

EXPLORING EARTH'S MYSTERIES
...PROTECTING ITS FUTURE

Shotgun Range

Facility Environmental Monitoring Report

Calendar Year 2002



July 1, 2003

Prepared by
D. Paquette
Environmental Services Division

GW74ER.03

Brookhaven National Laboratory Shotgun Range

Facility Environmental Monitoring Report

Calendar Year 2002

Summary of Results

Analysis of groundwater samples collected at the Shotgun Range during CY 2002 indicates that range operations have not impacted groundwater quality. Groundwater analyses indicate that all metals (including lead) are at concentrations that are consistent with established background levels. These findings have been consistent since 2000, when the groundwater surveillance program at the Shotgun Range began. It is recommended that the routine groundwater surveillance program for the range be suspended. The wells will be maintained for the collection of routine water level measurements, which are used to assess site wide groundwater flow patterns, and for potential future water quality sampling.

Background

The BNL shotgun range is used for (clay) trap and skeet target shooting by the Brookhaven Employees Recreation Association (BERA). The shotgun range is in an isolated, wooded area north of the new Waste Management Facility. The range was established by the BERA in 1974. Clay targets are thrown south from the trap house into an open field that is approximately 205 feet east–west by 410 feet north–south (Figure 1). Although most of the shot falls within the cleared range, shooting from several of the trap line positions results in the deposition of some of the shot into the nearby woods.

From 1974 until 2000, the types of shotgun shells used at the facility typically contained lead pellet. It is estimated that as many as 30,000 shotgun rounds per year have been used at the range. At an average of 1.125 oz. per round, as much as 2,100 pounds of lead may have been deposited on the surface of the range annually. To prevent additional deposition of lead, in early 2000 BNL implemented a rule that allows only steel shot to be used at the range.

Environmental Monitoring Program

In accordance with DOE Order 5400.1 (Environmental Protection), BNL established a groundwater monitoring program at Shotgun Range to evaluate potential impacts of range operations on environmental quality. In January 2000, BNL installed two wells (046-02 and 046-03) to improve its ability to monitor groundwater quality directly downgradient of the range. The groundwater monitoring program for the Shotgun Range is described in the *BNL Environmental Monitoring Plan* (BNL, 2000; BNL, 2002).

Monitoring Results

In CY 2002, groundwater monitoring wells at the Shotgun Range were sampled in March. All metals concentrations were below the applicable New York State Ambient Water Quality Standards (NYSAWQS) and were consistent with established background levels (Table 1).

Future Monitoring Actions

The following action is recommended:

- Terminate active monitoring. Wells should be maintained for routine water level measurements, which are used to evaluate site wide groundwater flow directions, and for potential future water quality sampling.

References

BNL, 2000. *Brookhaven National Laboratory, Environmental Monitoring Plan 2000* (March 31, 2000).

BNL, 2002. *Brookhaven National Laboratory Environmental Monitoring Plan, CY 2002 Update* (January 2002). BNL-52584 Update.

Table 1. Shotgun Range Metals Analytical Results for CY 2002. Primary contaminants are shown. See database for complete data set.

| Well | Sample Period | Ag | Al | Cd | Cr | Cu | Fe | Hg | Mn | Na | Pb | Zn |
|---------------------|---------------|--------|--------|--------|--------|--------|--------|---------|--------|-----|---------|---------|
| ------(mg/L)----- | | | | | | | | | | | | |
| 046-01 ^a | March | <0.001 | 0.004 | <0.001 | <0.001 | <0.002 | <0.075 | <0.0001 | <0.002 | 5.0 | <0.0013 | <0.004 |
| 046-02 | March | <0.001 | 0.008 | <0.001 | <0.001 | <0.002 | <0.075 | <0.0001 | 0.003 | 3.8 | <0.0013 | 0.008 |
| 046-03 | March | <0.001 | 0.016 | <0.001 | <0.001 | <0.002 | <0.075 | <0.0001 | 0.002 | 3.4 | <0.0013 | 0.009 |
| Typical MDL | | 0.001 | 0.002 | 0.001 | 0.001 | 0.002 | 0.075 | 0.0001 | 0.002 | 1.0 | 0.001 | 0.004 |
| NYSAWQS | | 0.05 | 0.2(a) | 0.01 | 0.05 | 0.2 | 0.3 | 0.0007 | 0.3 | 20 | 0.025 | 2.0 (b) |

^a Well 046-01 is located immediately upgradient of the shotgun range.
 MDL = Minimum Detection Limit
 (a) Drinking Water Standard – Secondary MCL for aesthetic quality.
 (b) NYSDEC Guidance Value.

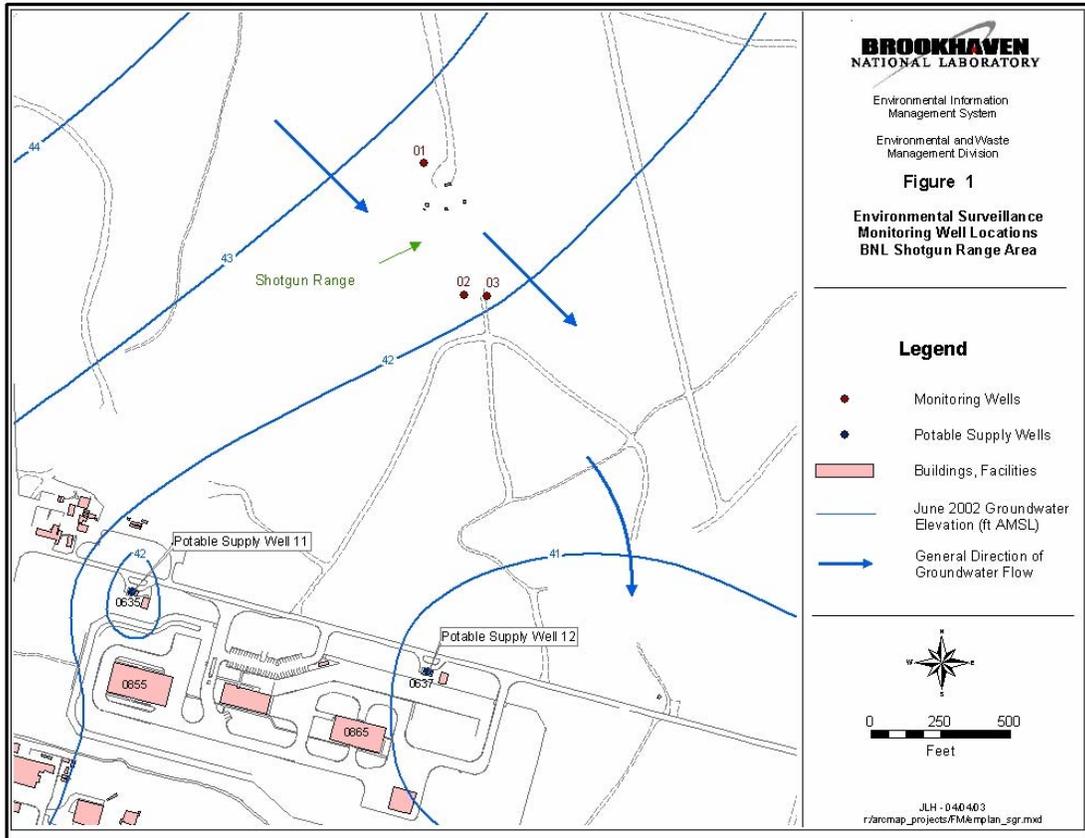


Figure 1. Locations of Monitoring Wells Near the Shotgun Range.