

Revised DRAFT

**Considerations for Stormwater Features at
Conditionally Closed Sites**

**Florida Department of Environmental Protection
Division of Waste Management
District & Business Support Program
Tallahassee, FL**

October 19, 2019

Please Read This Disclaimer:

This document is only intended as guidance when adding or modifying a stormwater feature at a conditionally closed site when such additions or modifications are restricted as part of the closure. This guidance is not a stormwater management system design document and does not authorize or provide design requirements for any construction of a stormwater feature. Nothing in this guidance supersedes any Federal, State, or Local requirements; nor does it create any new requirements. This guidance does not authorize dewatering or meet the requirements needed to obtain a dewatering permit. All applicable Florida Department of Environmental Protection, Water Resource Management Rules must be adhered to and are located at the following link: [Water Resource Management Rules](#).

Problem Statement:

Conditional Site Rehabilitation Completion Orders (CSRCOs) under Rule 62-780.680(2) or (3), F.A.C. may incorporate Institutional Controls (ICs) or Engineering Controls (ECs) that may restrict construction of new and/or alteration of existing stormwater management systems (SWMS). The State supports reuse of contaminated sites and recognizes that new construction requires placement of SWMS to appropriately manage runoff from impervious surfaces. Conditionally closed sites may require expansion of the impervious areas (new building foundations, parking, pavement, access roads, etc.) which may trigger a requirement for a new SWMS or modification of the existing SWMS.

In the case of contaminated sites that qualify for a conditional site rehabilitation completion order (CSRCO), the planning for potential areas for SWMS is important so as not to violate the possible institutional or engineering control, or otherwise cause contamination to circumvent the control and spread to either previously uncontaminated areas or offsite. If such a spread or impact occurred, it could result in requirements for additional site assessment and potentially lead to rescission of the CSRCO.

Goal of this guidance document:

The construction, modification, or operation of SWMS should not cause contaminated media to potentially spread or leach. A reasonable demonstration should be provided that neither the currently proposed or any future modification of the SWMS will alter the risk mitigation strategies used to satisfy the conditional closure requirements. If an adequate demonstration is not made, it may be necessary to alter the ICs or ECs used to close the site and amend the CSRCO.

Potential future or conceptual development plans including the type and location of the SWMS can be evaluated as part of the closure and the restriction can be removed from or modified in the CSRCO accordingly. For situations where prior SWMS evaluation is not possible, this guidance can also assist in evaluating criteria for the construction of a new or modification of an existing SWMS on a contaminated site following closure.

SWMS - Design & Best Practices at Contaminated Soil and/or Groundwater Sites in Relation to CSRCOs

The placement, design and use of stormwater structures, ponds, and pathways is a critical part of a plan to prevent the spread of pollution at known contaminated sites due to the potential to cause leaching from soils or to create a hydraulic head to spread contamination in groundwater to previously uncontaminated areas.

In general, efforts should be made to plan stormwater structures, ponds and other conveyance features be placed in previously non-contaminated areas of a site to mitigate the risk of exposure to contaminated media.

SWMS design requirements are subject to the requirements of the SWMS reviewing agencies and are subject to change. The appropriate reviewing agency should be consulted for current requirements and nothing in this guidance document alters those requirements.

Dry Pond vs Wet Pond:

Generally speaking, as of the time of this guidance, dry ponds are those where the bottom of the pond is above the Seasonal High-Water Table (SHWT) (typically ≥ 2 feet) and are designed to drawdown, often through infiltration, within 72 hours of a rain event. Dry ponds with underdrains are expected to drawdown within 36 hours. Wet ponds are those where the pond bottom is below the SHWT and are designed to recover to their static elevation within a certain timeframe (usually noted in the construction application).

SWMS should be designed with site groundwater elevation data in mind so as not to cause migration of the plume ~~outside of previously contaminated areas or off the property, nor expected to render the plume no longer stable or shrinking within any area of institutional or engineering controls. This design may be satisfied based upon professional judgment or the results of appropriate hydraulic modeling if necessary.~~ Groundwater elevation contour maps that accurately demonstrate the direction of groundwater flow at the site are useful in making this evaluation. If adequate groundwater elevation data are not available to accurately demonstrate the direction of groundwater flow, supplemental data collection from additional wells or piezometers may be warranted. The SWMS should only be placed in specific areas in such a way as to not impact or cause movement of contamination.

Further consideration may also be needed in the placement of engineering controls, so as to not interfere with or to clearly define the appropriate or available locations for the construction of SWMS.

The following questions should be considered during the planning stages of the SWMS either prior to closure or at a site where a CSRCO already exists:

- What will be the type of the future development: residential, commercial, recreational or some other use? Note that an institutional or engineering control may be required to reduce or eliminate exposure to impacted soil and/or groundwater. Other existing controls on the property may affect the placement or design of the SWMS.
- Based on the land use and size, as well as the underlying lithology, what type of stormwater system will work better?
 - a. Wet detention system
 - b. Detention with effluent filtration
 - c. Lined detention pond or vault
 - d. Dry system (retention pond)
 - e. Underground exfiltration
 - f. Sand chimney
- What is the extent of the groundwater plume?
- What is the nature of the contamination?
- Is there a restriction for the use of groundwater and/or irrigation wells?
- Is soil contamination under an engineering control (EC) and will the EC be breached?
- How will potential dewatering during construction of the SWMS affect plume migration?
- How will the water from the dewatering operations during SWMS construction be disposed (e.g., onsite management, sanitary sewer, generic permit, NPDES)?

Formatted: Font: Not Italic
Deleted: any restricted area
Formatted: Font: Not Italic
Formatted: Font: Not Italic
Deleted: restricted
Deleted: which
Deleted: demonstrated
Formatted: Font: Not Italic

Groundwater:

In addition to the incorporation of the SWMS into a conceptual site model and professional judgement of the effects of the SWMS, analytical or numerical models may be necessary to support that a SWMS will not cause migration of the plume outside of any previously contaminated areas or off the property nor expected to render the plume no longer stable or shrinking within any area of institutional or engineering controls. Approved fate and transport models and applicable design requirements must be consistent with the agencies responsible for reviewing the SWMS application, and should be discussed with the agencies to determine the applicable documentation in each site-specific case. A link to the models accepted for Chapter 62-780, Florida Administrative Code purposes can be found here: <https://floridadep.gov/waste/waste/content/guidance-documents-referenced-waste-management-rules>

Prior to Closure

- a. Depth to contaminant - If a demonstration is provided that groundwater is at a depth and that the infiltration from the SWMS will not cause the plume to migrate, then it may be possible to remove the stormwater restriction from the CSRCO. The demonstration or modeling and the use of any other supplemental factors should be based upon the appropriate design storm event usually 100-yr/24-hour or 25-year/24-hour depending on the type of system (open or closed) and the reviewing agency requirements. Simulation of expected variability and average rainfall events may be considered and incorporated into the modeling effort. Engineering the SWMS to impact only the upper surficial aquifer may assist in this demonstration.
- b. Plume in relationship to confining layer – If groundwater contamination is below a competent confining layer, stormwater restrictions should not be necessary. However, language may need to be included in the CSRCO that the confining unit cannot be breached in the construction of the SWMS.
- c. If construction of the SWMS will occur on top of the plume and cannot be addressed by a. or b. above, then the CSRCO can specify that any SWMS construction may require use of a liner thereby eliminating the need for subsequent Department (Waste Management) approval. Any outflow should direct runoff to areas away from the contamination and be designed so that the runoff does not remain or pond on the site where it could negatively impact the groundwater plume.

Subsequent to Closure

If the SWMS is proposed to be constructed above a groundwater plume where there are demonstrable concerns with regard to inducing contaminant migration, a liner is an option to address these concerns if the conditions in a. or b. from the "Prior Closure Section" above cannot be demonstrated.

If the SWMS for a conditionally closed site will be within 500 feet of the groundwater plume subject to the conditional closure, a mounding analysis should be conducted to evaluate the possible effect of the SWMS mounding on the existing plume.

Soil:

If soil contamination is present, the impact of the proposed SWMS on potential leaching or direct exposure should be considered.

Deleted: A mounding

Deleted: can

Deleted: used

Deleted: such that it

Deleted: restricted area

Deleted: restricted

Deleted: which may be demonstrated based upon professional judgment or the results of appropriate hydraulic modeling if necessary

Deleted: vertical or horizontal movement of the groundwater plume(s)

Deleted: .

Commented [TT1]: I did not see "accepted models" at the link, unless the EPA Fate and Transport link is the "accepted model"? This is not solely a "mounding model".

Commented [SDF2R1]: Right. This is a compendium of models that is 20 years old. Some have survived with updated versions, and new models have been developed.

Deleted: ¶

Commented [JN3]: It is important to consider the overall frequency and intensity of both peak and average storms – as the design storms typically will occur on a 25 to 100 year interval – and is not representative of the average storm during the lifetime of the SWMF – a one-time 100 year event plume interaction may be acceptable if the average storm does not demonstrate unacceptable plume movement

If soil exceeds the Leachability-based Soil Cleanup Target Level (L-SCTL), Synthetic Precipitation Leachate Procedure (SPLP, EPA method SW 846-1312) testing can be conducted under the footprint of the pond to demonstrate that contaminated soil will not leach. A minimum of three samples per lithological unit is recommended.

Alternatively, conditional site closure may be achieved as long as any constituent shown to exceed L-SCTL under a SWMS footprint is demonstrated by groundwater sampling to not exceed GCTLs and proper institutional controls are emplaced to reduce or eliminate access to groundwater.

If a dry pond is to be constructed on top of soil that exceeds the default direct exposure soil cleanup target level, an engineering control for the pond bottom to mitigate the exposure risk should be considered. This could be in the form of an appropriate barrier to eliminate exposure such as a 2-foot clean fill barrier or an impermeable liner. Alternatively, an alternative soil cleanup target level for an exposure scenario appropriate to a dry pond may be established. The control would be included in the Institutional Control Registry and documented in the CSRCO.

Further Consideration

On some sites it may be possible to identify portions of the property that do not need to be restricted with regard to stormwater construction. In such cases, the extent of stormwater restrictions could be documented in the CSRCO. The extent of the area with (or without) stormwater restrictions should be surveyed in and shown on the closure maps.

Acknowledgements:

The following people were instrumental in the development and drafting of this guidance: , Lanita “Lynn” Walker, P.E., Alex Webster, P.G., Yanisa G. Angulo, P.E., Simone Core, P.E., John R. Seago, P.G., Dale Melton, ES III, Indar Jagarine, P.E., Missy Palcic, P.E., Craig Parke, P.G., Florida Brownfields Association.