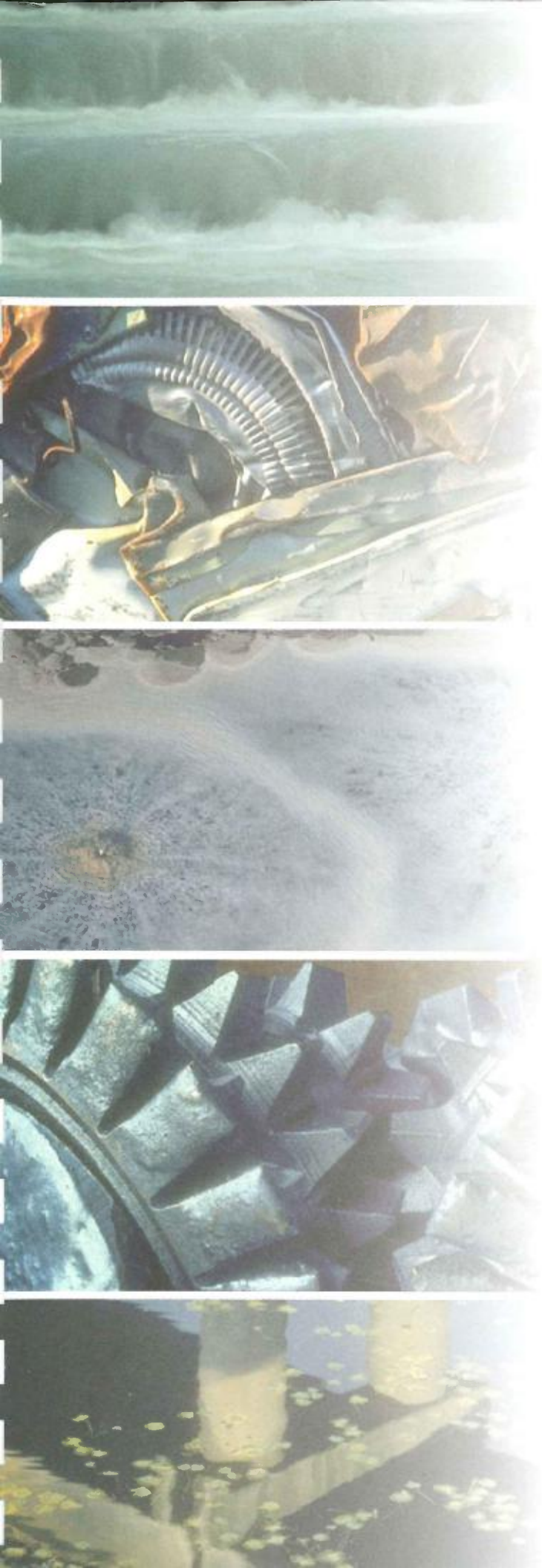

Site-Specific Cleanup Action Plan (SCAP)
Dock Street North Right of Way (ROW)
Thea Foss Upland Properties
Consent Decree 94-10917 6

Prepared for
The City of Tacoma
Public Work Engineering

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CONTENTS

CONTENTS (Continued)

Page

TABLES

FIGURES

SITE-SPECIFIC CLEANUP ACTION PLAN (SCAP)
DOCK STREET NORTH RIGHT OF WAY (ROW)
THEA FOSS UPLAND PROPERTIES
CITY OF TACOMA

INTRODUCTION

This document presents the Site-Specific Cleanup Action Plan (SCAP) for the Dock Street North Right of Way (ROW) located in Tacoma, Washington (Figure 1). The work described in this SCAP will complete the cleanup activities for Dock Street under Consent Decree 94-10917 6 between the Washington State Department of Ecology (Ecology) and the City of Tacoma (City). The cleanup of the Dock Street ROW south of East 15th Street is now generally complete, and the project is in the post-construction groundwater monitoring phase.

The project involves utility replacement and roadway upgrades in the Dock Street North ROW, in conjunction with area-wide property improvements for the Thea Foss Redevelopment effort. The ROW is an asphalt-paved roadway, and no changes to the current land use are anticipated. The primary concern with respect to environmental issues includes soil and groundwater quality during construction activities.

Area-Wide Cleanup

In 1994, the City voluntarily entered into an Administrative Order of Consent (AOC) with the United States Environmental Protection Agency (EPA) for cleanup of the Thea Foss Waterway, and the above-referenced Consent Decree with the Ecology for cleanup of the adjacent uplands. Cleanup work administered under the AOC and Consent Decree is closely related, and the respective in-water and upland cleanup areas share a common boundary at mean higher high water (MHHW) (MHHW is 11.8 elevation feet mean lower water [MLLW]). Ultimate compliance with provisions of both the AOC and Consent Decree will result in a cleanup action extending from the mouth to the head of the Thea Foss Waterway, and will include the adjacent City-owned uplands.

Site-Specific Cleanup Actions

This SCAP identifies the cleanup actions required for the Dock Street North ROW as defined by terms of the Thea Foss Redevelopment Cleanup Action Plan (CAP), Exhibit C to the Consent Decree. This SCAP was prepared following completion of a draft remedial investigation (RI) performed for the Dock Street

North ROW (Hart Crowser 2001a). The RI identifies site contamination issues and assesses the applicability of the Thea Foss Redevelopment CAP for purposes of planned construction and redevelopment activities. The RI includes an analysis of the nature and extent of contamination and historical sources. The RI also addresses the applicable cleanup alternatives for the site, given the identified environmental conditions and redevelopment scenarios. The final RI report is currently in preparation following resolution and disposition of review comments from Ecology.

This SCAP will be made available for public comment in accordance with WAC 173-340-600 of the Washington State Model Toxics Control Act (MTCA). Following the 30-day public comment period, a final SCAP will be issued and included as an amendment to the Consent Decree. The City of Tacoma will implement the final SCAP, with submittal of appropriate design, construction, and monitoring plans to Ecology for review.

SITE DESCRIPTION

The Dock Street North ROW includes the paved street area from East 15th Street to approximately 470 feet north of East 11th Street. As shown on Figure 2, the project also includes two additional areas associated with project development and cleanup:

- The triangular-shaped parcel located west of Dock Street and immediately north of East 15th Street; and

- The portion of the Dock Street ROW extending approximately 200 feet south of East 15th Street.

The latter area south of East 15th Street was added to the redevelopment project to facilitate necessary utility upgrades. Although not included with the draft RI for the Dock Street North ROW, this area will be incorporated by reference into the final RI. Site cleanup standards, alternatives, construction activities, and regulatory provisions addressed by this SCAP are applicable to the entire Dock Street North ROW project, including the portion south of East 15th Street.

The draft RI also identified approximately 700 feet of additional ROW north of the currently defined project area as part of the Dock Street North project. No construction or disturbance is currently planned in this area, however, and this 700-foot extension is expected to present minimal environmental concerns.

Historical Land Use

The Dock Street ROW was platted in the early 1880s and was originally tideland fronting a steep bluff to the west. Circa 1890, the tidelands were filled with material dredged from the current waterway area and material blasted from the adjacent hillside under the ownership of the Tacoma Land Company, then a subsidiary of the Northern Pacific Railroad Company. By 1893, stretches of Dock Street were planked roadways with railroad tracks. In 1910, Northern Pacific Railway transferred control of Dock Street to the City of Tacoma. By the late 1920s, certain portions of Dock Street were paved with concrete. No other uses of the Dock Street alignment, other than for transportation purposes, have been identified, with the exception of the triangular parcel near the south end of the study area.

Roadway

Given the lack of industrial development within the Dock Street ROW itself, historical filling beneath the ROW represents the most probable source of potential contamination over much of the project area. Fill materials were typically generated from local industrialized areas and may contain petroleum-hydrocarbons, related organic constituents, and metals typical of such areas.

Triangular Parcel

The triangular parcel north of South 15th Street was identified in 1896 as the site of McPower's lumberyard with refrigerated beer storage occurring in a building west of the lumberyard. Circa 1900, when the Oregon-Washington Railway Bridge was built across the Thea Foss Waterway, the access ramps for the span were located on the eastern side of the triangular Dock Street parcel.

Later tenants in the vicinity of the former lumberyard include unspecified merchants and storage (1910s), the Gladding McBean and Company brickyard (1920s), and a produce warehouse (1950s). A truck repair facility replaced the former beer storage building (southwest parcel corner) sometime before 1950. In the northern portion of the triangular parcel, at the foot of an access ramp for the bridge, a converted railroad car housed the Dock Street Diner from at least the 1940s into the 1950s. However, in the mid-1950s, these structures were demolished, the land was used for parking and storage of building materials. In the mid-1970s, and the bridge and its access ramps were dismantled.

Coal Gas Supply Lines Abandoned Drip Oil Tank

An abandoned coal gas supply line is located along the Dock Street ROW near South 15th Street. Segments of this abandoned line have also been encountered at other locations beneath Dock Street. In March 2000, a 1,100-gallon underground storage tank (UST) was removed near the intersection of the Dock Street and South 15th Street (Figure 2), and was thought to have been a drip oil tank for coal gas supply lines. Hart Crowser completed subsequent explorations to determine the nature and extent of petroleum hydrocarbons and related chemical constituents, including benzene (Hart Crowser 2002). As noted below, elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) were detected in soils near the location of the former UST and vicinity, but an additional source is suspected. Gasoline-range hydrocarbons, benzene, and related volatile constituents were detected in groundwater at several locations and may be related to the abandoned coal gas supply line as a possible source.

Asbestos-Insulated Pipe

During remediation of the Dock Street South ROW near Parcel 3, an abandoned steam line was uncovered and removed. The line was a 6-inch steel pipe encased in asbestos wrapping and surrounded by a 12-inch-diameter concrete pipe. Similar asbestos-wrapped piping could also potentially be encountered in the Dock Street North ROW during construction.

SITE CHARACTERIZATION

This section summarizes the physical characteristics and environmental quality of site soil and groundwater for the Dock Street North ROW. A more detailed discussion of physical subsurface conditions and the nature and extent of contamination is provided in the draft RI for Dock Street North, and a follow up memorandum (Additional Soil and Groundwater Samples Analytical Results Dock Street ROW near East 15th Street, Hart Crowser 2002). Locations of previous subsurface explorations are identified on Figure 2. Soil and groundwater samples with exceedances of applicable MTCA cleanup levels are listed in Tables 1 and 2, respectively. These results are also displayed on Figures 3 and 4.

Soil Characteristics and Quality

Subsurface Stratigraphy

Over much of the ROW area, soils encountered during previous exploration efforts consisted up to about 2 feet of subgrade fill beneath asphalt pavement. This material overlies silty sands believed to be dominantly dredge material from the late 1800s. Additional fill materials types are present near the triangular parcel area just north of East 15th Street. Prior to filling, a ravine was present along the approximate east-west alignment of East 15th Street. The ravine was filled over time, likely with material from the hillside to the west and/or other fill materials. The mixed fill materials encountered are quite variable and range from black silt to gravel. Wood was encountered in Strataprobes DSN-B08, DSN-B11 and DSN-B12, and brick debris was encountered in DSN-B08, DSN-B11, and DSN-B13. With the exception of trace amounts of coal near the upper contact of the dredge fill in probe DSN-B02, no evidence of subsurface debris was noted.

Soil Quality

Petroleum hydrocarbon-like odors were noted in soil samples during probing for DSN-B06, DSN-B07, DSN-B08 (location of the former truck repair yard), and DSN-B10. The depth occurrence of the odors was variable at each location. There were some low-level concentrations of oil-range hydrocarbons detected in a sample from probe DSN-B08, but the concentrations were below applicable MTCA cleanup levels.

Shallow soil samples from probes DSN-B12 and DSN-B14 contained concentrations of total carcinogenic PAHs (cPAHs) exceeding the MTCA Method B cleanup level of 0.137 milligrams per kilogram (mg/kg), expressed as benzo(a)pyrene equivalents (BaP). Total cPAH concentrations up to 15.13 mg/kg were calculated using the toxicity equivalent methodology presented in WAC 173-340-708(8). PAHs were also detected in a sample from probe DSN-B07, but at a concentration below the MTCA cleanup level. PAHs identified throughout the project area may be associated with petroleum hydrocarbons as well as non-petroleum sources such as burnt wood, coal-related materials, tar products, and coal ash. Locations and depths of soil quality criteria exceedances are shown on Figure 3.

The shallow soil sample from probe DSN-B07 contained arsenic at a concentration of 179 milligrams per kilogram (mg/kg). This concentration exceeded the MTCA cleanup level of 20 mg/kg based on natural background concentrations in soil.

Other analytical results were generally non-detect or below cleanup levels for PAHs, metals, and benzene, toluene, ethylbenzene, and xylenes (BTEX).

Groundwater Characteristics and Quality

Groundwater Conditions

Groundwater was encountered between depths of about 6 and 11 feet in borings and wells drilled in Dock Street. Net groundwater flow in the vicinity of Dock Street is toward the Thea Foss Waterway and water levels in the fill between Dock Street and the waterway are influenced by the tide. Based on experience at other sites along the waterway, the effects of the tide are expected to be significantly dampened beneath Dock Street. A water level fluctuation on the order of 0.5 foot was observed in monitoring wells DSN-MW01 and DSN-MW02 during high and low tide measurements made on March 20 and 21, 2001.

Groundwater Quality

Benzene was detected in a groundwater sample from Strataprobe DSN-B08 at a concentration of 170 micrograms per liter (µg/L), exceeding the MTCA Method B cleanup level of 71 µg/L. Low concentrations of toluene (2 µg/L) and xylenes (5.7 µg/L) were also detected in exploration DSN-B08. Gasoline-range hydrocarbons and one or more BTEX constituents were also detected in DSN-B09, DSN-B10, DSN-B11, and DSN-B14, but below applicable MTCA cleanup levels. A grab groundwater sample from exploration DSN-B09 located just north of East 15th Street was non-detect for benzene, indicating that any benzene plume is not very wide-spread downgradient from the DSN-B08 location where benzene exceeded the MTCA cleanup level.

The distribution of gasoline and BTEX detections in groundwater does indicate an obvious source of contamination. Gasoline and BTEX detections in groundwater also do match up well with petroleum hydrocarbon detections in soil. The distribution of these constituents indicates that coal gas line may be the most likely source, with the storm line acting as a preferential flow path.

Arsenic concentrations in DSN-MW01, DSN-MW02, and DSN-B08 (1.0, 1.8, and 4.8 µg/L, respectively) also exceeded the groundwater cleanup level of 0.14 µg/L. PAHs were detected in DSN-B12 at concentrations well below applicable cleanup levels.

SITE CLEANUP STANDARDS

Soil Cleanup Standards

The cleanup standards for the site soils were developed according to Chapter 173-340 WAC and are defined in the Thea Foss Upland Redevelopment Consent Decree and Cleanup Action Plan (State of Washington 1994). On February 12, 2001, the cleanup standards were updated according to the MTCA Amendments. For the purposes of this SCAP, the cleanup levels reflect updates from the MTCA Amendments, as provided for by the Consent Decree. Applicable standards are based on protection of groundwater and surface water, and on estimates of reasonable maximum exposure expected for protection of human health. In general, the residential use scenario as defined in MTCA represents the reasonable maximum exposure scenario for direct contact in the development site areas because of the potential for residential uses.

Cleanup levels for the chemicals of concern identified in Dock Street soils including arsenic, benzene, and cPAHs are discussed in the following paragraphs.

Arsenic

The arsenic soil cleanup level of 20 mg/kg, which is based MTCA Method A for direct contact and protection of groundwater, as adjusted for natural background for soil.

Benzene

The cleanup level for benzene in soils is 34.5 mg/kg based on groundwater protection under MTCA Method B. No benzene was detected in site soils during previous investigations; however, benzene was detected in groundwater.

Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)

The cleanup level based on residential contact exposures for individual cPAH compounds is 0.137, or 1 mg/kg for the sum of cPAH compounds using the toxicity equivalent methodology presented in WAC 173-340-708(8).

Contingency Petroleum Hydrocarbon Cleanup Levels

Total Petroleum hydrocarbons (TPHs) have not previously identified as constituents of concern for the Dock Street North ROW. As a contingency, cleanup levels are provided for petroleum hydrocarbons if encountered during

excavation. For planning purposes, this SCAP establishes the following contingency cleanup levels for TPH based on MTCA Method A screening levels:

Gasoline-Range TPH (Without BTEX)	100 mg/kg
Gasoline-Range TPH (With BTEX present)	30 mg/kg
Diesel-Range TPH	2,000 mg/kg
Heavy Oil-Range TPH	2,000 mg/kg
Mineral Oil-Range TPH	4,000 mg/kg

Groundwater Cleanup Standards

Groundwater cleanup levels are based on the protection of marine surface water including protection of aquatic life (marine chronic criteria; Chapter 173-201A WAC) and the protection of human health from consumption of aquatic organisms (40 CFR 131). Protection of surface water is applicable for the site since groundwater in the fill is not considered a current or future potable drinking water source. It is also unlikely that any contaminant in the shallow groundwater will be transported to an area where groundwater is a current or potential source of drinking water. Finally, there are no apparent impacts to the waterway from upland groundwater. Given the 90-plus years since the fill soils were placed, and the available groundwater quality data, the soil contaminants in Dock Street are not expected to impact groundwater or surface water quality in the future.

The distance from Dock Street to the waterway and the low mobility of the identified contaminants suggests there are no impacts to groundwater (Hart Crowser 2001a). In addition, groundwater in the fill is not a current drinking water source, nor is considered to be a future drinking water source based on the high dissolved solids content of the water as a result of saline mixing. It would be difficult to develop a drinking water source because of the potential for saline intrusion that would occur with any groundwater pumpage (i.e., salt water would be pulled further into the aquifer). Municipal controls restrict the placement of drinking water wells in the fill aquifer and wells presently using the deeper aquifer as a drinking water source are in areas much removed from the project area.

The following cleanup levels are established for arsenic, benzene, cPAHs, and a contingency for TPH. Contingency TPH cleanup levels are based on Method A levels for protection groundwater as a default.

Arsenic	0.14 µg/L
cPAHs	0.031 µg/L
Gasoline-Range TPH (Without BTEX present)	1,000 µg/L
Gasoline-Range TPH (With BTEX)	800 µg/L
Diesel-Range TPH	500 µg/L
Heavy Oil-Range TPH	500 µg/L
Mineral Oil-Range TPH	500 µg/L

CLEANUP ACTION PLAN

The MTCA requires that cleanup actions to protect human health and the environment comply with cleanup standards and other applicable state and federal laws, and provide for compliance monitoring. The Thea Foss Waterway Redevelopment CAP defined in Exhibit C of the Consent Decree was developed in accordance with these requirements. In addition to the requirements of this SCAP, the Consent Decree calls for compliance with property redevelopment plans, and applicable or relevant and appropriate requirements (ARARs).

Ecology has determined that the cleanup actions specified in the area-wide Consent Decree CAP apply to the Dock Street North site based on the results of the draft RI this project. The cleanup actions identified in the Consent Decree that are potentially applicable to the Dock Street ROW include:

- Contaminated soil will be isolated below 3 feet of clean soil cover, a building, or a pavement cap.
- If small quantities of soil occur, which are defined and localized, can be readily accessed, are technically and economically treatable, and pose a significant threat to human health and the environment were the soil to

remain, they will be removed for off-site disposal. Such soils will identified based on exceedances of remediation levels derived from Reasonable Maximum Exposure (RME) levels, as defined below in this SCAP.

- For utility installations, the trenches will be constructed in accordance with state and city standards with the additional requirement that 1 foot of overexcavation occur, or that a geofabric lining be used to provide a clean perimeter around the outside of the utility trench.

- In all cases where residual contamination above MTCA cleanup levels remains following remediation, institutional controls will be implemented to control future excavations, provide for long-term maintenance of the surface cap, and potentially provide for routine environmental monitoring.

To facilitate environmental cleanup, one of the strategies adopted by Ecology and the City in the Consent Decree CAP was to accomplish cleanup in the context of the site redevelopment. This is intended to facilitate cleanup and ensure a timely and cost-effective process. To assess appropriate cleanup actions for the Dock Street North ROW, improvements associated with the area-wide redevelopment were considered.

Proposed Redevelopment Plans

The current plan for the Dock Street ROW calls for replacing, upgrading, and/or installing several utility lines, and regrading and replacing the roadway. This includes installation of storm sewer, sanitary sewer, and water line utilities. A joint utility trench, with a transition area to existing utilities adjacent to the Municipal Dock area, will be completed. Following utility installation, the street will then be regraded and completed with an asphaltic-concrete pavement cap. In general, redevelopment grades will require filling Dock Street above the present elevation.

Cleanup Action Alternatives

The applicable cleanup alternatives identified for Dock Street in the Dock Street Site-Specific Remedial Investigation report include:

Alternative 1—No Action

No action is an applicable alternative where no contamination is identified and/or where no utility or re-paving work is planned and the existing roadway serves as a suitable cap. The existing soil and groundwater quality data indicate

the identified contamination beneath Dock Street does not pose a threat to human health or the environment under existing conditions.

Alternative 2—Isolation by Cap or Cover

Isolation by cap or cover is applicable and is provided in many areas by the existing pavement. Isolation by pavement cap will be provided into the future by the new roadway pavement, sidewalks, parking area, and/or soil cover. Figure 5 presents the areas where isolation by cap or cover will occur under the Dock Street improvement plans.

Alternative 3—Excavation and Treatment

Excavation and treatment of soils are applicable in areas where affected soils are to be excavated for utility installation, relocation, and/or upgrade. The Consent Decree CAP specifies the cleanup required for utility trenches. In addition to meeting state and federal standards for construction, trenches are to be overexcavated to allow for a minimum 1-foot perimeter of clean soil outside the standard trench dimensions, or be lined with a geofabric, to limit future exposures. This alternative applies to excavated soils containing constituent concentrations in excess of the Remediation Levels, or soils that cannot be reused for structural fill for Alternative 2 that contain constituent concentrations in excess of MTCA cleanup levels.

Soil Remediation Levels

The presence of a pavement cap and implementation of institutional controls will prevent direct contact exposures to children under a residential scenario. However, the Consent Decree requires that "hot spot" soils which pose a significant threat to human health and the environment be remediated. To evaluate what soils pose a significant risk, it is necessary to establish remediation levels. Remediation levels are set using alternate RME scenarios that reflect the highest exposure that can occur under current and potential future site exposure considering, among other factors, the potential for institutional controls to fail.

The alternate RME for the Dock Street North site would be based on protection of construction or utility workers. By virtue of its use as a roadway, now and into the future, Dock Street has the characteristics similar to an industrial property (as defined in WAC 173-340-745(b)(i)) including:

- People do not live or grow food there;
- Access is limited;

- Operations are characterized by noise, odors, and truck traffic; and
- The area is paved.

The only contact with subsurface soils would be through utility work, thus the alternate RME scenario for Dock Street is industrial by nature. Although in close proximity to residentially zoned property, the adjacent land use will not include any ground floor residential use. In addition, the hazardous substances are relatively immobile, and access to site soils is virtually impossible given use as a roadway. Furthermore, institutional controls will be implemented for this and the other upland properties under this Consent Decree.

Dock Street is intended to remain as a ROW into the future with subsurface utilities supporting the adjacent waterfront properties. The only potential for future exposure to soil contamination would be for construction workers during subsurface utilities work. Therefore, the alternate RME level would represent an adult worker with limited ingestion rates because of engineered controls that are inherent in a permanent roadway. From the perspective of protecting human health through direct contact exposures, soil remediation levels based on industrial land use represents the alternate RME.

Arsenic

The MTCA Method C industrial soil cleanup level for arsenic as a carcinogen is 87.5 mg/kg. The Method C industrial soil cleanup level for arsenic is based on ingestion of soil. As discussed above, the future construction worker at Dock Street is assumed to have an exposure frequency and duration that is less than the MTCA industrial worker. Therefore, an arsenic remediation level of 87.5 mg/kg based on industrial exposures is expected to represent protective criteria (i.e., more stringent and conservative than is likely to occur given the frequency of utility repairs and upgrades).

Benzene

The MTCA Method C cleanup level for benzene as a carcinogen is 2,390 mg/kg. The Method C cleanup level is based on ingestion of soil.

cPAHs

The MTCA Method C cleanup level for cPAHs, 18 mg/kg as a BaP equivalent. This cleanup level applies to individual cPAHs, as well as the sum of all cPAHs based on the toxicity equivalent methodology. These criteria are more stringent and conservative than is likely to occur given the frequency of utility repairs and

upgrades. The future construction worker is expected to be exposed to site soils only during initial installation of utilities and during utility repairs and upgrades.

Petroleum Hydrocarbons – Contingency Remediation Level

For planning purposes this SCAP establishes contingency remediation levels for TPH in the gasoline and heavier hydrocarbon ranges. The primary pathways of concern are soil to groundwater for gasoline-range TPH, and direct contact for the diesel-range and heavier fractions. To address these pathways, the following contingency remediation levels are established:

Gasoline-Range TPH (Without BTEX present)	1,000 mg/kg
Gasoline-Range TPH (With BTEX present)	300 mg/kg
Diesel-Range and Heavier TPH	20,000 mg/kg

The contingency remediation levels represent 10 times the contingency cleanup levels derived from MTCA Method A. The lack of free phase product in site groundwater during the previous site investigations further supports this approach. If encountered, soils with visible sheen or other indications of product phase petroleum hydrocarbons would be subject to removal and off-site treatment and/or disposal under the contingency remediation levels.

Detailed Description of Selected Alternative for Dock Street North

The selected alternative for Dock Street North includes excavation of impacted soils and isolation by cap or cover. Isolation will occur with new roadway pavement, soil cover and sidewalks, and asphalt parking. These elements will provide a cap to isolate future exposures to subsurface soils. In addition, the installation of new utilities and regrading will require removal of some of the excavated soils.

The cleanup action for the Dock Street ROW is depicted in plan view on Figure 5 and in cross section on Figure 6. Specific elements of the cleanup design are discussed below.

Site Preparation

Site preparation for Dock Street utilities and grading will consist of the following:

- Breaking up existing asphalt or sawcutting asphalt for utility construction and cut areas during grading. Debris will need to be removed and recycled or disposed of in permitted facility; and

- Abandoning and replacing, or modifying affected monitoring wells. Monitoring wells that will not be used for future monitoring will be abandoned in accordance to Chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells. Wells that will continue to be monitored will be protected during construction, with surface monuments modified as necessary.

Excavation of the Dock Street Soils

Soils will be excavated for utility trenches and regrading as called for in the roadway improvement design drawings. Three technologies were considered for soils excavated for the Dock Street improvements. These include using excavated soils as backfill, treating contaminated soils using thermal desorption as applicable, and landfilling of unsuitable materials. Each of these are discussed below.

Technology 1 - Backfill of Excavated Soils

It is expected that most of the soils excavated during Dock Street improvements will be placed back beneath the roadway. It is important to note that the new storm and water pipelines will be installed in the same or nearby locations as the existing pipelines. It is expected that the soils within these trenches will be generally clean and free of debris.

Replacement of the excavated soil as backfill is essentially a reuse and recycling alternative. Reuse and recycling are preferred alternatives under MTCA 173-340-360 if the residual constituent concentrations are below the remediation levels established in this SCAP.

Technology 2 - Thermal Desorption of Excavated Soils

Soil recycling through the use of off-site thermal desorption is a feasible soil treatment alternative for soils that exceed remediation levels for cPAHs, and contingency remediation levels for petroleum hydrocarbons. This technology involves heating the soil to temperatures of up to 900 to 1,100 degrees Fahrenheit, causing volatilization of contaminants. Soil exiting the treatment unit must meet MTCA Method A cleanup levels before reuse.

Thermal desorption is a preferred treatment because it is a permanent solution in that the contaminants are destroyed. There are, however, restrictions placed upon incoming soils by the facilities that are relevant for Dock Street soils. The soils must have a generally low fines content and water content.

Technology 3 – Off-Site Landfilling of Excavated Soils

Some soil may require landfilling where there is substantial debris and/or where constituent concentrations exceed remediation levels. Excavated soils with high silt and/or water contents will also require landfilling, along with other non-recyclable debris.

Handling of Excavated Soil

The preferred alternative for handling soil excavated from the trenches will be to replace the soil as trench backfill, as practical. Excavated soil from existing utility trenches is expected to be relatively clean. Soils tested outside of the utility trenches during the remedial investigation generally cleanup criteria as discussed above (i.e., below MTCA cleanup levels). However, soil located outside of the existing utility backfill is more likely to contain contaminants typical of the area historical development fill. Most of the soil tested in this area was dredge fill, which is expected to contain minimal, if any, contamination. It is expected that much of the soil excavated for the utilities beneath Dock Street can be replaced as trench backfill if structurally suitable.

Excavated soils will be stockpiled separately based on the field screening using vapor analyzers, visual, odor, and common-sense criteria. Commercially available field screening kits may also be used, as applicable. Field personnel should take note of any soils with a sheen, odor, or discoloration and should be aware of the possibility that abandoned coal gas lines and USTs, or abandoned asbestos-encased steam pipes may be encountered. Apparently suitable utility backfill will be segregated from soils not appropriate for backfill. Debris materials and any obvious waste material would not be suitable for backfilling. Soils not used for backfill will be sampled and chemically characterized to determine appropriate disposition. Stockpiled soils that appear to contain waste materials would be sampled and analyzed at a minimum for arsenic, benzene, PAHs, and petroleum hydrocarbons (as applicable based on the source of the material and field indicators). Soils with constituents exceeding remediation levels will be thermally treated and recycled, or landfilled based on the criteria discussed above.

Dewatering

Utility excavations may potentially encounter groundwater, and dewatering may be required depending on the trench construction method(s) used. Dewatering water will require special handling considerations and a permit will be needed if discharged to the City sanitary sewer lines. It is expected that temporary holding tank for settling will be required as a minimum pre-treatment measure prior to sanitary sewer discharge. Although a less likely disposal scenario, construction dewatering water discharged to the waterway or to ground would require additional regulatory approvals. Appropriate water quality characterization sampling and analysis would be conducted prior to discharge under any of the scenarios described.

Geotechnically Unsuitable Backfill

Another consideration is debris if encountered in mixed fill material. Brick, glass, asphalt, wood, and concrete debris were noted in previous explorations in Dock Street. Separation of these materials and alternate disposition may be required to meet project specification requirements, with associated recycling, or appropriate off-site disposal.

Geotechnically unsuitable soils typically contain excess silt or other materials and cannot be meet compaction specifications for backfilling purposes without reconditioning. Reconditioning of geotechnically unsuitable soil is an alternative to landfilling, but would require specialized soil handling (e.g., a staging area to spread soils for drying and/or for adding admixtures to the soil to make them reusable, stockpiling and chemical testing, etc.). Reconditioned soil would then need to meet the approval of a geotechnical inspector for reuse, as well as meet remediation levels for individual constituents. Under these conditions, geotechnically unsuitable soils could be used as backfill. Alternatively, these soils could be used at the Tacoma landfill as daily cover, or hauled to a suitable off-site disposal facility.

Pavement Cap and Soil Cover

The final street pavement and areas of sidewalk with soil cover will act as a cap to physically isolate residual soil contaminants present in the subsurface. The cap will prevent direct contact with subsurface soils and limit future infiltration of precipitation over much of the Dock Street North ROW area.

Stormwater Drainage

Stormwater collection is an integral part of the cap design for Dock Street as well as for the area-wide cleanup efforts. Dock Street is planned to slope westward at a 4 percent grade to direct roadway runoff away from the waterway. Roadway runoff from Dock Street will then be routed through catch basins to the storm sewer lines beneath Dock Street.

Stormwater drainage from the redevelopment sites will also be directed to the storm sewer beneath Dock Street. Replacement and upgrade of the existing storm drains within the Dock Street ROW are an important part of the stormwater management system for the cleanup of the waterfront property along the west side of Dock Street.

Compliance Monitoring

Compliance monitoring is performed to confirm that human health and the environment are protected during the construction, and operation and maintenance of the cleanup action. Compliance monitoring also confirms that the cleanup action has attained the cleanup standards prescribed by the cleanup plan and confirms the long-term effectiveness of the remedial action. Compliance monitoring will be performed according to the criteria specified in WAC 173-340-410 and -360(8) and the Consent Decree as follows:

- Protection Monitoring will be implemented during construction by ensuring that site workers are appropriately trained in health and safety and that a health and safety and contingency plans for encountering hazardous materials are available during construction. Soils that are obvious waste materials will be stockpiled on an adjacent property with appropriate contact and runoff controls.

- Performance Monitoring will be performed during construction on all soils where suspect contaminants are identified during excavation. Suspect soils will be stockpiled separately and chemically analyzed for constituents identified in this SCAP that are suspected to be present. Appropriate treatment and/or disposal will be performed on excavated soils in accordance the Consent Decree, this SCAP, and with applicable facility permits.

- Confirmation Monitoring will be performed by collecting groundwater monitoring data following completion of the roadway pavement. The groundwater monitoring will ensure that the disturbance of the soil during construction and the replacement of excavated fill soils will not cause future

leaching of contaminants to groundwater. A compliance monitoring plan will be submitted as part of the remedial design documents.

JUSTIFICATION OF CLEANUP ALTERNATIVE

MTCA requires that any alternative selected for site remediation must meet, as a minimum, four threshold criteria:

- Protect human health and the environment;
- Comply with cleanup standards;
- Comply with applicable state and federal laws; and
- Provide for compliance monitoring.

In addition, this SCAP shall use permanent solutions to the maximum extent practicable and consider public concerns. The selected alternative meets these criteria as described below.

Protection of Human Health and the Environment

The cleanup action protects human health and the environment by eliminating the potential for direct contact with subsurface soils. Besides the limited use of streets by pedestrians, the roadway, sidewalks, and soil cover itself will prevent contact with contaminated soils. As the preferred alternative, geotechnically suitable soils excavated from the site will be used as backfill unless they contain constituents exceeding remediation levels presented herein. Soils contaminated above remediation levels will be stockpiled and treated or landfilled, eliminating future direct contact concerns.

Groundwater quality in Dock Street has been impacted beyond background levels, but the data indicate that Dock Street soils are not acting as a source of contamination to groundwater. Thus backfilling with excavated fill soils should be protective of groundwater quality. Surface water runoff will be routed westward to storm drains. The cleanup action thus eliminates potential impacts to surface waters and marine sediment.

Compliance with Cleanup Standards

The selected cleanup alternatives were chosen to comply with the Consent Decree and the RME scenario expected into the future.

Compliance with Applicable or Relevant and Appropriate Requirements

Applicable or relevant and appropriate requirements (ARARs) associated with the following laws and regulations apply to the Dock Street North ROW:

Federal Laws and Regulations

- 33 USC 1251 *et. Seq.* (Clean Water Act) and 40 CFR 230;
- 40 CFR 131 Subpart D (Federally Promulgated Water Quality Standards);
- Subtitles C and D - 42 USC 6921-6949a and 40 CFR Part 268 (Resource Conservation and Recovery Act - RCRA);
- 20 CFR Subpart 1910.120 (Occupational Safety and Health Act); and
- Executive Order 11988 (40 CFR Part 6, Appendix A - Flood Plain Management).

State Laws and Regulations

- Chapter 70.105 RCW (Washington State Hazardous Waste Management Act) and Chapter 173-303 WAC (State Dangerous Waste Regulations);
- Chapter 90.48 RCW (State Water Pollution Control Act);
- Chapter 90.70 RCW (Puget Sound Water Quality Act);
- Chapter 173-201A WAC (Water Quality Standards for Surface Waters of the State of Washington);
- Chapter 173-14 WAC (Shoreline Management Act);
- Chapter 75-20 RCW (State Hydraulic Code) and Chapter 220-11 WAC (Hydraulic Code Rules);
- Chapter 70.95 (Solid Waste Management - Reduction and Recycling);
- Chapter 70.94 RCW (Washington Clean Air Act);
- Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Wells);

- Chapter 43.21C RCW (State Environmental Policy Act) and Chapter 197-11 WAC (State Environmental Policy Act Rules); and

- Washington Industrial Safety and Health Act (WISHA).

Cleanup activities described in this SCAP comply with the ARARs of the laws and regulations listed above. Other administrative approvals and authorizations which are separate from substantive requirements will be complied with as part of the permitting process.

Compliance Monitoring

Compliance monitoring will be provided during and post-construction as described above. Protection monitoring will be implemented during construction, and performance monitoring will include implementation of treatment or disposal of obvious waste material that is encountered. Post-construction confirmation groundwater monitoring will be performed to ensure that groundwater quality is not adversely impacted by construction activities.

Short-Term Effectiveness

The short-term effectiveness considers how the cleanup action impacts human health and the environment during the construction phase and prior to the attainment of cleanup standards. The primary risk during construction for Dock Street is workers coming in direct contact with contaminated soils during excavation and grading. The soils sampled to date do not indicate that constituent concentrations that would exceed construction work risk levels are present. In addition, exposures to contaminated materials that may be encountered during construction can be addressed through a worker health and safety plan, reducing dust generation by watering, and by constructing on-site drainage and erosion control measures.

Additional Criteria

Long-Term Effectiveness

The long-term effectiveness of the cleanup action is evaluated in terms of the magnitude of residual risk and the adequacy and reliability of the cleanup action. The residual risk will be dramatically reduced, or even eliminated, by capping the site with asphalt, concrete, and fill (to raise grade) for the Dock Street construction. In addition to the risk reduction offered by capping, the cleanup action further reduces residual risk by implementing treatment and/or disposal options for contaminated excavated materials.

Permanent Reduction of Toxicity, Mobility, or Volume

This evaluation criterion addresses the preferential implementation of treatment technologies that permanently and significantly reduce toxicity, mobility, and volume of the hazardous substances present. Given the nature of the expected fill materials and their age, a capping alternative is appropriate. Soils with cPAH, benzene, and petroleum hydrocarbon concentrations exceeding their applicable remediation levels will be considered for treatment using a thermal desorption technology. Thermal desorption reduces the toxicity, mobility, and volume of contaminants in soil permanently.

Implementability/Technical Feasibility

The technologies chosen in the cleanup action have been implemented and used reliably elsewhere to remediate contaminated soil with similar characteristics.

Cost

Backfilling the trenches with excavated soil will be the most cost-effective and practicable alternative for the soils based on the soil quality measured to date. Given the long-term use of the Dock Street corridor as a ROW, no significant additional risk reduction is achieved by treatment and/or disposal of all excavated soils. Given that soils are treated (as possible) where the applicable remediation levels are exceeded, and that the contaminants are isolated by a cap, the preferred alternative will be protective of human health and the environment and at the same time provide the most practicable approach to cleanup.

SUBSTANTIVE REQUIREMENTS FOR PERMITS

Persons conducting cleanup under a MTCA consent decree are exempt from having to obtain certain state and local permits or approvals. Instead, the substantive requirements of those permit laws must be complied with as part of the MTCA cleanup. The following are the applicable substantive requirements:

Community Concerns, WAC-340-360(5). State and community acceptance will be evaluated during public review and comment on the draft SCAP. The final SCAP will be modified based on the comments received.

Ecology, Chapter 90.48 RCW, Water Pollution Control. Construction design and implementation shall include measures to prevent any discharge into any

waters of the state any organic or inorganic matter that shall cause or tend to cause pollution of such waters according to the determination of Ecology.

Ecology, Chapter 70.105 RCW, Hazardous Waste Management. Remedial action shall not allow for handling and disposal of dangerous wastes in any manner not in compliance with the Act and Chapter 173-303 WAC.

State Environmental Policy Act (SEPA - Chapter 43.21C RCW) and SEPA Rules (Chapter 197-11 WAC). Rules on the integration of MTCA and SEPA provided in WAC 197-11-250 through -268 list applicable requirements for the project. Implementation of the site remediation action triggers SEPA environmental review (e.g., SEPA checklist), threshold determination, and public notice. Pursuant to WAC 197-11-060(5) and WAC 197-11-630, a review was done to ensure compliance of the remedial action with SEPA. Ecology issues a Mitigated Determination of Nonsignificance was issued for the site, and a public comment period was conducted concurrent with that for the site-specific RI and Consent Decree CAP.

Puget Sound Air Pollution Control Agency, Regulation I of the Puget Sound Air Pollution Control Agency. The remedial action will be performed so as to not allow the emission of any air contaminants in violation of the visual standard established by Section 9.03 of the regulation. The remedial action will be performed that allows the emission of particulate matter in violation of Section 9.04 of the regulation.

The remedial action will also be performed that allows the emission of air contaminates in violation of Section 9.11 of the regulation. Remedial action shall be performed that allows the emission of fugitive dust in violation of Section 9.15 of the regulation. Equipment utilized on site for the remedial action will be maintained in such a manner as to not be in violation of Section 9.20(b) of the regulation.

Regulation III of the Puget Sound Clean Air Agency. The numerical standards for compliance with air emissions regulations that apply to remedial action on the site are those listed in Appendix A, Acceptable Source Impact Levels, of the regulation. Demolition of buildings, incidental to the site remedial actions, shall be performed in accordance with Sections 4.02 and 4.03 with respect to the removal of asbestos-containing materials.

City of Tacoma, Storm Water Management Manual. Project activities will comply with provisions of the City of Tacoma Storm Water Management Manual and underlying regulations for storm water management in accordance with the National Clean Water Act, the Puget Sound Water Quality

Management Plan, and the National Pollutant Discharge Elimination System Stormwater Permit. For environmental cleanup and redevelopment activities comply with best management practices identified in Section A5 of manual "Construction and Demolition Activities" and Section A6 " Other Activities."

City of Tacoma, Chapter 13.10, Shoreline Regulations. The construction design will include:

- Measures to minimize erosion during and after construction and for the replanting of the site after construction;

- Measures to minimize potential for introducing contaminants to surface waters, depleting and contaminating groundwater, and increasing surface water runoff;

- Provisions for facilities or appurtenances for disposal of sanitary waste and shall monitor the use of chemicals, fertilizers, and other pollutants in such a manner so as to not degrade existing levels of surface water and groundwater quality. Dust control measures, including plants and vegetation where feasible shall be taken; and

- Signs required for safety and security will be allowed. All signs will be of permanent materials.

City of Tacoma, Chapter 70, Uniform Building Code - Excavation and Grading. Grading and excavation requirements include:

- Slope cut surfaces will be no steeper than safe for intended use, and will be no steeper than two horizontal to one vertical (2H:1V). Typical excavation trenches are expected to be 2H:1V. Detrimental amounts of organic material will not be permitted in fill.

- No rock or similar irreducible material with a maximum dimension greater than 6 inches shall be buried or placed in fill.

- The top cut slopes will not be made nearer to a site boundary line than one-fifth of the vertical height of the cut with a minimum of 2 feet and a maximum of 10 feet. The setback may need to be increased for any required interceptor drains or other utilities.

- Unless otherwise indicated on the approved grading plan, drainage facilities and terracing will conform to the provisions of Section 7012 for cut or fill slopes steeper than 3H:1V.

- The faces of cut and fill slopes will be prepared and maintained to control against erosion. This control may consist of effective planting. The protection for slopes will be installed as soon as practicable and prior to calling final approval.

City of Tacoma, Chapter 12.08 City Code. The project will comply with provisions for acceptance of any water generated discharged into the City sanitary or storm sewer systems.

Tacoma Pierce County Health Department, Waste Disposal Authorization. The project will comply with provisions for acceptance of any soils to be disposed of at the City of Tacoma Municipal Landfill according to criteria developed for the facility.

SCHEDULE FOR IMPLEMENTATION

The cleanup action described in this SCAP will be completed within a reasonable time frame. Factors to be considered in establishing the cleanup time frame shall be in accordance with WAC 173-340-360(6). The following tasks are planned for implementation of this cleanup action.

Task 1	Submit to Ecology a Draft Engineering Design Report (EDR), construction plans and specifications, maintenance plan, compliance monitoring plan, and financial assurance documents (hereafter "Remedial Design Documents").
	Schedule. Within one year of entry by the court of the amendment to the Area-Wide Consent Decree to include the SCAP for this site.
Task 2	Submit final documents listed in Task 1 that incorporate Ecology's comments on the draft documents.
	Schedule. Within 30 days of receipt of Ecology's comments on the drafts.
Task 3	Begin implementation of SCAP.
	Schedule. In accordance with the schedule approved in the Remedial Design documents.
Task 4	Submit as-built documentation of the cleanup and final financial assurance documents and procedures for periodic

adjustment.

Schedule. In accordance with the schedule approved in the Remedial Design documents.

Task 5 Perform long-term monitoring, operation and maintenance.

Schedule. In accordance with the schedule approved in the Remedial Design Documents.

REFERENCES

Hart Crowser 2001a. Draft Final Dock Street (North) Site-Specific Remedial Investigation, Thea Foss Upland Properties. June 25, 2001.

Hart Crowser 2001b. Use of MTCA Amendments, 2001 Memorandum, Thea Foss Upland Properties along Dock Street and North of South 15th Street. November 2, 2001.

Hart Crowser 2002. Additional Soils and Groundwater Samples Analytical Results Memorandum, Dock Street ROW near South 15th Street. April 16, 2002.

State of Washington Department of Ecology v. City of Tacoma and Metropolitan Park District of Tacoma, Consent Decree 94-10917 6, filed October 7, 1994.

Thea Foss Waterway Public Esplanade and Dock Street Phase I, Tacoma, Washington, Design Development Phase I. July 10, 1998.

F:\docs\jobs\1715600\Draft Dock Street North SCAP.doc

Tables

Table 1 - Summary of Soil Exceedances
Dock Street North ROW

Analyte Group	Analyte Name	Analyte Value in mg/kg	Qualifier	Depth in Feet	Sampling Date	Sample ID	MTCA Screening Level in mg/kg
Metals, Total	Arsenic	179		0 to 4	2/14/2001	DSN-B07-S-1	20
PAHs	Total cPAHs BaP	0.545 TE		2 to 3.5	9/15/1997	R15-B02-2-3.5	0.137
PAHs	Total cPAHs BaP	3.746 TE		7 to 8.5	9/15/1997	R15-B02-7-8.5	0.137
PAHs	Total cPAHs BaP	0.609 TE		9.5 to 11	9/15/1997	R15-B02-9.5-11	0.137
PAHs	Total cPAHs BaP	0.326 TE		4 to 5.5	9/15/1997	R15-B03-4-5.5	0.137
PAHs	Total cPAHs BaP	0.508 TE		6.5 to 8	9/15/1997	R15-B03-6.5-8	0.137
PAHs	Total cPAHs BaP	15.13 TE		7 to 8	12/12/2001	DSN-B12-S-1	0.137
PAHs	Total cPAHs BaP	0.248 TE		7 to 8.5	12/12/2001	DSN-B14-S-1	0.137

TE = Toxicity Equivalent
Explorations R15-B02 and R15-B03 are located adjacent to Dock Street North ROW excavation areas. Soil data for these borings are presented for reference purposes.

Table 2 - Summary of Groundwater Exceedances
Dock Street North ROW

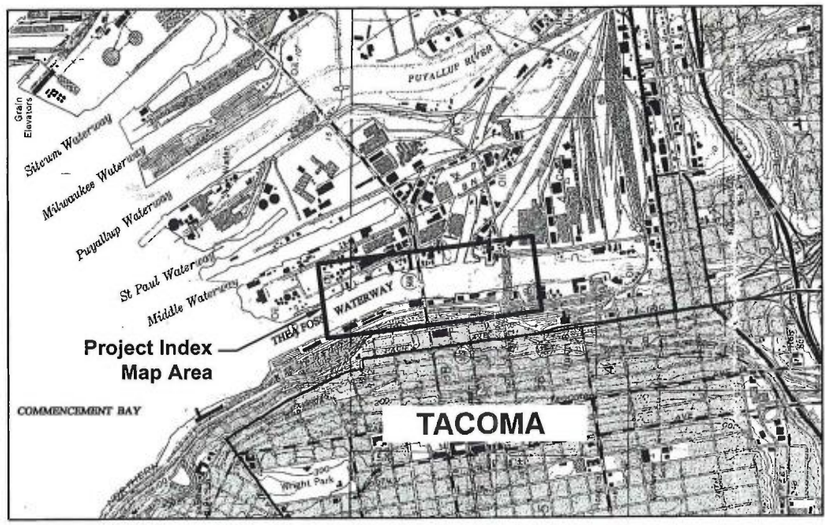
Analyte Group	Analyte Name	Analyte Value in ug/L	Qualifier	Sampling Date	Sample ID	MTCA Screening Level in ug/L
Metals, Dissolved	Arsenic	1.0	J	3/20/2001	DSN-MW01	0.14
Metals, Dissolved	Arsenic	1.8	J	3/20/2001	DSN-MW02	0.14
Metals, Dissolved	Arsenic	1.7		2/14/2001	DSN-B02	0.14
Metals, Dissolved	Arsenic	4.8		2/14/2001	DSN-B08	0.14
BTEX	Benzene	170		2/14/2001	DSN-B08	71

J - Indicates associated value is estimated

Figures

Vicinity Map

Regional Vicinity Map



Project Index Map

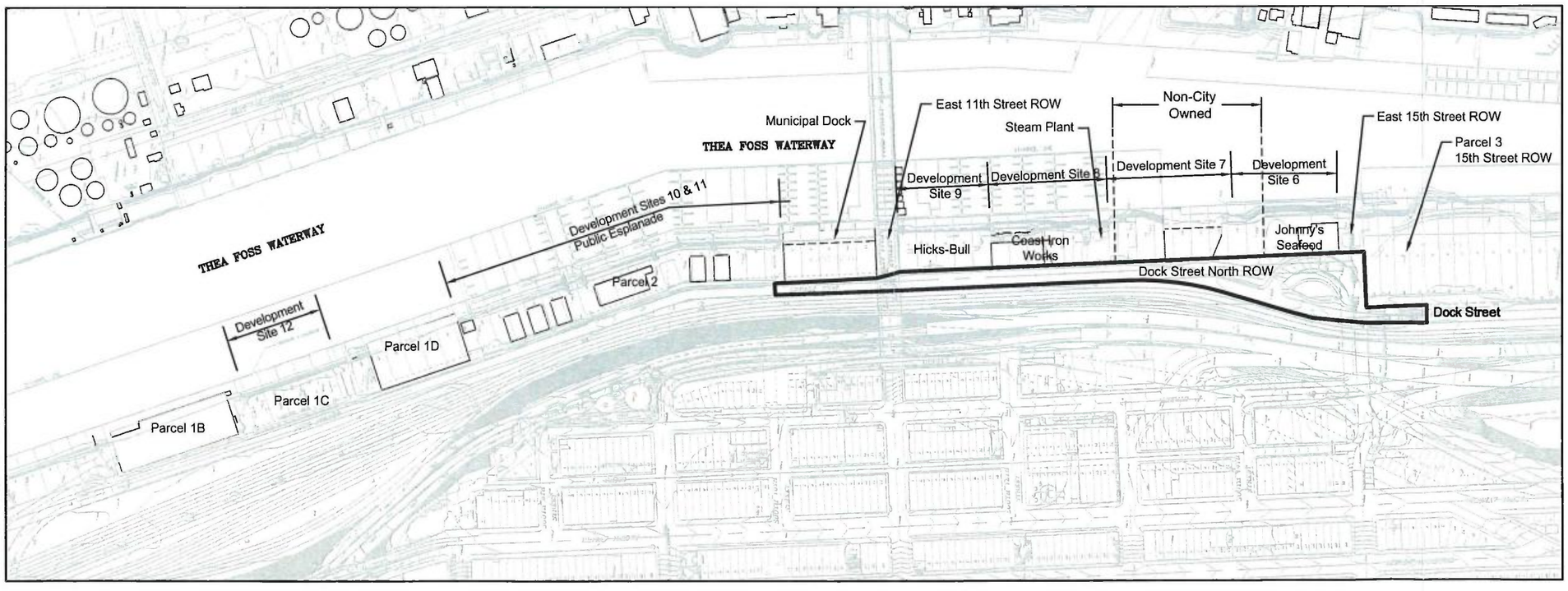


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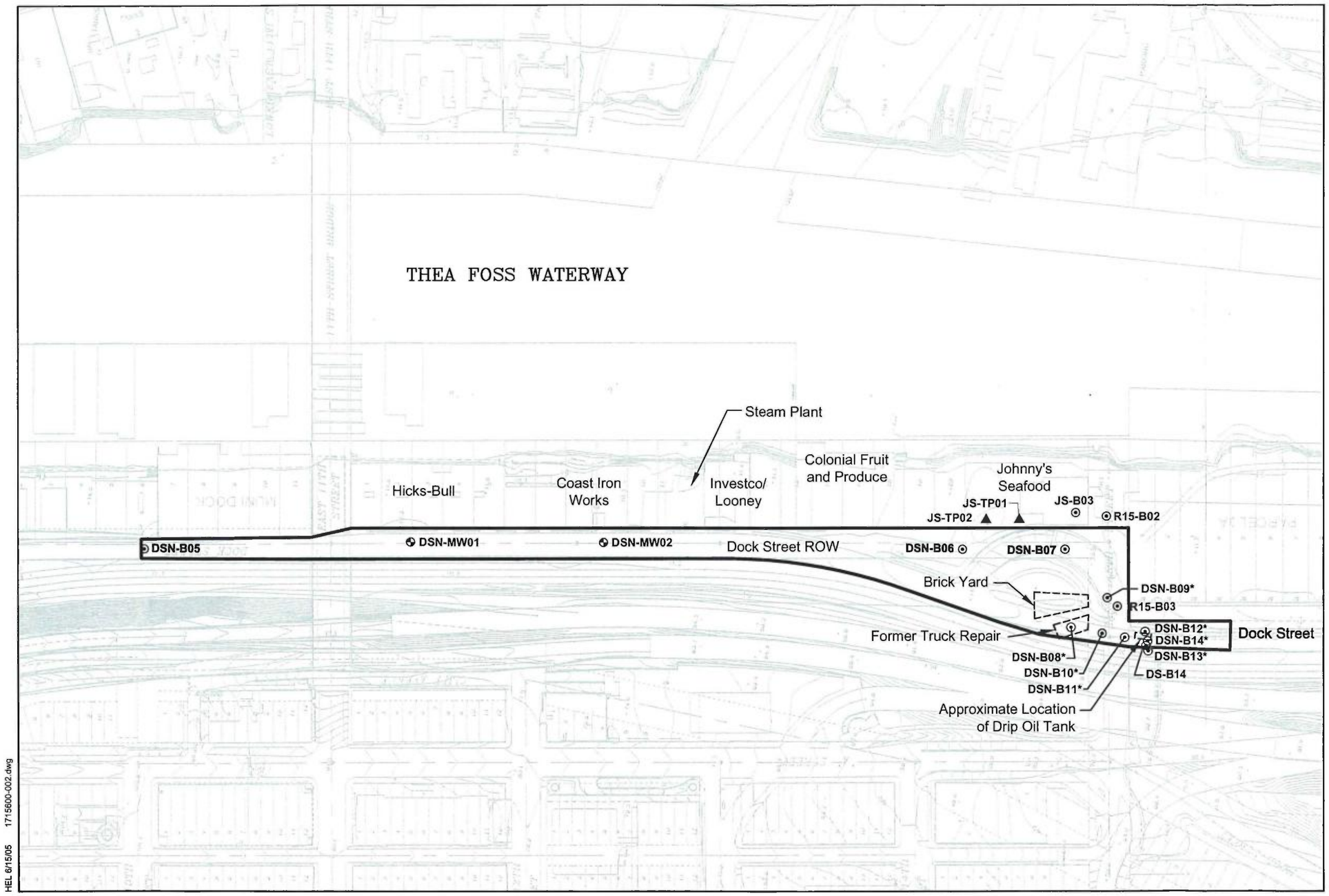
Figure 1

Site Exploration Plan with Significant Historical Features
Dock Street North ROW



Exploration Location and Number

DSN-B01* ⊙ Boring
Indicates Grab Groundwate Sample Collected

DSN-MW01 ⊕ Monitoring Well

JS-TP02 ▲ Test Pit

Potentially Significant Historical Area

N

0 200 400

Scale in Feet

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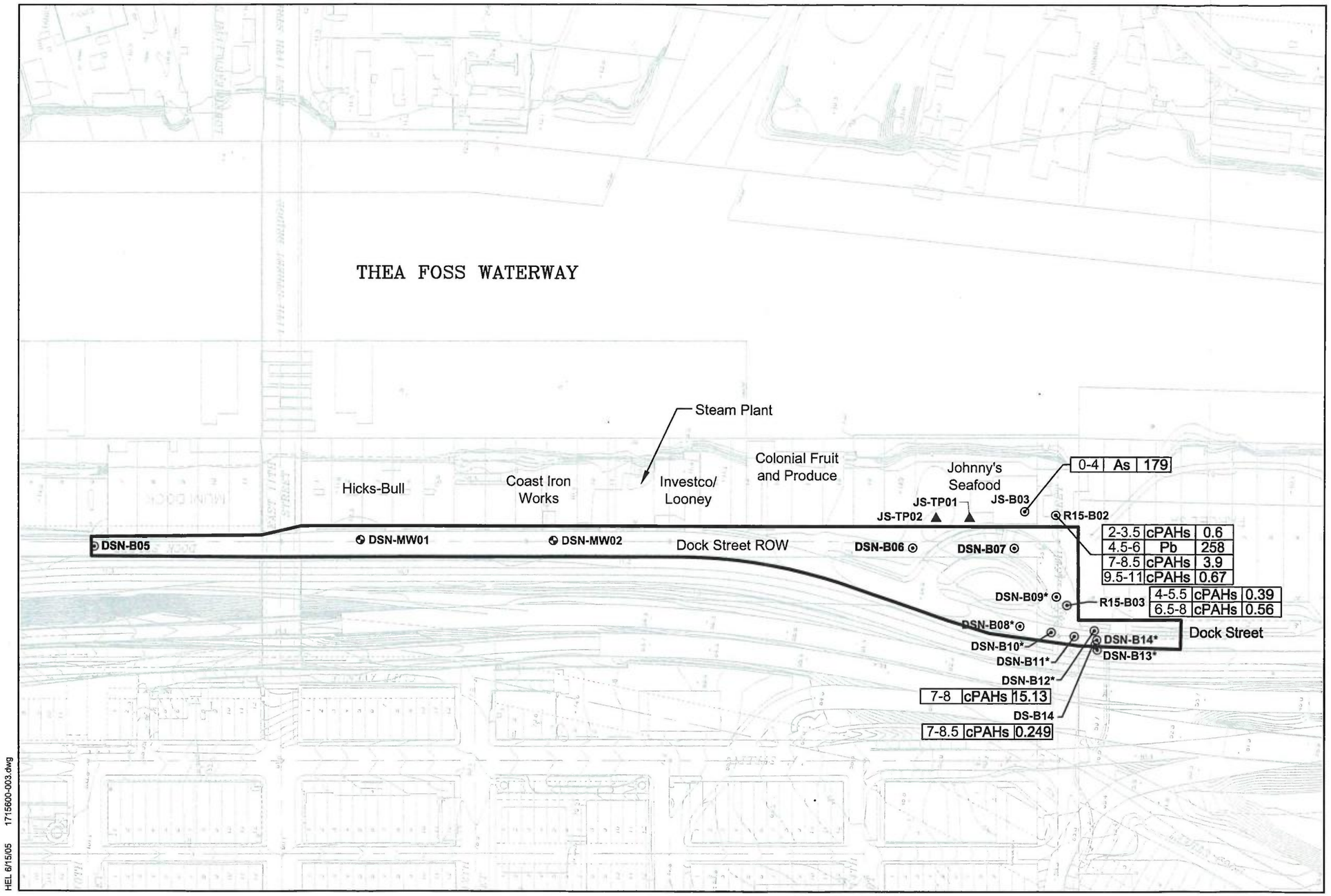
Figure 2

Soil Exceedance Data Summary
Dock Street North ROW



Exploration Location and Number

DSN-B01* ⊙ Boring

* Indicates Grab Groundwate Sample Collected

DSN-MW01 ⊕ Monitoring Well

JS-TP02 ▲ Test Pit

Constituent

As	Arsenic
cPAHs	cPAHs
Pb	Lead

0-4 Sample Depth in Feet

179 Concentration in mg/kg (Where one or more cPAH Compound exceeds the Cleanup Level the total cPAH Concentration is shown)

N

0 200 400

Scale in Feet

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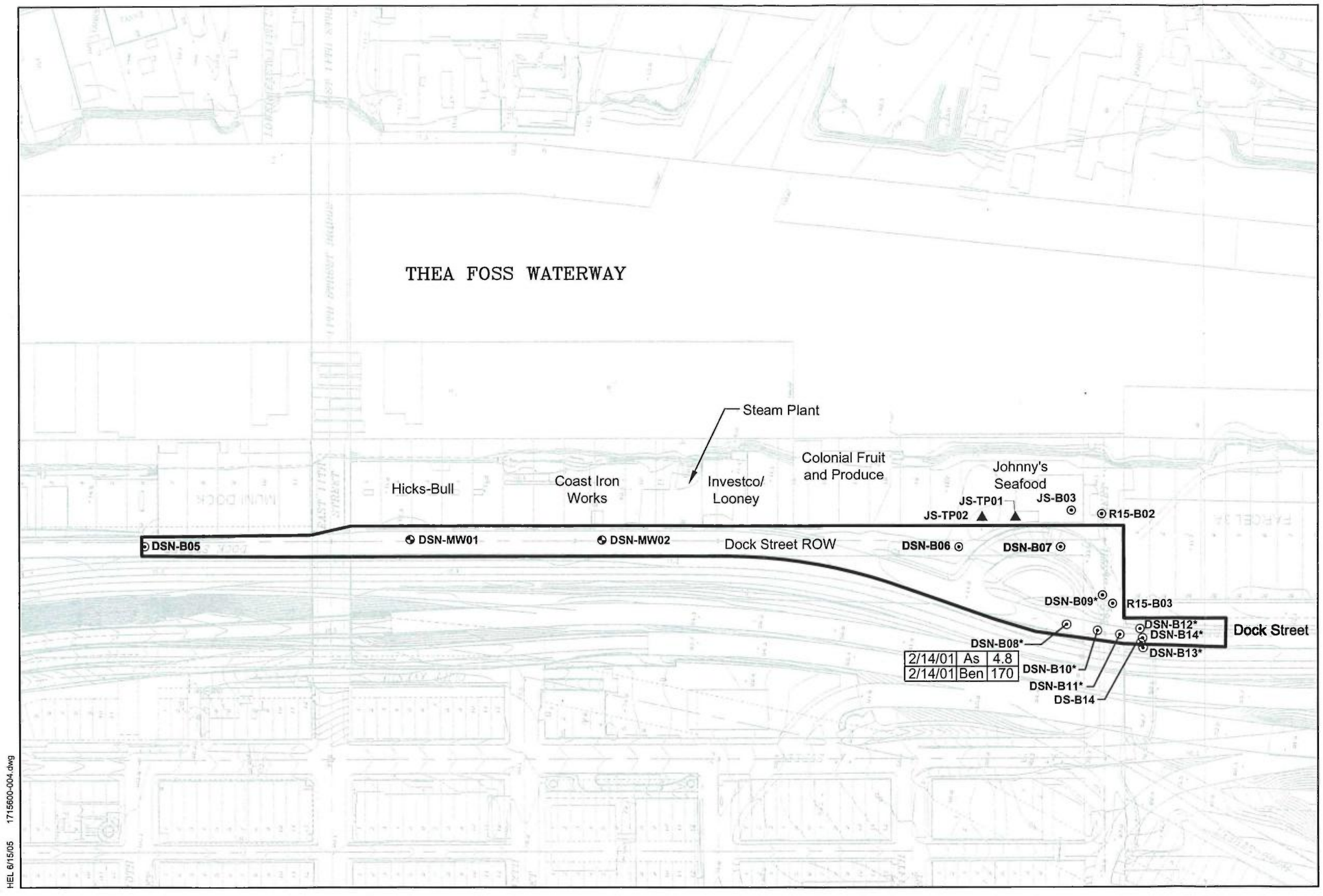
Figure 3

Groundwater Exceedance Data Summary
Dock Street North ROW



Exploration Location and Number

DSN-B01* ⊙ Boring

└ Indicates Grab Groundwate Sample Collected

DSN-MW01 ⊕ Monitoring Well

JS-TP02 ▲ Test Pit

Constituent

As Arsenic

Ben Benzene

2/14/01 Date Sampled

4.8 Concentration in ug/L

N

0 200 400

Scale in Feet

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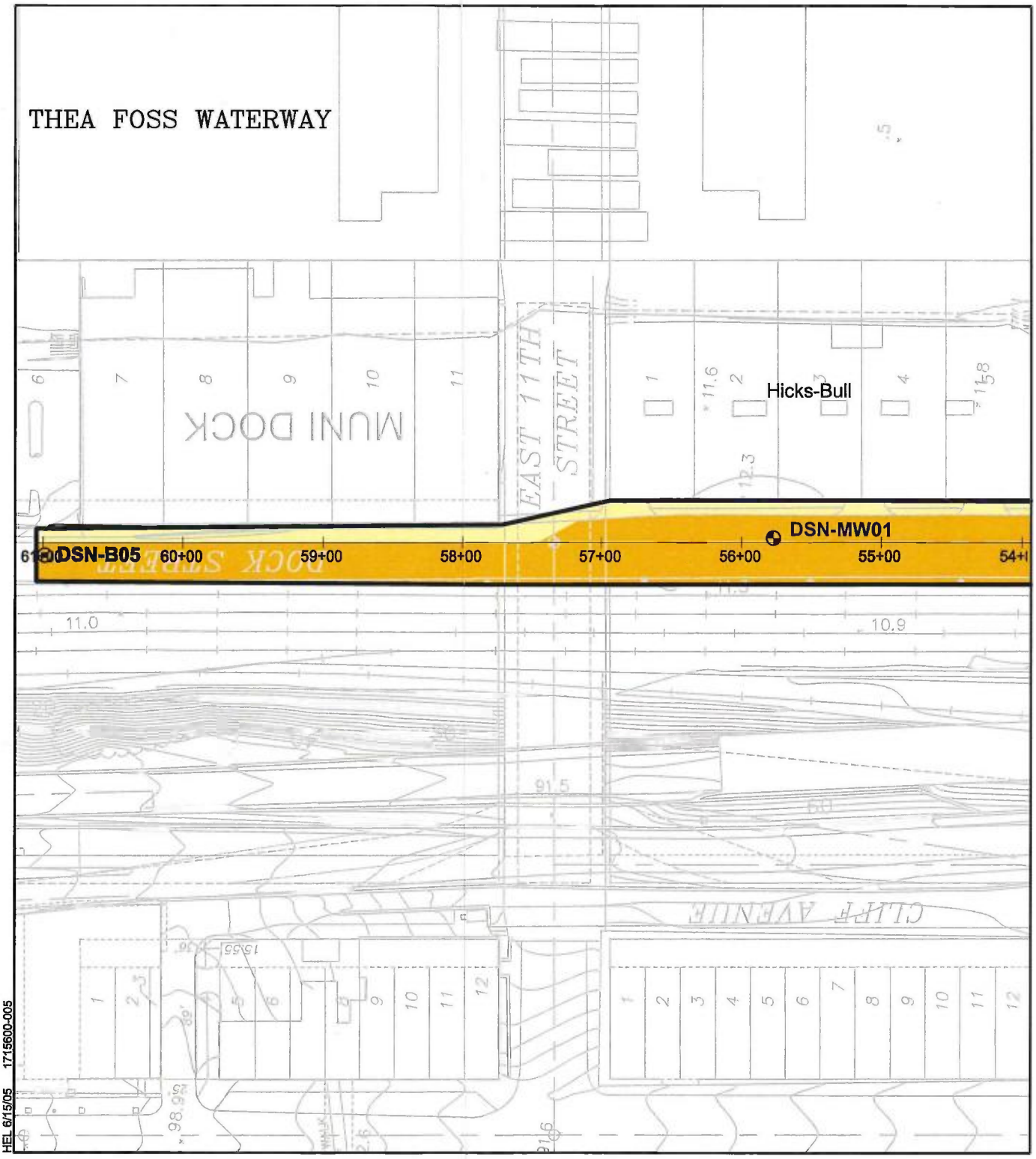
Figure 4

Proposed Cleanup Action Plan
Dock Street North ROW



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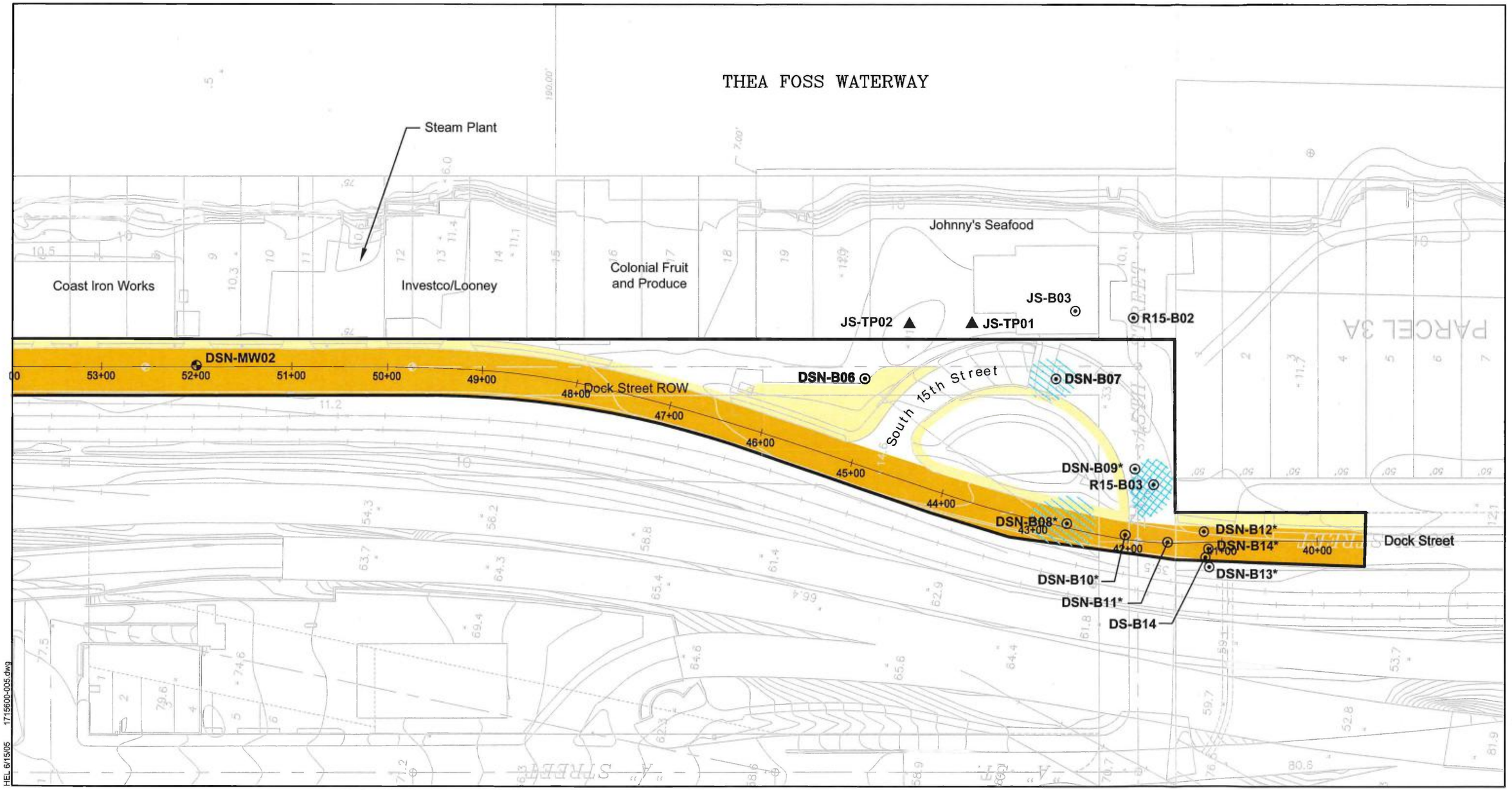

Exploration Location and Number

- DSN-B01* ⊙ Boring — Indicates Grab Groundwater Sample Collected
- DSN-MW01 ⊕ Monitoring Well
- JS-TP02 ▲ Test Pit

Area of Potential Soil Cleanup

- 0 to 4 Feet
- 4 to 10 Feet
- Extent of Sidewalk and Soil Cover
- Extent of Pavement Cap

N

0 100 200

Scale in Feet

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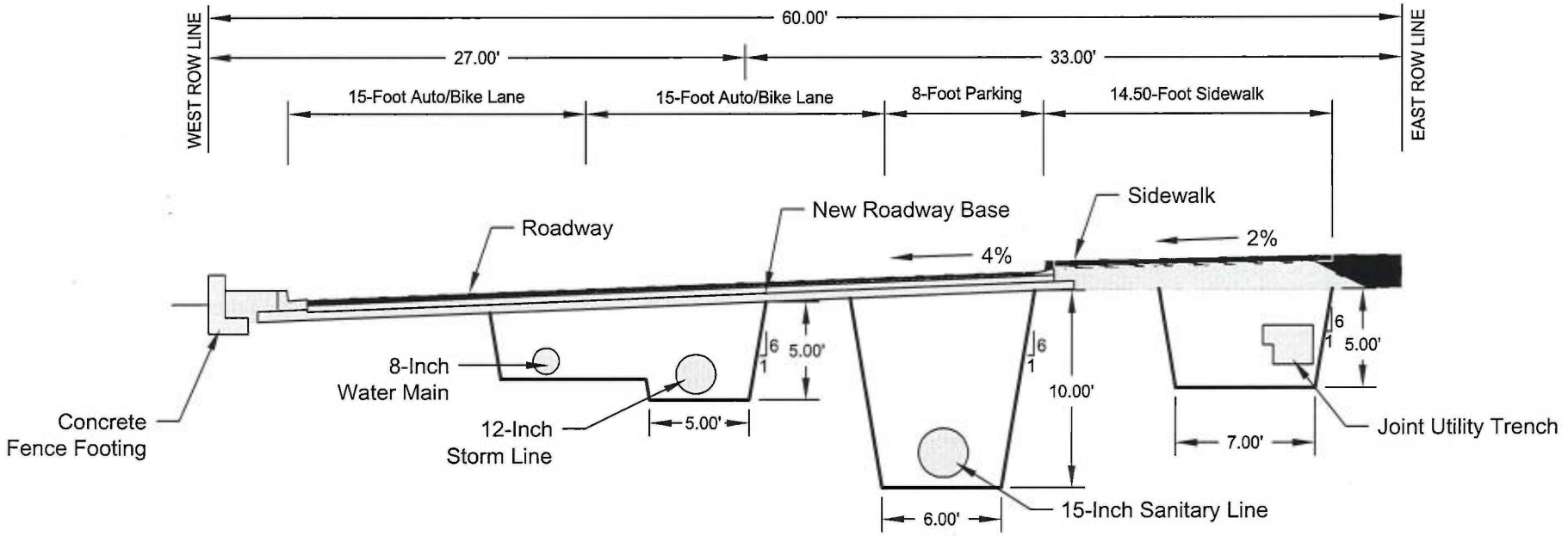
Figure 5

Cross Section of Cleanup Action Plan
Dock Street North ROW



Source: Base map prepared from drawing provided by...

0 8 16
Scale in Feet

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17156-00 6/05
Figure 6