NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Office of the Director
625 Broadway, 12th Floor, Albany, New York 12233-7011
P: (518) 402-9706 | F: (518) 402-9020
www.dec.ny.gov

Transmitted Via email

December 8, 2021

Pat Evangelista
Director
Superfund/Emergency Management
USEPA, Region 2
290 Broadway
New York, NY 10007
evangelista.pat@epa.gov

RE: USEPA/NYSDEC Joint Remedy Evaluation
Former Citizens Gas Works Manufactured Gas Plant (MGP) Site
Brooklyn, Kings County, New York
Site ID # C224012

Dear Mr. Evangelista,

In November of 2020 the Gowanus Community Action Group (CAG) submitted a resolution requesting that the EPA review and comment on the DEC proposed changes to the remediation plan for the Citizens Gas Works (Public Place) former Manufactured Gas Plant site (Citizens MGP). In March of this year, the EPA and the DEC responded to the CAG via a joint letter, dated March 22, 2021, with a commitment to work together to ensure that the remediation will be protective of public health and the environment, and that the basis for the remedy is clearly communicated to the public. This process has been underway since that date and included DEC's provision of written materials supporting the remedy selected for the Citizens site and four technical meetings (August 27th, October 14th, October 18th and November 12th), which were attended by EPA technical staff and management, EPA's technical consulting team, DEC technical staff and management, National Grid (as responsible party for implementing the approved Citizens remedial design) and their technical consulting team.

During these meetings, EPA presented certain concerns resulting from their more recent review of the Citizens remedy. As these discussions have progressed, EPA's concerns continue to evolve beyond those originally raised. In order to bring our collaboration to successful conclusion, we believe that it is imperative to gain formal consensus from EPA regarding your concerns to ensure they are sufficiently addressed, with the appropriate focus on protection of public health and the environment, such that we can move forward in jointly responding to the CAG in a timely manner.

To that end, following is a comprehensive list of EPA's concerns as the DEC currently understands them:

1. Residual impacts in shallow soil may serve as on-going sources of contamination to shallow groundwater which could migrate to off-site areas.

2. The potential for post-remediation groundwater mounding may result in impacted shallow groundwater expressing itself at ground surface or entering future buildings to be constructed at the site.

3. The potential for post-remediation groundwater mounding or residual impacts in shallow soil and groundwater may increase the potential for soil vapor intrusion concerns for future buildings constructed on-site.

4. The potential for post-remediation groundwater mounding, combined with off-site migration of impacted shallow groundwater, may result in impacted shallow groundwater causing soil vapor intrusion concerns for off-site buildings.

5. Potential changes in post-remediation intermediate/deep groundwater flow directions and/or gradients, combined with the off-Site migration of impacted intermediate/deep groundwater, may increase specific discharge/chemical flux to areas of the Gowanus Canal where ISS is not being performed, potentially reducing the anticipated design life of the sediment cap in those areas.

6. The potential the public may come in contact with contaminated soil.

7. The potential that residual impacts in shallow soil, in the form of staining, sheens, NAPL blebs/globs, and /or NAPL coatings may increase for soil vapor intrusion into future buildings to be constructed at the Site.

8. The potential that remaining NAPL-impacted soil, combined with post-remediation groundwater mounding, may result in off-Site migration of remaining NAPL and/or contaminated groundwater through the sealed joints of the new site bulkhead barrier wall to Gowanus Canal.

9. The potential that remaining NAPL-impacted soil, combined with post-remediation groundwater mounding, may result in off-site migration of remaining NAPL and/or contaminated groundwater through the sealed joints of Site bulkhead barrier wall below the Gowanus Canal ISS and sediment cap.

10. The potential that remaining NAPL-impacted soil, combined with post-remediation groundwater mounding, may result in off-Site migration of remaining NAPL and contaminated groundwater below the Site sealed bulkhead barrier wall and up into the Gowanus Canal.

During the technical meetings, the Citizens' team presented responses to each of the above concerns, including how the remedy has rendered the site protective of public health and the environment. Attached Table A-1 summarizes how DEC believes the concerns have been addressed and all exposure pathways mitigated, either as part of the on-going remedial actions or, once the remedy is complete, actions will continue under the oversight of the DEC as any work done on the site whether by National Grid, New York City, future developers, or others will be legally bound to comply with the Site Management Plan (or an Interim SMP). More specifically, the attached table includes EPA's concerns, the potential exposure routes, the remedial action objectives, the remedial actions and supporting information which demonstrate that the potential for future receptors to be exposed has been mitigated.

Based on the information contained herein, the multiple technical meetings, materials provided to EPA from the Citizens technical team, and the historical project-related documents, such as the 2007 Record of Decision, the 2017 100% remedial design (approved January 2018) and the 2020 Explanation of Significant Differences, DEC and NYSDOH believe that the current Citizens remedy appropriately addresses each concern and that the remedy is protective of public health and the environment. Additionally, as noted above and consistent with DEC's actions on all remedial sites, DEC will continue to review the protectiveness and effectiveness of the remedy post-development, to ensure compliance with long-term Site Management Plan, which includes the associated periodic review process. If necessary, DEC will require additional appropriate measures/corrective actions be implemented to maintain the long-term effectiveness of the remedy.

In conclusion, the DEC requests the following in a written response from EPA:

- Indication that the concerns outlined in this letter constitute the entirety of EPA's concerns pertaining to the Citizens MGP site remediation;

- Indication which concerns have been sufficiently addressed;

- Indication which concerns have not been sufficiently addressed and why (including specific basis);

- If EPA disagrees with anything in this letter, please clearly articulate the additional concern/items of disagreement with a specific detailed basis for that concern such that the Citizens team can provide an appropriate response.

- If EPA does not agree that the remedy is protective of human health, please articulate the concerns or items of disagreement with a specific detailed basis for that concern such that the Citizens team can provide an appropriate response. If EPA does agree that the remedy is protective of human health, please state that.

- If EPA does not agree that the remedy is protective of the environment, please articulate the concerns or items of disagreement with a specific detailed basis for that concern such that the Citizens team can provide an appropriate response. If EPA does agree that the remedy is protective of the environment, please state that.

The DEC remains committed to ensuring that the Citizens MGP site remedy is protective of human and the environment and looks forward to continued cooperation with EPA on this matter such that we may jointly respond to the CAG in a timely manner.

Sincerely,

Susan Edwards

Susan Edwards, P.E.
Acting Director
Division of Environmental Remediation

Ec: D. Garbarini, USEPA, (Garbarini.doug@epa.gov)
P. Van Rossem, National Grid (Patrick.vanrossem@nationalgrid.com)
J. Brown
D. Eaton
J. Miller
S. McLaughlin
S. Berninger
DecDocs C224012

Table A-1
Summary of Potential Concerns Raised by USEPA

Former Citizens Gas Works Manufactured Gas Plant Site
Borough of Brooklyn, Kings County, New York
NYSDEC Site Nos. 224012, C224012, and C224012B

Potential Concern Raised by USEPA	Related Environmental Media	Area	Zone[1]	Potential Future Receptor(s)	Potential Future Exposure Route(s)	Related Remedial Action Objective from Remedial Alternative Analysis[2]	Applicable Remedial Element, Engineering Control, or Institutional Control Included in Existing Site Remedy	NYSDEC Comments	Complete Exposure Pathway for Potential Future Receptor(s)?
1. Residual impacts in shallow soil, in the form of staining, sheens, NAPL blebs/globs, and/or NAPL coatings, may serve as on-going sources of contamination to shallow groundwater, which may be encountered by the public.	Groundwater	On-Site	Shallow	• Future Utility/Construction Workers • Future Residents, Employees, Students, or Recreational Users	• Dermal Contact • Inhalation of Volatilized Vapors • Ingestion/Incidental Ingestion	• Prevent, to the extent practicable, contact with, or ingestion of contaminated groundwater associated with the Site. • Remove, to the extent practicable, the source of groundwater contamination.	• Source Area Excavation • Hydraulic Relief System • Environmental Easement • Site Management Plan	• Remedial excavation activities on Parcels I and III of the Site resulted in removal of known shallow/near-surface source areas, which will help reduce dissolved-phase concentrations of Site-related constituents of concern in shallow groundwater over time. • Citizens hydraulic relief system mitigates groundwater mounding at the Site, thereby reducing potential for residual impacts in shallow soil to partition to shallow groundwater. • Environmental easement will prohibit the use of groundwater underlying the Site without necessary water quality treatment, as determined by NYSDOH or the New York City Department of Health and Mental Hygiene, to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from NYSDEC. • Property owners and developers are signatories with NYSDEC to Brownfield Site Cleanup Agreements and are legally required to comply with provisions of Site Management Plan. • Future ground-intrusive activities at the Site must be conducted in accordance with Site Management Plan to ensure that proper health and safety protocols are employed and remaining MGP-impacted material (if encountered) is handled/managed in accordance with applicable laws and regulations. • Future development plans will be reviewed by NYSDEC to ensure that such plans integrate harmoniously with Site remedy and continue to be protective of public health and the environment. • Engineering controls, including the hydraulic relief system, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness. • Groundwater monitoring and other environmental or public health monitoring will be performed as defined in Site Management Plan.	No
2. Post-remediation groundwater mounding may result in impacted shallow groundwater expressing itself at ground surface or entering future buildings to be constructed at the Site.	Groundwater	On-Site	Shallow	• Future Residents, Employees, Students, or Recreational Users	• Dermal Contact • Incidental Ingestion	• Prevent, to the extent practicable, contact with, or ingestion of contaminated groundwater associated with the Site.	• Hydraulic Relief System • Environmental Easement • Site Management Plan	• Expected floor elevations of future buildings on Parcel I of the Site will be above 100-year flood elevation (anticipated ground floor elevation of future school is +17.0 feet NAVD88). • Citizens hydraulic relief system mitigates groundwater mounding at the Site. • Simulated post-remediation groundwater elevations are approximately 9 feet lower than anticipated floor elevations of occupied spaces in future buildings. • Property owners and developers are signatories with NYSDEC to Brownfield Site Cleanup Agreements and are legally required to comply with provisions of Site Management Plan. • Future ground-intrusive activities at the Site must be conducted in accordance with Site Management Plan to ensure that proper health and safety protocols are employed and remaining MGP-impacted material (if encountered) is handled/managed in accordance with applicable laws and regulations. • Future development plans will be reviewed by NYSDEC to ensure that such plans integrate harmoniously with Site remedy and continue to be protective of public health and the environment. • Engineering controls, including the hydraulic relief system, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness. • Groundwater monitoring and other environmental or public health monitoring will be performed as defined in Site Management Plan.	No
3. Post-remediation groundwater mounding, combined with residual impacts in shallow soil and groundwater, may increase potential for soil vapor intrusion into future buildings to be constructed at the Site.	Groundwater	On-Site	Shallow	• Future Residents, Employees, or Students	• Inhalation of Volatilized Vapors	• Prevent, to the extent practicable, inhalation of contaminants volatilizing from soil or groundwater into closed structures.	• Vapor Mitigation Systems • Source Area Excavation • Hydraulic Relief System • Environmental Easement • Site Management Plan	• NYSDOH has conducted extensive studies across New York State and determined that soil vapor intrusion is not typically a concern at MGP sites. • Developer has agreed to proactively integrate vapor mitigation systems into future building construction on Parcel I of the Site. • Remedial excavation activities on Parcels I and III of the Site resulted in removal of known shallow/near-surface source areas, further reducing the potential risk of soil vapor intrusion into future buildings to be constructed at the Site. • Citizens hydraulic relief system mitigates groundwater mounding at the Site. • Property owners and developers are signatories with NYSDEC to Brownfield Site Cleanup Agreements and are legally required to comply with provisions of Site Management Plan. • Future development plans will be reviewed by NYSDEC to ensure that such plans integrate harmoniously with Site remedy and continue to be protective of public health and the environment. • Engineering controls, including the vapor mitigation systems and hydraulic relief system, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness. • Groundwater monitoring and other environmental or public health monitoring will be performed as defined in Site Management Plan.	No
4. Post-remediation groundwater mounding, combined with the off-Site migration of impacted shallow groundwater, may increase potential for soil vapor intrusion into off-Site buildings.	Groundwater	Off-Site	Shallow	• Future Off-Site Residents or Employees	• Inhalation of Volatilized Vapors	• Prevent, to the extent practicable, the migration of contaminated groundwater from the Site. • Prevent, to the extent practicable, inhalation of contaminants volatilizing from soil or groundwater into closed structures.	• Source Area Excavation • Hydraulic Relief System • Environmental Easement • Site Management Plan	• NYSDOH has conducted extensive studies across New York State and determined that soil vapor intrusion is not typically a concern at MGP sites. • Remedial excavation activities on Parcels I and III of the Site resulted in removal of known shallow/near-surface source areas, which will help reduce dissolved-phase concentrations of Site-related constituents of concern in shallow groundwater over time and further reduce the potential risk of soil vapor intrusion into off-Site buildings. • Citizens hydraulic relief system mitigates groundwater mounding at the Site, thereby reducing potential for residual impacts in shallow soil to partition to shallow groundwater. • Pre-remediation horizontal extent of impacted shallow groundwater is fairly localized to the Site and adjacent rights-of-way. Groundwater models predict minor changes to horizontal shallow groundwater flow directions and gradients under post-remediation conditions (post-remediation extent of impacted shallow groundwater anticipated to be similar to pre-remediation extent). • Shallow groundwater is generally located 20 feet or more below ground surface in off-Site areas west and northwest of Smith Street. • Engineering controls, including the hydraulic relief system, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness. • Groundwater monitoring and other environmental or public health monitoring will be performed as defined in Site Management Plan.	No

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Summary of Potential Concerns Raised by USEPA

Former Citizens Gas Works Manufactured Gas Plant Site
Borough of Brooklyn, Kings County, New York
NYSDEC Site Nos. 224012, C224012, and C224012B

Potential Concern Raised by USEPA	Related Environmental Media	Area	Zone[1]	Potential Future Receptor(s)	Potential Future Exposure Route(s)	Related Remedial Action Objective from Remedial Alternative Analysis[2]	Applicable Remedial Element, Engineering Control, or Institutional Control Included in Existing Site Remedy	NYSDEC Comments	Complete Exposure Pathway for Potential Future Receptor(s)?
5. Potential changes in post-remediation intermediate/deep groundwater flow directions and/or gradients, combined with the off-Site migration of impacted intermediate/deep groundwater, may increase specific discharge/chemical flux to areas of the Gowanus Canal where ISS is not being performed, potentially reducing anticipated design life of sediment cap in those areas.	Groundwater	Gowanus Canal	Intermediate/Deep	• Future Recreational Users • Future Ecological Receptors	• Dermal Contact • Incidental Ingestion • Respiration	• Prevent, to the extent practicable, the migration of contaminated groundwater from the Site. • Remove, to the extent practicable, the source of groundwater contamination.	• Sealed Bulkhead Barrier Wall • NAPL Recovery Wells • Environmental Easement • Site Management Plan • Gowanus Canal ISS and Sediment Cap	• Pre-remediation dissolved-phase concentrations of Site-related constituents of concern in intermediate/deep groundwater are generally consistent with or less than sediment porewater concentrations used in design of RTA2 cap treatment layers near Site. • With exception of area above existing gas transmission tunnel, entire stretch of Gowanus Canal adjacent to the Site and extending south of 9th Street bridge will be subject to ISS, which will mitigate the potential upwelling of intermediate/deep groundwater into Gowanus Canal (vertical gradient of intermediate groundwater below Gowanus Canal reduced by more than 50% under post-remediation conditions). • Anticipated post-remediation intermediate/deep groundwater flow direction at the Site is generally parallel to Gowanus Canal (towards southwest). • Continued removal of recoverable NAPL from intermediate/deep soils (via recovery wells) will help reduce dissolved-phase concentrations of Site-related constituents of concern in intermediate/deep groundwater over time. • Engineering controls, including the sealed bulkhead barrier wall and NAPL recovery wells, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness.	No
6. Public may come into contact with residual impacts in shallow soil.	Soil	On-Site	Shallow	• Future Utility/Construction Workers • Future Residents, Employees, Students, or Recreational Users	• Dermal Contact • Incidental Ingestion	• Prevent, to the extent practicable, ingestion/direct contact with contaminated soil.	• Soil Cover System • Source Area Excavation • Environmental Easement • Site Management Plan	• Cover system will consist of pavement, concrete, paved surfaces, parking areas, sidewalks, building foundations/slabs, or a minimum 2-foot thick vegetated clean soil cover in greenspace areas. • Remedial excavation activities on Parcels I and III of the Site resulted in removal of known shallow/near-surface source areas, further reducing potential contact with residual impacts in shallow soil. • Property owners and developers are signatories with NYSDEC to Brownfield Site Cleanup Agreements and are legally required to comply with provisions of Site Management Plan. • Future ground-intrusive activities at the Site must be conducted in accordance with Site Management Plan to ensure that proper health and safety protocols are employed and remaining MGP-impacted material (if encountered) is handled/managed in accordance with applicable laws and regulations. • Future development plans will be reviewed by NYSDEC to ensure that such plans integrate harmoniously with Site remedy and continue to be protective of public health and the environment. • Engineering controls, including the soil cover system, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness. • Groundwater monitoring and other environmental or public health monitoring will be performed as defined in Site Management Plan.	No
7. Residual impacts in shallow soil, in the form of staining, sheens, NAPL blebs/globs, and/or NAPL coatings, may increase potential for soil vapor intrusion into future buildings to be constructed at the Site.	Soil	On-Site	Shallow	• Future Residents, Employees, or Students	• Inhalation of Volatilized Vapors	• Prevent, to the extent practicable, inhalation of contaminants volatilizing from soil or groundwater into closed structures.	• Vapor Mitigation Systems • Source Area Excavation • Environmental Easement • Site Management Plan	• NYSDOH has conducted extensive studies across New York State and determined that soil vapor intrusion is not typically a concern at MGP sites. • Developer has agreed to proactively integrate vapor mitigation systems into future building construction on Parcel I of the Site. • Remedial excavation activities on Parcels I and III of the Site resulted in removal of known shallow/near-surface source areas, further reducing the potential volatilization of Site-related constituents of concern from residual impacts in shallow soil. • Property owners and developers are signatories with NYSDEC to Brownfield Site Cleanup Agreements and are legally required to comply with provisions of Site Management Plan. • Future development plans will be reviewed by NYSDEC to ensure that such plans integrate harmoniously with Site remedy and continue to be protective of public health and the environment. • Engineering controls, including the vapor mitigation systems, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness. • Groundwater monitoring and other environmental or public health monitoring will be performed as defined in Site Management Plan.	No
8. Remaining DNAPL in soil, combined with post-remediation groundwater mounding, may result in off-Site migration of remaining DNAPL through joints of sealed bulkhead barrier wall into Gowanus Canal.	Soil	Gowanus Canal	Shallow	• Future Recreational Users • Future Ecological Receptors	• Dermal Contact • Incidental Ingestion • Respiration	• Prevent, to the extent practicable, ingestion/direct contact with contaminated soil. • Recover, to the extent practicable, DNAPL at the Site.	• Source Area Excavation • Sealed Bulkhead Barrier Wall • Hydraulic Relief System • Environmental Easement • Site Management Plan	• Remedial excavation activities on Parcels I and III of the Site resulted in removal of known shallow/near-surface source areas in proximity to bulkhead barrier wall. • DNAPL migration is self limiting due to termination of operations more than 50 years ago (no on-going contribution to DNAPL mass), removal of source areas, and limited remaining finite mass of DNAPL. • Steel piles used in bulkhead barrier wall system include protective coatings (full length of land and water sides of each pile) and sacrificial steel thickness to mitigate potential corrosion (limited/low potential for corrosion to occur below mudline). • Interlocks of steel piles used in bulkhead barrier wall are either fully welded (for entire length of interlock) or sealed with hydrophilic waterstop joint sealant (Adeka Ultraseal P-201), which was tested for compatibility with DNAPL at the Site. • Hydraulic relief system includes water quality/treatment units (vortex-type hydrodynamic separators) that were required by USEPA to remove sheens/oils, silt, and debris from shallow groundwater prior to discharge. • Engineering controls, including the sealed bulkhead barrier wall and hydraulic relief system, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness. • Groundwater monitoring and other environmental or public health monitoring will be performed as defined in Site Management Plan.	No

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9. Remaining DNAPL in soil, combined with changes in post-remediation intermediate/deep groundwater flow directions and/or gradients, may result in off-Site migration of remaining DNAPL through joints of sealed bulkhead barrier wall and then potentially upwards through ISS/sediment cap into Gowanus Canal.	Soil	Gowanus Canal	Intermediate	• Future Recreational Users • Future Ecological Receptors	• Dermal Contact • Incidental Ingestion • Respiration	• Prevent, to the extent practicable, ingestion/direct contact with contaminated soil. • Recover, to the extent practicable, DNAPL at the Site.	• Source Area Excavation • Sealed Bulkhead Barrier Wall • NAPL Recovery Wells • Environmental Easement • Site Management Plan • Gowanus Canal ISS and Sediment Cap	• Remedial excavation activities on Parcels I and III of the Site resulted in removal of known shallow/near-surface source areas in proximity to bulkhead barrier wall. • DNAPL migration is self limiting due to termination of operations more than 50 years ago (no on-going contribution to DNAPL mass), removal of source areas, and limited remaining finite mass of DNAPL. • Steel piles used in bulkhead barrier wall system include protective coatings (full length of land and water sides of each pile) and sacrificial steel thickness to mitigate potential corrosion (limited/low potential for corrosion to occur below mudline). • Interlocks of steel piles used in bulkhead barrier wall are either fully welded (for entire length of interlock) or sealed with hydrophilic waterstop joint sealant (Adeka Ultraseal P-201), which was tested for compatibility with DNAPL at the Site. • Continued removal of recoverable DNAPL from intermediate/deep soils (via recovery wells along bulkhead barrier wall) will reduce quantity of accumulated DNAPL in subsurface (where present) over time. • Citizens groundwater model predicted post-remediation upward gradient between intermediate model layers 6 and 7 of up to 0.00881 foot/foot below Gowanus Canal, which is less than estimated upward gradient required to mobilize DNAPL (0.11 to 0.29 foot/foot). • Geologic heterogeneity of intermediate soils (below ISS layer in Gowanus Canal and extending to approximately elevation -90.0 feet NAVD88) further reduces potential for upward DNAPL migration. If DNAPL were to migrate upwards through intermediate soils, it would dissipate itself to immobile residual within short distances. • ISS layer in Gowanus Canal will have high capillary entry pressure, which will further prevent potential upward DNAPL migration through ISS layer/sediment cap into Gowanus Canal. • Engineering controls, including the sealed bulkhead barrier wall and NAPL recovery wells, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness.	No
10. Remaining DNAPL in soil, combined with changes in post-remediation intermediate/deep groundwater flow directions and/or gradients, may result in off-Site migration of remaining DNAPL below sealed bulkhead barrier wall and then potentially upwards through ISS/sediment cap into Gowanus Canal.	Soil	Gowanus Canal	Intermediate/Deep	• Future Recreational Users • Future Ecological Receptors	• Dermal Contact • Incidental Ingestion • Respiration	• Prevent, to the extent practicable, ingestion/direct contact with contaminated soil. • Recover, to the extent practicable, DNAPL at the Site.	• Source Area Excavation • Sealed Bulkhead Barrier Wall • NAPL Recovery Wells • Environmental Easement • Site Management Plan • Gowanus Canal ISS and Sediment Cap	• Remedial excavation activities on Parcels I and III of the Site resulted in removal of known shallow/near-surface source areas in proximity to bulkhead barrier wall. • DNAPL migration is self limiting due to termination of operations more than 50 years ago (no on-going contribution to DNAPL mass), removal of source areas, and limited remaining finite mass of DNAPL. • Continued removal of recoverable DNAPL from intermediate/deep soils (via recovery wells along bulkhead barrier wall) will reduce quantity of accumulated DNAPL in subsurface (where present) over time. • Citizens groundwater model predicted post-remediation upward gradient between intermediate model layers 6 and 7 of up to 0.00881 foot/foot below Gowanus Canal, which is less than estimated upward gradient required to mobilize DNAPL (0.11 to 0.29 foot/foot). • Geologic heterogeneity of intermediate soils (below ISS layer in Gowanus Canal and extending to approximately elevation -90.0 feet NAVD88) further reduces potential for upward DNAPL migration. If DNAPL were to migrate upwards through intermediate soils, it would dissipate itself to immobile residual within short distances. • ISS layer in Gowanus Canal will have high capillary entry pressure, which will further prevent potential upward DNAPL migration through ISS layer/sediment cap into Gowanus Canal. • Engineering controls, including the NAPL recovery wells, will be inspected, operated, monitored, and maintained in accordance with Site Management Plan to ensure their continued effectiveness.	No

Notes:

1. The groundwater/soil zones are defined in Section 4.1 of the *Final Remedial Investigation Report* (GEI Consultants, Inc. 2005) and generally consist of the following:
   - Unsaturated zone, which extends from ground surface to the water table;
   - Shallow zone, which extends from the water table to the bottom of the shallow discontinuous alluvial/marsh clay layer (meadow mat; approximately elevation -10.0 feet NAVD88);
   - Intermediate zone, which extends from the bottom of the shallow discontinuous alluvial/marsh clay layer (meadow mat; approximately elevation -10.0 feet NAVD88) to the bottom of the discontinuous glacial silt and glacial clay layers (upper glacial aquifer; approximately elevation -90.0 feet NAVD88); and
   - Deep zone, which extends from the bottom of the discontinuous glacial silt and glacial clay layers (upper glacial aquifer; approximately elevation -90.0 feet NAVD88) to the vertical extent of the subsurface explorations at the Site (approximately elevation -135.0 feet NAVD88).
2. The Remedial Action Objectives are identified in Section 4.0 of the *Remedial Alternative Analysis* (KeySpan Corporation 2007) and generally consist of the following:
   - Groundwater:
     - Prevent, to the extent practicable, contact with, or ingestion of contaminated groundwater associated with the Site.
     - Prevent, to the extent practicable, the migration of contaminated groundwater from the Site.
     - Remove, to the extent practicable, the source of groundwater contamination.
   - Soil:
     - Prevent, to the extent practicable, ingestion/direct contact with contaminated soil.
     - Recover, to the extent practicable, DNAPL at the Site.
   - Indoor Air:
     - Prevent, to the extent practicable, inhalation of contaminants volatilizing from soil or groundwater into closed structures.