Form 2

Technology Information	
Area	6
Title	Understanding the Groundwater Flow
Submitted by	Fluor Federal Services, Inc.

1. Overview of Technologies (features, specification, functions, owners, etc.)

Proposed techniques and approaches to collect data necessary to investigate groundwater flow (geologic condition / groundwater data measurement system, etc.):

- Utilize on site field laboratory for more timely sample results
- Implement more efficient well construction techniques, such as hydraulic hammers, GeoProbes, and cone penetrometers; include angled drilling techniques to mitigate space limitations and interferences
- Use downhole and surface geophysics to gain better understanding on moisture levels, locations and concentrations of gamma-emitting radionuclides, and geologic conditions

Proposed techniques to analyze water quality

- Integrate real-time data monitoring and logging systems for water level and quality sampling and data collection
- Utilize less expensive parameters that correlate with contaminants of concern versus contaminant only sampling; develop these relationships specific to water conditions

Proposed techniques to dig observation holes

- Use alternate data collection and sampling methods, such as drive points and aquifer tubes
- Install permanent well points using small diameter techniques and well design
- Integrate wells and observation holes with geophysical information

2. Notes (Please provide following information if possible.)

- Technology readiness level (including cases of application, not limited to nuclear industry, time line for application)
  - At Hanford, Fluor used a variety of drilling, coring, and direct push methods to access the subsurface; we integrated surface and downhole geophysics into our data collection strategy to maximize overall data sets
  - Fluor replaced sodium iodide radiological detectors with detector crystals made of lanthanum bromide, providing lighter equipment that allows for better energy resolution
  - Most of these techniques are readily implementatable
- Challenges
  - Site-specific geologic conditions
  - Availability of laboratory capacity and capability
  - Regulatory requirements/expectations for data quality
- Others (referential information on patent if any)