Biennial Report to the Governor and General Assembly on Toxic Substances in the Commonwealth

This biennial report is being submitted in accordance with the provisions of the Toxic Substances Information Act, contained in Section 32.1-245 of the *Code of Virginia*. The report summarizes activities of the Virginia Department of Health (VDH) relating to toxic substances and incidents involving exposure to toxic substances during the current biennium.

Ricin Manufacture in Chesterfield County

In February 2006, VDH and the Chesterfield Health Department staff worked closely with the Chesterfield Police Department, the Chesterfield Fire Department, and a special unit of the Federal Bureau of Investigation in criminal investigation and follow up involving manufacture of ricin in a residence in Chesterfield County. Ricin is a deadly biological toxin found in the waste produced when castor oil is made from castor beans. Due to immediate community recognition of the event, as well as apprehension about the health risks of potential exposure to ricin, the local health department was requested to handle all public health and community health issues, including development and implementation of an action plan.

The Chesterfield Health Department and VDH, in conjunction with the Chesterfield Police Department, organized community information and press materials, conducted media interviews and went door to door to inform residents. A standby epidemiology response team was formed in case area residents complained of past or present symptoms that could be associated with exposure to ricin.

Jet Fuel Pipeline Rupture in Henrico County

In April 2006, a petroleum pipeline operated by Plantation Pipeline Company ruptured in a Henrico County residential neighborhood, sending plumes of jet fuel 20 to 25 feet skyward, spraying nearby trees and homes, and saturating soil and backyards with more than 20,000 gallons of jet fuel. The jet fuel sprayed for 14 minutes at a distance of 200 feet. The fuel did not ignite and no one was injured. The incident resulted in evacuation of some 20 homes. VDH addressed citizens concerns regarding adverse effects of exposure to jet fuel.

Foam in the James River in Richmond

In June 2006, the Virginia Department of Environmental Quality (DEQ) received reports of foam floating on the surface of the James River. DEQ collected water samples from various locations on the James River, which were analyzed by the Division of Consolidated Laboratory Services in an attempt to determine what was causing the foam accumulation. Phosphate levels in the water were found to be two parts per million or two milligrams per liter, approximately 10 times higher than the

normal level. DEQ consulted with VDH to assess any human health risk related to this level of phosphates in the James River. It was determined that phosphate in water at these concentrations is not known to cause any harmful effects in humans exposed to the water through recreational activities such as swimming, wading and boating. Phosphate occurs naturally and may also be added to drinking water as a corrosion inhibitor. In addition, phosphates are generally used as surfactants in many detergents. High phosphorus levels are often an indication of pollution and are sometimes associated with wastewater contamination. The source of the recent high phosphorus in the James River has not yet been confirmed. However, a nearby laundry operation is suspected to be a possible contributor to higher phosphorus levels in the James River.

Carbon Monoxide Leak in Roanoke College Dormitory

The failure of gas-powered water-heating system resulted in carbon monoxide build up in a dormitory complex at Roanoke College in July 2006. More than 100 teenagers and adults who were staying in the complex were exposed to leaking carbon monoxide. One person died as a result of exposure. Others were treated in the emergency rooms of two nearby hospitals. During the course of the incident and its aftermath, VDH continually monitored the situation and coordinated with medical and other emergency responders.

Carbon Monoxide Leak in a Stafford County Hotel

Less than two weeks later after the Roanoke College incident, a malfunctioning boiler caused a carbon monoxide leak in a 100-room hotel in Stafford County. As a result, seven people were exposed to carbon monoxide and were treated and released from the hospital on the same day. VDH addressed citizens concerns regarding short-term and delayed adverse health effects from exposure to carbon monoxide.

Fish Consumption Advisories

In July 2006, VDH issued new fish consumption advisories due to contamination of fish with mercury in Harrison Lake in Charles City County and Chickahominy Lake in Charles City and New Kent counties.

In October 2006, VDH modified two existing fish consumption advisories for the Maury and James Rivers. The advisories were in response to fish tissue sample tests conducted by DEQ which indicated that the levels of polychlorinated biphenyls in fish from these advisory areas exceed VDH's guidelines. The advisory for the Maury River covered approximately 15 miles beginning in Buena Vista to where it meets the James River. The existing advisory was updated to include carp. VDH recommended that no more than two meals per month of carp caught from the advisory area be consumed. The existing advisory on the James River, from the I-95 James River Bridge in Richmond downstream to the Hampton Roads Bridge Tunnel, was updated to include hickory shad, blueback herring, and flathead catfish. VDH recommended that no more

than two 8-ounce meals per month of these species of fish caught from this advisory area be consumed.

North Anna Nuclear Power Station Waste Heat Treatment Facility

VDH staff in collaboration with other state, federal, and local government agencies, and citizens, participated in several public and stakeholder meetings regarding the Waste Heat Treatment Facility (WHTF), also known as the cooling lagoons, owned by Dominion Resources for the operation of the North Anna Nuclear Power Station.

In 1972, Dominion impounded 13,000 acres of the North Anna River and created a 17-mile long, 9,600-acre Lake Anna and a 3,400-acre WHTF. The lake is the source of intake water for the power station and the WHTF transfers the excessive heat from the cooling water before it is discharged back to the lake. Dominion has deed agreements with home owners around the cooling lagoons allowing them access to the lagoons. Residents around the cooling lagoons use the water for recreational purposes including swimming, boating, skiing, and fishing.

Several members of the public whose property is located on or near the cooling lagoons have expressed concern about the high temperature of the water in the lagoons and the potential risks these temperatures might create for contracting a rare protozoan disease, primary amebic meningoencephalitis (PAM). They would like the state to monitor and regulate the water in the lagoons as if it were public water and impose penalties on Dominion if there is a violation of regulations. Currently, DEQ regulates the discharge of water at the point where it enters Lake Anna. DEQ does not regulate the discharge of water from the power station or the waters in the cooling lagoons. Discussions between the state and concerned citizens are still ongoing.

Air Emissions from Mirant's Potomac River Generating Station in Alexandria

VDH and Alexandria Health Department, in cooperation with DEQ and the Agency for Toxic Substances and Disease Registry, are currently evaluating potential health effects of emissions from the coal burning Potomac River Generating Station (PRGS) in Alexandria on nearby residents. PRGS is owned and operated by Mirant Corporation. PRGS was built in 1949 and at that time was located in a low density neighborhood. However, the urban area surrounding the plant is now densely populated. The plant is woven into the complex network that supplies electricity to the Nation's Capitol and serves as a backup source of electricity in case of an emergency situation. For example, should there be a heat wave (above 96° F), the grid could falter and quickly result in a chain-reaction failure given the complex power needs of the region.

Next to the power plant is a high rise condominium building, Marina Towers, which was built close to the plant's stacks. The proximity and height of the Marina Towers structure produces a downwash effect that causes emissions from the stacks to

settle in the area rather than drift away. The residents of Marina Towers and others have complained of respiratory problems and have reportedly associated their symptoms with emissions from PRGS.

In August 2005, the results of two computer simulation studies on emissions from PRGS, one jointly commissioned by Mirant and DEQ and the second study commissioned by the City of Alexandria, became available. The results showed that if the plant operated all five of its generators at full capacity with certain wind conditions, the emissions of three substances (sulfur dioxide, nitrogen dioxide, and fine particulate matter) would substantially exceed the Environmental Protection Agency's (EPA) primary National Ambient Air Quality Standard (NAAQS) in the area immediately surrounding the plant. EPA sets the primary NAAQS limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.

Many studies reported in scientific literature suggest that long-term exposure to persistent levels of the above mentioned pollutants can adversely affect human health. Long-term health effects from chemical exposures typically are dependent on the frequency of exposure to a chemical, the concentration of the chemical the person is exposed to, the number of years of exposure, and the sensitivity of the individual to a particular chemical. Different people have varying sensitivities to air pollutants. Children and persons with existing respiratory problems such as asthma are most sensitive.

In response to the findings of the computer simulated studies, Mirant temporarily shut down PRGS in August 2005. A few months later, Mirant began operating its generators using Trona® to reduce emissions. Trona® is a mineral that according to Mirant has been shown reduce sulfur dioxide, nitrogen oxides, and possibly respirable particulate matter emissions in coal burning industrial processes.

VDH recommended to DEQ that real-time monitoring (in multiple locations) of ambient air for the above-named pollutants is necessary to fully evaluate the potential health effects of exposure to emissions from PRGS. DEQ is currently negotiating with Mirant concerning additional monitoring.