UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

July 24, 2020

MEMORANDUM

SUBJECT: Citizen Gas and Electric Company Site - Approval Memorandum to Perform an Engineering Evaluation/Cost Analysis for a Non-Time Critical Removal Action

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Response, Removal and Oil Planning Section

THRU: Adam Ruiz, Chief
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TO: Mary P. Peterson, Director
Superfund and Emergency Management Division

Site ID#: 07HY

I. SUBJECT

A release of hazardous substances has been identified at the former Citizens Gas and Electric Company Site (Site), a former manufactured gas plant (FMGP) located in Council Bluffs, Pottawattamie County, Iowa. The Site has been under investigation since 1999. Viable potentially responsible parties (PRPs) for the Site include Black Hills Corporation, Omaha Public Power District, Iowa Department of Transportation, and T & A Real Estate, L.L.C. (collectively, Respondents).

This memorandum documents the decision to proceed with an Engineering Evaluation/Cost Analysis (EE/CA) for a non-time-critical removal action consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Respondents are currently negotiating with the EPA to enter into an Administrative Settlement Agreement and Order on Consent (ASAOC) to conduct the EE/CA. The EE/CA will evaluate removal alternatives to mitigate releases or threatened releases of FMGP contaminants including benzene, toluene, ethylbenzene and xylenes (BTEX); polynuclear aromatic hydrocarbons (PAHs); naphthalene; phenolic compounds; and associated degradation products identified at the Site.

The decision to proceed with this EE/CA is consistent with existing EPA guidance for completion of EE/CAs pursuant to Section 300.415(b)(4)(i) of the NCP for non-time-critical removal actions. The EE/CA will provide for public involvement and evaluate and recommend the appropriate removal response actions for the Site consistent with criteria included in the NCP and EPA guidance.

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II. BACKGROUND

A. Site Description

The Site is located between 10th and 11th Avenues and 6th and 8th Streets in the city of Council Bluffs, Pottawattamie County, Iowa. Eleventh Avenue is currently a railroad right-of-way. The Site encompasses approximately 4.75 acres. The Site is in the southwest quarter of Section 36, Township 75 North, Range 44 West (U.S. Geological Survey 1994). Geographic coordinates at the approximate center of the Site are 41.251890 ° north latitude and 95.855405° west longitude. The Site is zoned for commercial use, and the surrounding area is mainly commercial and industrial with some residential areas a quarter mile from the Site.

The Site occupies two blocks east (Block 11) and west (Block 12) of South 7th Street, between 10th Avenue and a rail line. Block 12 currently consists of a vacant, grass-covered lot (north portion) and a fenced gravel lot (south portion). No structures are present within this block. Block 11 currently consists of a commercial building owned by T & A Real Estate, L.L.C. (south portion) and a Black Hills Corporation facility (north portion).

The Site operated as a gas manufacturing plant from 1870 to at least 1932. Coal carbonization was the method of gasification utilized at the Site from 1870 to 1882. Oil replaced coal in the gasification process in 1882; however, coal gas equipment was maintained at the plant until at least 1949 (Dames and Moore 1990). By 1930, the city had converted to natural gas, relegating the plant to operational status for emergency use only. In 1952, a propane air plant began operating at the Site (Barr Engineering Company 1995). A majority of structures associated with the FMGP have since been demolished. However, a review of the Iowa Department of Natural Resources (IDNR) Storage Tanks database identified multiple leaking underground storage tank (LUST) sites in the general Site vicinity (IDNR 2015). IDNR identified at least three gas holders, #2 (16.5 feet deep), #3 (4.5 feet deep), and #4 (16.5 feet deep) as source areas with extremely high concentrations of benzene and PAHs. IDNR also identified the need for further assessment to be performed in locating tar separators and underground piping associated with this type of operation in order to characterize its contents.

While the gas plant was operating, byproduct tars and carbon were produced along with the gas. A variety of oil-based feedstocks were used to produce gas, including kerosene, diesel oil and bunker C fuel oil. Contaminants and wastes typically associated with gas production include BTEX, PAHs, oxide waste, tar residues, sludge, wastewater, ash, and phenolic and ammonia compounds. Byproduct tars produced during gasification at the Site were refined into products (i.e., creosote, road tars, and fuels) or disposed of on-site (EPA 1993).

A review of the IDNR database of registered wells indicated about 481 water wells within a 4-mile target distance limit (TDL) of the Site. Of these, 447 are private wells and 34 are public wells. One public well and 11 private wells are within 1 mile of the Site; 30 private wells are within 1 to 2 miles of the Site; 7 public wells and 180 private wells are within 2 to 3 miles of the Site; and 26 public wells and 226 private wells are within 3 to 4 miles of the Site. The city obtains most of its drinking water from the Missouri River, which is two miles east of the Site.

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B. Nature and Extent of Contamination

Investigations conducted since 1969 have identified soil and groundwater contamination at the Site. BTEX and PAHs have been found in the soil and groundwater at the Site. BTEX and PAHs are designated as hazardous substances pursuant to 40 C.F.R. § 302.4.

In 1989, Peoples Natural Gas Company (Peoples) conducted a Phase I Preliminary Investigation at the Site, which included soil borings and groundwater sampling. This investigation included the installation of four groundwater monitoring wells and on-site soil borings. Elevated levels of BTEX and cyanide were found in one of the monitoring wells. BTEX compounds were found in three of the 11 soil samples collected on site. The investigation also found indications that volatile organic compounds had migrated off site.

In 1993, Peoples and the EPA entered into an Administrative Order on Consent, Docket No. VII-93-F-0033, specifying that Peoples complete a Phase II investigation to evaluate the extent of releases from the Site. The Phase II investigation was conducted in October 1995 and confirmed the presence of groundwater contamination within the western site parcel and concluded that elevated concentrations of BTEX and PAHs and VOCs at the Site were related to FMGP coal tar contamination. The Phase II investigation also confirmed the presence of non-aqueous phase liquid (NAPL) at the bottom of one of the Site's monitoring wells attributable to coal tar releases, with PAHs constituting approximately 18% of the material.

In 2003, a Phase II Environmental Site Assessment (ESA) was conducted one block east of the Site. The Phase II ESA concluded that soils had been adversely impacted by coal tar constituents from approximately 64 to 75.5 feet below ground surface (bgs) and identified coal tar contamination in the form of NAPL product at 68 to 73 feet bgs.

In March 2009, IDNR made a formal Request for Federal Action (RFA) for the EPA to take the lead on negotiating a consent order with the PRPs and/or take other appropriate actions to address contamination at the Site. IDNR provided a Site Assessment Memo with the RFA listing data gaps remaining in the assessment of the Site, including contaminant sources, groundwater, and soils.

In 2016, the EPA completed a Removal Assessment, which concluded that the elevated concentrations of BTEX and PAHs were likely related to the FMGP. Soil contamination has been detected in the southern portion of the Site, extending from 2 feet bgs to the soil-groundwater interface (approximately 5 to 14 feet bgs). Laboratory analysis indicated that coal tar constituents have significantly impacted groundwater within the immediate vicinity of the Site. Groundwater contamination was detected in the southern portion of the Site, which extends west across 6th Street and south of 11th Avenue and could possibly be more widespread at depth. The full horizontal and vertical extent of groundwater contamination has not been determined.

The Maximum Contaminant Levels (MCLs) are the maximum permissible levels of a contaminant in water that is delivered to any user of a public water system. MCLs for the hazardous substances found at the Site are:

- Benzene – 5 micrograms per liter (μg/L)
- Ethylbenzene – 700 μg/L
- Toluene – 1,000 μg/L

- Total xylenes – 10,000 µg/L
- PAHs – benzo(a)pyrene – 0.2 µg/L.

MCLs have not been established for the other PAHs found at the Site.

The analytical results from the 2016 Removal Assessment indicate the presence of the following hazardous substances in the subsurface soils at the Site in ranges exceeding their industrial soil Regional Screening Levels (RSLs) and/or Removal Management Levels (RMLs)*:

- Benzene – 0.023 to 44 milligrams per kilogram (mg/kg)
- Ethylbenzene – 0.0053 to 110 mg/kg
- PAHs – benzo(a)anthracene – 0.46 to 32 mg/kg; benzo(a)pyrene – 0.24 to 24 mg/kg; benzo(b)fluoranthrene – 0.3 to 32 mg/kg; dibenz(a,h)anthracene – 0.24 to 4.7 mg/kg; indeno(1,2,3-cd)pyrene – 0.34 to 14 mg/kg; naphthalene – 0.22 to 1,200 mg/kg

*The RSL represents a cancer risk = 1E-06 (one additional cancer case per one million persons exposed over a lifetime) or non-cancer hazard quotient = 0.1 (1 or lower means adverse noncancer effects are unlikely), and the RML represents a cancer risk = 1E-04 (one additional cancer case per ten thousand persons exposed over a lifetime) or non-cancer hazard quotient = 1.0

The analytical results from the 2016 Removal Assessment also indicate the presence of the following hazardous substances in groundwater at the Site in ranges exceeding their residential tap water RSLs and/or RMLs and/or MCLs*:

- Benzene – 8.6 to 11,000 µg/L
- Ethylbenzene – 14 to 2,600 µg/L
- Toluene – 8.4 to 490 µg/L
- Xylenes – m- and/or p-xylene - 16 to 2,200 µg/L; o-xylene - 6.4 to 1,300 µg/L
- PAHs – benzo(a)anthracene – 6.8 µg/L; biphenyl – 7.1 to 54 µg/L; chrysene – 6.1 µg/L; 2-methylnaphthalene – 5.3 to 1,000 µg/L; naphthalene – 24 to 9,200 µg/L

*The RSL represents a cancer risk = 1E-06 or non-cancer hazard quotient = 0.1, and the RML represents a cancer risk = 1E-04 or non-cancer hazard quotient = 1.0

The city obtains most of its drinking water from the Missouri River, located two miles east of the Site. The secondary source of water is the Missouri River Alluvium. Two wells at a depth of 150 feet have a capacity of 4.5 million gallons/day (MGD) each. One public well and 11 private wells are within 1 mile of the Site, 30 private wells are within 1 to 2 miles of the Site, 7 public wells and 180 private wells are within 2 to 3 miles of the Site, and 26 public wells and 226 private wells are within 3 to 4 miles of the Site. Completion of the EE/CA will further evaluate populations potentially at risk.

III. Threat to Human Health, Welfare, or the Environment

When the lead agency makes the determination based on factors listed in 40 C.F.R. § 300.415(b)(2) that there is a threat to public health, welfare, or the environment, the lead agency may take appropriate removal action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release. The factors in 40 C.F.R. § 300.415(b)(2) that justify conducting an EE/CA at the Site are as follows:

300.415(b)(2)(i) - Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants, or contaminants.

Previous environmental assessments have determined that BTEX, naphthalene, and PAHs are present at concentrations that exceed regulatory risk-based standards in surface soils at the Site and have migrated off site.

300.415(b)(2)(ii) Actual or potential contamination of drinking water supplies or sensitive ecosystems.

The city of Council Bluffs obtains most of its drinking water from the Missouri River and the Missouri River alluvium. A review of the IDNR database of registered wells indicated about 481 water wells within a 4-mile TDL of the Site. Of these, 447 are private wells and 34 are public wells. One public well and 11 private wells are within 1 mile of the Site. Laboratory analysis indicated coal tar constituents have significantly impacted groundwater within the immediate vicinity of the Site and may be more widespread at depth.

300.415(b)(2)(iii) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.

Review of the IDNR Storage Tanks database identified multiple LUST sites in the general Site vicinity (IDNR 2015). Gas holders left on site have indicated high concentrations of BTEX and PAHs both in the inside and the outside of the gas holders. Associated underground piping may also contain tars and other FMGP wastes that will require further assessment.

300.415(b)(2)(iv) - High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.

BTEX, naphthalene, and PAHs are present in surface soils across the Site at concentrations that exceed EPA risk-based standards for industrial soils and groundwater, and have migrated beyond the Site, potentially affecting neighboring residential areas. While the Site is currently zoned commercial, it is possible that a change in land use in the area surrounding the Site may occur, as the city's plan for the overall area is "significant industrial activity, public facilities, recreational opportunities, and commercial activity."

300.415(b)(2)(vii) The availability of other appropriate federal or state response mechanisms to respond to the release.

The EPA has explored other mechanisms to respond to this release of hazardous substances and has identified the Respondents listed above. The RFA that IDNR submitted to the EPA stated that no State mechanisms or funding are available to conduct the required removal action.

IV. ADDITIONAL FACTORS DEMONSTRATING APPROPRIATENESS OF REMOVAL ACTION

A. Time Sensitivity of the Response

PAHs are a group of chemicals that generally occur as complex mixtures, not as single compounds. As a result, individual PAHs differ in their degree of toxicity. Benzo(a)pyrene, a PAH that has been found on this Site, serves as an index chemical for deriving relative potency factors to estimate the carcinogenicity of other PAHs. Benzo(a)pyrene is classified as "carcinogenic to humans" based on strong and consistent evidence in animals and humans. Exposure to benzo(a)pyrene is also associated with developmental, reproductive, and immunological effects.

Benzene is classified as "carcinogenic to humans," and is associated with leukemia, especially acute myelogenic leukemia. People living around hazardous waste sites may be exposed to levels of benzene that are higher than background levels of benzene in the air. When exposed at high levels, benzene may cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Benzene exposure may also be associated with reproductive and developmental effects, based on animal studies.

Toluene is a colorless, flammable liquid. Breathing large amounts of toluene for short periods of time adversely affects the human nervous system, kidneys, liver, and heart. Some studies have shown that repeat exposure to large amounts of toluene during pregnancy can adversely affect a developing fetus. Toluene can contribute to the formation of photochemical smog when it reacts with other volatile organic carbon substances in the air.

Ethylbenzene occurs naturally in coal tar and petroleum. People living near hazardous waste sites may be exposed to elevated levels of ethylbenzene in the air, water, and soil. Exposure to high levels can cause dizziness and decreased mobility. At lower exposure levels, people may experience eye and throat irritation.

Xylene is a colorless, flammable liquid that is sometimes released into water and soil as a result of use, storage, and transport of petroleum products. Short-term exposure at high levels can cause irritation of the skin, eyes, nose, and throat. Short-term and long-term exposure to high concentrations of xylene can cause adverse effects to the nervous system. Exposure of high levels of xylene to pregnant women may cause harmful effects to the fetus.

A non-time-critical removal action is recommended to implement the preferred removal action alternative determined in the EE/CA. The selected removal action alternative will address the imminent and substantial endangerment to public health, or welfare, or the environment. The EPA will select the preferred removal action alternative from the EE/CA, after public comment and technical review, and document the preferred removal action alternative through an Action Memorandum upon approval of the EE/CA.

B. Comprehensiveness of the Proposed Action

The removal action alternative selected in the EE/CA must address the BTEX, naphthalene and PAH contamination in industrial soils. The EE/CA will also evaluate whether potential future remedial actions may be appropriate after implementation of the removal action alternative(s), and if so, will strive to be consistent with future longer-term remedial actions.

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C. Likely Cost of the Action

An ASAOC for Respondents' development of an EE/CA is being negotiated. Since the EE/CA will be funded by the Respondents, the EPA's costs will generally be related to negotiation of legal agreements, review of submitted documents, and project oversight, including field oversight if needed. The EPA's costs related to the EE/CA should be minimal and will be recovered from the Respondents as "future response costs" under the ASAOC.

V. ENDANGEREMENT DETERMINATION

Actual or threatened releases of hazardous substances at the Site may present an imminent and substantial endangerment to public health, or welfare, or the environment. A non-time-critical removal action is therefore necessary and appropriate to abate, prevent, minimize, stabilize, mitigate, or eliminate such threats.

VI. SCOPE OF THE EE/CA

The purpose of the EE/CA will be to evaluate the removal action alternatives available for reducing or eliminating the threats posed by BTEX, naphthalene, PAHs, and degradation products.

Pursuant to the EPA's Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA (EPA/540-R-93-057), which details the outline of an EE/CA, alternatives will be evaluated based upon effectiveness, implementability, cost, and compliance with applicable or relevant and appropriate requirements (ARARs). In reviewing Respondents' development of the range of alternatives to be evaluated in the EE/CA, the EPA will consider Section 300.415 of the NCP as well as other relevant guidance. The "no action" alternative should be considered in addition to other removal action alternatives. The EE/CA should also consider post-removal site control and appropriate consistency with longer-term remedial actions. The following are various removal actions which may be appropriate and will be evaluated individually or in combination in the EE/CA for this Site:

- Prevention or abatement of actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants, or contaminants;
- Prevention or abatement of actual or potential contamination of drinking water supplies or sensitive ecosystems;
- Stabilization or elimination of hazardous substances in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release;
- Treatment or elimination of high levels of hazardous substances, pollutants, or contaminants in soils largely at or near the surface that may migrate;
- Minimization or elimination of the effects of weather conditions that may cause hazardous substances, pollutants, or contaminants to migrate or to be released;
- Elimination of threat of fire or explosion;
- Determination of availability of other appropriate federal or state response mechanisms to respond to the release; and
- Mitigation or abatement of other situations or factors that may pose threats to the public or the environment.

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VII. ENFORCEMENT STRATEGY

The Respondents and the EPA are currently negotiating the terms of an ASAOC whereby Respondents will develop an EE/CA. Upon completion of the EE/CA and 30-day availability for public comment, the EPA will select the most appropriate removal alternative, which will then be documented through an Action Memorandum. The EPA will be the lead agency for overseeing the EE/CA and implementation of the preferred removal action alternative. It is anticipated that negotiations for an ASAOC between the EPA and Respondents to implement the preferred non-time-critical removal action alternative will occur upon the EPA's approval of the Action Memorandum documenting the preferred removal action alternative. The non-time-critical removal action for the Site will follow the approval of the EE/CA and selection of the removal alternative(s).

VIII. ESTIMATED COSTS

Because the EE/CA will be developed by the Respondents pursuant to an ASAOC, the EPA's costs will be related to project management and oversight, such as technical review of EE/CA documents, legal negotiations, technical meetings/presentations, and field oversight if additional field work is conducted. The EPA's oversight and project management costs related to the EE/CA should be minimal, and those costs will be recoverable from the Respondents.

IX. OTHER CONSIDERATIONS

The proposed non-time-critical removal action is expected to be consistent with longer-term remedial actions at the Site if longer-term remedial actions are appropriate and may possibly supplant any remedial action at the Site.

IDNR actively participates in overseeing cleanup activities throughout the state of Iowa and supports this action at this Site. The EPA will continue to actively collaborate with IDNR throughout the non-time-critical removal action process at the Site.

X. RECOMMENDATION

Site investigations have determined that there has been a release or threatened release of hazardous substances to the environment at the Site. Consistent with Section 104(b) of CERCLA, further investigation and evaluation of potential removal action alternatives through completion of an EE/CA is necessary at the Site to implement a non-time critical removal action not inconsistent with the NCP.

Approved:

MARY PETERSON Digitally signed by MARY PETERSON Date: 2020.07.24 11:52:32 -05'00'

Mary P. Peterson, Director
Superfund and Emergency Management Division

Attachments: Attachment A- Figures

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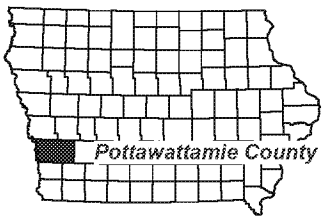

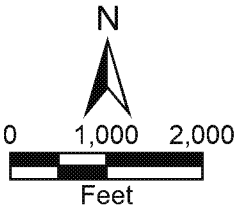

Source: USGS Council Bluffs North, Iowa 7.5 Minute Topo Quad,1994;
USGS Council Bluffs South, Iowa 7.5 Minute Topo Quad, 1994

Citizen's Gas and Electric Company Site
Council Bluffs, Iowa

Figure 1
Site Location Map

TETRA TECH

Date: 10/23/2015 Drawn By: Clayton Hayes Project No: X9025.16.0112.000

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Legend

- DPT soil and groundwater sample location
- Former LUST location
- Monitoring well groundwater sample location
- Approximate site boundary
- Former gasometer location
- Former gasometer/tar pit location
- Site feature boundary
- DPT Direct push technology
- LUST Leaking underground storage tank

N

0 75 150

Feet

Source: ESRI, ArcGIS Online, Bing Maps Imagery, 2014

Citizen's Gas and Electric Company Site
Council Bluffs, Iowa

Figure 2

Sample Location Map

TETRA TECH

Date: 2/1/2016 Drawn By: Nick Wiederholt Project No: X9025.16.0112.000

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