

elsewhere in the study area. These volatile organic and extractable organic (PAH) compounds are common constituents of gasoline. The highest concentrations of this contamination was detected in the shallow overburden well S75S (4,712 ppb). The concentrations decreased with depth to 230 ppb in the bedrock well S75D. Lower levels (170 to 750 ppb) were detected in wells located on the Juniper Development Group property. Gasoline is less dense than water and if spilled on the ground surface could migrate through the vadose zone to groundwater. The resultant plume of gasoline contamination would consist of an immiscible layer on top of the water and a dissolved portion in groundwater. Sparse data make description of the extent and characteristics of this plume difficult.

6.2 Sources of Contamination

NUS/FIT identified four areas of groundwater contamination within the study area. The following sections will present the evidence for identifying the source areas. The northeastern plume, characterized by a predominance of TCE and trans-1,2-DCE, emanates from the W.R. Grace property. The northern plume, characterized by a predominance of TETRA emanates from the UniFirst Corporation property. The western area of contamination, characterized by a predominance of trichloroethene and isolated part per million (ppm) concentrations of other volatile organic contaminants, emanates primarily from the Wildwood Conservation Corporation property. The source area of the gasoline contaminated groundwater detected at well S75 cannot be determined. Volatile organic groundwater contamination underlying the Juniper Development Group property may be due to prior site activities.

6.2.1 Northeastern Volatile Organic Contaminant Plume

NUS/FIT concludes that the northeastern plume emanates from the W.R. Grace property. The evidence supporting this conclusion is as follows:

- Onsite disposal of hazardous waste was demonstrated by the excavation and sampling of the contents of 55-gallon drums in the rear of the facility. A

number of volatile organic and extractable organic compounds were detected in the contents of the drums as well as in soils in the excavated area (Section 2.3). Further excavation of contaminated soils has been conducted and will be discussed in Part II of the Remedial Investigation.

- Groundwater underlying W.R. Grace property is contaminated primarily by chlorinated solvents with a high percentage of TCE (40 to 60%) with respect to the remaining constituents trans-1,2-DCE; 1,1,1-TCA; TETRA; 1,1-dichloroethene; and vinyl chloride. TCE was not detected in these proportions elsewhere in the north and the northeastern portions of the study area.
- Volatile organic groundwater contamination was not detected upgradient of the W.R. Grace property at well locations GW-1, GW-2, and GW-8.
- NUS/FIT has detected a continuous plume of volatile organic groundwater contamination that extends from the W.R. Grace property downgradient to Wells G & H. The highest concentrations detected were on the W.R. Grace property with mean concentrations as high as 1,003 ppb and 2,433 ppb in the overburden and shallow bedrock, respectively. Concentrations decrease with distance away from the W.R. Grace property and towards Wells G & H. This plume configuration is consistent with local groundwater flow patterns.

6.2.2 Northern Volatile Organic Contaminant Plume

NUS/FIT concludes that the northern plume emanates from the UniFirst Corporation property. The evidence supporting this conclusion is as follows:

- UniFirst used TETRA as a dry cleaning agent in its uniform service operations. It stored the solvent onsite in a 5,000 gallon above ground tank from 1977 to 1982. A spill, contained and cleaned up by UniFirst, was reported by the firm in 1979.

- Contamination detected in groundwater underlying the UniFirst Corporation property consisted of 89 to 92% TETRA with respect to the remaining constituents (1,1,1-TCA; TCE; trans-1,2-DCE).
- Volatile organic groundwater contamination was not detected upgradient and north of the property at well locations IUS-1, IUS-2, and IUS-3.
- NUS/FIT has detected a continuous plume of volatile organic contamination emanating from the UniFirst property and extending downgradient to Wells G & H and the Aberjona River.

6.2.3 Western Volatile Organic Contaminant Area

NUS/FIT concludes that the western area of groundwater contamination emanates primarily from the Wildwood Conservation Corporation property with possible additional sources of volatile organic groundwater contamination located north and south of the property. The evidence supporting this conclusion follows:

- Surface disposal of 55-gallon drums (now rusted), miscellaneous debris, and pesticide caps on the Wildwood Conservation Corporation property has been documented. Interpretation of aerial photography suggests that the Wildwood Conservation Corporation property may have been used for disposal of drums and/or tanks.
- Soil boring analytical data collected by Woodward-Clyde Consultants in 1983 demonstrated shallow soil contamination on the Wildwood Conservation Corporation property.
- Groundwater contamination has been detected at the Wildwood Conservation Corporation property consisting primarily of the chlorinated solvent TCE with localized high concentrations of 1,1,1-TCA; trans-1,2-DCE; and TETRA.

- Volatile organic groundwater contamination was not detected north and northwest of the property at well locations S79, S80, and S74.
- NUS/FIT identified an area of volatile organic groundwater contamination concentrated in shallow overburden extending from well location BW-7 to well location BSW-2.
- Volatile organic contamination of groundwater was also demonstrated south and downgradient of the property at well locations S83 and S77.

6.2.4 Northwestern Contaminant Area

NUS/FIT concludes that an area of gasoline contamination of unknown dimensions exists in the vicinity of well location S75 and is likely the result of a spill(s) or leaking underground storage tank(s). This contamination is characterized by the presence of volatile organic (benzene, toluene, ethylbenzene, xylene) and extractable organic (polynuclear aromatic hydrocarbons) compounds detected in groundwater at this location. These compounds are common constituents of gasoline. Additional groundwater contamination by benzene, toluene, ethylbenzene, and xylene underlies the Juniper Development Group property. It is also likely the result of a gasoline spill(s) or leaking underground storage tank(s).

This pattern of contamination was not detected elsewhere in the study area. Based on groundwater flow, the source of contamination at well S75 is believed to be northwest of well S75. Contamination of groundwater underlying the Juniper Development Group property may be due to site activities occurring before the current ownership.

6.3 Summary

NUS/FIT conducted the Wells G & H Remedial Investigation to characterize the extent and degree of contamination at the site, identify potential source areas, and provide data for the Feasibility Study. Through the installation of groundwater monitoring wells and subsequent sampling and analysis, NUS/FIT has demonstrated

that four areas of groundwater contamination exist in the Wells G & H aquifer area. Separate plumes of volatile organic groundwater contamination have been linked to the W.R. Grace property and the UniFirst Corporation property. An area of volatile organic groundwater contamination has been linked to the Wildwood Conservation Corporation property and a separate area of groundwater contamination has been identified in the northwest corner of the study area. On the basis of groundwater flow, the source of the latter area of contamination in the northwest corner of the study area is likely northwest of well location 'S75. However, the exact source area can not be identified due to the lack of data in that area. Contamination of groundwater underlying the Juniper Development Group property may be due to past site activities.