

EXPLORING EARTH'S MYSTERIES
...PROTECTING ITS FUTURE

Brookhaven National Laboratory Biology Greenhouse Area

Facility Environmental Monitoring Report Calendar Year 2001



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**Brookhaven National Laboratory
Biology Department Greenhouse Area
Facility Environmental Monitoring Report
Calendar Year 2001**

Summary of Results: Analysis of groundwater samples collected near the Biology Department's greenhouse area during CY 2001 indicates that greenhouse operations have not impacted groundwater quality. No pesticides were detected, and metals and nitrate levels are at concentrations that are consistent with established background levels.

Background

The Biology Department facility (Building 463) includes 11 greenhouses where various types of plants are grown for biological research. Eight of the greenhouses have dirt floors and three have concrete floors.

Pesticides and fertilizers have been routinely used in the greenhouses. Records also indicate that copper sulfate was applied to the dirt floors on an annual basis until the mid-1980's. During the Facility Review Project, the pesticide Endosulphan II was detected in soil samples collected from a dry well located within Greenhouse 10.

Environmental Monitoring Program

In accordance with DOE Order 5400.1, BNL established a groundwater monitoring program at the greenhouse area to evaluate potential impacts to environmental quality. The monitoring program for the greenhouse area is described in the BNL Environmental Monitoring Plan (Daum *et al.* 2000; BNL, 2001).

Monitoring Results

Groundwater

Two wells are used to monitor groundwater quality in the greenhouse area (Figure 1). The wells were sampled in September 2001, and tested for pesticides, metals, and anions. Groundwater monitoring results indicate that greenhouse operations are not impacting groundwater quality. Pesticides were not detected, and all water quality and most metals concentrations were below the applicable New York State Ambient Water Quality Standards (NYS AWQS) (see Tables 1, 2 and 3). Sodium was detected at a concentration

slightly above the NYS AWQS of 20 mg/L in well 084-36 (Table 3). The detection of low levels of sodium is not uncommon in wells located within the developed area of the site, and could be related to road salting operations.

Future Monitoring Actions

The following actions are recommended:

- For CY 2002, continue sampling the Biology Greenhouse wells on an annual basis. Samples will be analyzed for pesticides, metals, and anions.
- If no contaminants are detected during 2002, reduce sampling frequency to once every two years starting in CY 2003.

References

BNL, 2001. Brookhaven National Laboratory Environmental Monitoring Plan, CY 2001 Update (January 2001). BNL-52584 Update.

Daum, M., Dorsch, W., Fry, J., Green, T., Lee, R., Naidu, J., Paquette, D., Scarpitta, S., and Schroeder, G., 2000. Brookhaven National Laboratory, Environmental Monitoring Plan 2000 (March 31, 2000).

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Pesticides Results for CY 2001**

Table 1

Well	Sample Period	Endosulfan II (see Note 1) (µg/L)
084-36	November*	<0.1
084-37	November*	<0.1
Typical MDL		0.1
NYSAWQS		50 (Note 2)

MDL: Minimum Detection Limit

*: Initial results for samples collected during scheduled September collection period failed QA review.

Note 1: Endosulfan II was the primary contaminant of concern based upon the findings of the Facility Review Project. All other pesticides analyzed for using EPA Method 608 were non-detectable.

Note 2: Specific standard for this compound has not been established. Default standard is 50 µg/L.

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Water Quality Results for CY 2001**

Table 2

Well	Sample Period	Chlorides (mg/L)	Sulfates (mg/L)	Nitrate (mg/L)
084-36	September	47.8	16.8	2.5
084-37	September	41.0	16.8	2.3
Typical MDL		4.0	4.0	1.0
NYSAWQS		250	250	10

MDL: Minimum Detection Limit

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 Metals Results for CY 2001
 Table 3**

Well	Sample Period	Ag (mg/L)	Al (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (mg/L)	Mn (mg/L)	Na (mg/L)	Pb (mg/L)	Zn (mg/L)
084-36	September	<0.001	0.011	<0.001	<0.001	0.003	<0.075	<0.0001	<0.002	24.3	<0.0013	0.005
084-37	September	<0.001	0.007	<0.001	0.002	<0.002	<0.075	<0.0001	<0.002	19.9	<0.0013	<0.004
Typical MDL		0.001	0.002	0.001	0.001	0.002	0.075	0.0002	0.002	1.0	0.001	0.004
NYSAWQS		0.05	0.1	0.01	0.05	0.2	0.3	0.0007	0.3	20	0.025	0.3

Note: Primary potential contaminants shown. Other metals were analyzed for – see database for complete data set

MDL: Minimum Detection Limit

NA: Not analyzed for.

