



Division of Water Resources
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West Virginia Department of Environmental Protection

Bob Wise
Governor

Michael O. Callaghan
Secretary

3 July 2002

Andrew Hartten
Dupont Corporate Remediation Group
Barley Mill Plaza
Building 27
Wilmington,
Delaware 19805

Re: Washington Works and Dupont Landfills
Order # GWR-2001-019
Wood and Mason Counties

Dear Mr. Hartten:

The Groundwater Program of the Division of Water Resources has reviewed the report, *C-8 Plume Identification and Groundwater Assessment Work Plan, Dupont Washington Works Facility and Local, Letart, and Dry Run Landfills*. Also included with this was the report, *Appendix A, Sampling and Analysis Plan for Dupont Washington Works Facility and Local, Letart, and Dry Run Landfills*. These two reports were prepared by your office and were dated May 2002.

The *C-8 Plume Identification and Groundwater Assessment* report proposed the following:

- To install three new groundwater monitoring wells at the Washington Works Facility. These wells will be screened in the bedrock water-bearing zone, and will be located near existing alluvial wells. One well will be located adjacent to the river and just downstream of the anaerobic digester ponds, a second will be located adjacent to the river and upstream of the riverside landfill, and the third will be located on the southern side of the railroad tracks and near the eastern end of the parking lot complex.
- To install four clusters of shallow and deep bedrock monitoring wells at the Local Landfill. The shallow well of each cluster will be screened in the uppermost water-bearing zone, and the deep well will be screened in the underlying significant water-bearing zone. The determination to install the shallow wells will be made in the field and will be based on whether a viable upper water-bearing

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zone is identified in the boring. The four well clusters will be located east of the southeastern landfill cell, east of the northeastern cell, south of the western cell along the unnamed creek found there, and north of the western cell and on the south side of State Route 892.

- To install six new well clusters at the Letart Landfill. The shallow well of these clusters will be screened in the shallowest water-bearing zone encountered (probably Zone A), and the deep wells will be screened in the Zone F water-bearing zone. The determination to install the shallow wells will be made in the field and will be based on whether a viable upper water-bearing zone is identified in the boring. These wells will be located around the perimeter of the landfill. One Zone F well will be located to the northwest of the landfill in an unnamed tributary leading north to Brinker Run, a two-well cluster will be located on the east site of the landfill and southwest of the small building at the site, a two-well cluster will be located southeast of the landfill near the edge of the river valley, and a Zone F well will be located near the river and west of the unnamed tributary that drains the landfill toward the Ohio River.

- To install six new well clusters at the Dry Run Landfill. The shallow well of these clusters will be screened in the shallowest water-bearing zone, and the deep wells will be screened in the underlying zone. The determination to install the shallow wells will be made in the field and will be based on whether a viable upper water-bearing zone is identified in the boring. Five of the proposed well clusters will surround the existing landfill. Two of these will be spaced equally along the northeastern side of the landfill, two will be spaced equally along the southwestern side of the landfill, and the fifth cluster will be located to the south of the landfill in the unnamed tributary that drains south into an unnamed tributary of Pine Run. The sixth well cluster will be located in the Dry Run flood plain about 900 feet northwest and downstream of the landfill pond.

In addition, it is our understanding, after reviewing the *Sampling and Analysis Plan*, that these new wells will be completed in the following manner:

- At the Local and Dry Run Landfills, the shallow, overburden wells will be installed with a truck-mounted hollow stem auger. These wells will be two inches in diameter with a five- to ten-foot well screen.
- At the Letart Landfill, the shallow, overburden wells will be installed with an air rotary drilling rig. These wells will be two inches in diameter with a 20-foot well screen.

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- The deep wells will be two inches in diameter with a 20-foot well screen. These wells will be installed at the Washington Works, the Local Landfill, and the Dry Run Landfill using an air-rotary or roto-sonic drilling rig. The deep wells will be installed at the Letart Landfill using an air rotary drilling rig, and core samples will be collected at this site through the Zone F water-bearing zone. A temporary ten-inch diameter steel surface casing will be set approximately eight feet into competent bedrock to case off the unconsolidated material at each of the four sites.
- A West Virginia Certified Monitoring Well Driller will conduct all well installations in accordance with 47 CSR 60, the *West Virginia Monitoring Well Design Standards*. The borings will be advanced until refusal, i.e., less than six inches of penetration per 100 blow counts. Each well will be constructed of 2-inch-diameter threaded PVC, with a PVC plug on the bottom.
- The soil and rock in each boring will be continuously logged using a split-spoon, and the soil will be logged using the Unified Soil Classification System by a qualified geologist or engineer. The well logging and installation will also be supervised by a qualified geologist or engineer.
- During well completion, the annular space around the well screen will be filled with the appropriate gravel pack, and this will extend two feet above the top of the screen. Bentonite will be placed above the gravel pack and confirmed by line measurements, and a bentonite or cement-bentonite grout will be used to fill in the remainder of the annulus space.
- A protective six-inch-diameter outer steel casing, locking caps, and concrete pads will be installed for each well.
- Following installation, each well will be thoroughly developed by surging and pumping, or bailing to remove the fines from the screened interval. The wells will be developed for a minimum of one hour, and the pH, temperature, conductivity, and turbidity will be monitored.
- Each new well location will be surveyed to the nearest permanent surveyed benchmark. The elevation will be surveyed to the ground surface and top of casing to the nearest 0.01 foot. Horizontal locations will be surveyed to the nearest 0.5 foot using the West Virginia State Plane Coordinates.
- A complete round of groundwater sampling will be collected after the wells have been installed and completed.

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- Selected wells will be subjected to falling head and rising head slug tests, where a clean PVC pipe is lowered into the well and then quickly removed. The results will be measured by an electronic data logger and pressure transducer.

Our office is in agreement with your proposed plan, your proposed well locations, and the methods by which you plan to drill, complete, and test the resulting groundwater monitoring wells. You have our permission to begin work in the field. We have only three additional criteria, and these are:

- Each new well should be labeled, not only with the local well number, but also in accordance with 47 CSR 60, the *West Virginia Monitoring Well Design Standards*.
- You should contact both our office and the local Environmental Enforcement inspector approximately one week before the work begins, so that we have the option of being present. The inspector for Wood County is Ms. Cindy Musser, whose phone number is 304-420-4635, and the inspector for Mason County is Mr. Charlie Morris, whose phone number is 304-757-1693.
- While your office prefers to work in West Virginia State Plane Coordinates, our office typically works in either latitude or longitude or Universal Transverse Mercator coordinates. Could a list of the coordinates for *all* of the wells at all four of your sites be provided to us in UTMs, 1927 North American Datum?

In addition, our office has continuing concerns at all three of the landfills. These are:

- At the Local Landfill, where were the Outlet-003, "R2", Stream #1, and Stream #2 sampling points?
- At the Letart Landfill, where exactly is the Stream #1 (Brinker Run) sampling point? We also understand the Upper Pond sampling location was closed when the landfill's cap was installed; however, where were the North Spring, Southwest Spring, and Stream Mountain Road sampling points?
- At the Dry Run Landfill, where is the Property Boundary sample being collected? And are SS-1 and SS-2 (as shown on the map) the same as Stream #1 and Stream #2 (which is shown in the data)?

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Lastly, there is one item that we feel is important and do not want to lose amid all of our correspondence, and this is that the hillside around the landfills (and particularly the Local Landfill) should be walked so that any intermittent seeps may be discovered. These seeps, if we so choose, can then be sampled for C-8.

If your office has any questions, please do not hesitate to contact me at 304-558-2108. Our teletypewriter number is 304-558-2751.

Sincerely,

DIVISION OF WATER RESOURCES



David P. Watkins
Regulatory Program Section Chief

cc: John Britvec, Permits
Dave Chaney, Permits
George Dasher, Groundwater Program

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