COMMONWEALTH OF PENNSYLVANIA

Department of Environmental Protection
Hazardous Sites Cleanup Program

Bishop Tube Site
East Whiteland Township, Chester County
Contaminant Source Area Remediation

STATEMENT OF DECISION

The Commonwealth of Pennsylvania, Department of Environmental Protection ("Department") files this statement of the basis and purpose of its decision in accordance with Section 506(e) of the Pennsylvania Hazardous Sites Cleanup Act, Act of October 18, 1988, P.L. 756 No. 108 ("HSCA"), 35 P.S. § 6020.506(e).

The Pennsylvania Department of Environmental Protection (Department) has selected the proposed prompt interim response alternative outlined in the Analysis of Alternatives and Proposed Response Document which proposes in situ treatment to remediate contaminated soil and groundwater and potentially separate phase liquids beneath a former manufacturing plant.

The selected remedy is protective of public health and the environment because it mitigates the risks associated with direct contact with site contaminants and reduces further migration of contaminants from the site through the groundwater or vapor to indoor air pathways..

I. SITE INFORMATION

A. Site Location and Description

The Bishop Tube Site ("Site") is located on Malin Road, south of U.S. Route 30, in Frazier, East Whiteland Township, Chester County. The Site is situated at latitude 40° 02' 24" N and longitude 75° 32' 13" W. The Site may be located on the Malvern, PA 7.5 Minute Series Quadrangle.

The 13.7 acre Bishop Tube property is currently owned by Constitution Drive Partners L.P., which purchased it from the Central and Western Chester County Industrial Development Authority (C&WCCIDA) in 2005, with the intention of redeveloping the property for commercial/light industrial use. C&WCCIDA acquired the property from Christiana Metals in early 2000. Two adjoining manufacturing buildings on the site occupy 3.2 acres. The remainder of the property primarily consists of paved and gravel storage/parking areas, with limited undeveloped grass and wooded areas. Topography slopes from 500 ft mean sea level (MSL) at the southern property boundary to 350 ft MSL at the northern property boundary. Considerable cutting and filling was conducted at the site to accommodate the building and parking areas. The Bishop Tube property is currently not occupied. However, the recent purchaser of the site is developing plans for the site.

The area of the Site is in the town of Frazier, which is characterized by mixed commercial and residential land uses. Public water is available in the area of the Bishop Tube Site. However, one home, located down gradient of the site, is supplied by a private well. A full house carbon filtration system equipped with an ultraviolet light for disinfection was installed at the affected residence in 1999, at the expense of Christiana Metals (former owner/operator of Bishop Tube). The General Warren Village residential area borders the site to the east across Little Valley Creek from the former manufacturing plant. Little Valley Creek is designated as an Exceptional Value stream under the Department's Water Quality Regulations. Rail lines border the site to the north (Norfolk Southern) and south (Amtrak). A drainage swale is present adjacent to the property on the Norfolk Southern right-of-way. A bulk fuel storage terminal (formerly Exxon Mobil) is located just west of the site across Malin Road.

B. Site History

Initial manufacturing involving precious metals processing was started by the J. Bishop Company at the site in 1951. J. Bishop reportedly began using the facility for manufacturing steel tubes in the 1950's. The manufacture and processing of metal alloy tubes and associated equipment continued at the site until 1999. Several companies conducted these operations during this period including Matthey Bishop, Inc., Johnson Matthey (all successors to J. Bishop), Whittaker Corp. (1969 – 1974), Christiana Metals (1974 – 1988), Alloy Steel Corp. (1988 – 1991), and Marcegaglia USA (1991 – 1999). Tube production concentrated on seamless stainless steel products for much of the period of operation. Aerial photographs reveal that the lower building, known as Plant #8, was erected between 1958 and 1964. Hazardous substances were employed in the manufacturing processes throughout the history of manufacturing at the site. Most notably trichloroethene (TCE) was utilized in two vapor degreasers, processed in onsite distillation units and stored in an above ground tank at the site.

After site closure, in 1999, the site owner, Christiana Metals, informed the Department that voluntary actions to investigate and remediate the site would cease. At this time the site was abandoned. C&WCCIDA obtained title to the property and began marketing the property for industrial redevelopment while the Department initiated environmental investigations at the property.

In March 2005 a Prospective Purchase Agreement ("PPA") was reached between Constitution Drive Partners, L.P. ("Developer") and the Department. Under the PPA the Developer agreed to remediate unsaturated soil hot spots at the site. Under the agreement the Department agreed to use its best efforts to undertake groundwater remediation without causing undo interference to the Developer's business activities. The Department and Developer agreed that groundwater above the bedrock zone and soil remediation in the same areas would require some coordination of remediation activities between the two parties.

In November 2005 the site owner approached the Department with a plan aimed at addressing the three soil hot spot areas and suggested that installation of infrastructure necessary to cleanup unsaturated soil and the shallow groundwater should be installed and operated concurrently within the former Plant #8 vapor degreaser area. Further testing revealed the need to install a vapor barrier beneath the floor of the Plant #8 area to accommodate soil remediation and ultimately to address intrusion of hazardous vapors into the building.

C. Release of Hazardous Substances

Department files regarding releases of hazardous substances to the adjacent stream, Little Valley Creek, date to the early 1970's. Inspections revealed that waste pickle liquor solution was disposed in an on-site lagoon. Aerial photographs indicate that the pickle liquor lagoon operated at least from 1964 to after 1971. The lagoon had been closed and capped prior to a 1981 aerial photograph.

In the early 1980's, fluoride was detected in a non-contact cooling water stream discharge. Groundwater was the source of the cooling water and well sampling revealed elevated concentrations of fluoride. It is suspected that the source of the fluoride contamination was hydrofluoric acid used in a pickle liquor solution by Bishop Tube to clean and descale stainless steel.

In addition, the Department has historical evidence that TCE has been released into the soils and groundwater since at least the mid-1960's. Christiana Metals installed monitoring wells at the site in 1981, 1987, 1992, and 1993 as part of a voluntary site characterization. These investigations revealed extremely high levels of TCE in groundwater at the site. The extent of off-site contamination is not fully known. The contaminated home well, referenced above, is located along Conestoga Road, approximately 1500 feet northeast of the site and has historically contained TCE at levels exceeding the Federal Maximum Contaminant Level of 5 ug/l. An additional well installed at 30 Conestoga Road was found to contain TCE at approximately 9,000 ug/l. Because of the contamination the well has not been used as a drinking water supply. TCE has also been detected in wells located at the Worthington Steel facility and in a large spring just upstream of the former Worthington Steel property, approximately 1 ¼ mile east northeast of Bishop Tube.

Baker Environmental (Baker) has conducted a three-phased environmental investigation on behalf of the Department. These investigations have focused on soil, surface water, and groundwater conditions on the Bishop Tube property. Three main areas of soil contamination were identified at the site including, areas beneath former vapor degreasers in the upper and lower buildings and under a former drum storage area. Baker has concluded that dense non-aqueous phase liquids (solvent mixtures also known as DNAPLs) have migrated through the soil and into the fractured bedrock in these areas. Baker installed eight additional wells at the site, including four wells screened in three discreet water-bearing intervals. In addition to the wells installed for monitoring at the site, Baker has sampled the well at 30 Conestoga Road for four consecutive quarters. Maximum concentrations of TCE have been detected in monitoring well MW-26C, which monitors a deep bedrock water-bearing zone near the northeast corner of the site. This finding is consistent with published information concerning regional groundwater flow. In addition to TCE, fluoride, chromium (total) and nickel have been found in on-site groundwater at levels exceeding the Pennsylvania residential Medium Specific Concentrations (MSCs).

Levels of TCE as high as 10,754,000 ug/Kg were detected in the soil during the site investigation. TCE levels in groundwater in a nearby deep monitoring well are as high as 1,900,000 ug/L. The Maximum Contaminant Level which has been established for TCE

in drinking water is 5 ug/L. The Department's Statewide Human Health Standard for TCE in soil is 500 ug/Kg for the soil to groundwater pathway. Other contaminants were detected in soil samples during the investigation including tetrachloroethene, 1,2-dichloroethene, and 1,1,1-trichloroethane. A number of these compounds also were detected at levels in excess of the soil to groundwater standards. Some of the highest concentrations of these contaminants were detected in the area of a former vapor degreaser located in the lower building known as Plant 8. Operations in this area also included an above ground TCE storage tank, sub-floor transmission piping, and reportedly a TCE reprocessing unit. In this area high concentrations of contaminants were found in soils above and below the water table, which averages 4 – 7 ft. below ground surface.

In animal studies, TCE has been shown to cause several types of cancer. Other health effects, which may be related to chronic or acute exposure, may affect the nervous system. The chemical may enter the body through ingestion, dermal contact, and inhalation. Site contamination of groundwater poses a danger to health and the environment through migration to the down gradient home well and adjacent stream. Contact may occur from drinking or showering with contaminated water, by migration of vapors from contaminated soil and/or groundwater to buildings, through direct contact with contaminated soil on the site property during excavation or construction activities or through contact with the stream in areas affected by the site.

II. RESPONSE CATEGORY

The Department has determined that an interim response action, as defined in Section 103 of HSCA, should be taken to treat soil and shallow groundwater source areas, which constitute a continuing release of hazardous substances to the environment. The Department has also determined that there is a reasonable basis for prompt action within the meaning of Section 505(b) of HSCA in order to avoid damaging the protective vapor barrier proposed by the Developer, and to coordinate response actions with the Developer in a cost-effective manner. Concurrent construction of saturated soil treatment (under this response) and vapor collection and treatment components is necessary to address the source of contamination beneath the Plant #8 area. Under an interim response action, the response is expected to cost less than $2 million and take less than 1 year to complete construction. The proposed response is estimated to cost $765,700 and construction is expected to be completed within 2-5 months. Operations and maintenance will be required after system construction and may be incorporated into future groundwater response action(s).

The proposed response action includes installation of horizontal and vertical wells for treatment of soil and groundwater in place. These actions are appropriate for a prompt interim response. The Department may undertake any interim response, which it deems necessary or appropriate to protect the public health, safety and welfare or the environment where there is a release or threatened release of a hazardous substance. The Department has determined that the proposed response is necessary and appropriate. The proposed response actions will achieve the response action objectives established by the Department, as discussed below, and be protective of public health, safety and welfare, and the environment.

III. CLEANUP STANDARDS

This proposed response is not a final remedial response pursuant to Section 504 of HSCA and therefore is not required to meet the cleanup standards that apply to final remedial responses.

IV. APPLICABLE RELEVANT and APPROPRIATE REQUIREMENTS (ARARs)

In addition to the cleanup standards provided in the Land Recycling and Environmental Remediation Standards Act ("Act 2"), the following standards, requirements, criteria or limitations are legally applicable, or relevant and appropriate under the circumstances presented by the site.

Waste Management

Act 97 - Solid Waste Management Act
Act 108 - Hazardous Sites Cleanup Act
Pennsylvania Code. Title 25.
Chapters 260-270 - Hazardous Waste
Chapters 271-285 - Municipal Waste
Chapters 287-299 - Residual Waste
52 FR 3138 - Land Disposal Restrictions (California List Rule)

Water Quality

Clean Streams Law
Pennsylvania Code. Title 25.
Chapter 105 - Dam Safety and Waterway Management
Clean Water Act
40 CFR 125.100 - Best Management Practices

Air Quality

Air Pollution Control Act
Pennsylvania Code. Title 25.
Chapter 123 - Standards for Contaminants
Chapter 127 - Construction, Modification, Reactivating, and Operation of Sources

V. ANALYSIS OF ALTERNATIVES

ALTERNATIVE 1: No Action

Alternative 1 involves taking no action to address the saturated soil or groundwater within the source area beneath the former Plant #8 area at the site. Allowing wastes including DNAPLs to remain in the source area would result in the continued release and further off-site migration of hazardous substances in groundwater contaminated by the source area. The No Action alternative must be evaluated under the Hazardous Sites Cleanup Act to establish a baseline for comparison to other alternatives. The no action alternative would not address the source area contamination at the site and therefore would not address the source of the regional groundwater contamination plume and resulting stream discharge and vapor intrusion concerns at the site.

Compliance with ARARs

The no action alternative is not considered protective of public health or of the environment and would not comply with ARARs.

Cost Effectiveness

The no action alternative would have no cost for implementation. Implementation of the No Action Alternative for this source area could increase the overall cost and time frame of a final remedial response to address groundwater contamination at the site by allowing groundwater to be impacted and migrate from a continuing source of contamination where significant mass of contamination is present. In addition, the no action alternative would be likely to increase overall costs of response action at the Site because of inefficiencies that would be realized from a lack of coordination with the Developer's response actions at the Site.

ALTERNATIVE 2: Treatment of Groundwater Contained in Unconsolidated Materials within the Former Plant #8 Source Area

This alternative involves physical, biological, and/or chemical treatment of contaminated saturated soil and groundwater source area beneath the former Plant #8 degreaser area. Successful completion of this alternative may involve one or more of the treatment methods. For example a period of physical remediation may be followed by chemical or biological treatment to achieve source reduction objectives. This remedy would involve installation of wells into the treatment areas. Treatment methods may involve injection and/or capture of air, steam, heated air, oxidizing agents, or amendments designed to stimulate biological degradation of site contaminants. Contaminants would be destroyed in place or removed via extracted vapors and captured or destroyed above ground by treatment equipment constructed on the site. Captured hazardous substances not destroyed on site would be transported to an approved off-site treatment, storage, and disposal (TSD) facility for treatment, reuse, recycling, destruction, or proper disposal.

Alternative 2 removes and irreversibly destroys the contaminants and wastes from media within the source area and thus removes the risk of exposure to contaminated soil, groundwater, and vapor within buildings as well as, the risk of on-going groundwater impact. The objective of this remedy is to remove sufficient mass of TCE and related contaminants to reduce dissolved contaminant levels in the shallow (overburden) zone around the treatment area. Over time this remedy is also expected to reduce impacts to surface water associated with the site.

The Department envisions use of physical treatment of the hotspot areas using air sparging in conjunction with the soil vapor extraction remedy proposed by the site developer. This scenario takes advantage of the developer's plan to capture and treat hazardous substances contained in the unsaturated soils at the site. Performance of field work in conjunction with the developer allows the Department to construct wells required for treatment of the saturated zone, prior to installation of a vapor barrier beneath the

former Plant 8 vapor degreaser area. Air sparging coupled with soil vapor extraction is a well-tested strategy for addressing sites such as Bishop Tube. Pilot testing conducted by the site developer has revealed that a vapor barrier must be installed for the vapor collection to be effective. The shallow depth of the groundwater table poses some issues with regard to implementability of air sparging coupled with soil vapor extraction, since the water table could potentially interfere with vapor collection. Construction of engineering controls or adoption of an alternative treatment technology may be required to address this concern. The Department intends to evaluate the performance of the remedy during implementation to determine if a modification in the treatment technology (i.e. more aggressive physical treatment with heat or steam, chemical or biological amendment) would be appropriate. Construction activities associated with this alternative will be coordinated with the developer's soil vapor extraction system installation and could be completed within 2 to 4 months of project initiation. Operations and maintenance of the system will be required, and will involve vapor collection and treatment system operations, monitoring of emissions and performance monitoring through air and groundwater sampling. Presently the Department anticipates that O&M of the system will be necessary for a period of 2 – 5 years and may be incorporated into future phases of site cleanup.

Installation of the remedy (piping, vapor barrier and subsurface equipment) may present a temporary risk to workers from volatile organic emissions during well drilling and system installation. Emissions from these activities may be monitored and controlled, if necessary, using protective health and safety equipment such as respirators, foam covers, or other fugitive emission control measures.

Compliance with ARARs

Air emissions from the vapor collection and treatment system will be treated to meet air quality requirements. 25 Pa. Code Section 127.12(a)(5) requires that the emissions from a new source will be the minimum attainable through the use of the best available technology (as that term is defined in 25 Pa. Code Section 121.1).

Wastes generated during the construction and operation of the remedy would be handled in accordance with applicable waste management regulations.

Cost Effectiveness

The total cost for treatment of VOC contaminated saturated-zone soils, is estimated at $765,700. Since many of the components of this alternative overlap with the developer's proposal to implement soil vapor extraction, the Department anticipates coordinating tasks and sharing costs with the developer to maximize cost effectiveness and efficiency. Facilitating this coordination required the Department to initiate work on this remedy promptly. Specific costs associated with this alternative are summarized in Table 1. Future operations and maintenance costs are anticipated for this alternative, and are included in Table 1. These estimated costs assume successful implementation of Air Sparging combined with Soil Vapor Extraction. If an alternative remedial approach is

deemed necessary, these costs are likely to change. Efforts have been made to maximize the flexibility of the remediation system to cost effectively provide for such alternative approaches.

If evaluated as a component of an overall site remedy, Alternative 2 is more cost effective than the No Action Alternative. Generally, removal and/or destruction of contaminants in the source area, where they are most concentrated, have the potential to reduce the overall project life span and cost.

VI. SELECTED RESPONSE

The Department has selected Alternative 2, Treatment of Groundwater Contained in Unconsolidated Materials within the Former Plant #8 Source Area. The alternative addresses contaminated saturated soil and water at the site. The remedy involves treatment of the highly contaminated saturated zone beneath the former vapor degreaser operation using physical, chemical or biological amendments injected into the source area through wells. Off-gases containing hazardous substances produced by the process will be captured by a soil vapor extraction system and treated before being released to the atmosphere. Under this response tasks and costs have been shared between the Department and the developer's soil vapor system to provide for compatibility and increased efficiency. This alternative is protective of public health and the environment, complies with applicable or relevant and appropriate requirements (ARARs), is feasible, effective, implementable, and permanent. Conducting Alternative 2 in coordination with the site developer cost effectively incorporates components of the soil remediation proposed by the site developer without compromising the effectiveness of the proposed protection of air quality within the site building.

VII. RESPONSE TO PUBLIC COMMENTS

The Department's response to the public comments concerning the selection of this response action is filed in the administrative record.

FOR THE COMMONWEALTH OF
PENNSYLVANIA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

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