

**Integrated Wind and Solar Powered Free-Product Recovery System at Former St. Croix Alumina Site in St. Croix U.S. Virgin Islands**

Timothy Gordon  
U.S. EPA, Region 2  
[gordon.timothy@epa.gov](mailto:gordon.timothy@epa.gov)

A recovery system was required under a 2001 RCRA Corrective Action Order to clean-up a plume of light non-aqueous phase liquids (LNAPLs), comprised mostly of diesel, on the groundwater underlying this bauxite refinery facility. Because the facility was closing and there was no existing hook-up to the local power grid, the Respondents Group recommended installation of a free-product recovery system utilizing pneumatic well pumps powered by 4 wind turbine compressors (WTCs). The WTCs are mounted on masts and resemble farm “wind-mills”. The initial WTC powered, pneumatic pump system came on-line in early 2002. Subsequently, between 2004 and 2007, electric total-fluid and skimmer pumps, powered by solar panels and wind electric generators (WEGs) were added to enhance recovery. The electrical pumps are powered directly, on-demand, from an integrated power supply system consisting of 8 solar panels and 4 WEGs, with no batteries involved. This type of electrical system (no batteries) was chosen because access to the site is not well controlled, and potential theft of batteries was considered a major problem. The downside is that no pumping occurs when there is insufficient wind and sunlight. This was acceptable because the plume is relatively stable and groundwater is not utilized down-gradient of the site.