UPDATE ON RISK-BASED CORRECTIVE ACTION & CONTAMINATED MEDIA FORUM

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FDEP Strategy for Revisions to Site Cleanup Rules

I • RBCA Rule Consolidation (June 2013)

II • Probabilistic Risk Assessment CTLs (Feb 2014)

III • New Guidance
    • New Rulemaking (780 & 777 FAC)
CMF Principal Focus Groups

- Background
- Soil Direct Exposure and Leachability, Institutional/Engineering Controls
- 62-777 FAC CTLs
- Probabilistic Risk Assessment
- Ecological Risk
Addressing Background Conditions

- FDEP Soil Background Guidance (2012)
- FDEP Groundwater Background Guidance (2013)
- Anthropogenic v. Naturally-Occurring Conditions
- Background Studies & Databases
- Relationship to SRCO
Use of Surface Water CTLs in GW Closure Decision (2014; no written policy)

- Limited GW impacts
- “discharge” to surface water with higher SW CTL
- apply Fresh Surface Water CTL as closure criteria:

<table>
<thead>
<tr>
<th>COC</th>
<th>SW CTL</th>
<th>GW CTL</th>
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<tbody>
<tr>
<td>ARSENIC</td>
<td>50 ppb</td>
<td>10 ppb</td>
</tr>
<tr>
<td>1,4 DIOXANE</td>
<td>120 ppb</td>
<td>3.2 ppb</td>
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</table>

- Proposed legislation was intended to formalize policy (HB 841/SB 1302)
- Could be addressed by rule-making or guidance
Allow Incremental Sampling Methodology (ISM) as an option for soil sampling

- No soil sampling options were removed
- Intent is not to limit other options
- Struck “3X” requirement for direct exposure
- Allow comparison of 95% UCL (discrete or ISM) to default leachability numbers
- Cannot use ISM for comparison to acute numbers
62-780 Proposed Rulemaking

- Additional Options for Evaluating Leachability
  - Intent is to provide an option to take mass into account


- Leachability-based SCTLs shall be based on protection of the GW CTLs (or the alternative CTLs, as appropriate)

- Leachability SCTLs shall not be applicable if FDEP determines, based upon individual site characteristics, and in conjunction with ICs/ECs, if needed, that contaminants will not leach into the groundwater at levels that pose a threat to human health and environment are protected
Options to Evaluate Leachability

1. Soil < 62-777 L-SCTLs
2. When no GW impacts are present, no leachability issue even if soil > 62-777 L-SCTL
3. Where GW concentrations are consistent with “background” - no leachability issue even if soil > 62-777 L-SCTL
4. Use of direct test of soil leachability (SPLP or other)
5. Site specific derivation of L-SCTLs using actual soil characteristics or back-calc from Alterative GCTLs (ie. Poor Quality CTLs)
6. Evaluation of GW data or fate & transport modeling
7. Use of Engineering Controls
8. **CMF Recommendation:** L-SCTLs should not necessarily be “not to exceed” values – should be consideration of mass and distribution of impacts
62-780 Proposed Rulemaking

- Clarified Sampling & Reporting Frequency
  - Sampling frequency & reporting frequency can be established on a site-specific basis
  - Each sampling event does not necessarily require a corresponding report
    - All events must be reported
62-780 Proposed Rulemaking

- Clarified switching from active remediation to natural attenuation monitoring when appropriate
  - Existing language seemed to limit options once active remediation was implemented
  - Not necessary to run systems all the way to GCTLS
  - RMO II and RMO III criteria can be endpoints to active remediation
  - Go straight from active remediation to NAM if desired
    - Post-active remediation monitoring, *per se*, would not be required
62-780 Proposed Rulemaking

- Strengthened language on use of field screening techniques
  - Allow for use in decision-making, with appropriate verification
  - Not limited to determining optimal locations for collecting samples for lab analysis
62-780 Proposed Rulemaking

- Separated Emergency Response & Interim Source Removal (ISR) into two rules
  - More straightforward to implement
  - Separates requirements for emergency response from ISR requirements
  - No ISR options removed
  - Added to Free Product definition, “or a hazardous substance that is present as a solid in its original form as a product or waste material”
62-780 Proposed Rulemaking

- Conditional Closures with Free Product
  - Free product is not migrating and does not pose a risk to human health, public safety or the environment and all affected property owners agree to allow the free product to remain.
  - Language from 376.3071, F.S.:
    - “wherever it is technologically feasible and cost-effective”
Alternative Cleanup Target Levels (ACTLs) under 376.30701, FS

- 62-777 tables are not standards, but offered as conservative ‘walk-away’ defaults
- Overly conservative assumptions embodied in equations result in CTLs not reflective of “actual circumstances of exposure”
- In practice, FDEP reluctant to allow alternative methods or assumptions to derive ACTLs (exception is recreational)
ACTLs Using Probabilistic Risk Assessment (Feb 2014)

- Probabilistic Risk Assessment (PRA) is permitted!
- Allows range/distribution of inputs, rather than single point assumptions
- Must use FDEP Risk Equations
- May use alternative toxicity values from alternative sources meeting rigorous scientific review process
- May define “alternative basis of exposure”
Probabilistic Risk Example

\[
SCTL = \frac{\text{[Target Risk]} \times \text{[Body Weight]} \times \text{[Constants]}}{\text{[Soil Ingestion]} \times \text{[Toxicity]} \times \text{[Exposure Freq]} \times \text{[Exposure Duration]}}
\]

Body Weight

Soil Ingestion Rate

Exposure Duration

Distribution of SCTLs

10%
Probabilistic Risk Assessments

• Several Science/Policy Decisions
  ◦ Forward vs backward risk calculations
  ◦ Selection of input assumptions for modeling (variability and uncertainty)
  ◦ Input distribution shapes
  ◦ Exposure start age – children
  ◦ Soil Ingestion rate
  ◦ Exposure duration
  ◦ Exposure frequency
  ◦ Bioavailability
How Can ACTLs Help?

PRAs - Use distributions to develop new alternative “defaults” to 62-777 Tables:

- Residential Direct Exposure CTL ~2-6x increase
- Com/Ind Direct Exposure CTL ~1.5-4x increase for carcinogens (which tend to drive problems)
- For non-carcinogens less impact because calcs driven by daily exposure (soil ingestion may allow changes up to 2x)

Use Site-specific exposure scenario to define inputs and derive appropriate ACTLs

- For example: 55+ Community Arsenic RES DE CTL 11.7 (v. 2.1)

Proposed Legislation would have limited requirements for using RCs with ACTLs (HB 841/SB 1302)
Florida RBCA Since 2010

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Ecological</th>
<th>Human Health</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Disagreed</td>
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<tr>
<td>DEP --</td>
<td></td>
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</tr>
<tr>
<td>2010</td>
<td>2</td>
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<td>2013</td>
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<td>1</td>
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<td>2014</td>
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<td>1</td>
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<td>2015 (partial)</td>
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<td>1</td>
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<tr>
<td>Totals</td>
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<td>11</td>
</tr>
<tr>
<td>Success Rate</td>
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<td></td>
</tr>
</tbody>
</table>

Note: 2015, partial results are not included in total or success rate tabulations as the year is not complete.
62-777 FAC CTL Rulemaking

- Numerous technical changes considered by EPA since 2005
- Complex task ahead to sort through options - CMF
  - Toxicity Values
  - Exposure Assumptions
  - CTL Formulae
  - Newer EPA Methods
  - Others
- Draft CTLs based only on toxicity factors uploaded to FDEP web site [http://www.dep.state.fl.us/waste/](http://www.dep.state.fl.us/waste/)
Groundwater Equation Considerations

- CTLs based on MCLs will not change
- Include inhalation and dermal pathways
  - Currently required for 780 risk assessment
- Separate equations for mutagenic carcinogens, non-mutagenic carcinogens, and non-carcinogens
  - Accommodate Age Dependent Adjustment Factors (ADAFs) and aggregate resident-type exposure for carcinogens
  - Current GCTLs based on adult-only exposure
  - Potentially use ADAFs for children (mutagenic carcinogens)
- Exclude Relative Source Contribution (RSC)
  - Consistent with Superfund but inconsistent with Office of Water
Deterministic vs. Probabilistic Calculation of CTLs

- Considered range of options for updating 62-777 CTLs
  1. Use existing deterministic equations and just update parameter values
  2. Update deterministic equations and parameter values
  3. Update use probabilistic approach

- Proposing option #2 as best short-term strategy for updating CTLs

- Anticipate eventual full probabilistic approach
  - Need to develop protocols, distributions etc.
Soil Equation Considerations

- **Direct Contact**
  - Change age averaging of body weight and soil ingestion
  - Use RfC instead of RfD<sub>i</sub> for inhalation exposure
    - RfD<sub>i</sub> no longer supported
  - Include ADAFs for mutagenic carcinogens
  - Eliminate extrapolated RfD<sub>d</sub> and calculate dermal dose using RAGS D equations for organics and inorganics

- **Leachability**
  - Add mass-based leachability equation per EPA SSL
Default Exposure Assumptions Considerations

- Based upon current EPA recommendations
  - Exposure Factors handbook, 2011 & updates

  Some body weight, exposure duration, skin surface area and dermal adherence assumptions
  - Full list on website (http://www.dep.state.fl.us/waste/)

- Base groundwater CTL exposure assumptions on child rather than adult only exposures

- Add an outdoor worker scenario
  - Current default commercial/industrial scenario is for indoor worker
Apportionment (i.e., RBCA Killer)

- **Statute**
  - 376.30701(2)(e) Consider the additive effects of contaminants...
  - “Additive effects” means a scientific principle that the toxicity that occurs as a result of exposure is the sum of the toxicities of the individual chemicals to which the individual is exposed.

- **Rule**
  - Apportionment required in 62-780 (sometimes)
  - Not considered if default SCTLs used (disincentive to develop Alt CTLs)
  - Not used for background chemicals
  - Not considered for groundwater (required by Rule but simply ignored)

- **Alternative Interpretation of Statute**
  - Restrict additive effects to Dose Addition
  - Applicable to compounds considered to act in a similar fashion
  - PAHs and Dioxins (e.g., benzo(a)pyrene equivalents)
  - Already considered in Florida Rules
“...examples of ICs that do not require a restrictive covenant are governmental controls that impose restrictions on land use or resource use. Typical examples of other forms of ICs for groundwater at a site include groundwater delineated areas under Chapter 62-524, F.A.C., county or municipal ordinances prohibiting the installation of potable water wells in urban areas or mandating that any new potable well be connected to the county or municipal water delivery system, groundwater classified as undrinkable, and prohibition on installation of wells in potable wellhead protection areas under Chapter 62-521, F.A.C.

When using existing governmental controls to close a site, a site owner is not required to place a restrictive covenant by deed or title to the property if the governmental control achieves the necessary degree of restriction on access to contaminated media.”

- Jorge Caspary Memorandum “Site Closure with Conditions”
Factors To Be Considered:

- **Scope and coverage of the local ordinance(s):**
  - Required connection to municipal water for potable/irrigation;
  - Well construction requirements/limitations
  - Ch. 373 preemption issue: prohibition on installation of new wells

- **Nature and concentration of Contaminants**

- **Size/location of plume**

- **Location of existing improvements**

- **Status of site development (dewatering consideration)**

- **Presence of existing infrastructure for provision of irrigation**

- **Location of existing irrigation wells (if any) relative to plume**

- **Potential for additional construction/impact of construction**

- **Potential for installation of new stormwater features or enlargement of existing stormwater features at or near the affected property**

- **Possible additional guidance from OGC (pending)**
FDEP Definition of “Residential Use”

“The following uses of the Property are prohibited: agricultural use of the land including forestry, fishing and mining; hotels or lodging; recreational uses including amusement parks, parks, camps, museums, zoos, or gardens; residential uses, and educational uses such as elementary or secondary schools, or day care services. These prohibited uses are specifically defined by using the North American Industry Classification System, United States, 2012 (NAICS), Executive Office of the President, Office of Management and Budget. The prohibited uses by code are: Sector 11 Agriculture, Forestry, Fishing and Hunting; Subsector 212 Mining (except Oil and Gas); Code 512132 Drive-In Motion Picture Theaters; Code 51912 Libraries and Archives; Code 53111 Lessors of Residential Buildings and Dwellings; Subsector 6111 Elementary and Secondary Schools; Subsector 623 Nursing and Residential Care Facilities; Subsector 624 Social Assistance; Subsector 711 Performing Arts, Spectator Sports and Related Industries; Subsector 712 Museums, Historical Sites, and Similar Institutions; Subsector 713 Amusement, Gambling, and Recreation Industries; Subsector 721 Accommodation (hotels, motels, RV parks, etc.); Subsector 813 Religious, Grantmaking, Civic, Professional, and Similar Organizations; and Subsector 814 Private Households.”

-- Institutional Controls Procedures Guidance (Nov 2013)
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“Carve Outs” From Model RC

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- Sample “carve out” supplemental text:
  “Notwithstanding the foregoing, nothing herein shall be deemed to prohibit the use or operation of a health club, recreation or fitness facility, including ancillary child or daycare services, provided those uses are wholly contained within a building on the Property including foundation that prevents human exposure to soil.”
ICPG Clarification on Use Restriction

• Use of NAICS sector descriptions to define restricted uses is **not mandatory**

• Alternative descriptions for permitted and/or prohibited uses may be used that are **consistent with the degree and nature of the cleanup exposure conducted and actual conditions of exposure**
Alternative Use Restrictions

- Eliminate NAICS code based definition and replace with narrative that defines specific conditions of exposure that are prohibited.
- Where site-specific ACTLs have been derived – text must capture the essential exposure assumptions upon which the ACTLs were derived.

Example for age restricted community (Arsenic < 7.4 ppm)

“The future use of the Property shall be for residential development; provided, however, no person under the age of eighteen (18) years old may occupy or reside in any residential housing unit or common area, amenity or other improvement which may be constructed on the Property from time to time, for a period exceeding thirty (30) days in any calendar year.

Temporary occupancy that lasts more than four (4) hours on any given day, whether the duration of the temporary occupancy be continuous or in the aggregate, shall constitute ‘occupancy’ of one (1) day for purposes of hereof.”
Alternatives To Blanket Groundwater Restrictions

- Groundwater restrictions can be limited to a particular aquifer or to a limited portion of a property in appropriate circumstances

- Recommend weight of evidence approach (for ICPG):
  - The nature and concentrations of contaminants
  - The affected aquifer(s)
  - Size and location of plume
  - The proposed use(s) of aquifer to be permitted
  - The ability to demonstrate isolation of the proposed restricted aquifer from the aquifer(s) that will remain available for use
  - Interconnections to surface water
Other Department Approved IC Methods

- MOA for Land Use Controls – Port Manatee
- MOARC (JaxPort)
- Government Ordinances*
- Delineated Areas – Rule 62-624, F.A.C.
- MOAs between EPA and WMDs
- Land Use Control and Implementation Plans
FOR IMMEDIATE RELEASE: June 26, 2014

CONTACT: DEP Press Office, 850.245.2112, DEPNews@dep.state.fl.us

DEP, DOT REACH AGREEMENT TO OPTIMIZE PETROLEUM CLEANUP PROGRAM

~Agreement to make petroleum rehabilitation more efficient and economical reached~

TALLAHASSEE – The Florida Department of Environmental Protection (DEP) and the Florida Department of Transportation (DOT) recently signed a Memorandum of Understanding that augments current collaboration between the two agencies to prioritize environmental assessment in areas critical to the expansion of vital transportation corridors. The agreement also ensures taxpayer funds used to remediate petroleum sites located under state roads are optimally utilized.
DEP/DOT Memorandum of Understanding

- Takes Advantage of the inherent “Barriers To Exposure” Provided by the FDOT’s Management of the ROW
  - Physical Barriers, i.e., road pavement, clean fill
  - Administrative Barriers, i.e., FDOT’s permitting process that is designed to control all activities in the ROW

- Currently the MOU is only for petroleum contamination

- IC = MOU + DOT Map Note + recorded notice
Current Evaluation of Controls

- **Section 376.301, Florida Statutes**
  - “Institutional controls” means the restriction on use or access to a site to eliminate or minimize exposure. Such restrictions may include, but are not limited to, deed restrictions, restrictive covenants, or conservation easements.

- **Rule 62-780.680**
  - IC’s and EC’s for NFA shall apply if they are protective of human health, public safety, and the environment.

- When using municipal ordinances is it preempted because it attempts to regulate well construction or consumptive use?
Application of DE SCTLs at Depth for Delineation and Closure (Dec. 2014 Guidance)

- DE SCTLs apply from 0-2’ bls
- If soil > DE SCTL is between 2’-12’ bls, no RC is required if another “suitable IC” is used:
  - “Deed notice” *(form pending)*
  - FDEP IC Registry
- Must complete delineation to RES DE SCTL
- Sampling below water table/in smear zone not required
In Development: Guidance on Use of Engineering Controls

- Provide alternatives to use of 2’ clean fill or impermeable surface to address DE path
- Provide template Engineering Control Maintenance Plan to facilitate approval for typical concrete or asphalt caps
- Eliminate requirement for recordation of complete ECMP in the RC – allow evolution of plan without need for modification of RC
Key Dates

- CMF July 22, 2015 in Tallahassee
  - 9 a.m. to 4 p.m.
  - 62-777 Discussion

- Comments due on Draft Rule 62-780
  - August 31st

- Next Rulemaking Workshop
  - Mid Fall (Tallahassee)
Collaboration Yields Results!

- Better decision-making
- Increased transparency
  - development & implementation of guidance
  - information dissemination
- Rule-making and CMF – Working Together
Thank You!

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