## Attachment 31: Engineering Controls Reporting and Monitoring

Introduction[[1]](#footnote-2)

The use of Institutional Controls (IC) and Engineering Controls (EC) is common when closing sites under the Risk Based Corrective Action (RBCA) procedures described in rule Chapter 62-780, Florida Administrative Code (F.A.C.).

Institutional Controls are formal restrictions on property such as a land use restriction, a groundwater use restriction or a requirement that an EC be maintained. ICs are recorded on the deed for an affected property and can be verified through review of the local property records.

Engineering Controls eliminate risk by physically preventing exposure to contaminated media or physically isolating contaminated media. ECs take many different forms, from various types of caps and cover material (permeable and impermeable) to slurry walls. The integrity of an EC can be adequately assessed only by field inspection or monitoring data review. ECs may be for either prevention of direct exposure to contaminated soil (e.g., permeable and impermeable caps) or for protection of groundwater either through prevention of infiltration that can cause leaching (e.g., impermeable caps) or through containment of the groundwater plume (e.g., slurry walls). The inspection, monitoring and maintenance requirements for an EC (collectively EC Maintenance requirements) will be part of the Site Rehabilitation Completion Order (SRCO) and the IC per Chapter 62-780, F.A.C. It is then incumbent upon the property owner (or PRSR) to adhere to these requirements as a condition of the SRCO.

Evaluating Proposed Engineering Controls

Engineering Controls can be proposed under a wide variety of circumstances. The purpose of an engineering control is to address risk of exposure by preventing contact with contaminated media or by otherwise physically interrupting an exposure pathway (e.g., an impermeable cap to prevent leaching.)

An EC may be proposed at any time during a cleanup. Per the requirements of Section 62-780.680, F.A.C., a proposed EC must be in a document that is signed and sealed by a Professional Engineer (PE) registered in Florida and it must include a statement by the signing PE that, to the best of his or her knowledge, the engineering control is consistent with commonly accepted engineering practices, is appropriately designed for its intended purpose, and has been implemented. For a newly constructed EC, the statement must be supported by an EC design document that contains the detailed design specifications for the EC. For an existing structure that will serve as an EC (e.g. a gas station driveway and parking lot), the statement must be supported by a detailed report of all measurements, testing and other considerations that led the PE to certify the EC. The supporting information must include any EC Maintenance requirements, including the frequency of inspections and monitoring, and the criteria for determining when an EC has failed. The EC Maintenance requirements will be site-specific based on the type and extent of contamination and the ECs intended purpose. DEP site managers and PEs must use professional judgment to determine if the EC will be protective and if the proposed EC Maintenance schedule is appropriate based on the potential risk that will result if the EC fails. Note that the DEP PE is not expected to provide professional certification of the structural integrity of the proposed control. The Order approving the EC should include the EC Maintenance criteria (see below).

If a PRSR declines to include an EC Maintenance plan with its EC design, then the EC cannot be considered adequately protective and a conditional closure should not be approved. In such cases, the correspondence notifying the PRSR that its EC design is inadequate should include specific direction for the PRSR to continue the site rehabilitation process as required by Chapter 62-780, F.A.C.

Orders for ECs

An EC will be approved in a DEP Order. In most cases, this order will be the Site Rehabilitation Completion Order (SRCO), although a specific “Engineering Control Approval Order” could be used if circumstances dictate. The rule requires the PRSR to provide constructive notice of DEP’s intent to approve the implementation of any controls (ICs and ECs) to the local government and to the owners and residents of any properties that will be subject to controls [see subsections 62-780.220(7) and .680(8), F.A.C.]. Therefore, DEP must provide an “intent to approve”[[2]](#footnote-3) the SRCO to the PRSR (similar to the intent to approve a Temporary Point of Compliance) that directs the PRSR to provide the required notice. Any objections raised should be resolved among the PRSR, affected parties and DEP prior to EC implementation whenever possible. However, the official opportunity for affected parties to challenge the use of an EC will be following issuance of the SRCO. Following resolution of any objections that result from the notice of intent to approve the EC, the PRSR will implement the EC and have a Florida-registered PE certify, as discussed in the previous section of this document, that to the best of his or her knowledge, the engineering control is consistent with commonly accepted engineering practices, is appropriately designed for its intended purpose, and has been implemented. Upon receiving the certification of EC implementation and proof of IC recordation, DEP can issue the SRCO. Ideally, any comments or objections will have been addressed prior to issuance of the SRCO, but a copy of the SRCO should still be provided to all parties who expressed an interest based upon the notice they received from the PRSR. The SRCO provides another point of entry if their concerns have not been satisfied.

Inspection, Monitoring and Maintenance (EC Maintenance)

Per Chapter 62-780, F.A.C., at the end of the site rehabilitation process, the SRCO and IC will also include the EC Maintenance requirements. The Conditional SRCO will briefly describe the EC Maintenance requirements. Failure to perform EC Maintenance as described in the SRCO can result in revocation of the SRCO by DEP.

While a summary of the EC Maintenance requirements is sufficient for the SRCO, the IC itself should include a detailed description of the EC Maintenance requirements (as an Exhibit to the IC) that is similar to, if not the same as, that provided in the approved EC design document. The EC Maintenance requirements in the IC also should include a description of the conditions that constitute a failure of the EC. For example, the groundwater contaminant levels, or trend in groundwater contaminant levels, outside a slurry wall that should lead to a repair effort or further investigation should be provided. For engineered caps, the size, depth and frequency (area or time) of breaches in the cap could be specified.

A properly engineered and constructed impermeable cap is presumed to prevent infiltration that might cause leaching. Therefore, post-closure groundwater monitoring is not required, but periodic inspections by the property owner or PRSR to verify that the cap is intact, functional and continues to serve its intended purpose are required by Chapter 62-780, F.A.C. Because routine inspection of a slurry wall normally is not possible, periodic monitoring of the groundwater to verify containment of a groundwater plume by a slurry wall or similar sub-surface EC is also required by Chapter 62-780, F.A.C. EC Maintenance requirements for a slurry wall must include sampling and analysis of a down-gradient well.

A PRSR has no obligation to routinely report the results of EC Maintenance inspections or sampling to DEP. However, a PRSR must report a failure of an EC designed to prevent the migration of a contaminated groundwater plume (e.g., slurry wall) within 30 days of discovery whenever the PRSR’s monitoring indicates that groundwater is migrating [see subparagraph 62-780.680(2)(c)2., F.A.C.]. Because routine reporting is not required, the “monitoring” of an EC after an SRCO has been issued is different from pre-SRCO monitoring such as in the Natural Attenuation Monitoring phase of site rehabilitation. Even though a failure of an EC designed solely to prevent direct exposure or leaching is not required to be reported to DEP, it is required to be repaired immediately.

As noted above, any failure of an EC to prevent migration of a plume must be reported to DEP within 30 days of discovery. If the PRSR reports that it has already taken the appropriate steps to repair the EC, DEP should review the actions taken to repair the EC and determine if they were adequate. If the failure has not been corrected, then the PRSR may submit an EC repair plan to DEP for approval or may implement the repair at its own risk. In either case, the PRSR must complete the repair as soon as practicable, to avoid a “reopener” scenario that could result in SRCO revocation. If extensive repairs are required such that the validity of the original EC design is questionable, then it may be necessary to revoke the SRCO. If it is not possible to adequately repair the EC, then additional site rehabilitation and an alternative remedy will be required.

DEP can require repair of any type of EC if it independently discovers a failure. The SRCO can be revoked if the PRSR does not repair the EC as soon as practicable.

Other than failures of an EC constructed to prevent plume migration, there is no requirement that the PRSR notify DEP or send a report with the results of its inspection and monitoring. When a PRSR receives an SRCO, conditional or not, the Order is final agency action and no further routine interaction with DEP is required with regard to the cleanup of that contaminated site. The PRSR, or property owner, is only required to contact DEP in the event of plume-control EC failure as described above, creating a “reopener” scenario.

DEP IC/EC Audit Program

To provide a level of assurance that the PRSRs are fulfilling their obligations under their ICs, the Waste Cleanup Program has established a program to independently verify both ICs and ECs on a five-year cycle. This effort is called ICECAP (IC/EC Audit Program). State contractors are tasked to review the county property records to verify that the restrictions are currently recorded on the deed, interview property owners to determine if they are aware of the property use restrictions, and inspect the property for any signs that the restrictions are not being maintained (e.g., wells installed where they are prohibited, breaches in an impermeable cap, etc.). The results of the inspections are sent to DEP site managers and the Office of General Counsel for further action.

The goal of ICECAP is to perform inspections at least every 5 years to ensure that the ICs/ECs are in place and effective. Other DEP cleanup programs may also periodically inspect IC/ECs. As part of the recorded IC, the property owners who own conditionally closed sites grant site access to DEP for inspection purposes.

1. This summary provides guidance on the administrative requirements for inspection, monitoring, maintenance and reporting for engineering controls. For discussion of some of the technical aspects of the various types of controls please see the white paper from the Contaminated Soils Forum Engineering Controls Focus Group “[Engineering Controls Final Report](http://www.dep.state.fl.us/waste/quick_topics/publications/wc/csf/focus/engineer.pdf)” [↑](#footnote-ref-2)
2. The Petroleum Restoration Program uses the term “provisional approval” to describe this advance notice. [↑](#footnote-ref-3)