

JUNE 2021

Guidance for Soil Reuse Involving Soil Mixing/Blending Activities at 62-780, F.A.C. Sites

Florida Department of Environmental Protection
Division of Waste Management
District and Business Support Program
Tallahassee, FL
DRAFT – June 2021

Disclaimer:

This document is only intended as guidance when engaging in site activities involving soil reuse including but not limited to soil mixing or soil blending and placement within the contaminated site. If soil reuse is planned for a 62-780 site, a detailed description of the soil reuse activities should be included in the Remedial Action Plan's Soil Management Plan section. Nothing in this guidance supersedes any Federal, State, or Local requirements; nor does it create any new requirements. All applicable Department rules must still be adhered to.

Commented [A1]: New requirements include a Verification Sampling and Analysis Plan.

Commented [A2R1]: FDEP: This is a guidance document and is not intended to create new "requirements".

The Florida Department of Environmental Protection (FDEP) District and Business Support Program (DBSP) has prepared this guidance to promote consistency of data interpretation and to conduct soil mixing/blending in a protective manner for sites where soil reuse is performed.

Background

Soil mixing and blending has been allowed by the Division of Waste Management (Division) for several years. ~~The activity is generally associated with~~ This guidance was developed for large land tracts like former agricultural land or former golf courses that are redeveloped as primarily residential parcels. ~~This and guidance may not be applicable to many~~ need to be modified for Code (F.A.C.). The PRSR may have discussions with the Division to determine the applicability and/or modification of this guidance.

Soil mixing has not been performed in a consistent manner from one site to another site. Many times, what becomes the normal practice in one geographic area is performed quite differently in other areas. In retrospect, not all previous soil reuse practices are equally protective and this guidance is intended to ensure that current soil reuse practices are protective regardless of whether they are consistent with precedent.

Soil mixing is a remedial activity where site excavated soils from an area of soil impacts are stockpiled and then physically well mixed with the goal of achieving a blended soil that meets applicable residential or alternative soil cleanup target levels (SCTLs).

One important part of soil mixing/blending activities which the Division has found to be inconsistent and therefore potentially not equally protective is the methodology for collection of stockpile samples and the interpretation of the results. The methodology used to create stockpiles, the number of samples collected, the depth within the stockpile from which the sample is collected and the type of sampling process used to collect a sample varies considerably from site to site. Site closure decisions have been made based on such stockpile sampling results and mixed soil stockpile sampling results. Because of the variability in volumes of stockpiles and sampling techniques, it is important to understand whether the sampling results accurately characterize the soil concentrations for the stockpiles. Additionally, these mixed soils have been reused on the site without follow up verification sampling to ensure that the soil meets direct residential exposure SCTLs or other approved alternative SCTLs at residential redevelopment sites.

Unfortunately, there are no easy answers for correcting the uncertainties in stockpile sampling methodology. To date, the Division and other state environmental agencies throughout the United States have not found economical solutions to reduce the uncertainties. In fact, researching other states' practices regarding soil mixing revealed that most states do not allow the blending of soils to achieve lower soil concentrations.

The Division did commission a study by the University of Florida, Center for Environmental and Human Toxicology to evaluate what sampling methodology would be part of Best

Commented [A3]: MG: Add clarification to this statement, additional detail?

Commented [A7R6]: FDEP: As noted, this is addressed subsequently.

Commented [A8]: Perhaps outline the use of the term "SCTLs" to mean "site SCTLs" indicating an approved set of SCTLs for the site? Then, this term could be used throughout the rest of the document.

Commented [A9R8]: FDEP: The guidance document has been revised to incorporate "applicable SCTLs".

Formatted: Highlight

Commented [A10]: Soil blending and reuse has been used at commercial sites as well, so should this statement include that potential?

Commented [A11]: FDEP: Removed this sentence.

Formatted: Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Between : (No border)

Formatted: Highlight

Formatted: Highlight

Formatted: Highlight

Formatted: Highlight

Formatted: Highlight

Formatted: Highlight

Management Practices for site soil reuse. A *White Paper – Stockpile Sampling for Soil Reuse at a Site* (Stuchal and Roberts, December 2020) was prepared. The results of the study indicated that Incremental Sampling Methodology (ISM) yielded the most representative characterization. However, there are still questions regarding the volume of soil to be tested and ISM is labor intensive, especially for stockpile determinations.

To address the uncertainties associated with site soil reuse, this guidance has been prepared. This guidance should not be used to re-evaluate sites which have previously received an approved Site Rehabilitation Completion Order. However, moving forward this guidance is recommended for evaluating all proposed site rehabilitation activities.

Purpose

This guidance is intended to primarily be focused on large land tracts that are being redeveloped as residential parcels and may need to be modified for other types of sites undergoing rehabilitation under Chapter 62-780, F.A.C. It is also only intended for use on soils where the contaminant concentrations in existing soils are relatively low and they have been demonstrated that soil mixing activity will readily result in soil concentrations below the applicable SCTLs. An initial site assessment should be completed for the entire site prior to any source removal or mixing activities being implemented. It is recommended that proposed soil blending/mixing procedure Remedial Action Plans or Interim Source Removal Plans be approved prior to any reuse activities being conducted on a site.

This guidance does not promote the reuse of soils that are not suitable for reuse purposes. Soil reuse will generally not be possible on sites where wide-spread impacted soil where-with-where significant concentrations are present. Soil reuse is not allowed for soils impacted by polychlorinated biphenyls (PCBs) or soils that contain a RCRA Listed Waste. It should be noted that soil containing a listed waste may meet residential SCTLs but is still regulated as hazardous and cannot be reused. Hazardous soils are soils that exhibit any one or more of the following properties: ignitability, corrosivity, reactivity, or toxicity. These types of soils must be managed and disposed of in accordance with federal regulations. Please refer to the revised FDEP August 9, 2006 guidance memorandum – *Management of Contaminated Media under RCRA*.

Soils that are not suitable for reuse should be removed from the site and properly disposed of at an appropriate permitted facility. The off-site disposal of soil will be directed by the Person Responsible for Site Rehabilitation (PRSR) and any soil analysis requirements for off-site disposal will be driven by the receiving waste disposal facility and not the Division. As with any waste cleanup site, all off-site disposal shall be properly documented within the Remedial Action Status Report or Interim Source Removal Report, as applicable, with the name and address of the disposal facility, permit information, and transportation volume documentation. Also, the PRSR should include in the report figures with depicting the areas of the site where from which soil was removed, the depth of removal, and a statement as well as if, as to whether groundwater was encountered as part of removal actions should be included in the report.

Formatted: Highlight

Commented [A12]: JP: ISM is a great tool, but application for stockpile sampling for soil re-use needs to be thought through. Stockpiles can be generated continuously throughout a months-long soil management project. Increments need to be established for this.

Commented [A13R12]: FDEP: Agreed. The increments are established in the white paper referenced in this paragraph.

Formatted: Highlight

Formatted: Highlight

Formatted: Highlight

Commented [A14]: MG

Commented [A15R14]: FDEP: This guidance document is primarily focused on large tracts and not small sites where other forms of treatments or disposal are feasible.

Commented [A16]: MG: Add clarification to this statement, additional detail?

Commented [A17]: MJ: What is considered relatively low? We have blended soils with arsenic concentrations in "hot spots" upwards of 50 mg/kg with success.

Commented [A18R17]: FDEP: Reuse feasibility should be evaluated (pilot testing, blending calculations, etc.) to determine if soil is suitable for reuse.

Definitions –

CONTAMINATED SITE

A contaminated site is the area where the discharge/release impacts exist or have spread from _____ have spread beyond the source property boundaries.

The term “contaminated site” is defined in ss. 376.301(11) and 376.79(7), Florida Statutes, as: “any contiguous land, sediment, surface water, or groundwater areas that contain contaminants that may be harmful to human health or the environment.” The definitions Section 62-780.200, F.A.C., points to these statutory definitions and also defines “site” to mean “contaminated site” as defined in the statute. See Subsection 62-780.200(47), F.A.C. The term “site” should not be confused with or used interchangeably with “property,” “facility,” “parcel,” or other similar terms.

FOOTPRINT

The footprint of soil contamination is synonymous with the definition of contaminated site.

SOIL REUSE

Soil reuse is considered to be any time site soils that exceed Chapter 62-777, F.A.C. Residential, or Commercial/Industrial ~~Direct Exposure~~ Exposure SCTLs, or Leachability SCTLs are mixed within the impacted soil footprint area with other site soils from _____ the footprint or with imported clean fill specifically imported to the site for soil mixing/blending within the contaminated area with the goal to achieve the site specific applicable SCTL(s) established for the associated project, and the blended soils are then placed anywhere on within the site _____ for any purposes. ~~Post-placement vVerification~~ Post-placement verification sampling will be needed for all areas where the blended soils were placed outside of previously impacted areas to confirm that the applicable SCTLs have been met ~~are still being met in those areas have been met~~. Mixed soil from the site may only be reused and placed with in the footprint. Mixed soils should not be placed on the source property outside the site original footprint of contamination (i.e., the site is smaller than the property), nor should mixed soils be placed on properties other than the source property not owned by the PRSR unless those properties are also within the footprint being remediated (i.e., when the site extends beyond the source

¹ The term “source property” is defined within the notice provisions of Subsection 62-780.220(3), F.A.C., as “the location from which the contamination originates.”

Commented [A19]: LD: I recommend moving the definitions to the beginning of the guidance document (after the disclaimer) because the term “site” is used multiple times above and many readers will be equating that term to “property” rather than the “contaminated site” or “footprint.” This is the most common point of confusion in site cleanup world.

Commented [A20R19]: FDEP: This is a common comment. I agree with this revision

Commented [A21]: MJ: Is a routine application considered a discharge or release? Should it say “impacts resulting from routine application”?

Commented [A22]: MJ: How do we address regional applications where the arsenic impacts are interspersed throughout the area? By testing off-site properties with similar agricultural histories, it becomes unclear if we are delineating off-site migration or identifying new impacts unrelated to the site itself.

Commented [A23R22]: This is not the document to address this question in.

Commented [A24]: Should this be the same definition as in 376.301, F.S. and 376.79, F.S., or is this meant to be a specific definition pertaining to this guidance?

Commented [A25]: No definition of “footprint” in 376.301, F.S., or 376.79, F.S. This definition of footprint indicates the entire “site” is the footprint. Many times, the area of soil impacts is less than the entire site.

Commented [A26]: GS: What if deeper, unimpacted soils within the footprint are mixed. I don't think specifying “outside” is appropriate
TG: Perhaps add, or blended with deeper soils from inside the footprint.

Commented [A27]: LD: If they are site-specific ASCTLs, then state that; but if you mean the default SCTLs, then delete “site-specific” since it creates confusion

Commented [A28]: redundant

Commented [A29]: redundant

Commented [A30]: TG: This contradicts the prior statement that the blended soils are then placed anywhere on the site. Should statement read “...may only be reused and placed within the site boundaries”? If the blended soils meet SCTLs, then there should be no prohibition to using them anywhere.
GS: I agree, but technically suitability for reuse ... [1]

Commented [A31R30]: FDEP: Blended soil can be placed anywhere within the contaminated site for reuse provided the applicable SCTLs have been achieved. If ... [2]

Commented [A32]: MG: This contradicts previous statement about using the soil anywhere on the property

Commented [A33]: LD: The PRSR does not always own the source

property boundaries such that it is a multi-property site) nor should these mixed soils be reused on properties that are not part of the site.

Summary of Important Points to Consider

- Reuse feasibility should be evaluated following the initial soil site assessment. Wide-spread impacts of elevated soil concentrations must be evaluated to determine if the soil is suitable for reuse. Contaminated soils not suitable for reuse should be properly disposed off-site at a permitted facility or managed with institutional and engineering controls on the site.
- The physical soil mixing/blending activity is only allowed within the original impacted soil area(s) (“the footprint”), on an impervious surface, or in a container to prevent the spread of contamination to previously unimpacted areas.
- ~~Any time there is reuse conducted on a site, verification sampling to confirm soils meet the residential direct exposure criteria (or other established ASCTLs) should be conducted at every place on the site where mixed/blended soils were reused.~~
- All soil disposal off-site shall be arranged by the PRSR; all analytical requirements for off-site disposal at a permitted waste facility are directed by the receiving facility and not the Division. The Division only requires that this activity be thoroughly documented in the Remedial Action Site Status Report or Interim Source Removal Report, as applicable.
- ~~All excavation stockpile sampling or mixed soil/blended soil sampling shall be at the discretion of the PRSR. The Division will not make any site decisions based on stockpile sampling results.~~
- Stockpiles are considered temporary soil storage on sites and must be removed before 60 days elapses in accordance with Subparagraph 62-780.500(3)(a)10, F.A.C.² Note if a RCRA site, the timeframe is 90 days and removal must adhere to federal regulations (and on-site reuse is not permissible).
- The Division will allow the use of clean fill to be mixed with site soils for blending purposes.
- It is the responsibility of the PRSR to demonstrate/certify that the fill soil is clean through laboratory analysis that considers the source of the clean fill. The analysis is recommended to be comprehensive and more than just the site constituents of concern. However, this sampling and analysis of the imported clean fill is a recommendation only and not a requirement. The Division does not regulate the use of backfill under Chapter 62-780, F.A.C. If the imported clean fill is at a later time found to be a source of contamination, the PRSR will be liable for cleanup.
- ~~If clean fill is imported to the site for blending purposes, as with all blended soil that is placed on the site, all placement areas should include follow up verification sampling to~~

² For RCRA cleanups, hazardous soils can be consolidated within an Area of Contamination (See EPA guidance) without being considered placement. If hazardous soils are moved outside of an AOC and placed on the ground, “placement” occurs along with Land Disposal violations. There is a 90-day limit for storage in containers and/or tanks or a containment building without a permit. RCRA does have a 40 CFR Part 270 Subpart H RAP (a type of RCRA permit) for temporary storage (up to 2 years) in a Staging Pile that can be used for management of hazardous soils.

Commented [A34]: MJ: This may present a logistical challenge if the area is small. If additional land is needed to stockpile and blend the soils and proper site preparations are taken to prevent any contaminant migration (e.g., impervious surface, stormwater/erosion controls, etc.), would the FDEP allow a variance?

Commented [A35]: In accordance with Rule 62-780.525(5)(a)7, excavated contaminated soil is allowed to be stockpiled on an impermeable surface; therefore, if soil mixing/blending occurs on impermeable or impervious surfaces, along with applicable controls, contamination spread would be controlled.

Commented [A36]: TG Edit: The physical soil mixing/blending activity is typically only allowed within the original impacted soil area(s) (“the footprint”). If blended soils are spread beyond the original area of impact, then confirmation samples will be required to ensure that soils meet the applicable SCTLs.
TG Comment: This is a new concept that others may not agree with.

Formatted: Font: Bold

Commented [A37]: MJ: Can the clean fill be used from other areas on the property outside the “contaminated site”?

Commented [A38]: MG: Including clean fill from off-site

Commented [A39]: JP: Mention quarry fill here? Quarries certify that soils are free from contamination.

Commented [A40R39]: FDEP: Demonstration that fill is contamination free is the responsibility of the PRSR regardless of the source (e.g. if it is from a quarry).

Commented [A41]: JP: Imported clean fill?

Commented [A42]: LD: Introduces another different term. Isn't it just “fill”?

Commented [A43R42]: FDEP: Agree – the document has been revised for consistency.

confirm the residential direct exposure criteria (or established ASCTLs) are not exceeded.

- Clean fill imported to the site should be tested as required by applicable Clean fill guidance documents prior to transportation to the site, and strictly used only as backfill does not require verification sampling. Any sampling of backfill is at the discretion of the PRSR to document the fill material is free from contamination. The source of imported fill should be documented. Additionally, the site locations where the clean fill is placed should be documented.
- Soil reuse actions should be thoroughly planned in a Soil Management Plan (SMP) section of the RAP or Interim Source Removal Proposal (ISRP), as applicable, and documented in the Remedial Action Site Status Report or Interim Source Removal Report, as applicable. The SMP should be approved by the FDEP prior to implementation of soil reuse activities.
- Soils blended for reuse may be used anywhere on within the site footprint provided verification sampling is conducted to confirm that the appropriate SCTL was achieved and all locations where reuse occurred are documented.

Initial Site Assessment

Prior to making any decision regarding the allowance of reuse on a site where rehabilitation is being conducted under Chapter 62-780, F.A.C., a complete initial site soil assessment is required. The results from the initial soil assessment should be used to evaluate if blending of soils is achievable to meet the lowest applicable default SCTL (or established ASCTL) for the site. The PRSR at this stage should be made aware that site closure decisions are not made based on stockpile sampling and any stockpile sampling will be at the discretion of the PRSR. Additionally, the PRSR should be made aware that any plans to reuse soil through soil mixing or blending activities should be followed by verification sampling everywhere on site the reused soil is placed. A verification sampling and analysis plan should be submitted with the SMP.

The FDEP site manager should be aware that additional soil assessment may be required to make the reuse feasibility determination. Also reuse may be proposed at various stages of the project and each proposal should be evaluated on its own merits. Approval of reuse does not set a precedent for approval of reuse at a later project stage.

Developing a Soil Management Plan, should be completed in accordance with the Soil Management Plan guidance document.

Developing a Soil Management Plan

A Soil Management Plan should be developed anytime soils are excavated, stockpiled, mixed with other site soils, or soil is imported for use in blending, and then the soils are reused on a site. The SMP should be comprehensive and cover all soil management activities. A SMP is intended to document how site soils are managed to prevent contamination of soils that were found not to be impacted as part of the initial site assessment. The SMP should include

Commented [A44]: TG: I would consider expanding this to say that blended soils may be used anywhere within the property; however, in-situ confirmation samples are required for blended soils used outside of the original area with established soil impacts.

Commented [A45]: JP: Should be part of the SMP

Formatted: Font: Not Bold

location figures of where removal actions are planned, the depth of removal actions, if groundwater will be encountered, where stockpiles and soil mixing activity are planned, how excavated soil will be moved to the stockpile area, how stockpiles will be managed—including what impervious surface will the stockpiled material be placed on, what stormwater/erosion safeguards will be put in place, and how will the stockpiles be managed to prevent dust issues; how will soils be mixed, any sampling that will be conducted for the stockpiles, how will contaminated soils be transported on site, and how will mixed soils be transported on site.

Documentation needs to be provided for all soils disposed off site (name of facility, address, volume, what site constituent caused the soils to be disposed off site).

The SMP should describe if clean fill will be imported for the purpose of mixing with impacted site soils and subsequently be reused on site. If reuse will occur, then a verification soil sampling plan should be proposed including sampling procedures, number of samples, sampling depth intervals, definition of exposure unit(s) and map figure(s) showing areas of reuse with sample locations (see Verification Sampling discussion).

The source of the clean fill and volume imported for blending purposes should be documented and any analysis that was performed for clean certification should be provided.

If soils are to be reused, a verification sampling and analysis plan should be provided. The sampling and analysis plan should define the exposure unit(s) used for verification sampling, and the proposed number of samples and locations within the exposure unit(s).

The SMP should include the proposed process to be followed if verification sample results exceed the applicable SCTL(s), including any corrective actions to be taken to remove failing soils from the site or to propose an engineering control.

Stockpiles

All stockpiles either of contaminated soil from removal action or with blended soil for reuse should be managed in accordance with the following recommended guidance:

When excavated contaminated soil or sediment is temporarily stored or stockpiled outside the footprint on site, the soil or sediment shall be placed on an impermeable surface to prevent

runoff. Any excavation shall be secured to prevent entry by the public. The temporary storage or stockpiling of excavated contaminated soil or sediment shall not exceed 60 days, unless it is stockpiled on a right-of-way, in which case it shall be removed for proper treatment or proper disposal as soon as practical but no later than 30 days after excavation.³ The PRSR is advised that other federal or local laws and regulations may apply to these activities.

³ Stockpiling of hazardous media outside of the AOC is prohibited under RCRA as noted above.

Commented [A46]: MJ: If the blending activities can only occur within the footprint of the "contaminated site" as stated under Summary of Important Points to Consider, then do they have to be placed on an impervious surface? Soils are frequently excavated and stockpiled in place and then blended.

Commented [A47]: TG: Unnecessary and problematic.....stockpiles are limited to the impacted area. Difficult to blend soils that are placed on plastic.

Commented [A48]: TG: What COCs caused soils to be removed for offsite disposal should be in the RAP/ISRP and not associated with the offsite disposal documentation. Waste manifests and weigh ticket information only. As stated previously, "...all analytical requirements for off-site disposal at a permitted waste facility are directed by the receiving facility and not the Division."

Commented [A49]: MJ: Although not required

Commented [A50]: TG: Redundant from two paragraphs previous.

Commented [A51]: MG: Outside of the treatment footprint

Commented [A52]: GS: If the pile is covered to prevent exposure to precipitation, how is the potential leaching likely to occur? This is overly burdensome in my opinion, especially if the stockpiles are within the footprint of the contaminated soil anyway.

TG: I agree. Stockpiles are within contamination footprint. Impossible to blend soils that are on plastic. Eliminate this requirement.

Commented [A53]: TG: Why. Blending, lab analysis, potential re-sampling, soil management could easily extend beyond 60 days. Change to stockpiling or storage should not exceed the time limits established in the SMP.

Stockpile Sampling Procedures

FDEP recommends stockpile sampling using ISM. ISM is a structured composite sampling methodology that reduces data variability and provides an accurate estimate of the mean concentration. Typically, an ISM sample is obtained by dividing the stockpile into Decision Units (DUs). The DU is divided into a number of grids equivalent to the number of increments in the sample. Then, one increment is taken from each grid at a location determined using a random number generator. The location can be the same or a new location can be determined for each grid.

Decision Unit Rationale and Characterization

Decision units are defined as the volume of soil over which decisions should be made. The DU volume for a stockpile is based on three factors:

1. Contaminants of concern (COCs);
2. Proposed land use for re-use of stockpiled materials (residential or commercial/industrial); and
3. Total volume of stockpiled material.

The following table provides a summary of default DU volume based on COCs. Alternate DU volumes may be proposed that are supported by and incorporate site specific factors.

<u>Contaminants of Concern*</u>	<u>Land Use for Re-Used Stockpiled Material</u>	<u>Default Stockpile DU Volume (cubic yards)</u>	<u>Exposure Considerations</u>
<u>Volatile Organic Compounds</u>	<u>Any</u>	<u>20</u>	<u>Direct exposure</u>
<u>Highly Leachable, Non-Volatile Contaminants</u>	<u>Any</u>	<u>20</u>	<u>Leachability to surface and groundwater</u>
<u>Low Mobility, Nonvolatile Contaminants</u>	<u>Unrestricted</u>	<u>100</u>	<u>Direct exposure</u>
	<u>Residential</u>	<u>500</u>	
	<u>Commercial/Industrial</u>	<u>1000</u>	

*Volatile Organic Compounds are Volatile Organic Aromatic and Volatile Organic Halocarbons (EPA Method 8260 or equivalent). Highly Leachable Non-Volatile Contaminants include triazine herbicides, organophosphate herbicides, chlorinated herbicides, 1,4-Dioxane, perchlorate

Refer to the Interstate Technology & Regulatory Council (ITRC) Incremental Sampling Methodology for sample collection and analysis procedures for each group of COCs listed in the table above.

Sampling During Stockpile Formation

Collecting samples from the soil while it is being transferred from the source area to a stockpile permits equal and unbiased access to the entire mass of soil and the preparation of representative samples. Appropriate DU areas and volumes are established in the field during excavation. DUs are then excavated one at a time and sampled as the soil is being transferred to or placed in the stockpile. When implementing this approach, the individual increments can be collected directly from heavy equipment (e.g., front end loader buckets) at appropriate intervals based on the appropriate DU volume as the stockpile is being formed.

Sampling After Stockpile Formation

Because stockpiles are various shapes and sizes, accessing DUs in the interior of a stockpile can be difficult and unsafe. Two approaches for stockpile sampling are recommended. For both approaches, increments should be distributed across the surface of the DU and at depth so that increments accurately represent the entire DU volume.

- (1) Stockpiles can be flattened or spread to a specified depth and grids are assigned across the surface of the stockpile. The soil is sampled similar to surface soil ISM sampling.
- (2) If the stockpile cannot be flattened, increments can be sampled from a vertical side of the stockpile to a depth equivalent to a volume of the DU. These samples should be taken horizontally into the stockpile. The number of vertical walls or cuts into a stockpile is determined by the size of the DU.

ISM Sampling Procedures

A minimum of 30 increments and three replicates for each ISM sample is recommended. Thirty increments have been shown to achieve 95% coverage of the mean in simulation studies when three replicates are used. This recommendation is also supported by a decade of practitioner experience that concludes 30 increments is sufficient to control the random heterogeneity in most instances. In order to be health protective and provide an accurate estimate of the mean concentration, a 95% UCL should be used. For the calculation of a 95% UCL, a minimum of three replicates is required. All DUs should be sampled in triplicate. Extrapolation of variance between DUs to calculate a 95% UCL is not recommended unless it can be reasonably assumed that the distribution of contaminants in the stockpile is homogenous.

Conventional Composite Sampling Procedures

Independent grab samples may be proposed for use in the SMP. The number of independent grab samples must be sufficient to provide a statistically accurate representation of the soils in question.

Due to the time required to process samples, ISM is not always feasible for stockpile sampling on large-scale redevelopment projects. The following are procedures for collection of conventional samples from stockpiles.

Formatted: Font: Not Italic

The default DU volumes also apply to conventional composite stockpile samples. The table below specifies the number of samples required for each type of COC.

<u>Contaminants of Concern</u>	<u>Land Use for Re-Used Stockpiled Material</u>	<u>Default Stockpile DU Volume (cubic yards)</u>	<u>Number of Composite Samples for Non-Volatile Compounds</u>	<u>Number of Discrete Samples for Volatile Organic Compounds</u>
<u>Volatile Organic Compounds</u>	<u>Any</u>	<u>20</u>	<u>NA</u>	<u>1 sample per DU volume</u>
<u>Highly Leachable, Non-Volatile Contaminants</u>	<u>Any</u>	<u>20</u>	<u>1 sample per DU volume</u>	<u>NA</u>
<u>Low Mobility Contaminants</u>	<u>Unrestricted</u>	<u>100</u>	<u>1 sample per DU volume</u>	<u>NA</u>
	<u>Residential</u>	<u>500</u>	<u>3 samples per DU volume</u>	
	<u>Commercial/Industrial</u>	<u>1000</u>	<u>5 samples per DU volume</u>	

Each composite sample will be comprised of equal amounts of soil from depths of 1/6, 1/3 and 2/3 of the pile height. A single composite sample should consist of three individual samples collected from these heights within a stockpile at a single location.

Samples to be analyzed for VOCs must be collected as discrete samples, not composites.

Samples shall be collected in accordance with Chapter 62-160, Florida Administrative Code (FAC), Standard Operating Procedures (DEP SOP-001/01 or most recent revision).

All stockpile sampling shall follow all applicable safety requirements (OSHA, NFPA, safety plan, etc.).

References

Interstate Technology Regulatory Council, Technical Regulatory Guidance, 2020, *Incremental Sampling Methodology (ISM) Update*

Miami-Dade County Department of Environmental Resources Management, 2004, *Soil Reuse Guidance for Miami-Dade County*, SWP-Guidance No. 1, Pollution Remediation Section

State of Hawai'i Department of Health, Hazard Evaluation and Emergency Response Office, 2011, *Guidance for the Evaluation of Imported and Exported Fill Material, Including Contaminant Characterization of Stockpiles*

Stuchal, Leah D. and Roberts, Stephen M., 2020, *Stockpile Sampling for Soil Reuse at a Site Whitepaper*, prepared for the Florida Department of Environmental Protection Division of Waste Management

Verification Sampling

Verification sampling and analysis should be performed any time site soils are mixed/blended and reused for any purpose anywhere on the site.

- The verification sampling and analysis plan should be thoroughly documented in the SMP.
- Verification sampling should only be conducted after the mixed soils are reused on the site.
- The locations where reused soils are placed needs to be thoroughly documented and the areas precisely located on site figures.
- Verification sampling should be conducted within the direct exposure interval of 0-2 ft below land surface for the areas where blended or mixed soils were reused. Where blended soils were placed deeper than 2 ft, verification sampling should be conducted to the full depth of the reuse fill area.
- Point samples are not allowed and all soil sampling should be conducted in accordance with 62-780.600, F.A.C. and FDEP Field Sampling Standard Operating Procedures.
- Verification samples will be used to characterize the reused soil to determine if the soil concentration results meet the appropriate SCTLs (or established ASCTLs).
- Verification sampling can be conducted using either discrete or Incremental Sampling Methodology (ISM) sampling methodologies.
- The verification sampling and analysis plan should include the size of the exposure unit for the verification sampling. The default exposure unit size per 62-780, F.A.C. is ¼ acre (generally the size of a residential lot). However, other sizes of the exposure unit can be proposed but must be approved by the FDEP. Note that larger exposure unit sizes may require a Declaration of Restrictive Covenant to prevent subdivision of the exposure unit.
- The number of verification samples should be at a density which characterizes and ensures the blended soils meet the appropriate SCTLs (or established ASCTLs).

NOTE: The 95% upper confidence limit approach as described in 62-780.680, F.A.C., is a rule option associated with site soil assessment to obtain an average soil contaminant concentration. This approach is not required to determine the number of samples per an exposure unit to determine if the blended soils placed as fill meet the applicable SCTLs.

Evaluation of Verification Sampling Results

Formatted: Font: (Default) Calibri, Underline, Font color: Auto

Commented [A54]: MJ: Should this be over intervals of 0-0.5' and 0.5-2' rather than 0-2'?

Commented [A55]: TG: Is this additional sampling below 2 feet, or a composite from 0 to the total blending depth that may be deeper than 2 feet? Direct exposure is based on the upper two feet only. GS: Unless an institutional control or other methods are used to prevent human exposure? This appears inconsistent with the December 2014 Supplemental Guidance for Application of Direct Exposure SCTLs for Subsurface soils. What if the reuse extends below 12 ft?? Clarification appears warranted

Commented [A56]: Need to define? TG: "Point sample" is not defined. Is this a grab sample? Subsequent statement indicate discrete or ISM samples are allowed.....Please define.

Commented [A57]: JP: If soils are stockpiled and then used as a 2-foot clean fill cap, the upper six inch sampling interval doesn't make sense. Should only sample in 2-ft increments

Commented [A58]: MJ: The intent of the blending and reuse of the soils is to allow for unrestricted residential use. A possible restrictive covenant despite blending of the soils to meet unrestricted use may not be a desired outcome for developers.

Commented [A59]: GS: So in the scenario of a golf course redevelopment or other large scale soil blending operation for subsequent residential development, is this indicating that every proposed residential lot in a 1,000 home development would need to be sampled?? TG: I'm assuming the intent is to limit the use of blended soil to larger, non-residential lots (for instance) so less verification sampling is required?

Commented [A60R59]: FDEP: The options are, dispose of contaminated soil offsite and bring clean fill with no reuse sampling, or blend soils and sample after reuse at a frequency that is sufficiently protective. There is not an option to blend and collect 1 sample per acre, or less.

Commented [A61]: MJ: Can more specific guidance on frequency be provided since the UCL approach is not required to determine the # of samples?

Commented [A62]: TG: Is not required...but is it allowed? Can 95%UCL evaluation results be used for the post-blending action?

Commented [A63R62]: FDEP: Yes, but there should be an IC preventing subdivision of lots to areas less than the EU

The FDEP will evaluate the verification sampling results for each exposure unit.

- If the result exceeds the applicable SCTL, then step out samples may be collected within the exposure unit. Step out samples should continue to be collected at sufficient distances to ensure that all soil exceeding the applicable SCTL has been identified.
- These results should determine if the entire exposure unit needs the soil replaced or if protection can be managed by an institutional or engineering control.

Commented [A64]: JP: What about removing soil around a sampling point and re-testing? This approach is implied in the separate SMP guidance 5)d)v

Commented [A65R64]: If you perform an excavation, you would need confirmation samples, so same idea. We aren't going to assume that an unconfirmed excavation extent removed all of the hot spot.

Commented [A66]: MJ: The soils could also be re-blended and followed by verification

Commented [A67]: TG: Can 95% UCL results be used.
GS: Agree – 95% UCL should be included here

Formatted: Indent: Left: 0.5", Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Between : (No border)

Page 4: [1] Commented [A30]

Author

TG: This contradicts the prior statement that the blended soils are then placed anywhere on the site. Should statement read "...may only be reused and placed within the site boundaries"? If the blended soils meet SCTLs, then there should be no prohibition to using them anywhere.

GS: I agree, but technical suitability for reuse isn't established until post-placement verification sampling, so you could run the risk of contaminating previously un-impacted areas if the soils are re-used outside the footprint and are subsequently found remain at levels > SCTLs.

Page 4: [2] Commented [A31R30]

Author

FDEP: Blended soil can be placed anywhere within the contaminated site for reuse provided the applicable SCTLs have been achieved. The guidance has been revised to provide clarification on soil reuse is acceptable, including the definition of a contaminated site

Subject: RE: Draft ICPG Updates and New Draft Guidance - comments

Good afternoon Brian, _____

FPL offers the following comments to the draft ICPG documents

Draft Guidance for Preparation of Soil Management Plans

1. Will the language for definitions (e.g. Decision Unit, Exposure Unit, etc.) be provided for review?

Draft Guidance for Soil Reuse Involving Soil Mixing/Blending Activities

1. Seeking clarification on whether this guidance is applicable to all development, including commercial and industrial.
2. The definition for contaminated site included in this document is inconsistent with the definition in 376.301 F.S. (which is also referenced in Chapter 62-780).
2. Seeking clarification as to whether the residential direct exposure requirement is applicable to just the top two feet of blended soil or does it extend deeper than 2 feet below land surface (ft-bls)?
3. Seeking clarification as portions of the document reference that blended soils meet the **lowest applicable SCTL** for the site, while in other portions of the document it references blended soils meeting **residential SCTLs**. Will blended soils need to meet the lowest applicable SCTLs or residential SCTLs?

Thank you.

Guidance for Soil Reuse Involving Soil Mixing/Blending Activities at 62-780, F.A.C. Sites

Florida Department of Environmental Protection

Division of Waste Management

District and Business Support Program

Tallahassee, FL

DRAFT – June 2021

Disclaimer:

This document is only intended as guidance when engaging in site activities involving soil reuse including but not limited to soil mixing or soil blending and placement within the contaminated site. If soil reuse is planned for a 62-780 site, a detailed description of the soil reuse activities should be included in the Remedial Action Plan's Soil Management Plan section. Nothing in this guidance supersedes any Federal, State, or Local requirements; nor does it create any new requirements. All applicable Department rules must still be adhered to.

The Florida Department of Environmental Protection (FDEP) District and Business Support Program (DBSP) has prepared this guidance to promote consistency of data interpretation and to conduct soil mixing/blending in a protective manner for sites where soil reuse is performed.

Background

Soil mixing and blending has been allowed by the Division of Waste Management (Division) for several years. The activity is generally associated with large land tracts like former agricultural land or former golf courses that are redeveloped as primarily residential parcels. This guidance may not be applicable to many other types of sites undergoing rehabilitation under 62-780, Florida Administrative Code (F.A.C.).

Commented [A1]: Be consistent: soil mixing/blending or just soil mixing, unless there is a difference between mixing and blending, then define,

Soil mixing has not been performed in a consistent manner from one site to another site. Many times, what becomes the normal practice in one geographic area is performed quite differently in other areas. In retrospect, not all previous soil reuse practices are equally protective and this guidance is intended to ensure that current soil reuse practices are protective regardless of whether they are consistent with precedent.

Soil mixing is a remedial activity where site ~~excavated~~ soils from an area of soil impacts are ~~stockpiled and then~~ physically well mixed with the goal of achieving a blended soil that meets ~~residential~~ the applicable or alternative soil cleanup target levels (SCTLs). The mixing process may occur in-situ or from a stockpile of excavated soil.

Commented [A2]: In SCS' experience, soil blending projects are not limited to residential redevelopments.

Commented [A3]: Most of SCS' soil blending projects have been implemented in-situ, as opposed to in stockpiles. This guidance should be modified to include provisions for both stockpile and in-situ blending.

One important part of soil mixing/blending activities which the Division has found to be inconsistent and therefore potentially not equally protective is the methodology for collection of stockpile samples and the interpretation of the results. The methodology used to create stockpiles, the number of samples collected, the depth within the stockpile from which the sample is collected and the type of sampling process used to collect a sample varies considerably from site to site. Site closure decisions have been made based on such stockpile sampling results and mixed soil stockpile sampling results. Because of the variability in volumes of stockpiles and sampling techniques, it is important to understand whether the sampling results accurately characterize the soil concentrations for the stockpiles. Additionally, these mixed soils have been reused on the site without follow up verification sampling to ensure that the soil meets direct residential exposure SCTLs or other approved alternative SCTLs at residential redevelopment sites.

Unfortunately, there are no easy answers for correcting the uncertainties in stockpile sampling methodology. To date, the Division and other state environmental agencies throughout the United States have not found economical solutions to reduce the uncertainties. In fact, researching other states' practices regarding soil mixing revealed that most states do not allow the blending of soils to achieve lower soil concentrations.

The Division did commission a study by the University of Florida, Center for Environmental and Human Toxicology to evaluate what sampling methodology would be part of Best Management

Practices for site soil reuse. A *White Paper – Stockpile Sampling for Soil Reuse at a Site* (Stuchal and Roberts, December 2020) was prepared. The results of the study indicated that Incremental Sampling Methodology (ISM) yielded the most representative characterization. However, there are still questions regarding the volume of soil to be tested and ISM is labor intensive, especially for stockpile determinations.

To address the uncertainties associated with site soil reuse, this guidance has been prepared. This guidance should not be used to re-evaluate sites which have previously received an approved Site Rehabilitation Completion Order. However, moving forward this guidance is recommended for evaluating all proposed activities.

Purpose

The ~~is~~ intent of this guidance is to provide general criteria for soil mixing/blending projects. Soil mixing/blending is not a viable remedial strategy for all sites. The suitability of mixing/blending soil to meet the applicable SCTLs must be carefully evaluated based on site-specific information, including the desired closure endpoint, the concentrations and distributions of the contaminants of concern (COCs), soil type(s), and the amount of imported fill (if needed to mix/blend with the impacted soil) that the site has the capacity to accept. Soil mixing/blending ratios should be calculated using conservative estimates of COC concentrations to evaluate whether or not soil mixing/blending is expected to be a successful remedial approach for the site. Often, soil mixing/blending projects involve source removals of localized hot spots to support favorable soil blending calculations. ~~intended primarily be focused on large land tracts that are being redeveloped as residential parcels. It is also only intended for use on soils where the contaminant concentrations in existing soils are relatively low and the soil mixing activity will readily result in soil concentrations below the applicable SCTLs.~~ An initial site assessment should be completed ~~conducted~~ for the entire site prior to any source removal or mixing activities being implemented. It is recommended that Remedial Action Plans or Source Removal Plans be approved prior to any reuse activities being conducted on a site.

Commented [A4]: These statements to vague; there are circumstances where mixing/blending could apply to commercial sites (e.g., no engineering control desired) and to sites with high concentrations (e.g., in combination with localized source removal).

This guidance does not promote the reuse of soils that are not suitable for reuse purposes. ~~Soil reuse will generally not be possible on sites where wide spread impacted soil where significant concentrations are present.~~ For example, soil reuse is not allowed for soils impacted by polychlorinated biphenyls (PCBs) or soils that contain a RCRA Listed Waste. It should be noted that soil containing a listed waste may meet residential SCTLs but is still regulated as hazardous and cannot be reused. Hazardous soils are soils that exhibit any one or more of the following properties: ignitability, corrosivity, reactivity, or toxicity. These types of soils must be managed and disposed of in accordance with federal regulations. Please refer to the revised FDEP August 9, 2006 guidance memorandum – *Management of Contaminated Media under RCRA*.

Commented [A5]: SCS generally agrees with this statement, but it is vague and the feasibility of mixing/blending should be based blending calculations..

Soils that are not suitable for reuse should be removed from the site and properly disposed of at an appropriate permitted facility. The off-site disposal of soil will be directed by the Person Responsible for Site Rehabilitation (PRSR) and any soil analysis requirements for off-site disposal will be driven by the receiving waste disposal facility and not the Division. As with any

waste cleanup site, all off-site disposal shall be properly documented within the Remedial Action Status Report with the name and address of the disposal facility, permit information, and transportation volume documentation. Also, figures with the areas of the site where soil was removed, the depth of removal, as well as if groundwater was encountered as part of removal actions should be included in the report.

Definitions –

CONTAMINATED SITE

A contaminated site is the area where the discharge/release impacts exist or have spread from the source. A site may encompass the source property and adjoining properties if the impacts have spread beyond the source property.

FOOTPRINT

The footprint of soil contamination is synonymous with the definition of site.

SOIL REUSE

Soil reuse is considered to be any time site soils that exceed [Chapter 62-777, F.A.C. Residential, Commercial/Industrial or Leachability](#) the applicable SCTLs are mixed within the impacted soil footprint area with other site soils from the footprint or with imported clean fill specifically imported to the site for soil mixing/blending within the contaminated area with the goal to achieve the site specific SCTL(s), and the blended soils are then placed anywhere on the site for any purposes. Verification sampling will be needed for all areas where the blended soils were placed to confirm that the applicable SCTLs have been met. Mixed soil from the site may only be reused and placed with the footprint. Mixed soils should not be placed on properties not owned by the PRSR unless those properties are also within the footprint being remediated nor should these mixed soils be reused on properties that are not part of the site.

Summary of Important Points to Consider

- Reuse feasibility should be evaluated following the initial soil site assessment. Widespread impacts of elevated soil concentrations must be evaluated to determine if the soil is suitable for reuse. Contaminated soils not suitable for reuse should be properly disposed off-site at a permitted facility or managed with institutional and engineering controls.
- The physical soil mixing/blending activity is only allowed within the original impacted soil area(s) (“the footprint”).
- Any time there is reuse conducted on a site, verification sampling to confirm soils meet the residential direct exposure criteria applicable SCTLs should be conducted at every place on the site where mixed/blended soils were reused.
- All soil disposal off-site shall be arranged by the PRSR; all analytical requirements for off-site disposal at a permitted waste facility are directed by the receiving facility and not

Commented [A6]: This term seems to be applied inconsistently throughout the document, sometimes referring to the impacted area and other times to the entire site (as defined). SCS recommends using it to refer to the impacted area or to use the term remedial unit (RU) to differentiate between clean and impacted areas of the site.

Commented [A7]: The term remedial unit could be used here.

Commented [A8]: Does “footprint” here mean soil from anywhere on the site?

Commented [A9]: Please confirm that “footprint” here means the entire site, i.e., mixed soil may be used anywhere on site (including non-impacted areas). Also, if verification testing documents impacts, can the soil be re-blended in place?

Commented [A10]: All sites, regardless of contamination level/distribution, should be evaluated using site-specific information to support the blending/mixing project.

Commented [A11]: Here “footprint” implies the remedial unit (i.e., impacted area). Please clarify that if verification testing documents an exceedance, then re-blending in place (within the new locations, which may be a formerly un-impacted area), is allowed.

the Division. The Division only requires that this activity be thoroughly documented in the Remedial Action Site Status Report.

- All excavation stockpile sampling or mixed soil/blended soil sampling shall be at the discretion of the PRSR. The Division will not make any site decisions based on stockpile sampling results.
- Stockpiles are considered temporary soil storage on sites and must be removed before 60 days elapses in accordance with 62-780.500(3)(a)10, F.A.C.¹ Note if a RCRA site, the timeframe is 90 days and removal must adhere to federal regulations (and on-site reuse is not permissible).
- The Division will allow the use of clean fill to be mixed with site soils for blending purposes.
- It is the responsibility of the PRSR to certify that the soil is clean through laboratory analysis that considers the source of the clean fill. The analysis is recommended to be comprehensive and more than just the site constituents of concern. However, this sampling and analysis of the imported clean fill is a recommendation only and not a requirement. The Division does not regulate the use of backfill under 62-780, F.A.C. If the imported clean fill is at a later time found to be a source of contamination, the PRSR will be liable for cleanup.
- If clean fill is imported to the site for blending purposes, as with all blended soil that is placed on the site, all placement areas should include follow up verification sampling to confirm the ~~residential direct exposure~~ applicable criteria ~~are~~ is not exceeded.
- Clean fill imported to the site and strictly used only as backfill does not require verification sampling. Any sampling of backfill is at the discretion of the PRSR to document the fill material is free from contamination.
- Soil reuse actions should be thoroughly planned in a Soil Management Plan (SMP) section of the RAP or Interim Source Removal Proposal (ISRP) and documented in the Remedial Action Site Status Report. The SMP should be approved by the FDEP prior to implementation of soil reuse activities.
- Soils blended for reuse may be used anywhere on the site provided verification sampling is conducted to confirm that the appropriate SCTL was achieved and all locations where reuse occurred are documented.

Initial Site Assessment

Prior to making any decision regarding the allowance of reuse on a site where rehabilitation is being conducted under 62-780, F.A.C., a complete initial site soil assessment is required. The results from the initial soil assessment should be used to evaluate ~~d~~ if blending of soils is

¹ For RCRA cleanups, hazardous soils can be consolidated within an Area of Contamination (See EPA guidance) without being considered placement. If hazardous soils are moved outside of an AOC and placed on the ground, “placement” occurs along with Land Disposal violations. There is a 90-day limit for storage in containers and/or tanks or a containment building without a permit. RCRA does have a 40 CFR Part 270 Subpart H RAP (a type of RCRA permit) for temporary storage (up to 2 years) in a Staging Pile that can be used for management of hazardous soils.

achievable to meet the lowest applicable SCTL for the site. The PRSR at this stage should be made aware that site closure decisions are not made based on stockpile sampling and any stockpile sampling will be at the discretion of the PRSR. Additionally, the PRSR should be made aware that any plans to reuse soil through soil mixing or blending activities should be followed by verification sampling everywhere on site the reused soil is placed. A verification sampling and analysis plan should be submitted with the SMP.

The FDEP site manager should be aware that additional soil assessment may be required to make the reuse feasibility determination. Also reuse may be proposed at various stages of the project and each proposal should be evaluated on its own merits. Approval of reuse does not set a precedent for approval of reuse at a later project stage.

Developing a Soil Management Plan

A Soil Management Plan should be developed anytime soils are excavated, stockpiled, mixed with other site soils, or soil is imported for use in blending, and then the soils are reused on a site. The SMP should be comprehensive and cover all soil management activities. A SMP is intended to document how site soils are managed to prevent contamination of soils that were found not to be impacted as part of the initial site assessment. The SMP should include location figures of where removal actions are planned, the depth of removal actions, if groundwater will be encountered, where stockpiles and soil mixing activity are planned, how excavated soil will be moved to the stockpile area, how stockpiles will be managed – including what impervious surface will the stockpiled material be placed on, what stormwater/erosion safeguards will be put in place, and how will the stockpiles be managed to prevent dust issues; how will soils be mixed, any sampling that will be conducted for the stockpiles, how will contaminated soils be transported on site, and how will mixed soils be transported on site.

Documentation needs to be provided for all soils disposed off-site (name of facility, address, volume, what site constituent caused the soils to be disposed off-site).

The SMP should describe if clean fill will be imported for the purpose of mixing with impacted site soils and subsequently be reused on site. If reuse will occur, then a verification soil sampling plan should be proposed including sampling procedures, number of samples, sampling depth intervals, definition of exposure unit(s) and map figure(s) showing areas of reuse with sample locations.

The source of the clean fill and volume imported for blending purposes should be documented and any analysis that was performed for clean certification should be provided.

If soils are to be reused, a verification sampling and analysis plan should be provided. The sampling and analysis plan should define the exposure unit(s) used for verification sampling, and the proposed number of samples and locations within the exposure unit(s).

The SMP should include the proposed process to be followed if verification sample results exceed the applicable SCTL(s), including any corrective actions to be taken to remove failing soils from the site or to propose an engineering control.

Stockpiles

All stockpiles either of contaminated soil from removal action or with blended soil for reuse should be managed in accordance with the following recommended guidance:

When excavated contaminated soil or sediment is temporarily stored or stockpiled on site, the

of excavated contaminated soil or sediment shall not exceed 60 days, unless it is stockpiled on a right-of-way, in which case it shall be removed for proper treatment or proper disposal as soon as practical but no later than 30 days after excavation.² The PRSR is advised that other federal or local laws and regulations may apply to these activities.

Verification Sampling

Verification sampling and analysis should be performed any time site soils are mixed/blended and reused for any purpose anywhere on the site.

- The verification sampling and analysis plan should be thoroughly documented in the SMP.
- Verification sampling should only be conducted after the mixed soils are reused on the site.
- The locations where reused soils are placed needs to be thoroughly documented and the areas precisely located on site figures.
- Verification sampling should be conducted within the direct exposure interval of 0-2 ft (or the thickness of the blended interval if less than 2 feet) below land surface for the areas where blended or mixed soils were reused. Where blended soils were placed deeper than 2 ft, verification sampling should be conducted to the full depth of the reuse fill area.
- Point samples are not allowed and all soil sampling should be conducted in accordance with 62-780.600, F.A.C. and FDEP Field Sampling Standard Operating Procedures.
- Verification samples will be used to characterize the reused soil to determine if the soil concentration results meet the appropriate SCTLs.
- Verification sampling can be conducted using either discrete or Incremental Sampling Methodology (ISM) sampling methodologies.

Commented [A12]: This procedure seems to be applicable to soil addressed by source removal/disposal, but does appear to be necessary for soil mixing/blending, which is done within the remedial unit (impacted area).

Commented [A13]: Define point sample. What is the protocol for ISM sampling of contaminants with acute toxicity SCTLs (e.g., copper)?

Commented [A14]: What is the protocol for ISM sampling of contaminants with acute toxicity SCTLs (e.g., copper)? Since it is not typically feasible to define DUs as individual house lots (or even theoretical ¼-acre plots), is there any available guidance on how to demonstrate uniform concentrations, such that larger DUs (i.e., made up of multiple EUs/house lots) can be supported.

² Stockpiling of hazardous media outside of the AOC is prohibited under RCRA as noted above.

- The verification sampling and analysis plan should include the size of the exposure unit for the verification sampling. The default exposure unit size per 62-780, F.A.C. is ¼ acre (generally the size of a residential lot). However, other sizes of the exposure unit can be proposed but must be approved by the FDEP. Note that larger exposure unit sizes may require a Declaration of Restrictive Covenant to prevent subdivision of the exposure unit.
- The number of verification samples should be at a density which characterizes and ensures the blended soils meet the appropriate SCTLs.

NOTE: The 95% upper confidence limit approach as described in 62-780.680, F.A.C., is a rule option associated with site soil assessment to obtain an average soil contaminant concentration. This approach is not required to determine the number of samples per an exposure unit to determine if the blended soils placed as fill meet the applicable SCTLs.

Evaluation of Verification Sampling Results

The FDEP will evaluate the verification sampling results for each exposure unit.

- If the result exceeds the applicable SCTL, then step out samples may be collected within the exposure unit. Step out samples should continue to be collected at sufficient distances to ensure that all soil exceeding the applicable SCTL has been identified.
- These results should determine if the entire exposure unit needs the soil replaced or **re-blended** or if protection can be managed by an engineering control.

DECEMBER 2021



December 30, 2021

BOARD OF DIRECTORS

Dr. E. Christian Wells
President
University of South Florida

Dr. Krystal Pree Hepburn
President-Elect
EnviroStewards Consulting, LLC

Daniel Nedvidek
Secretary
Pinellas County

Melissa Schick
Treasurer
PPM Consultants

Lisa Duchene
The Goldstein Environmental
Law Firm, P.A.

Frank L. Hearne
Mechanik Nuccio Hearne &
Wester, P.A.

Nadia Locke
E Sciences, Inc.

Beth Norman
Cardno

Keith Wilkins
Keith Wilkins & Associates

Office of District and Business Support
Division of Waste Management
Florida Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Submitted via email: ICPG@FloridaDEP.gov

RE: DRAFT Guidance for Soil Reuse Involving Soil Blending Activities at Chapter 62-780, F.A.C., Sites

Dear FDEP:

On behalf of the Florida Brownfields Association (“FBA”), we thank and commend the Florida Department of Environmental Protection (FDEP) for your work on the above-referenced draft guidance document.

The FBA Legislative, Policy & Technical Committee has reviewed the draft guidance document with many perspectives and stakeholders included. Please accept for consideration of revisions, the comments, edits and suggestions outlined using tracked changes in the attached version of the draft guidance document.

The FBA Legislative, Policy & Technical Committee is available to answer any questions or provide further clarification of the intent of the suggestions, which are meant to enhance and ease the implementation of the guidance for FDEP and practitioners as well as stakeholders of Brownfields sites or any affected properties. To this end, The FBA Legislative, Policy & Technical Committee would support meeting with the FDEP draft guidance committee to review the suggestions and provide additional insight to assist with the further development of the guidance document.

We look forward to ongoing collaboration with the FDEP to reach consensus on matters that are in the best interest of the State of Florida on these important documents. Please feel free to contact me with any questions.

Sincerely,

A handwritten signature in black ink that reads "E. Christian Wells".

Dr. E. Christian Wells, President
Florida Brownfields Association

c/o The FBA Legislative, Policy & Technical Committee:

Frank L. Hearne, Co-Chair, frank@floridalandlaw.com
Stephen Hilfiker, Co-Chair, shilfiker@ermi.net
Michael Sznajstajler, Co-Chair, michael.sznajstajler@CobbCole.com
F. Joseph Ullo Jr., Co-Chair, jullo@stearnsweaver.com

Janet M. Peterson, Janet.Peterson@apexcos.com
Laurel Lockett, llock@carltonfields.com
Lisa M. Duchene, lduchene@goldsteinenvlaw.com
Jorge Caspary, JCaspary@cameron-cole.com
Jason Lichtstein, Jason.Lichtstein@akerman.com
Jay Nordqvist, JNordqvist@gseengineering.com
Leslie Herd, lherd@ramboll.com
Terry Griffin, Terry.Griffin@cardno.com
Mary Stewart, mstewart@goldsteinenvlaw.com
Ryan Tuttle, rtuttle@geosyntec.com
Matthew Wissler, mwissler@geosyntec.com
David Latham, dlatham@geosyntec.com
Greg Schultz, Greg.Schultz@cardno.com
Daniel Nedvidek, DNedvidek@co.pinellas.fl.us

Cc: Becky Buice, FBA Executive Director

Attachment via email: FBA Comments on DRAFT Guidance for Soil Reuse Involving Soil Blending Activities at Chapter 62-780, F.A.C., Sites

Guidance for Soil Reuse Involving Soil Blending Activities at Chapter 62-780, F.A.C., Sites

Florida Department of Environmental Protection

Division of Waste Management

District and Business Support Program

Tallahassee, FL

DRAFT – October 2021

DISCLAIMER

This document is guidance for engaging in site activities involving soil reuse including but not limited to soil mixing or soil blending and placement within the contaminated site. Soil mixing and soil blending are used interchangeably within this guidance document. If soil reuse is planned for a Chapter 62-780 site, a detailed description of the soil reuse activities should be included in the site's Soil Management Plan (SMP). This guidance is not intended to provide the mechanics on how to blend soil. Nothing in this guidance supersedes any Federal, State, or Local requirements; nor, as guidance, does it create any new rule requirements under Chapter 62-780, Florida Administrative Code (F.A.C.). All applicable Florida Department of Environmental Protection (Department) rules must still be adhered to.

The Florida Department of Environmental Protection (FDEP) District and Business Support Program (DBSP) has prepared this guidance to promote consistency of data interpretation and to conduct soil blending in a protective manner for sites where soil reuse is performed. Nothing in this document precludes consideration of specific soil management practices on a site-specific basis.

DEFINITIONS

Contaminated Site

The term "contaminated site" is defined in ss. 376.301(11), Florida Statutes, as: "any contiguous land, sediment, surface water, or groundwater areas that contain contaminants that may be harmful to human health or the environment." The definition in Section 62-780.200(47), F.A.C., points to this statutory definition and defines "site" to mean "contaminated site" as defined in the statute. The term "site" should not be confused with or used interchangeably with "property," "facility," "parcel," or other similar terms.

In other words, a contaminated site is the area where contaminants of concern exist or have spread from the source. A site may encompass the source property and adjoining properties if the impacts have spread beyond the source property boundaries. However, it should be noted that not all "contaminated sites" are subject to site rehabilitation under Chapter 62-780, F.A.C. (See 376.30701(1a)(a±), F.S.)

Decision Unit

A Decision Unit (DU) is defined as the volume of soil over which decisions will be made. For ease of analysis, the DU size may be set equivalent to the Exposure Unit (EU) size of the receptor of concern, but this is not required.

Exposure Unit

"Exposure Unit" means an area over which receptors are expected to have equal and random exposure.

To obtain RMO I closure, the exposure unit shall not exceed ¼ acre. To obtain RMO II or RMO III closure, the exposure unit may exceed a ¼ acre if ~~unless~~ it is demonstrated using statistically appropriate techniques, which shall include an appropriate number of samples which are representative of the exposure unit based on the conceptual site model, that the contaminants are uniformly distributed; or, a larger exposure unit has been approved by the Department based on the redevelopment plan and property end use or the implementation of an institutional control to prevent subdivision of the exposure unit.

Soil Reuse

Soil reuse is considered to be any time site soils that exceed Direct Exposure soil cleanup target levels (SCTLs) or other applicable SCTLs are mixed with lesser contaminated soils or with imported clean fill specifically imported to the site for soil blending within the contaminated site with the goal to achieve the applicable SCTL(s). The blended soils may then be placed anywhere within the contaminated site property for which that soil meets the SCTL for reuse provided that the applicable SCTL was achieved. Post-placement verification sampling is recommended for all areas where the blended soils were placed to confirm that the applicable SCTLs have been met. Blended soils should only be placed on the source property and other properties that include within the contaminated site being remediated (i.e., when the site extends beyond the source property boundaries such that it is a multi-property contamination site).

If blended soils meet residential SCTLs, then these soils are considered “clean soil” and may be used anywhere within the property(ies).

Source Property

The term “source property” is defined within the notice provisions of Subsection 62-780.220(3), F.A.C., as “the location from which the contamination originates.”

Stockpile

Excavated, impacted site soils that are accumulated from remedial actions, which are temporarily stored and properly managed in accordance with the site’s SMP to prevent the spread of impacts to uncontaminated areas of the property site.

ACRONYMS

ASCTL	Alternative Soil Cleanup Target Level
BLS	Below Land Surface
COC	Contaminant of Concern
DBSP	District and Business Support Program
DU	Decision Unit

F.A.C.	Florida Administrative Code
Ft	Feet
FDEP	Florida Department of Environmental Protection
ISM	Incremental Sampling Methodology
ITRC	Interstate Technology and Regulatory Council
PCBs	Polychlorinated Biphenyls
PRSR	Person Responsible for Site Rehabilitation
SCTL	Soil Cleanup Target Level
SMP	Soil Management Plan
UCL	Upper Confidence Limit

BACKGROUND

Soil blending has been allowed by the Division of Waste Management (Division) for several years. This guidance was developed for large land tracts like former agricultural land or former golf courses that are redeveloped as primarily residential parcels and for which a person who voluntarily rehabilitates such a property “wishes the Department to review any documents concerning site rehabilitation or issue any order with respect to completion of the rehabilitation tasks.” See Subsection 62-780.150(3), F.A.C. It is important to note that Chapter 62-780, F.A.C., is not otherwise applicable to such properties except in area(s) where a specific discharge or release has occurred (for example, chemical storage or mixing areas) for which liability otherwise exists under applicable provisions of Chapters 376 or 403, F.S. -(See 376.30701(1a)(a1), F.S.). A change in use of property, in and of itself, does not render that property subject to the provisions of Chapter 62-780, F.A.C., or this guidance. This guidance may need to be modified for other types of sites undergoing rehabilitation under Chapter 62-780, F.A.C., if blending activities are proposed. The Person Responsible for Site Rehabilitation (PRSR) may have discussions with the Division to determine the applicability and/or modifications of this guidance.

Soil blending has not always been performed in a consistent manner from one site to another site. Many times, what becomes the normal practice in one geographic area is performed quite differently in other areas. In retrospect, not all previous soil reuse practices are equally protective, and this guidance is intended to provide safeguards so that current soil reuse practices are protective regardless of whether they are consistent with precedent. Soil blending is a remedial activity where site soils from an area of soil impacts are physically blended with non-contaminated soils with the goal of achieving a level of Contaminants of Concern (COCs) in contamination (or “contamination concentration in”) soil that meets the applicable SCTLs.

One important part of soil blending activities which the Division has found to be inconsistent and, therefore, potentially not equally protective is the methodology for collection of stockpile samples and the interpretation of these results. The methodology used to create stockpiles, the number of samples collected, the depth within the stockpile from which the sample is collected, and the type of sampling process used to collect a sample varies considerably from site to site. Site closure decisions have been made based on such stockpile sampling results and blended soil stockpile sampling results. Because of the variability in volumes of stockpiles and sampling techniques, it is important to understand whether the sampling results accurately characterize the soil concentrations for the stockpiles.

There are no easy answers for correcting the uncertainties in stockpile sampling methodology. To date, the Department and other state environmental agencies throughout the United States have not found economical solutions to reduce the uncertainties. In fact, researching other states’ practices regarding soil blending revealed that most states do not allow the blending of soils to achieve lower soil concentrations.

PURPOSE

This guidance has been prepared to address the uncertainties associated with site soil reuse. The guidance should not be used to re-evaluate sites which have previously received an approved Site Rehabilitation Completion Order. The intent of this guidance is to provide general criteria for soil blending projects. Soil blending may not be a viable remedial strategy for all sites. The suitability of blending soil to meet the applicable SCTLs must be carefully evaluated based on site-specific information, including the desired closure endpoint, the concentrations and distributions of the [contaminants of concern \(COCs\)](#), soil type(s), leachability potential, and the amount of imported fill (if needed to blend with the impacted soil) that the site has the capacity to accept. A demonstration should be provided and supported with appropriate documentation that, following soil blending, the soil concentration will achieve the applicable SCTLs. It is recommended that proposed soil blending procedures be approved prior to any reuse activities being conducted on a site. An initial site assessment should be conducted prior [to](#) the implementation of source removal or blending activities.

This guidance does not promote the reuse of soils that are not suitable for reuse purposes. For example, soil reuse is not allowed for soils impacted by polychlorinated biphenyls (PCBs) or soils that contain a RCRA Listed Waste. It should be noted that soil containing a listed waste may meet residential SCTLs but is still regulated as hazardous and cannot be reused. Hazardous soils are soils that exhibit any one or more of the following properties: ignitability, corrosivity, reactivity, or toxicity. These types of soils must be managed and disposed of in accordance with federal regulations. Please refer to the revised FDEP August 9, 2006 guidance memorandum – *Management of Contaminated Media under RCRA*.

Soils that are not suitable for reuse should be addressed in some other manner (e.g., either removed from the site and properly disposed of at an appropriate permitted facility or capped with an engineering control [on the site](#)).

SUMMARY OF IMPORTANT POINTS TO CONSIDER

- Any time there is reuse conducted on a site, verification sampling (or an alternative approved approach) to confirm soils meet the applicable SCTLs should be conducted at every location on the [property site](#) where blended soils were placed.
- Reuse feasibility should be evaluated following the initial soil site assessment. For example, wide-spread impacts of elevated soil concentrations should be evaluated (pilot testing, blending ratio calculations, etc.) to determine if the soil is suitable for reuse. Contaminated soils not suitable for reuse should be properly disposed of off-site at a permitted facility or managed with institutional and engineering controls on the site.
- The physical soil blending activity is only allowed within the original impacted soil area(s) (the contaminated site), on an impervious surface, or in a container to prevent the spread of contamination to previously unimpacted areas.
- All soil disposal off-site shall be arranged by the PRSR; all analytical requirements for off-site disposal at a permitted waste facility are directed by the receiving facility and not

the Division. The rule only requires that this activity be thoroughly documented in report submittals to the Division.

- Stockpiles used for blending activities are considered temporary soil storage and must be removed before 60 days elapse in accordance with Subparagraph 62-780.500(3)(a)10, F.A.C.¹ Note: If the site is a RCRA site, the timeframe is 90 days and removal must adhere to federal regulations (and on-site reuse is not permissible).
- When excavated contaminated soil or sediment is temporarily stored or stockpiled outside the contaminated site, the soil or sediment shall be placed on an impermeable surface to prevent leachate infiltration and secured in a manner that prevents human exposure to contaminated soil or sediment and prevent soil or sediment exposure to precipitation that may cause surface runoff. [When excavated contaminated soil or sediment is temporarily stored in a contaminated area, storage on an impermeable surface is not required.](#)
- The Division will allow the use of imported clean fill to be mixed with site soils for blending purposes.
- It is the responsibility of the PRSR to demonstrate that the fill soil is clean through laboratory analysis that considers the source of the clean fill. The analysis is recommended to be comprehensive and more than just the site COCs. However, this sampling and analysis of the imported clean fill is a recommendation only and not a requirement. The Division does not regulate the use of fill under Chapter 62-780, F.A.C. The expectation is that all imported clean fill will meet the applicable SCTLs. If the imported clean fill is at a later time found to be a source of contamination, the PRSR will be liable for cleanup.
- The source of imported fill and the site locations where clean fill is placed should be documented.
- Soil reuse actions should be thoroughly planned in an SMP and documented in the Remedial Action Plan Report. The SMP should be approved by the FDEP prior to implementation of soil reuse activities (see [Guidance for Preparation of Soil Management Plans](#)).

INITIAL SITE ASSESSMENT

Prior to making any decision regarding the allowance of reuse on a site where rehabilitation is being conducted under Chapter 62-780, F.A.C., a complete initial site soil assessment should be

¹ For RCRA cleanups, hazardous soils can be consolidated within an Area of Contamination (See EPA guidance) without being considered placement. If hazardous soils are moved outside of an AOC and placed on the ground, “placement” occurs along with Land Disposal violations. There is a 90-day limit for storage in containers and/or tanks or a containment building without a permit. RCRA does have a 40 CFR Part 270 Subpart H RAP (a type of RCRA permit) for temporary storage (up to 2 years) in a Staging Pile that can be used for management of hazardous soils.

completed. The results from the initial soil assessment should be used to evaluate if blending of soils ~~is achievable~~ may be used to meet the lowest applicable default SCTL [or established Alternative SCTL (ASCTL) or background concentration] for the site.

Additional soil assessment may be required to make the reuse feasibility determination. Also reuse may be proposed at various stages of the project and each proposal should be evaluated on its own merits. Approval of reuse during one phase of a project does not set a precedent for approval of reuse at a later project stage.

DEVELOPING A SOIL MANAGEMENT PLAN (SMP)

The SMP is a component of the Remedial Action Plan and should include a thorough discussion on how soils will be managed as part of any excavation activities including interim actions. Guidance for developing a SMP is available: [Guidance for Preparation of Soil Management Plans](#).

VERIFICATION SAMPLING

Verification sampling and analysis should be performed to confirm the blended soils meet the applicable SCTLs any time site soils are blended and reused for any purpose anywhere on the property-site. If alternative approaches other than verification sampling are proposed, the alternative should be described in detail and documented in the SMP.

- The verification sampling and analysis plan should be thoroughly documented in the SMP.
- Verification sampling should only be conducted after the blended soils are reused on the property-contaminated site.
- The locations where reused soils are placed should be thoroughly documented and the areas should be precisely located on site figures.
- Verification sampling should be conducted within the depth interval where blended or mixed soils were reused. Typically, placement of blended soil occurs within the top two feet (ft) and verification sampling should be conducted at the direct exposure interval of 0-2 ft below land surface (bls) where blended or mixed soils were reused. Where engineering controls are not utilized, and blended soils were placed deeper than 2 ft, verification sampling should be conducted to the full depth of the reuse fill area. Note this sampling depth interval is different from the standard rule requirement (0-0.5 ft, 0.5-2 ft) because the blended soil is expected to be relatively homogeneous.
- Representative vertical samples should be collected. For example, at the property a-site where soil reuse has occurred within the top two feet, discrete interval verification samples should be collected from homogenized soil collected from 0-2 ft bls, and not at a single sample depth interval (e.g. a point sample collected at 1 ft bls). Note: this does not apply when sampling for volatile organic compound (VOC) analysis.

- Verification samples should be used to characterize the reused soil to determine if the soil concentration results meet the appropriate SCTLs.
- Verification sampling may be conducted using either discrete (homogenized soil representing the sample interval) or ISM sampling methodologies. Composite sampling methods other than ISM are not used for site closure per Chapter 62-780, F.A.C.
- The verification sampling and analysis plan should include the size of the exposure unit for the verification sampling. The default exposure unit size per Chapter 62-780, F.A.C., is ¼ acre (generally the size of a residential lot). Other sizes of the exposure unit may be proposed but must be approved by FDEP. Note that larger exposure unit sizes may require a Declaration of Restrictive Covenant to prevent subdivision of the exposure unit.
- The number of verification samples should be at a density which characterizes and ensures the blended soils meet the appropriate SCTLs.
- A verification sampling plan is site-specific. The number and placement of verification samples may vary from site to site depending on the [property site](#) layout, where blended soil originated from and its final placement.

NOTE: The 95% upper confidence limit approach as described in Rule 62-780.680, F.A.C., is a rule option associated with site soil assessment to obtain an average soil contaminant concentration. This approach is not required to determine the number of samples per exposure unit to determine if the blended soils meet the applicable SCTLs.

EVALUATION OF VERIFICATION SAMPLING RESULTS

The FDEP will evaluate the verification sampling results for each exposure unit.

- If the result exceeds the applicable SCTL, then ~~step~~-out samples may be collected within the exposure unit. Step out samples should continue to be collected at sufficient distances to ensure that all soil exceeding the applicable SCTL has been identified.
- These step-out results should help determine if ~~the entire exposure unit~~ [the area represented by the sample](#) might need the soil replaced or re-blended or if the contamination may be managed by an engineering control.

STOCKPILE SAMPLING VERIFICATION USING INCREMENTAL SAMPLING METHODOLOGY

The Division commissioned a study by the University of Florida, Center for Environmental and Human Toxicology to evaluate stockpile sampling methodology that would be part of Best Management Practices for site soil reuse ([White Paper – Stockpile Sampling for Soil Reuse at a Site](#) (Stuchal and Roberts, December 2020)). The results of the study indicated that Incremental Sampling Methodology (ISM) yielded the most representative characterization. If verification sampling as described above is not conducted, an alternative approach could be to verify that stockpiled blended soils meet applicable SCTLs using ISM as per Interstate Technology and

Regulatory Council (ITRC) guidance and the *White Paper – Stockpile Sampling for Soil Reuse at a Site* (Stuchal and Roberts, December 2020). ISM or an equivalently rigorous stockpile sampling regimen could be allowable for verification of stockpile sampling results. Discrete or composite sampling methods are generally not statistically robust enough characterization methods to be representative of contaminant concentrations for decision making purposes.

ISM is a structured composite sampling methodology that reduces data variability and provides an accurate estimate of the mean concentration. Typically, an ISM sample is obtained by dividing the stockpile into Decision Units (DUs). For ease of analysis, it is recommended that the DU size be equivalent to the exposure area of the receptor of concern. The DU is divided into a number of horizontal and vertical grids equivalent to the number of increments in the sample. Then, one increment is taken from each grid at a location determined using a random number generator. The location may be the same or a new location may be determined for each grid.

A minimum of 30 increments and three replicates for each ISM sample are recommended when using this methodology. All DUs should be sampled in triplicate. In order to be health protective and provide an accurate estimate of the mean concentration, a 95% UCL should be used. For the calculation of a 95% UCL using ISM, a minimum of three replicates per DU are required. Extrapolation of variance between DUs to calculate a 95% UCL is not recommended unless it may be reasonably demonstrated that the distribution of contaminants in the stockpile is homogenous.