

**Project: Landfill Monitoring**  
**Client: Yeager Skanska**  
**Location: Milliken Landfill, Ontario, California**  
**Year: 2005**

### Application Notes:

Intermountain Environmental was hired as a subcontractor to install two weather stations each with an array of soil moisture sensors deployed at various depths.

Milliken Landfill is located in the heart of San Bernardino County. Residents in the area had complained about the landfill for many years and the County had taken action to close it. One problem that comes with a landfill is that water penetrates the landfill material and carries all sorts of chemicals in the ground water supply.

There was ongoing groundwater extraction and treatment to minimize off-site migration of contaminated groundwater. A landfill gas flair system was put in place to minimize the dispersion of landfill gas. A portion of the landfill was capped with an alternative cover system. Yeager Skanska was the engineering firm that had the responsibility for monitoring the performance of the cap. They hoped to prove that it would minimize the infiltration of water into the trash of the landfill. They wanted to monitor the design of the cap to show that it would minimize erosion and runoff from the landfill.



*Weather Station installed at the top of the newly capped area of the Milliken Landfill*

They also wanted to monitor the climate at the landfill and especially the amount of precipitation that fell on the capped area of the landfill and how that moisture moved through the top layers of the cap. Yea

### Installation and System Design:

Yeager Skanska had chosen several sites and had a 10 ft. x 10 ft. chain link fence installed around the area they wanted to put the weather stations. We installed one station on the top of the capped area and a second station about halfway down the northern side of the capped area. The weather station included an WS5103 RM Young Wind Speed and Direction Sensor, an RH45 Visalia Relative Humidity and Air Temperature Sensor, a Kipp & Zonen CM3 Pyranometer, a Texas Electronics RG5258 8" Tipping Bucket Rain Gauge, and five Campbell Scientific CS615 Soil Moisture Probes installed at 6", 12", 18", 30" and 42" depths.

The system is powered with a PS12LA Rechargeable Power Supply that is recharged using an MSX10 10-Watt Solar Panel. A Campbell Scientific CR23X Data logger is used to measure and record the data on an hourly basis. The system has an Air Link Redwing Cellular Modem attached to it.

This allows the user to contact the weather station remotely to get both real time information and to poll historical data.

The installation took two days. The most difficult part of the project was getting the cellular phone provider in the area to correctly set up the account for the user. It took several hours and numerous phone calls, but with the help of Intermountain Environmental field technicians the cellular provider finally got the account set up correctly and after that the stations operated flawlessly. We have found that most cellular providers are not familiar with the use of cell phones for data transmission and therefore have a difficult time getting the accounts setup correctly without being guided through the process by someone like an Intermountain Environmental technician.



*Weather Station installed about half way down the north side of the capped area of the Milliken Landfill*

For Information on this project or these products please contact:

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