Public Health Assessment

Colesville Municipal Landfill

Broome County
Colesville,, New York

August 1993

New York State Department of Health

Agency for Toxic Substances and Disease Registry

PUBLIC HEALTH ASSESSMENT

COLESVILLE MUNICIPAL LANDFILL

COLESVILLE, BROOME COUNTY, NEW YORK

CERCLIS NO. NYD980768691

New York State Department of Health
Under a Cooperative Agreement With the
Agency for Toxic Substances and Disease Registry

THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6), and in accordance with our implementing regulations 42 C.F.R. Part 90). In preparing this document ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate.

In addition, this document has previously been provided to EPA and the affected states in an initial release, as required by CERCLA section 104 (i)(6)(H) for their information and review. The revised document was released for a 30 day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The public health assessment has now been reissued. This concludes the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

Agency for Toxic Substances
and Disease Registry.....William L. Roper, M.D., M.P.H. Administrator
Barry L. Johnson, Ph.D., Assistant Administrator

Division of Health Assessment
and Consultation.....Robert C. Williams, P.E., Director
Juan J. Reyes, Deputy Director

Federal Programs Branch.....Sally L. Shaver, Chief

Community Health Branch.....Cynthia M. Harris, Ph.D., Chief

Remedial Programs Branch.....Sharon Williams-Fleetwood, Ph.D., Chief

Records & Information Management Branch.....Max M. Howie, Jr., Chief

Emergency Response & Consultation Branch.....C. Harold Emmett, P.E., Chief

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National Technical Information Service, Springfield, VA
(703) 487-4650

SUMMARY

The Colesville Landfill is an inactive municipal landfill which received about 68,500 gallons of drummed industrial wastes between 1973 and 1975. The 113-acre site is located in a rural region of Broome County, New York, approximately one mile north of the Hamlet of Doraville, within the Town of Colesville. In 1983, volatile organic compounds (VOCs) were found in drinking water supplies of homes near the landfill property. Broome County provided residents in the affected homes with carbon filtration systems and bottled water. Subsequent site investigations led to the closure of the landfill in December 1984. The Colesville Landfill was accepted to the National Priorities List in June 1986.

In 1987, New York State and the potentially responsible parties signed a Consent Order agreement to evaluate the nature and extent of contamination at the site and alternatives for cleanup. A Remedial Investigation of the landfill area was completed in 1988 and identified ground water as the primary mechanism for off-site migration of contaminants. Other migration pathways for site-related contaminants include runoff of contaminated soils and leachate migration to surface water bodies. Site-related contaminants including inorganic compounds and VOCs have been found in ground water, leachate and stream sediment. Ground water quality standards are exceeded for site-related organic compounds both on and off-site. Silver, cadmium and arsenic in on-site ground water exceed standards.

Existing and potential human exposure routes include: ingestion, inhalation and dermal absorption of VOCs in potable water; direct contact with soil, surface water and stream sediments; direct contact and inhalation of contaminants in surficial leachate seeps and ingestion of wild animals (e.g., deer and turkey) which may have been exposed to site contaminants. Ground water near the Colesville Landfill is used for drinking water and agricultural needs. Broome County has purchased several of the affected properties, which remain unoccupied, and continues to maintain and monitor the filtration systems quarterly and supply bottled water to the remaining affected residents. Currently, there is no fence around the site to restrict access to non-authorized persons.

Residents of Doraville have expressed concern about the potential for future impacts to their drinking water by site contaminants and want the County to provide an alternate water supply source. Previous sampling of Doraville residents' wells did not show any evidence of site-related contaminants.

A Record of Decision was signed in March 1991 and identified the following remedy for the site: (1) installation of a landfill cap and leachate collection system, (2) pumping and treatment of contaminated ground water, and (3) installation of a community water supply well upgradient of the site for water distribution to affected residents. Additionally, ambient air in homes near the landfill will be surveyed for methane gas and VOCs and control measures will be put in place to ensure that methane will not impact the homes in the future. Furthermore, monitoring wells downgradient of the site and between the Hamlet of Doraville should be routinely monitored to evaluate the potential for contamination of water supplies of Doraville residents.

Based on the information reviewed, the Colesville Landfill is a public health hazard because of the risk to human health from past exposures and possible future exposures to hazardous substances at concentrations that may result in adverse health impacts. The Colesville Landfill is contaminating ground water, both on- and off-site, primarily with VOCs. Homeowner wells south and southwest of the site are contaminated. Broome County purchased several of these homes which are now unoccupied. Other homeowners have water supplies treated with carbon filters or are using bottled water.

The New York State Department of Health has performed, and is planning, several public health actions at the site. Community health education for persons whose wells were contaminated has been performed. In addition, the NYS DOH is considering including residents, who were exposed to volatile organic compounds (VOCs) through the use of contaminated well water, on a registry being developed for persons exposed to VOC contaminated drinking water. The Agency for Toxic Substances and Disease Registry's Health Activities Recommendations Panel has evaluated the site and concurs with the actions taken and planned by the NYS DOH.

BACKGROUND

A. Site Description and History

The Colesville Landfill is an inactive municipal landfill and National Priorities List (NPL) site. Since 1983, it has been under investigation to identify potential impacts to the environment and human health.

The Colesville Landfill is located across from the intersection of County Route 541 and County Route 29N/64S (East Windsor Road) in the Town of Colesville, Broome County, New York (Appendix 1--Figure 1). The entrance to the landfill is immediately south of this intersection, on the east side of Route 64S. The landfill property is approximately 113 acres of rugged terrain, including steeply sloping woodlands and a large plateau area. Of the 113 acres, approximately 35 acres have been used for waste disposal, primarily on the plateau area.

There are no buildings onsite and the only roadway entrance to the landfill property is via the entrance on East Windsor Road. Currently, a locked gate and a posted "No Trespassing" sign restricts vehicular access to the site. However, aside from the steep slopes along the landfill perimeter, there are no restrictions to site access by pedestrians.

The landfill surface slopes gently westward, steepening sharply near East Windsor Road. Site drainage is primarily westward; however, a branch-like pattern of surface water runoff has developed to the north, south and east. Subsurface soils at the site are primarily glacial deposits of sand, silt, clay and gravel. Underlying bedrock is generally shale or siltstone.

There are no distinctive markers along the property boundary, which resembles a distorted "T" on its side. Generally, the site is bounded by East Windsor Road to the west, Nabinger Hill Road to the North, Penny Hollow Road to the east, and the Hamlet of Doraville to the south. Three unnamed streams surround the landfill property to the north, east and south. The north stream flows south from Nabinger Road towards the landfill and then veers southwest along the plateau area of the landfill property boundary, prior to discharging to the Susquehanna River. The east stream originates just east of the landfill disposal area (plateau) and flows south towards East Windsor Road. South of the landfill property, there are several springs which flow south, towards the east stream.

The Town of Colesville owned the Colesville Landfill property from 1965 to 1969 and operated the landfill between 1965-1971. The Broome County Department of Public Works owned the Colesville Landfill between 1969 and 1984 and operated the site between 1971 and 1984. The Colesville Landfill was primarily used for the disposal of municipal solid waste. The landfill served an estimated 12,000 people and received approximately 9,000 tons of municipal refuse per year. The standard procedure for waste disposal at the landfill was a cut and fill trench operation. Historical aerial photographs indicate that early disposal operations occurred on the north side of the plateau area.

Between 1973 and 1975, approximately 68,500 gallons of drummed industrial wastes were disposed at the Colesville Landfill. These industrial wastes originated from the GAF Corporation's Binghamton Plant and were primarily organic solvents. Exact types and quantities of individual wastes are not known; however, paint scrapping and thinner, liquid residue from coating sensitized paper, drummed aqueous dye and metal wastes were reportedly dumped at the site during this time. Table 1, Appendix 2, describes some of these wastes.

Landfill disposal practices for drummed industrial wastes reportedly varied with the landfill operator on duty when the waste haulers arrived at the site. Drummed wastes were disposed in designated areas as well as co-disposed with municipal wastes. Site records indicate that a narrow trench, which extended for 600 feet along the south-central landfill property boundary, was designated for drum disposal. The trench was approximately 50 feet wide and excavated to an estimated depth of 30 feet. According to site personnel, the majority of drummed wastes were placed in this trench; drums were either buried intact or punctured and crushed prior to burial.

The wastes produced at the GAF plant in Binghamton included dye wastes, organic solvent mixtures, mixed chemical solvents; lead iodide, lead bromide, cadmium, ammonium salts, and other metals. Disposal of industrial wastes occurred in the south and central portions of the fill area. Approximately 468,000 cubic yards of municipal solid waste and industrial chemical wastes are estimated to have been disposed at the site. In 1974, GAF was refused permission to dispose of dye-saturated filter media at the site, and by February 1975, all dumping of GAF wastes stopped.

Because of contamination, the Colesville Landfill was closed in December 1984. In addition, the site was listed by the New York State Department of Environmental Conservation (NYSDEC) on the New York State Registry of Inactive Hazardous Waste Sites. The site was included on the NPL in June 1986. On January 9, 1987, an Order on Consent for remediation of the Colesville Landfill was signed by the potentially responsible parties, including Broome County and the GAF Corporation.

A Remedial Investigation (RI) and Feasibility Study (FS) of the Colesville Landfill were begun in the fall of 1987. As part of the RI, monitor wells were installed and sampled; surface water and sediment samples were collected and area homeowner wells were also sampled (Appendix 1--Figure 2). In addition, a multi-phase geophysical investigation was conducted to determine the location and extent of landfilled materials in buried or waste trenches on site. The RI was completed in the spring of 1988. In 1990, confirmatory sampling was conducted by Wehran Engineering to verify conclusions of the RI.

Public comment has been solicited for all of the proposed remedial alternatives in the detailed analysis phase of the feasibility study. In Spring 1991, the United States Environmental Protection Agency (US EPA) selected the preferred remedy for the Colesville Landfill which includes: (1) placement of a multi-media cap on the landfill which complies with New York State solid waste regulations; (2) installation of a leachate collection system; (3) pumping of ground

water at and downgradient of the landfill, followed by treatment via air stripping prior to discharge to the North Stream or the Susquehanna River; and (4) provision of a new public water supply, to be located north of the landfill, with distribution to affected residents. Engineering design for implementation of the selected remedy was initiated in the Spring of 1991 and remediation activities are expected to begin in 1993.

B. Site Visits

The Colesville Landfill property has been inspected by local and state representatives, as well as other parties investigating the Colesville Landfill site.

In June 1983, representatives of the New York State Department of Health (NYSDOH) and Broome County Health Department (BCHD) inspected the Colesville Landfill facility twice. During both site inspections, refuse was observed being disposed in direct contact with ground water and leachate was observed at numerous locations on the ground surface and along the slopes of the fill areas. During the second site inspection (June 30), leachate was leaving the site via a creek along the northwest side of the landfill. Water samples were collected from six residences near the site and two samples were collected from private water supplies in the Hamlet of Doraville.

On July 19, 1983, the site was inspected by the Broome County Health Department and the Broome County Department of Public Works. During this inspection, numerous leachate seeps were observed to the north, northwest and downgradient of the landfill perimeter. All of the leachate seeps had a characteristic iron staining; the surface of leachate pools along the eastern slope of the landfill had an oily sheen. Water from two springs was flowing along the south slope of the landfill, approximately 400-500 feet from the landfill perimeter. These springs also had the characteristic iron-stained leachate and were draining towards the creek which flows south along the eastern edge of the landfill disposal area. Water samples were also collected from homeowner wells near the site.

In November 1983, representatives of the New York State Department of Environmental Conservation (NYSDEC), Division of Solid and Hazardous Waste, conducted a detailed assessment and documented existing environmental and public health concerns at the Colesville Landfill. Exposed piles of refuse, leaking containers, leachate seepage and discolored surface water in drainage ditches were observed. Those residents immediately adjacent to the site with private water supply wells were of primary concern.

A site visit was conducted by Claudine Jones and Susan Collamer of the NYSDOH in January 31, 1991, to assess general post-closure demographics (e.g., proximity of remaining occupied residences to the landfill) as well as current site accessibility. Currently, roadway access to the landfill disposal area is restricted at the site entrance by a locked gate; a "No Trespassing" sign is also posted on the gate. No signs of recent activity (e.g., tire tracks or footprints in the snow) around the site entrance were observed. The nearest occupied home to the landfill is approximately 50 feet to the south, on the west side of East Windsor Road; this home is

currently supplied with bottled water. No evidence of recreational activities (i.e., cross-country skiing or sledding) was found within the immediate vicinity or downgradient of the landfill perimeter. The nearest livestock pastures were approximately 1/4 mile north of the site on the east side of East Windsor Road.

On December 28, 1992, the NYS DEC project manager for the site was contacted to determine if there had been any changes to the site conditions. Since the last visit by the NYS DOH in January 1991, there have been no changes to the site conditions.

C. Demographics, Land Use, and Natural Resource Use

The site is located in an undeveloped, rural region of Broome County. The area surrounding the landfill includes large tracts of undeveloped rolling woodlands, cultivated agricultural fields, livestock pastures and scattered single-family residences. Approximately 60 private residences (approximate population of 191) are within a one-mile radius of the site, with 367 residences (approximate population of 1,167) within a three-mile radius. The nearest homes to the landfill are to the west and southwest along East Windsor Road, with the closest home about 300 feet from the landfill perimeter. The nearest and largest grouping of residential development is the Hamlet of Doraville, approximately 1/2 mile south of the landfill. Several of the homes near the landfill perimeter were purchased by Broome County from area residents and are now unoccupied.

The 1980 census tract data for the Town of Colesville indicate that the local population (approximately 4,965 persons) is primarily of English and European descent, approximately 80% of which were born in Broome County. The median age of Colesville residents is approximately 29 years. About 57.1% of the population over 25 years of age are high school graduates and 7% have completed 4 or more years of college. Approximately 70% of the working population aged 16 years or older are private wage and salary workers, approximately 20% are government employees and about 9% are self-employed.

A Delaware-Hudson railway service line runs north-south, generally along the Susquehanna River, west of the landfill property. The only known public gathering place within a one-mile radius of the landfill, is the Doraville Methodist Church, approximately 1/2 mile south of the landfill perimeter, in the Hamlet of Doraville. However, this building appears unused.

The Susquehanna River near the Colesville Landfill may be used for recreation (e.g., fishing and swimming) and fish propagation. The unnamed tributaries to the north and south of the landfill could also be used for fishing, fish propagation and recreation.

The only known or registered state wetland area near the site is approximately 1.5 miles to the northwest, upgradient and west of Center Village. No known federal wetlands are in the site vicinity. Some areas along the banks of the Susquehanna River have been mined for natural gravel deposits; however, none of these areas are near the Colesville Landfill.

Ground water near the Colesville Landfill is used for drinking water and agricultural needs. Generally, ground water for these purposes is obtained from the unconsolidated glacial outwash deposits. Ground water in the site area also recharges local streams and the Susquehanna River.

D. Health Outcome Data

The New York State Health Department maintains several health outcome data bases which could be used to generate site specific data if warranted. These data bases include the cancer registry, the congenital malformations registry, the heavy metals registry, the occupational lung disease registry, the pesticide poisoning registry, vital records (birth and death certificates) and hospital discharge information.

The Broome County Health Department (BCHD) conducted a study of cancer incidence in areas of the County where organic chemical contamination of water supplies had occurred or where there was public perception that contamination had occurred. The Town of Colesville was one of the areas studied. The results of this study are presented in a 1986 BCHD report entitled, "Cancer Occurrence by Common Drinking Water Source-Broome County, NY: 1976-1980" and are outlined in the Public Health Implications section.

COMMUNITY HEALTH CONCERNS

Between 1983 and 1985, the NYSDOH received several letters from residents living near the Colesville Landfill, as well as copies of letters directed to public officials. In these letters, citizens expressed concern for their health and well-being because of potential exposure to chemicals that may have migrated from the landfill. Several of the letters listed specific family and community illnesses including reproductive, central nervous system and carcinogenic effects, as well as dermal, gastric and urinary tract irritations.

In November 1990, the NYSDOH surveyed homeowners on East Windsor Road, whose wells had been impacted by previous waste disposal activities at the Colesville Landfill, to determine their preference for remediation of their water supplies. The two proposed remedial action alternatives presented to the homeowners were (1) upgrading the existing filter systems or (2) a new water supply. The majority of impacted homeowners preferred a new water supply.

On January 30, 1991, the United States Environmental Protection Agency (USEPA), in conjunction with the NYSDEC, held a public meeting to inform the public of EPA's and NYSDEC's preferred remedy and solicited public comments on all the remedial alternatives, as well as the preferred alternative. NYSDOH attended this meeting to address health-related questions posed by the public.

The only health-based concern raised at this meeting was asked by a representative of a citizen's action group for the Hamlet of Doraville, who questioned the basis for excluding residents of

Doraville from the proposed water supply. The response was that previous sampling of Doraville residents' wells did not show any site-related contaminants. The representative for the Citizens Action of New York cited that one Doraville resident had been supplied with a carbon filter and ultra-violet light system for water treatment and thus, warranted inclusion within the new water supply distribution. The citizen's action group representative also stated that one Doraville resident tested her water supply and the results differ from those of the county. The residents of Doraville would like to access the new water supply.

Between April 17 and June 9, 1992, the NYS DOH conducted a public comment period for the public health assessment for the Colesville Landfill site. The NYS DOH sent 62 copies of the public health assessment to persons on the mailing list for the Colesville Landfill site. The responses to comments received during the public comment period are shown in Appendix 3.

ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS

To identify other possible facilities that could contribute to ground water, surface water and/or sediment contamination near the Colesville Landfill Site, the NYSDOH searched the 1989 Toxic Chemical Release Inventory (TRI). The TRI has been developed and is updated by the U.S. EPA from the chemical release information provided by certain industries. The TRI database search conducted by NYSDOH for the area near the Colesville Landfill site did not contain any information on toxic chemical release(s) in the Town of Colesville, Broome County, New York for 1989.

Tables referred to in the following sections are shown in Appendix 2.

A. On-Site Contamination

The on-site sampling data are limited to ground water. Contaminants detected in on-site monitoring wells include arsenic (376 mcg/L), cadmium (28 mcg/L), lead (13.6 mcg/L), benzene (640 mcg/L), and chlorinated solvents. On-site ground water contaminants are summarized in Table 2.

On-site surface soils were not characterized during the RI, as an interim cover was placed on the landfill surface when it was closed in December 1984. This interim cover was composed of native soils, which were excavated to create disposal trenches and stockpiled on-site, in combination with fill materials from off-site sources.

B. Off-Site Contamination

Off-site contamination from the Colesville Landfill was first detected in March 1983 during sampling of private water supplies near the landfill. Several organic compounds were found in water samples from five homes located west and south of the landfill property. Well depths

ranged from 10-220 feet deep and included driven, dug and drilled wells. One of the water supplies was a spring which originates east of the landfill disposal area.

Contaminants in shallow wells (10-18 feet deep) included: vinyl chloride, 1,1-dichloroethane, trans-1,2-dichloroethane, chloroform, 1,1,1-trichloroethane, benzene, trichlorofluoromethane, 1,1-dichloroethene, chloroform, trichloroethene, copper, zinc, and trace amounts of arsenic. Contaminants in drilled (deep) wells included chloroform, toluene, trichloroethene, zinc and trace amounts of arsenic. Contaminants in the spring included vinyl chloride, benzene, toluene, 1,1-dichloroethane, trans-1,2-dichloroethene, and 1,1,1-trichloroethane.

Following the initial discovery of residential well contamination in the Colesville Landfill area, the NYSDOH collected confirmatory samples from the water supplies of the affected residences in the spring (April/May) of 1983. In July 1983, ground water samples collected by the Broome County Health Department from homeowner wells near the site contained volatile organic compounds (VOCs) including 1,1-dichloroethene (11 mcg/L), trichloroethene (160 mcg/L), 1,1,1-trichloroethane (270 mcg/L), 1,1-dichloroethane (320 mcg/L), chloroform (8 mcg/L) and trans-1,2-dichloroethene (140 mcg/L). These results prompted the Broome County Department of Public Works to install granular activated carbon filters on the five impacted water supply wells near the landfill. In addition, Broome County contracted with Wehran Engineering to investigate the Colesville Landfill in 1983 and 1984.

Additional ground water samples from impacted water supplies were also obtained during the 1983 and 1984 hydrogeologic investigations of the landfill area and during the RI in 1987. Table 3 summarizes the highest concentrations of volatile compounds in the residential water supplies between 1983 and 1987. The only inorganic contaminant in homeowner wells was zinc (73-581 ppb) at levels below NYS standards for drinking water supplies.

The purpose of the 1983 investigation was to determine and evaluate the hydrogeologic conditions at the Colesville Landfill site as well as to define the quality of ground water beneath and adjacent to the landfill in both surficial deposits and bedrock. Eight monitoring wells were installed on and around the periphery of the landfill disposal area and ground water samples from these wells were analyzed for general water quality indicator parameters and total volatile organics, expressed as 1,2-dichloroethane.

Both the 1983 and 1984 studies found that ground water beneath the landfill was being contaminated with VOCs from wastes disposed at the site. The areas of highest ground water contamination occurred along the southern and western site boundaries. Contamination was primarily confined to the upper portions of the glacial outwash aquifer underlying the site and ground water flow was in a southwesterly direction, towards the Susquehanna River. Based on the geology, ground water flow, and sampling data, ground water and private water supply wells to the south and southeast and near Doraville, did not appear to be impacted by site contaminants.

Ground water contamination has also been documented in monitoring wells south and west (downgradient) of the landfill. Organic contaminants in monitoring wells off-site include benzene (70 mcg/L), vinyl chloride (10 mcg/L), and other chlorinated solvents. Inorganic contaminants in off-site monitoring wells including arsenic (15.3 mcg/L), cadmium (8 mcg/L), chromium (41 mcg/L), and lead (11.7 mcg/L). Table 4 summarizes contaminants in ground water off-site and Table 5 gives a summary of State and Federal water quality standards and guidelines for site contaminants.

Site contaminants were also detected in stream sediment and leachate seeps offsite. A summary of the highest concentrations of chemicals detected in sediment in the North Stream, Susquehanna River and the spring south of the landfill during the RI are given in Tables 6 (organic) and 7 (inorganic).

On October 29, 1987, a composite liquid leachate sample was collected by Brian Davidson of the New York State Department of Environmental Conservation, near the North Stream on the northwest slope of the landfill perimeter. This leachate sample was found to contain several compounds which were also found in the site monitoring wells. Table 8 summarizes the compounds detected in the leachate sample.

Off-site surface soils were characterized at three leachate seep areas along the southern slope of the landfill disposal area. In this area, natural springs emerge to form the headwaters of a branch to the south spring. The soil samples collected at these locations were referred to as leachate sediment samples in the RI, probably due to the high moisture content. Organic compounds detected in these surface soil/leachate sediment samples include chloroethane (48 mcg/kg) and trichloroethene (9 mcg/kg). Several inorganic parameters were also detected in these samples; however, they appear to fall within normal background concentrations.

No organic priority pollutants were detected in any surface water samples from the North and East streams or the Susquehanna River during the RI. Metals were detected in surface water samples at locations downstream of the landfill; however, the levels were not significantly elevated above background.

C. Quality Assurance and Quality Control

In preparing this public health assessment ATSDR and NYSDOH rely on the information in the referenced documents and assume that adequate quality assurance and quality control (QA/QC) measures were followed with regard to chain-of-custody, laboratory procedures, and data reporting. The validity of the analysis and conclusions drawn for this public health assessment is determined by the completeness and reliability of that information.

A discussion of the quality assurance and quality control (QA/QC) measures during field sampling and analytical procedures for the RI are given in the final RI report. During the RI, sample collection and chain-of-custody procedures were followed, and field and trip sample

blanks were analyzed. In addition, several ground water samples were split with the NYSDEC as an additional QA/QC measure. The split samples were sent to two different laboratories. Analytical results of the split samples did show source differences in concentrations of VOCs; however, these differences were considered attributable to sample handling in the field and laboratory. Overall, the split sampling results did not suggest any analytical problems and the data collected for the RI are considered reliable for this investigation.

D. Physical and Other Hazards

There are no known physical hazards at the site. The site has not yet been capped in accordance with State regulatory requirements, and there may be some potential for differential settling of the landfill surface.

The potential for fire and/or explosions of industrial wastes is unlikely, as waste materials are buried approximately 30-50 feet below the landfill surface. However, since municipal solid wastes were disposed at this site, methane gas may be generated by decomposition. Methane gas may form gas pockets on-site or it may migrate off-site where an ignition source may produce a fire or explosion. The presence of methane gas at and around the landfill has not been investigated or documented.

PATHWAY ANALYSES

As discussed previously ("Site Description and History" subsection), industrial wastes were primarily disposed in an unlined trench, 30-50 feet deep and centered along the southern perimeter of the active waste disposal area. Industrial wastes were also co-disposed with municipal solid wastes in other parts of the active landfill area and drums were reportedly buried intact or punctured, drained and crushed prior to disposal.

To determine whether nearby residents and persons on-site are exposed to contaminants migrating from the site an evaluation was made of the environmental and human components that lead to human exposure. The pathways analysis consists of five elements: a source of contamination, transport through an environmental medium, a point of exposure, a route of human exposure, and an exposed population.

An exposure pathway is categorized as a completed or potential exposure pathway if the exposure pathway cannot be eliminated. Completed pathways require that the five elements exist and indicate that exposure to a contaminant has occurred in the past, is currently occurring, or will occur in the future. Potential pathways, however, require that at least one of the five elements is missing, but could exist. Potential pathways indicate that exposure to a contaminant could have occurred in the past, could be occurring now, or could occur in the future. An exposure pathway can be eliminated if at least one of the five elements is missing and will never be present. The environmental and human exposure pathways associated with the site are discussed in the following subsections. Based on this analyses, only exposure to contaminated

groundwater is considered a completed exposure pathway--the remaining pathways are considered potential exposure pathways.

A. Environmental Pathways

Environmental media contaminated at the Colesville Landfill include: ground water, sub-surface soils and soils adjacent to leachate seeps. Off-site migration of site contaminants in ground water, surface water and stream sediment has been documented. Vinyl chloride and other VOCs have also been detected in leachate seeps along stream channels and the sloping terrain along the landfill perimeter.

Streams near the site are not used as potable water supplies. Although these streams drain into the Susquehanna River, the river does not show evidence of site-related contamination nor does it provide potable water for neighboring communities. The City of Binghamton, Town of Vestal and Village of Endicott obtain water from the Susquehanna River for public water supplies; however, these public water supplies are more than 25 miles downstream from the site. Since site access is not currently restricted, inhalation of VOCs and direct contact with contaminants in leachate seeps at and around the landfill surface, are a health concern for site trespassers (hunters, children). Additionally, wild animals such as deer and turkey, which can forage freely on the site, may be hunted for food and should be considered a potential source of human exposure for contaminants that bioaccumulate.

B. Human Exposure Pathways

The exposed population is primarily homeowners whose wells became contaminated with VOCs migrating in ground water. Other potentially exposed populations include children, hunters, and fishermen who may come into contact with contaminated stream sediment and surface waters, as well as persons trespassing at the site who may be exposed to leachate seeps and contaminated soils.

Based on the number, extent and types of environmental contaminants, the potential environmental pathways, as well as the characteristics of the population affected by the site, the following have been identified as completed and potential human exposure routes to site-related contaminants at the Colesville Landfill: (1) ingestion, inhalation, and dermal absorption of contaminants in potable water; (2) direct contact with contaminated sediment, surface water and surface soils; and (3) inhalation of VOCs and direct contact with contaminants in leachate seeps. The estimated duration of exposure associated with each of these exposure routes is as follows:

Media	Exposure Route	Exposure Duration
ground water*	Inhalation	Long-term
	Ingestion	Long-term
	Dermal	Long-term
Surface Water	Direct Contact	Short-term
Sediment	Direct Contact	Short-term
Leachate Seeps	Direct Contact	Short-term
	Inhalation	Short-term

* Exposure to contaminated ground water is considered the only completed exposure pathways currently identified.

PUBLIC HEALTH IMPLICATIONS

As discussed in earlier sections of this report ("Environmental Contamination and Other Hazards" and Pathway Analyses" subsections), several homes near the site have contaminated water supplies. Broome County has installed carbon filtration systems in the affected homes. Since the initial discovery of residential well contamination in 1983, several of the affected homes have been purchased by Broome County and now remain empty. For other homeowners whose water supplies have been contaminated, the County continues to monitor and maintain the filtration systems and the nearest occupied residence to the landfill is supplied with bottled water. However, prior to 1983, it is not known how long area residents may have been exposed to site contaminants which were disposed at the landfill between 1973 and 1975.

A. Toxicological Evaluation

Table 5 summarizes State and Federal ground water quality standards and guidelines for chemicals in ground water at and near the Colesville Landfill. Comparing these values with analytical data for compounds in ground water both onsite (Table 2) and offsite (Tables 3 and 4) indicates that all organic compounds concentrations exceeded the standards. Arsenic, silver and cadmium in ground water onsite exceeded standards.

The following chemical-specific summaries discuss potential health affects that are associated with exposure to site contaminants. **The information for these summaries was obtained from the ATSDR Toxicological Profiles cited in the Reference section of this public health assessment.**

Benzene

Benzene has been associated with an increased risk of leukemia in industrial workers who breathed large amounts of the chemical in the workplace over a long period of time. Benzene also causes cancer in laboratory animals exposed to high levels over their lifetimes. Chemicals that cause cancer among exposed industrial workers and laboratory animals are believed to increase the risk of cancer in humans exposed to lower levels over long periods of time. Benzene has also been associated with damage to blood-cell-forming tissues and immune and nervous systems of industrial workers and laboratory animals.

Methylene Chloride

People exposed to high levels of methylene chloride in air show effects much like those produced by alcohol. Prolonged exposures may cause changes in blood and liver and decreased responses to visual and auditory stimulation. Most of these effects usually disappear fairly rapidly after exposure stops. Exposure to high concentrations of methylene chloride causes liver and kidney damage and affected the blood of laboratory animals. Methylene chloride causes cancer in laboratory animals exposed to high concentrations over their lifetime. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed to lower levels over long periods of time.

1,1-Dichloroethane

There is some evidence that 1,1-dichloroethane causes cancer in laboratory animals exposed to high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed to lower levels for long periods of time. Exposure to high levels of 1,1-dichloroethane damages the kidneys of laboratory animals and has caused delayed growth in the offspring of animals exposed during pregnancy.

1,1-Dichloroethene and trans-1,2-Dichloroethene

Humans exposed to high levels of 1,1-dichloroethene have had nervous system and liver damage. 1,1-Dichloroethene damages the liver, kidneys, lungs, heart and nervous system of laboratory animals exposed to high levels. Birth defects have been observed in the offspring of laboratory animals exposed to high levels of this chemical in air during pregnancy. 1,1-Dichloroethene causes cancer in laboratory animals exposed to high levels over their lifetimes. Whether or not it causes cancer in humans is unknown. Limited data on exposure of humans or laboratory animals to trans-1,2-dichloroethene show that this chemical causes nervous system damage, and changes in the liver and lungs.

1,2-Dichloropropane

People exposed to large amounts of 1,2-dichloropropane have experienced effects on the nervous system, blood and liver. Exposure to high concentrations of 1,2-dichloropropane has also

damaged the liver, kidneys and adrenal glands of laboratory animals. 1,2-Dichloropropane causes cancer in laboratory animals exposed to high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed to lower levels over long periods of time.

Xylene

Some people exposed to large amounts of xylene have had liver, kidney, and nervous system damage. Exposure to high concentrations damages the nervous system, liver, kidneys and heart in laboratory animals. Exposure of pregnant laboratory animals to high concentrations of xylene shows that xylene may cause developmental damage in the unborn. Chemicals which cause adverse effects in laboratory animals may pose a risk to humans who are exposed to lower levels over long periods of time.

1,2-Dichloroethane

1,2-Dichloroethane causes cancer in laboratory animals exposed to high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed to lower levels over long periods of time. Whether or not 1,2-dichloroethane causes cancer in humans is unknown. Some humans exposed to large amounts of this chemical have had nervous system, liver, lung, kidney and heart damage. Exposure to high concentrations of 1,2-dichloroethane causes a decreased ability to fight infection in laboratory animals.

Trichlorofluoromethane

Exposure of laboratory animals to high concentrations of trichlorofluoromethane damaged the heart, liver, kidneys and central nervous and respiratory systems of these animals. Chemicals which cause adverse effects in laboratory animals may also pose a risk to humans who are exposed to lower levels over long periods of time.

Toluene

Exposure to high concentrations of toluene primarily affects the nervous system, liver and kidneys of laboratory animals. Chemicals which cause adverse effects in laboratory animals after high levels of exposure may also pose a risk to humans who are exposed to lower levels over long periods of time.

1,1,1-Trichloroethane

Some industrial workers exposed to large amounts of 1,1,1-trichloro-
ethane have had nervous system, liver and cardiovascular system damage. Exposure to high concentrations of this chemical causes nervous system, liver and cardiovascular system damage

in laboratory animals. Chemicals which cause adverse health effects in exposed industrial workers and laboratory animals may also pose a risk of adverse health effects in humans who are exposed at lower levels over long periods of time.

Trichloroethene

Trichloroethene causes cancer in laboratory animals exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed to lower levels over long periods of time. Whether or not trichloroethene causes cancer in humans is unknown. Some humans exposed to large amounts of this chemical have had nervous system, liver and kidney damage. Exposure to high concentrations of trichloroethene causes liver and kidney damage and effects on the immune system and blood in laboratory animals.

Vinyl Chloride

Vinyl chloride has been associated with increased risk of cancer and possibly miscarriage among industrial workers who were exposed to relatively large amounts of this chemical over a long time in workplace air. Vinyl chloride has also caused cancer in laboratory animals exposed at high levels over their lifetimes. Chemicals that cause cancer among exposed industrial workers and laboratory animals are believed to increase the risk of cancer in humans exposed to lower levels over long periods of time.

Chloroform

Chloroform was used as a surgical anesthetic for many years before its harmful effects were recognized. Laboratory animals and some humans exposed to chloroform have had liver, kidney and nervous system damage. Exposure to high concentrations of chloroform also causes damage to the male reproductive system in laboratory animals. Chloroform causes liver and kidney cancer in laboratory animals exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans exposed to lower levels over long periods of time. Whether or not chloroform causes cancer in humans is unknown. However, several studies of drinking water and cancer in humans suggest a small increased risk of cancer in populations exposed to drinking water containing trihalomethanes, including chloroform, which are chemical by-products of disinfection (chlorination).

On-site and off-site groundwater, and off-site leachate and sediments are contaminated with the above described chemicals at levels of concern. An assessment of the toxicological implications of past, present and potential human exposure pathways of concern is presented below:

1. Past ingestion, dermal and inhalation exposure to volatile organic contaminants in off-site private homeowner wells.

For an undetermined period of time, residents in the Town of Colesville in Broome County, New York were exposed to volatile organic compounds in drinking water, many of which exceeded New York State ground water and/or drinking water standards or guidelines (see Tables 3 and 5). Chronic exposures to chemicals in drinking water are possible by ingestion, dermal and inhalation exposures from water uses such as showering, bathing and cooking. Although exposures vary depending on individual life-styles, each of these exposure routes contributes to the overall body burden and thus increases the potential for chronic health effects.

Benzene and vinyl chloride are known human carcinogens. Chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, methylene chloride and trichloroethene cause cancer in laboratory animals exposed to high levels over their lifetime. These six chemicals have been classified as either probable or possible human carcinogens by the US EPA. Chemicals that cause cancer in laboratory animals may also increase the risk of cancer in humans who are exposed to lower levels over long periods.

Toxicological data are inadequate to assess the carcinogenic potential of trans-1,2-dichloroethene, 1,1,1-trichloroethane and trichlorofluoromethane. Based on US EPA cancer potency estimates and the limited sampling of private homeowner wells, we estimate that persons exposed to contaminated drinking water may have a high increased risk of developing cancer over a lifetime.

These volatile organic compounds also produce a variety of noncarcinogenic toxicities (discussed in the above chemical-specific summaries) at exposures several orders of magnitude greater than exposure from off-site private homeowner wells. However, all the chlorinated solvents have similar toxicities. Therefore, although the risks of noncarcinogenic health effects from these exposures aren't completely understood, the existing data suggest that they are low.

2. Potential ingestion, dermal and inhalation exposure to contaminants in private wells as a result of contaminant plume migration.

As indicated in Tables 2 and 4, ground water both on and off-site is contaminated with volatile organic compounds and metals at concentrations that exceed New York State ground water and/or drinking water standards or guidelines. There is a potential for oral (ingestion), dermal and inhalation exposure to contaminants in residential well water from contaminant ground water.

The volatile organic compounds that were found in off-site private homeowner wells (see #1 above) and are classified by the US EPA as human, probable or possible human carcinogens, have also been detected in ground water both on and off-site. Based on US

EPA cancer potency estimates, exposure to these chemicals in drinking water at levels found in ground water both on site (see Table 2) and off-site (see Table 4) would pose a high increased cancer risk over a lifetime of exposure.

The volatile organic compounds also produce a variety of noncarcinogenic toxicities (discussed in the above chemical specific summaries) at exposures generally several orders of magnitude greater than exposure from ground water both on and off-site. However, all the chlorinated solvents have similar toxicities. In addition, benzene is at a level that potential exposure to this chemical would be in excess of the daily exposure that is likely to be without an appreciable risk of adverse noncarcinogenic health effects over a lifetime of exposure. Therefore, although the risks of noncarcinogenic health effects from these exposures aren't completely understood, the existing data suggest that they are significant.

Metal Contaminants

Chronic exposure to elevated lead levels is predominantly associated with neurological and hematological effects. At high exposure levels, lead can cause kidney damage, gastrointestinal distress, and reproductive effects including abortion and damage to the male reproductive system. The developing fetus and young children are particularly sensitive to lead-induced neurological effects, with symptoms ranging from delayed mental development and behavioral effects at low blood lead levels to frank ataxia, stupor, coma and convulsions at high blood levels. The most sensitive effect from chronic elevated exposure to cadmium is kidney damage. At high exposure levels, cadmium can cause adverse effects on bone, the gastrointestinal tract, liver, the hematopoietic system, cardiovascular system and reproduction. Arsenic can cause nerve, liver, blood vessel damage and behavioral problems including learning and hearing deficiencies. Studies with laboratory animals indicate that exposure to elevated levels of arsenic during pregnancy may increase the risk of adverse developmental and reproductive outcomes. Exposure to high silver concentrations primarily causes liver and kidney damage. Exposure to drinking water contaminated with these metals, in particular arsenic, at concentrations found in ground water on and off-site would pose a significant risk of adverse health effects.

3. Dermal, ingestion and inhalation exposure to contaminants in leachate seeps near the North Stream.

Children and fishermen could be exposed to contaminants in leachate at seeps along the banks of North Stream (see Table 8). Present and future exposure to these contaminants is expected to be primarily limited to skin contact. This risk of adverse health effects could be high for exposure to vinyl chloride, low from exposure to methylene chloride, acetone, trans-1,2-dichloroethene, 2-butanone, benzene and trichloroethene and minimal for all other organic contaminants and metals in these leachate seeps.

4. Dermal, ingestion and inhalation exposure to contaminants in sediments of waterbodies near the Colesville Landfill.

Children and fishermen could be exposed to organic contaminants and metals in stream and river sediments (see Tables 6 and 7). These contaminants, are at levels which could result in a minimal risk of adverse health effects.

B. Health Outcome Data Evaluation

In 1986, the Broome County Health Department reported on the cancer incidence in areas of the county where the water supplies were contaminated with organic chemicals or where there was a public perception that contamination had occurred. Cancer cases diagnosed during 1976-1980 as reported to the NYS Cancer Registry were used in the study. The area near the Colesville Landfill, including the Hamlet of Doraville, was included in this study as part of the Town of Colesville. Expected numbers of cancers of 17 common sites and all sites were calculated using age- and sex-specific incidence for Upstate New York from the NYS Cancer Registry. For the Town of Colesville, overall cancer incidence was below expected for both males and females; no statistically significant excesses of cancer of any site were found for either sex. There were no cases of cancer reported within two miles of the landfill.

NYS DOH is developing a registry of persons exposed to VOCs in drinking water. Families living in the homes near the Colesville Landfill found to have contaminated wells will be considered for inclusion in the registry.

C. Community Health Concerns Evaluation

Residents of Doraville have expressed concern regarding possible exposures to site contaminants via drinking water. These concerns have been addressed at a public meeting and in the Record of Decision document. Sampling of area wells prior to the remedial investigation did not show evidence of site-related contaminants in community wells. Provisions have been incorporated into the selected site remedy for long-term monitoring of ground water between the site and the community to address community concerns related to possible future exposures to site contaminants via drinking water.

Between 1983 and 1985, the NYS DOH received several letters from residents living near the Colesville Landfill, as well as copies of letters directed to public officials, citing specific family and community illnesses believed to be the result of exposure to site contaminants. The illnesses cited included reproductive, central nervous systems and carcinogenic effects, as well as dermal, gastric and urinary tract irritations. These complaints were primarily reported by one resident whose home has since been purchased by the county and is unoccupied. The NYS DOH has developed a registry of persons exposed to VOCs in drinking water and families which live in the homes near the landfill with contaminated wells will be considered for inclusion in the registry. In 1986, the Broome County Health Department reported on cancer incidence in areas

of the county where the water supplies were contaminated with organic chemicals or where there was a perception that contamination had occurred. There were no reported cases of cancer within two miles of the landfill.

CONCLUSIONS

Based on the information reviewed, the Colesville Landfill is a public health hazard because of the risk to human health from past exposures and possible future exposures to hazardous substances at concentrations that may result in adverse health impacts. The Colesville Landfill is contaminating ground water, both on and off site, primarily with VOCs. Homeowner wells south and southwest of the site are contaminated. Broome County purchased several of these homes which are now unoccupied. Other affected homeowners have been supplied with carbon filters for treatment of their water or are using bottled water to reduce the risk of exposure to contaminated ground water while final cleanup remedies are being designed and implemented.

Surface soils have not been characterized, but are not expected to be contaminated because an interim cover was placed on the landfill surface when it was closed in December 1984. Furthermore, US EPA has concluded that the absence of "hot spots" in subsurface soils, which may represent major sources of contamination, does not necessitate excavation and treatment of landfilled materials. The remedial action objective for landfill soils is to eliminate the potential for exposure via direct contact and reduce or eliminate infiltration of precipitation through the site soils.

The ground water from seeps near the landfill are contaminated with VOCs. The surface soil at the seeps may contain residual levels of contaminants. The surface water and sediment in nearby streams may have been impacted by contaminants from the site, but the residual levels are minimal. The indoor air of homes above the contaminated ground water plume may be impacted although the potential impact is expected to be small.

In 1986, the Broome County Health Department conducted a study of cancer incidence in the Colesville Landfill area. Results of this study indicated that overall cancer incidence was below expected for both males and females and no statistically significant excesses of cancer of any site were found for either sex.

The citizens of Doraville are concerned about their drinking water quality being affected in the future by site contaminants and want to receive drinking water from the proposed public water supply system. Their drinking water has been tested; no contaminants were detected. Because the ground water flow is to the west, rather than the south, the contamination is not expected to reach their wells. However, the monitoring wells which are between the contaminated ground water plume and their wells can be used to monitor contaminant movement. If contamination is detected in these monitoring wells in the future, additional remedial actions could be initiated to ensure that the wells of Doraville residents do not become contaminated.

RECOMMENDATIONS

1. Site access to the landfill property and areas where leachate seeps occur should be restricted to eliminate the potential for direct contact with contaminants.

2. Control measures to minimize discharge of contaminated ground water to the North Stream and Susquehanna River should be implemented.

3. Homeowners with contaminated water should be provided with a new water supply. The drinking water before and after the granular activated carbon filters should be analyzed for alcohols and ketones to determine if they are present.

4. Monitoring wells downgradient of the site and between the Hamlet of Doraville should be routinely monitored to evaluate the potential for impact to water supplies of Doraville residents.

5. Ambient air in homes near the landfill should be surveyed for methane and VOCs. Measures should be in place to ensure that methane will not impact the homes in the future.

6. Appropriate measures to protect worker health and safety associated with exposure to site contaminants during site remediation should be implemented.

7. A review of the carbon filter maintenance and confirmatory sampling schedule should be conducted to verify drinking water quality at affected residences.

HEALTH ACTIVITIES RECOMMENDATION PANEL RECOMMENDATION

The data and information developed in the public health assessment for the Colesville Municipal Landfill site, Colesville, New York, has been evaluated by ATSDR's Health Activities Recommendation Panel for appropriate follow-up with respect to health activities. Because of past exposure to contaminated drinking water, the panel recommends this site for follow-up health activities. Specifically, the panel agrees that those persons exposed in the past should be added to NYSDOH's registry being developed for VOC exposures from drinking contaminated drinking water. In addition, the panel recommends that community health education be performed for the persons who were exposed to contaminants in their drinking water.

PUBLIC HEALTH ACTIONS

Public Health Actions Taken:

1. Broome County has sampled homeowner wells downgradient of the landfill and has provided bottled water and/or carbon filters to homes with contaminated wells. The County has also purchased several of the affected properties from homeowners living near the landfill.

2. Prior to the Remedial Investigation, private water supplies of homeowners in Doraville were sampled to determine if site-related contaminants were present.

3. Community health education of homeowners whose wells were contaminated as a result of waste disposal activities at the Colesville Landfill site has occurred during homeowner well sampling in 1983 and also during a NYS DOH survey of homeowners in November 1990, whose wells had shown site-related contamination. In addition, NYS DOH staff addressed community concerns at the public meeting on January 30, 1991.

Public Health Actions Planned:

1. The selected remedy includes provisions for a new public water supply, to be located north (upgradient) of the landfill, with distribution to affected homes.

2. The selected remedy provides for routine sampling of monitoring wells between the ground water contaminant plume at the landfill and private residences in Doraville to evaluate the potential for future contamination of private water supplies in Doraville.

3. Control measures will be put in place to ensure that methane gas will not migrate to nearby homes.

4. The selected remedy requires extraction (by pumping) and treatment (via air stripping) of contaminated ground water to control migration of the ground water contaminant plume and to restore ground water quality to levels consistent with State and Federal requirements.

5. The selected remedy calls for imposition of property deed restrictions to prevent the future installation of drinking water wells at the site.

6. A multimedia cap will be installed over the landfill material to prevent infiltration of precipitation through landfill soils to the water table.

7. A fence will be installed to further protect the integrity of the landfill cap by restricting access to the site.

8. NYS DOH is developing a registry of persons exposed to VOCs in drinking water. Residents who were exposed in the past to VOCs through the use of domestic water supplies will be considered for inclusion to this registry.

CERTIFICATION

This Public Health Assessment was prepared by the New York State Department of Public Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the public health assessment was initiated.

Technical Project Officer, SPS, RPB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this Public Health Assessment and concurs with its findings.

Division Director, DHAC, ATSDR

PREPARERS OF THE REPORT

Claudine F. Jones

Program Research Specialist

Bureau of Environmental Exposure Investigation

New York State Department of Health

ATSDR REGIONAL REPRESENTATIVE

Arthur Block

Regional Operations

Office of the Assistant Administrator
Agency for Toxic Substances and Disease Registry

ATSDR TECHNICAL PROJECT OFFICER

Gregory Ulirsch

Technical Project Officer

Division of Health Assessment and Consultation,
Remedial Programs Branch
Agency for Toxic Substances and Disease Registry

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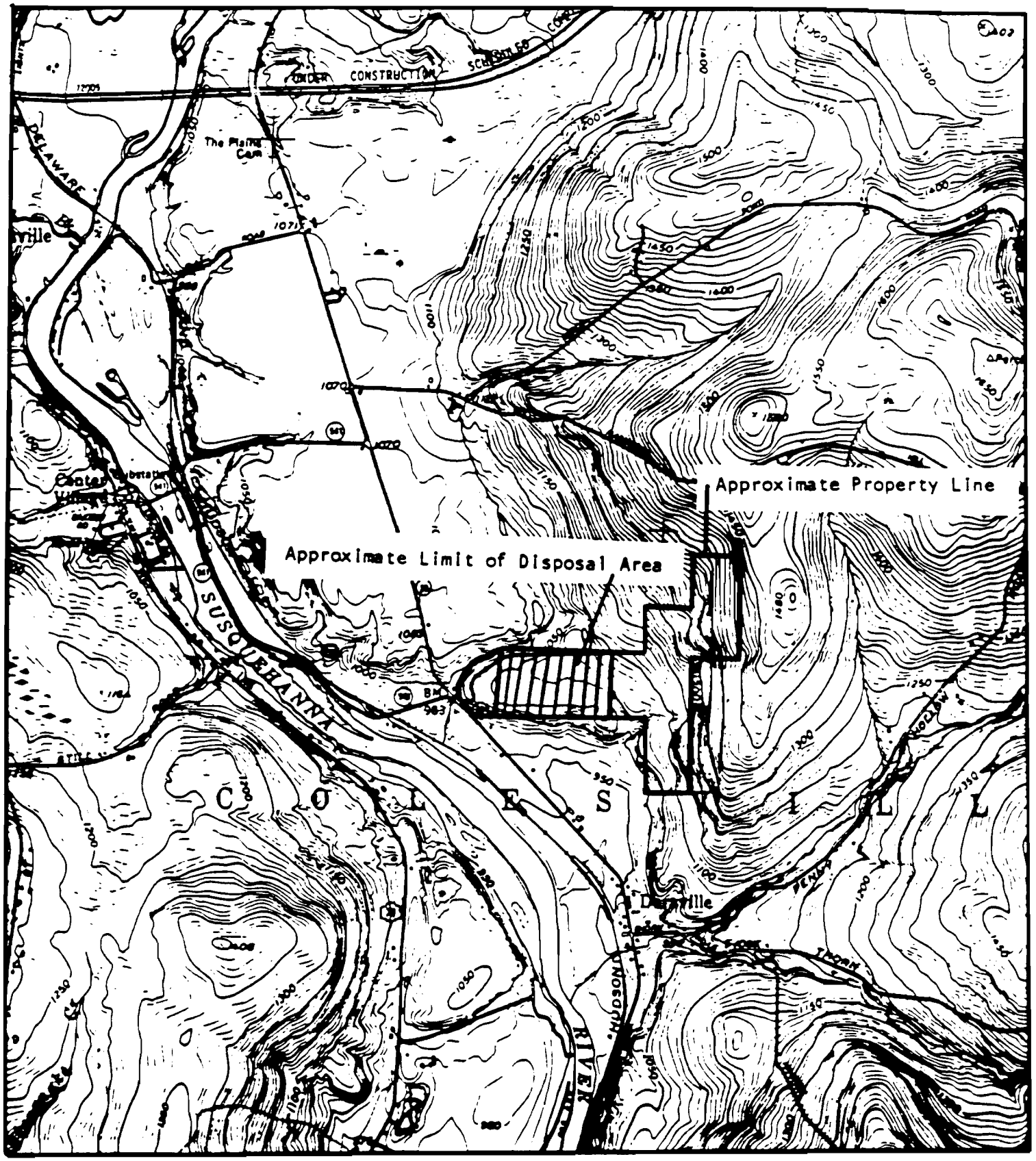
APPENDIX 1



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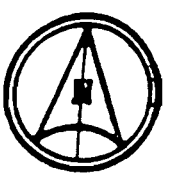
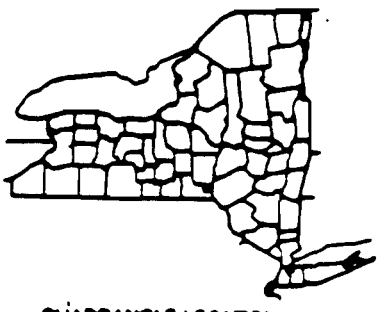
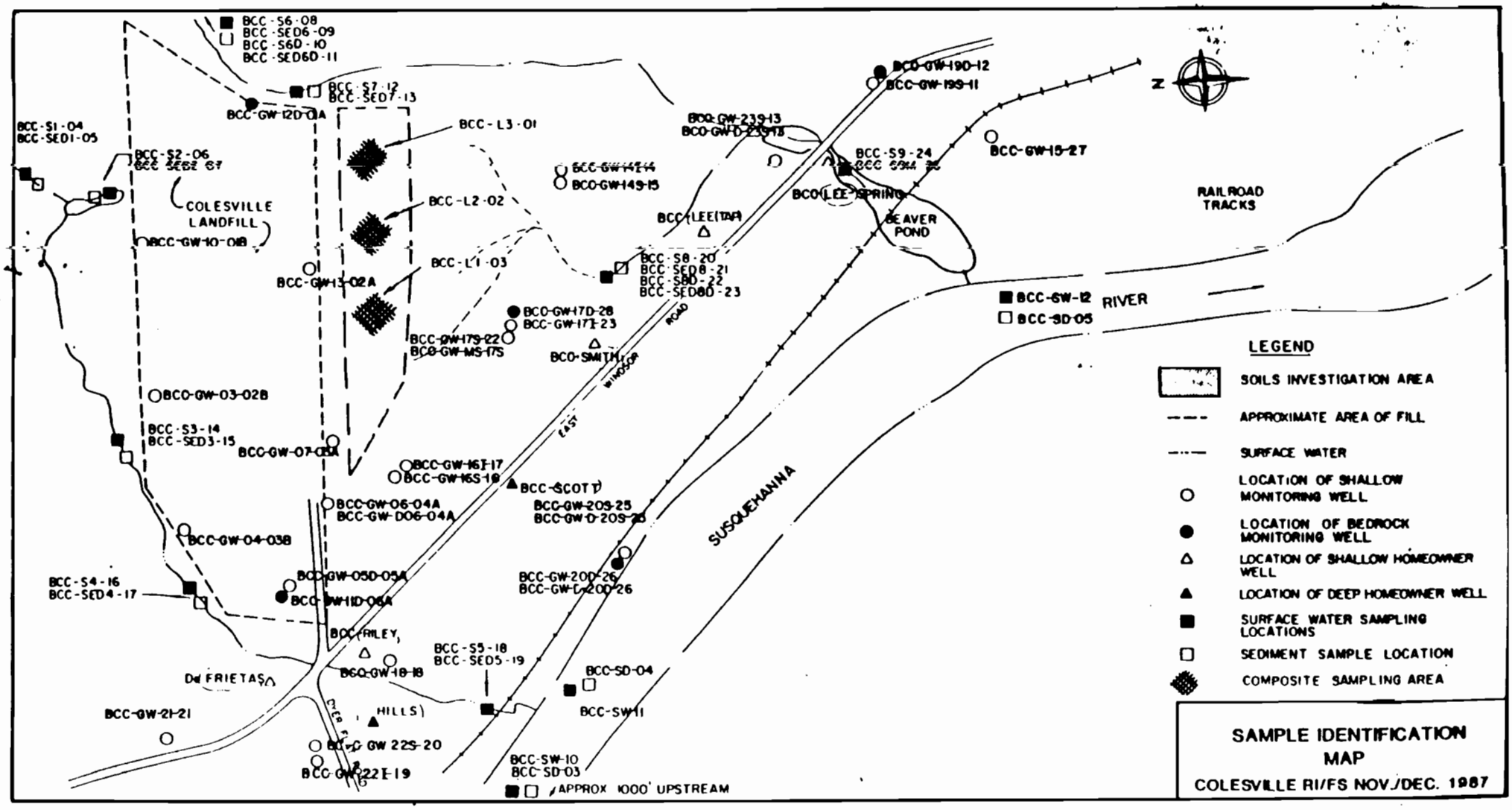




QUADRANGLE LOCATION

Figure 1: Site Location Map - Colesville Landfill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BCC-S1-04
BCC-SED1-05
BCC-S2-06
BCC-L3-01
BCC-L2-02
BCC-L1-03
COLESVILLE LANDFILL
BCC-GW-10-01B
BCC-GW-13-02A
BCC-GW-14S-14
BCO-GW-14S-15
BCO-GW-23S-13
BCO-GW-23D-13
BCO-GW-19D-12
BCC-GW-19S-11
BCC-S9-24
BCC-GW-15-27
BCO-LEE SPRING
BCC-LEE(TAP)
BEAVER POND
RAILROAD TRACKS
BCC-S8-20
BCC-SED8-21
BCC-S8D-22
BCC-SED8D-23
BCC-GW-12
BCC-SD-05
RIVER
BCO-GW-17D-28
BCC-GW-17I-23
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LEGEND
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APPROXIMATE AREA OF FILL
SURFACE WATER
LOCATION OF SHALLOW MONITORING WELL
LOCATION OF BEDROCK MONITORING WELL
LOCATION OF SHALLOW HOMEOWNER WELL
LOCATION OF DEEP HOMEOWNER WELL
SURFACE WATER SAMPLING LOCATIONS
SEDIMENT SAMPLE LOCATION
COMPOSITE SAMPLING AREA
SAMPLE IDENTIFICATION MAP
COLESVILLE RI/FS NOV./DEC. 1987

Figure 2

APPENDIX 2

Table 1.

Summary of Industrial Wastes Disposed at the
Colesville Landfill in Broome County, New York.

Waste Type	Waste Components	Waste Properties	Approximate Quantity Disposed at Site
Aqueous Dye Wastes	- 0.18% sulfate - traces of zinc, aluminum, iron, tin	- 15% total solids at 110°C - pH is neutral to alkaline - density: 8.3-9 lbs/gal	10 drums/month
Mixed Chemical Solvents	- 15% Chlorine content - isopropyl alcohol - methanol - methylene chloride - acetone - traces of other hydrocarbons and oxygenated solvents	- 5% total solids at 110°C - 6,500 BTU/lb - density: 8.3 lbs/gal	10 drums/month
Organic Solvent Mixtures	- 10% chlorinated solvents and water - benzene - acetone - cyclohexane - methanol - ethanol - n-hexane - toluene - xylene - isopropyl alcohol - methylcellosolve	- 8,000 BTU/lb - 5% total solids at 110°C - density: 6.8-8.3 lbs/gal	10 drums/month

Adapted from: Wehran Engineering, 1983 and 1988.

BTU = British Thermal Units

lb = pounds

gal = gallons

°C = degrees centigrade

These data are indicators of contamination and may or may not be sufficiently high to be a significant health concern.

Table 2.

Summary of Contaminants Detected in Groundwater at Colesville Landfill.

Chemical	Highest Concentration Reported (mcg/L)
arsenic	376
cadmium	28
lead	13.6
silver	126
zinc	187
benzene	640
chlorobenzene	180
chloroform	44
chloromethane	60
1,1-dichloroethane	1600
1,2-dichloroethane	12
1,1-dichloroethene	32
ethylbenzene	70
methylene chloride	3500
trans-1,2-dichloroethene	1500
toluene	120
1,1,1-trichloroethane	950
trichloroethene	640

Adapted from Wehran Engineering, Inc.; September 1988.

mcg/L = micrograms per liter

These data are indicators of contamination and may or may not be sufficiently high to be a significant health concern.

Table 3.

Summary of Volatile Organic Compounds Detected in Private Water Supplies Near the Colesville Landfill (1983-1987).
(all units in mcg/L)

Chemical	March 1983	April 1983	December 1983	May/June 1984	September 1984	December 1987
benzene	4	31	ND	2	ND	ND
2-butanone	ND	ND	ND	ND	ND	13
chloroethane	ND	ND	ND	ND	ND	2
chloroform	2	12	8	ND	12	72
1,1-dichloroethane	ND	33	27	8	170	480
1,2-dichloroethane	7	ND	ND	ND	ND	10
1,1-dichloroethene	ND	12	12	ND	54	110
1,2-dichloropropane	ND	ND	ND	ND	ND	2
methylene chloride	100	10	ND	180	8	6
toluene	12	1	ND	ND	ND	ND
trans-1,2-dichloroethene	130	70	120	17	8	600
1,1,1-trichloroethane	460	150	>330	16	220	400
trichloroethene	440	130	140	ND	100	220
trichlorofluoromethane	ND	2	ND	ND	34	ND
vinyl chloride	2	6	ND	ND	ND	11
xylenes (total)	1	1	ND	ND	ND	ND

ND - Not detected

mcg/L = micrograms per liter

Note: Only the highest concentration in the water supplies is given.

Adapted from: Wehran Engineering, Inc., September 1988.

These data are indicators of contamination and may or may not be sufficiently high to be a significant health concern.

Table 4.

Summary of Contaminants Detected in
Groundwater Near the Colesville Landfill.

Chemical	Highest Concentration Reported (mcg/L)
arsenic	15.3
cadmium	8
chromium	41
lead	11.7
silver	89
zinc	271
benzene	70
chlorobenzene	40
chloroethane	8
1,1-dichloroethane	140
ethylbenzene	32
toluene	57
trans-1,2-dichloroethene	72
1,1,1-trichloroethane	73
trichloroethene	34
trichlorofluoromethane	26
vinyl chloride	10

Adapted from Wehran Engineering, Inc.; September 1988.

mcg/L = micrograms per liter

These data are indicators of contamination and may or may not be sufficiently high to be a significant health concern.

Table 5.

New York State and Federal Standards and Guidelines for Chemicals Detected in Ground Water Near the Colesville Landfill (all values mcg/L).

Chemical	NEW YORK STATE Ground-Water	NEW YORK STATE Drinking Water	U.S. EPA Drinking Water
Organic			
benzene	ND;0.7p	5	5
chloroform	100;7p	100d	100d
chlorobenzene	5	5	100
chloroethane	5	5	--
1,1-dichloroethane	5	5	--
1,2-dichloroethane	5	5	5
1,1-dichloroethene	5	5	7
trans-1,2-dichloroethene	5	5	100
ethylbenzene	5	5	700;30ps
methylene chloride	5	5	5p
1,1,1-trichloroethane	5	5	200
trichloroethene	5	5	5
xylenes (all isomers)	5	5	10,000i;20ps
vinyl chloride	2	2	2
Inorganic			
Arsenic	25	50	50
Cadmium	10	10	10
Chromium	50	50	50
Lead	25	50	50
Silver	50	50	50
Zinc	300	5000	5000

d = drinking water standard for total trihalomethanes produced as a result of disinfection with chlorine. This standard is inappropriate for evaluating environmental contamination not associated with disinfection practices.

g = guidance value

i = total xylenes

p = proposed maximum contaminant level (MCL)

ps = proposed secondary MCL

Table 6.

Summary of Organic Compounds Detected in Sediment of Waterbodies Near the Colesville Landfill.

Chemical	North Stream	South Spring	Susquehanna River
toluene	ND	11	6
benzene	ND	13	ND
trichloroethene	ND	12	ND
1,1-dichloroethane	32	ND	ND
methylene chloride	340	230	ND
naphthalene	1200	ND	ND
bis(2-ethylhexyl)phthalate	2000	ND	ND

All units in ug/kg (micrograms per kilogram)
ND - not detected

These data are indicators of contamination and may or may not be sufficiently high to be a significant health concern.

Table 7.

Summary of Inorganic Compounds Detected in Sediment of Waterbodies Near the Colesville Landfill.

Chemical	North Stream	South Spring	Susquehanna River
arsenic	25	15	11.9
cadmium	1	5	ND
chromium	20	20	ND
copper	40	ND	18.5
lead	14	14	125
nickel	41	16	ND
silver	6	12	ND
zinc	149	75	542.5

All units in mg/kg (milligrams per kilogram)

ND - not detected

These data are indicators of contamination and may or may not be sufficiently high to be a significant health concern.

Table 8.

Summary of Compounds Detected in Leachate Near the Colesville Landfill (October 29, 1987).

	Leachate Composite at North Stream (mcg/L)*
Organic Compounds	
Vinyl chloride	61
Methylene chloride	78 B
Acetone	600
1,1-Dichloroethane	99
trans-1,2-Dichloroethene	180
2-Butanone	380
1,1,1-Trichloroethane	77
Trichloroethene	8.4
Benzene	11
Toluene	33
Chlorobenzene	350
Total xylenes	27
4-Methyl-2-pentanone	25
Inorganic Compounds	
Aluminum	88,900
Arsenic	227
Barium	666
Beryllium	(4.6)
Cadmium	6.2
Calcium	180,000
Chromium	95
Cobalt	(40)
Copper	191
Iron	463,000
Lead	306
Magnesium	54,900
Manganese	15,400
Mercury	0.3
Nickel	164
Potassium	5,090
Sodium	18,500
Vanadium	168
Zinc	460

*Sample was diluted by a factor of 10.
B - Analyte found in method blank.

Values in parentheses indicate that the result is a value greater than or equal to the instrument detection limit but less than the contract required detection limit.

These data are indicators of contamination and may or may not be sufficiently high to be a significant health concern.

APPENDIX 3

SUMMARY OF PUBLIC COMMENTS AND RESPONSES

Comments were received during the public comment period (4/17/92-6/9/92) for the Colesville Landfill Public Health Assessment. The comments have been summarized and numbered in the order that they were received and similar comments have been grouped together.

Comment #1

The lack of a new water system is adversely affecting the entire Doraville Community including homes adjacent to the community. Residents are worried that their wells will become contaminated and that they will unknowingly ingest contaminants. In view of the impact upon the Colesville Township, we request that all homes in the Doraville area be considered for inclusion into a central water distribution system.

Response

Groundwater at the Colesville Landfill site is contaminated with volatile organic compounds (VOCs) and metals. Groundwater flows from the site in a southwesterly direction towards the Susquehanna River. Several residential wells immediately downgradient of the site have been contaminated, but private wells in the Hamlet of Doraville have not contained contaminants. The selected remedy in the final (March 1991) Record of Decision (ROD) for the Colesville Landfill site will protect private water supplies by 1) installation of a multi-media cap over landfill material, 2) extraction of groundwater from beneath and downgradient of the landfill and 3) monitoring of groundwater quality downgradient (i.e., between the landfill and the Hamlet of Doraville) of the site. Installation of a cap will prevent downward percolation of rain and surface water overflow on the landfill from migrating through waste materials. Pumping and extraction of groundwater from beneath and downgradient of the landfill will capture groundwater contaminants and redirect groundwater flow for treatment prior to being discharged to the Susquehanna River. Monitoring of groundwater quality downgradient of the site will be conducted to evaluate the effectiveness of the remedial actions at the site. The ROD also provides for protection to those residents with contaminated water supplies by stipulating construction of a new water supply system northwest of the site. Implementation of the selected remedy is anticipated to occur during 1993. During the interim, residences with contaminated water supplies will continue to be monitored on a quarterly basis and have been provided with bottled water for drinking and cooking purposes and/or carbon filtration systems to remove contaminants from well water. In addition, Broome County has purchased some of the affected properties from residents and these homes are now unoccupied.

Comment #2

On page 14 you say NYS DOH surveyed the homeowners. I don't recall being surveyed. We had to insist we be tested.

Response

Homeowner wells near the Colesville Landfill site have been sampled to determine if site-related contaminants had migrated from the site to downgradient drinking water supplies. Initial sampling of homeowner wells focused on those residences immediately downgradient or adjacent to the landfill. Additional residential well sampling activities were subsequently expanded to include other private wells at homes downgradient of the landfill along East Windsor Road and in the Hamlet of Doraville. Only those homeowners whose wells had shown evidence of site-related contaminants in their water supply were surveyed by NYS DOH in November 1990 for determining the affected homeowners preference of the two alternatives proposed for their future water supply. The two proposed alternatives presented to homeowners with contaminated water supplies during this survey were 1) upgrading the existing filter systems or 2) a new water supply.

Comment #3

Various chemicals have been reported at high levels, but when our well was sampled they say our water is fine. How can this be? I have read a list of chemicals dumped at the landfill, yet other chemicals keep showing up that were never dumped there. Where do they come from? On our own water reports some companies show chemicals that never were dumped. We have had tests done by EPA, Wehran and the county, all within a week of each other, and some show we have chemicals, while the other reports say we do not have any chemicals in our water. The reports we have from the county on the chemicals and barrels are very different from yours.

Response

Existing waste disposal records may document only some of the waste types and chemicals which were disposed at the site during this time, while disposal of other wastes may not have been recorded. In preparation of this health assessment, the NYS DOH used all accessible information and data about past waste disposal practices and landfilling operations. In preparation of the health assessment, the NYS DOH and ATSDR must rely on the referenced documents and assume that these summaries are complete. The NYS DOH has contacted the Broome County Health Department for copies of these waste disposal records, if available, for review and will make any changes as needed.

Sample results of private water supplies may vary significantly from sample results for groundwater collected from monitoring wells on-site. This may be due to several factors including local groundwater flow direction; location and distance of the residential well from the site; depth, type and condition of the well on the residential property and concentration of contaminants in groundwater on-site.

Analytical results of drinking water analyses may have changed over time at the same homeowner well for several reasons. Different agencies or entities involved with sampling activities may have used different laboratories to perform water quality analyses. There may have been differences in the analytical methods used by each laboratory to test the water

samples as well as differences in the analytical capabilities of the equipment used by different laboratories. Different analytical methods may vary slightly in the list of chemicals to be tested and there may also be some variations in the detection limits (i.e., the lowest concentration at which the presence of a chemical in a sample is reported with confidence) of different analytical methods. Slight differences in detection limits between various analytical methods and equipment used by the lab may show a particular chemical to be present above the detection limit on one water quality report and not present above the detection limit on another water quality report. It is important to recognize that environmental conditions are constantly changing (i.e., dynamic) and that a single sample is representative of only a very small portion of the site at a particular point in time.

Comment #4

On page 21 the report states that the Susquehanna River does not supply water to a municipality, but Binghamton gets its water from the river.

Response

The City of Binghamton is situated along the Susquehanna River, more than 25 miles downstream of the Colesville Landfill site. While it is true that the City of Binghamton does obtain its drinking water from the Susquehanna River, its distance from the site does not classify it as a "neighboring community" to the Colesville Landfill site and Hamlet of Doraville. This description was intended to describe users of the Susquehanna River in the immediate vicinity of the site area and has been modified for clarification.

Comment #5

Table 5, I don't understand why groundwater has a lower standard than drinking water (e.g., zinc: 300 mcg/L in groundwater and 5,000 mcg/L in drinking water, arsenic: 25 mcg/L in groundwater and 50 mcg/L in drinking water).

Response

The NYS DOH drinking water standards listed in Table 5 of the health assessment have been established by the NYS DOH for protection of human health based upon anticipated and estimated water use by an individual associated with drinking (2 liters per day over a lifetime of 70 years), cooking, bathing and other household uses, as well as available toxicological and health effects information. Drinking water standards for some chemicals such as iron and manganese are protective of human health but are determined primarily because of aesthetic purposes (i.e., staining of plumbing fixtures, taste or odor).

The groundwater standards listed in Table 5 of the health assessment were established by the New York State Department of Environmental Conservation (NYS DEC) for protection of Class GA fresh groundwaters. The best usage of Class GA groundwater is as a source of a potable water supply. The NYS DEC may establish a more stringent standard for a

specific chemical necessary to prevent groundwater pollution and protection of groundwaters for their best use, as a future potable water supply.

Comment #6

Page 38 of the report states that a new well will be put in. The local paper states that the county is trying for a buyout. We recommend that all properties are bought from the people who wish to leave the area. The damage is already done to our bodies. What will moving solve? For the victims of the landfill, it's too little too late!

Response

The final (March 1991) record of decision (ROD) for the Colesville Landfill presents the selected remedy for the site, which includes construction of a new water supply for distribution to the present and future affected residential water supplies near the landfill. As a responsible party, Broome County offered homeowners with contaminated water supplies the opportunity to relocate at the expense of the county. To date, the County has purchased all but one of the affected residential properties.

Comment #7

Further study of health concerns should be done, including the evidence of cancer and other illnesses. I know of people who lived near the dump and are now deceased. Do you have their health records? Are their names recorded in a registry or is something going to get done? Since the landfill closed, there has been serious illness, similar to those in the past. A woman died of cancer in 1991. She died of the same type of cancer that three doctors describe as being the type found in third world countries where contaminated water is prevalent.

Response

The area near the Colesville Landfill, including the Hamlet of Doraville, was included in a study of cancer incidence by the Broome County Health Department (BCHD). This study evaluated cancer incidence for the period between 1976 and 1980 in areas of the county where water supplies were known to be contaminated with organic chemicals or where there was a public perception that contamination had occurred. Results of the study indicated that for the Town of Colesville, cancer incidence rates were below what was expected for both males and females and there were no cases of cancer reported within two miles of the landfill. NYS DOH will request that this study be updated through 1990 to determine whether cancer rates from 1981-1990 are similar to those found in the earlier study. In addition, the NYS DOH has developed a registry of persons exposed to volatile organic compounds (VOCs) in drinking water. With this registry, NYS DOH will periodically receive health information and updated addresses for exposed individuals. Families living in homes near the Colesville Landfill with contaminated water supplies will be considered for inclusion in the registry.

Comment #8

What about the children? They are the victims. All of them have suffered some type of illness. Stress is another illness which this problem has caused. With such a high level of dangerous chemicals in the area, the children in this area cannot expect a normal lifespan. How can we not do all possible to insure their health is protected when there is an obvious hazard near where they live? I know of children living in the area that either have Downs Syndrome or other birth defects. The doctors in the area are not interested in hearing that they live near a landfill because they say it is too controversial.

Response

The NYS DOH has a statewide registry for mandatory reporting of birth defects. Any children with birth defects whose parents were living near the Colesville Landfill at the time of their birth have been included as part of this registry.

Because the population living around any individual waste site is too small to conduct a birth defects study, NYS DOH recently conducted a study examining birth defect rates around 590 waste sites in 20 counties in New York State. The study found a small increased risk of birth defects associated with living near the waste sites. The NYS DOH is currently involved with three follow-up studies that assess exposure based on available environmental data, address the impact of active industrial emissions, and examine other potential risk factors in the development of birth defects.

Specific health concerns should be discussed with a personal physician who may contact the NYS DOH to consult with DOH physicians regarding the possible relationship between health concerns and exposure to site contaminants. Physicians may contact the Bureau of Environmental and Occupational Epidemiology at 518-458-6202.

Exposure to site contaminants in drinking water has been alleviated for these residents with contaminated water supplies by installation of carbon filters and/or delivery of bottled water. Remediation of the site will include measures to minimize exposures to site contaminants, thereby reducing/eliminating the existing hazard.

Comment #9

The State has been aware of the problem for almost ten years. Something should be done immediately. Several people have died, and contaminants from the landfill are the suspected cause. The area should be fenced and a safe alternate source of water should be provided for the residents involved. The health assessment concludes that the landfill is a hazard and poses potential risk to human health from past exposure and future health impacts. We have been waiting since 1983 for something to be done. Why is something not being done, immediately? We are very concerned about our life expectancy and that of future generations. It seems that all the recommendations are meaningless. A Record of Decision was signed in March 1991, and it stated that the remedy for the site was:

- o Landfill cap
- o Community water supply
- o Pumping and treatment of contaminated water

Now it is June 1992 and nothing is being done.

Response

Following initial discovery of residential well contamination near the Colesville Landfill in 1983, Broome County initiated delivery of bottled water to the affected residences as an immediate, temporary measure to minimize exposures to site contaminants in drinking water. The County subsequently installed carbon filters at the affected homes to remove contaminants from the potable water supply as an interim measure, and monitored water quality on a quarterly basis to evaluate the effectiveness of the filters. Later, the county offered to purchase properties from homeowners near the landfill with contaminated water supplies and all but one of the five homes with contaminated water supplies has been purchased. These measures were all executed to mitigate known exposures to site contaminants in drinking water.

At the same time, other activities to stop dumping at the landfill and investigate the extent of contamination around the landfill were initiated. The landfill was closed in December 1984 and an interim cover was placed on the landfill surface. A remedial investigation and feasibility study (RI/FS) was initiated in 1988. An RI/FS is a focused study which is conducted to characterize site contaminant conditions and must be conducted in order to determine the most appropriate measure(s) needed to properly remediate contaminants at a site. Generally, an RI/FS may take two or more years to plan, implement, conduct and finalize.

Throughout the course of the investigation, information about progress of investigations at the site is presented to the public for comment. All public comments are reviewed and considered prior to selecting a remedy for the site. The selected remedy is then presented in the Record of Decision. These efforts and studies do take time, but are necessary to ensure that the site is properly characterized and remediated and that all exposure concerns associated with past, present and future site conditions are addressed.

Comment #10

The seven recommendations listed on pages 36 and 37 appear to be excellent recommendations, however, until they are fully implemented, residents continue to feel the direct effects of the contaminated landfill.

Response

The recommendations of the public health assessment have been made for consideration

as part of follow-up health and remediation activities at the site. The NYS DOH and ATSDR will coordinate with the appropriate regulatory agencies to develop plans to implement the recommendations contained in this public health assessment.

Comment #11

The location of the landfill in the Town of Colesville was not properly evaluated. Locating a landfill on a hill with a residential area below shows a lack of study and concern on the part of the people responsible for locating the landfill.

Response

As discussed in the "Site Description and History" subsection of the health assessment report, disposal operations at the Colesville Landfill site began in 1965. Unfortunately, at this time and also during the time when industrial wastes were disposed at the site (1973-1975), there were no federal or state regulations to control for disposal of hazardous wastes. It is not clear if homes which are presently located near the site perimeter were established when landfilling operations began.

Comment #12

Why was dumping allowed at night after the dump was closed?

Response

The NYS DOH is not aware that illegal dumping occurred at night after closure of the landfill in December 1984 and is in the process of determining if the Broome County Health Department or the New York State Department of Environmental Conservation have knowledge of illegal disposal activities.

Comment #13

For many years, the smell and stench from the landfill was tolerated by all the people. We cannot know at what point in time we will be zapped again with chemicals in the water when more barrels rust through.

Response

Odors are often associated with landfilling operations. When the landfill was closed in December 1984, an interim cover was placed on the landfill surface, significantly reducing the potential for odors to migrate from the landfill. As part of site remediation, a gas vent layer will be installed which will provide additional controls for odors migrating from the landfill in the future.

As buried wastes are to remain on site, the selected remedy will control for any future releases of contaminants to groundwater. Groundwater will be pumped from beneath and

downgradient of the landfill and treated. Groundwater pumping ("extraction") wells will be located such that the contaminant plume and contaminants migrating from the landfill will be "captured" and prevented from migrating off-site to downgradient receptors.

Comment #14

The presence of methane at and around the landfill should be constantly checked and controlled.

Response

One of the recommendations of the public health assessment, calls for appropriate measures to ensure that methane will not impact homes near the landfill in the future. As stated in the record of decision (ROD), the selected remedy will include installation of a gas venting layer to address and control for methane at the landfill.

Comment #15

In addition to living with constant fear, our residents note they have suffered a decline in property values - due to the widespread knowledge of the contaminated landfill and associated groundwater, and the reluctance of people to move into such an area.

Response

For those homeowners whose water supplies have been contaminated as a result of past disposal activities at the Colesville Landfill, Broome County has offered to purchase their property. The objectives of the selected remedy for the site is to restore on-site groundwater to levels which are consistent with federal and state groundwater standards, including NYS DOH drinking water standards. The goal of the remedial action is to restore groundwater at (and near) the site to its beneficial use, which is as a drinking water source.

Comment #16

This area was one of the first settled in the Town of Colesville. While the area cannot be brought back to that pristine condition, it should not be allowed to worsen and to enlarge.

Response

The landfill was closed in December 1984 to prevent additional wastes from being disposed at the site. Since that time, a remedial investigation and feasibility study has been conducted to characterize contaminant conditions at the site and evaluate alternatives for site remediation. The selected remedy is designed to be protective of human health and the environment. Removal and treatment of contaminants in groundwater will reduce the volume of contaminated groundwater and toxicity of contaminants in treated groundwater. Installation of a cap at the landfill surface will reduce the mobility of buried waste by minimizing the potential for wastes to leach to groundwater as a result of downward

percolation of rain and surface water overland flow through waste materials. Leachate collection trenches will control any leachate that is generated during and after site remediation, from migrating off-site. A fence will be installed around the landfill to prevent unauthorized access. The top soil layer of the landfill cap will be seeded to promote rapid growth of vegetation. The goal of the remedial action is to restore groundwater to its beneficial use which is as a drinking water source.

Comment #17

We recommend that families be kept more informed of what is going on.

Response

A public meeting was held on January 30, 1991 to inform the public of US EPA's and the NYS DEC's preferred remedy and solicit public comment on all the remedial alternatives, as well as the preferred alternative. The remedial investigation and feasibility study report and proposed plan for the site were released for public comment on 1/5/91. Information about the site history, past site investigations, including the remedial investigation and feasibility study and the selected remedy for the site are available at the information repositories which have been established for the Colesville Landfill site. The information repositories have been established by the US EPA to provide citizens with access to documents containing information about the site. These repositories are:

Town of Colesville
Town Hall
Hurpursville, N.Y. 13787

NYS DEC
50 Wolf Road, Room 222
Albany, N.Y. 12233-7010

U.S. EPA
Emergency and Remedial Response Division
26 Federal Plaza
Room 29-30
New York, N.Y. 10278

Additional site-related information and reports that are generated in the future will also be included in the document respiratory for public access.

Comment #18

Deer and turkeys travel in about a three mile radius.

Response

Ingestion of wild animals such as deer and turkey, were identified as a potential source of human exposure for contaminants that bioaccumulate. There is no fencing around the site at present to prevent access by animals that can be hunted for food. A fence will be installed around the site as part of site remediation efforts and this fencing will minimize the extent to which wild animals can forage freely on the site, thereby reducing the potential for exposure to contaminants that bioaccumulate in animals which are hunted for food in the area.

Comment #19

Would planting trees over the affected area help? Would trees and/or other plants absorb any of the toxic material?

Response

Planting trees around inactive hazardous waste site may be conducted as part of the remedial effort, but primarily for aesthetic purposes. At the Colesville Landfill, a cap is to be installed over the landfill material as part of the selected remedy for the site. This cap will be designed to mitigate downward percolation of rain and overland surface waters through underlying waste materials to groundwater. Planting trees at the landfill surface, either before or after installation of the landfill cap, would most likely compromise the integrity (i.e., the structure) of the cap and subsequently, the effectiveness of the cap in preventing additional leaching of wastes to groundwater.

Comment #20

Test well number 19D was filled with concrete. How can a true test be taken from it?

Response

The only monitoring wells which were backfilled with concrete as part of well abandonment at the site were monitoring wells 12s and 12d. These wells were "abandoned" because there was some concern regarding the construction of the wells and the appropriateness of using these wells as monitoring points. Two new monitoring wells were installed in close proximity to the original location of these wells and are also referenced as monitoring wells 12s and 12d. The NYS DOH and NYS DEC do not have any information to suggest that monitoring well 19d has been filled with concrete and the construction of this well will be verified. During development of the Operation and Maintenance (O&M) plan for the site, appropriate groundwater monitoring locations will be identified to evaluate if contaminants are migrating off-site and to ensure protection of downgradient residential water supplies.

Comment #21

The one person responding to health concerns was the spokesperson for all the people in the "Concerned Parents of Doraville Group".

Response

Based on the Department of Health's sign-in sheet from the public meeting held on January 30, 1991, it is our understanding that the spokesperson representing the Hamlet of Doraville was a representative of the Citizen Action of New York.

Comment #22

What about the future?

Response

Currently, development of the conceptual design for the selected remedy is underway. It is anticipated that the remedy at the site will be started in the Fall of 1993. Once the remedy for the site has been completed, an operations and maintenance (O&M) plan will be developed for post-remediation activities at the site.

At sites where wastes are to remain on-site as part of the selected remedy the National Contingency Plan (NCP) requires five year reviews to be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment.