FOURTH FIVE-YEAR REVIEW REPORT FOR
LI TUNGSTEN SUPERFUND SITE
NASSAU COUNTY, NEW YORK

Prepared by

U.S. Environmental Protection Agency
Region 2
New York , New York

Evangelista, Pat

Digitally signed by Evangelista, Pat
Date: 2020.07.28 11:21:54 -04'00'

Pat Evangelista, Division Director
Superfund and Emergency Management Division

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Date

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COCs	Chemicals of Concern
cy	cubic yards
ECs	Engineering Controls
ECL	Environmental Conservation Law
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FYR	Five-Year Review
GCDC	Glen Cove Development Corporation
ICs	Institutional Controls
IGW	Impact-to-Groundwater
MCLs	Maximum Contaminant Levels
µg/dL	micrograms/deciliter
µg/L	microgram per liter
mg/kg	milligrams/kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RA	Remedial Actions
RAO	Remedial Action Objectives
RA	Remedial Action
RAB	Removal Action Branch
RAR	Remedial Action Report
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
ROPC	Radionuclides of Potential Concern
RPM	Remedial Project Manager
RXRGIP	RXR Glen Isle Partners, LLC
SMP	Site Management Plan
SVI	Soil Vapor Intrusion
TCE	Trichloroethylene
UAO	Unilateral Administrative Order
USACE	United States Army Corps of Engineers
UG	Upper Glacial
VOCs	Volatile Organic Compounds

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment and is functioning as intended by the decision documents. The methods, findings, and conclusions of reviews are documented in the FYR. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the Li Tungsten Superfund Site (Site), located in Glen Cove, Nassau County, New York. The triggering action for this statutory review is the signature date of the previous FYR, which was September 30, 2015. A FYR is required at this Site because the remedial actions (RAs) selected at the Site will leave hazardous substances, pollutants, or contaminants on Site above levels that allow for unlimited use and unrestricted exposure.

The Site is being addressed in four operable units (OUs), OU 1, OU 2, and OU 4. OU 3 was an EPA Removal action and is not covered here. OU 1 involves the excavation and off-site disposal of contaminated soils for the former Li Tungsten facility and contaminated groundwater, OU 2 involves the excavation and off-site disposal of contaminated soils for portions of the nearby Captain's Cove property and associated contaminated groundwater, and OU 4 involves the dredging of Glen Cove Creek of radioactive slag contamination. **Figure 1** shows the areas addressed by OU 1, OU 2, and OU 4. EPA's involvement at the Captain's Cove property, OU 2, is solely related to radionuclide and metal contamination brought there from the Li Tungsten facility. EPA's actions at OU 2 represent a small portion of remedial work performed at the property, as New York State is addressing significant non-radionuclide contamination pursuant to its State Superfund program, and is responsible for all operation and maintenance activities at the property (**Figure 2**). Further OU 2 details can be found later in this document.

The Site FYR was led by Lorenzo Thantu, the EPA Remedial Project Manager (RPM). Participants included Michael Scorca (EPA hydrogeologist), Marian Olsen (EPA Human Health Risk Assessor), Michael Clemetson (EPA Ecological Risk Assessor), and Shereen Kandil (EPA community involvement coordinator). The City of Glen Cove (Glen Cove) and the Potentially Responsible Parties (PRPs) were notified of the initiation of the FYR. The FYR began on August 18, 2019.

Site Background

The 26-acre Li Tungsten Superfund site property is located adjacent to Glen Cove Creek in Glen Cove, Nassau County, New York (**Figure 3).** The former Li Tungsten facility is located at 63 Herbhill Road, while the Captain's Cove property is located one-half mile farther west on Garvies Point Road. These two properties lie along the northern edge of Glen Cove Creek. Glen Cove Creek is a one-mile federal navigation channel maintained by the United States Army Corps of Engineers (USACE). Former operations at the Site included the processing of tungsten and other metals which began in 1942 and ceased in 1985. Site operations generally involved the processing of ore and scrap tungsten concentrates into metal tungsten powder and tungsten carbide powder, although other specialty metal products were

also produced. Lack of and/or limited waste management practices resulted in the deposition of process waste throughout the Site. In 1984, the Glen Cove Development Corporation (GCDC) acquired the property and leased it to the Li Tungsten Corporation which declared bankruptcy in 1985 leaving the property unmanaged.

There are two groundwater aquifers in the area - the Upper Glacial (UG) Aquifer and the Lloyd Aquifer. The Site includes the former Li Tungsten facility, adjacent areas where radiologically- and/or metals-contaminated ore residuals were disposed, and Glen Cove Creek. The former facility (OU 1) consists of four parcels:

- Parcel A, a seven-acre paved area abutting the mile-long tidal Glen Cove Creek, served as the main operations center when the facility was active.
- Parcel B, a six-acre tract north of Parcel A, is undeveloped land, historically used for facility parking, containing a small pond, an intermittent stream and a small wetland.
- Parcel C, approximately 10 acres, (north of Parcel A and west of Parcel B) is where the former Dickson Warehouse and the Benbow Building were located.
- Parcel C', an undeveloped four-acre tract adjacent to Parcel C, was not utilized as part of the facility and was not contaminated by facility operations.

The 23-acre Captain's Cove Condominiums State Superfund site property is generally bounded by Hempstead Harbor to the west, Garvies Point Preserve to the north, the former Glen Cove Anglers Club to the east, and Glen Cove Creek to the south.

While the area in the vicinity of the site has been industrial in nature since the mid 1800s, the Site and adjacent areas along Glen Cove Creek are currently being transformed into residential and commercial uses. The immediate area now includes restricted residences (institutional controls (ICs) required) for portions of Li Tungsten site property and the Captain's Cove property, light industry, commercial businesses, and State and Federally-designated hazardous waste sites and Brownfields properties (**Figure 4**).

FOURTH FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Li Tungsten Superfund Site		
EPA ID: NYD986882660		
Region: 2	**State:** NY	**City/County:** Glen Cove/Nassau County
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		

Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**
Author name (Federal or State Project Manager): Lorenzo Thantu
Author affiliation: EPA
Review period: 9/30/2015 - 12/31/2019
Date of site inspection: 10/29/2019
Type of review: Statutory
Review number: 4
Triggering action date: 9/30/2015
Due date *(five years after triggering action date)*: 9/30/2020

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Soils

During the mid-1990's, EPA performed a remedial investigation (RI) of the Li Tungsten and Captain's Cove properties, which revealed contamination from prior Site practices which posed a risk to human health and the environment. The primary Site contaminants of concern (COCs) are various radionuclides and heavy metals associated with spent ore residuals and slag.

Specifically, the RI determined that surface and subsurface soils contained elevated levels of many metals, *e.g.*, antimony, arsenic, barium, copper, cobalt, chromium, lead, manganese, mercury, nickel, radium, thorium, uranium, vanadium, and zinc, as well as radionuclides of potential concern (ROPC), including uranium-238, radium-226, radium-228, thorium-230 and thorium-232. Investigation of the Captain's Cove property confirmed that the ROPC were present, but limited to two separate areas of the property, (Area A (west end) and Area G (east end)), where ore residuals from the former facility operations had been dumped.

The Site risk assessment, conducted in the absence of remedial action and ICs, concluded that heavy metals (*e.g.*, arsenic, manganese, cobalt, antimony, and nickel) are present in soils at Parcel A, Parcel B, Lower Parcel C, and Upper Parcel C, at concentrations that may pose unacceptable risks under commercial and residential uses. The Captain's Cove Areas A and G risk assessment concluded that inorganics, *e.g.*, arsenic, manganese, and antimony, and polychlorinated biphenyls (PCBs) are present in soils at concentrations that pose an unacceptable human health risk under residential and commercial uses. Radiological contamination in soils on both the Li Tungsten and Captain's Cove properties presented an unacceptable risk to current and future populations under residential and commercial uses.

An ecological risk assessment was also conducted and concluded that inorganic contaminants in soil at the Li Tungsten and Captain Cove properties posed an unacceptable risk to ecological receptors.

Groundwater

Groundwater sampling at the former facility showed contamination by volatile organic compounds (VOCs). The most concentrated area of VOCs was detected in four wells along the border of the Mattiace Petrochemical Co., Inc., Superfund site with western Parcel C. This plume contained high concentrations of a variety of VOCs, including trichloroethylene (TCE) and tetrachloroethylene (PCE), as well as benzene, toluene, ethylbenzene, and xylenes (collectively, BTEX) and was attributed to the leaking underground storage tanks. EPA subsequently constructed a groundwater and soil vapor treatment facility at Mattiace to remediate the on-site sources, as well as to capture and treat the groundwater plume. Additional information on the Mattiace site, is available at: https://www.epa.gov/superfund/mattiace-petrochemical.

Another less-concentrated plume of VOCs, primarily TCE and PCE, was also detected in the middle portion of Parcel A/Lower Parcel B, downgradient of the Crown Dykman State Superfund site and attributable to previous dry cleaning operations at that site. The groundwater contamination at the Crown Dykman site is being addressed by the New York State Department of Environmental Conservation (NYSDEC) under the state superfund program.

Inorganic COCs were detected in groundwater above maximum contaminant levels (MCLs) in several locations with no defined plume. ROPC generally met or only slightly exceeded drinking water standards.

At Captain's Cove, EPA's efforts focused on ROPCs and associated metal contamination disposed there from Li Tungsten. Low levels of ROPC were found in a few wells. Metals, including arsenic, antimony, selenium, iron, and manganese, were detected at significant levels in several wells.

Ponds, Wetlands and Sediment

Surface water and sediment samples collected on Parcels A, B, and C showed that a number of inorganics were present at levels exceeding NYSDEC criteria. ROPC were generally found to be within water quality and sediment guidance values.

On the Captain's Cove property, surface water and sediment samples collected from the two retention ponds and a topographic depression in the southwest portion showed inorganics exceeding surface water and sediment criteria, while ROPC did not.

A risk assessment was conducted for these areas on the Li Tungsten property and concluded that, under future adolescent trespasser scenario, inorganics in the pond sediment and surface water posed an unacceptable human health risk.

An ecological risk assessment was also conducted and concluded that pond, sediment and surface water inorganic contaminants posed an unacceptable risk to ecological receptors.

Glen Cove Creek

The former Mattiace monitoring program consisted of four locations along the length of the Creek, at which both the water column and sediments were analyzed for VOCs, SVOCs, inorganic contaminants, pesticides and PCBs (**Figure 5**). The sediment data from this monitoring program indicated that there

were elevated levels of metals which exceeded ecological values. A screening level ecological risk assessment was conducted for the Creek and concluded that there is potential risk to ecological receptors.

A human health risk assessment was conducted for the Glen Cove Creek and found that radiological contaminants posed an acceptable risk to current/future recreational and construction workers in the creek. For the sediment that had already been dredged and consolidated on the property, the sediment posed an unacceptable risk to future workers and residents of the property.

Response Actions

From 1989 to 1990, EPA ordered and supervised emergency actions which were conducted by GCDC. Following these emergency actions to protect human health and the environment, along with additional investigations, the EPA placed the Site on the National Priorities List (NPL) in October 1992. From 1996 to 1998, EPA performed an additional Removal Action to address threats from the contents of approximately 270 chemical storage tanks.

OU 1/OU 2 1999 Remedy Selection

The 1999 ROD included the following remedial action objectives (RAOs):

Building Materials

- Prevent exposure to building materials contaminated with radionuclides or chemicals of concern (ROPC or COCs);
- Eliminate hazards to future Site workers posed by unstable structures; and
- Remove any structural impediments that might interfere with pre-design sampling and implementation of soil and groundwater remediation.

Soil/Sediment

- Prevent or minimize exposure to COCs through inhalation, direct contact or ingestion; and
- Prevent or minimize cross-media impacts from COCs in soil/sediments migrating into underlying groundwater.

Groundwater/Ponded Water

- Prevent or minimize ingestion, dermal contact and inhalation of inorganic-contaminated groundwater hot spot areas on Lower Parcel C and on Parcel A that are above State and Federal MCLs (Note: organic groundwater contamination from the Crown Dykman State Superfund site is being addressed by the NYSDEC);
- Restore groundwater quality to levels which meet State and Federal standards; and
- Remediate contaminated surface water in on-site ponds to reduce risks to public health and the environment.

In order to achieve these RAOs, EPA selected the following RAs as described in the September 1999 ROD:

- Excavation of soils and sediments contaminated above cleanup levels;
- Separation of radionuclide-contaminated soil from non-radionuclide soil contaminated with heavy metals;
- Off-site disposal of both radionuclide and metals-contaminated soil at appropriately licensed facilities;
- Off-site disposal of radioactive waste located in the Dickson Warehouse at an appropriately licensed facility;
- Building demolition at the Li Tungsten facility;
- Storm sewer and sump cleanouts at the Li Tungsten facility;
- Institutional controls governing the future use of the Site;
- Decommissioning of Industrial Well N1917 on Parcel A;
- Collection and off-site disposal of contaminated surface water from Parcels B and C (EPA's RI determined that Parcel C' was uncontaminated); and
- Long-term groundwater monitoring program to assess the recovery of the UG Aquifer after the soil remedy is implemented.

October 2002 Explanation of Significant Differences (ESD)

As a result of an increase in excavated volumes of waste as identified in the 1999 ROD, EPA issued an ESD for the Site to increase the materials from 69,350 cubic yards (cy) to 132,100 cy. Actual volumes reported show that approximately 158,000 cy of contaminated soils were excavated and disposed of off Site.

May 2005 ESD

The 1999 ROD stated that the OU 1 and OU 2 remedy would meet commercial cleanup levels, based on the City of Glen Cove's 1998 Glen Cove Creek Revitalization Plan. However, the City subsequently revised the Plan for the properties along the Creek to allow for a significant residential component. As a result, EPA prepared and issued an ESD in May 2005 that reevaluated the 1999 ROD remedy, and presented the following major determinations:

- EPA determined that access to any remaining radionuclides needed to be further restricted in soil to allow for residential future use of the Site;
- The lead cleanup level remains at 400 mg/kg as the residential cleanup level for Superfund sites and is protective of public health under a residential scenario as proposed for this Site (see additional discussion of updates to the lead remediation in response to Question B);
- The arsenic cleanup level of 24 mg/kg was considered sufficiently protective of a residential scenario using current toxicity values; and
- Prior to the 2005 ESD, post-excavation data showed that the areas of the Site generally met then-acceptable residential standards for arsenic, lead, and radionuclides. EPA did reserve judgment on the suitability for residential development on Parcel A.

May 2016 ESD

In 2015, as a result of a change in future anticipated use in the area, Glen Cove made a renewed request to EPA to allow for residential future use, with restrictions, of Parcel A. In November 2016, RXR Glen Isle Partners, LLC (RXRGIP) acquired the 56-acre waterfront property from the City, consisting of the

former Li Tungsten facility and the Captain's Cove properties. For Lower Parcel C, the City plans to construct a municipal surface asphalt parking lot.

Based on this renewed request, EPA issued a third ESD as part of the May 2016 Site Proposed Plan for Remedy Modification, after evaluating recent sampling data and taking into consideration RXRGIP's plans for removal of additional soil contamination at Parcels A and B at the former Li Tungsten facility property. In September 2016, RXRGIP initiated a response action to remove the targeted contaminated soils; this effort was completed in December 2016. This third ESD announced the change in land use from commercial/light industrial to residential with restrictions for Parcel A, as well as to reaffirmed that, by reverting the use of Lower Parcel C to commercial/light industrial land use (specified in the 1999 ROD) from residential with restrictions (specified in the 2005 ESD), the remedy would still be protective of human health.

OU 1 2016 Amendment to 1999 Remedy Selection for Soil Contamination at Lower Parcel C

Sampling by EPA and RXRGIP identified additional soil contamination above "impact-to-groundwater" cleanup levels for arsenic and lead in subsurface soils at the Li Tungsten facility that needed to be addressed. The 2016 ROD Amendment did not change the RAOs for soil/sediment identified in the 1999 ROD.

In order to achieve these RAOs, EPA selected the following RAs as described in the 2016 ROD Amendment:

- Excavation and off-Site disposal of soil contaminated above "impact-to-groundwater" cleanup levels for arsenic and lead in subsurface soils and above direct contact cleanup levels for arsenic and lead in surface soils.

- Implementation of additional ICs, such as environmental easements, to ensure the integrity of the cover system that is to be placed over the entire upland area of the Site as part of the development of the Site properties. The cover system at the Site will include two feet of clean soil over an underlying demarcation layer in areas other than where above-ground structures, such as buildings, or pavement or sidewalks, which are also considered part of the cover system, are located.

- Evaluation and implementation of mitigative actions to address soil vapor intrusion in future buildings developed on Site.

- Continuation of the long-term groundwater monitoring program to assess the recovery of the UG Aquifer after the soil remedy set forth in this ROD Amendment is implemented.

- Development of a Site Management Plan (SMP), which will include a soil management plan that addresses excavation and management of remaining contamination during and after Site development and also an Institutional Controls Implementation and Assurance Plan (ICIAP) that identifies all ICs and engineering controls and details steps and media-specific requirements necessary to ensure that they remain in place and effective.

The ROD Amendment further asserted that the arsenic and lead cleanup levels for direct-contact exposure have not changed since the 1999 ROD, although the expected land use changed. The arsenic and lead cleanup levels for direct-contact exposure apply to accessible soils from 0-2 feet below ground surface. However, the 2016 ROD Amendment established new Site-specific impact-to-groundwater (IGW) cleanup levels of 175 milligrams/kilogram (mg/kg) for arsenic and 660 mg/kg for lead for soil below 2 feet remaining at the Site that is contaminated with arsenic and lead and may pose an ongoing threat to groundwater.

OU 4 (Glen Cove Creek) 2005 Remedy Selection

The 2005 ROD included the following RAOs:

- Reduce or eliminate any direct contact, ingestion, or external radiation threat to public health and the environment associated with ROPC-contaminated slag in the Creek project area; and
- Reduce or eliminate any direct contact, ingestion, inhalation or external radiation threat to public health and the environment associated with ROPC-contaminated slag placed in upland disposal areas.

In order to achieve these RAOs, EPA selected the following remedial actions as described in the 2005 ROD:

- Construction of a dewatering facility on the Li Tungsten property;
- Two phases of Creek dredging to remove radioactive slag materials;
- Dewatering of the dredged sediment followed by segregation of slag from the dewatered sediment; and
- Off-site transportation and disposal of the radioactive slag at an appropriately licensed facility.

Status of Implementation

After the 1999 ROD, EPA issued two unilateral administrative orders (UAOs) to the PRPs, the first in May 2000 to perform the remedial design for the northern half of the former facility (EPA implemented the work for the southern half of the former facility), and the second in September 2000 to complete the remedial action (RA) for certain portions of the remedy (*i.e.*, excavation and off-site disposal work on the northern half of the former facility, and off-site disposal of wastes on the Captain's Cove property). EPA also negotiated with the City of Glen Cove, a PRP for the Captains Cove property, and reached a Prospective Purchaser Agreement (PPA) in July 1999, which included City financing of some of EPA's RA activities at the Captain's Cove property. The PPA covered all 26 acres of the Li Tungsten property and 23 acres of the Captain's Cove property, which were acquired by the City for sale and transfer to third parties for redevelopment.

OU 1 - Former Facility

At the southern half of the former facility, 528 cy of soil exceeding radiation criteria were excavated and staged in the Dickson Warehouse for future off-site disposal. 2,295 tons of nonradioactive soils exceeding heavy metals criteria were excavated and disposed of off-site at a licensed subtitle D facility. In Spring 2004, TDY Industries, Inc. (TDY), contractor for the PRPs, emptied the Dickson Warehouse by disposing of 5,180 tons of radioactive waste materials staged inside. TDY also excavated and

disposed of 3,530 tons of radioactive soils. All buildings, except the Loung building, on Parcel A were razed and disposed of off-site.

In June 2006, TDY completed the remaining remedial work for OU 1 which primarily entailed work on the northern half of the former facility. This included excavation and off-site disposal of non-radioactive, heavy-metals contaminated soils, radioactive soils, and PCB-contaminated soils. All excavation work was completed in July 2007. In November 2007, under a Consent Judgment, TDY performed additional work at the Site, including off-site disposal of the stockpiled radioactive and PCB-contaminated soils and decontaminated the Warehouse.

On July 14, 2017, the NYSDEC issued and approved a beneficial use determination (BUD) to the City of Glen Cove for the dredge spoils stockpile, free of radionuclide slag, located on Parcel A for reuse as fill beneath Engineering Controls (ECs) on the Li Tungsten Superfund site (a portion of the overall waterfront project site). Pursuant to NYSDEC's approved BUD for reuse, approximately 58,565 cy dredge spoils were placed on Parcel A (57,130 cy), Parcel B (1,210 cy) and Parcel C (225 cy) (**Figure 6**).

OU 1 - Lower Parcel C

The 2016 OU 1 ROD Amendment established cleanup levels of 175 mg/kg for arsenic and 660 mg/kg for lead for soils that may pose an ongoing threat to groundwater. The RA was conducted from October 2016 through December 2016 where soils contaminated with arsenic and lead were excavated on Lower Parcel C. 13,060 tons of nonhazardous lead/arsenic-contaminated soil and 804 tons of hazardous arsenic-contaminated soil were excavated and disposed at off-site permitted facilities.

OU 1 – Parcels A and B

From September to December 2016, RXRGIP implemented pre-construction/development remedial activities, also in accordance with the soil IGW cleanup requirements of the 2016 OU 1 ROD Amendment, on Parcels A and B, to allow for restricted residential use development of these parcels. During the course of the remedial activities on Parcels A and B, 75.2 tons of PCB-contaminated and 153.93 tons of metals-contaminated soils were excavated and disposed of off site.

OU 2 - Captains Cove

Between 2001 and 2003, at the Captain's Cove property (OU 2), an estimated 112,000 tons of soils were excavated, segregated, and staged by the EPA's Removal Action Branch (RAB) into stockpiles of radioactive wastes, non-radioactive, metals-contaminated wastes and concrete and wood debris. In February 2005, the USACE removed the stockpiles for off-Site disposal.

OU 4 - Glen Cove Creek

EPA designated Glen Cove Creek as OU 4 of the Li Tungsten site. EPA signed a ROD on March 30, 2005, selecting a remedy involving remedial dredging and removal of radioactive hot spots in the Creek. The USACE initiated navigational dredging for the inner half of the Creek in September 2000 and used Parcel A of the Li Tungsten property as a temporary dewatering area. A survey performed by EPA determined that the dredged sediments were contaminated with chunks of radioactive slag from earlier facility operations, which resulted in a stoppage of dredging activities at that time. In October 2006,

USACE initiated on-site construction activities, including two large sediment dewatering cells on Parcel A. Dredging to a navigational depth of between eight and ten feet below mean low water was accomplished mechanically by means of a crane equipped with a clamshell bucket. Any "hot spots" were subsequently dredged and placed with the rest of the dredged material into the dewatering cells on Parcel A.

In August 2007, TDY mobilized to the Site to segregate radionuclide slag from the dewatered sediments. The final volume of scanned sediments was 31,374 cy and was disposed of off-site. From October 2007 to July 2008, EPA's RAB completed the dredging of two isolated "hot spots" against the bulkhead on Parcel A using a long-reach excavator from land to try to minimize the possibility of bulkhead collapse, and also rebuilt part of the damaged bulkhead along Parcel A. The Creek's navigational channel was effectively cleared of radionuclides that could otherwise impact future navigational dredging operations. However, because there is still the potential that radiologically contaminated slag could still be present below the navigational dredging depth in the Creek channel, EPA has notified the USACE that any permit applications it receives for work in the future should consider and address the potential for disturbance of radionuclides that may have not been removed during EPA's remedial activities.

In January 2018, RXRGIP submitted a permit application for the Glen Cove Creek Mixed-Use Waterfront Redevelopment Project to the USACE requesting approval for additional dredging in Glen Cove Creek to accommodate a marina/boat dock adjacent to Parcel A. Because the proposed dredging would impact the remedy EPA implemented for OU 4, EPA required that the scope of dredging proposed under the permit be expanded to include additional dredging in the Creek in the area near the Parcel A bulkhead which was not dredged as part of the hot spots 1 and 2 remediation. The permit that was granted includes additional dredging in the Creek near the Parcel A bulkhead, outside of the navigational channel, which could not be dredged as part of the OU 4 hot spots dredging. Approximately 90 cy of sediments are expected to be removed adjacent to a 100 foot length of the bulkhead near Parcel A. The dredged hot spots area will then be capped with a five-foot cover consisting of 12 inches of clean gravel (bottom) and 48 inches of clean sand (top); all other non-hot-spots dredged areas will be capped with a two-foot cover consisting of 12 inches of gravel (bottom) and 12 inches of sand (top). The dredging and capping work commenced in June 2020 and is expected to be completed by December 31, 2020. The dredged materials will be disposed of at permitted off-site facilities.

The Li Tungsten Environmental Easement requires ongoing restricted-residential construction activities to comply with the Li Tungsten November 2016 Interim SMP and implement all ICs and ECs required thereunder on the entirety of the Li Tungsten site property. An individual Interim SMP is being finalized for a portion of Parcel B referred to as Block H and Roads F & G. An individual Interim SMP for a portion of Parcel A referred to as Block I will be prepared and submitted to EPA and NYSDEC for review and approval during the Fall of 2020. These individual Interim SMPs and the November 2016 Interim SMP will manage the remaining contamination at the Site on an interim basis. A final SMP is expected to be submitted to EPA and NYSDEC for review and approval in late 2021. The Li Tungsten November 2016 Interim SMP also includes a soil management plan that addresses excavation and management of remaining contamination during and after Site development and also an ICIAP that identifies all ICs and ECs and details steps and media-specific requirements necessary to ensure that they remain in place and effective. **Table 1** provides a summary of the controls implemented for the Li Tungsten site as well as the inspections, monitoring, maintenance and reporting activities required by the Li Tungsten November 2016 Interim SMP.

IC Summary Table

Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	Li Tungsten Parcel A, Parcel B, Lower Parcel C, and Upper Parcel C Captain's Cove Areas A and G	Restrict installation of ground water wells and ground water use	New York Environmental Conservation Law (NYECL) Section 15-527, New York Sanitary Code (Title 10 of the New York Code of Rules and Regulations Section 5-2.4 - Need for permit) Nassau Public Health Ordinance Article 4 (Effective 8-1-87)
Soil	Yes	Yes	Li Tungsten Parcel A, Parcel B, Lower Parcel C, and Upper Parcel C Captain's Cove Areas A and G	Ensure the integrity of the cover system that is to be placed over the entire upland area of the Site as part of the development of the Site properties and also compliance with all ICs and ECs placed on the Site.	Li Tungsten Environmental Easement granted to the NYSDEC pursuant to Article 71, Title 36 of the NYECL, and recorded with the Nassau County Clerk on October 24, 2016, requires compliance with all ICs and ECs placed on the Site Captain's Cove Environmental Easement granted to the NYSDEC pursuant to Article 71, Title 36 of the NYECL, and recorded with the Nassau County Clerk on October 27, 2016, requires compliance with all ICs and ECs placed on the Site All ICs implemented. ECs,

					e.g., cover systems, still being placed on the Li Tungsten and Captain's Cove Condominium sites as part of the ongoing restricted residential development

All ICs and ECs for Parcel A, Parcel B, Lower Parcel C, and Upper Parcel C have been incorporated into the Site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC pursuant to Article 71, Title 36 of the New York Environmental Conservation Law (NYECL), and recorded with the Nassau County Clerk on October 24, 2016, requires compliance with all ICs and ECs placed on the Li Tungsten site. The IC boundaries, including Parcel C prime, are shown on **Figure 7;** however, the ICs pertaining to ECs discussed below do not apply to Parcel C prime. The Environmental Easement requires compliance with the Li Tungsten November 2016 Interim SMP and all ICs and ECs placed on the Site.

ICs would also apply to "red flag" areas on Parcel A and Lower Parcel C. During the implementation of the OU 1 remedial activities at the former Li Tungsten facility property portion of the Site, EPA determined that excavation of some arsenic-contaminated soil and, to a lesser extent, lead-contaminated soil along the western and eastern edges of Lower Parcel C and on the southern portion of Parcel A was infeasible because of the existing utilities and infrastructure. These areas with remaining soil contamination, referred to as "red flag" areas, are present within the immediate area of the fence line on Parcel C (e.g., along two storm drain systems as well as underground electric and natural gas services) and on Parcel A in close proximity to the former bulkhead in place along the Glen Cove Creek.

In addition, the Li Tungsten Environmental Easement and November 2016 Interim SMP require ICs and ECs which include evaluation of and implementation of mitigative actions to address soil vapor intrusion (i.e., soil vapor mitigation systems) and incorporate their design into the plans and specifications for all buildings developed and constructed on Parcel A, Parcel B, Lower Parcel C, and Upper Parcel C. An active Sub-Slab Depressurization System (SSDS) has already been installed beneath the vapor barrier system in potentially occupied areas of residential Building H on Parcel B, effectively preventing potential volatile chemicals from moving from the sub-surface into the indoor air of the overlying building. Similarly, as part of ongoing development construction on Parcel A, a soil vapor intrusion system consisting of a vapor barrier and an SSDS will also be installed beneath the Building I and Marina Support Building foundation on Parcel A. In the future, as the property is further developed, including any new development and construction, further evaluation of vapor intrusion will be conducted as necessary. In addition, as noted above and in the 2016 ROD Amendment, the possibility exists that some radionuclide materials could exist in the Creek channel below the depths that the USACE dredged to allow for safe navigation, as well as in small setback areas adjacent to the bulkhead at Parcel A. EPA has notified the USACE that any permit applications it receives for work in the future should consider and address the potential for disturbance of radionuclides that may have not been removed during EPA's remedial activities.

An Environmental Easement granted to the NYSDEC pursuant to Article 71, Title 36 of the New York Environmental Conservation Law (NYECL), and recorded with the Nassau County Clerk on October 27, 2016, requires compliance with all ICs and ECs placed on the Captain's Cove Condominium site.

Climate Change

Potential Site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the Site.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the **last** FYR as well as the recommendations from the last FYR and the current status of those recommendations.

Protectiveness Determinations/Statements from the 2015 FYR

Protectiveness Statement(s)		
Operable Unit: 1	*Protectiveness Determination:* Short-term protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy at OU 1 currently protects human health and the environment because there is no risk due to incomplete exposure pathways. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: **(1)** Complete analyses of additional soil samples and, based on results of this data and other recent soil data, evaluate, select (as appropriate) and implement measures to address residual contamination above the remedy cleanup criteria. **(2)** Implement ICs to address the instances where soil contamination was left in place above residential standards and further remediation will not occur, and to prevent groundwater exposure. **(3)** Complete an SMP which will address, among other things, oversight of ICs. **(4)** Sample and remove the dredge spoils that remain on Parcel A.		
Operable Unit: 2	*Protectiveness Determination:* Short-term protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy at OU 2 currently protects human health and the environment because there is no risk due to incomplete exposure pathways. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: **(1)** Implement ICs to address the instances where soil contamination was left in place above residential standards and further remediation will not occur, and to prevent groundwater exposure. **(2)** Complete an SMP which will address, among other things, oversight of ICs.		
Operable Unit: 4	*Protectiveness Determination:* Short-term protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy at OU 4 currently protects human health and the environment because radioactive contaminated slag has been dredged from Glen Cove Creek, segregated from dredged sediments, and disposed of off Site. However, in order for the remedy to be protective in the long-term, ICs		

need to be implemented for the portion of the Parcel A bulkhead where radioactive slag was left in place due to logistical issues regarding removal.

Sitewide Protectiveness Statement (if applicable)

Protectiveness Determination:	*Addendum Due Date (if applicable):*
Short-term protective	Click here to enter date.

Protectiveness Statement: The remedy at the Site currently protects human health and the environment because there are no complete exposure pathways. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: **(1)** Complete analyses of additional soil samples and, based on results of this data and other recent soil data, evaluate, select (as appropriate) and implement measures to address residual contamination above the remedy cleanup criteria. **(2)** Implement ICs to address the instances where soil contamination was left in place above residential standards and further remediation will not occur, and to prevent groundwater exposure. **(3)** Complete an SMP which will address, among other things, oversight of ICs. **(4)** Sample and remove the dredge spoils that remain on Parcel A. **(5)** Implement ICs for the portion of the Parcel A bulkhead where radioactive slag was left in place due to logistical issues regarding removal.

Status of Recommendations from the 2015 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1 and 2	Groundwater - Groundwater concentrations remain above MCLs.	Continue annual groundwater monitoring at the Site to evaluate the effects of past remediation, any further remediation, and redevelopment on groundwater concentrations.	Ongoing	As required by the 2016 ROD Amendment and also by the Li Tungsten November 2016 Interim SMP, RXRGIP has taken over continuation of the long-term groundwater monitoring program. Due to ongoing construction activities, groundwater monitoring and sampling is being suspended until completion of construction activities. Upon completion of construction activities in 2020, groundwater monitoring wells EMW-4, MW-1, MP-6, PRA-7, and PRA-6 will be replaced in close proximity to their original locations with the same screen intervals and groundwater monitoring/sampling will continue in accordance with the November 2016 Interim SMP.	N/A

1 and 2	Soils - Surface and subsurface soils remain above ROD cleanup objectives across areas of the Site.	Complete analyses of additional soil samples and, based on results of this data and other recent soil data, evaluate, select (as appropriate) and implement measures to address residual contamination above the remedy cleanup criteria.	Completed	Based on evaluation of the additional soil sampling results, EPA amended the 1999 ROD to address residual contamination. In accordance with the soil cleanup requirements of the 2016 OU 1 ROD Amendment, additional Lower Parcel C remedial action by EPA and Parcels A and B pre-construction/development remedial action by RXRGIP were completed in December 2016.	December 2016
1 and 2	Institutional Controls - Institutional controls have not been implemented at the Site.	Complete implementation of ICs in instances where soil contamination was left in place above remedy cleanup criteria and further remediation will not occur, as well as ICs associated with preventing exposure to Site groundwater. Finalize the SMP which will include measures to monitor ICs.	Completed	ICs have been implemented.	10/24/2016
1	Soils - Dredge spoils remain stockpiled on Parcel A.	Ensure that the City samples and removes the dredge spoils which was previously identified as the responsibility of the City of Glen Cove after creek remediation in 2007.	Completed	On July 14, 2017, the NYSDEC issued and approved BUD for the dredge spoils stockpile located on Parcel A for reuse as fill beneath ECs on the Li Tungsten Superfund site (a portion of the overall waterfront project site). Pursuant to NYSDEC's approved BUD, approximately 58,565 cy dredge spoils were placed on Parcel A (57,130 cy), Parcel B (1,210 cy) and Parcel C (225 cy) (**Figure 6**).	7/14/2017

Note that although not included in the recommendations portion of the 2015 FYR, the 2015 FYR did indicate that in order for the OU 4 remedy to be protective, ICs for the area adjacent to Parcel A

bulkhead, where radioactive slag was left in place due to logistical issues regarding removal, needed to be implemented. Since any work in this portion of the Creek would require a permit from the USACE New York District, EPA has notified the USACE that any permitting of work in this area should address the potential that such work may disturb or expose radionuclide-contaminated sediments in this area, and that special measures may be needed to address this potential. As noted above, RXRGIP will construct a marina in this area and per requirements of the USACE permit, RXRGIP will dredge approximately 90 cy of sediments within the hot spots area and cap it with a five-foot cover consisting of 12 inches of gravel (bottom) and 48 inches of sand (top).

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On October 1, 2019, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at Superfund sites in New York, New Jersey, Puerto Rico and the U.S. Virgin Islands including the Li Tungsten Superfund site. The announcement can be found at the following web address: https://www.epa.gov/aboutepa/fiscal-year-2020-five-year-reviews.

In addition to this notification, a public notice was distributed via email to local public officials and other interested parties and copies were also mailed to interested parties. The announcement indicated that EPA is conducting a FYR of the remedy for the Site to ensure that the implemented remedy remains protective of public health and the environment and is functioning as designed. It also indicated that once the FYR is completed, the results will be made available in the local Site repository at the Glen Cove Public Library located at 4 Glen Cove Avenue, Glen Cove, New York, as well as the website: www.epa.gov/superfund/li-tungsten. In addition, the notice included contact information, including addresses and telephone numbers, for questions related to the FYR process or the Li Tungsten site. The documents will also be available at EPA's offices at 290 Broadway, New York, New York 10007 (18 Floor).

No interviews were conducted as part of this FYR.

Data Review

Extensive soil sampling was done by EPA on Lower Parcel C and as part of pre-construction investigation and sampling activities by RXRGIP on Parcels A and B to enable a full delineation of the vertical and horizontal extent of contamination exceeding the Site-Specific IGW Action Levels for lead and arsenic. Post-excavation soil sampling, conducted on Lower Parcel C, Parcel A, and Parcel B, verified that the concentrations of lead and arsenic in soil within the excavated areas were below the Site-Specific IGW Action Levels to the groundwater table.

In January 2015, February 2016 and April 2017, five monitoring wells in the groundwater monitoring network were sampled (**Figure 8**) and analyzed at a laboratory for metals (including contaminants of concern arsenic and lead), as well as Radium 226 and Thorium 232.

Well EMW-4, located on Lower Parcel C, showed declining arsenic levels from 100 µg/L in 2015 to 85 µg/L in 2016. Lead concentrations slightly increased from 4.7 µg/L in 2015 to 8 µg/L in 2016 but remain below EPA's Action Level of 15 µg/L (see **Figure 9)**.

Well MW-1, located at Captain's Cove, showed declining arsenic concentrations from 460 µg/L in 2015 to 21.4 µg/L during 2017 (see **Figure 9).**

Well MP-6, located on the upgradient part of Parcel A, showed arsenic concentrations below the State MCL of 25 µg/L and the EPA MCL of 10 µg/L and lead concentrations below the State MCL of 25 µg/L and the EPA Action Level of 15 µg/L.

Well PRA-7, located on Parcel B, and wells PRA-6 and replacement well PRA-6, located about 650 feet southwest of the Li Tungsten property, showed arsenic concentrations below State MCL of 25 µg/L and the EPA MCL of 10 µg/L and lead concentrations below the State MCL of 25 µg/L and the EPA Action Level of 15 µg/L.

In 2017, as part of the redevelopment of the property, the five wells, discussed above, were properly abandoned. Until the redevelopment activities are completed, sampling of these wells is suspended. At that time, these five wells will be replaced as close to their original locations as feasible.

Sediment and surface water sampling was conducted at 6 sampling locations from July 2017 through December 2019. There were some detections of arsenic and lead in surface water; however, there were no exceedances of ecological standards. The arsenic and lead concentrations detected in sediment exceeded ecological values on a sporadic basis. The radiological sampling data indicated that the concentrations of radium, thorium, and uranium were at background or just above background.

Site Inspection

The Site inspection was conducted on October 29, 2019. The purpose of the inspection was to assess the protectiveness of the remedy. The following parties were in attendance:

Lorenzo Thantu, EPA RPM
Damian Duda, EPA Section Chief
Michael Scorca, EPA Hydrogeologist
Chris Engelhardt, NYSDEC Project Manager
Karen Gomez, NYSDEC Regional Engineer
Naomi Handell, U. S. Army Corps of Engineers
Ann Fangmann, City of Glen Cove
Derek Ersbak, PW Grosser Consulting
Shashank Nemichand, RXRGIP

During the October 29, 2019 Site inspection, water was observed infiltrating into the lower level parking lot of Building H on Parcel B, specifically, at the seam between the floor and wall on the north side of the lower level parking lot. This is likely a result of local hydrogeologic conditions that have the potential to create a positive hydraulic head at portions of the Site. The seam was immediately sealed by RXRGIP to prevent continued water infiltration. To document the effectiveness of the foundation repair, inspections of the seam will be performed daily for a month, followed by weekly for the next two months and monthly for the final nine months of the first year. If no defects are noted during the first year, inspections will be reduced to annually and then included as part of the annual inspection thereafter. Although this does not directly affect protectiveness, EPA will monitor to verify that the repair is permanent.

A composite cover system comprising of either a minimum of 24 inches of clean soil or impermeable surface, including a minimum of 5 inches of asphalt pavement, a minimum of 4 inches of concrete-

covered sidewalks, or a minimum of 8 inches of concrete building slabs, has been installed on Parcels A and B. In addition, an active SSDS has been installed beneath the vapor barrier system in occupied areas of residential Building H on Parcel B, effectively preventing potential volatile chemicals from moving from the sub-surface into the indoor air of the overlying building. Similarly, as part of ongoing development construction on Parcel A, a soil vapor intrusion system consisting of a vapor barrier and an SSDS will also be installed beneath the Building I and Marina Support Building foundation on Parcel A. The Lower Parcel C is presently undeveloped but will require similar ECs, at minimum, a composite cover system, when it is developed in the future for a municipal parking lot.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended in that contaminated soils, structures, and groundwater have been addressed. Additional soil contamination that was discovered in 2014 and 2015 by RXRGIP and EPA and found to exceed the 1999 ROD cleanup levels outside the "red flag" areas on Parcel A and Lower Parcel C have been addressed. In accordance with the 2016 ROD Amendment, soil contamination in Lower Parcel C and Parcels A and B has been remediated to address impacts to groundwater.

The 1999 ROD considered remedial alternatives for groundwater beneath a portion of the Site (Lower Parcel C into the western portion of Parcel A) that was contaminated with arsenic and lead. A "No Action" remedy was selected citing the expectation that the soils remedy once implemented (including excavation of arsenic and lead contaminated soils) would improve the groundwater quality beneath the Site. As stated above, additional RAs were implemented on Lower Parcel C and Parcels A and B per the requirements of the 2016 OU 1 ROD Amendment which also included a continuation of the long-term groundwater monitoring. In 2017, as part of the redevelopment of the property, the five monitoring wells were properly abandoned. The five wells will be replaced as close to their original locations as feasible when the ongoing redevelopment activities are completed, at which time the long-term groundwater monitoring program will resume. Prior to their removal, arsenic and lead levels in groundwater monitoring wells had declined. Total (unfiltered) arsenic concentrations detected in Well EMW-4, located on Lower Parcel C, which had been notably higher during the previous FYR period, declined from 100 µg/L in 2015 to 85 µg/L in 2016. The lead concentration at this well was 4.7 µg/L in 2015 and 8 µg/L in 2016; lead values remain below the EPA Action Level of 15 µg/L. For Well MP-6 located on Parcel A, during this FYR period, arsenic remained below the State MCL of 25 µg/L and the EPA MCL of 10 µg/L. Lead concentrations remained below the State MCL of 25 µg/L and the EPA Action Level of 15 µg/L. For Well PRA-7 located on Parcel B, arsenic concentrations continued to remain below the EPA MCL of 10 µg/L and the lead concentrations have also remained below the EPA Action Level of 15 µg/L during this FYR period.

As noted above, no one is currently exposed to the groundwater and also ICs have been implemented to ensure exposures do not occur in the future.

The Li Tungsten Environmental Easement requires implementation of ICs to ensure the integrity of the cover system. The cover system consists of either two feet of clean soil with an underlying demarcation layer or above-ground structures, such as buildings, or pavement or sidewalks, being placed over Parcel A, Parcel B, and Upper Parcel C as part of RXRGIP's ongoing redevelopment construction activities. A similar cover system will also be placed over the Lower Parcel C as part of Glen Cove's future development and construction of a municipal parking lot to support upcoming ferry service and other

public amenities. The Li Tungsten Environmental Easement requires compliance with the Li Tungsten November 2016 Interim SMP, and all ICs and ECs placed on the Site. Presently, an individual Interim SMP is being finalized for Parcel B. An individual Interim SMP for Parcel A will be prepared and submitted to EPA and NYSDEC for review and approval during the Fall of 2020. These individual Interim SMPs and the November 2016 Interim SMP will manage the remaining contamination at the Site on an interim basis. A final SMP is expected to be submitted to EPA and NYSDEC for review and approval in late 2020.

The remedies selected in the 1999 OU 1/OU 2 ROD, 2006 OU 1 ROD Amendment, and 2005 OU 4 ROD addressed contaminated on-site soil and sediment in Glen Cove Creek, calling for the excavation and off-site disposal. The dredging of the creek implemented per the 2005 OU 4 ROD involved two phases. One phase was dewatering of the sediment and the second was segregation of the slag. As stated above, additional dredging by the RXRGIP, primarily intended to allow for the construction of Parcel A dock/marina/slips, which requires upland excavation, commenced in June 2020. Dredging will include an area in the Creek that was adjacent to the Parcel A bulkhead (portions of hot spots 1 and 2) which could not be removed during the implementation of OU 4 remedy. The USACE permit for this work requires that appropriate precautions be taken because the removed sediments could contain radiologically-contaminated slag. The dredged hot spots area will then be capped with a five-foot gravel and sand cover. The dredging and capping work is expected to be completed by December 31, 2020. The Glen Cove Creek surface water and sediment monitoring program, which was implemented pursuant to the 1991 ROD for the Mattiace site, ceased in 2011. RXRGIP took over implementation of the surface water and sediment monitoring program in 2015 and is conducting the monitoring program for the duration of the ongoing construction activities.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Human Health Risk Assessment - The expected land use changed several times including in the redevelopment of the property discussed above and memorialized in the ROD Amendment issued in September 2016. The 1999 ROD identified an arsenic cleanup level of 24 mg/kg, a lead cleanup level of 400 mg/kg, a cleanup level for PCBs of 1 mg/kg in surface soils, and 10 mg/kg for PCBs in subsurface soils. These concentrations are consistent with the 2020 Regional Screening Levels (RSLs) that provide risk based screening levels for a range of chemicals based on current exposure and toxicity values. The ROD also identified cleanup levels for Thorium-232 of 5 pCi/g1 and for Radium-226 of 5 pCi/g1. The May 2005 ESD revised radiation cleanup levels for radium and thorium in order for the 1999 remedy to be protective of restricted residential use. For thorium, the cleanup level was lowered from 5 pCi/g for the thorium-232 isotope to 5pCi/g for the sum of two isotopes, thorium-230 and thorium-232. Similarly, the radium cleanup goal was changed from 5 pCi/g for radium-226 to 5 pCi/g for the sum of radium-226 and radium-228.

Since last FYR, EPA issued a lead memorandum in December 2016 (OLEM Directive 9200.2-167) indicating a blood lead level (BLL) of 10 µg/dL is no longer considered health-protective. The memo indicates that current scientific information regarding adverse health effects from lead exposure are evident with BLLs between 2 and 8 µg/dL. A target BLL of 5 µg/dL reflects current scientific literature on lead toxicology and epidemiology that the adverse health effects of lead exposure do not have a threshold. At the time of the 1999 ROD, a cleanup goal of 400 mg/kg for lead in soil was selected. Even though the approach for addressing lead has changed since the remedy was selected, a cover system, consisting of either two feet of clean soil with an underlying demarcation layer or above-ground

structures, such as buildings, or pavement or sidewalks, is required over all developed Li Tungsten parcels, and will be placed across the site and will interrupt potential exposures to lead in soil below 2 feet. Analytical results from the two-foot clean soil cover that has been partially placed on Parcel B, and is expected to be completed by December 31, 2021, range in concentrations from 14.6 mg/kg to 24.7 mg/kg, well below what a revised lead cleanup goal that would be identified under the new policy. The construction and installation of two-foot clean soil cover for Parcel A is expected to be completed by December 31, 2021 and will serve as a barrier to potential exposures below 2 feet.

In addition, the Li Tungsten Environmental Easement and November 2016 Interim SMP require ICs and ECs which include evaluation of and implementation of mitigative actions to address soil vapor intrusion (i.e., soil vapor mitigation systems) and incorporate their design into the plans and specifications for all buildings developed and constructed on Parcel A, Parcel B, Lower Parcel C, and Upper Parcel C. An active Sub-Slab Depressurization System (SSDS) has already been installed beneath the vapor barrier system in potentially occupied areas of residential Building H on Parcel B, effectively preventing potential volatile chemicals from moving from the sub-surface into the indoor air of the overlying building. Similarly, as part of ongoing development on Parcel A, a soil vapor intrusion system consisting of a vapor barrier and an SSDS will also be installed beneath the Building I and Marina Support Building foundation on Parcel A. In the future, as the property is further developed, including any new development and construction, further evaluation of potential vapor intrusion will be conducted, as necessary.

The RAOs are still valid.

Ecological Risk Assessment - The remedy selected in the 1999 and 2005 RODs addressed contaminated on-Site soil and sediment in Glen Cove Creek, calling for the excavation and offsite disposal. The dredging of the creek involved two phases. One phase was dewatering of the sediment and the second was segregation of the slag. The surface water and sediment monitoring program was implemented pursuant to the 1991 ROD for the Mattiace Petrochemical Co., Inc. site. The monitoring data indicated that concentrations of uranium, thorium and radium were detected at and just above background levels. Although there were some concentrations of arsenic and lead in sediment which exceeded ecological screening values, the occurrences were on a sporadic basis. EPA has notified the USACE that any permit applications it receives for work in the future should consider and address the potential for disturbance of radionuclides that may have not been removed during EPA's remedial activities. Additional dredging to be implemented by RXRGIP adjacent to Parcel A and subsequent placement of a five-foot cap over the dredged area will further reduce any potential human health or ecological risks associated with slag that may be present in the non-dredged setback area adjacent to portions of the Parcel A bulkhead. Since the exposure pathways have been addressed, the remedy is functioning as intended for ecological receptors.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no new information that calls into question the protectiveness of the remedy.

I. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU 1, 2 and 4

OTHER FINDINGS

Though not an issue that affects protectiveness, EPA should continue to monitor repairs to the Parcel B lower level parking lot. In addition, EPA should continue to monitor the ongoing development of the Site to ensure that it adheres to the SMP and ICs in the implementation of all ECs, e.g., cover systems.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
Operable Unit: OU 1	*Protectiveness Determination:* Protective	*Planned Addendum Completion Date:*
Protectiveness Statement: The remedy at OU 1 currently protects human health and the environment.		
Operable Unit: OU 2	*Protectiveness Determination:* Protective	*Planned Addendum Completion Date:*
Protectiveness Statement: The remedy at OU 2 currently protects human health and the environment.		
Operable Unit: OU 4	*Protectiveness Determination:* Protective	*Planned Addendum Completion Date:*
Protectiveness Statement: The remedy at OU 4 currently protects human health and the environment.		
Sitewide Protectiveness Statement		
Protectiveness Determination: Protective		*Planned Addendum Completion Date:*
Protectiveness Statement: The remedy at the Site currently protects human health and the environment.		

VIII. NEXT REVIEW

The next FYR report for the Li Tungsten Superfund Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Document	Date
Record of Decision for the Li Tungsten Superfund Site, Operable Units 1 and 2	September 30, 1999
Record of Decision for the Li Tungsten Superfund Site, Operable Unit 4	March 30, 2005
Explanation of Significant Differences for the Li Tungsten Superfund Site	May 2005
Remedial Action Report for OU 1 of the Li Tungsten Superfund Site	October 22, 2008
Remedial Action Report for OU 2 of the Li Tungsten Superfund Site	September 29, 2006
Remedial Action Report for OU 4 of the Li Tungsten Superfund Site	September 30, 2008
Preliminary Close-out Report for the Li Tungsten Superfund Site	September 25, 2008
Second five-year review	June 2010
Annual Li Tungsten Groundwater Monitoring Reports	2010-2013
Glen Cove Creek Data Summary (Excel Spreadsheet)	
PWGC Pre-Construction Confirmatory/Insurance Data Gap Subsurface Investigation Report	May 2014
SEC Final Status Survey Report (RSSR) Parcel A, Parcel Lower C and Parcel Upper C	April 2015
Third five-year review	September 2015
Li Tungsten Pre-Construction Investigation Summary Report	March 2016
Li Tungsten Interim Site Management Plan	November 2016
Li Tungsten Construction Completion Report	January 2017
Li Tungsten Annual Groundwater Monitoring Report	August 2017

APPENDIX B – CHRONOLOGY OF SITE EVENTS

October 1992	Listing of Li Tungsten Site on NPL
September 1999	ROD for OU 1 and OU 2
July 2000	RAB completion of Parcel A RA
August 2001	RAB completion of Lower Parcel C RA
August 2002	PRP completion of dredged dewatered sediment remediation
October 2003	RAB completion of all Captain's Cove excavation work
April 2004	PRP completion of off-site disposal of wastes staged in Dickson Warehouse
March 2005	ROD for OU 4
May 2005	ESD regarding effect of City's zoning changes on the 1999 ROD
August 2005	First Five-Year Review for OU 1 and OU 2
July 2006	EPA/USACE completion of transportation and disposal of all wastes staged at Captain's Cove
February 2007	EPA/USACE completion of remedial dredging of the Creek and the navigational dredging of Acceptance Area 4
November 2007	PRP completion of segregation of radionuclide slag from dewatered Creek sediments on Parcel A
August 2008	PRP completion of excavation and off-site disposal activities for Parcel B and upper Parcel C, including off-site disposal of all "specialty" wastes staged in the Dickson Warehouse
September 2008	Issuance of PCOR
June 2010	Second Five-Year Review
May 2014	Potential Developer's Subsurface Investigation completed
January 2015	Potential Developer's MARSSIM study completed
September 2015	Third Five-Year Review
September 2016	Amended ROD for OU 1 and OU 2
July 2017	NYSDEC's July 14, 2017 approval of Soil Mechanics' Revised July 13, 2017 Li Tungsten Parcel A BUD Dredge Spoil Augmentation Plan

APPENDIX C – FIGURES

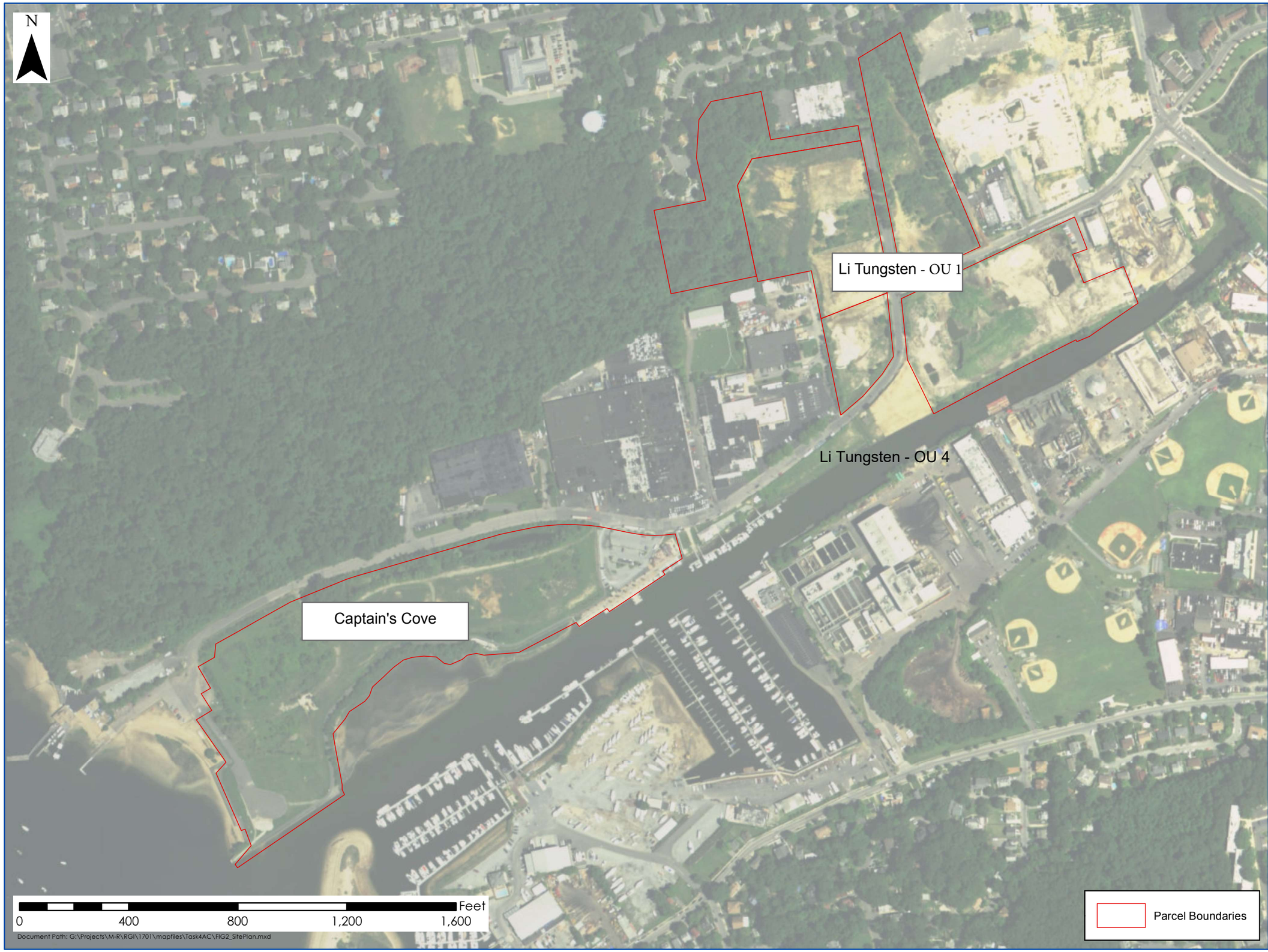
DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

Li Tungsten Site
Original OUs 1 and 2 Site Plan

Source: Googlearth.com
SCALE: Not to Scale

Figure 1

0283-10.1 - Li Tungsten Parcels Site Plan v2 December 11, 2012 2:44 PM



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Strategic Environmental and Engineering Solutions

P.W. GROSSER CONSULTING ENGINEER AND HYDROGEOLOGIST, P.C.

630 Johnson Avenue. • Suite 7
Bohemia • NY • 11716-2618
Phone: (631) 589-6353 • Fax: (631) 589-8705
E-mail: INFO@PWGROSSER.COM

DRAWING PREPARED FOR:

RXR Glen Isle Partners, LLC
625 RXR Plaza
Uniondale, NY

REVISION	DATE	INITIAL	COMMENTS

DRAWING INFORMATION:

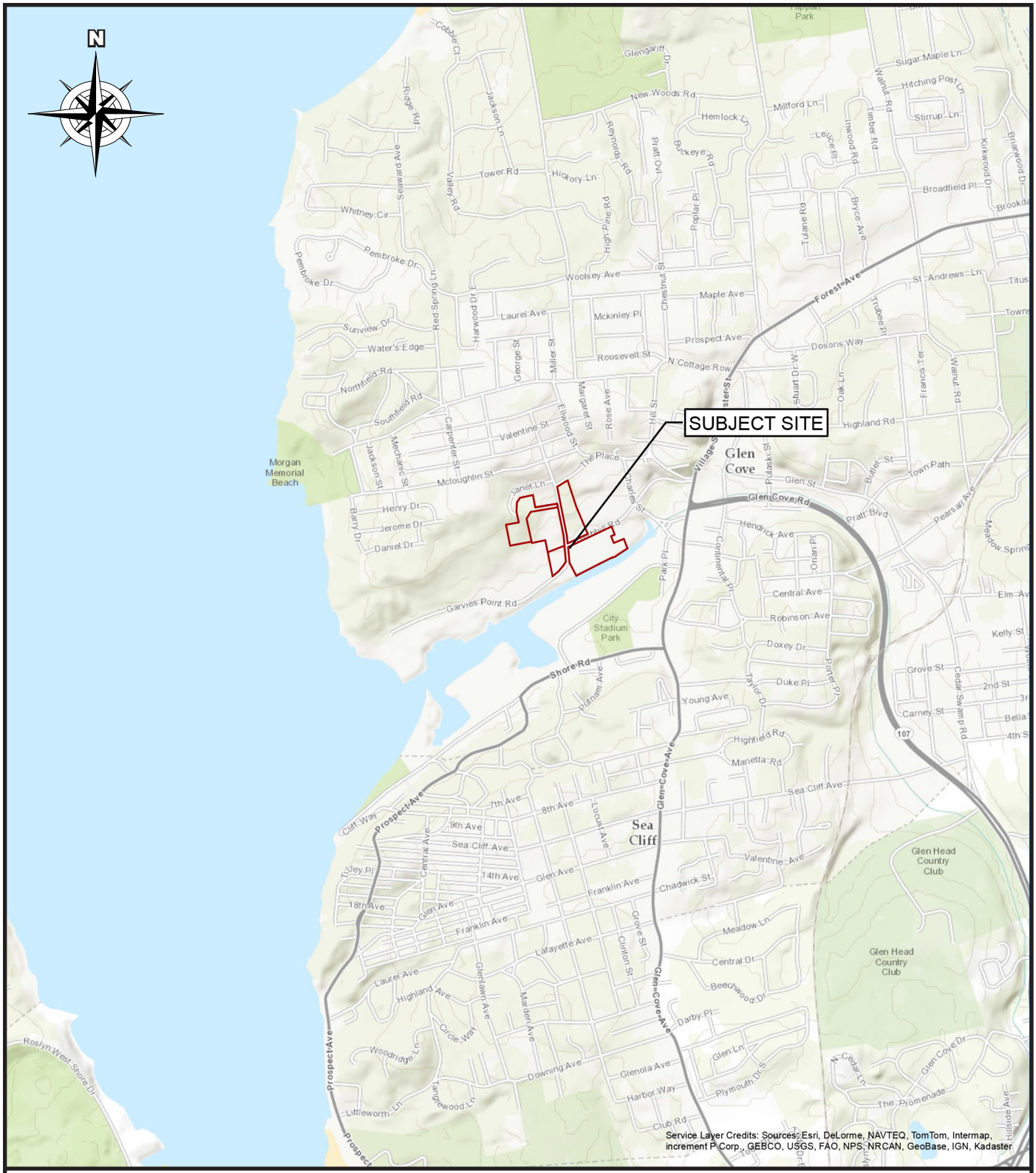
Project:	RGI1701	Designed by:	DE
Date:	6/16/2017	Drawn by:	TS
Scale:	AS SHOWN	Approved by:	DE

Li Tungsten - OU 1 & 4

Garvies Point
Glen Cove, NY

FIGURE NO:

2



0 ¼ ½ ¾ 1 Miles

D&B Engineers and Architects, P.C.

LI TUNGSTEN SITE GLEN COVE, NEW YORK

SITE LOCATION MAP

FIGURE 3

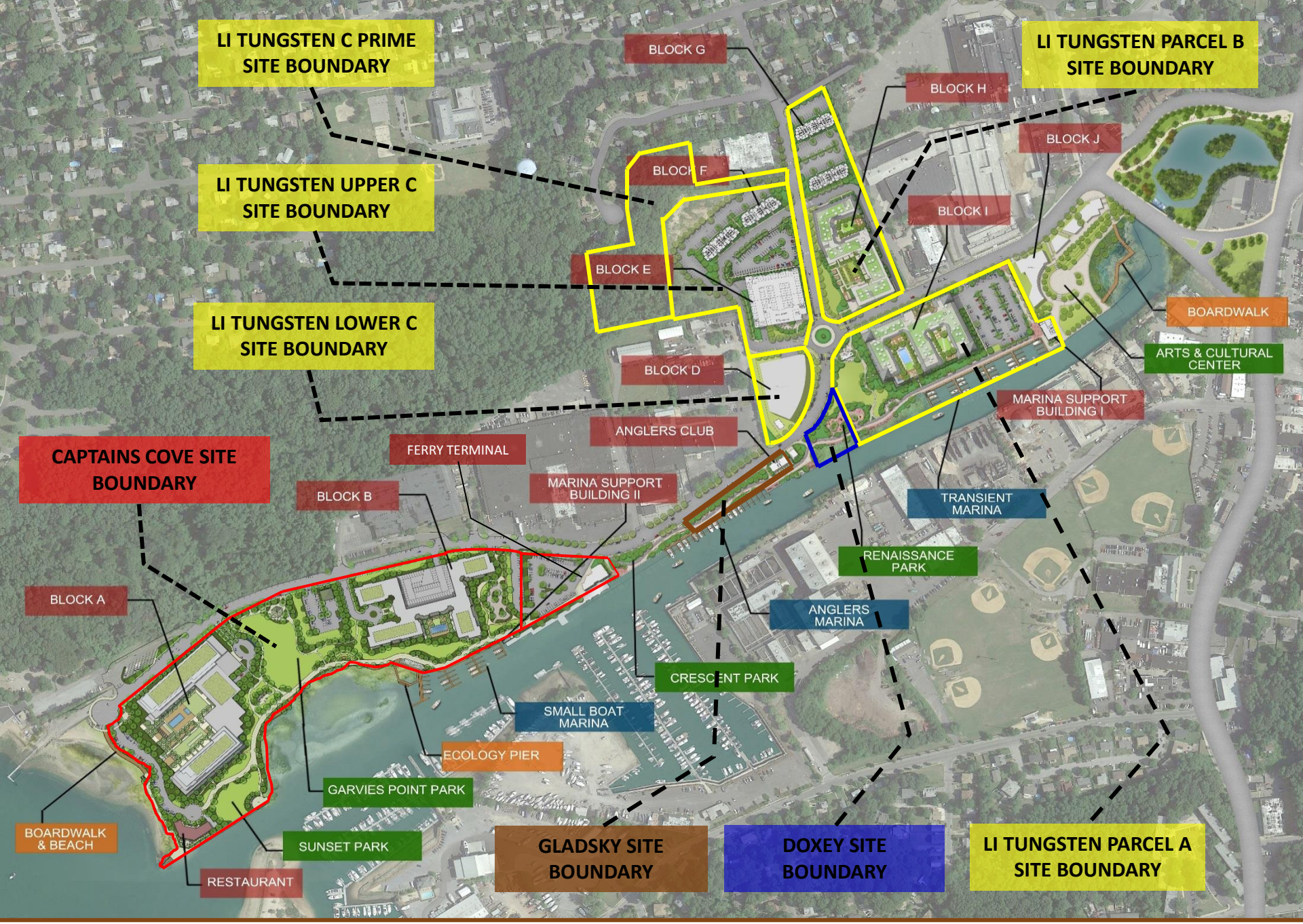


Figure 4 - Garvies Point Mixed-Use Waterfront Development & Vicinity Map (Including Superfund & Brownfield Sites) (Approximate – Not to scale)

LI TUNGSTEN CORP.

EST. POP. WITHIN A 1 MILE SITE BUFFER: 20779
(based on Census 2000 Block-level data)

SITE AREA IN ACRES 51.17

Figure 5 - Former Mattiace Groundwatet & Creek Sampling Locations (GC1 - GC 4)

SITE ID: NYD986882660
SITE NAME: LI TUNGSTEN CORP.
DATE OF MAP: Feb 26, 2007
RPM: ALS, ED

CITY: GLEN COVE
STATE: NY ZIP: 12801
CONG. DIST.: NY03

0.05 Miles

Contamination Polygon Source Document:
ROD 09-1999,Caps Cove ROD 09-1999,GlenCove CreekROD 03-2005

File: \\R2VABS\VOL1\ADMIN\r2npl\workload\sitepdfs\npl\mapbookQA91.mxd, 21-Feb-07 17:08, r2ltuser

N

The Place

Janet Lane

Charles Street

Tax Lot 619
Building G

Approximately 1,210 CY
dredge spoils placed.

Dickson Street

Tax Lot 620
Public Use Easement
Area Roads F and G

Tax Lot 22
Building F

Tax Lot 618
Building H

Herb Hill Road

Tax Lot 21
Building E

Tax Lot 23
Public Use Easement
Area NC Preserve

Tax Lot 17
Building I

Tax Lot 20
Public Use Easement
Area Road E

Approximately 225 CY
dredge spoils placed.

Approximately 28,565 CY
dredge spoils placed
(approximately 16,850 CY
within Building I +
approximately 11,715 CY
within Public Use Area).

Tax Lot 19
Lower C

Li Tungsten Superfund Site
Tax Lot 16
Public Use Easement Area 1

Doxey Site
Tax Lot 16
Public Use Easement Area 1

Gladsky Site
(Future Anglers Club)
Tax Lot 16
Public Use Easement Area 1

Garvies Point Road

Tax Lot 14
Public Use
Easement Area
Ferry Terminal

Tax Lot 13
Building B

Tax Lot 12
Building A

Captain's Cove Condominium Site
Tax Lot 10
Public Use Easement Area 2

Tax Lot 11
Restaurant

0 250 500 750 1,000 Feet

Approximate Dredge Spoils Placement Area
Road line
Public Roads - Covered
Building Footprint
Parking Lot
Service Driveway

Owner

Public Use Easement Areas (Glen Cove IDA)
RXR Glen Isle Partners, LLC

PWGC
CLIENT DRIVEN SOLUTIONS
P.W. Grosser Consulting, Inc.
630 Johnson Ave., Suite 7
Bohemia, NY 11716
Ph: 631-589-6353 • Fax: 631-589-8705
pwgc.info@pwgrosser.com

DRAWING PREPARED FOR:

RXR Glen Isle Partners, LLC
625 RXR Plaza
Uniondale, NY

REVISION	DATE	INITIAL	COMMENTS

DRAWING INFORMATION:

Project:	RGI1701	Designed by:	DE
Date:	7/16/2019	Drawn by:	TS
Scale:	AS SHOWN	Approved by:	DE

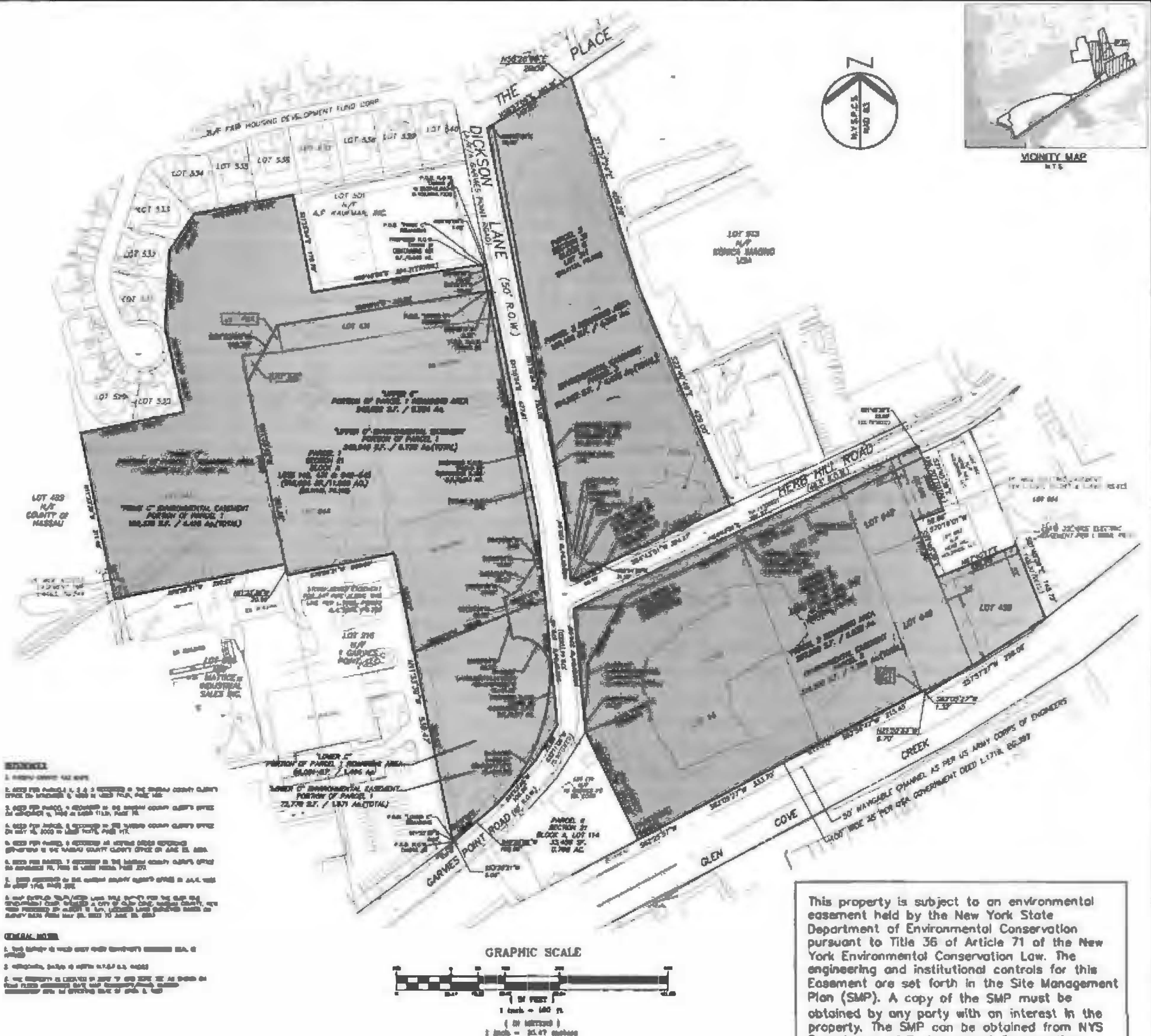
BUD-Approved Parcel A
Dredge Spoils

Garvies Point
Glen Cove, NY

FIGURE NO:

6

Document Path: W:\Projects\M-RI\RGI\1701\mapfiles\FIG02_GarviesPoint_Site.mxd



This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New York Environmental Conservation Law. The engineering and institutional controls for this Easement are set forth in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP can be obtained from NYS Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, New York 12233 or at "derweb@dec.ny.gov".

ENVIRONMENTAL EASEMENT AREA ACCESS

The DEC or their agent may access the environmental easement area as shown hereon through any existing street access or building ingress/egress access point.

THIS SURVEY IS CERTIFIED TO:

- The People of the State of New York acting through their Commissioner of the Department of Environmental Conservation.
- Glenn Cove Industrial Development Agency and/or City Of Glen Cove and each of their respective successors
- Chicago Title Insurance Company
- Fidelity National Title Insurance Company

PROFESSIONAL LAND SURVEYOR

PROJECT

GLEN ISLE - GLEN COVE WATERFRONT REDEVELOPMENT

SHEET TITLE

ENVIRONMENTAL EASEMENT FOR LI TUNGSTEN SITE
SECTION 31 BLOCK G LOT 311
DICKSON LANE, GLEN COVE, NEW YORK
SECTION 21, BLOCK A, LOTS 14 & 15
63 HERBHILL ROAD, GLEN COVE, NEW YORK
SECTION 21, BLOCK A, LOT 142
70 DICKSON LANE, GLEN COVE, NEW YORK
SECTION 21 BLOCK A, LOTS 541, 543, 648-650
HERBHILL ROAD, GLEN COVE, NEW YORK
SECTION 21, BLOCK A, LOT 458
45 HERBHILL ROAD, GLEN COVE, NEW YORK
SECTION 21, BLOCK A, LOT 542
VALLEY ROAD, GLEN COVE, NEW YORK
SECTION 21, BLOCK A, LOT 548
GARVIES POINT ROAD, GLEN COVE, NEW YORK

DATE 08/17/2014

SCALE 1"=100'

Figure 7

PWGC
Strategic Environmental and Engineering Solutions

P.W. GROSSER CONSULTING ENGINEER AND HYDROGEOLOGIST, P.C.

630 Johnson Avenue. • Suite 7
Bohemia • NY • 11716-2618
Phone: (631) 589-6353 • Fax: (631) 589-8705
E-mail: INFO@PWGROSSER.COM

DRAWING PREPARED FOR:

RXR Glen Isle Partners, LLC
625 RXR Plaza
Uniondale, NY

REVISION	DATE	INITIAL	COMMENTS

DRAWING INFORMATION:

Project:	RGI1701	Designed by:	DE
Date:	6/16/2017	Drawn by:	TS
Scale:	AS SHOWN	Approved by:	DE

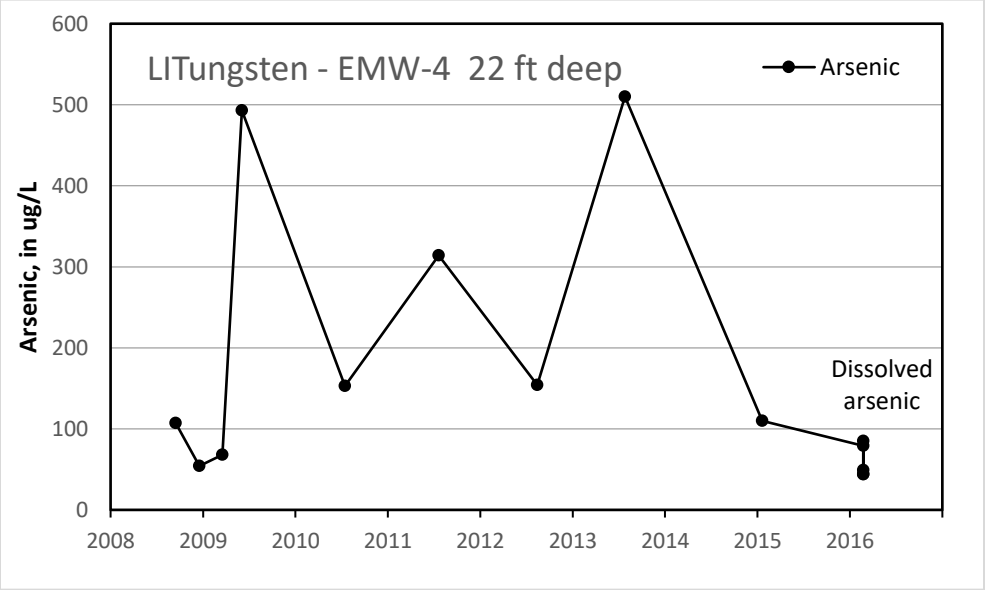
WELL LOCATIONS

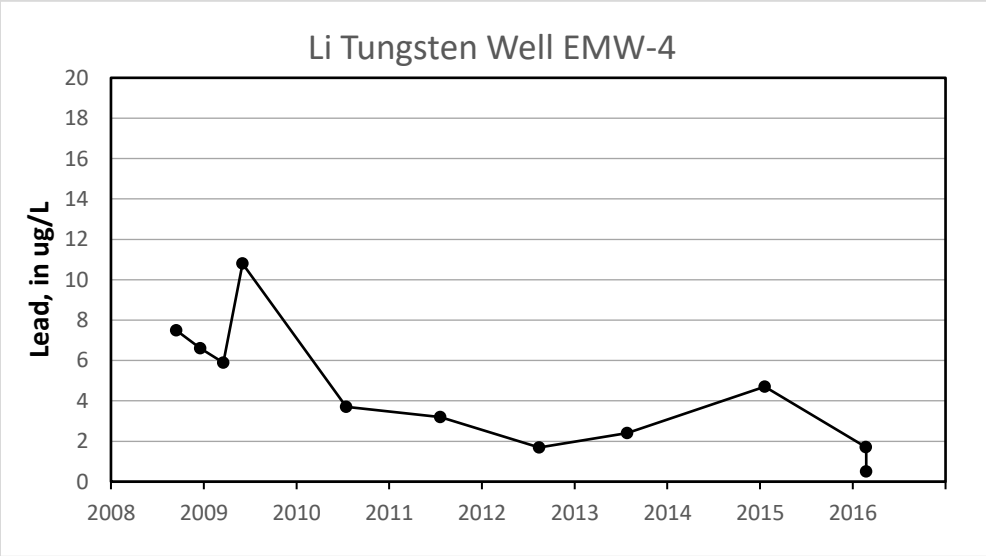
Li Tungsten
Glen Cove, NY

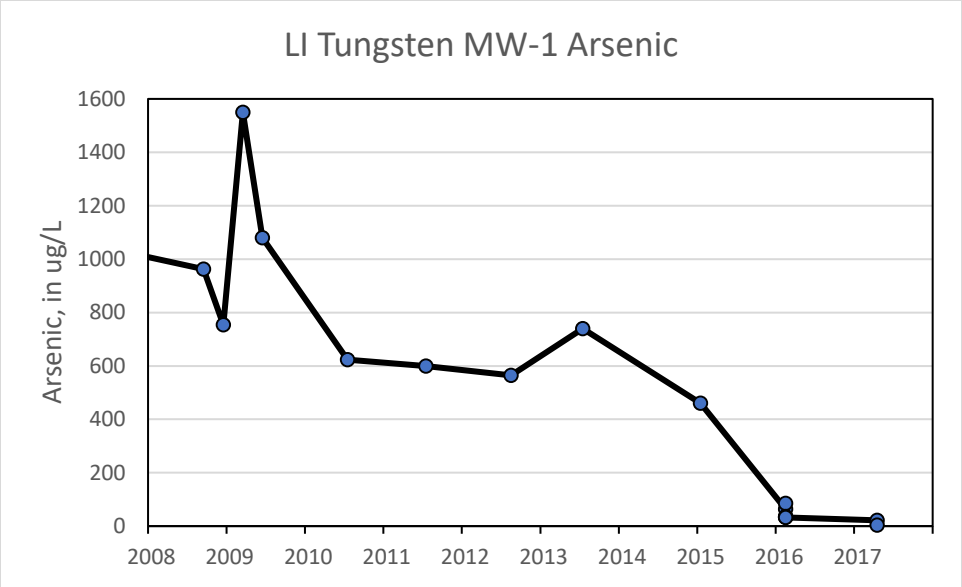
FIGURE NO:

8

Figure 9 - 2015 – 2017 Arsenic Concentration Trend (Wells EMW-4 and MW-1) and Lead Concentration Trend (Well EMW-4)






LI Tungsten MW-1 Arsenic
Arsenic, in ug/L
1600
1400
1200
1000
800
600
400
200
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017

APPENDIX D – TABLES

Table 1- Summary of Li Tungsten Site Inspections, Monitoring, Maintenance And Reporting Activities Requirements

Institutional Controls:	1. The Residential Controlled and Prime Controlled property (Parcel A, Parcel B, Parcel Upper C and Parcel C Prime) may be used for restricted residential, commercial, and industrial use
	2. The Commercial Controlled property (Parcel Lower C) may be used for commercial and industrial use
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP
	4. All ECs must be inspected at a frequency and in a manner defined in the SMP.
	5. The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Nassau County Department of Health 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 the Department.
	6. Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
	7. Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
	8. All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
	9. Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
	10. Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
	11. Access to the site must be provided to agents, employees or other representatives of EPA and the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.

	12. The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on **Figure 7**, and any potential impacts that are identified must be monitored or mitigated; and	
	13. Vegetable gardens and farming on the site are prohibited;	
Engineering Controls:	1. Cover system (once installed)	
	2. Soil Vapor Mitigation Systems (once installed).	
Inspections:		Frequency
1. Cover inspection		TBD
2. Soil Vapor Mitigation System(s) inspection		TBD
Monitoring:		
1. Groundwater Monitoring Wells MW-1, EMW-4, MP-6, PRA-6 and PRA-7		Annually
Maintenance:		As needed
Reporting:		
1. EC Inspection Report		TBD
2. Groundwater Monitoring Report		Annually
3. Periodic Review Report		Annually