • Repair eroded areas and revegetate as necessary. • Mow as needed ~ two to twelve times a year • Manually remove sediments and debris at least once per year. • Re-seed as necessary
Level Lip Spreader	• Inspect level spreaders regularly, especially after large rainfall events. • Note and repair any erosion or low spots in the spreader.
Infiltration Chambers	• Inspect Bi-Annually in the Spring and Fall • Periodically monitor water depths at 0, 24, and 48 hours after a storm event to check infiltration rates over a period of years to determine clogging problems.

LONG TERM POLLUTION PREVENTION PLAN**Good Housekeeping Practices:**

Where applicable, the Operator shall apply good housekeeping practices including, but not limited to the following. See SWPPP for additional information:

Materials Management: As applicable

- An effort will be made to store only enough product required to perform the required work. Regular inventory of materials will reduce the occurrence of overstocking.
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, wherever possible, should be under a roof or other enclosure to prevent contact with stormwater.

- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposing of the container.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The Operator will inspect daily to ensure proper use and disposal of materials onsite.
- Routinely clean work space and maintain machinery.
- Regularly inspect equipment and facilities.
- Train employees to respond to spills or leaks.

Vehicle Washing Controls: As applicable

- Wash vehicles on gravel, grass, or other permeable surface outside of the Buffer Zone or pump wash water runoff to a permeable area.
- Block off catch basin grates, if applicable.
- Use hose nozzles that turn off automatically.
- Use only biodegradable soaps.

Other Good House Keeping Practices:

- Litter and other debris shall be collected and properly disposed of as frequently as necessary
- Property owners shall keep the site maintained and in an orderly manner to protect downstream resources.

Storage & Use of Hazardous Products, Petroleum Products, Fertilizers, Herbicides, & Pesticides:

Where applicable, the following practices will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff. (If a Total Maximum Daily Load (TDML) is developed that indicates that use of fertilizers containing nutrients must be reduced, a nutrient management plan shall be developed.)

Hazardous Products:

- Shall be stored in a secured area under cover
- Products will be kept in original containers unless they are not re-sealable.
- Original labels and material safety data will be retained; they contain important product information.
- If surplus product must be disposed of, manufacturer's or local and State recommended methods for proper disposal will be followed.

Petroleum Products:

- Shall be stored in a secured area undercover.
- All onsite vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

Fertilizers:

- Shall be stored in a secured area undercover.
- Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Stored fertilizers will be kept covered. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.
- Any overcast fertilizer on grasses or paved areas shall be cleaned off.

Paints:

- All containers will be tightly sealed and stored in a secure covered area when not required for use. Excess paint will not be discharged to the storm or sanitary sewer systems but will be properly disposed of according to manufacturer's instructions and State and local regulations.

Spill Prevention and Response Plans

In addition to the good housekeeping and material management practices discussed in the previous sections, the following practices will be followed for spill prevention and cleanup:

Spill Control Practices	
☒	Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
☒	Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
☒	All spills will be cleaned up immediately after discovery.
☒	The spill area will be kept ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
☒	Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size.
☒	The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
☒	The Operator or Operator's representative will be the spill prevention and cleanup coordinator. He/she will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted onsite.

Maintenance of Lawns, Gardens, and other Landscaped Areas:

- Inspect lawns, gardens, and other landscaped areas for signs of erosions, bare spots, diseased plant species, and overall vegetation health.
- Regularly mow the grassed areas as required. Refer to the Schedule for Inspection and Routine Maintenance of Stormwater System (above) for specific mowing and maintenance requirements of the Stormwater system.
- Remove and Replant, reseed, re-mulch, and prune as required to maintain healthy vegetation.

Pet Waste Management:

In no case, should pet wastes be allowed to discharge into the stormwater system.

Operations and Maintenance of Septic Systems:

See SWPPP for construction phase sanitary waste provisions.

Solid Waste Management:

- All waste materials will be collected and stored in a securely covered (lidded or tarped, or enclosed within the building) metal dumpster rented from a licensed hauler or equivalent waste receptacle.

- The dumpster/waste receptacle will meet all local and State solid waste management regulations.
- All trash and debris from the site will be deposited in the dumpster and/or waste receptacle.
- The dumpster and/or waste receptacle will be emptied a minimum of once per week or more often if necessary, and the trash will be hauled to a state approved landfill. No waste materials will be buried onsite.
- All personnel will be instructed regarding the correct procedure for waste disposal. Notices stating these practices will be posted onsite. The Operator who manages the day-to-day site operations will be responsible for seeing that these procedures are followed.

Snow Disposal and Plowing (as relative to Wetland resource Areas):

- Snow shall not be plowed or stored into the wetland resource areas or within any the stormwater system (i.e. rain garden, Water Quality Swale, etc.).
- Store snow in a designated onsite location or properly disposed at an offsite location.
- Minimize the use of salt/sand or other deicing chemicals.

Winter Road Salt and/or Sand Use and Storage:

- Preferably, salt and deicing chemicals for the driveway will be stored off-site and only employed when necessary.
- Any salt and deicing chemicals necessarily stored onsite shall be stored in a proper container or structure designed to prevent the generation and escape of contaminated runoff or leachate.
- Storage design shall apply the following BMP components: A flat site, slightly raised above surrounding grades, adequate space, an impervious/paved storage pad, proper roofing, and runoff collection/containment.

Prevention of Illicit Discharges to the Stormwater Management System:

- All non-stormwater discharges must be reported and documented as illicit discharges. An Illicit Discharge Compliance Statement (see example in Attachment B) must be submitted to the issuing authority verifying that no illicit discharges exist on the site. Pollution prevention measures shall be implemented to prevent illicit discharges to the stormwater management system, including wastewater discharges and discharges of stormwater contaminated by contact with the process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.
- Illicit discharges do not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing, and water used to clean residential buildings without detergents.
- A scaled plan of the site must accompany the Illicit Discharge Compliance Statement identifying the location of any systems for conveying stormwater on the site and showing that these systems do not allow the entry of any illicit discharges into the stormwater management system. The plan shall also show the locations of any systems for conveying wastewater and/or groundwater on the site and show that there are no connections between these systems and the stormwater management systems. This information shall be included with the plans submitted with the Notice of Intent and Operation and Maintenance Plan or included as a separate plan with the Illicit Discharge Compliance Statement.
- If applicable, where illicit discharges have been identified, the actions taken to identify and remove the illicit discharges must be documented and shown on the plan.

Training Requirements for Staff and Personnel Involved with Implementing the Long Term Pollution Prevention Plan:

- Staff and personnel involved with implementing this plan shall be trained to understand this Operation and Maintenance plan, the SWPPP, emergency procedures, Good Housekeeping BMPs, stormwater BMPs, sedimentation and erosion control measures, and the non-stormwater BMPs.
- Refer to the Stormwater Management Fact Sheet (Attachment D) and the SWPPP for further

information and training logs.

Emergency Contact List

- See Attachment E for Emergency Contacts.

Comprehensive Site Evaluation

A comprehensive site inspection shall be performed on an annual basis. The scope of the comprehensive site inspection should encompass all of the noted possible sources of pollution and activities noted. The Operator should use the attached form(s) (Attachment D) for the inspection process and note the date, time, and an account of the circumstances leading up to any found contaminants. If the release is a reportable quantity of oil or other controlled substance, the Operator shall notify all appropriate and applicable agencies.

The annual inspections should take place in the spring, immediately following a rainfall event, in order to get the most representative inspections. The inspections should involve visually inspecting the site and the surrounding areas. The results of the inspection should be noted on the forms provided. Any noted contaminants should be recorded on the forms and acted upon as noted below.

Also, as a result of good housekeeping measures throughout the course of the year, the Operator shall determine what, if any, additional measures or changes need to be made to the Operation and Maintenance Plan.

Records Keeping and Actions Requirements

All comprehensive site analysis shall be logged and kept with the Operation and Maintenance Plan. Any other notes and/or issues arising on a daily basis shall be logged and kept with the Operation and Maintenance Plan.

If there is a “reportable incident” the Operator shall log the incident in the Operation and Maintenance Plan and revise the Operation and Maintenance Plan within 14 days of the noted incident. The Operation and Maintenance Plan revision should be designed to alleviate the source of contamination and reduce the noted pollutants. After the Operation and Maintenance Plan revision, the pollution source noted shall be inspected and logged again during the next rainfall event. If the suspected contaminant is not present, the Operator shall log this information and pay close attention to this area during the next annual inspection. If the contaminant is still present, the Operation and Maintenance Plan shall be revised again, within 14 days, and re-evaluated during the next rainfall event until the contaminant is satisfactorily reduced or eliminated, i.e. not present during the subsequent inspection.

A reportable incident means any incident that is noted as having a Physical Observation other than “none” (on the Visual Inspection Worksheet) and/or any noted pollution sources recognized during the course of operations. Daily good housekeeping such as sweeping and picking up stray trash/paper/plastic materials does not constitute a reportable incident.

Records must be kept with the Operation and Maintenance Plan documenting the status and effectiveness of plan implementation. At a minimum, records must address the results of the annual evaluations, routine maintenance and inspections, spills, monitoring, and maintenance activities.

Facilities Maintenance

Maintenance involves the regular operation, inspection, and replacement or repair of systems and BMPs.

Storm water BMP reviews should be performed throughout the year, per the above schedule, in addition to the required annual inspections. Any potential problems or maintenance requirements should be reported and documented. All BMPs identified in the Operation and Maintenance Plan must be maintained in effective operating condition.

As noted, good housekeeping is a key component of the Operation and Maintenance Plan. Good housekeeping includes all of the Pollution prevention measures noted under this Operation and Maintenance Plan and all subsequent measure implemented throughout operations. The facilities maintenance plan will quickly respond to noted deficiencies as well as provide preventative maintenance where applicable.

Disclaimer

This Operation and Maintenance Plan is intended to satisfy the requirements under the Massachusetts Stormwater Handbook only and does not cover the exact steps required for materials handling and reporting as established under local, state and federal codes and permits. This Operation and Maintenance Plan does not alleviate the owner from complying with any and all other requirements governing the operation and maintenance of a facility of this nature.

Owner, Operator, Contractor(s), and other personnel who perform work on the site should become familiar with the location and characteristics of the wetland resource areas, and of the requirements under the applicable federal, state, and local laws and regulations.

This Operation and Maintenance Plan is an essential component of the Stormwater Management System for the Project. The Owner is ultimately responsible for assuring that the Stormwater System is operated and maintained in accordance with all applicable permits and approvals, including, but not limited to Massachusetts Wetlands Protection Act permits, Massachusetts Stormwater Management Policy, Massachusetts Groundwater or Surface Water Discharge Permits, and U.S.E.P.A. NPDES Stormwater Discharge Permit. Copies of all applicable permits and plans should be attached to this Operation and Maintenance Plan. All Permit requirements are incorporated by reference into this Operation and Maintenance Plan whether they are attached or not.

Attachment A
Policy #BWP-94-092: Reuse & Disposal of Street Sweepings

This Policy provides guidance on Massachusetts Department of Environmental Protection requirements, standards, and approvals for handling, reuse and disposal of street sweepings.

By Carl F. Dierker,
Assistant Commissioner, Bureau of Waste Prevention
[Signature on Original]

1. Policy Statement & Scope

This Policy explains Department of Environmental Protection (MassDEP) requirements for managing street sweepings. Street sweepings are solid waste subject to the Massachusetts solid waste regulations. The options for managing street sweepings are as follows.

1. Use the street sweepings in accordance with the preapproved uses described in Section 4 of this policy.
2. Use the street sweepings for a beneficial use after obtaining prior approval from MassDEP under the provisions of the solid waste regulations, 310 CMR 19.060, Beneficial Use of Solid Wastes.
3. Dispose of street sweepings at a permitted solid waste landfill.

The provisions and requirements for managing street sweepings under these options are the subject of this policy.

2. Applicability

This policy applies to the reuse or disposal of street sweepings that are generated in the ordinary and customary maintenance of roadways. The policy does not apply to catch basin cleanings or street sweepings mixed with catch basin cleanings or other wastes. The policy does not apply to the material generated as the result of the cleanup of an oil or hazardous material spill.

Street sweepings are not exempt from the Hazardous Waste Regulations, 310 CMR 30.000, and must be handled as hazardous waste when they exhibit any of the characteristics of a hazardous waste. If there is no evidence of unusual contamination, MassDEP does not require street sweepings to be routinely tested, but, as is the case with any waste, the generator has the ultimate responsibility for determining whether the waste is a hazardous waste.

3. Definitions

Department or means the Massachusetts Department of Environmental Protection (MassDEP).

Public Way means the strip of land over and under a publicly owned, paved road or highway and includes the publicly owned land adjacent to the road or highway.

Street Sweepings means materials consisting primarily of sand and soil generated during the routine cleaning of roadways but may also contain some leaves and other miscellaneous solid wastes collected during street sweeping. *Street sweepings* does not mean the material generated during the cleanup of a spill or material from other structures associated with a roadway such as catch basins.

Urban center roads means local roads in central commercial and retail business districts and industrial and manufacturing areas.

4. Pre-Approved Uses, Restrictions & Conditions

This policy allows street sweepings to be used in several applications. No approval from MassDEP is required when the restrictions and conditions identified in this policy are adhered to. However, sweepings shall not be

used unless prior approval is obtained from the owner of the location where the sweepings are to be used.

4.1. Use at Landfills

Street sweepings may be used for daily cover at lined or unlined permitted solid waste landfills and need no prior MassDEP approval if the sweepings satisfy the requirements for daily cover material specified at 310 CMR 19.130(15).

4.2. Use as Fill in Public Ways

Street sweepings shall be used for fill in public ways without prior approval from MassDEP only when the following restrictions and conditions are observed:

- The sweepings have not been collected from Urban Center Roads (see definition);
- The sweepings are used under the road surface or as fill along the side of the road within the public way;
- The sweepings are not used in residential areas;
- The sweepings are kept above the level of the groundwater;
- The sweepings are not used in designated "No Salt Areas";
- The following definitions have been taken verbatim from the solid waste regulations and are repeated here for clarity in understanding this policy.
- The sweepings are not used within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;
- The sweepings are not used within 500 feet of a ground or surface drinking water supply.

4.3. Use As an Additive to Restricted Use Compost

Street sweepings shall be used as an additive to compost without prior approval from MassDEP only when the following restrictions and conditions are observed:

- The sweepings have not been collected from Urban Center Roads (see definition);
- The compost is used only in public ways;
- The compost is not used in residential areas;
- The compost is kept above the level of the groundwater;
- The compost is not used in designated "No Salt Areas";
- The compost is not used within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;
- The compost is not used within 500 feet of a ground or surface drinking water supply.

5. Other Uses

Any use not pre-approved in the preceding section requires prior MassDEP approval under the Beneficial Use provisions of the *Solid Waste Management Facility Regulations* at 310 CMR 19.060. A "Beneficial Use Determination" or BUD can be made only after the submission of an application characterizing the waste and describing the proposed beneficial use.

6. Disposal

While the beneficial use of street sweepings is strongly encouraged, MassDEP does not prohibit the disposal of street sweepings. Street sweepings may be disposed in either lined or unlined permitted solid waste landfills without prior approval from the Department.

7. Handling

7.1. Collection of Street Sweepings

Although MassDEP does not regulate the collection of street sweepings, collection practices should be compatible with intended uses. For example, sweepings from Urban Center Roads are not approved for the uses allowed for sweepings from other areas. Keeping sweepings from Urban Center Roads separate from

sweepings from other areas will make the full benefits of this policy available.

This policy does not cover sweepings known to be contaminated by spills, and such sweepings should be collected separately and kept segregated. Depending on the contamination and circumstances, the handling of contaminated sweepings may be governed by the Massachusetts Contingency Plan, [310 CMR 40](#), the Massachusetts Hazardous Waste Regulations, 310 CMR 30, the Massachusetts Site Assignment Regulations for Solid Waste Facilities, 310 CMR 16 or the Massachusetts Solid Waste Management Facility Regulations, 310 CMR 19.

7.2. Storage

Street sweepings shall be temporarily stored prior to use, only when the following conditions are satisfied:

- Storage must be at the site where the sweepings are generated (in the public way) or at a location, such as a DPW yard, that is under the control of the governmental entity which is doing the sweeping or has contracted for the sweeping;
- The sweepings shall be protected from wind and rain to the extent necessary to prevent dust, erosion and off-site migration;
- The sweepings shall not be stored within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;
- The sweepings shall not be stored within 500 feet of a ground or surface drinking water supply;
- Storage shall incorporate good management practice and result in no public nuisance;
- Storage must be temporary. Street sweepings shall be used within one year of collection unless the MassDEP Regional Office in the region where the sweepings are stored grants a written extension. An extension may be granted when it is demonstrated that all storage conditions will continue to be satisfied and the stored sweepings will be put to a specific identified use prior to the expiration of the extension period.

7.3. Preparation Prior to Use

Solid waste, such as paper, auto parts and other trash, shall be removed from the sweepings prior to use. Leaves, twigs and other organic matter should also be removed when good engineering practice indicates this is necessary to produce a material that is suitable for the intended use.

8. Background

MassDEP has consistently classified street sweepings as solid waste subject to Massachusetts General Law Chapter 111, Section 150A and the Massachusetts Solid Waste Regulations (*Site Assignment Regulations for Solid Waste Facilities*, 310 CMR 16.00 and *Solid Waste Management Facility Regulations*, 310 CMR 19.000). There has been confusion among some in the regulated community about this classification.

Prior to the development of this policy, the options for handling street sweepings were limited to:

1. Disposal at a permitted solid waste landfill,
2. Use as cover at a permitted solid waste landfill or
3. Use in accordance with a Beneficial Use Determination (BUD). BUD decisions are made on a case-by-case basis and require the submittal of a formal application to MassDEP containing data showing the chemical composition of the street sweepings.

The simplest of these options was either to use the sweepings for landfill cover or to dispose of the sweepings at the local landfill. As many local landfills close, these options become less available to many communities. However, transporting sweepings to a distant landfill involves increased transportation costs and possibly payment of tipping fees.

To clarify the requirements and to provide simpler and less expensive alternatives for handling street sweepings, the Department undertook the development of this policy. Because useful studies of the chemical

composition of street sweepings could not be found in the literature, MassDEP solicited the help of municipalities and state agencies in conducting a study of the composition of street sweepings from various types of areas. The results showed that sweepings from all areas, except Urban Center Roads, were similar with the main constituents of concern being total petroleum hydrocarbons (TPH) and polynuclear aromatic hydrocarbons (PAHs). Very limited data from Urban Center Roads indicated that sweepings from these areas may be more contaminated than sweepings from other areas.

The test results indicate that sweepings may contain levels of contamination that are unsuitable for unrestricted use. However, except for sweepings from Urban Center Roads, the levels of contamination were consistent and low enough to allow the use of sweepings in restricted applications without requiring testing or pre-approval as long as certain conditions were met. Sweepings from urban areas were excluded from some pre-approved uses. This situation could change when more data are available from Urban Center Roads.

This policy makes it possible for municipalities, state agencies and other governmental entities to handle street sweepings in an environmentally sound manner with a minimum of paperwork and expense.

9. Additional Information

For additional copies of this policy, permit application forms or other MassDEP documents, call any MassDEP Regional Office and ask for the Service Center or visit <http://www.mass.gov/dep>. The permit application numbers for Beneficial Use Determinations are BWP SW 39, 40, 41 and 42.

Copies of all Massachusetts regulations, including the solid waste regulations, may be purchased from the State House Bookstore, 617-727-2834. The solid waste regulations are:

310 CMR 16.000, *Site Assignment Regulations for Solid Waste Facilities*
310 CMR 19.000, *Solid Waste Management Facility Regulations*

Questions about the Provisions of the Policy – If you have technical questions about the policy, please call any MassDEP office and ask to speak with a staff member about the provisions of the policy.

Attachment B
Illicit Discharge Compliance Statement

SAMPLE – SIGNED STATEMENT TO FOLLOW PENDING SALE OF PROPERTY

Storm Water Discharges have been evaluated on behalf of the Applicant by Foresight Land Services to check for the presence of Non-Storm Water Sources. This evaluation was performed as visual field observations at the site-specific areas. At the time of the inspection on _____, there were not visible signs of non-storm water discharge.

No Non-Storm water discharges have been identified and none are proposed in the construction plans.

As Applicant, I hereby agree that, if any Non-Storm Water Discharges are identified during the normal course of construction or subsequent operations on the property, they shall be recorded, measures implemented to abate the illicit discharge, and the Stockbridge Conservation Commission shall be notified.

Evaluation Date by Foresight Land Services, Inc.: _____

Signed (print and sign)
Applicant:

Date

Attachment C
NOT APPLICABLE

Table LUHPPL: Best Management Practices for Land Uses with Higher Potential Pollutant Loads

- Discharges from certain land uses with higher potential pollutant loads may be subject to additional requirements, including the need to obtain an individual or general discharge permit pursuant to the MA Clean Waters Act or Federal Clean Water Act.
- All proponents must implement source control and pollution prevention.
- All BMPs shall be designed in accordance with specifications and procedures in the Massachusetts Stormwater Handbook Volumes 2 and 3.
- The required water quality volume equals 1 inch times the total impervious area of the post-development site.
- Many land uses have the potential to generate higher potential pollutant loads of oil and grease. These land uses include, without limitation, industrial machinery and equipment and railroad equipment maintenance, log storage and sorting yards, aircraft maintenance areas, railroad yards, fueling stations, vehicle maintenance and repair, construction businesses, paving, heavy equipment storage and/or maintenance, the storage of petroleum products, high-intensity-use parking lots, and fleet storage areas. To treat the runoff from such land uses, the following BMPs must be used to pretreat the runoff prior to discharge to an infiltration structure: an oil grit separator, a sand filter, organic filter, filtering bioretention area or equivalent.
- 44% TSS removal is required prior to discharge to an infiltration device.
- Until they complete the STEP or TARP verification process outlined in Volume 2, proprietary BMPs may not be used as a terminal treatment device for runoff from land uses with higher potential pollutant loads. For the purpose of this requirement, subsurface structures, even those that have a storage chamber that has been manufactured are not proprietary BMPs, since the pretreatment occurs in the soil below the structure, not in the structure itself.

Pretreatment

	Deep Sump Catch Basin
	Oil Grit Separator
	Proprietary Separators - See Volume 2
	Sediment Forebays
	Vegetated Filter Strip (<i>must be lined</i>)

Treatment

Sand Filters, Organic Filters, Proprietary Media Filters, Wet Basins, Filtering Bioretention Areas, and Extended Dry Detention Basins must be lined and sealed unless 44% of the TSS has been removed prior to discharge to the BMP.	Filtering Bioretention Areas including rain gardens
	Constructed Stormwater Wetlands
	Dry Water Quality Swales
	Extended Dry Detention Basins
	Gravel Wetlands
	Proprietary Media Filter. (Does not include catch basin inserts) (Proprietary Media Filters may be used for terminal treatment for runoff from land uses with higher potential pollutant loads, only if verified for such use by the TARP or STEP process. See Volume 2.)
	Sand /Organic Filters
	Wet Basins

Infiltration

	Exfiltrating Bioretention Areas including rain gardens
	Infiltration Basins
	Infiltration Trenches
	Leaching Catch Basins
	Subsurface Structures

Attachment D**Stormwater Management Fact Sheet – Employee Training**

United States
Environmental Protection
Agency

Office of Water
Washington, D.C.

EPA 832-F-99-010
September 1999



Storm Water Management Fact Sheet Employee Training

DESCRIPTION

In-house employee training programs are established to teach employees about storm water management, potential sources of contaminants, and Best Management Practices (BMPs). Employee training programs should instill all personnel with a thorough understanding of their Storm Water Pollution Prevention Plan (SWPPP), including BMPs, processes and materials they are working with, safety hazards, practices for preventing discharges, and procedures for responding quickly and properly to toxic and hazardous material incidents.

APPLICABILITY

Typically, most industrial facilities have employee training programs. Usually these address such areas as health and safety training and fire protection. Training on storm water management and BMPs can be incorporated into these programs.

Employees can be taught through 1) posters, employee meetings, courses, and bulletin boards about storm water management, potential contaminant sources, and prevention of contamination in surface water runoff, and 2) field training programs that show areas of potential storm water contamination and associated pollutants, followed by a discussion of site-specific BMPs by trained personnel.

ADVANTAGES AND DISADVANTAGES

Advantages of an employee training program are that the program can be a low-cost and easily implementable storm water management BMP.

The program can be standardized and repeated as necessary, both to train new employees and to keep its objectives fresh in the minds of more senior employees. A training program is also flexible and can be adapted as a facility's storm water management needs change over time.

Obstacles to an employee training program include:

- Lack of commitment from senior management.
- Lack of employee motivation.
- Lack of incentive to become involved in BMP implementation.

KEY PROGRAM COMPONENTS

Specific design criteria for implementing an employee training program include:

- Ensuring strong commitment and periodic input from senior management.
- Communicating frequently to ensure adequate understanding of SWPPP goals and objectives.
- Utilizing experience from past spills to prevent future spills.
- Making employees aware of BMP monitoring and spill reporting procedures.
- Developing operating manuals and standard procedures.

- Implementing spill drills.

IMPLEMENTATION

An employee training program should be an on-going, yearly process. Meetings about SWPPPs should be held at least annually, possibly in conjunction with other training programs. Figure 1 illustrates a sample employee training worksheet. Worksheets such as these can be used to plan and track employee training programs. Program performance depends on employees' participation and on senior management's commitment to reducing point and nonpoint sources of pollution; therefore, performance will vary among facilities. To be effective these programs need senior management's support

COSTS

Costs for implementing an employee training program are highly variable. Most storm water training program costs will be directly related to labor and associated overhead costs. Trainers can reduce costs by using free educational materials available on the subject of storm water quality.

Figure 2 can be used to estimate the annual costs for an in-house training program. Table 1 provides an example of how this worksheet can be used to estimate annual costs.

REFERENCES

1. U.S. EPA, 1979. *NPDES BMP Guidance Document*.
2. U.S. EPA, Pre-print, 1992. *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices*. EPA 832-R-92-006.

ADDITIONAL INFORMATION

Center for Watershed Protection
Tom Schueler
8391 Main Street
Ellicott City, MD 21043

City of Coral Gables, Florida

Tim Clark
285 Aragon Avenue
Coral Gables, FL 33134

Hillsborough County, Florida
Jose Rodriguez
Hillsborough County Public Works
601 East Kennedy Boulevard
Tampa, FL 33601

King County, Washington
Dave Hancock
Department of Natural Resources, Water and Land
Resources Division, Drainage Services Section
700 5th Avenue, Suite 2200
Seattle, WA 98104

Mitchell Training, Inc.
Barbara Mitchell
5414 SW 177th Street
Archer, FL 32618

Southeastern Wisconsin Regional Planning
Commission
Bob Biebel
916 N. East Avenue, P.O. Box 1607
Waukesha, WI 53187

The mention of trade names or commercial products does not constitute endorsement or recommendation for the use by the U.S. Environmental Protection Agency.

For more information contact:

Municipal Technology Branch
U.S. EPA
Mail Code 4204
401 M St., S.W.
Washington, D.C., 20460



EMPLOYEE TRAINING		Worksheet Completed by: _____ Title: _____ Date: _____	
Instructions: Describe the employee training program for your facility below. The program should, at a minimum, address spill prevention and response, good housekeeping, and material management practices. Provide a schedule for the training program and list the employees who attend the training sessions.			
Training Topics	Brief Description of Training Program/Materials (e.g., film, newsletter, course)	Schedule for Training (list dates)	Participants
Spill Prevention and Response			
Good Housekeeping			
Material Management Practices			
Other Topics			

Source: U. S. EPA, 1992.

FIGURE 1 SAMPLE WORKSHEET FOR TRACKING EMPLOYEE TRAINING

Title	Number	Average Hourly Rate (\$)	Overhead* Multiplier	Estimated Yearly Hours on SW Training	Estimated Annual Cost (\$)
Stormwater Engineer	1	x 15	x 2.0	x 20	= 600
Plant Management	5	x 20	x 2.0	x 10	= 2,000
Plant Employees	100	x 10	x 2.0	x 5	= <u>10,000</u>
Total Estimated Annual Cost \$12,600					

*Note: Defined as a multiplier (typically ranging between 1 and 3) that takes into account those costs associated with costs other than salary of employing a person, expenses, etc

TABLE 1 EXAMPLE OF ANNUAL EMPLOYEE TRAINING COSTS

Title	Number	Average Hourly Rate (\$)	Overhead Multiplier	Estimated Yearly Hours on SW Training	Estimated Annual Cost (\$)
_____	_____	x _____	x _____	x _____	= _____ (A)
_____	_____	x _____	x _____	x _____	= _____ (B)
_____	_____	x _____	x _____	x _____	= _____ (C)
_____	_____	x _____	x _____	x _____	= _____ (D)
Total Estimated Annual Cost (Sum of A+B+C+D)					

Source: U.S. EPA, 1992.

FIGURE 2 SAMPLE ANNUAL TRAINING COST WORKSHEET

Attachment E
List of Emergency Contacts

Owner/Operator(s):

Company or Organization Name: _____

Name: _____

Address: _____

City, State, Zip Code: _____

Telephone Number: _____

Fax Number: _____

E-mail: _____

Emergency 24-Hour Contact:

Company or Organization Name: _____

Name: _____

Address: _____

City, State, Zip Code: _____

Telephone Number: _____

Fax Number: _____

E-mail: _____

Becket Police Department:Telephone Number: (413) 623-6010 – For emergencies dial 911**This Operation and Maintenance Plan was Prepared by:**Company or Organization Name: Foresight Land Services, Inc.Name: Steven A. Mack, P.E.Address: 1496 West Housatonic StreetCity, State, Zip Code: Pittsfield, MA 01201Telephone Number: (413) 499-1560Fax Number: (413) 499-3307E-mail: smack@foresightland.com

Attachment F
Visual Inspection Worksheet

Outfall(Point) # _____ Photograph # _____ Date: _____

Location: _____

Weather: air temp: _____°F rain: Y N sunny cloudy

Outfall flow rate estimate: _____gal/min

Known industrial or commercial uses in drainage area? Y N

Describe: _____

PHYSICAL OBSERVATIONS

Odor: none sewage sulfide oil gas rancid-sour other: _____

Color: none yellow brown green gray other: _____

Turbidity: none cloudy opaque

Floatables: none petroleum sheen sewage other: _____ (collect sample)

Deposits/stains: none sediment oily describe: _____ (collect sample)

Vegetation conditions: normal excessive growth inhibited growth

extent: _____

Damage to outfall structures:

identify structure: _____

damage: none / concrete cracking / concrete spalling / peeling paint / corrosion

other damage: _____

extent: _____

(USEPA)



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

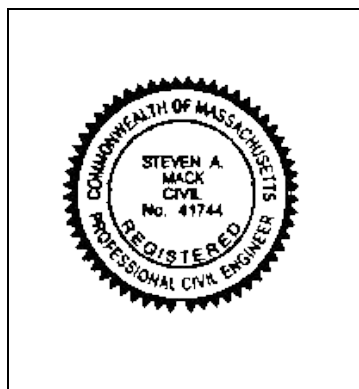
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



1/28/2022

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☒ New development
- ☐ Redevelopment
- ☐ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☒ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☒ Use of “country drainage” versus curb and gutter conveyance and pipe
- ☒ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☒ Water Quality Swale
- ☒ Grass Channel
- ☐ Green Roof
- ☒ Other (describe): Rainwater collection and reuse/recycling

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☐ Soil Analysis provided.
- ☒ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☒ Static
 - ☐ Simple Dynamic
 - ☐ Dynamic Field¹
- ☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- ☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☐ is near or to other critical areas
 - ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- ☒ The BMP is sized (and calculations provided) based on:
 - ☒ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☐ Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
 - ☐ Redevelopment Project
 - ☐ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☐ Description and delineation of public safety features;
 - ☐ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☐ An Illicit Discharge Compliance Statement is attached;
- ☒ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.