Six Possible Receptors: How GRBCA Determines Applicable Groundwater (GW) ACLs

I. Local Water Resources Survey (LWRS) and Receptor Field Survey Results:

A. Petroleum Release Investigation Process Summary:

1. **Notification/Identification** to report release and complete initial abatement
2. **CAP-Part A** for initial site characterization including the Local Water Resource Survey (LWRS) and Receptor Field Survey
3. **SISR** to delineate contamination
4. **CAP-Part B** to remediate the contamination

B. LWRS and Receptor Field Survey Possible Results to Include in Risk Evaluation:

All or any combination of receptors listed below located within 500 feet of the release point:

Receptor* (*located within 500 feet of release point*)		Exposure Pathway
1	**Onsite Structure** (*within GW plume footprint*)	**Vapor Intrusion** (*Soil to Indoor Air*)
		Vapor Intrusion (*GW to Indoor Air*)
2	**Offsite Residence** (*outside GW plume footprint*)	**Vapor Intrusion** (*GW to Indoor Air*)
3	**Offsite Non-residence** (*outside GW plume footprint*)	
4	**Nearest Water Well** (*Public or non-public*)	**Direct Exposure** (GW Ingestion, dermal contact)
5	**Surface Water Intake**	
6	**Nearest Perennial Surface Water Body**	

*A default evaluation included in workbook algorithms is the soil to GW leaching pathway/receptor.

II. How GRBCA Identifies the Receptor Most at Risk:

A. GW Evaluation at the Petroleum Release Source Using the Maximum Concentration GW Benzene (MW^{Cmax}):

1. ***"Release Point" Determination:*** RBTL Report Table 9 includes GW COC analytical results for up to 6 GW samples. The onsite GW MW with the highest benzene concentration history will be included in Table 9. This onsite, maximum GW benzene concentration MW is defined as the Release Point. In the workbook, the Release Point is identified by the symbol (MW^{Cmax}) and from, distance to all evaluated receptors is measured. (*NOTE: "Release Point" and "(MW^{Cmax})" are the same and their use is interchangeable.)*
2. ***Analytical Composition of*** (MW^{Cmax})**:** Where GW benzene concentration defines which MW will be the release point, the workbook determines what COCs are assigned to (MW^{Cmax}). Within the GW source area, each MW will exhibit COC concentration results that will vary. Instead of using only the COC values that are from (MW^{Cmax}), the workbook assigns the maximum concentration for each COC from Table 9 to (MW^{Cmax}). This ensures that (MW^{Cmax}) includes the maximum COC values from the GW source area for the risk evaluation to conservatively evaluate applicable receptors.
3. ***(MW^{Cmax}) is the focal point of the risk evaluation, not the receptors:*** Using AOC (MW^{Cmax}), the workbook calculates the GW SSTLs at each evaluated receptor. The workbook then compares these calculated SSTLs to receptor specific MCLs, ISWQs or RBTLs. For each receptor where the calculated SSTLs from (MW^{Cmax}) exceed

applicable MCLs, ISWQs or RBTLs, the workbook then back calculates what GW source area COC concentrations at (***MW^{Cmax})*** is protective of the receptor.

4. ***Five receptors reduced to one:*** The workbook compares the different AOC (***MW^{Cmax}***) GW SSTLs (*or back calculated SSTLs*) for each receptor and selects the lowest SSTLs. For the GRBCA process, up to five (5) of the six (6) receptors are evaluated in this worksheet. The receptors evaluated in this worksheet will be reduced to one receptor. This receptor is identified as the AOPC Receptor Most at Risk and concludes the AOPC SSTL Report evaluation.
5. ***Comparing the AOC GW SSTLs to the AOPC GW SSTLs:*** The Site Summary Report worksheet, Table 1, will include the applicable AOC and AOPC GW SSTLs. These SSTL calculations are based on protective SSTLs calculated at (***MW^{Cmax}***), but for two (2) different receptors (AOC structure and AOPC Receptor Most at Risk). The final comparison in the workbook is completed in Table 1 and the lowest of the AOC SSTL or AOPC SSTL values will be identified as the Receptor Most at Risk for this release and will be depicted in Table 1, blue column, the applicable GW Alternate Cleanup Limits (ACLs).

B. GW Evaluation at a Secondary Source Using a Near Receptor MW (*MW^{NR}*):

A near receptor MW is identified and included in the receptor evaluation for evaluated receptors. The selected MW is considered a secondary source for the receptor. The purpose of this secondary source evaluation results from an expanding GW contaminant plume toward a receptor caused by (a) variability in GW migration rates transporting contaminants, where contaminant transport exceeds attenuation and/or (b) the impact of a very large or ongoing release resulting in high advection. Both possibilities may result in increased risk of exposure to a nearby receptor.

1. ***Selecting a near receptor MW (MW^{NR}):*** Within each evaluated receptor category in risk evaluation, the nearest MW having moderate benzene concentration and located between (***MW^{Cmax}***) and the receptor is used for evaluation. The target GW benzene concentration ideally approximates half that of (***MW^{Cmax})***, but a wider range can be used. Do not use a low detection, GW benzene MW. If no MW meets criteria or is not present, then use (***MW^{Cmax}***), which will duplicate tables, and is acceptable.
2. ***(MW^{NR}) selection(s)may be the same or different for evaluated receptors:*** When GW flow in the release source area is consistently within a direction, ***(MW^{NR})*** may be the same selection for multiple receptors. If radial GW flow, variable GW flow, or high GW head pressure conditions exist at the release source area, then ***(MW^{NR})*** selections for receptors may be different.

*NOTE: If each AOPC receptor (**MW^{NR}**) is known when RBTL Report, Table 9 is completed, the MW(s) can be entered there, saving the user from entering the analytical results in AOPC Table 2.*
NOTE: For a UST site to operate or have operated, Receptor #1, Onsite Structure, is the GRBCA default evaluated receptor. If Receptor 2-6 are not present, Receptor 1, will determine the GW ACLs.

Note: The GW to indoor air pathway for Receptor 1, Onsite Structure, includes the shortest possible distance (depth to GW) and has no lateral distance component. The result is Receptor 1 can be located anywhere within the dissolved plume footprint and the calculated COC threshold levels will not change. If Receptor 2 and/or 3 are present, their foundation type and the distance from the release point are both risk-determining factors. GRBCA publishes the algorithm results for all receptors evaluated. It is possible for either Receptor 2 and/or 3 to have lower calculated threshold levels compared to Receptor 1.