Hazardous Waste, Part B, Combustion Facility, RCRA, Permit Renewals - Requirements for Revised Risk Assessments

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Several VDEQ, Office of Remediation Programs-issued RCRA part B Combustion facility permits will be renewed in the next few years - thus requiring a new review of risk assessment related information. To ensure that the most recent and relevant risk assessment is included in the permit review at the same time available resources are used efficiently, the following list is developed to identify need to revise the risk assessment that is currently included in each permit.

For combustion facilities, the risk assessment depends on the type of waste being treated, emission characteristics of the waste, equipment and processes used for combustion, location, meteorology and topography of the area, results of trial and risk burns, available emission and toxicity factors, list of emission products, feed stream constituents, etc. Thus, more than one aspect of facility operations may trigger the need for a revised risk assessment, and the following list is developed based on these aspects.

Note:

1. *The operating facilities have an additional option to evaluate base-line risk for the current receptors(using the most recent soil (surface and subsurface), groundwater, surface water, sediment, biota and air data). This effort would identify immediate/interim remediation action, if any, which the operating facility may need to take. This base-line risk assessment will represent impacts from past operational history and will have limited use in conducting a revised, permit-related risk assessment that is to be applicable to future facility operations. If baseline risk assessments are conducted, the current media concentrations may be added to the predicted media concentration and included in revised, permitrelated risk assessment.*

2. *If a facility has more than one operating permit for combustion units, the permit will need to be revised to address the overall health impact and ecological impact from the operation of all the combustion units on the property. In such a case, if only one combustion process is changed, the risk assessment representing that unit as well as overall risk assessment will be addressed.*

1. Risk Assessment Revision- Risk Inputs:

This revision will use the same facility information, process information, list of hazardous constituents of concern (HCOCs), waste characteristics, emission sources and emission rates, emission factors, modeled/measured air concentration of COCs, area of maximum deposition, and human and ecological receptors as identified in the current risk assessment. This revision will ONLY include the revised risk calculation and will NOT require combustion process related or air dispersion modeling. If any of the following have changed, the risk assessment will need to be revised.

i. Toxicity values (change in values, new values added/removed)

ii. Changes in EPA guidance on HHRA risk assessment and/or emission data usability guidance
iii. Dermal or gastrointestinal absorption value,
iv. Change in carcinogenic/noncarcinogenic/mutagenic designation
v. Change in volatile/non-volatile designation
vi. Change in particulate emission factor (PEF), volatilization factor (VF)
vii. Fraction available/absorbed
viii. Chemical parameters including but not limited to: Henry's law constant, solubility, diffusivity in air, diffusivity in water, density, partition coefficient, and permeability
ix. Change in overall calculation algorithm and/or intake dose calculation
x. Change in exposure input parameters including but not limited to:
Soil: adherence factor, ingestion rate, dermal surface area and chemical specific parameters;
Surface water: ingestion rate, dermal surface area and chemical specific parameters; Food (fruit/veggies, fish, meat and dairy: ingestion rate; Groundwater: dermal surface area
xi. Addition/change in acute toxicity values
xii. Addition/change in toxicity values for one or more ecological receptors

2. Air Dispersion Modeling/OBODM Revision-Input/topography changes:

This revision will use the same facility information, process information, list of HCOC, waste characteristics, emission sources and emission rates, and emission factors. Unless EPA Region 3 has approved a new air dispersion modeling methodology/protocol for the combustion process being included in the permit review, the facility must use the same model as was used in current permit. If the same model has a more recent updated version available, the recent update may be used but the input parameters should be same as the ones used in current permit. The facility must include scientifically and technically sound justification for change(s) in input parameters and the change(s) would need to be approved by VDEQ, Office of Remediation Programs. Any changes to the following will require revised air dispersion modeling followed by revised risk assessment modeling.

i. Stack parameters such as height, diameter, temperature, velocity, etc.
ii. Building wake effect due to new construction or removal of buildings that were considered in the original modeling
iii. Use of unit emission rate versus constituent specific emission rate
iv. Particle size and density distribution (this is in part governed by the process and the type of waste)
v. Wet scavenging coefficients- for rural and urban setting
vi. Land use in the modeled area. E.g., from undeveloped to residential, especially if new residential area is at or near area of maximum deposition
vii. Meteorological data over last 5 years- if significantly different from what is used in the current model
viii. Significant topography changes such as demolition of hillocks etc.
ix. Any other sensitive model input parameter

3. Waste Characteristic/Process/Trial Burn/Risk Burn/BangBox Changes:

This revision will result in the development of entirely new process modeling, air dispersion modeling, and quantitative human health and ecological risk assessments. Unless EPA Region 3 has approved a new air dispersion model for the combustion process being included in the permit review, the facility must use the same model as used in current permit. If the same model has a more recent updated version available, the recent update may be used but the input parameters should be same as the ones used in current permit. The facility must include scientifically and technically sound justification for changes in input parameters and the changes shall need to be approved by VDEQ, Office of Remediation Programs. Any changes to the following will require a revised risk assessment report:

i. Waste characteristic and/or composition, quantity of waste to be treated, number of days of operations, addition of new waste stream, removal of a waste stream especially if it was used as indicator waste stream for modeling.
ii. Supplemental BangBox emission factors
iii. Emission factors-site specific and literature based
iv. New literature/test results addressing emission testing/studies
v. Revised combustion model (e.g. POLU13)
vi. Combustion process:
    a) new technology
    b) new, or the addition of auxillary fuel
    c) retrofitting old equipment
    d) changes in types and efficiencies of air pollution equipment used
    e) changes in operating parameters to accommodate wider range of waste feed/emission
    f) rates and compositions? (this includes changes in emission rates and may have
    g) implications regarding new trial and risk burns?)
    h) time required to treat the waste
    i) changes in value of default input parameters (e.g. atomizing steam rate)
vii. Newer analytical protocols and equipment that have lower detection limits, thus quantitatively identifying more COPCs in emissions
viii. Any other operational changes that directly or indirectly affect the release of pollutants into the air during operation of the unit
ix. Incorporating MACT limits versus risk based limits and recalculating total risk/hazard

In addition to the above, the risk assessment input may be required during operational phase of the facility. For example, annual soil monitoring may require soil and groundwater screening levels. Also, the permit will include risk based closure guidance.