UGI COLUMBIA GAS PLANT

SUPERFUND SITE

COLUMBIA BOROUGH, PENNSYLVANIA

PAD980539126

RECORD of DECISION

RECORD OF DECISION
UGI COLUMBIA GAS PLANT

DECLARATION

Site Name and Location

UGI Columbia Gas Plant Superfund Site
Columbia Borough, Lancaster County, Pennsylvania
CERCLIS ID Number PAD980539126

Statement of Basis and Purpose

The attached Record of Decision (ROD) presents the selected remedial action for the UGI Columbia Gas Plant Superfund Site (Site) located in Columbia Borough, Lancaster County, Pennsylvania. The remedial action was developed in accordance with the statutory requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §§ 9601 - 9675, and is consistent, to the extent practicable, with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This remedy selection decision is based upon an Administrative Record compiled for this Site. An index to the Administrative Record is attached.

The Commonwealth of Pennsylvania concurs with this remedial action. A copy of the Commonwealth's concurrence letter is attached.

Assessment of the Site

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. Section 9606, that actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response actions selected in this ROD, may present an imminent and substantial endangerment to the public health and welfare, or to the environment.

Description of the Selected Remedy

The Selected remedy includes the following major components:

1. For Soils:

• No further remediation of on-Site soils is necessary because on-site soils have been capped thereby preventing contact with Manufactured Gas Plant (MGP)-related wastes.

• Institutional controls in the form of deed notices, easements and/or restrictive covenants

prohibiting current and future Site property owners from using Site property for residential use or in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial actions performed at the Site.

2. For Groundwater

• Monitored natural gradient flushing of dissolved MGP constituents to the Susquehanna River to dilute, disperse, and biodegrade to non-detectable levels.

• In accordance with CERCLA Section 121(d)(4)(C), EPA has chosen to invoke a TI waiver of the Maximum Contaminant Level (MCL) and Risk Based Concentration (RBC) ARARs for 27 contaminants that were found within and above the Dense Non-Aqueous Phase Liquid (DNAPL) in the DNAPL Zone because EPA has determined that aquifer restoration to drinking water quality is technically impracticable from an engineering perspective.

• Long-term groundwater sampling to confirm that contaminants of concern are not present outside the limits of the DNAPL Zone at concentrations exceeding ARARs.

• Institutional controls restricting the installation and use of groundwater wells and prohibiting any use of the Site that would interfere with the protectiveness or integrity of the selected remedy.

Statutory Determinations

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. The remedy does not satisfy the statutory preference for treatment as a principal element of the remedy because treatment would result in extraordinarily high costs with no significant increase in protectiveness.

Because the selected remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a review under Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), will be conducted within five years after the date of initiation of the remedial action to ensure that the selected remedy is, and will be, protective of human health and the environment.

Data Certification Checklist

The following information is included in the ROD. Additional information can be found in the Administrative Record for the Site.

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James J. Burke 9/24/07

James J. Burke, Director — Date
Hazardous Site Cleanup Division
EPA, Region III

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COLUMBIA BOROUGH, PENNSYLVANIA
RECORD of DECISION

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DECISION SUMMARY

I. SITE NAME, LOCATION AND DESCRIPTION

The UGI Columbia Gas Plant Superfund Site (Site) is located in Columbia Borough, Lancaster County, Pennsylvania, approximately four hundred feet northeast of the Susquehanna River. The Site includes a former manufactured gas plant (MGP; hereinafter the plant property shall be referred to as the MGP Facility) which occupies approximately 2 acres; the Borough of Columbia's (Borough) municipal garage; the Lancaster Water Authority (LWA) pumping station; property owned by Pennsylvania Lines LLC; and a pedestrian tunnel which extends underneath the railroad tracks on the northern side of the Site. The Shawnee Creek, a tributary to the Susquehanna River, and the Municipal Authority of Columbia's wastewater treatment plant are also located in the vicinity of the Site (Figure 1).

The MGP Facility caused Site soils and groundwater to become contaminated with hazardous substances including volatile organic compounds (VOCs) including benzene, toluene, and xylene (BTEX); semi-volatile organic compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs), and inorganics including metals and cyanide (MGP-related wastes). The contamination in the groundwater exists as dense non-aqueous phase liquids (DNAPL) which reside in the fractures of the bedrock, and act as a source for a dissolved phase plume of contaminants in the groundwater. Soil contamination remains in surface and subsurface soils at the Site; however, those areas where soil contamination remains have been capped.

II. SITE HISTORY AND ENFORCEMENT ACTIONS

A. MGP Facility Ownership

Starting in 1851, the Columbia Gas Company used the MGP Facility for manufacturing gas for distribution in the City of Columbia. Columbia Gas Company later became Lancaster Light Gas and Fuel Company. In 1935, the Pennsylvania Power and Light Company (PP&L Co.) (now known as PPL Electric Utilities Corp.) acquired Lancaster Light, Gas and Fuel Company by merger. PP&L Co. continued to manufacture gas at the MGP Facility until 1949 when the MGP Facility was sold to Lancaster County Gas Company (Lancaster Gas), which merged into United Gas Improvement Company (UGI Company) in 1953. From 1949 to 1950, Lancaster Gas used the MGP Facility to produce a propane/air mixture which was used as a substitute for gas manufactured from coal. Lancaster Gas decommissioned the propane/air plant at an undocumented time in 1950. At that time, aboveground structures were demolished and removed, and the gas relief holder foundations and tar/waste separator were backfilled.

In 1976, Thomas and Rosemary Crouse (the Crouses) purchased the MGP Facility from UGI Corporation, formerly known as UGI Company. It is unclear for what purposes the Crouses used the MGP Facility. Since the time UGI Corporation sold the MGP Facility to Crouses, UGI Corporation changed its name to UGI Utilities, Inc. (UGI). What is now known as UGI Corporation is a holding company.

In 1979, the Crouses subdivided the MGP Facility property into two parcels (Figure 2). The parcel that included the former gas plant (Parcel A) was purchased by George B. and Gladys M. Roach (the Roaches) and the other parcel (Parcel B) was purchased by Leo W. Lowe, Sr. The Roaches conducted a boating business on Parcel A. After the Roaches purchased Parcel A, coal tar was found oozing into the parking area. Subsequently, re-grading took place at which time coal tar displaced from the relief holder pit was pushed into the pedestrian tunnel and a small earthen dike was built to contain the coal tar. In 1987, PP&L Co. removed and properly disposed of the coal tar contamination from the pedestrian tunnel and capped the buried gas holders with concrete.

In 1986, Realty Company, a wholly owned subsidiary of PP&L Co. acquired an option to purchase Parcel B and assigned the option to the Roaches so that they could move their boat business to Parcel B in order to avoid interference to their business from the environmental investigations and remediations being conducted by PP&L Co. and UGI on Parcel A. Mr. Roach exercised the option and acquired Parcel B on August 14, 1986. In 1991, the Roaches sold Parcels A and B to their daughter, Darlene Judd.

In January 1994, PP&L Co. repurchased Parcel A from Darlene Judd and in 2002 repurchased Parcel B from George G. and Bruce E. Roach, who had acquired Parcel B from their sister, Darlene Judd, on June 12, 1998.

Through a series of corporate name changes and corporate restructuring, PP&L Co. is now PPL Electric Utilities Corp. (PPL), a subsidiary of the PPL Corporation, a holding company. The MGP Facility is currently not in use and is surrounded by a security fence.

B. MGP Facility Operation

Gas was historically produced at the Site through a coal gasification process which included reacting steam with hot coal, coke and wood. The gas went from two gas generating sets through a washbox, condenser, washer cooler, and then was stored in a gas holder. From the gas holder, the gas went through a coal tar separator and a purifier and finally to a relief holder for distribution in the City of Columbia.

The primary waste streams generated during the coal gasification process were liquid coal tar, boiler ash and spent gas purifying materials. Coal tar is a mixture of volatile organic compounds (VOCs) including benzene, toluene, and xylene (BTEX); semi-volatile organic compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs) and inorganics including metals and cyanide (hereinafter collectively referred to as "MGP-related wastes").

Coal tars were generated from the coal tar separator which separated coal tar from liquid waste. The coal tar separator received liquids from the washer cooler, drip pumps and overflows from the gas holder. Coal tars generated from the tar separator were stored in the relief holder pit, which had a 46,000 cubic foot capacity, to allow for separation of the tar/water emulsion. The relief holder pit was constructed of riveted steel plates and was held within a pit that was approximately 30 feet deep. The relief holder pit failed in 1947, and its foundation was used, thereafter, for tar separation. Marketable coal tar was removed for sale and below-grade tar was left in the pit. Overflows of the tar separator, which occurred during periods of heavy rainfall and in the winter, were discharged to an open ditch that led to the Susquehanna River. There are reports that local fishermen complained that their boats were being covered with tar.

Boiler ash was stockpiled in the area in front of the relief holder during the 1930s and 1940s. The ash was hauled away three times per week. A portion of the boiler ash may have been disposed on the southern side of Front Street. It is not known where the majority of the ash was disposed. The boiler ash does not contain any contaminants of concern at the Site.

The purifier wastes were generated from iron-oxide treated wood chips arranged on wooden racks. When the wood chips could no longer be regenerated, they were removed from the purifier. The wood chips were subsequently disposed of on Site as paving and dust control material. The wood chips contained cyanide which is a contaminant of concern at the Site.

C. Remaining Site Property

The Borough's municipal garage is located to the southwest of the MGP Facility. Site-related contamination has been found in the groundwater under the Borough's municipal garage. The Borough currently uses the garage for storage (Figure 2).

Railroad tracks currently owned by Pennsylvania Lines LLC are located on the southwest of the Site between the Borough's municipal garage and the MGP Facility. Site-related contamination has been found in the groundwater under Pennsylvania Lines LLC's property. Pennsylvania Lines LLC currently operates on the railroad tracks.

LWA property borders the MGP Facility to the southwest. The LWA provides public water to the Borough of Columbia. As part of its operations, the LWA uses two extraction wells (cooling water wells) to generate cooling water for its river water intake pumps. As discussed in more detail in Section V.A., LWA treats the cooling water with activated carbon; mixes it with water from the main water intake in the Susquehanna River; treats the combined water in the treatment plant process to make it potable in accordance with PADEP requirements, tests the combined water to confirm PADEP standards have been achieved, and then distributes it through the public water supply system. The cooling water wells contribute one tenth of one percent of the total water supply. As a result of long-term pumping, a lobe of dissolved phase plume (LWA Lobe) has been drawn over to and is captured by the LWA wells.

D. Environmental Studies and Previous Actions

Results of early environmental investigations revealed that MGP operations at the Site resulted in the release of VOCs, PAHs, heavy metals, and cyanide into soil, groundwater and surface water at the Site. EPA proposed the Site for inclusion on the Superfund National Priorities List (NPL) in June 1993 and added the Site to the NPL in May 1994.

In April 1996, PP&L entered into a Consent Order and Agreement with the Pennsylvania Department of Environmental Resources (PADER) (now named the Pennsylvania Department of Environmental Protection (PADEP)) to conduct a RI/FS to determine the nature and extent of contamination at the Site, to characterize the risks to human health and the environment, to evaluate alternatives to clean up the contamination at the Site, and to initiate interim actions on the gas and relief holders and the Susquehanna River.

In 1997, PP&L applied steam and hot water injection to the two gas and relief holders. In addition, approximately 3,350 gallons of tar were extracted from the two holders and taken for off-site thermal treatment and disposal. Following the tar extraction, coal tar remained in subsurface soils below the holders. The holders were then injected with over 760 cubic yards of a grout and cement mixture to stabilize and solidify them. In addition, in 1998, approximately 700 tons of contaminated sediments were removed from the Susquehanna River and shipped off-site for thermal treatment and disposal. A sheet pile wall was installed along the river bank in the area adjacent to the sediments. The area was re-graded and covered with a geosynthetic cloth, rock, and stone.

In April 1998, PADEP approved the RI and in June 1998, it approved a Risk Assessment Report. The RI identified approximately 15,000 cubic yards of contaminated surface and subsurface soil on-Site. The RI also identified contamination in on-Site groundwater that had migrated off-Site and was detected in deep groundwater near the Susquehanna River. In 2002, PADEP approved PPL's FS Report which determined options for addressing the remaining contamination at the Site.

In October 2006, EPA approved a Groundwater Engineering Analysis Report (Groundwater Report) for the Site. In the Groundwater Report, PPL provided documentation for a request for a technical impracticability waiver (TI Waiver) for the applicable or relevant and appropriate requirements (ARARs) for groundwater due to the presence of DNAPL in the fractured bedrock under the MGP Facility. The MGP-related wastes form the DNAPL under the MGP Facility.

In November 2006, EPA received a Soil Remedy Engineering Analysis Report (Soil Report) for the Site from PPL and UGI. The Soil Report updated the cost estimates presented in the FS.

On November 29, 2006, PPL, UGI and EPA entered into an Administrative Settlement and Order on Consent (2006 Settlement Agreement), Docket No. CERC-03-2007-0006DC,

pursuant to Sections 104, 106(a) and 122(a) of CERLCA, 42 U.S.C. §§ 9604, 9606(a) and 9622(a). Under the Settlement Agreement, PPL and UGI, among other things, installed caps over two (2) areas where MGP-related wastes remained on-Site; excavated and disposed of soil and MGP-related wastes as necessary, and installed four (4) monitoring wells.

On June 27, 2007 EPA issued a Proposed Remedial Action Plan (PRAP), regarding the cleanup of groundwater and soils at the Site, for public review and comment.

III. COMMUNITY PARTICIPATION

Pursuant to 40 C.F.R. § 300.430(c), a Community Relations Plan was developed for the Site. In accordance with Sections 113(k)(2)(B)(i-v) and 117 of CERCLA, the Administrative Record, including the Proposed Plan, the Feasibility Study Report and the Soil Remedy Engineering Analysis and the Groundwater Report, was made available for public inspection in an Administrative Record file for the Site. The Administrative Record may be reviewed electronically at http://www.epa.gov/arweb. The notice of availability of the Administrative Record was published in the *Lancaster New Era* on June 27, 2007.

A period of public review and comment on the Proposed Plan was held from June 27, 2007 through July 26, 2007. A public meeting regarding the Proposed Plan was held on July 19, 2007 at the Columbia Borough Hall, 308 Locust Street, Columbia, PA. A transcript of that meeting is included in the Administrative Record. A summary of the written public comments received and EPA's responses to those comments is attached to this Record of Decision as a Responsiveness Summary.

IV. SCOPE AND ROLE OF RESPONSE ACTION

This ROD presents EPA's final response action for soil and groundwater contamination at the Site.

For soils, EPA has determined that the following remedial components are necessary:

- No further remediation of on-Site soils because those areas where MGP-related waste remains in the soil have been capped.

- Long-term maintenance of cap and stormwater management facilities.

- Implementation of institutional controls. Institutional controls consist of non-engineering measures including administrative and/or legal controls that help to minimize the potential for human exposure to site related contamination. The institutional control components of the soil remedy include deed notices, easements and/or restrictive covenants, to prohibit current and future Site property owners from using Site property for residential use or in any manner that would

interfere with or adversely affect the integrity or protectiveness of the remedial actions performed at the Site.

For groundwater, EPA determined that the following remedial components are necessary:

- Monitored natural gradient flushing to dilute, disperse, and biodegrade dissolved MGP constituents.

- EPA has chosen to invoke a TI waiver of ARARs, both the Maximum Contaminant Levels (MCLs) promulgated at 40 C.F.R. Part 141 pursuant to Section 1412 of the Safe Drinking Water Act, 42 U.S.C. Section 300g-1, and EPA Region III Risk-Based Concentrations (RBCs), for 27 contaminants that were found within and above the Dense Non-Aqueous Phase Liquid (DNAPL) in the DNAPL Zone, pursuant to CERCLA Section 121(d)(4)(C). EPA has determine that restoration of ground water to drinking water quality is technically impracticable from an engineering perspective using currently available technologies within a reasonable or foreseeable time frame. The alternative remedial strategy is monitored natural gradient flushing of the dissolved plume and institutional controls.

- Long-term groundwater sampling to confirm that contaminants of concern are not present outside the limits of the DNAPL Zone at concentrations exceeding ARARs.

- Institutional controls restricting the installation and use of groundwater wells and prohibiting any use of the Site that would interfere with the protectiveness or integrity of the selected remedy.

V. SITE CHARACTERISTICS

The various environmental investigations conducted at the Site and surrounding areas identified MGP-related wastes in groundwater, soil and sediments in a nearby area of the Susquehanna River.

A. Groundwater

Based upon the information gathered during the RI, PPL estimates that between 345 and 34,500 gallons of DNAPL are contained and/or trapped within the fractured bedrock under the MGP Facility and under surrounding land parcels at the Site. The range in this estimate is primarily a function of the estimated potential variance in the fractured bedrock pore space in the DNAPL source area. The DNAPL is composed of tar-like liquids resulting from the former MGP operations which do not easily dissolve in water (i.e., low solubility). The DNAPL was found primarily in two distinct fracture zones which are oriented in an east-west direction and

source area.

A dissolved phase plume has been identified in the immediate vicinity of the DNAPL. Since the DNAPL has a low solubility and, thus, does not mix well with groundwater, the plume area is relatively small and is found in the area immediately adjacent to the DNAPL. The DNAPL and the portion of the dissolved phase plume which is immediately adjacent to the DNAPL is hereinafter referred to as the "DNAPL Zone." All of the DNAPL is believed to be located in the DNAPL Zone illustrated on Figure 3. The DNAPL Zone has a spatial extent of approximately seven (7) acres and a depth of 160 feet below ground surface as illustrated on Figure 4.

The dissolved phase plume immediately adjacent to the DNAPL is prevented from expanding by the presence of the Susquehanna River into which the groundwater discharges. Sampling and analysis show that any contaminated groundwater discharged into the Susquehanna River is quickly diluted to levels below those that are detectable.

A portion of the dissolved phase plume is being drawn towards the cooling water wells operated by the LWA which is located to the west of the DNAPL Zone. The LWA uses two extraction wells (cooling water wells) to generate cooling water for its river water intake pumps. As a result of long-term pumping, a lobe of dissolved phase plume (LWA Lobe) has been drawn over to and is captured by the LWA's pumping wells CWW-1 and CWW-2. The raw water pump station on Front Street pumps water from the Susquehanna River to the treatment plant on 15th Street. The pump station has six vertical turbine pumps. The bearings on these pumps require water for both cooling and cleaning. River water was originally used for cooling the main intake pumps at the plant. However, the LWA had problems with debris and turbidity and in 1954 stopped using river water and installed a cooling water well (CWW-1). As the plant capacity expanded, an additional cooling water well (CWW-2) was installed. Both wells are six inches in diameter and 150 feet deep. Reportedly, the wells are each capable of pumping approximately 50 gallons per minute (g.p.m.). To meet current needs the combined pumping rate from both wells for cooling water is approximately 11 g.p.m. The wells alternate on and off as the system calls for water.

The cooling water discharges to a wet well beneath the pump station on Front Street. The main surface water intake pumps also discharge to the wet well. The cooling water wells contribute one tenth of one percent of the total water supply. The LWA treats the source water from both the Susquehanna River and the cooling water wells to make it potable. The maximum capacity of the plant is 25 million gallons per day (mgd); however, the average amount treated is approximately 12 mgd. After treatment, this water is tested to confirm it is potable in accordance with PADEP requirements and is then distributed through the public water supply system.

As part of the RI study, samples of cooling water were taken as part of groundwater monitoring activities. Benzene exceeded its MCL in samples collected from CWW-1 during both rounds of sampling (49 micrograms per liter (ug/l) in round No. 1 and 140 ug/l in round No. 2). The VOCs, toluene and xylene, were also detected in the second round of sampling from

CWW-1 (3 ug/L) and CWW-2 (2 ug/L), respectively. Benzene was detected above its MCL in samples from CWW-2 during both rounds (46 ug/l and 240 ug/l).

The LWA Lobe extends outside the spatial extent of the DNAPL Zone. If LWA were to stop pumping wells CWW-1 and CWW-2, a portion of the LWA Lobe would likely remain outside the DNAPL Zone and it would no longer be extracted and treated. In that event, alternate remedial methods would have to be examined to determine if remediation of the LWA Lobe were necessary.

Groundwater sampling results from the RI, illustrated in Table 1, below, revealed that the following chemicals of potential concern (COPCs) have exceeded their respective MCL and/or their respective EPA Region III Risk-Based Concentration (RBC):

Table 1: Site Contaminants of Potential Concern Detected in Groundwater

Compound	Maximum Concentration Detected (mg/l)	RBC For Tap Water (mg/l)*	MCL (mg/l)*
Volatile Organic Compounds (VOCs)			
Benzene	39	0.00034 (C)	0.005
Ethylbenzene	4.7	1.3 (N)	0.7
Tetrachloroethene	0.005	0.0001 (C)	0.005
Toluene	9.5	2.3 (N)	1.0
Trichloroethene	0.003	0.000026 (C)	0.005
1,2,4-Trimethylbenzene	0.47	0.061 (N)	0.07
Xylenes (Total)	3.7	0.21 (N)	10
Semi-Volatile Organic Compounds (SVOCs)			
Acenaphthene	0.75	0.37 (N)	NA
Benzo(a)anthracene	0.19	0.00003 (C)	NA
Benzo(a)pyrene	0.15	0.000003 (C)	0.0002
Benzo(b)fluoranthene	0.13	0.00003 (C)	NA
Chrysene	0.14	0.003 (C)	NA
Fluoranthene	0.28	1.5 (N)	NA
1-MethylNaphthalene (1)	0.75	0.0065 (N)	NA
2-Methyl Naphthalene	2.6	0.024 (N)	NA
Naphthalene	8.2	0.0065 (N)	NA

Compound	Maximum Concentration Detected (mg/l)	RBC For Tap Water (mg/l)*	MCL (mg/l)*
Phenanthrene (2)	1.2	0.18 (N)	NA
Pyrene	0.72	0.18 (N)	NA
Other SVOCs			
Bis(2-ethylhexyl phthalate - also called- di(2-ethylhexyl)phthalate or DEHP	0.069	0.0048 (C)	0.006
Dibenzofuran	0.081	0.037 (N)	NA
Inorganic Compounds			
Aluminum	9.6	37 (N)	0.05-0.2 (4)
Barium	0.541	7.3 (N)	2
Cyanide	0.22	0.73 (N)	0.2
Iron	42	26 (N)	0.3 (4)
Lead	0.019		0.015 (TT)
Manganese	3.0	0.73 (N)	0.05 (4)

* = Since the RI, EPA has updated the MCLs and/or RBCs for some of the Site-related COPCs. This Table reflects the current MCLs, as of June 2003, and RBCs, as of April 2007.

NA- Not Available
1- The RBC for Naphthalene is used as the RBC for these compounds
2- The RBC for Pyrene is used as the RBC for this compound
3- EPA "Action level" for lead in groundwater
4- Secondary MCL

N- Indicates that the RBC is based on noncarcinogenic effects (using a target hazard quotient of 0.1).
C- Indicates that the RBC is based on carcinogenic effects (using a target cancer risk of 10E-06).
TT- Treatment technique

B. Soils

The RI identified approximately 15,000 cubic yards of remaining contaminated surface and subsurface soils at the Site. The RI identified the following soil contamination:

1. **Surface Soil (0 to 6 inches deep)**:

The RI included the collection of three on-site samples and five off- site surface soil samples. One off-site sample was collected northwest of the Site, and the other four were collected south/southwest of the Site between the Site and the Susquehanna River. While full analytical results are presented in the RI, the COPCs found are listed immediately below:

Surface Soils COPCs:
PAHs: Acenaphthylene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene

Inorganics: Aluminum, Arsenic, Beryllium, Cadmium, Iron, Lead and Manganese

2. **Subsurface Soil (deeper than 6 inches)**:

The RI included the collection of eight on-site samples and eight off-site samples ranging in depth from 1.3 feet to 23.1 feet. Five of the off-site samples were from soil borings and 3 were from test pits. Four off-site samples were located near the bank of the Susquehanna River and four near Front Street and the railroad tracks south of the Site property. All sixteen (16) samples were analyzed for PAHs, target analyte list (TAL) metals and cyanide.

Subsurface Soils COPCs:
PAHs: Acenaphthylene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Dibenzo(a,h)anthracene, Indeno(1, 2, 3-cd)pyrene

Inorganics: Aluminum, Arsenic, Beryllium, Iron, Manganese and Thallium.

C. Sediments

1. Shawnee Creek

Sampling conducted in 1998 as part of the RI found COPCs in the sediments of Shawnee Creek. However, based on sampling conducted by PPL in February 2005, EPA has determined that the data demonstrate that MGP-related wastes are not the main source of the relatively low concentrations in sediments at, near, and upstream of the Site.

2. Susquehanna River

In July 2003, PPL took samples of Susquehanna River sediments as part of its TI Waiver application to evaluate whether MGP-related wastes in bedrock groundwater could discharge to river sediments. While sampling results revealed that total PAHs range from 0.111 mg/kg to 18.59 mg/kg, the kinds of PAHs found in the Susquehanna River sediment were not those which are formed during the MGP process. Therefore, EPA has concluded that the concentrations of PAHs detected in the Susquehanna River sediment were not attributable to the UGI site

D. Sediment Pore Water

In July 2003, PPL also conducted sediment pore water sampling at, near, and upstream of the former MGP Facility as part of its TI Waiver application. The sampling results show that concentrations of VOCs and PAHs were non-detectable in sediment pore water. This data demonstrate that the risk posed to ecological receptors, such as sediment fauna, does not warrant a response action.

E. Surface Water

No Site-related MGP COPCs have been detected in the surface water.

VI. CURRENT AND POTENTIAL FUTURE LAND USES

As a result of the work conducted by PPL and UGI pursuant to 2006 Settlement Agreement, no buildings remain on the Site. There is a concrete cap over each former holder and the remainder of the Site is capped with asphalt.

The area surrounding the Site is predominantly a light industrial area. The Site is, however, bordered on the southeast by residential property. The Site is located in an area recently zoned as a "conservation district." The Borough implemented this zoning classification to minimize development near the Susquehanna River. Under this zoning classification, residential and groundwater well development are not allowed. In addition, the Borough requires all water supply outlets within the Borough to be connected to either a public water system or a PADEP- approved private water system. The LWA, which supplies drinking water to the Borough, draws water from the Susquehanna River about 2,500 feet upstream of the Site.

EPA's selected remedy prohibits residential use of the Site. However, commercial or industrial uses of the Site are permitted so long as the integrity and protectiveness of EPA's selected remedy are maintained. Columbia Borough and PPL are in discussion on the sale of the site property. Columbia Borough has expressed an interest on reusing the property for the Borough's vehicle parking and vehicle maintenance garage and for the storage of road salt.

VII. SUMMARY OF SITE RISKS

As part of the RI, PPL performed a Preliminary Ecological Risk Assessment in 1994 and a Baseline Human Health Risk Assessment (HHRA) Report in 1998. The HHRA Report evaluated hypothetical upper-bound carcinogenic (cancer causing) and non-carcinogenic risks to various potential human receptors of COPCs from the Site known as the Reasonable Maximum Exposure (RME). The HHRA Report relied upon conservative assumptions and used conservative input parameter values. As such, the numeric values summarized in the HHRA Report should be considered conservative estimates of risks to human health.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, establishes acceptable levels of carcinogenic risk for Superfund sites ranging from one excess cancer case per 10,000 people exposed to one excess cancer case per 1 million people exposed if no action is taken at the site. The risk range is, therefore, between one in 10,000 and one in one million additional cancer cases. Expressed in scientific notation, the risk range is between 1.0E-04 and 1.0E-06 over a defined period of exposure to contaminants at the Site. Remedial Action is warranted at a Site when the calculated cancer risk level exceeds 1.0E-04. EPA's initial cleanup goal is to reduce risk to 1.0E-06. When multiple contaminants make reducing the aggregate risk to 1.0E-06 impracticable, EPA will establish cleanup goals which reduce the risk presented by the Site to within the acceptable risk range (between 1.0E-04 and 1.0E-06).

The NCP also states that sites should not pose a health threat due to non-carcinogenic but otherwise hazardous chemicals. Chemical contaminants that are ingested (eaten), inhaled (breathed) or dermally absorbed (skin contact) may present non-carcinogenic risks to different organs of the human body. EPA defines a non-carcinogenic threat by a ratio, called the Hazard Index (HI). The HI identifies the potential for the most sensitive individuals to be adversely affected by the non-carcinogenic effects of chemicals. Although the HI is not a linear scale, as a general rule, the greater the value of the HI above 1.0, the greater the level of concern. Thus, if the HI exceeds 1.0, there may be concern for the potential non-carcinogenic health effects associated with exposure to the chemical.

A. Summary of HHRA

PPL concluded in the HHRA that groundwater and soil at the Site posed unacceptable risks due to the presence of MGP-related wastes. Surface water, sediments, and air were eliminated from further evaluation based on the results of the human health risk assessment and, thus, were not considered for remedial actions.

1. Groundwater

Contaminated groundwater has been detected in monitoring wells on Site. Currently there are no drinking water wells located at the Site or in the area between the Site and the Susquehanna River. If a drinking water well were installed in these areas, the use of groundwater

as drinking water could pose non-carcinogenic risks (HI) greater than 1 and potential cancer risks greater than 1E-04.

Groundwater samples collected from residential wells located approximately one quarter mile to the northwest of the Site were analyzed for MGP-related wastes. There were no MGP-related wastes detected. Transport of COPCs toward these residences appears unlikely based on the location of the wells, the low mobility of the MGP-related wastes, and the nature and direction of the bedrock fractures. Moreover, these private wells have been abandoned and the residences are now on public water. The following table, Table 2, shows the groundwater risk estimates for the scenarios considered in the HHRA:

Table 2: Groundwater Human Health Cancer Risks For Current and Future Scenarios

Scenario: Future Receptor	Total Risk	
	Hazard Index (HI)	Cancer Risk
Hypothetical Resident (Off MGP Facility in DNAPL Zone Between Site and River)		
Child (0-6 yrs)	920	7E-03
Adult (7-30 yrs)	370	1E-02
Hypothetical Resident (On MGP Facility)		
Child (0-6 yrs)	580	1E-02
Adult (7-30 yrs)	230	2E-02

2. Soils

The following table, Table 3, shows the soil risk estimates for the scenarios considered in the HHRA and a May 19, 1998 EPA Human Health Risk Memorandum. For the table, it can be seen that on-site soils (surface and subsurface) would pose an unacceptable risk to potential future residents. The Hazard Quotients for the on-site construction worker scenario and off-site child resident scenario were found to be 1.2 and 1.8, respectively.

Table 3: Soils Human Health Cancer Risks For Current and Future Scenarios

Receptor	Total Risk	
	Hazard Index (HI)	Cancer Risk
Scenario: Onsite		
Industrial Worker (Surface Soil Only)	0.12	1.3E-05
***Construction Worker (Surface and Subsurface Soil)**	**1.2***	**2.3E-05**
Trespasser (Surface Soil and Sediment)	0.05	1.3E-06
Child Resident (Surface and Subsurface Soil)	**4.2**	**4E-04**
Adult resident (Surface and Subsurface Soil)	0.4	1.6E-04
Scenario: Offsite (Subsurface Soil Near River)		
Construction Worker	0.4	3.3E-06
Child Resident	1.8	6.2E-05
Adult Resident	0.12	2.4E-05
Scenario: Offsite (Subsurface Soil South of the Site)		
Construction Worker	0.6	1.1E-05

* NOTE: This result taken from HHRA Report. All other results in table taken from EPA Human Health Risk Memorandum dated May 19, 1998.

a. MGP Facility Soils

Pursuant to the 2006 Settlement Agreement, PPL and UGI installed two (2) caps in areas where MGP-related wastes remained in the soil. The caps have eliminated the risk associated with exposure to Site soils so long as the Site is not used for residential purposes and the integrity and protectiveness of the caps are maintained.

If the Site is ever developed for residential use, Site soils (surface and subsurface) would pose an unacceptable risk for potential future residents. For the future resident scenario, the cancer risk estimate for a child resident is 4E-04, and the cancer risk estimate for an adult resident is 1.6E-04. The HI values for future potential child and adult residents are 4.2 and 0.4, respectively.

b. Soils near the Susquehanna River and the wastewater treatment plant

If this area of the Site is redeveloped for industrial purposes, the soil would pose a relatively low cancer risk to construction workers by direct contact with subsurface soils. The estimated risk is 3.3E-06, and is associated with incidental ingestion of carcinogenic PAHs in subsurface soil while excavating at the Site. The non-carcinogenic risk is 0.4. Since the calculated risks are within EPA's acceptable risk range, remedial action in this area is not warranted.

c. Soils between Front Street and the railroad tracks across from the MGP-Facility

If this area of the Site is redeveloped for industrial purposes, the potential for soil to pose a moderate cancer risk to construction workers is estimated to be 1.1E-05 and is associated with incidental ingestion of carcinogenic PAHs in subsurface soil while excavating at the Site. The non-carcinogenic risk is 0.6. Since the calculated risks are within EPA's acceptable risk range, remedial action in this area is not warranted.

3. Susquehanna River Sediment

MGP-related wastes were present in the sediment of the Susquehanna River. Removal of the impacted sediments occurred in January 1998. The removal of sediments eliminated the human health risk associated with exposure to MGP-related wastes in those sediments.

4. Surface Water in Susquehanna River

There were no COPCs detected in Susquehanna River surface water.

5. Shawnee Creek Sediment

Under current conditions, the potential risk associated with exposure from incidental ingestion and dermal contact to Shawnee Creek sediment is less than 1E-06. Therefore, remedial action in this area is not warranted.

6. Surface Water in Shawnee Creek

There were no COPCs detected in Shawnee Creek surface water.

B. Ecological Risk Assessment

A preliminary ecological risk assessment (PERA) was conducted for the Site in 1994 and submitted to the PADEP and EPA for review and subsequent approval. The PERA provided a

basis for determining if a potential for ecological risk exists and identified data gaps that should be addressed in order to quantify risks. The PERA indicated that no habitat existed on the Site, but PAHs in the Susquehanna River sediment posed a potential risk to the environment. The contaminated sediment was removed in January 1998 in a removal action described in PPL's Engineering Evaluation/ Cost Analysis (EE/CA) dated August, 1995, which can be found in the Administrative Record for the Site.

In July 2003, the Susquehanna River sediments were again sampled, and in February 2005 Shawnee Creek sediments were also re-sampled. Site-related contaminant concentrations found in surface water and sediments in the river were below the respective ecological screening levels. Furthermore, the data from the Susquehanna River and Shawnee Creek indicated that PAH contamination was due to non-Site related sources. Therefore, EPA concluded that a baseline ecological Risk Assessment was unnecessary for the Site.

VIII. REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAOs) for the risk associated with the soil and groundwater at the Site are:

A. Soils

The RAOs for on-site soils are to:

1) Protect the integrity of the on-Site caps;
2) Maintain caps and stormwater management system, and
3) Implement institutional controls to prevent residential use and any other uses of the Site property which would interfere with or adversely affect the integrity or protectiveness of the caps.

B. Groundwater

Although the beneficial use of the aquifer as a potential drinking water source and restoration to its beneficial use would be an RAO, the presence of DNAPL in the fractures and a limited dissolved plume in the immediate vicinity of the DNAPL precludes the ability to fully restore the affected portion of the aquifer to potable quality. Thus, the RAOs for groundwater are as follows:

1) Prevent human exposures to MGP-related wastes in the groundwater via ingestion, inhalation and dermal contact
2) Prevent further migration of the dissolved phase plume and
3) Implement institutional controls to prevent groundwater uses which would interfere with or adversely affect the integrity or protectiveness of the final remedy for the Site.

IX. DESCRIPTION OF ALTERNATIVES

CERCLA requires that any remedy selected to address contamination at a hazardous waste site must be protective of public health and welfare and the environment, be cost-effective, be in compliance with regulatory and statutory provisions that are applicable or relevant and appropriate requirements (ARARs), and consistent with the NCP to the extent practicable. The Superfund law also expresses a preference for permanent solutions, for treating hazardous substances onsite, and for applying alternative or innovative technologies.

A detailed analysis of the remedial alternatives for soil and groundwater are presented below. These alternatives were developed by PPL and were presented in the FS and the Soil Remedy Engineering Analysis and the Groundwater Report.

A. Soil Alternatives

1. Alternative S-1: No Action

Capital Cost:	$0
Annual O&M Cost:	$0
Present Worth Cost:	$0
Time to implement:	Immediate

The NCP, at 40 C.F.R. § 300.430(e)(6), requires the development of the No Action alternative for remedial actions. The purpose of the No Action alternative is to provide a baseline for comparison against the other alternatives. Under this alternative, no remedial action would be taken to remove, control migration from, minimize exposure to or otherwise reduce the risks associated with Site-related contaminated soils. In addition, no efforts would be made to control the future use of the areas containing contaminated soils. No construction sequence and no capital costs would be incurred, and no ARARs would be considered under this alternative. However, because contaminated soils would remain in place, EPA would conduct five-year reviews as required by Section 121(c) of CERCLA.

2. Alternative S-2: No Further Action and Institutional Controls

Capital Cost:	$ 0
Annual O&M Cost:	$ 13,500
Present Worth Cost:	$167,522
Time to Implement:	weeks to months

This alternative controls risks through the implementation of institutional controls to

maintain the integrity and protectiveness of the remedial actions previously taken at the Site. This alternative requires no further remediation of on-Site soils because those areas where MGP-related waste remains in the soil have been capped. In order to ensure that the integrity and protectiveness of those caps are maintained, this Alternative requires that PPL and UGI to maintain the caps, and implement ICs at the Site. This alternative would allow for the commercial and/or industrial reuse of the Site. EPA would require PPL and UGI to implement ICs such as deed notices, easements and/or restrictive covenants prohibiting current and future Site property owners from using Site property for residential use or in any manner that would interfere with or adversely affect the integrity, protectiveness or implementation of the remedial actions performed at the Site.

No capital costs would be incurred, and no ARARs would be considered under this alternative. However, because contaminated soils would remain in place under the caps at the Site, EPA would conduct five-year reviews as required by Section 121(c) of CERCLA.

B. Groundwater Alternatives

1. Alternative GW-1: No Action

Capital Cost:	$0
Annual O&M Cost:	$0
Present Worth Cost:	$0
Time to Implement:	0 years

The NCP, at 40 C.F.R. § 300.430(e)(6), requires the development of the No Action alternative for remedial actions. The purpose of the No Action alternative is to provide a baseline for comparison against the other alternatives. Under this alternative, no remedial action would be taken to remove, control migration from, minimize exposure to or otherwise reduce the risks associated with Site-related contaminated groundwater. The No Action alternative would not meet any of the cleanup objectives described earlier in this Proposed Plan. In addition, this alternative would not provide any controls necessary to protect people and the environment from the Site-related contamination. No capital costs would be incurred and no ARARs would be considered under this alternative. However, because contaminated groundwater would remain in place, EPA would conduct five-year reviews as required by Section 121(c) of CERCLA.

2. Alternative GW-2: Monitored Natural Gradient Flushing and Institutional Controls

Capital Cost:	$ 90,000
Annual O&M Cost:	$ 51,300
Present Worth Cost:	$796,000
Time to Implement:	Several Weeks to a Few Months

This alternative includes utilizing the TI Waiver for groundwater cleanup ARARs in the 7.0-acre area shown on Figure 3 and referred to as the DNAPL Zone. Natural gradient flushing

of the dissolved phase plume from the DNAPL Zone into the Susquehanna River would constitute the natural gradient flushing component of this alternative. For this remedy component, the dissolved MGP constituents will continue to be diluted, dispersed, and biodegraded to non-detectable levels in the Susquehanna River, which effectively contains the plume and prevents it from expanding.

EPA is waiving the requirement achieve groundwater ARARs over the designated area of the aquifer, the DNAPL Zone, due to technical impracticability from an engineering perspective. Currently, no technologies are capable of restoring groundwater to health-based standards in the area of the DNAPL under present Site conditions. A large amount of viscous DNAPL is present in the fractured bedrock. Any technology capable of removing the DNAPL in such an environment would first have to mobilize the DNAPL and then have to extract the mobilized DNAPL. No known technologies are capable of extracting DNAPL from such a complicated fractured bedrock geologic system. Moreover, any attempt to remobilize the DNAPL may cause ecological and human health risks which do not currently exist in the Site vicinity and Susquehanna River.

With respect to the dissolved phase plume immediately adjacent to the DNAPL within the fractured bedrock, technologies used at other sites have been able to reduce the size of the dissolved phase plume. However, at this Site, the dissolved phase plume is in the immediate vicinity of the DNAPL and discharges to the Susquehanna River where it is diluted so that the MGP-related constituents cannot be detected in the water column.

As stated previously, under existing conditions, a small fraction of dissolved phase plume, referred to as the LWA Lobe, will continue to be pulled from the DNAPL area by the LWA cooling water wells. EPA anticipates that LWA will continue to treat that extracted water. However, if LWA were to stop pumping, alternate remedial methods would have to be examined and implemented to cleanup any portion of the LWA Lobe which remains outside of the DNAPL Zone.

The groundwater monitoring and IC components of the remedy would apply to both the DNAPL Zone and the LWA Lobe. Since the dissolved constituents of the DNAPL source area have relatively low solubilities and the natural gradient is to the Susquehanna River, the plume area associated with the DNAPL is relatively small. A monitoring program will be established to confirm that the remedy is consistently performing within expectations and that conditions in the Site area do not change significantly. Under the 2006 Settlement Agreement, PPL and UGI enhanced the existing well network by installing four (4) additional monitoring wells in the vicinity of the LWA property, in or near areas of suspected DNAPL contamination, and near discharge locations to the Susquehanna River and Shawnee Creek. Up to 12 wells will be monitored annually for MGP-related constituents.

The IC components of this remedy consist of non-engineering measures including administrative and/or legal controls that help to minimize the potential for human exposure to contaminated groundwater. Currently, local zoning and groundwater development restrictions

are in place and are enforceable by the Borough. These restrictions prohibit, among other things, the installation of new wells. Additional ICs will be established at the Site to augment the existing protection afforded by the local zoning restrictions. These ICs will include such things as title notices and land use restrictions through easements and covenants and orders from or agreements with EPA and/or PADEP and will allow permanent access to Site wells for monitoring purposes.

Presently, there are no identified human health exposures to groundwater under an industrial use scenario at the Site and there will continue to be no human health risks so risks at the Site will not change under this alternative.

The ARARs for this alternative are the regulations codified at 40 C.F.R. § 141.24, promulgated by EPA pursuant to the Safe Drinking Water Act.

3. Alternative GW-3: Groundwater Extraction and Treatment

Capital Cost:	$ 2,347,000
Annual O&M Cost:	$ 610,000
Present Worth Cost:	$10,700,000
Time to Implement:	1-2 years

Alternative GW-3 includes the extraction and treatment of the dissolved phase plume to hydraulically control the contaminated groundwater and prevent the migration of the dissolved plume towards the cooling water wells and the Susquehanna River. Groundwater extracted would be treated and discharged to the Susquehanna River. Alternative GW-3 incorporates EPA's intent to invoke a TI waiver because of the presence of the DNAPL contamination. Therefore, as in Alternative GW-2, there would be no further cleanup of the DNAPL and ICs and long-term monitoring will be implemented.

The extraction system required as part of this alternative would include the installation of up to 15 recovery wells to collect contaminated groundwater. A treatment system, discharge pipe, recovery wells, and transmission pipelines are components of this alternative and would also have to be installed and maintained to remove the contaminants of concern to appropriate levels for surface water discharge. The treatment system would include chemical precipitation to remove metals followed by granular activated carbon to remove organic contaminants. The specific treatment system utilized could be modified in the future based on bench-scale testing and the actual treatment system capacity. Operation and maintenance of the system would continue in perpetuity, but its cost is estimated based on a 30-year period in accordance with EPA guidance.

Modeling under natural gradient conditions provided in the TI waiver demonstration indicates that groundwater will be contaminated for at least several centuries and likely for several thousand years due to the presence of the DNAPL. Pumping and treating groundwater from the DNAPL Zone would not likely change the rate of DNAPL dissolution into groundwater

appreciably. This result is expected because the limited contact with DNAPL; the low solubility of the DNAPL component, the high groundwater velocities, and the short contact times associated with groundwater extraction activities at the Site would result in the extraction of low contaminant concentrations from the groundwater. As a result, groundwater extraction activities at the Site are not expected to significantly change the extremely long time required for cleanup of groundwater, nor would they appreciably reduce the mass of DNAPL within the DNAPL Zone.

The LWA Lobe would be contained as long as the LWA continues to pump wells CWW-1 and CWW-2. If pumping were to discontinue, alternate remedial methods would be examined and implemented to cleanup the LWA Lobe outside the DNAPL Zone (Figure 3). The Susquehanna River prevents the potential for further groundwater plume migration or plume enlargement from the DNAPL to the West.

As with Alternative GW-2, monitoring wells will be sampled and the data analyzed and reported. A total of 40 samples per year have been considered for compliance and monitoring and have been included in the cost estimate. The ICs, as described for Alternative GW-2, would also be included in the alternative.

The ARARs for this alternative are the regulations codified at 40 C.F.R. § 141.24, promulgated by EPA pursuant to the Safe Drinking Water Act.

X. COMPARATIVE ANALYSIS OF ALTERNATIVES

The following is a summary of the comparative analysis of the alternatives for Site soils:

1. Overall Protection of Human Health and the Environment

A primary requirement of CERCLA is that the selected remedial alternative be protective of human health and the environment. A remedy is protective if it reduces current and potential risks to acceptable levels within the established risk range posed by each exposure pathway at the Site.

Soil:

The No Action alternative would not provide adequate protection of human health and the environment in that it does not prevent human exposure to Site-related contaminants. The No Action Alternative will not be discussed further in the nine criteria analysis because it does not satisfy the threshold criteria of providing overall protection to human health and the environment.

Alternative S-2 is protective of human health and the environment since it provides for continued risk reduction through the implementation of ICs. The caps installed under the 2006

Settlement Agreement prevent contact with MGP-related wastes and the implementation of ICs will maintain the protectiveness and integrity of the caps.

Groundwater:

Alternative GW-1, No Action, would not be protective of human health and the environment, and as such will not be considered further in the nine criteria analysis.

Since no current groundwater risks have been identified at the Site, both groundwater Alternatives GW-2 and GW-3 are protective of human health and the environment. Groundwater from the Site discharges to the Susquehanna River where contamination is not detected at measurable concentrations. A small amount of groundwater is used as cooling water by the LWA. This water is treated and tested to ensure it meets drinking water standards before use. In addition, future groundwater use in the Site area is prevented by an existing zoning ordinance which prohibits the installation of new wells.

If an unauthorized well is installed in the cooling water well area or if the current groundwater restrictions are repealed, Alternative GW-3, Groundwater Extraction and Treatment, may afford a limited amount of additional protection because it isolates the dissolved phase plume from the cooling water wells, the river, and any potential new unauthorized well, for as long as pumping continues. Moreover, in addition to the existing ordinance prohibiting groundwater use, EPA would require that institutional controls be implemented under both alternatives.

The groundwater extraction activities required as part of Alternative GW-3 have the potential to mobilize the DNAPL and cause potential DNAPL migration within the low-permeability bedrock system. In addition, the groundwater extraction system could draw contaminated groundwater and DNAPL outward towards the extraction wells, thereby expanding the extent of contamination in the aquifer.

In addition, during groundwater extraction activities conducted under Alternative GW-3, modeling provided in the Groundwater Report, Appendix A, showed that the Shawnee Creek could be negatively impacted due to induced recharge (leakage) from the Creek to the aquifer and from the loss of recharge from the aquifer to the Creek. The reduction in the Creek water volume may have a negative impact on biological conditions in the creek. Considering this and the potential for this alternative to destabilize the DNAPL present at the Site, Alternative GW-2 is slightly more protective of the environment than Alternative GW-3.

2. Compliance with ARARs

Any remedial action selected by EPA must comply with all applicable or relevant and appropriate federal and state environmental requirements or provide the basis upon which such requirement(s) can be waived.

Section 121(d) of CERCLA and the NCP at 40 C.F.R. § 300.430(f)(1)(ii)(B) require that remedial action at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state substantive environmental requirements, standards, criteria and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA 121(d)(4).

Applicable requirements are those substantive environmental standards, requirements, criteria, or limitations promulgated under federal or state law that are legally applicable to the Remedial Action to be implemented at the site. Only those state standards that are identified by the state in a timely manner and that are more stringent than federal requirements may be applicable. *Relevant and appropriate* requirements, while not being directly applicable, address problems or situations sufficiently similar to those encountered at the site that their use is well-suited to the particular circumstance. Only those state standards that are identified by the state in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.

EPA will also consult to-be-considered material (TBCs). TBCs are non-promulgated advisories or guidance issued by Federal or State governments that are not legally binding and do not have the status of potential ARARs. However, EPA will consider TBCs along with ARARs and EPA may use the TBCs in determining the necessary level of cleanup for protection of health and the environment.

Soil:

Under Alternative S-2, no further remedial action would be taken and, therefore, no ARARs would be considered.

Groundwater:

EPA's goals for addressing contaminated groundwater are as follows:

> EPA expects to return usable groundwaters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the Site. When restoration of the ground water to beneficial uses is not practicable, EPA expects to prevent further migration of the plume, prevent exposure to the contaminated ground water, and evaluate further risk reduction. (40 CFR 300.430(a)(1)(iii)(F))

As shown in Table 4, below, EPA has determined that MCLs and RBCs are relevant and appropriate standards for remediating the contaminated groundwater under Alternatives GW-2 and GW-3. However, EPA has determined that the total removal of the DNAPL and the actual restoration of the groundwater to ARARs is technically impracticable from an engineering perspective, and is, therefore, waiving the ARARs.

Pumping wells within the DNAPL Zone, as provided in Alternative GW-3, may change the specific size and character of the plume. The plume may change because extraction wells located along the edge of the DNAPL Zone (i.e., in relatively clean areas) may draw contaminated water and potentially mobilize the currently stable DNAPL. Therefore, Alternative GW-3 would need to be designed to meet several additional ARARs, including location specific ARARs for treatment, storage, and disposal of potentially hazardous wastes and ARARs for minimization of the potential harm, and restoration and preservation of the natural and beneficial values of floodplains. In addition, under Alternative GW-3, Shawnee Creek could be negatively impacted due to induced recharge (leakage) from the creek to the aquifer, and from the loss of recharge from the aquifer to the creek, as shown by modeling provided in Appendix A of the September 2006 Groundwater Engineering Analysis Report contained in the Administrative Record.

3. Long-Term Effectiveness and Permanence

Soil:

Alternative S-2 achieves this criterion. The caps installed pursuant to the 2006 Settlement Agreement minimize further contaminant migration to the groundwater and prevent potential contact with contaminated subsurface soils. Alternative S-2 would require ICs including deed notices and easements and/or restrictive covenants, as appropriate, combined with the local ordinances to prohibit residential use of the Site and to maintain the protectiveness and the integrity of the caps.

Groundwater:

Neither GW-2 or GW-3 will provide a measurable difference in long-term groundwater conditions in and around the area of the DNAPL at the Site and in the Site vicinity.

Alternative GW-2 will have minimal impacts on existing conditions in the Susquehanna River and Shawnee Creek and will not impact the cooling water wells. The remedy will need to be monitored indefinitely. A small amount of the contaminant mass will be removed by the cooling water wells as long as they remain operational. This mass removal is not expected to change overall Site conditions.

The nature of the DNAPL within a low-permeability fractured bedrock matrix also introduces significant uncertainty with regard to the long-term effectiveness of Alternative GW-3. The installation of the wells within the bedrock may mobilize DNAPL. Further, over the long term, the extraction wells may not be able to sustain a reasonable yield and maintain capture in certain areas. In addition, the heterogeneous nature of the fractured bedrock allows preferential flowpaths to be created. These flowpaths may leave specific areas untreated and cause lateral spreading of DNAPL, thereby reducing the effectiveness of the system considerably.

The groundwater extraction system required as part of Alternative GW-3 will need to be

operated, maintained and monitored indefinitely to hydraulically control the dissolved phase plume. The efficiency of this operation will be greatly reduced by the limited size of the dissolved plume which could reduce the concentration of contamination being treated and increase the quantity of relatively clean water entering the system. The operation of this system will also compete with the LWA cooling water wells for water, and the modeling provided in September 2006 Groundwater Engineering Analysis Report, Appendix A contained in the Administrative Record, indicates that sufficient water may not be available to meet the LWA's cooling needs. This lack of sufficient supply of water will also reduce the long-term effectiveness of the system installed as part of Alternative GW-3. Considering the potentially severe limitations and minor potential benefits on the long term effectiveness and system performance of Alternative GW-3, it is believed that Alternative GW-2 is a more efficient and effective alternative for the long term permanent management of the Site.

4. Reduction of Toxicity, Mobility or Volume

Soil Alternatives:

Prior cleanup activities at the Site (i.e. steam and hot water injection; extraction and stabilization activities) conducted on the holders as part of the interim remedial activities have reduced the toxicity, mobility and volume of source materials at the Site. Alternative S-2 would not further reduce toxicity or volume of the contamination any further, but implementing ICs to protect the integrity and protectiveness of the caps will ensure that the volume of water infiltrating to groundwater continues to be reduced.

Groundwater Alternatives:

Neither Alternative GW-2 nor GW-3 significantly (defined by EPA as greater than a 90%) reduce the toxicity, mobility or volume of contamination in groundwater.

The toxicity of the groundwater contamination will not change under either Alternative GW-2 or Alternative GW-3 since the DNAPL will continue to be present.

There will be no change in the mobility of the contaminants under Alternative GW-2. Under Alternative GW-3 the mobility of the dissolved contaminants in the groundwater may be increased due to pumping. It is possible this pumping may cause DNAPL in fractures to be mobilized into previously DNAPL-free regions. Numerous literature references support this potential DNAPL behavior and the heterogeneous and low permeability nature of the Site aquifer make it especially prone to allowing lateral movement of the DNAPL.

Under Alternatives GW-2 and GW-3, a small and relatively insignificant amount of the dissolved DNAPL mass/volume will continue to be removed by the cooling water wells (less than 0.02 pounds/day). However, since the source mass/volume is so large relative to the mass/volume dissolved in groundwater, the mass/volume reduction associated with this is not

expected to change Site conditions overall.

Under Alternative GW-3, a small amount of contaminant mass will be removed by the groundwater extraction system. This mass is estimated to be approximately 10 pounds per day initially, and is expected to drop to a much lower level as the more soluble DNAPL components are depleted. Considering the size of the dissolved plume, the source mass/volume of DNAPL removal will be relatively small compared to the size of the DNAPL present.

In summary, neither Alternative GW-2 nor GW-3 will significantly reduce the toxicity of the contaminants at the Site. Alternative GW-2 will not increase the mobility of the contamination present, but Alternative GW-3 may increase both the mobility of the dissolved phase contamination and the DNAPL. Although Alternative GW-3 may remove slightly more contaminant mass than Alternative GW-2, neither alternative will have a significant impact on the amount of contamination present. Given the complexity of removing DNAPL from a low-permeability aquifer, clean-up times are still expected to be several centuries to several thousand years with Alternative GW-3. Considering this information, these two alternatives are believed to be roughly equivalent with regard to this criterion.

5. Short-Term Effectiveness

Soil Alternatives:

Alternative S-2 would be effective in the short-term. Under this alternative, there would be no impacts to on-site workers and the community.

Groundwater Alternatives:

Once all planning and access issues are addressed, both GW-2 and GW-3 could be implemented through conventional means and methods.

Alternative GW-2 would be effective in the short-term. PPL and UGI has already installed the wells necessary to monitor effectively both the DNAPL Zone and the LWA Lobe. Additional wells may be required if long-term monitoring reveals the need for additional wells.

Alternative GW-3 requires the installation of a treatment system, discharge pipe, recovery wells, and transmission pipelines. GW-3, therefore, would be much more disruptive to traffic and would create potential noise and odors given the need to install trenching and piping across multiple properties, through Shawnee Creek, beneath roadways, and beneath railroad tracks. Workers would be required to wear specialized protective clothing and to perform air monitoring to minimize health and odor impacts. Alternative GW-3 would also require a permanent discharge to the Susquehanna River.

Although both alternatives could be completed in an effective manner, Alternative GW-2 is much less disruptive to traffic and local properties because no additional wells need to be

installed in the short-term. For this reason, alternative GW-2 has considerable advantages with regard to the short-term effectiveness criterion.

6. Implementability

Soil Alternatives:

The ICs required by Alternative S-2 are readily implementable. They will, however, require PPL and UGI to use their best efforts to have Site property owners, including PennDOT, Pennsylvania Lines LLC and the Municipal Authority of Columbia, record deed notices. Such coordination may be difficult and require assistance from EPA and PADEP.

Groundwater Alternatives:

Although Alternative GW-2 and GW-3 could both be implemented, Alternative GW-2 could be implemented more easily.

The groundwater monitoring wells necessary for Alternative GW-2 were installed by PPL and UGI under the 2006 Settlement Agreement. Those wells would also be used under Alternative GW-3; however, Alternative GW-3 would require additional wells along with the installation of a treatment system, discharge pipe, recovery wells, and transmission pipelines. Alternative GW-3 would therefore require additional access agreements from parties including, but not necessarily limited to the LWA, Columbia Borough, PennDOT and Pennsylvania Lines LLC.

For Alternative GW-3, the technology and process options are well established and the equipment is available from multiple suppliers and contractors for installation. Treatability testing and aquifer pumping tests would be necessary to confirm the appropriate system design specifications. Monitoring of the influent, effluent, and wells and operation and maintenance of the system are straightforward. Operation of an extraction well system within the DNAPL area as part of Alternative GW-3 has the potential for mobilizing DNAPL. Implementation of Alternative GW-3 would also require the imposition of water discharge criteria which would need to be established by PADEP.

ICs would be required for both Alternative GW-2 and GW-3. For Alternative GW-2, ICs would be required to provide access to the monitoring wells and to limit well installation which could lead to the potential exposures to groundwater and DNAPL. Alternative GW-3 would require additional ICs to allow permanent access for constructing, operating and maintaining the groundwater extraction system and for permanent use and access to railroad crossings, crossing state roadways, stream crossings, and other areas of trench installation. These access agreements will need to be coordinated with parties including, but not necessarily limited to the LWA, Columbia Borough, PennDOT and Pennsylvania Lines LLC. Past experience has shown that these types of activities can prolong the project schedule significantly and may also require EPA's involvement.

Based on the above analysis Alternative GW-2 is more easily implementable than GW-3.

7. Costs

An estimated capital, annual operation and maintenance (O&M), and total present worth cost for each of the alternatives has been calculated for comparative purposes, and is presented in Table 3.

For cost estimation purposes, a period of 30 years has been used for O&M. In reality, maintenance of a Site where waste is left in place would be expected to continue beyond thirty years. Similarly, the actual duration of operation for the groundwater extraction and treatment system would depend on its ability to successfully limit off-site migration of Site-related contaminants. The evaluation was based on cost estimates presented in the Focused Feasibility Study, and the Soil and Groundwater Report. The present worth is based on both the capital and O&M costs, and provides the means of comparing the cost of different alternatives.

Table 3 : Summary of Estimated Costs for Soil and Groundwater Alternatives

Alternative Number	Capital Cost	Annual O&M Cost	Present Worth Cost
-Soil Alternatives-			
Alternative S-1	$0	$0	$0
Alternative S-2	$0	$13,500	$167,522
-Groundwater Alternatives-			
Alternative GW-1	$0	$0	$0
Alternative GW-2	$90,000	$51,300	$796,000
Alternative GW-3	$2,347,000	$610,000	$10,070,000

Soil

The costs associated with S-2 are relatively minimal.

Groundwater

The costs associated with Alternative GW-3 are very high relative compared to the costs associated with Alternative GW-2, and as discussed above, Alternative GW-3 provides no additional risk reduction. Therefore, Alternative GW-2 is strongly favored based on the cost

criterion.

8. State Acceptance

The Commonwealth of Pennsylvania supports the selection of Alternative S-2, No Further Action and Institutional Controls, for soils, and Alternative GW-2, Monitored Natural Gradient Flushing with Institutional Controls, for groundwater.

9. Community Acceptance

A thirty-day public comment period on EPA's Proposed Plan for the Site began on June 27, 2007. An advertisement announcing the issuance of the Proposed Plan and a public meeting to discuss the Plan was placed in the *Lancaster New Era*. The public meeting was held on July 19, 2007 at the Columbia Borough Hall, 308 Locust Street, Columbia, PA.

The community appears to fully support EPA's findings and preferred alternative. All attendees at the public meeting appeared to agree with EPA's preferred alternative. No one objected to EPA's preferred alternative, nor did anyone recommend an alternative approach. A copy of the transcript of the public meeting is included in the Administrative Record.

Written comments were received during the public comment period. The comments and EPA's responses are provided in the Responsiveness Summary.

XI. PRINCIPAL THREAT WASTES

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable, 40 C.F.R. Section 300.430(a)(1)(iii)(A). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund Site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Principal threat wastes are those materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur.

EPA does not believe that soil contamination at the Site constitutes a principal threat requiring treatment because the remaining soil contamination is not highly toxic, contained, and, therefore, not mobile due to wind entrainment, volatilization, surface runoff, or subsurface transport.

DNAPL within the aquifer at the Site could be categorized as a principal threat because it is liquid and contains high concentrations of Site-related contaminants. However, because areas of mobile DNAPL within the fractured bedrock have not been identified and given the difficulty in locating and removing mobile DNAPL from the fractured bedrock without potentially

mobilizing the DNAPL, treatment of the DNAPL is not practicable.

XII. EPA'S SELECTED REMEDY

After carefully comparing the evaluation criteria for the available alternatives, EPA's selected remedy for the Site is as follows:

A. Soils

Alternative S-2, No Further Action and Institutional Controls, is EPA's selected remedy. EPA selected this alternative because it is protective of human health and the environment, provides for the continued safe management of the remaining materials under the caps, includes institutional controls to control future use of the Site, can be implemented quickly, and has negligible impacts to the surrounding community. Periodic maintenance will ensure that the integrity of the caps and that the stormwater management system are maintained. Additionally, this alternative allows for the possible future reuse of the Site consistent with the current zoning classification.

If the Site were ever developed for residential use, Site soils (surface and subsurface) would pose an unacceptable risk for potential future residents. While EPA does not consider residential use to be a reasonably anticipated future use of the MGP Facility, EPA's final remedy requires institutional controls, in the form of deed notices, easements and/or restrictive covenants, to prohibit current and future Site property owners from using Site property for residential use or in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial actions performed at the Site.

With respect to Site property other than the MGP Facility, PPL and UGI are required, as part of the final remedy, to obtain easements from other Site property owners, such as the LWA, Columbia Borough, PennDOT and Pennsylvania Lines LLC, which will prohibit residential use of the properties, well installation and groundwater use, and any uses that would interfere with or adversely affect the integrity or protectiveness of the remedial actions performed at the Site.

B. Groundwater

Alternative GW-2, Monitored Natural Gradient Flushing with Institutional Controls, is EPA's selected remedy. EPA selected this Alternative for groundwater because it prevents current and future human exposures via ingestion, inhalation and dermal contact to MGP-related wastes in the groundwater and monitors the natural flushing and migration of the dissolved phase plume to the Susquehanna River.

As noted previously, a number of Site-related contaminants have impacted the groundwater as DNAPL and as dissolved contaminants. In addition, groundwater studies done

during the RI indicate that groundwater from the Site discharges to the Susquehanna River; however, Site-related contamination is not detected in the surface water at measurable concentrations. A small amount of groundwater that is used as cooling water by the LWA is contaminated by the Site and is mixed in with the large volume of river water. The cooling water wells contribute one tenth of one percent of the total water supply. The LWA treats both the source water from the Susquehanna River and the cooling water wells to make it potable. After treatment, this water is tested to confirm it is potable in accordance with PADEP requirements and is distributed through the public water supply system.

As part of the remedy review process, EPA evaluated MCLs and RBCs for MGP-related wastes in the DNAPL and the dissolved phase plume. EPA judged these requirements to be "relevant and appropriate" standards for remedy selection at the Site. However, conditions at the Site preclude the actual ability to clean the groundwater in the DNAPL Zone to drinking water standards.

EPA is waiving ARARs, both MCLs and RBCs, for 27 contaminants that were found within and above the DNAPL in the DNAPL Zone, pursuant to CERCLA Section 121(d)(4)(C), because aquifer restoration to drinking water quality is technically impracticable using currently available or new and innovative methods or technologies within a reasonable or foreseeable time frame. As long as the DNAPL source zones are not removed or contained, aquifer restoration in and downgradient of the source zone cannot be achieved. DNAPL containment, removal, and treatment methods were evaluated for the Site. Removal and in-situ treatment of DNAPL is technically impracticable because the DNAPL is trapped within the fractured bedrock. The DNAPL has extremely low solubility and high viscosity. Any technology capable of removing the DNAPL would first need to mobilize the DNAPL. No known technologies are capable of doing this under these Site conditions. Moreover, any attempt to mobilize the DNAPL would disturb the DNAPL, thereby increasing potential contaminant migration and potentially creating human health risks, which do not currently exist, at the Site.

With respect to the dissolved phase plume, the dissolved phase plume is in the immediate vicinity of the DNAPL and discharges to the Susquehanna River, where it is diluted below levels which can be detected. The proximity of the Site to the Susquehanna River limits the continued migration of the dissolved phase plume emanating from the DNAPL. While there is a small lobe (LWA lobe) of the dissolved phase plume migrating toward the LWA and contamination is being pulled into their cooling water wells and ultimately mixed into the LWA water supply (cooling water wells represent 0.1% total volume), the LWA's treatment process is capable of removing the groundwater contaminants prior to distribution to the LWA clients. These current unique Site circumstances preclude the feasibility of restoring the downgradient dissolved plume to meet drinking water standards. However, if the cooling water wells were ever abandoned, a focused feasibility study should be performed to evaluate how to clean up the groundwater contaminant plume which has been pulled to these wells through pumping.

As part of EPA's selected remedy, a regimen of long-term groundwater sampling will be established as part of the Remedial Design. The monitoring will determine whether contaminants of concern are present outside the limits of the DNAPL Zone at concentrations exceeding ARARs.

In addition, as discussed in more detail in Section B.2., above, Alternative GW-2 will require institutional controls restricting the installation and use of groundwater wells and prohibiting any use of the Site that would interfere with the protectiveness or integrity of the selected remedy. The selected remedy will meet all ARARs, other than those being waived, and provide a long-term and permanent solution. The selected remedy offers short-term effectiveness, provided appropriate controls and plans are in place.

XIII. STATUTORY DETERMINATIONS

The selected remedial alternative satisfies the requirements of CERCLA and the NCP. EPA believes that the remedy is protective of public health and welfare and the environment. In addition, the selected remedy complies with ARARs (except in the instance in which ARARs are waived), is cost-effective, and utilizes permanent solutions to the maximum extent practicable. The remedy does not satisfy the statutory preference for treatment as a principal element of the remedy because treatment would result in extraordinarily high costs with no significant increase in protectiveness and could also potentially mobilize the existing DNAPL. Because the selected remedy will result in hazardous substances, pollutants or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a review under Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), will be conducted within five years after initiation of the remedial action to ensure that the remedy selected for the Site is providing protection of human health and the environment.

The following sections discuss how the selected remedy for the Site meets the statutory requirements of CERCLA:

A. Protection of Human Health and the Environment

The selected remedy will provide protection of human health and the environment. With respect to soils, the on-Site caps effectively contain any remaining MGP-related wastes in the soil and periodic maintenance will ensure the integrity of the caps are maintained. Institutional controls required by the selected remedy will prevent current and future human exposure to the soil contamination. With respect to groundwater, the DNAPL is effectively trapped within the fractured bedrock and the dissolved phase plume immediately adjacent to the DNAPL is prevented from expanding by the presence of the Susquehanna River into which the groundwater discharges. EPA selected remedy prevents current and future human exposures via ingestion, inhalation and dermal contact to MGP-related wastes in the groundwater and maintains the

natural flushing and migration of the dissolved phase plume to the Susquehanna River.

Implementation of the selected remedy will not pose any unacceptable short term risks or cross media impacts to the Site, or to the community.

B. Compliance with and Attainment of Applicable or Relevant and Appropriate Requirements (ARARs)

EPA is waiving ARARs, both MCLs and RBCs, for 27 contaminants that were found within and above the DNAPL in the DNAPL Zone, pursuant to CERCLA Section 121(d)(4)(C), because aquifer restoration to drinking water quality is technically impracticable using currently available or new and innovative methods or technologies within a reasonable or foreseeable time frame. No other ARARs have been identified for the selected remedy.

C. Cost-Effectiveness

The selected remedy is cost-effective in providing overall protection in proportion to cost and meets all other requirements of CERCLA. The NCP at 40 C.F.R. § 300.430(f)(1)(ii)(D), requires EPA to evaluate cost-effectiveness by comparing all the alternatives which meet the threshold criteria--protection of human health and the environment and compliance with ARARs--against three additional balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; and short-term effectiveness. EPA has considered these criteria and has determined that the selected remedy provides the best balance for overall effectiveness in proportion to its cost. EPA estimates the net present worth of the selected remedy to be $963,522.

D. Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

None of the remedial alternatives considered would, from a practicability standpoint, provide a permanent remedy for all aspects of contamination at the Site. All alternatives, when considering the entire Site, would rely to some extent upon contaminant containment, the relative immobility of the contaminants, institutional controls and/or the long-term maintenance and monitoring that would necessarily accompany these measures to provide the required levels of protection of human health and the environment. EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized while providing the best balance among the other evaluation criteria.

E. Preference for Treatment as a Principal Element

Treatment, as a principal element of the remedy, was not selected for soils because the

caps prevent dermal contact, ingestion and inhalation of MGP-related wastes. Therefore, EPA's selected remedy is no further action with institutional controls to protect the integrity and protectiveness of the caps.

With respect to groundwater, EPA believes that treatment as a principal element of the selected remedy would very significantly increase the cost of the remedy, would increase the time frame of the remedy, and would increase the complexity of the remedy without increasing the protectiveness of the remedy.

XIV. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Site was released for public comment on June 27, 2007. Comments received during the comment period are addressed in Section III of this ROD. The Proposed Plan identified EPA's preferred alternatives for soil and groundwater. The remedy selected in this ROD involves no changes to the preferred alternatives identified in the Proposed Plan.

RESPONSIVENESS SUMMARY

Responsiveness Summary

This Responsiveness Summary responds to those public comments received by EPA on the Proposed Remedial Alternative Plan (PRAP) for the UGI Columbia Gas Plant Superfund Site (Site) in Lancaster County, Pennsylvania. Some of the public comments EPA received were those recorded by the court reporter during the formal comment portion of the public meeting which was held on July 19, 2007. Additional comments were submitted in writing to EPA before the close of the public comment period. EPA's response to each comment follows:

I. *Comments received during the public meeting*

The following comments are direct quotes taken from transcript of the July 19, 2007 public meeting. Where necessary, EPA has added text, placed in brackets, to provide context.

1. **Comment:** If the borough wanted to build something there, what could they build there? A garage? You couldn't build anything where you had to put a big foundation down, could you?

   EPA Response: Future reuse of Site property may take place so long as any such reuse does not interfere with or impair the integrity and protectiveness of EPA's selected remedy. If a site owner proposes to construct a building with a foundation, any such construction could be performed in coordination with EPA and PADEP to ensure that construction methods do not interfere with or adversely affect the integrity and protectiveness of the remedy and that adequate health and safety measures, environmental monitoring and proper disposal of contaminated soils are implemented.

2. **Comment:** [The Borough] talked maybe about expanding the sewer plant [which is located on the adjacent property currently occupied by the Borough maintenance garage] back toward the highway sheds. Now the way it sounds that's not going to be a possibility either. And as far as changing anything at the highway sheds, is that going to be possible?

   EPA Response: EPA has determined that commercial or industrial uses of the Site do not pose a risk to human health so long as the integrity and protectiveness of EPA's selected remedy are maintained. Therefore, EPA's selected remedy includes institutional controls which prohibit current and future Site property owners from using Site property for residential use or in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial actions performed at the Site. The institutional

controls would also prohibit the installation of new wells and the use of groundwater for drinking water purposes.

If future development plans call for a building with a foundation, construction could be performed in coordination with EPA and PADEP to ensure that the integrity and protectiveness of the remedial actions performed at the Site are maintained and that adequate health and safety measures, environmental monitoring and proper disposal of contaminated soils are implemented.

3. **Comment**: I've heard both we can inhabit that capped area and we cannot inhabit it. Now we can go over there, do what we have to do, we have to leave. And then I also heard that we'd be allowed to spend, say, a shift over there. Which is it?

EPA Response: While no one can inhabit the Site for residential purposes, EPA's selected remedy does not impose any time restrictions on people using or occupying the Site for non-residential purposes. PPL and UGI, as required by EPA, installed caps over two (2) areas at the Site where MGP-related wastes remain. Those caps eliminate the risk associated with exposure to Site soils so long as the Site is not used for residential purposes and the integrity and protectiveness of the caps are maintained.

4. **Comment**: Have there been any, at this point, air samplings that would indicate a future problem of occupying a building on a slab? And are there going to be any tests once the slab is in place to assure that we could, indeed, place a building and have it occupied, whether it's 24/7 or whether it's an eight-hour shift? . . . . So that we have a baseline established of any potential air contaminants that would affect anybody who would be on site.

EPA Response: No vapor intrusion sampling has been performed at the Site. PPL Electric Utilities Corp. (PPL), the current owner of the MGP Facility, in coordination with the Borough, has constructed a building foundation at the MGP Facility which includes a passive venting system to eliminate the potential of vapor intrusion into the proposed building. EPA does not plan on conducting vapor intrusion sampling.

5. **Comment**: I was looking for the application of BPMs [Best management Practices] that have been adopted basically by the Commonwealth for storm water management. My initial concern is, inasmuch as the borough intends to take over that site, is for the safety of anyone that could go on the site. And particularly, I had a concern with basically a storm water management basin where kids could enter in particularly after a storm and think it's a swimming hole, when, in fact, there's some inherent hazards associated with that; not the least of which is drowning. So I had a concern about the engineering methodology that was applied as far as the storm water management control, and more

specifically, the storm water basin that has been considered for construction on the site.

EPA Response: The storm water management system was designed with review and input from Borough, the Commonwealth of Pennsylvania and the Lancaster County Conservation District (LCCD). The design is conservative and utilizes standard engineering practices. Additionally, the design meets the requirements of the regulations governing storm water management. The storm water drainage basin will be surrounded by a fence and the former MGP Facility will also be fenced. The storm water drainage basin is designed to drain after a storm event and not retain a standing volume of water. This design, in combination with fencing, reduces the chances of trespassers entering the basin and drowning.

6. **Comment:** So for future consideration as far as engineering and design, we should look at minimizing the subsurface disturbance, excavations, et cetera, that are associated with building a new waste water treatment facility? Is that a reasonable assumption? (Similar in content to Comment 2, above).

EPA Response: See EPA's Response to Comment 2, above. When construction plans are prepared, EPA, PADEP, PPL and the Borough will discuss proposed property reuse and construction methods impacting soil excavation, testing and proper disposal of potentially hot spots as appropriate.

7. **Comment:** They're not working on [construction] now, so how are you going to get done by end of August? They let weeks go by.

EPA Response: EPA anticipates meeting the construction schedule. The design to place storm water inlets along Front Street had to be modified due to an existing water line. Because the design had to be modified, approval from PennDOT was required. As a result, the removal action was shut down for approximately two weeks. The construction resumed on July 24, 2007.

8. **Comment:** A couple years ago they [conducted a sediment removal on the Susquehanna River]. They had stated they couldn't get it all out, they went so many feet down into the river. Is that going to be checked to see if that would be a cause of future pollution, or what? They dredged it there.

EPA Response: The sediments removal action was performed in 1998. A total of 700 tons of contaminated sediments were removed and shipped offsite for proper disposal. All contaminated sediments were removed at the time of the action. There is no planned future sediment sampling. The coal tar contamination that remains is in the fractured bedrock which is underneath of the Susquehanna River and cannot be removed from an engineering perspective using currently available or new and innovative methods or

technologies within a reasonable or foreseeable time frame.

9. **Comment:** [The storm-water line] runs down into the river from the plant. I was concerned about that because we use that for fishing.

EPA RESPONSE: The stormwater discharge from the treatment plant is outside the scope of EPA's selected remedy.

10. **Comment**: The waivers you asked for, have they been approved?

EPA Response: Yes. EPA has chosen to invoke a TI waiver of the ARARs for 27 contaminants that were found within and above the Dense Non-Aqueous Phase Liquid (DNAPL) in the DNAPL Zone, pursuant to CERCLA Section 121(d)(4)(C), because aquifer restoration to drinking water quality is technically impracticable.

11. **Comment:** At the completion when everything is finished, will there be any buildings on [the MGP Facility]?

EPA Response: At the completion of the removal action, no building will be located on the MGP Facility. There will be two caps, a stormwater management system and a foundation on which a building could be constructed in the future.

12. **Comment:** If you would give an off-the-wall date that maybe everything would be done, when it would be turned over to the borough, months, years?

EPA Response: The removal action is scheduled to be complete in mid-September and EPA anticipates issuing the ROD in late September. PPL and the Borough will arrange the details regarding the sale and transfer of the property at some time thereafter.

13. **Comment:** How often will they test [groundwater]?

EPA Response: Groundwater monitoring will be performed on an annual basis.

14. **Comment:** My problem is with disturbing the area within your DNAPL zone [when the Borough is planning an expansion to the Wastewater treatment plant on the property currently occupied by the Borough's maintenance garage]. (Similar in content to Comments 2 and 6, above).

EPA Response: The DNAPL zone does extend under the property where the Borough's maintenance garage is currently located. As discussed in EPA Responses to Comments 2 and 6, above, EPA has determined that commercial or industrial uses of the Site do not

pose a risk to human health so long as the integrity and protectiveness of EPA's selected remedy is maintained. Moreover, when construction plans are more formalized, EPA, PADEP, PPL and the Borough will discuss proposed property reuse to ensure that construction methods do not interfere with or adversely affect the integrity and protectiveness of the remedy.

II. Written Comments

1. **Comment:** PPL submitted text which more accurately reflects the ownership history at the Site.

   EPA Response: EPA incorporated PPL's text concerning ownership history of the Site into the ROD.

2. **Comment:** In addition to this revised text, PPL suggests that the discussion relating the pushing of tar into the pedestrian tunnel and the subsequent removal of that material by PPL may be better located in Section II, Paragraph D – Environmental Studies and Previous Actions section.

   EPA Response:. EPA did not move the text in the ROD relating to the coal tar in the pedestrian tunnel because it relates to George and Gladys Roach's use of the MGP Facility during their ownership. EPA did, however, add text to fourth paragraph summarizing PPL's removal and proper disposal of the coal tar contamination from the pedestrian tunnel.

Table 4 and Figures

Table 4: Applicable or Relevant and Appropriate Requirements (ARARs)

ARAR or TBC	Citation	Classification	Summary of Requirement	Applicability to Selected Remedy
A. Federal				
1. Safe Drinking Water Act, 42 U.S.C. Section 300f et seq.				
Maximum Contaminant Levels	40 C.F.R. Section 141	Relevant and Appropriate	Enforceable standards for public drinking water supply systems. The NCP requires that MCLs shall be attained by remedial actions for groundwater that is current or potential source of drinking water.	These standards apply to: Benzene, Ethylbenzene, Tetrachloroethene, Toluene, Trichloroethene, 1,2,4-Trimethylbenzene, Xylenes (total), Benzo(a)pyrene, Barium, Cyanide, Lead, and Manganese Note that EPA has chosen to invoke a TI waiver of the MCL ARARs for 27 contaminants that were found within and above the Dense Non-Aqueous Phase Liquid (DNAPL) in the DNAPL Zone, pursuant to CERCLA Section 121(d)(4)(C)

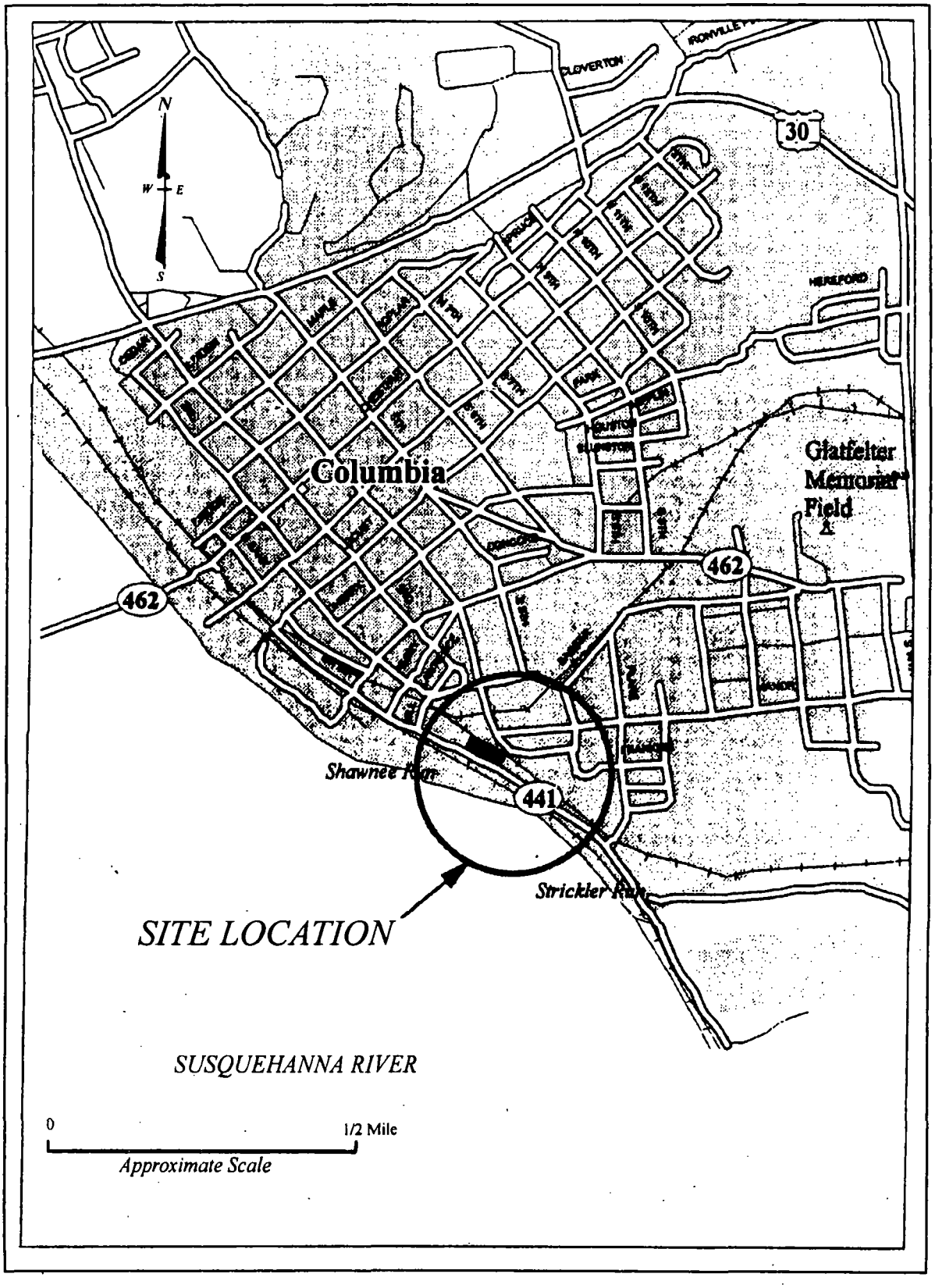

FIGURE 1: Site Location Map, UGI Columbia Gas Plant Superfund Site

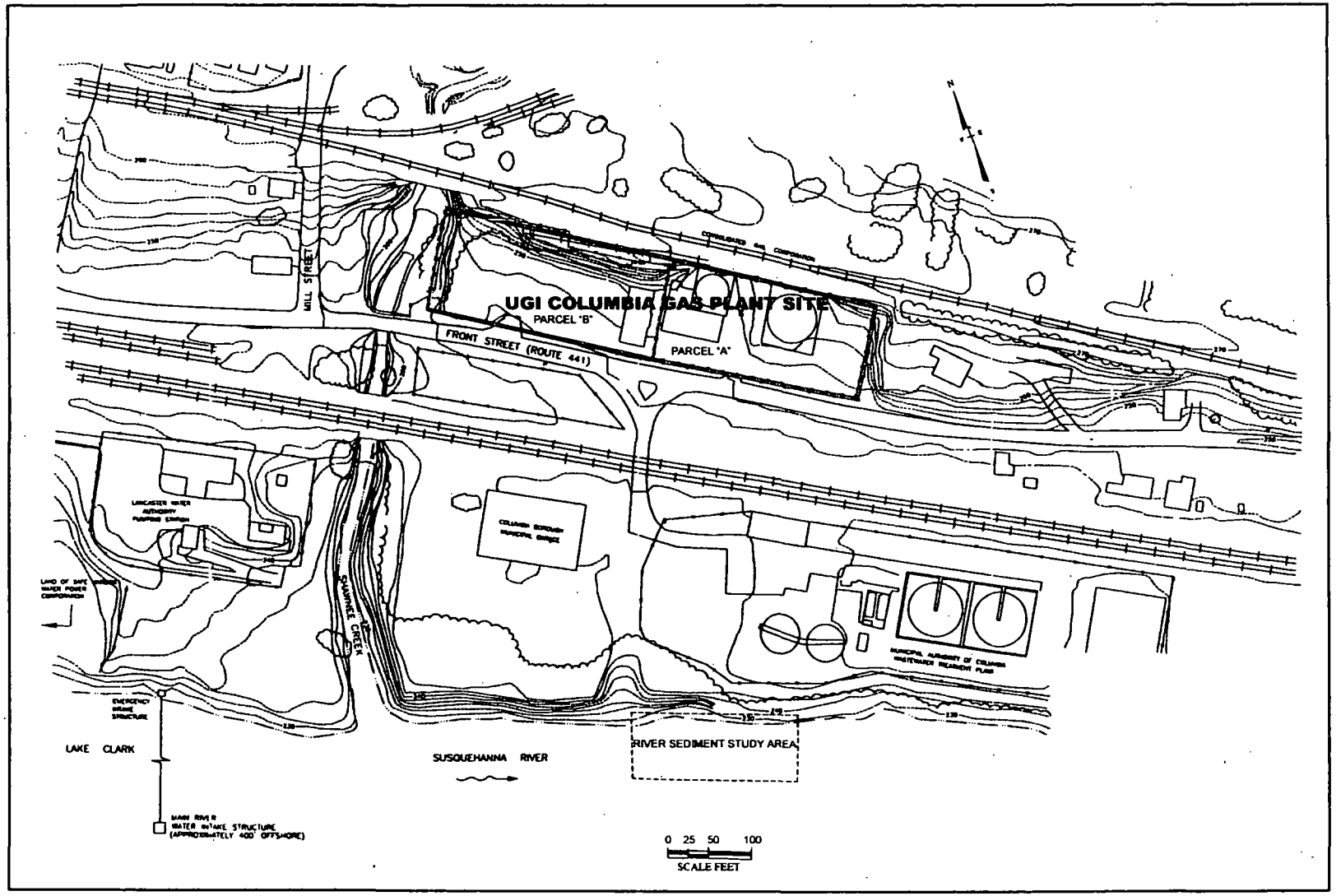

FIGURE 2: UGI Columbia Gas Plant Superfund Site Property Location

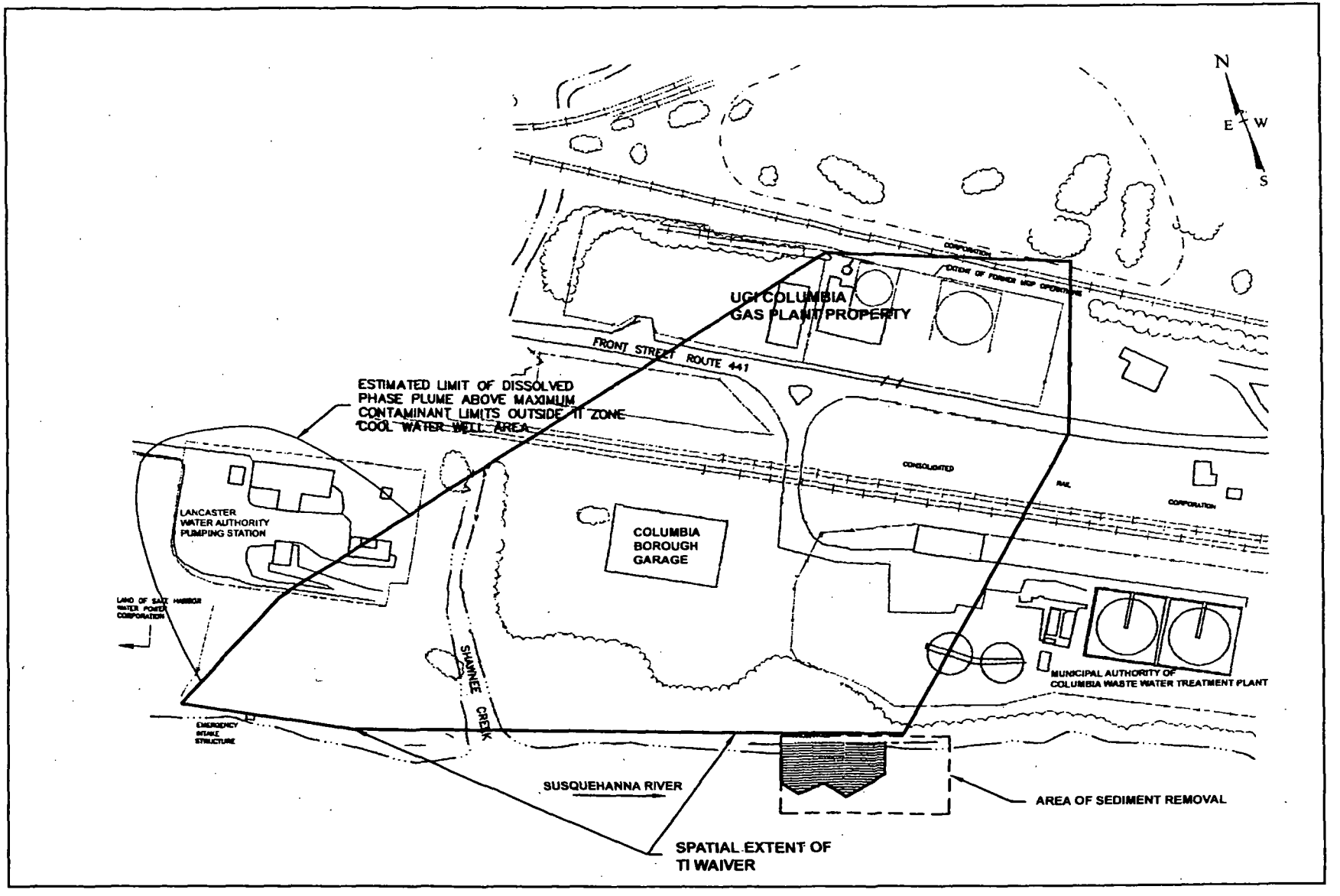

FIGURE 3: UGI Columbia Gas Plant Superfund Site : Spatial Extent of the DNAPL ZONE

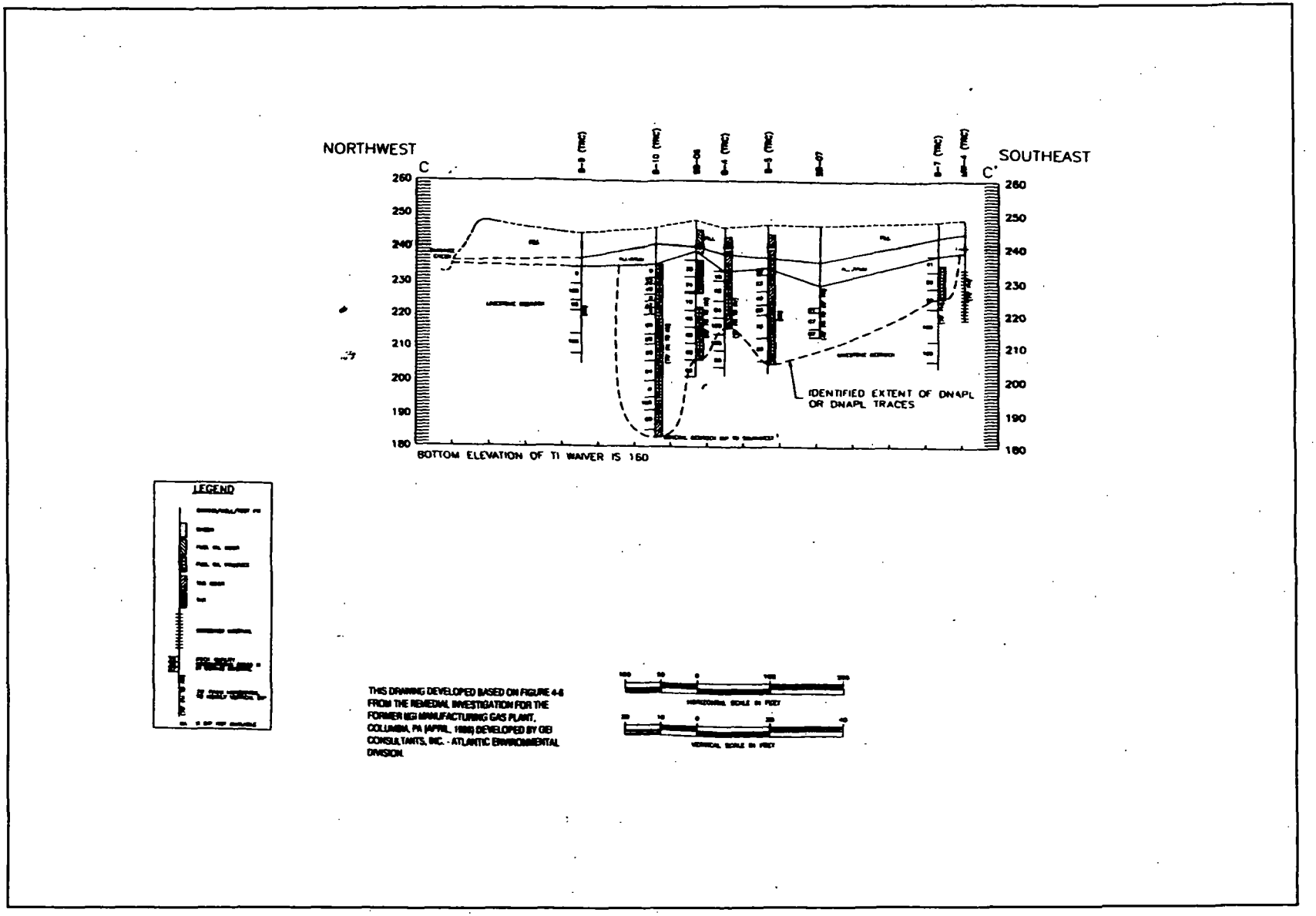

Figure 4: DNAPL Contamination Shown at Depth. A Cross-Section of Site DNAPL ZONE

PADEP Concurrence Letter

Pennsylvania Department of Environmental Protection

909 Elmerton Avenue
Harrisburg, PA 17110-8200

September 13, 2007

Southcentral Regional Office

717-705-4705
FAX - 717-705-4830

Mr. James Burke, Acting Director 3HW00
Hazardous Waste Management Division
USEPA, Region 111
841 Chestnut Street
Philadelphia, PA 19107-4431

Re: Record of Decision
UGI Columbia Superfund Site
Columbia Borough, Lancaster County

Dear Mr. Burke:

The Department of Environmental Protection (DEP) has reviewed the Record of Decision (ROD) for the UGI Columbia Superfund Site, in Columbia Borough, Lancaster County, received September 4, 2007.

The selected remedy for this site consists of the following major components:

- For soils, Alternative S-2, No Further Action and Institutional Controls
    - ° No further remediation of onsite soils is necessary because onsite soils have been capped thereby preventing contact with Manufactured Gas Plant (MGP) - related wastes.
    - ° Institutional controls in the form of deed notices, easements, and restrictive covenants prohibiting current and future site property owners from using site property for residential use, or in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial actions performed at the site.
- For Groundwater, Alternative GW-2, Monitored Natural Gradient Flushing with Institutional Controls for Groundwater
    - ° The natural gradient flushing of dissolved MGP constituents to the Susquehanna River will dilute, disperse, and biodegrade to non-detectable levels.
    - ° In accordance with CERCLA Section 121(d)(4)(C), the invocation of a Technical Impracticability (TI) Waiver of the MCL and RBC Applicable or Relevant and Appropriate Requirements (ARAR) for 27 contaminants that were found within and above the Dense Non-Aqueous Phase Liquid (DNAPL) in the DNAPL Zone, because aquifer restoration to drinking water quality is technically impracticable from an engineering perspective using currently available or new and innovative methods or technologies within a reasonable or foreseeable time frame.

- Long-term groundwater sampling to confirm that contaminants of concern are not present outside the limits of the DNAPL Zone at concentrations exceeding ARARs.

- Institutional controls restricting the installation and use of groundwater wells and prohibiting any use of the site that would interfere with the protectiveness or integrity of the selected remedy.

DEP hereby concurs with EPA's proposed remedy with the following conditions:

- EPA will assure that DEP is provided an opportunity to fully participate in any negotiations with responsible parties.

- DEP will be given the opportunity to review and comment on documents and concur with decisions related to the design and implementation of the remedial action, to assure compliance with ARARs.

- DEP's posture is that its design standards are ARARs pursuant to CERCLA Section 121 and we will reserve the right to enforce those design standards.

- DEP reserves its right and responsibility to take independent enforcement actions pursuant to state law.

- This concurrence with the selected remedial action is not intended to provide any assurances pursuant to CERCLA Section 104(c)(3). Therefore, the Department will not provide the ten percent state matching funds or assume operation and maintenance of the remedy.

Thank you for the opportunity to comment on this EPA ROD. If you have any questions regarding this matter, please call Ms. Elise Juers at 717-705-4852.

Sincerely,

Rachel S. Diamond

Rachel Diamond
Regional Director

Enclosure