Stockman Associates LLC

August 18, 2022

Alex Herchenreder
Town of Deerfield
Land Use and Building Administrative Assistant
8 Conway Street
South Deerfield, MA 01373

Re: Notice of Intent (NOI)
All States Material Group
901 River Road
Deerfield, MA 01373
Map 21 Lot 1 and Map 7 Lot 14
Wetland Consultant Peer Review

Dear Mr. Herchenreder and Commissioners:

Per request of the Deerfield Conservation Commission, Stockman Associates LLC has performed a wetland consultant peer review of a Notice of Intent (NOI) submitted by Kleinfelder on behalf of their client, All States Materials Group, for the improvement of an existing gravel haul road including widening the road, replacing an existing stream crossing, and constructing a pad site to be utilized for a parking area. The project is located at 901 River Road in Deerfield, MA (Map 21 Lot 1 and Map 7 Lot 14). As requested by the Deerfield Conservation Commission, the third-party review excludes the review of the May 4, 2022 Stormwater Report prepared by Kleinfelder. It is our understanding that the Deerfield Conservation Commission is seeking a separate peer review by a licensed professional engineer to evaluate the May 4, 2022 Stormwater Report and other engineering components.

Based on the submitted site plan and the field review, portions of the reviewed area contain protected Bank, Land Under Water Bodies and Waterways, Bordering Vegetated Wetland (BVW), Riverfront Area and jurisdictional Buffer Zone.

Materials Reviewed

- NOI WPA Form 3 and other supporting site plans and documents within the May 12, 2022 submittal prepared by Kleinfelder.

- NOI Plan Set "*ASMG Haul Road Replacement 901 Rover Road Deerfield, MA 01342*" prepared by Kleinfelder dated 04/27/2022 (Sheets 1 through 21)

Site Visit

1) On August 9, 2022 Ms. Emily Stockman (Stockman Associates LLC) conducted a site visit to review the delineated resource areas and project area presented on the NOI plan set. Mr. Daniel Hartman (AMSG) and Ms. Emma Mrowka (Kleinfelder) were also present during the site visit.

Review Comments

Resource Area Boundary Delineation Flagging Review

1) At the time of the site visit the majority of the delineation flagging was presence and labels were legible. Flags no longer in place (predominately, but not limited to, Stream 7A) were observed on the ground and could not be confirmed. Intact legible flagging and GPS provided by Kleinfelder was utilized to review the delineated boundaries in the field.

   The majority of the flagging locations and labels are omitted from the submitted site plans. As such, a full assessment of the flagging relative to the submitted site plan could not be performed. Revised site plans should be submitted depicting all delineation flag locations and labels.

   The follow comments pertain to persisting, legible flagging observed in the field.

   - Stockman Associates concurs with the MAHWL flagging associated with Stream S1 demarcated by flags S1-11 to S1-22 and flags S1-111 to S1-122.

   - Stockman Associates concurs with the Bank flagging associated with intermittent Stream S6 demarcated by flags S6-1 to S6-10 and S6-101 to S6-110.

   - Stockman Associates concurs with the Bank flagging associated with Stream S7 demarcated by flags S7-1 to S7-6 and S7-101 to S7-106. NOTE: The boundary of Bank upgradient of flags S7-1 and S7-101 was not delineated and was not reviewed. No work is proposed within this location and Bordering Vegetated Wetland W1 is located closer to the proposed work area.

   - Bank associated with Stream 7A could not be completely reviewed in the field. Only flag S7A-2 was intact, and the flag locations and labels are not provided on the NOI plan set.

   - Stockman Associates concurs with the BVW flagging associated with W2 demarcated by W02-1 through W02-9.

   - While Stockman Associates concurs with the field review of the BVW boundary associated with W1, the NOI site plans do not depict flag locations and labels.

   - The boundary indicating Bank of Stream S5, includes portions of a narrow associated Bordering Vegetated Wetland BVW fringe dominated by *Onoclea sensibilis*, *Amphicarpaea bracteate*, and *Osmunda claytoniana*. The boundary should be revisited to accurately depict the associated BVW, which subsequently qualifies Stream S5 as a protected intermittent stream (upgradient BVW as required under 310 CMR 10.04)

2) The 100-FT Buffer Zones depicted on the NOI plan site are not complete and are not presented on all applicable sheets.

   a. 100-FT Buffer Zones associated with Bank have not been depicted.

3) A hydrophytic plant community was observed within existing road swales north and south of the catch basin located proximal to proposed temporary sediment trap #5 and the proposed pad. Discussion during the site visit indicated that this area may be part of a permitted stormwater system and potentially not subject to regulation under 310 CMR 10.00 as a protected resource area. It is recommended that the applicant submit supporting documentation to demonstrate that the hydrophytic plant community is not considered a resource area per 310 CMR 10.02(2)(c), which states,

   "*Notwithstanding the provisions of 310 CMR 10.02(1) and (2)(a) and (b), stormwater management systems designed, constructed, installed, operated, maintained, and/or improved as defined in 310 CMR 10.04 in accordance with the Stormwater Management Standards as provided in the Stormwater Management Policy (1996) or 310 CMR 10.05(6)(k) through (q) do not by themselves constitute Areas Subject to Protection under M.G.L. c. 131, § 40 or Buffer Zone provided that:*

   1. *the system was designed, constructed, installed, and/or improved as defined in 310 CMR 10.04 on or after November 18, 1996; and*
   2. *if the system was constructed in an Area Subject to Protection under M.G.L. c. 131, § 40 or Buffer Zone, the system was designed, constructed, and installed in accordance with all applicable provisions in 310 CMR 10.00.*"

   If supporting documentation cannot be provided, the hydrophytic plant community should be further assessed and delineated as a Bordering Vegetated Wetland if the criteria under 310 CMR 10.55(2) is met.

4) A hydrophytic plant community (*Betula allegheniensis*, *Symplocarpus foetidus*, *Tsuga canadensis*, *Onoclea sensibilis*, *Athyrium angustum*, *Impatiens capensis*, *Carex spp*., *Ulmus americana*, *Lindera benzoin*) and indicators of wetland hydrology were observed to the west of perennial Stream S1. The area is located at the toe of a slope proximal to (and extends into) the location of the proposed temporary sediment trap #3, permanent stormwater pocket wetland, and access road. Based on the observed hydrophytic plant community and indicators of wetland hydrology the area meets the criteria for a protected BVW and should be revisited and delineated accordingly.

5) A hydrophytic plant community (*Lindera benzoin*, *Symplocarpus foetidus*) and indicators of wetland hydrology were observed to the east of perennial Stream S1. The area is located at the toe of a slope and along perennial stream S1 proximal to and within the area of the proposed temporary sediment trap #2. Based on the observed hydrophytic plant community and indicators of wetland hydrology the area meets the criteria for a protected BVW and should be revisited and delineated accordingly.

6) The 200-FT Riverfront Area boundary depicted on sheet C-101 should be re-visited. The offset boundary lines do not appear accurate.

7) The Riverfront Area boundary is not depicted on sheet C-106.

<u>Performance Standards Review</u>

<u>Inland Bank & Land Under Waterways (LUW)</u>

The submitted WPA Form 3 states that 745-LF of Bank will be altered will no proposed replacement.

The submitted WPA Form 3 states that 4,318-SF of LUW will be altered will no proposed replacement.

Intermittent Stream S6

1) The application proposes a loss of Bank and LUW associated with intermittent Stream S6. Stockman Associates LLC suggests that Exhibit A be revisited and revised to specifically quantify the loss of Bank and LUW attributed to Stream S6. There is a loss of Bank associated with the haul road widening (STA 13+00, STA 14+00) and a secondary downstream loss (STA12+00 confluence with perennial stream).

2) The application proposes a "vegetated conveyance swale" to reroute the lower reach of Stream S6. This terminology and design do not comply with the requirements of 310 CMR 10.54(4) and 10.56(4).

    a. 310 CMR 10.05(6)(k) prohibits the construction of stormwater conveyances within Bank and Land under Waterways. The proposed "vegetated conveyance swale" presents as a stormwater conveyance BMP rather than a replication/replacement stream. The applicant is encouraged to review the MassDEP guidance (attached) regarding data collection and design for restored/replacement Bank and LUW.

    b. Filter fabric is not recommended for use in stream replacement due to detrimental impacts to aquatic life. Similarly, natural substrate (not riprap) is appropriate for stream replacement. An in-kind stream replacement design for Stream S6 should be proposed in compliance with 310 CMR 10.54(4) and 10.56(4)

3) The applicant should provide details related to how the loss (filling) of Bank and LUW associated with the haul road widening(STA 13+00, STA 14+00) will be mitigated. Will Bank be restored further to the south? Will this include the widening of the stream channel to the south to maintain the water-carrying capacity? The NOI narrative states that proposed "*grading of the north bank and LUWW of Stream S6*" will occur. Details regarding the grading of the Stream S6 should be included in the NOI site plan set.

4) The depicted LOD and silt fence cross intermittent Stream S6 from approximately STA 14+50 to 13+50. Is this indicating both temporary and permanent impacts to Stream S6 within this reach? Silt fence should not be installed within an intermittent stream channel.

Perennial Stream S1

5) The application proposes impacts to Bank and LUW associated with perennial Stream S1. Stockman Associates LLC suggests that Exhibit A be revisited and revised to specifically quantify the loss of Bank and LUW attributed to Stream S1.

6) The application proposed a "vegetated conveyance swale" to reroute a portion of perennial Stream S1. This terminology and design do not comply with the requirements of 310 CMR 10.54(4) and 10.56(4).

    a. 310 CMR 10.05(6)(k) prohibits the construction of stormwater conveyances within Bank and Land under Waterways. The proposed "vegetated conveyance swale" presence as a stormwater conveyance BMP rather than a replication/replacement stream. The applicant is encouraged to review the MassDEP guidance (attached) regarding data collection and design for

restored/replacement Bank. As stated in the NOI narrative, Stream S1 is classified under the Cowardin system as Riverine Upper Perennial Unconsolidated Bottom Cobble-Gravel and should be replicated as such.

b. Filter fabric is not recommended for use in stream construction due to detrimental impacts to aquatic life. Similarly, natural substrate (not riprap) is appropriate for stream construction.

c. The applicant should provide additional information regarding the purpose of the proposed perennial stream "vegetated conveyance swale" and impacts to the existing westerly perennial stream reach that will be partially bypassed. If the intent is to provide better stream flow alignment with the proposed new culvert, a stream relocation/restoration is an appropriated proposal under 310 CMR 10.54(4) and 10.56(4).

7) Stockman Associates suggests that the downstream impacts to Bank associated with the replacement culvert be revisited. It appears from the site plan that the downstream length of the culvert may be shortened to reduce the loss of existing, daylighted stream channel.

8) The energy dissipator proposed at the replacement culvert outlet presents as a stormwater BMP, rather than a stream restoration/replacement design. Filter fabric is not recommended for use in stream construction due to detrimental impacts to aquatic life. Similarly, natural substrate (not riprap) is appropriate for stream construction. Stockman Associates suggests that the design be revisited to consider natural substrate (boulders, large flat stone) appropriately sized to address dissipation and mimic natural stream characteristics.

9) The application proposes an impact to the Bank and LUW of perennial Stream S1 associated with the proposed construction of temporary sediment basin #3 and proposed "pocket wetland". Based on the observed hydrophytic plant community and indicators of wetland hydrology west of perennial Stream S1 a redesign of the "pocket wetland" and associated impacts is anticipated. Therefore, final comments regarding proposed work within this area are reserved at this time.

10) The depicted LOD and silt fence are partially located within perennial Stream S1. Silt fence should not be installed within a perennial stream.

11) The NOI application asserts that the Massachusetts River & Stream Crossing Standards have been met to the maximum extent feasible. Supporting details have not been provided.
    a. The bankfull width of Stream S1 and its determination should be submitted.
    b. An assessment of the required and proposed openness ratio and 1.2x bankfull width span should be submitted.
    c. A cross-section of the proposed culvert should be provided with the NOI plan set.

12) The NOI narrative asserts that the installation of a stream crossing is exempt from the requirements to perform a wildlife habitat evaluation.

    a. This exemption applies to stream crossings that fully comply with the Massachusetts River & Stream Crossing Standards (***emphasis added***),

"*Work on a stream crossing shall be presumed to meet the performance standard set forth in 310 CMR 10.54(4)(a)* ***provided the work is performed in compliance with the Massachusetts Stream Crossing Standards by consisting of a span or embedded culvert in which, at a minimum, the bottom of a span structure or the upper surface of an embedded culvert is above the elevation of the top of the bank, and the structure spans the channel width by a minimum of 1.2 times the bankfull width***."

As stated above supporting details regarding bankfull width and openness ratio have not been provided. Rather, the stream crossing is proposed as meeting the Massachusetts River & Stream Crossing Standards to the maximum extent feasible (rather than full compliance).

b. Proposed impacts to Stream S6 associated with the widening of the haul road, do not qualify for the stream crossing exemption under 310 CMR 10.54(4)(a)6 and 10.56(4)(a)6. With that said, based on observations made during the sit visit, the upper reach of Stream S6 proposed to be altered provides little to no wildlife habitat value. The reach is highly manipulated (shoulder of existing haul road, riprap, stormwater inputs).

Bordering Vegetated Wetland

13) Based on observations made in the field, the proposed temporary sediment trap #3, pocket wetland, access road and temporary sediment trap #2 will impact protected BVW. These proposed structures should be re-evaluated after the assessment and delineation of BVW. Per 310 CMR 10.55 (4), BVW impacts must be avoided, minimized, and mitigated.

14) As previously stated on page 2, a hydrophytic plant community was observed within existing road swales north and south of the catch basin located proximal to proposed temporary sediment trap #5 and the proposed pad. If supporting documentation establishing the area as a legally permitted stormwater system cannot be provided, the hydrophytic plant community should be further assessed and delineated as a Bordering Vegetated Wetland if the criteria under 310 CMR 10.55(2) is met.

Riverfront Area

15) A complete assessment of the Performance Standards under 310 CMR 10.58(4) (a) through (d) has not been provided.

16) The proposed project does not meet the minimum 100-foot-wide area of undisturbed vegetation requirement under 310 CMR 10.58(4)(d)1.a. and the application does not include the submittal of evidence to justify work within the inner 100-FT.

17) In the event that full compliance with the performance standards under 310 CMR 10.58(4) cannot be met, the project *may* be eligible for Limited Project status under 310 CMR 10.53(3)(e)

18) The proposed project does not appear to qualify for review under Riverfront Area Redevelopment 310 CMR 10.58(5), therefore, the Performance Standards under 310 CMR 10.58(4) must be met, or limited project status applied. Based on a review of readily available aerial imagery, the haul road did not exist in August of 1996. Construction of the haul road is first visible circa 2005-2009. The Commission should review the property

files to determine whether the haul road was legally permitted under 310 CMR 10.00. If so, were there any ongoing special conditions associate with the Order of Conditions?

Additional Comments/Recommendations

1) The NOI narrative states that the proposed project timeline extends from October 2022 to May 2023. This period is outside of the typical low-flow conditions when stream crossing replacements are characteristically constructed to reduce potential adverse impacts. Additional details should be provided to demonstrate how the replacement will be achieved in a controlled, stable matter during anticipated high flows. Details regarding the proposed sandbag dike should be provided to demonstrate that high-flow volumes will be appropriately retained and the work area isolated. NOTE: While Sheet C-130 indicates an upstream, temporary sandbag dike, the NOI narrative (page 3) states that the upstream and downstream sides of the stream will be blocked by sandbag check dams. The applicant should clarify the proposed methods for isolating the work area, check dams are not clearly depicted on Sheet C-130.

2) Calculations should be provided demonstrating that the temporary bypass hose and pump have been sized appropriately for anticipated high-flow.

3) The NOI narrative states that "*compost filter sock and/or haybales would be used at the end of the discharge hose to act as a sediment trap*…" this should be shown on sheet C-130. The sheet currently shows an approximate discharge directly into the downstream reach. Compost filter sock and/or strawbales should be located within an upland, not directly within the stream.

4) Portions of the proposed project timeline fall within the winter months, outside of the growing season. Proposed site stabilization measured requiring the germination of seed and establishment of a stable vegetative cover can not be achieved outside of the growing season. The applicant should address how winter stabilization will be successfully achieved. If used, erosion control blankets comprised of fiber-based biodegradable materials should be installed (rather than blankets containing plastic netting which presents a significant hazard to wildlife).

5) There is a LOD line shown on sheets C-105 and C-110 extending south along an existing drive. A site plan detailing the LOD and proximal upstream reach of Stream S1 has not been submitted. Sheets C-106 and C-112 omit the area to the south. This area was not reviewed in the field.

6) The NOI plan set has not been stamped and signed.

7) The submitted Checklist for Stormwater Report has not been stamped and signed.

8) The site plans do not indicate any test pits for onsite soils assessment pertaining to stormwater management and design. Mapped soil types by the NRCS must be confirmed in the field. Any observed deviations from the NRCS mapped soil type must be incorporated into the stormwater management design. Based on soil textures documented in the wetland determination and delineation forms, observed soils were not consistent with mapped soil types. Rather, finer textures soils (including clay loams and sandy clay loams) were documented as observed.

9) The Commission should consider that Stockman Associates, ASMG and Kleinfelder conduct a follow-up site visit once identified BVWs have been delineated and revised site plans have been provided.

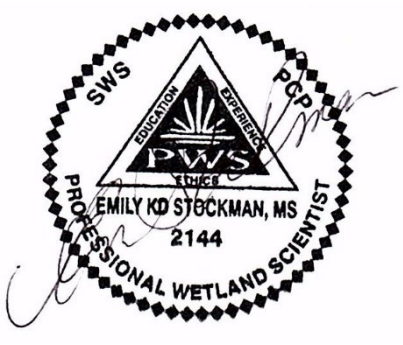
10) The Commission is encouraged to provide this Stockman Associates peer review letter to the licensed professional engineer providing the separate peer review to evaluate the May 4, 2022 Stormwater Report and other engineering components

I trust that the above comments will assist the Commission in their review of the previously referenced NOI application. Please do not hesitate to contact me with any questions.

Sincerely,

Emily Stockman

Emily Stockman, M.S., P.W.S.
Senior Scientist/Principal
Stockman Associates LLC



Western Regional Office, Bureau of Water Resources, Wetlands Program

Restoration Plan

for Superseding Orders of Conditions and/or

Water Quality Certification Applications

Data Required for Proposed Bank (Inland) and Land Under Water Bodies and Waterways/Land Under Water Restoration Areas

Per 310 CMR 10.54(4); 310 CMR 10.56(4); 310 CMR 10.60(3); 314 CMR 9.06(2) and *Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands* (MassDEP 2006)

The Applicant shall, at a minimum, provide the following information, which shall serve as the **Restoration Plan** in compliance with applicable regulation. If a particular piece or kind of information requested in this Form is more detailed or specific than that called for in *Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands*, the Applicant shall defer to this **Restoration Plan** and supply the requested information per this **Restoration Plan**.

Please check each ☐ below indicating that the data has been collected and provided. Blank spaces have been provided after each ► to fill in applicable information, or references to documents and plans where such information can be located. Please use a different color and/or font when filling in blank spaces after the ►.

Some data required below may not be applicable to a given site. If so, record "n/a" adjacent to the ► and further justify as necessary.

PLEASE NOTE: The below shall be filled out on behalf of the Applicant by the designated Ecologist/Field Scientist approved by the Department in proceedings before it.

PLEASE NOTE: For proposed alteration (as defined at 310 CMR 10.04 Alter) of jurisdictional Resource Areas (as defined at 310 CMR 10.04 Resource Area and as defined as "Waters of the United States within the Commonwealth" per 314 CMR 9.02, and therein by reference to "land Under Water") of substantial areal size and/or linear extent, and/or in disparate geographic settings or locations, the Ecologist/Field Scientist may elect to fill out a copy of this form for each distinct area, provided each such form is linked to an identifiable geography or location.

☐ If checked, this is one (1) of several forms used to demonstrate compliance with applicable regulation.
Geography or Location Descriptor ►

1 PARCEL AND PROJECT DATA

► Wetlands Protection Act File Number: Transmittal Number:

☐ Owner(s) of parcel(s) on which proposed Bank (Inland) (hereinafter "Bank") [as defined at 310 CMR 10.54(2)] and/or Land Underwater Bodies and Waterways (hereinafter "LUWW") [as defined at 310 CMR 10.56(2)] and Land Under Water (hereinafter "LUW") Restoration Area(s) [per 310 CMR 10.54(4); 310 CMR 10.56(4) and 310 CMR 10.60(3)] will be located:

►

☐ Municipality and locus, including facility name (if any) and street address ('the Site"):

►

☐ Assessor's map and parcel identifying codes:

►

☐ Land use and land cover of the **present** condition of the proposed Bank/LUWW/LUW Restoration Area site(s):

►

☐ Name and credentials of Ecologist/Field Scientist who designed the Bank/LUWW/LUW Restoration Area(s):

►

☐ Name and credentials of construction contractor(s) responsible for building Bank/LUWW/LUW Restoration Area(s), and designated foreperson:

►

☐ Name and credentials of Compliance Monitor appointed to monitor Bank/LUWW/LUW Restoration Area(s):

►

2 DATA FOR BANK/LUWW/LUW PROPOSED TO BE ALTERED

☐ The Bank/LUWW/LUW proposed to be altered is associated with the following Subcategory (each as defined at 310 CMR 10.04) of LUWW [as defined at 310 CMR 10.56(2)]:

- ☐ Jurisdictional Intermittent Stream
- ☐ River
- ☐ Pond
- ☐ Lake (including Great Ponds and Reservoirs)

► Name of Water Body or Waterway (if any):

☐ Natural Community Classification per *Classification of the Natural Communities of Massachusetts* (Draft) by Patricia C. Swain and Jennifer B. Kearsley, MA DFW NHESP, Westborough, MA. July 2000 (www.mass.gov/dfewle/dfw/nhesp/nhclass.htm) (record):

►

☐ Classification from *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al, US Fish and Wildlife Service, FWS/OBS-79/31, 1979):

►System:

- ☐ Riverine
- ☐ Lacustrine
- ☐ Palustrine

►Subsystem:

►Class:

►Subclass:

►Water Regime Modifier:

► Other Modifiers:

►Dominance Type (if any):

☐ If a "river" or "stream", report the "Rosgen Classification of Natural Rivers" Stream Type per *Applied River Morphology* (Dave Rosgen 1996, 2nd Edition):

►

☐ Government and scientific records used (list sources and conclusions):

►

☐ Previous permit findings used (list sources and conclusions):

►

Establishment of Transects for Collection of Cross-Section Data:

☐ Establishment of transects for collection of cross-section data is deemed necessary to describe Site, proposed alteration to the Site, and to monitor restoration success

OR

☐ Establishment of transects is not necessary

►Justify:

☐ The Ecologist/Field Scientist confirms through the checking of the below ☐ that transects shall be established as described:

- ☐ A sufficient number of transects shall be set perpendicular to the flow vector (for jurisdictional intermittent "streams" or "rivers") or to the Bank (Inland) (for "ponds" and "lakes")
- ►Rationale for selecting number of transects:

- ☐ The ends of each transect shall be located beyond at least the High Water Mark(s) (as defined at 314 CMR 9.02 High Water Mark) **OR**
  - ☐ Beyond bankfull discharge elevation (see Wolman and Miller 1960, and Dunne and Leopold 1978) if demonstrably different than the High Water Mark
- ☐ Each transect shall be georeferenced both vertically and horizontally, either by survey to a known benchmark; or by use of a total station theodolite having a Global Navigation Satellite System interface
- ☐ Each end of each transect shall be marked by a recoverable monument in the field through installation of an iron pipe or similar device (except for one end of a transect where it ends in water column for "ponds" and "lakes")
- ☐ The transects shall be used to create cross-sectional profiles minimally displaying:
  - ☐ The topographic and bathymetric relief of the substrate
  - ☐ The position of elevation contour(s) of the "High Water Mark"/"bankfull discharge elevation" (specify)
  - ☐ The maximum depth of the thalweg (as measured vertically from the "High Water Mark") (for jurisdictional "streams" and "rivers")
  - ☐ The maximum height of point bars (for jurisdictional "streams" and "rivers")
  - ☐ The position and extent of islands, bars, shoals, riffles, pools and other significant hydrogeomorphic features

Hydrogeomorphic Setting and Characteristics of Bank/LUWW/LUW Proposed to be Altered:

- ☐ Located on point bar, channel bar, or other aggrading feature
- ☐ Located on cut bank or other erosive feature
- ☐ Located on crossover between aggrading/erosive features
- ☐ Located on or proximate to deltaic formation
- ☐ Located along or proximate to falls, cataracts, rapids, plunge pool
- ☐ Located along stream characterized by riffle/step/pool
- ☐ Located proximate to meander scar, oxbow, below terrace, or other floodplain feature
- ☐ Located proximate to spring seep, or other headwater feature
- ☐ Located on or proximate to shoal <2 meters deep measured from High Water Mark
- ☐ Other: ►

Significant Biotic and Abiotic Characteristics of Bank/LUWW/LUW Proposed to be Altered:

- ☐ Located within 2 meters of High Water Mark **and** vegetated with vascular species
- ☐ Included beaver lodge/dam/canal/cache or muskrat lodge
- ☐ Included standing dead wood
- ☐ Included woody material or bedrock/rock fragments extended above Low Water Mark
- ☐ Other: ►

Substrate Characteristics of Bank/LUWW/LUW Proposed to be Altered

☐ Particle size distribution of Bank/LUWW/LUW to be altered collected, and attached as/in:

►

☐ Color photographs of the substrate(s) are included as/in:

►

Plant Community in Bank/LUWW/LUW Proposed to be Altered (if any)

☐ The Ecologist/Field Scientist has established a sufficient number of relevés (vegetation sampling plots) necessary to fully describe the plant community (structure, species richness, relative abundance, cover type, etc.) of the Bank/LUWW/LUW proposed to be altered. Data **shall** be collected using "Form 3: Quantitative Community Characterization" (June 2006) prepared by the Massachusetts Natural Heritage and Endangered Species Program (MANHESP) (available at www.mass.gov/dfwele/dfw/nhesp/natural_communities/field_forms.htm). Each Form 3 shall be completed per the methods detailed within "Natural Community Field Form Instructions, Modified for Massachusetts" (June 2006 MANHESP) available at the same web address. Plants shall be identified to the species level and scientific nomenclature should follow *The Vascular Plants of Massachusetts: A County Checklist-First Revision*, by Melissa Dow Cullina, Bryan Connolly, Bruce Sorrie and Paul Somers (Massachusetts Natural Heritage & Endangered Species Program, Massachusetts Division of Fish and Wildlife, 2011) or an equivalent acceptable to the Department. Color photographs or color reproductions of photographs for each relevé, both for plant community composition and structure shall be submitted as part of this information

☐ A complete and thorough inventory of all vascular species of plants within the area of Bank/LUWW/LUW proposed to be altered has been completed, using scientific nomenclature following per *The Vascular Plants of Massachusetts: A County Checklist-First Revision*, by Melissa Dow Cullina, Bryan Connolly, Bruce Sorrie and Paul Somers (Massachusetts Natural Heritage & Endangered Species Program, Massachusetts Division of Fish and Wildlife, 2011) or an equivalent acceptable to the Department, and is included as/in:

►

☐ Each species inventoried has been ranked through visual estimate as to abundance

☐ A "dominance type" [see *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al 1979)] has been assigned to each "strata/life form" [see Section 40 of Form 3]

Metrics of the Bank/LUWW/LUW Proposed to be Altered

☐ Linear extent, as expressed in feet, of the Bank proposed to be altered is:

►

☐ Areal extent, as expressed in square feet, of the Bank and/or LUWW/LUW (specify) proposed to be altered is:

►

☐ Methodology for calculating the areal extent of the Bank and/or LUWW/LUW proposed to be altered is:

►

3 DATA FOR PROPOSED BANK/LUWW/LUW RESTORATION AREA(S)

☐ For restoration of jurisdictional "streams" or "rivers" the Ecologist/Field Scientist has consulted and utilized, to the extent practicable, the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) *Stream Restoration Design Handbook, National Engineering Handbook Part 654* (Released September 20, 2007), and specifically, the techniques and methods described within:

a. Technical Supplement 14I, *Streambank Soil Engineering*, Part 654 *National Engineering Handbook*;

b. Technical Supplement 14J, *Use of Large Woody Material for Habitat and Bank Protection*, Part 654 *National Engineering Handbook*

Proposed Substrate Amendments for Bank/LUWW/LUW Restoration Area(s)

☐ Ecologist/Field Scientist has prepared a list of materials, quantification of materials, and source of materials and attached as:

►

Proposed Substrate Structure and Composition of Bank/LUWW/LUW Restoration Area(s)

☐ Rock fragments re-used/recovered from Site (specify):
- ☐ Boulders [>60.4 cm diameter]
- ☐ Stones [>25.4 cm but <60.4 cm diameter]
- ☐ Cobble [>7.6 cm but <24.4 cm diameter]
- ☐ Gravel [>2.0 mm but <7.6 cm diameter]
- ►Explain:

☐ Sediment re-used/recovered from Site (specify):
- ☐ Sand [>0.074 mm but <2.0 mm diameter]
- ☐ Mud [<0.074 mm]
- ☐ Organic
- ►Explain:

☐ Ecologist/Field Scientist has provided a written justification for proposed use of off-site materials, if any, and attached as:

►

☐ Rock fragments and/or sediment from off-site. Source: ►

☐ "Dead Woody Material" from Site

☐ "Dead Woody Material" from Off-site

☐ Artificial structures proposed and shown on site plan or otherwise described:

*per *Stream Restoration Design Handbook, National Engineering Handbook Part 654*

†per *Applied River Morphology* (Dave Rosgen 1996, 2nd Edition)

- ☐ Coir fascines*
- ☐ Brush mattresses*
- ☐ Brush revetments*
- ☐ Rootwad revetments*
- ☐ Fascines*
- ☐ Brush layer benches*
- ☐ Geotextile "vegetated reinforced soil slopes" (VRSS)* using, to the greatest extent feasible, biodegradable materials that are un-welded/unknotted
- ☐ Interstitial plantings* native to the County in which the work is proposed, per *The Vascular Plants of Massachusetts: A County Checklist-First Revision*, by Melissa Dow Cullina, Bryan Connolly, Bruce Sorrie and Paul Somers (Massachusetts Natural Heritage & Endangered Species Program, Massachusetts Division of Fish and Wildlife, 2011)
- ☐ Submerged shelters (whole trees/tree tops/boles/brush piles) †
- ☐ Boulder clusters/"In-stream Boulder Dissipaters" that are mobile & deformable †
- ☐ Boulder deflectors that are mobile & deformable †
- ☐ Random boulder placements that are mobile & deformable †
- ►Justification:
- ☐ Other. Specify and Justify: ►

Proposed Plant Community in Bank/LUWW/LUW Restoration Area(s) (if Appropriate)

☐ The Ecologist/Field Scientist has proposed a written projection of the structural and plant community composition for the Bank/LUWW/LUW Restoration Area(s) upon its maturation, and has provided a written justification, attached as:

►

☐ The Ecologist/Field Scientist has proposed a written floral composition of the Bank/LUWW/LUW Restoration Area(s) upon the completion of construction, which is attached as:

►

- ☐ Within this written floral composition, the Ecologist/Field Scientist has listed proposed species by:
  - ☐ Scientific Name (use Sorrie and Somers 1999, or equivalent)
  - ☐ Horticultural source of stock/condition
  - ☐ Total number of planting units per species
  - ☐ Type of planting (bare root, potted, transplanted, etc.)
  - ☐ Type of seeding (specification(s) for commercial mix, on-site source, etc.)
  - ☐ Planting schedule
  - ☐ Post-planting care by species, and responsible party(ies)

4 MINIMUM SITE PLAN FEATURES

- ☐ Site plan has been stamped by a Professional Land Surveyor or Registered Professional Engineer
- ☐ Scale is 1 inch = 30 feet or better, unless alternate scale is approved by the Department
- ☐ Contour interval of one (1) foot unless alternate interval is approved by the Department
- ☐ All data collection points, relevés, transects geographically portrayed
- ☐ Proposed boundary of Bank/LUWW/LUW Restoration Area(s) clearly demarcated
- ☐ Linear and areal extent, as expressed in feet and square feet, of Bank/LUWW/LUW Restoration Area(s) is printed
- ☐ Ordinary High Water Mark ("OHWM"), Boundary of Bank [as defined at 310 CMR 10.54(2)]; and the Mean Annual High Water Line [MAHWL, as defined at 310 CMR 10.58(2)(a)2.] (if Bank is associated with a "River") is shown, with surveyed points (flags)
- ☐ Location and type of substrate amendments are portrayed (mapped)
- ☐ Location of planted material is clearly referenced
- ☐ Location and extent of seeded areas is clearly referenced
- ☐ Microtopographic features spatially portrayed (mapped)
  - ☐ Depressions
  - ☐ Mounds
  - ☐ Rock fragments, bedrock left in place
  - ☐ Woody debris
  - ☐ Artificial structures
  - ☐ Other proposed features (perches, nesting boxes, platforms, etc.)
  - ☐ "Limit-of-work"/"project site" (as defined at 310 CMR 10.04) boundary clearly demarcated
- ☐ Position and type of erosion and sedimentation controls
- ☐ Long-term protective measures at the boundary of Bank/LUWW/LUW (fences, signs, easements)
- ☐ Cross-section plans with:
  - ☐ Depth to excavated surface
  - ☐ Confining layers, if any
  - ☐ Gradient statistics for proposed and/or existing contours within one hundred (100) feet of the proposed boundary of the Bank/LUWW/LUW Restoration Area(s)

☐ Location of chemically treated surfaces (e.g. roads) existing or proposed within one hundred (100) feet of the proposed boundary of Bank/LUWW/LUW Restoration Area(s) and mitigation, **OR**

☐ No chemically treated surfaces exist or are proposed within one hundred (100) feet of the proposed boundary of the Bank/LUWW/LUW Restoration Area(s)

5 DEWATERING PLAN

☐ A dewatering plan is necessary to conduct the restoration and is attached; **OR**

☐ A dewatering plan is not necessary to conduct the restoration

► Explain:

☐ Ecologist/Field Scientist has prepared a dewatering plan, which shall minimally include identification of techniques for bypass of water around the area(s) of restoration; and separately, identification of techniques for treatment of residual water ("seepage water") within the area(s) of restoration. All such plans shall completely segregate bypass water from residual water.

This dewatering plan shall include:

☐ Identification of any regulatory "time-of-year" ("TOY") restrictions governing the proposed work [from the US Army Corps of Engineers "General Permits-Commonwealth of Massachusetts" ("MGP"), any Massachusetts Natural Heritage and Endangered Species Program directive, and any presumptive directions offered by the Massachusetts Division of Fisheries and Wildlife]. The Department will require adherence to MGP TOY restrictions unless the Applicant demonstrates that compliance with them is not practicable;

☐ Identification of any "Cold-water Fishery" (as defined at 310 CMR 10.04) within the subject reach where work is proposed, by reference to the Massachusetts Division of Fisheries and Wildlife "Coldwater Fishery Resources Index" (See http://www.mass.gov/dfwele/dfw/fisheries/conservation/cfr/watershed_index.htm);

☐ Use of temporary flume pipes to bypass flowing water in small rivers and intermittent streams, when flowing, and upstream and downstream temporary dams to isolate the work area and protect it from backwatering. Flume pipes shall be equipped with anti-seep collars where they pass through temporary dams, and shall include fish screens on their upstream inverts. Flume pipes shall be sized to adequately minimally handle a two-year storm event;

☐ Use of cofferdams to isolate the area of alteration from flowing water in larger rivers, and in reservoirs, lakes, and ponds;

☐ Use of pumps and hose lines to dewater standing water held behind cofferdams, and to dewater residual water and leaked water in isolated work areas. The rating, type, and location of all pumps and the intake and discharge positions of all hoses shall be identified and located on the site plans;

☐ Use of appropriate energy dissipaters and erosion and sedimentation control best management practices at the discharge orifices of all bypass flume pipes and pump hoses;

☐ Treatment of pumped residual water prior to discharge back to resource areas. Techniques such as filter bags, frac tanks, and stilling basins shall be analyzed and specifically proposed. As part of this analysis, an adequate and field-based estimate of sediment grain sizes shall be conducted, and the chosen best management practice(s) shall be demonstrated to be capable of adequately filtering the target grain sizes;

☐ Salvage of sessile aquatic organisms (vertebrates, crayfish, freshwater mussels, etc.) stranded during dewatering;

☐ Structural and nonstructural best management practices to separate stormwater from the area of alteration during work and while the site is unstable;

☐ Assurance that the substrate of the area of alteration is stable prior to the reestablishment of flow within it;

☐ The Ecologist/Field Scientist is aware that dewatering plans should be designed according to *Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road Crossings* (USDA Forest Service-National Technology and development Program 0877 1801-SDTDC, May 2008) (available at http://www.nae.usace.army.mil/reg/Stream/USFS_StreamSimulationManual.pdf) to the extent practicable, and acknowledges that this reference was consulted while developing plans. This document is very useful, even for restoration not located in flowing streams.

6 BANK/LUWW/LUW RESTORATION AREA(S) MONITORING

☐ The Ecologist/Field Scientist is aware that a Superseding Order of Conditions and/or Water Quality Certification requiring construction of a Bank/LUWW/LUW Restoration Area(s) per 310 CMR 10.54(4); 310 CMR 10.56(4); and/or 310 CMR 10.60(3)(e); and/or 314 CMR 9.06(2) will require a comprehensive monitoring and reporting plan with the following minimum data and submittals:

☐ Adequate, field based description of Bank/LUWW/LUW stability

☐ Adequate, field-based description of restored hydrogeomorphology

☐ Adequate, field based description of restored fisheries habitat

☐ Adequate, field-based description of restored wildlife habitat

☐ For Restoration Area(s) that include vegetation restoration: At least one (1) relevé (vegetation sampling plot) necessary to fully describe the plant community (structure, species richness, relative abundance, cover type, etc.) of the Restoration Area(s) for each proposed cover type (distinct structural and community composition), and no fewer than two (2) relevés in total for each 5,000 square foot increment of restoration. Data **shall** be collected using "Form 3: Quantitative Community Characterization" (June 2006) prepared by the Massachusetts Natural Heritage and Endangered Species Program (MANHESP) (available at www.mass.gov/dfwele/dfw/nhesp/natural_communities/field_forms.htm). Each Form 3 shall be completed per the methods detailed within "Natural Community Field Form Instructions, Modified for Massachusetts" (June 2006 MANHESP) available at the same web address. Plants shall be identified to the species level and scientific nomenclature should follow per *The Vascular Plants of Massachusetts: A County Checklist-First Revision*, by Melissa Dow Cullina, Bryan Connolly, Bruce Sorrie and Paul Somers (Massachusetts Natural Heritage & Endangered Species Program, Massachusetts Division of Fish and Wildlife, 2011) or an equivalent acceptable to the Department. Color photographs or color reproductions of photographs for each relevé, both for plant community composition and structure shall be submitted as part of this information. Should the Restoration Area(s) be too small to accommodate standard relevés, the Ecologist/Field Scientist shall modify the size, shape, and number of relevés accordingly.

☐ All plants encountered shall be identified to the species level. Scientific nomenclature shall follow per *The Vascular Plants of Massachusetts: A County Checklist-First Revision*, by Melissa Dow Cullina, Bryan Connolly, Bruce Sorrie and Paul Somers (Massachusetts Natural Heritage & Endangered Species Program, Massachusetts Division of Fish and Wildlife, 2011) or an equivalent acceptable to the Department.

- ☐ Data collected on each "Form 3: Quantitative Community Characterization" shall be taken during or near peak biomass in early summer.
- ☐ Annual follow-up data collection on each "Form 3: Quantitative Community Characterization" shall be gathered within fourteen (14) calendar days of the date of the first such data collection.
- ☐ This shall be repeated for at least two (2) full consecutive growing seasons after completion of construction, and then until such time at the Restoration Area(s) meets all General Performance Standards at 310 CMR 10.54(4); 310 CMR 10.56(4); and 310 CMR 10.60(3)(e), as determined solely by the Department.
- ☐ A complete and thorough annual inventory of all vascular plants within the entire Restoration Area(s) shall be conducted. Scientific nomenclature shall follow per *The Vascular Plants of Massachusetts: A County Checklist-First Revision*, by Melissa Dow Cullina, Bryan Connolly, Bruce Sorrie and Paul Somers (Massachusetts Natural Heritage & Endangered Species Program, Massachusetts Division of Fish and Wildlife, 2011) or an equivalent acceptable to the Department. All non-indigenous species encountered shall be identified as such in the inventory, and if encountered, a draft eradication/control plan shall be submitted to the Department for approval by August 31st of each year.
- ☐ All data collected during each of the years specified in a Superseding Order of Conditions and/or Water Quality Certification shall be submitted in a written report. Based upon the data collected during sampling events, the Ecologist/Field Scientist shall render a conclusion within each report as to the success of the Bank/LUWW Restoration Area(s) per 310 CMR 10.54(4); 310 CMR 10.56(4); and/or 310 CMR 10.60(3)(e); and 314 CMR 9.06(2)