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GROUND WATER BRIEFING PAPER

Prepared for the
City of Richmond
Environmental Plan Advisory Committee
Water Subcommittee

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Environmental Plan Advisory Committee
Water Subcommittee

7-16-91

ISSUE: **GROUNDWATER**

BACKGROUND:

The City of Richmond is situated on the fall zone, a zone characterized by an abrupt change in elevation between the piedmont physiographic region of the state to the west and the coastal plain to the east. The fall zone runs in a north/south orientation roughly aligned with I-95. Several groundwater aquifers originate at the fall zone and flow in an easterly direction underneath the coastal plain. The fall zone is an important water recharge zone for these aquifers. Although water demand in the City of Richmond is met entirely through the water from the James River, land use activities can adversely impact groundwater quality and thus affect the water supply source that serves several tidewater Virginia localities. In addition, because groundwater contributes to the flow of the James River and its tributaries, groundwater can also contribute pollutants.

SPECIFIC MANDATES:

- 1) The protection of groundwater at solid waste facilities is the priority goal of the Virginia Solid Waste Management Plan's landfill regulations. The Plan's regulations require, among other things, that facility operators monitor groundwater at permitted solid waste facilities.
- 2) The Virginia Underground Storage Tank Program, Authorized under articles 9 and 10 of the Water Control Law, provides for the regulation of underground storage tanks (USTs). This program grants authority for the local implementation of regulations requiring the phased upgrade of all old tanks, strict controls on new tanks, and funding for the cleanup of leaking tanks.
- 3) The Virginia Pollution Discharge Elimination System (VPDES) is administered by the State Water Control Board (SWCB) and requires a permit for all discharges into state waters. The intent of VPDES is the protection of water quality. Over the last three years the SWCB has included in its VPDES permits a requirement for monitoring of public and private waste treatment lagoons for groundwater contamination. The City's new VPDES permit for the wastewater treatment plant, which will become affective sometime this fall, includes this groundwater monitoring requirement.
- 4) The Chesapeake Bay Preservation Act requires the local designation and protection of sensitive environmental features from the adverse impacts of development. The goal of the Act is the protection of water quality of the Chesapeake Bay and it's tributaries. The protection of sensitive environmental features (e.g., wetlands) contained in resource protection areas (RPA) and resource management areas (RMA), as designated under Chesapeake Bay Preservation Act regulations, can protect groundwater resources. The local designation of RPAs and RMAs, and revisions to the City's comprehensive plan and ordinances to meet the

requirements of the CBPA regulations are required to be in place by November 15, 1991.

CITY RESPONSIBILITIES:

- 1) The Richmond Department of Public Works has responsibility for the management of the City's solid waste facilities and their compliance with the State's Solid Waste Management Plan.
- 2) The City is responsible for the permitting of the installation and removal of underground storage tanks under the UST program. Installation permits are administered by the Office of Building Inspection, Mechanical Department, and removal permits are issued by the Fire Bureau.
- 3) When the Richmond Wastewater Treatment Plant's new VPDES permit comes into affect the City will be required to monitor groundwater around its sludge handling operation area. If groundwater contamination is found, remediation will be required.
- 4) The City is responsible for the implementation of Chesapeake Bay Preservation Act regulations.

CURRENT CITY STATUS:

- 1) There are 6 City owned landfills in Richmond. One facility is open and accepts construction "rubble" from city owned properties and projects, and 5 facilities have been closed. The "rubble" landfill has a leachate collection system and the groundwater is sampled quarterly by the City at nearby monitoring wells. The five closed landfills are not regulated under the Solid Waste Management Plan and no voluntary monitoring program is in place.
- 2) There are approximately 7,000 underground storage tanks registered with the SWCB at 2,000 facilities in the City. Since the UST program began in 1987 the City has, on average, permitted the removal of approximately 300 underground storage tanks per year. There are roughly an equal number (7,000) of USTs that do not fall under regulation. These are tanks under 5,000 gallons and are primarily household heating oil tanks. City owned USTs currently number approximately 100. Since the UST program began approximately 30 City owned tanks have been removed. A proactive program is in affect that involves testing all tanks annually and the removal of those that fail.
- 3) Groundwater monitoring at the wastewater treatment plant will begin when the new VPDES permit takes affect in the Fall of 1991.
- 4) The City has submitted an implementation program to CBLAD for its approval. Approval is currently pending.

UNRESOLVED ISSUES:

- 1) What is the impact of known, unregulated activities on groundwater in the City? How many unregulated sites are there, where are they, what contaminants do they possess, how many acres and what is the volume of groundwater affected? For example: there are 5 closed City owned landfills that are not required to be monitored for their groundwater impacts; and, there are approximately 7,000 mostly privately owned household heating oil

tanks in the City that do not fall under regulation.

2) How many known, regulated sites are there where substances are handled or stored that have the potential to contaminate groundwater? SARA Title III program Local Emergency Planning Committees are charged with developing emergency response plans that include the identification of facilities that have extremely hazardous substances on-site.

3) How can unknown sites that contain groundwater contaminants which are now vacant or under a different use be identified and remediated?

ACTION STRATEGIES:

1) Inventory sites that have the potential to contaminate groundwater.

2) Develop a hydrogeologic map of the City. A hydrogeologic map shows the locations and depths of aquifers, describes the makeup of the geology of aquifers, contains information on the movement of groundwater, and can be used as a planning tool and source of information for groundwater remediation activities.

3) Determine the groundwater contamination potential of land within the City using a methodology such as DRASTIC mapping.

4) Develop a groundwater management plan that could be implemented through the City's comprehensive plan. Elements to be considered in the plan include: designation of groundwater recharge areas as sensitive areas; conditional zoning in sensitive areas; a site plan review procedure that includes site plan ordinances and facility design requirements aimed at groundwater protection; and, an erosion and sediment control plan.

ADDITIONAL INFORMATION:

PROTECTION VIRGINIA'S GROUNDWATER: A Handbook for Local Government Officials. Virginia Water Resources Research Center. VPI&SU, Blacksburg, Virginia. November, 1986.

VIRGINIA GROUNDWATER MANAGEMENT HANDBOOK: State Agency Programs for Groundwater Protection. The Virginia Groundwater Protection Steering Committee. State Water Control Board, Richmond Virginia. 1988.

A Groundwater Protection Strategy for Virginia. The Virginia Groundwater Protection Steering Committee. State Water Control Board, Richmond Virginia. 1990 Supplement.

Jaffe, Martin and Frank Dinovo. Local Groundwater Protection. Chicago, Illinois: American Planning Association, 1987.