

Code of Practice for Wetland Replacement Works

Made under the *Water Act* and the
Water (Ministerial) Regulation

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DEFINITIONS

- 1(1) All definitions in the *Water Act* and associated regulations shall apply, except where expressly defined in this Code of Practice.
- (2) For the purpose of this Code of Practice,
 - (a) “authenticating wetland professional” means a professional member who meets the requirements set forth in *Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Works in Alberta*, as amended or replaced from time to time, to be able to authenticate professional documents for submission under the *Alberta Wetland Policy*, published by the Department and as amended or replaced from time to time;
 - (b) “borehole” means a hole advanced into the ground for the purpose of determining engineering or geological classification and properties for instrumentation purposes;
 - (c) “catchment” means the area of upstream land that catches precipitation and drains toward the outlet of a wetland replacement works;
 - (d) “Code of Practice” means the *Code of Practice for Wetland Replacement Works*, as amended or replaced from time to time;
 - (e) “contouring” means the movement of soil to alter slopes and topography;
 - (f) “delineation” means the process used to identify wetlands and determine their ecological boundaries as set forth in *Alberta Wetland Identification and Delineation Directive*, as amended or replaced from time to time;
 - (g) “ditch plug” means a structure that is an above and below grade impermeable barrier constructed of earth material that is installed at an outlet;
 - (h) “earth material” means surface material, with suitable texture and moisture content, that consists of sand, silt, clay, peat or rock but does not include topsoil or subsoil;
 - (i) “earthen embankment” means a structure that is an above or below grade impermeable barrier constructed of earth material used to block, control, retain, manage or divert the flow of water into or out of the wetland replacement area, including but not limited to dikes, levees, and berms;
 - (j) “emergency” means a situation where there is an imminent risk to the aquatic environment, public health or safety, or an imminent risk of structural failure related to wetland replacement works;
 - (k) “excavated area” means the area that is disturbed for the sole purpose of acquiring earth material required for a structure;

- (l) “firm or frozen ground conditions” means soil conditions that will support the equipment while conducting a wetland replacement activity and will not cause an adverse effect to the wetland, including, but not limited to, rutting, compaction, or siltation;
- (m) “grade” means the lowest elevation of the ground surface at the proposed structure location prior to the commencement of a wetland replacement activity;
- (n) “grade control structure” means a structure that prevents gully development and bed erosion by dissipating the energy created by the flow of water at an outlet;
- (o) “impermeable barrier” means a structure or part of a ditch plug or earthen embankment made of bedrock or compacted soil that does not allow fluid to pass through;
- (p) “impermeable soil” means soil with a range of particle size distribution containing a minimum of 15 percent clay by volume making it suitable for compaction to impermeability;
- (q) “length” means the distance parallel to the flow direction at an outlet;
- (r) “lift” means a layer of placed, uncompacted soil that cannot exceed a height of 30 centimetres;
- (s) “mineral wetland” means a wetland with topsoil or subsoil that has either no accumulation of peat or a peat layer less than 40 centimetres deep;
- (t) “natural drainage pattern” means the surface flow regime associated with the pre-disturbance or pre-drainage hydrology of a wetland, even if it was historically altered or drained;
- (u) “normal hydrologic conditions” means the hydrologic conditions within the catchment of the wetland being restored or constructed, under the climatic conditions of the last 30 years, including but not limited to precipitation, evaporation, runoff, groundwater flux and water levels;
- (v) “outlet” means a point where water flows from a wetland by a
 - (i) channel,
 - (ii) ditch,
 - (iii) stream,
 - (iv) drainage,
 - (v) conveyance, or
 - (vi) subsurface drainage works;
- (w) “peat” means organic soil composed of partially decomposed plant material that accumulates in some wetlands under saturated conditions;
- (x) “peatland” means a wetland that has greater than or equal to 40 centimetres of accumulated peat;

- (y) “person responsible” means
 - (i) a person who is responsible for a wetland replacement works,
 - (ii) a successor, assignee, executor, administrator, receiver, receiver-manager, liquidator or trustee of a person described in clause (i), or
 - (iii) a person who acts as the principal or agent of a person described in clause (i) or (ii);

- (z) “salvage” means to collect and stockpile any
 - (i) topsoil,
 - (ii) subsoil, or
 - (iii) peat,in a manner that retains the original quality and quantity of the topsoil, subsoil or peat;

- (aa) “slope” means the ratio of the vertical rise to the horizontal run measured in the same units;

- (bb) “soil amendments” means alterations to the physical, chemical, or biological characteristics of topsoil, subsoil, soil or peat;

- (cc) “structure” includes but is not limited to
 - (i) a ditch plug,
 - (ii) an earthen embankment,
 - (iii) a grade control structure,
 - (iv) a natural vegetated spillway,
 - (v) a reinforced grass spillway,
 - (vi) a rock chute spillway, or
 - (vii) an impermeable barrier;

- (dd) “subsoil” means the layer of soil up to a maximum depth of 1.2 metres below the topsoil surface, that consists of the B horizon, in accordance with *The Canadian System of Soil Classification*;

- (ee) “subsurface drainage works” means a system constructed of tile, pipe or tubing of any material, beneath the surface of the land for the purpose of removing water from a wetland;

- (ff) “topsoil” means the uppermost layers of soil consisting of the L, F, H and A horizons, and up to a maximum depth of 40 centimetres of the O horizon, in accordance with *The Canadian System of Soil Classification*;

- (gg) “UTM coordinates” means coordinates that use the Universal Transverse Mercator grid to identify or plot the specific location of a site or object;

- (hh) “vegetation amendments” means alteration to the physical or biological characteristics of vegetation including but not limited to
 - (i) seeding with native, non-invasive species,
 - (ii) planting native, non-invasive species,
 - (iii) removing non-native, invasive and weed species, or
 - (iv) placing or removing woody debris, being downed trees, stumps, branches, leaves and other tree or shrub sourced materials;

- (ii) “weed species” means a plant designated in accordance with the regulations of the *Weed Control Act*;
- (jj) “wetland” means land saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soil, hydrophytic vegetation, and various kinds of biological activity that are adapted to a wet environment;
- (kk) “wetland construction” means the manipulation of the physical, chemical, biological or hydrological characteristics of a site with the goal of creating a wetland replacement area at a location that was non-wetland, and where the wetland replacement area created has
 - (i) a storage capacity less than or equal to 6,250 cubic metres,
 - (ii) an average depth of water, being the ratio of the volume of a wetland to the surface area of the wetland at design full capacity, of at least 10 centimetres but no more than 60 centimetres under normal hydrologic conditions,
 - (iii) a maximum depth of water of 2 metres, and
 - (iv) a 1:100 year flood magnitude of less than or equal to 1.5 cubic metres per second at an outlet;
- (ll) “wetland replacement activity” means an activity related to wetland replacement works as described in section 3(9) of the *Water (Ministerial) Regulation*;
- (mm) “wetland replacement area” means the area restored or constructed as a result of a wetland replacement activity;
- (nn) “wetland replacement works” means any structure or technique used for wetland construction or wetland restoration, including
 - (i) a structure,
 - (ii) contouring,
 - (iii) erosion and sediment control,
 - (iv) soil amendments,
 - (v) vegetation amendments,
 - (vi) decommissioning of subsurface drainage works, or
 - (vii) drilling and reclaiming a borehole in a wetland replacement area;
- (oo) “wetland restoration” means any manipulation of the physical, chemical, biological or hydrological characteristics of a wetland, that has been partially or completely lost by drainage, infilling or other forms of degradation or impairment, with the goal of re-establishing the pre-disturbance area, natural drainage pattern, hydrology and natural processes but only applies to
 - (i) a catchment area less than or equal to 300 hectares in size, and
 - (ii) a 1:100 year flood magnitude of less than or equal to 1.5 cubic metres per second at an outlet;
- (pp) “width” means the distance perpendicular the flow direction at the outlet.

APPLICATION

- 2(1) Subject to subsection (2), this Code of Practice applies to
- (a) wetland construction; and
 - (b) wetland restoration.
- (2) This Code of Practice does not apply to:
- (a) wetland replacement works that include
 - (i) an outfall,
 - (ii) a rock chute spillway with a bed width greater than 3 metres,
 - (iii) a reinforced grass spillway with a bed width greater than 3 metres,
 - (iv) a structure made of metal, steel or concrete, or
 - (v) a structure that has moving components or mechanical devices capable of diverting water; or
 - (b) a wetland replacement activity that
 - (i) occurs within a floodway, being the portion of a flood plain area where flows are deepest, fastest and most destructive,
 - (ii) occurs within a contaminated site, or
 - (iii) includes watercourse realignment.

COMPLIANCE WITH THE CODE OF PRACTICE

- 3 For the purposes of section 3(9) of the *Water (Ministerial) Regulation*, the person responsible must comply with the requirements set out in this Code of Practice.

NOTICE TO THE DIRECTOR

- 4(1) Notwithstanding section 4(1) of the *Water (Ministerial) Regulation*, unless another time period is agreed to by the Director, the person responsible must provide notice to the Director at least 14 calendar days prior to commencing a wetland replacement activity under this Code of Practice.
- (2) After notice to the Director has been provided for the commencement of a wetland replacement activity, the person responsible may change any of the information provided to the Director, as long as
- (a) the change complies with this Code of Practice; and
 - (b) notice of the change is provided to the Director in accordance with subsection (1).
- (3) Notice to the Director under subsection (1) must
- (a) be submitted in the form and manner prescribed by the Director;

- (b) include the information provided in the Schedule; and
- (c) include any other information as requested by the Director.

EMERGENCY

- 5(1) Where there is an emergency, the person responsible must
- (a) take appropriate measures to remedy the emergency; and
 - (b) notify the Director of the emergency immediately upon becoming aware of the emergency, with any information regarding the nature of the emergency that is available to the person responsible at the time.
- (2) Within 30 days of completion of the appropriate measures to deal with the emergency, or another time period as agreed to by the Director, the person responsible must submit the following information to the Director:
- (a) a chronology of events before, during and after the emergency;
 - (b) a description of any damage to the wetland replacement works caused by the emergency;
 - (c) a description of any damages or flooding to any private or public property caused by the emergency;
 - (d) a description of any actions or wetland replacement activity taken by the person responsible during or after the emergency, including repairs or changes to the wetland replacement works;
 - (e) a statement as to whether the person responsible
 - (i) complied with section 8 and section 9, and
 - (ii) incorporated the specifications, measures and recommendations of any reports prepared under section 10 by an authenticating wetland professional.
- (3) Notification under this section must be in the manner prescribed by the Director.
- (4) Where the Director is notified under subsection (1)(b), notice under section 4(1) is not required.

CONTRAVENTIONS

- 6(1) In the event of a contravention of this Code of Practice, the person responsible must

- (a) notify the Director of the contravention immediately upon becoming aware of the contravention, with any information regarding the nature of the contravention that is available to the person responsible at the time; and
 - (b) take appropriate measures to remedy the contravention.
- (2) Within 7 calendar days of the immediate reporting under subsection (1), the person responsible must submit the following information to the Director:
- (a) a description of the contravention;
 - (b) an explanation as to why the contravention occurred;
 - (c) a summary of all measures that were taken to mitigate the adverse effects to the aquatic environment or other water users related to the contravention;
 - (d) the name and contact information of the person responsible for carrying out a wetland replacement activity, including any persons that were retained or employed by the person responsible, and a description of their responsibilities at the time the contravention occurred; and
 - (e) any proposed measures designed to prevent future contraventions.
- (3) Notification under this section must be in the manner prescribed by the Director.

OBTAINING CONSENT

- 7 Prior to commencing, continuing or carrying out a wetland replacement activity under this Code of Practice, the person responsible must obtain written consent from the landowner on which the wetland replacement activity will occur, that includes:
- (a) permission to access the site for the purposes of
 - (i) performing an initial site assessment,
 - (ii) completing the wetland replacement activity, and
 - (iii) any monitoring or maintaining the wetland replacement works; and
 - (b) acknowledgement that any future activity occurring in the wetland replacement area will require authorization under the *Water Act*.

STANDARDS FOR CARRYING OUT A WETLAND REPLACEMENT ACTIVITY

- 8 The person responsible who commences, continues or carries out a wetland replacement activity under this Code of Practice must

- (a) develop an erosion and sediment control plan prior to commencing the wetland replacement activity and implement the plan while conducting the wetland replacement activity;
- (b) develop a plan to prevent the transfer of non-native species to the aquatic environment prior to commencing the wetland replacement activity and implement the plan while conducting the wetland replacement activity;
- (c) design the wetland replacement works so that the maximum depth of water at any location within the wetland replacement area will be less than or equal to 2 metres under normal hydrologic conditions, including any excavated area;
- (d) design the wetland replacement activity so that adjacent properties, other water users or licensees are not adversely affected, unless agreed to by signed written letter, easement or permit;
- (e) design the wetland replacement activity so that there is no increase to flood magnitude or frequency outside of the wetland replacement area;
- (f) ensure that no wetland replacement activity is conducted in a water body frequented by fish;
- (g) ensure any soil that is to be used as part of a wetland replacement works is free of contaminants and weed species;
- (h) install only non-reactive or inert structures within the wetland replacement area;
- (i) design and carry out the wetland replacement activity in a manner that prevents adverse effects to the aquatic environment;
- (j) conduct the wetland replacement activity under firm or frozen ground conditions, unless an emergency has occurred, or measures are in place to prevent adverse effects to the aquatic environment;
- (k) conduct the wetland replacement activity in a manner that results in no flood damage to any private or public property outside of the wetland replacement area;
- (l) construct a wetland to have an undulating basin that supports microtopography;
- (m) construct structures to meet or exceed the designed life span of the wetland replacement works;
- (n) stabilize wetland replacement works using only native, non-invasive plant species when seeding or planting is required;
- (o) notwithstanding subsection 8(n), stabilize structures using only non-invasive, non-weed species;
- (p) maintain wetland replacement works for a minimum of ten years from the commencement of the wetland replacement works;

- (q) notwithstanding subsection 8(p), when using treated storm water as the water source for wetland construction, maintain the wetland replacement works for the life span of the wetland replacement works; and
- (r) reclaim any borehole drilled as part of the wetland replacement activity.

CONDITIONS FOR CARRYING OUT A WETLAND REPLACEMENT ACTIVITY

- 9(1) The person responsible who commences, continues or carries out a wetland replacement activity under this Code of Practice must remove all peat, debris and organic material from the side slopes and foundation when constructing or installing a structure.
- (2) When installing a ditch plug for wetland restoration in a mineral wetland, the ditch plug must
 - (a) be installed perpendicular to the outlet;
 - (b) be installed on a foundation of impermeable soil or bedrock;
 - (c) have a width that extends at least 3 metres past each bank edge of the outlet;
 - (d) have a length of at least 3.5 metres;
 - (e) have a height from the foundation to the crest that allows for a minimum 10 percent settling of the soil;
 - (f) have a height above grade that does not exceed 2 metres after settling of the soil;
 - (g) be installed with a minimum freeboard of 15 centimetres;
 - (h) be composed of impermeable soil to a compaction of at least 2,400 kilopascals;
 - (i) have upstream, downstream and side slopes no steeper than 1:10; and
 - (j) have an associated spillway that prevents gully development and bed erosion, while maintaining flow conditions.
- (3) Notwithstanding subsections (2)(g) and (j), if a ditch plug is designed to overtop for managing wetland discharge, a grade control structure must be installed.
- (4) Notwithstanding subsection (1), when installing a ditch plug for wetland restoration in a peatland, the ditch plug must
 - (a) be installed perpendicular to the outlet;
 - (b) be installed on a foundation of

- (i) peat compacted to a density greater than or equal to the surrounding peat, or
 - (ii) soil compacted to a density greater than or equal to the surrounding soil;
 - (c) have a width that extends at least 2 metres past each bank edge of the outlet;
 - (d) have a length of at least 3 metres;
 - (e) have a height above grade, after compaction, of at least 30 centimetres, but no more than 50 centimetres;
 - (f) be composed of peat of the same level of decomposition as the surrounding peat;
 - (g) be constructed in lifts;
 - (h) be compacted, using an excavator, to two thirds of the initial lift volume;
 - (i) have upstream, downstream and side slopes no steeper than 1:10; and
 - (j) have peat placed downstream of the ditch plug to
 - (i) a minimum of 30 metres, and
 - (ii) the elevation and compaction of the surrounding peat.
- (5) When a rock chute spillway is installed, it must
- (a) have a bed width less than or equal to 3 metres;
 - (b) be straight from upstream to downstream;
 - (c) have a centre channel slope no steeper than 1:3.5; and
 - (d) be designed to pass the 1:100 year flood magnitude.
- (6) When a reinforced grass spillway is installed, it must
- (a) have a bed width less than or equal to 3 metres;
 - (b) be straight from upstream to downstream;
 - (c) have a centre channel slope no steeper than 1:7;
 - (d) have no exposed soil; and
 - (e) be designed to pass the 1:100 year flood magnitude.
- (7) Notwithstanding subsection (1), when a natural vegetated spillway is installed, it must
- (a) be located in an area undisturbed by any other wetland replacement works;
 - (b) have a minimum bed width of 3 metres;

- (c) have a centre channel slope no steeper than 1:30;
 - (d) have no exposed soil; and
 - (e) be designed to pass the 1:100 year flood magnitude.
- (8) When an earthen embankment is installed, it must
- (a) be installed on a foundation of impermeable soil or bedrock;
 - (b) have a length of at least 3.5 metres;
 - (c) have a minimum freeboard of 15 centimetres;
 - (d) have a height from the foundation to the crest that allows for a minimum 10 percent settling of the soil;
 - (e) have a height above grade that does not exceed 2 metres after settling of the soil;
 - (f) be composed of impermeable soil to a compaction of at least 2,400 kilopascals;
 - (g) have upstream, downstream and side slopes no steeper than 1:10;
 - (h) have an associated spillway that prevents gully development and bed erosion while maintaining flow conditions;
 - (i) result in a wetland replacement area that has an irregular-shaped boundary, and
 - (j) if installed at an outlet:
 - (i) be installed perpendicular to the outlet, and
 - (ii) extend at least 3 metres past both sides of the edge of the outlet.
- (9) Notwithstanding subsection 8(g), when using treated storm water as the water source for wetland construction, the earthen embankment must have upstream, downstream and side slopes no steeper than 1:8.
- (10) When contouring or removing soil for wetland construction:
- (a) the topsoil must be salvaged prior to removal;
 - (b) the salvaged topsoil must be replaced after soil is removed for wetland construction;
 - (c) notwithstanding subsection 10(b), the salvaged topsoil must not be replaced if weed species are present;
 - (d) the constructed wetland must have no weed species present; and
 - (e) the constructed wetland must have

- (i) slopes no steeper than 1:16, and
 - (ii) an irregular-shaped boundary.
- (11) Notwithstanding subsection (10)(e)(i), when using treated storm water as the water source for wetland construction, the constructed wetland must have slopes no steeper than 1:10.
- (12) Subject to subsections (8) and (10), when using an impermeable barrier as the wetland basin for wetland construction, the impermeable barrier must
 - (a) cover the entire wetland replacement area; and
 - (b) be composed of impermeable soil to a compaction of at least 2,400 kilopascals.
- (13) When decommissioning a subsurface drainage works, the following conditions must be met:
 - (a) the subsurface drainage works must be rendered inoperable by:
 - (i) removing subsurface drainage works at least 15 metres downstream, starting from the downstream edge of the wetland replacement area, or
 - (ii) placing a permanent, impermeable plug within all subsurface drainage works at least 15 metres downstream, starting from the downstream edge of the wetland replacement area;
 - (b) the terminal outlet of the subsurface drainage works must be permanently blocked with an impermeable material for at least 60 centimetres; and
 - (c) any excavation required to decommission the subsurface drainage works must be backfilled and compacted to a density greater than or equal to the surrounding soil.
- (14) When an excavated area is required to obtain earth material associated with a wetland replacement works, the excavated area must
 - (a) have an edge to edge distance from any structure of at least 35 metres;
 - (b) have an irregular-shaped boundary;
 - (c) have any topsoil, subsoil or peat salvaged prior to removal of the earth material;
 - (d) have the salvaged topsoil, subsoil or peat replaced after removal of the earth material;
 - (e) have slopes no steeper than 1:8 that match the surrounding topography; and
 - (f) have an edge to edge distance of at least 30 metres between any two excavated areas, when more than one excavated area is required.
- (15) Further to subsection (14):
 - (a) when non-peat earth material is required, the total volume obtained must be less than or equal to 625 cubic metres; or

- (b) when peat earth material is required, the peat must be obtained at depths less than or equal to 10 centimetres.

AUTHENTICATING WETLAND PROFESSIONAL REPORT

- 10(1) Subject to subsection (3), and prior to providing notice to the Director under section 4, the person responsible must retain an authenticating wetland professional to prepare and sign a report that includes the following information:
- (a) a description of the wetland replacement activity, including:
 - (i) the designed maximum water level of the wetland replacement area,
 - (ii) the total wetland replacement area, in hectares, resulting from the combined wetland replacement works, and
 - (iii) a description of all measures the person responsible should take to meet the standards and conditions set out under section 8 and section 9;
 - (b) a wetland assessment that details the ecological conditions prior to the commencement of the wetland replacement works, including:
 - (i) a description of the wetland replacement area including:
 - a. topography,
 - b. hydrological characteristics of the wetland including catchment size and depth of water,
 - c. borehole or soil assessment,
 - d. vegetation assessment,
 - e. wildlife surveys,
 - f. potential erosion susceptibility, and
 - g. a classification of the wetland type in accordance with the *Alberta Wetland Classification System*,
 - (ii) a map, diagram or air photo that shows the location of the proposed wetland replacement works, including the legal description of the land, catchment area and the UTM coordinates, and
 - (iii) a delineation of any existing wetland area;
 - (c) an engineering design for the wetland replacement works that includes:
 - (i) the type of material that will be used for the construction,
 - (ii) a description of any structures that form part of the overall design,
 - (iii) a description of any structures or contouring that are located outside of the wetland replacement area, and
 - (iv) any surveyed and unsurveyed profiles and cross-sectional drawings;
 - (d) a description of assessments used to prepare the report, including:
 - (i) study sites, methods used, dates and times,
 - (ii) any existing information, published and unpublished reports reviewed,
 - (iii) any new information gathered through assessments, and
 - (iv) any reports prepared by the authenticating wetland professional; and
 - (e) any other information considered relevant by the authenticating wetland professional.

- (2) A field assessment must be conducted for any information under subsection (1)(b) that cannot be compiled using desktop methods.
- (3) A report under this section is not required to cover
 - (a) maintenance; or
 - (b) monitoringof the wetland replacement works.
- (4) Further to subsection (3)(a), while a report is not required, the person responsible must prepare in writing the information contained in subsection (1)(c)(i) to (iv) and make it available upon request of the Director.
- (5) Notwithstanding subsection (3)(a), unless an emergency has occurred, if any wetland replacement activity cannot be carried out during firm or frozen ground conditions, a report under this section is required.

RECORDKEEPING

- 11(1) The person responsible must record and retain all the following information for a minimum of ten years after the completion of a wetland replacement activity, unless another time period is agreed to by the Director:
 - (a) the name and contact information of any person who carried out a wetland replacement activity;
 - (b) a copy of any plans prepared for the installation of the wetland replacement works;
 - (c) any as built plans or as constructed plans, if such as built plans or as constructed plans were prepared;
 - (d) the start and completion dates of the wetland replacement works;
 - (e) all photographs or video-recordings taken of the wetland replacement area before and after the completion of the wetland replacement activity; and
 - (f) a copy of all reports prepared or, in the event a report is not required, the information the person responsible is required to compile under subsection 10(4).
- (2) When requested in writing by the Director, the person responsible must submit any information or records retained under subsection (1) to the Director in the period specified by the Director.

SCHEDULE

Notice to the Director

Information that must be contained in a notice for the purposes of section 4:

- (a) name and contact information of the person responsible for the wetland replacement works;
- (b) name and contact information of the person responsible's authorized representative;
- (c) legal land description(s) of the wetland being restored or constructed;
- (d) UTM coordinates of the wetland replacement works;
- (e) identify whether any reports were prepared, the date and title of any such reports;
- (f) tentative commencement and completion dates of the wetland replacement activity; and
- (g) a description of the proposed wetland replacement activity, including:
 - (i) methods of placing, constructing, operating, installing, maintaining, removing or disturbing a wetland replacement works,
 - (ii) a map, diagram or air photograph showing the location and extent of the wetland replacement works, and
 - (iii) a statement that specifies
 - a. the wetland size and classification prior to the commencement of the wetland replacement activity, and
 - b. the anticipated wetland size and classification after the completion of the wetland replacement activity.