

[Form 2 (to be reported to Committee on Countermeasures for Contaminated Water Treatment and to be disclosed to public)]

Technology Information	
Area:	(6) Understanding the Groundwater Flow
Title:	Integrated Groundwater Monitoring and Modeling System
Submitted by:	The S.M. Stoller Corporation (Stoller)
<p>1. Overview of Technologies (features, specification, functions, owners, etc.):</p> <p>In similar situations (i.e., complex and changeable groundwater flows through contaminated sites), Stoller has applied a comprehensive and integrated system to understand, monitor, and model the contaminated groundwater movement. This integrated system can include some or all of the following.</p> <p>a) <u>Advanced Geophysical Logging System</u> - This would include:</p> <ul style="list-style-type: none"> • Direct push geo-probes and small diameter bore holes (for rapid installation). • Small diameter spectral gamma logging system. • High-resolution spectral gamma logging system. • Detection limits are less than 0.04 Bq/g for natural radionuclides and most fission products. <p>b) <u>Real-Time Monitoring System</u> - The Stoller geophysical logging system is based on in-situ almost continuous measurements. It does not require sample handling and provides bulk concentration for much larger volumes in comparison to laboratory samples (faster, more cost-effective solution).</p> <p>c) <u>Groundwater Modeling Software System</u> - The Stoller groundwater modeling software systems are flexible and dynamic for both very large and small scale project applications and for different geo-strata and groundwater/contaminant flow conditions. System parameters can be designed to quickly and efficiently model groundwater flow parameters and simulate contaminant diffusion based upon geologic, hydrogeologic, and hydrochemistry conditions. Groundwater modeling software systems, coupled with advanced geophysical logging and real-time monitoring provide the technical basis for empirical understanding of the site conditions at Fukushima Daiichi NPS.</p>	
<p>2. Notes (Please provide following information if possible.)</p> <p>a) <u>Technology Readiness Level</u> - All elements of the Stoller integrated groundwater monitoring and modeling system are operating and have been applied at various radioactively contaminated sites including the US DOE Hanford Site, US DOE Pantex Site, US DOE Fernald Site, US DOE Moab Site, Sellafield (UK), and many others including US state agencies, commercial clients and oil and gas exploration support.</p> <p>b) <u>Challenges</u> - Groundwater monitoring and modeling at the Fukushima Daiichi NPS presents a number of difficult challenges. The complex nature of the groundwater flow coupled with potential contaminant contributions from the plant itself and from tank storage will require a coordinated, complex and integrated system to most effectively monitor and model the situation. Stoller has applied such an integrated system at different sites under similar conditions. Some particular challenges at F-1 are:</p> <ul style="list-style-type: none"> • Complex geology and the potential for complex groundwater paths (Stoller has worked with similar situations). • Operations at a contaminated site (Stoller frequently works under similar situations; e.g., Hanford, Sellafield, and many other sites). • Crowded sites for drilling operations (Stoller has experience with this restriction; e.g., Sellafield). • Proximity to the sea (Stoller has worked at Sellafield with seawater incursion in the groundwater). <p>c) <u>Other Information</u> - Stoller's integrated groundwater modeling system and monitoring equipment can interface with most computer systems, is compact in size, lightweight, and easily transportable with minimal maintenance required.</p>	