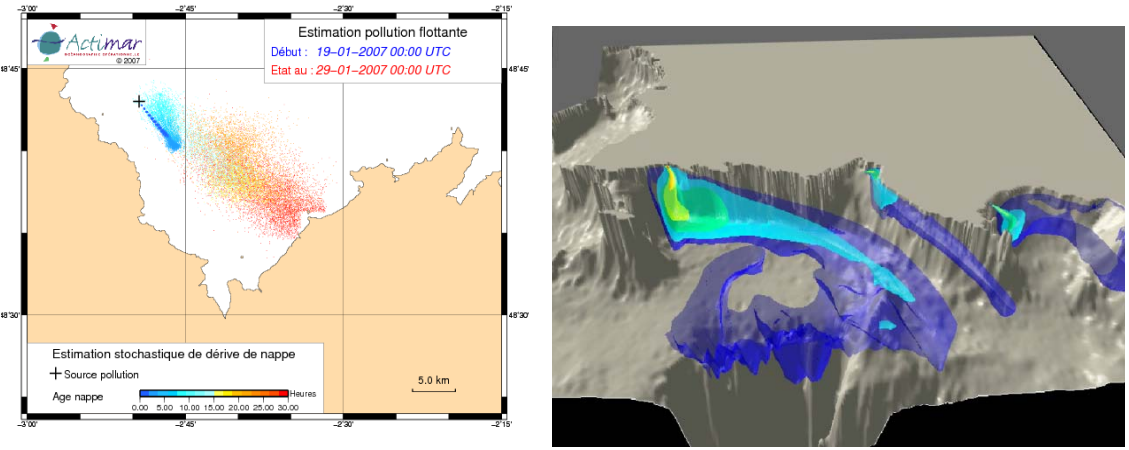


## Form 2

Technology Information	
Area	(7) Understanding the Groundwater Flow
Title	<b>Coupled modelling: groundwater, surface water, hydrodynamic</b>
Submitted by	SAFEGE (SUEZ ENVIRONNEMENT GROUP)
<p>1. Overview of Technologies (features, specification, functions, owners, etc.)</p> <p><b>Summary Description:</b></p> <p>An aquifer model has already been carried out on site.</p> <p>However, the objective here is to develop an integrated operational modelling platform of: groundwater, surface water, runoff, hydrodynamics (sea).</p> <p><b>Advantages:</b></p> <p>This model will:</p> <ul style="list-style-type: none"> <li>• clarify the flow interfaces between these zones through additional acquired data</li> <li>• test the effectiveness of the different solutions / technologies thought of for the site</li> <li>• undertake monitoring of radioactive pollution</li> </ul> <p><b>Specifications:</b></p> <p>The aquifer model with software Feflow or Modflow 3D type allows:</p> <ul style="list-style-type: none"> <li>• 3D Modeling of impermeable walls or remediation wells (hydraulic barrier) with the required accuracy (0.3 m mesh with a “tight wall”)</li> <li>• Test the effectiveness of different degrees of permeabilities of the impermeable wall, etc. ..</li> <li>• Modelling of flows and exchanges with the sea</li> <li>• Modelling of the saline intrusion from sea</li> </ul> <p>The hydrodynamic model with software Seamer allows:</p> <ul style="list-style-type: none"> <li>• 3D high resolution modelling of seawater temperature, salinity and currents</li> <li>• to simulate the dispersion and mixture of liquid discharges</li> <li>• to assess the marine environmental impact induced by different considered solutions</li> </ul>	
	

Modelling of surface waters (rivers, rain water ...) will also be integrated into the platform thanks to existing modeling tools (Mike Flood, Mike 21 ...).

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

**Technology readiness level (including cases of application, not limited to nuclear industry, timeline for application):**

- Accuracy and relevance of the models depend on the quality of the data and expertise of the operator.
- SAFEGE and its subsidiary ACTIMAR are consultancy experts in integrated modelling
- Different modeling tools exist and can be rapidly deployed, as provided sufficient data is available
- The integrated platform needs to be partly developed.

**Challenges:**

- Develop an operational interface between each model.

**Other (referential information on patent if any):**

- SAFEGE holds the patent for the Seamar modeling tool.