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**Subject:** January 12 NFSS Conference Call (UNCLASSIFIED)  
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Classification: UNCLASSIFIED  
Caveats: NONE

Hello Ann,  
Below is information regarding the pumping activities at Modern for our discussion on Wednesday.

There are two water-bearing zones present at the NFSS: the UWBZ and the LWBZ. The UWBZ and LWBZ are separated by a low-permeability clay unit, which impedes interaction between the two water-bearing units. Modern historically pumped groundwater from the lower water-bearing zone during construction of earlier landfill cells. In July 2005, the Corps met with Modern to discuss the potential impacts of the groundwater extraction on NFSS contaminant transport. Based upon the range of Modern pumping rates, groundwater modeling, and review of hydraulic heads on both NFSS and Modern, the pumping at Modern has a maximum radius of influence in the lower water-bearing zone of up to 2000 feet from the dewatering point on Modern. This influence of Modern pumping on the lower water-bearing zone has been demonstrated by potentiometric surface maps from past Environmental Surveillance Technical Memoranda (see 1996 example). The groundwater flow direction in the upper water-bearing zone (where the uranium groundwater plumes exist) remains unaffected, however, the reversal of groundwater flow direction follows a similar shape as the radius of influence. The hydraulic gradient (or change in water levels over the change in distance between the two monitoring wells), however, is minimal (i.e. 0.003 to 0.007 ft/ft). Therefore, although past Modern pumping activities have reversed groundwater flow direction at NFSS, the impact to contaminant migration is negligible.

Additionally, background groundwater data was collected on Modern Landfill property at locations hydraulically upgradient (upstream) from Modern's landfills. The Modern pumping activities would result in drawing background groundwater off-site onto the property. Although Modern Landfill was a former NFSS vicinity property, the site was investigated, remediated, and independently verified as meeting DOE cleanup criteria. Regardless, a statistical outlier testing was conducted to further ensure the data was representative of background conditions. For example, data from 2 wells located near the former rail line on Modern property were removed from the background dataset, even though their results were less than the safe drinking water standard, before determining background screening criteria because they were statistical outliers.

Background levels for the UWBZ and LWBZ were developed using ProUCL. ProUCL is a statistical software package developed by EPA (2009a) that includes methods to estimate exposure point concentration terms, "not-to-exceed" values, and background threshold values for data sets with and without nondetect observations. Using ProUCL, statistics were obtained for the minimum and maximum detected observations, the 95% normal upper tolerance limit (UTL), the 95% lognormal UTL, and the 95% gamma UTL, if appropriate. Additionally, background levels for analytes in the UWBZ and LWBZ were designated as the lower, and most conservative, of the maximum detected value, the 95% normal UTL, the 95% lognormal UTL, and the 95% gamma UTL. Therefore, the background screening criteria was designed to represent the upper end of background and not based upon a single data point.

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