

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): December 20, 2017

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: New England District; City of Worcester, MA; NAE-2011-01980

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: MA County/parish/borough: Worcester Co. City: Worcester

Center coordinates of site (lat/long in degree decimal format): Lat. 42.217735° **Pick List**, Long. -71.792887° **Pick List**.

Universal Transverse Mercator: 18

Name of nearest waterbody: Blackstone River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Blackstone River

Name of watershed or Hydrologic Unit Code (HUC): 01090003 (Blackstone)

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 7 Nov 2017

☒ Field Determination. Date(s): 3 Jan 2017

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are no** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- ☐ TNWs, including territorial seas
- ☐ Wetlands adjacent to TNWs
- ☐ Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- ☐ Non-RPWs that flow directly or indirectly into TNWs
- ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- ☐ Impoundments of jurisdictional waters
- ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: linear feet: width (ft) and/or acres.

Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: Pick List

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.

Explain: Human-induced and Isolated intrastate wetlands with no nexus to interstate commerce.

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**

Identify TNW: .

Summarize rationale supporting determination: .

2. **Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW.**

(i) **General Area Conditions:**

Watershed size: Pick List

Drainage area: Pick List

Average annual rainfall: inches

Average annual snowfall: inches

(ii) **Physical Characteristics:**

(a) **Relationship with TNW:**

☐ Tributary flows directly into TNW.

☐ Tributary flows through Pick List tributaries before entering TNW.

Project waters are Pick List river miles from TNW.

Project waters are Pick List river miles from RPW.

Project waters are Pick List aerial (straight) miles from TNW.

Project waters are Pick List aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW⁵: .

Tributary stream order, if known: .

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☐ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):

Average width: feet
Average depth: feet
Average side slopes: **Pick List**.

Primary tributary substrate composition (check all that apply):

☐ Silts	☐ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain:		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:

Presence of run/riffle/pool complexes. Explain:

Tributary geometry: **Pick List**

Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Pick List**

Estimate average number of flow events in review area/year: **Pick List**

Describe flow regime:

Other information on duration and volume:

Surface flow is: **Pick List**. Characteristics:

Subsurface flow: **Pick List**. Explain findings:

☐ Dye (or other) test performed:

Tributary has (check all that apply):

☐ Bed and banks	
☐ OHWM ⁶ (check all indicators that apply):	
☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	
☐ Discontinuous OHWM. ⁷ Explain:	

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) **Chemical Characteristics:**

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain:

Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

(iv) **Biological Characteristics. Channel supports (check all that apply):**

- ☐ Riparian corridor. Characteristics (type, average width):
- ☐ Wetland fringe. Characteristics:
- ☐ Habitat for:
 - ☐ Federally Listed species. Explain findings:
 - ☐ Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - ☐ Aquatic/wildlife diversity. Explain findings:

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain:

Surface flow is: **Pick List**

Characteristics:

Subsurface flow: **Pick List**. Explain findings:

☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
 - ☐ Discrete wetland hydrologic connection. Explain:
 - ☐ Ecological connection. Explain:
 - ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List**.

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) **Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) **Biological Characteristics. Wetland supports (check all that apply):**

- ☐ Riparian buffer. Characteristics (type, average width):
- ☐ Vegetation type/percent cover. Explain:
- ☐ Habitat for:
 - ☐ Federally Listed species. Explain findings:
 - ☐ Fish/spawn areas. Explain findings:
 - ☐ Other environmentally-sensitive species. Explain findings:
 - ☐ Aquatic/wildlife diversity. Explain findings:

3. **Characteristics of all wetlands adjacent to the tributary (if any)**

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)

Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
☐ TNWs: linear feet width (ft), Or, acres.
☐ Wetlands adjacent to TNWs: acres.
2. **RPWs that flow directly or indirectly into TNWs.**
☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.

Identify type(s) of waters: .

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.

Identify type(s) of waters: .

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .
☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
- Identify type(s) of waters:
- ☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - ☒ Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- ☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☒ Wetlands: 2.7 acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Epsilon Associates, 2011.
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - ☐ Office concurs with data sheets/delineation report.
 - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
 - ☐ USGS NHD data.
 - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: Worcester South, 2015.
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation: Worcester County, MA/MassGIS overlay, 2009.
- ☒ National wetlands inventory map(s). Cite name: Worcester South, MA 2007.
- ☒ State/Local wetland inventory map(s): MassDEP Wetlands, MassGIS overlay, 2009.
- ☒ FEMA/FIRM maps: MassGIS overlay.
- ☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date): MassGIS, 2014.
 - or ☒ Other (Name & Date): Alan Anacheka-Nasemann, 3 Jan 2017.
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law: .
- ☐ Applicable/supporting scientific literature: .
- ☒ Other information (please specify): Historic USGS Quad Maps: 1892, 1939, 1948, 2001.

B. ADDITIONAL COMMENTS TO SUPPORT JD: See attached Field Observation Report.

FIELD OBSERVATION REPORT
in support of
APPROVED JURISDICTIONAL DETERMINATION
for
Greenwood Street Landfill
30 Nippnapp Trail
Worcester, MA, 01607

U.S. Army Corps of Engineers Regulatory File No. NAE-2011-01980

City of Worcester DPW
20 E. Worcester St.
Worcester, MA 01604

November 7, 2017

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Abstract: An approved jurisdictional determination under the Clean Water Act was requested by the City of Worcester for a site containing approximately 2.7 acres of wetlands located adjacent to the City's Greenwood Street Landfill accessible via 30 Nipnapp Trail, Massachusetts. The author, on behalf of the U.S. Army Corps of Engineers, New England District, Regulatory Division, completed a review of existing geographic data followed by a site visit. Three individual water bodies within the parcel boundaries, including wetlands, totaling approximately 2.7 acres, were evaluated for Clean Water Act jurisdiction. Wetlands A, B and C were determined to be human-induced and now abandoned, but otherwise non-jurisdictional, isolated, intrastate wetlands with no nexus to interstate commerce.

1. Purpose

The U.S. Army Corps of Engineers received a request from the City of Worcester, MA for an approved jurisdictional determination (AJD) for a parcel of land located at its Greenwood Street Landfill site. The City plans to remediate buried sewage sludge over which three reportedly isolated wetland areas are presently located. The City is finalizing plans to cap and close the sludge/landfill pursuant to an Administrative Consent Order issued by the Massachusetts Department of Environmental Protection (MADEP). The City therefore seeks confirmation that permanent loss of these wetlands does not require permits pursuant to §404 of the Clean Water Act. Upon project completion the City intends to consider post-closure re-use. To date, these options include installation a solar panel array atop the closed landfill. The JD request was accompanied by a report prepared by Mr. Dwight Dunk, who prepared an initial report in 2011 and re-submitted the same on behalf of his current firm, Epsilon Associates. The 2011 report included a map of three (presumably isolated and/or artificial) wetland areas.

2. Site History

The Corps previously received and reviewed a formal JD request in 2011. The Corps concluded (correspondence dated October 28, 2011) that the wetlands had formed on top of a landfill and therefore were not jurisdictional. This was based, in part, on the Corps' Standard Operating Procedures (SOP) dated October 15, 1999, which plainly state, "[w]etlands that form on top of landfill are not subject to Corps jurisdiction." No formal JD or other data forms were completed. However, the 1999 SOP had already been superseded in relation to the *Carabell* and *Rapanos* Supreme Court decisions. The new (and current) SOP, dated July 1, 2009, should have been applied to the determination; it contains no statement related to wetlands that form atop existing solid waste landfills. Accordingly, the SOP and other JD forms are now and herewith applied to this site/project to determine the valid status of the Greenwood Street Landfill wetlands.

3. Site Location

The parcel is located on Greenwood Street in Worcester. Table 1 provides coordinates and watershed information. The site includes three wetlands ("A," "B" and "C") along the west side of the landfill.

Table 1: Site location data for Greenwood Street Landfill

Waterway	Latitude/Longitude	Area Sq. Ft. (Acres)	Watershed HUC	Watershed Name
Wetland A	42.216995 / -71.792953	21,345 (0.49)	01090003	Blackstone
Wetland B	42.217735 / -71.792887	16,120 (0.37)		
Wetland C	42.220801 / -71.792670	80,150 (1.84)		

4. Background Information: Several historic and more current maps were consulted to examine site conditions over time. The USGS quads consulted are presented here in chronological order so as to examine how the site (and the wetlands thereon) have seemingly evolved over the last century.

a. **USGS Webster Historic Quadrangle, 15', 1892:** The 1892 Quadrangle shows the eastern edge of the site bordered by the existing railroad line (Figure 1), but no other development is evident. No wetlands or other waterways are indicated on the site.

b. **USGS Worcester South Historic Quadrangle 7.5', 1939:** By 1939, the site was identified as the "Worcester Sewage Disposal Plant." The Quadrangle (Figure 2) shows a series of (obviously constructed) square depressions, which were evidently drying beds into which sewage sludge was placed over time. A large square constructed pond (possibly a lagoon) was found at the southern limit of the treatment area. No other wetlands or waters are identified on the landfill property. The map also shows a dirt road oriented N-S along the edge of the area; this road is located in the vicinity of the noted wetlands identified above.

c. **USGS Worcester South Historic Quadrangle 7.5', 1939 (1948 photorevision).** By 1948 the southern extent of drying bed depressions had been largely replaced by circular structures, presumably settling tanks that were part of sewage treatment operations (Figure 3). The square pond had been partially filled/narrowed. No wetlands are identified on-site. The dirt road noted above remained in the same position/location as the 1939 version. It is also noteworthy that both the 1939 and 1948 quadrangles show the entirety of the site to be below elevation 450' (MSL), albeit there is a 450' contour line immediately west of the access road.

d. **National Wetland Inventory (NWI), MA USGS Quad, Worcester South (on-line version, via MassGIS, 2007 data:** Figure 4 is a MassGIS overlay of the digital NWI map on the USGS Quadrangle that was available to MassGIS in 2001. No NWI wetlands are identified on the site, but the 2001 USGS quadrangle still shows the road that was on the 1939/48 quadrangles. It appears to follow the W edge of the landfill, but then veers from its original true N path to a more NNE path, before turning sharply right, and dead-ending. This would be consistent with an access road that is used in landfill operations. Also, the landfill elevation had changed and mapped portions of it were exceeding 450'. The 450' contour continues onto the landfill edge, and the mapped road proceeding over it was thus not merely re-routed but also higher in elevation than the original.

e. **USGS Worcester South Quadrangle, 2015:** The most current USGS Quadrangle (Figure 5) shows the site as cleared and devoid of forested vegetation. It also illustrates that substantial on-site work happened between 2001 and 2015. Contours now suggest an irregularly trapezoidal shape, as would be expected of a carefully contoured landfill edge. The eastern edge remains bordered by a railroad line that separates the site from the Blackstone River. The map identifies a small pond northwest of the site, and separated from it by a spur railway. The pond drains to the east via a channel that "dead ends" as it reaches the main rail line; it quite likely passes through a culvert under the rail and directly into the River. The dirt road identified on prior maps now dead-ends well south of the landfill boundary.

f. **State/Local Wetland Inventory Maps: MassGIS DEP Wetlands Image, 2005:** The MassGIS MADEP wetlands map is overlain on the 2014 aerial photograph as Figure 6. It identifies a small marsh/bog wetland located near the southwest edge of the landfill, and which roughly overlaps with Wetland A.

d. NRCS (2009) Soil Survey: Worcester County, MA; (on-line version, via MassGIS) The soil survey (Figure 7) identifies Udorthents, Urban Land and Chatfield-Hollis (15-25% slopes) as the soils indicated on the site. None of these is listed as a hydric soil. Wetlands A and B are both identified within the Udorthents soil type, while Wetland C is indicated to overlap the mapped Udorthents/Chatfield-Hollis boundary.

g. Aerial Photographs: MassGIS Color Infrared Aerials, 2014: The aerial photograph (Figure 8) shows a series of regularly spaced bands of green separated by dirt pathways. A diagonal access road roughly bisects the dirt path/green areas and provides access to the top of the landfill. This aerial seems to be more detailed than is the 2015 USGS quadrangle. It shows the access road proceeding S-N, and dead ending at the top of the landfill.

5. **Applicant Data:** The 2011 Report was resubmitted with the current JD request; the reader is referred to that report and the results therein are not repeated here. The maps here are intended as an update to the 2011 report. The site map accompanying the delineation identifies a stone-lined ditch along the northern edge of the landfill; this appears to have been constructed as part of normal landfill operations. It should also be noted that the North Arrow on this map is not oriented correctly.

6. **Site Visit Details/Observations:** Table 2 provides the parameters and personnel pertinent to the site visit.

Table 2: Worcester Greenwood Street Landfill Site Visit Parameters:

Date(s) of Inspection(s)	January 2, 2017
Weather	Overcast, mixed rain/wet snow, 40°F
Participants	Alan Anacheke-Nasemann, Corps of Engineers Dwight Dunk, Epsilon Assoc. Bob Fiore, City of Worcester Bruce Haskell, Langdon Environmental

We met on the site and proceeded to walk along the wetland boundaries. Standing water was visible in Wetland C; Wetlands A and B had no standing water and contained remnants of emergent/scrub-shrub vegetation. No discernible inlets or outlets were observed. I did follow the boundary of wetland A closely, as it appeared to have a linear channel...which dead-ended, with no trace of continuance via culvert, pipe, or ephemeral stream channel. Vegetation was a mix of invasive species in the understory, with scrub-shrub and young trees; in particular, gray birch (*Betula populifolia*), quaking aspen (*Populus tremuloides*) and red maple (*Acer rubrum*). Herbaceous vegetation included multiple patches of giant reed grass (*Phragmites australis*). The young growth of predominantly pioneer and/or invasive species indicates a highly and recently modified landscape.

7. **Findings and Conclusions:**

- Wetlands A, B and C are not waters of the U.S.; they are isolated, intrastate wetland with no nexus to interstate commerce, pursuant to the U.S. Supreme Court decision in *Solid*

Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers (SWANCC; 2001). The nearest natural tributary to Wetland C is approximately 600' to the north, and is separated from the wetland by an existing spur railroad track. The wetlands are located within a mix of Udorthents and Charlton-Hollis soil types, neither of which are hydric, and thus all available evidence leads to a conclusion that these wetlands formed on a long-historically, highly modified landscape. There is no evidence of use of the wetlands by faunal species that rely on both flowing water and nearby, seasonal wetlands, and therefore they cannot be deemed to be adjacent to other waters of the United States as defined by 33 CFR 328.3(c).

- The area on which the wetland units are located is believed to have been filled with remnant sewage. Before the now capped landfill was built, remnant sewage sludge was reportedly re-located to the west (i.e., the sludge in the old drying beds noted above was pushed to the west). Its presence in this area has been confirmed by MADEP and placement of stable capping over these areas is therefore required by the Consent Order referenced above. It is possible, but not certain, that soils had been excavated from that area, and used as fill for the landfill, prior to relocating the sludge into any such excavations. In any event, soil was seemingly then placed over the sludge, as a crude cap, well prior to the advent of modern landfill/waste sludge closure/remediation requirements. Mr. Dunk believes it most likely that the wetlands formed due to differential settling creating the existing depressions, with the added input of runoff off the landfill (both while active and now capped) as the primary source of surface water. Mr. Dunk and City officials believe this to be the sequence of events, though actual plans (grading plans etc.) were never developed for this sludge re-location operation. Accordingly, it is difficult to determine exactly how elevations changed over time.
- Prior conclusions that the wetlands formed “on top” of the landfill may appear to contradict historic USGS quads and current site conditions, all of which suggest that these wetlands are located at the *base* of the now capped landfill slope, and not at its peak. Based on review of USGS maps and aerials in chronological order, it appears that the wetlands are either excavated depressions from which fill was obtained in order to construct access roads and/or landfill/solid-waste capping materials between 1948 and 2001, or are the results of the differential settling that Mr. Dunk supposes. It could well be that the wetlands’ hydrology today derives primarily from rapid runoff from the steep landfill slope. Regardless of the cause (excavation or sloughing) the fill areas surrounding the site suggest that the wetlands exist within confined, ponded areas with no mapped or visible drainageways.
- I therefore find that the wetlands near the Worcester landfill are most likely human-induced, and resulted from substantial construction and earthwork over the last century. Application of the preamble to 33 CFR Part 328 suggests that the wetlands could meet the definition of “pits excavated in dry land for the purpose of obtaining fill...” Whether or not this is the case, today they are no longer used for that purpose, and could thus be argued to be abandoned. However, they nevertheless do not meet the definition of waters of the United States. The wetlands have not developed ecological characteristics to suggest that they are either physically or ecologically linked to surface tributaries or other

waters of the United States, and thus the Corps concludes that they are both human-induced and isolated per *SWANCC*.

8. **References**

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Federal Register November 13, 1986, Preamble to 33 CFR 328.3, p. 41217.

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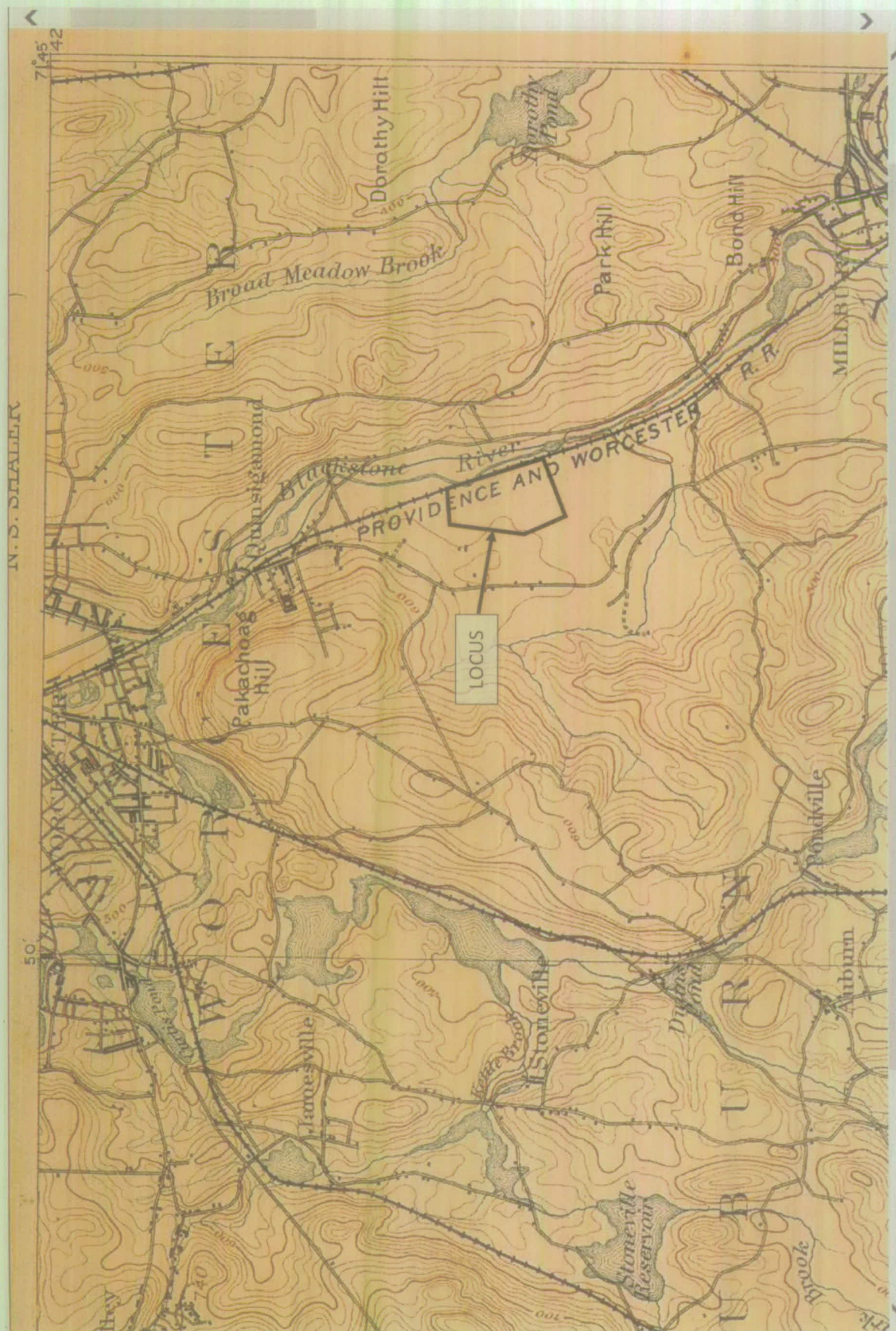


Figure 1: USGS Quad: Webster 1892

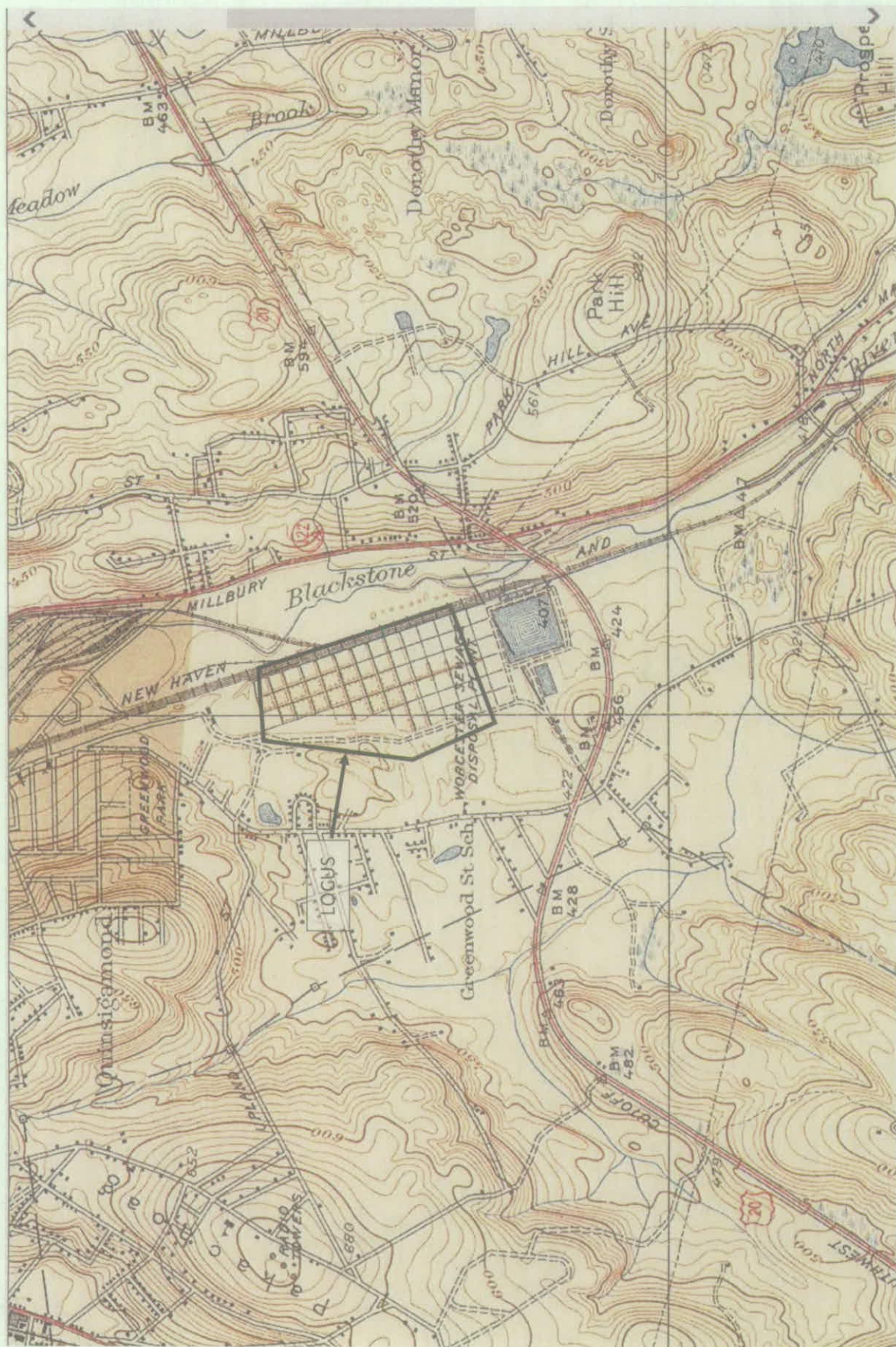


Figure 2: USGS Quad, Worcester MA, 1939



Figure 3: USGS Quad, Worcester MA, 1939 (1948 PR)

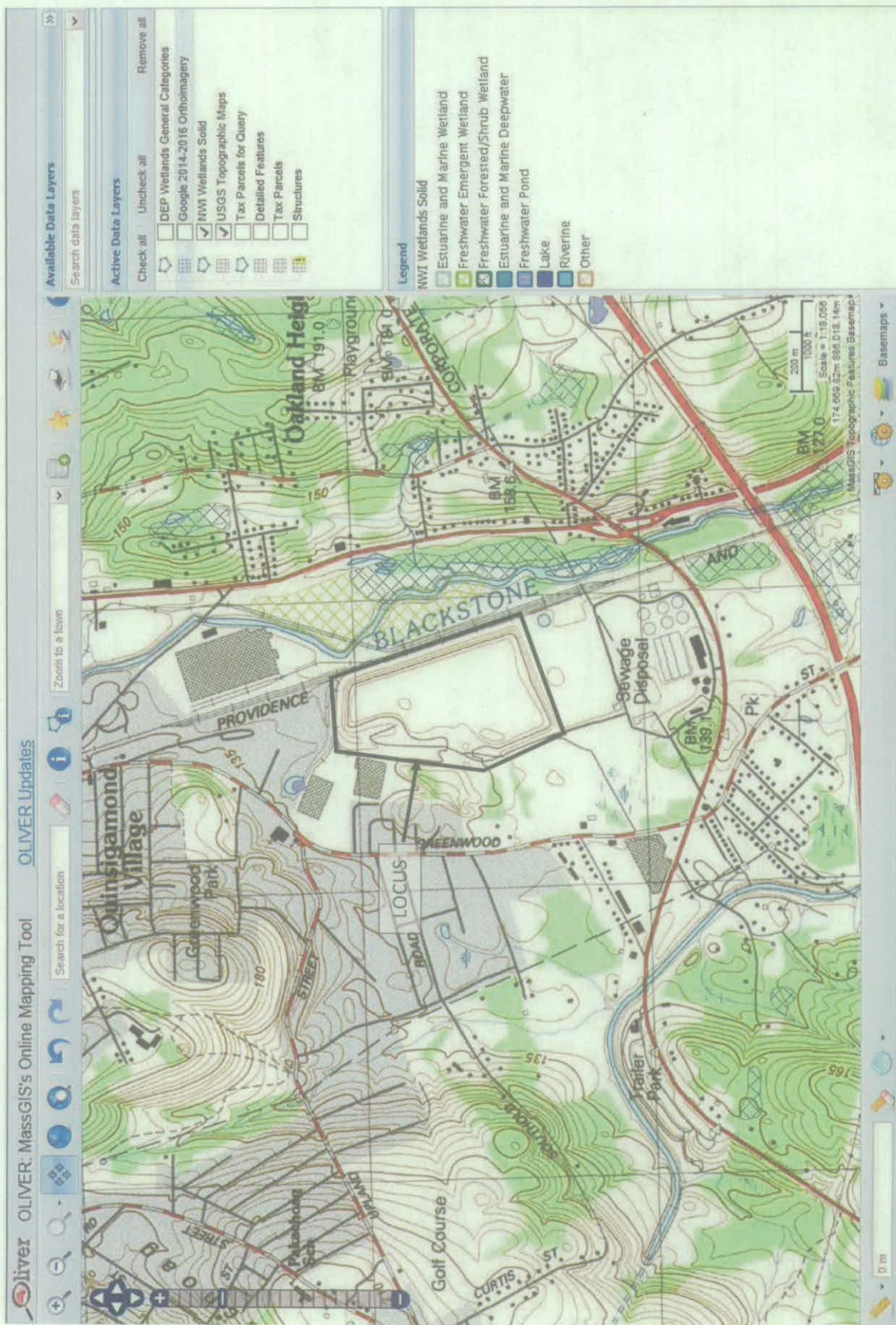


Figure 4: National Wetland Inventory (2007 data) overlain on USGS Quadrangle (2001).

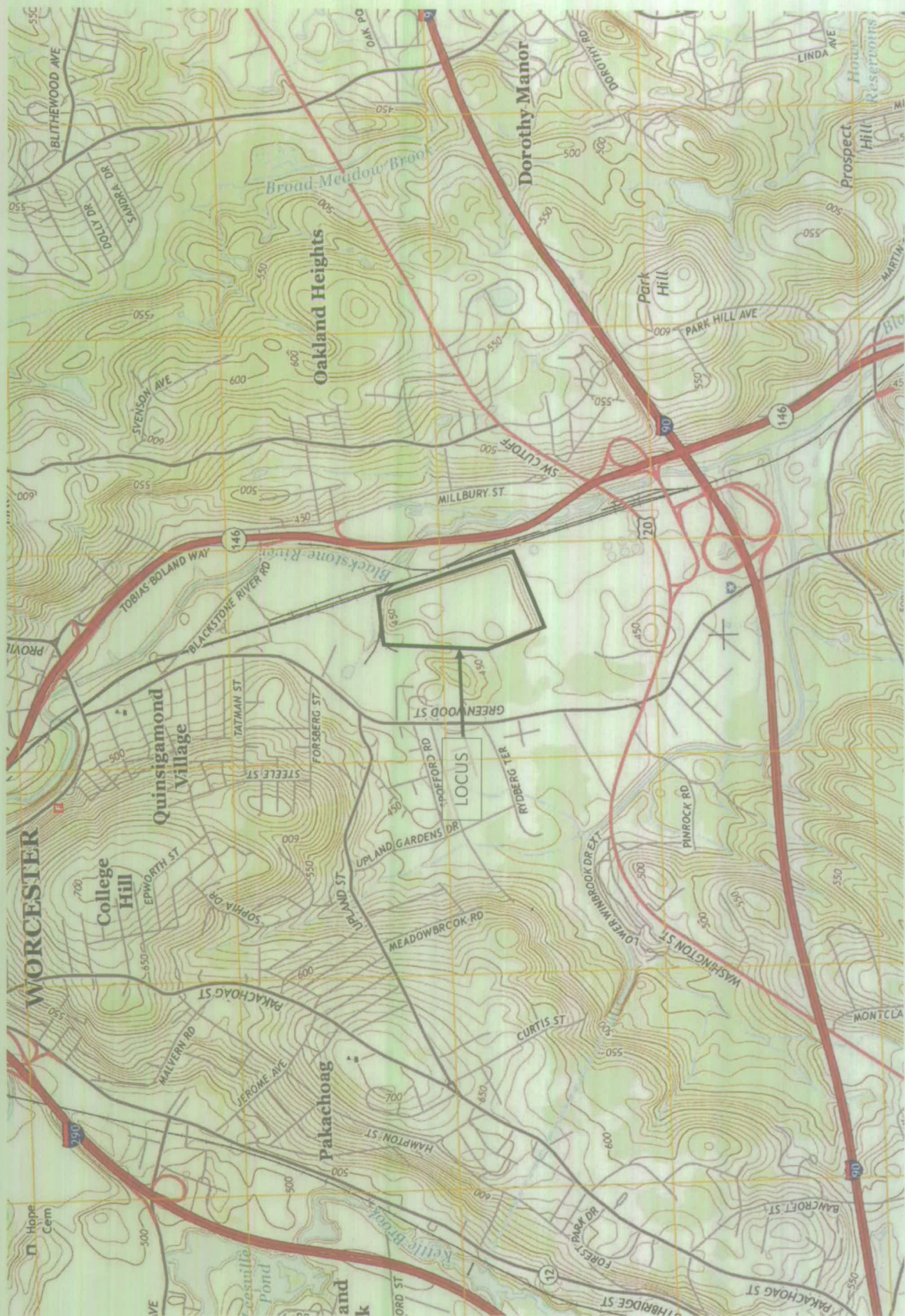


Figure 5: USGS Quad (Worcester South), 2015

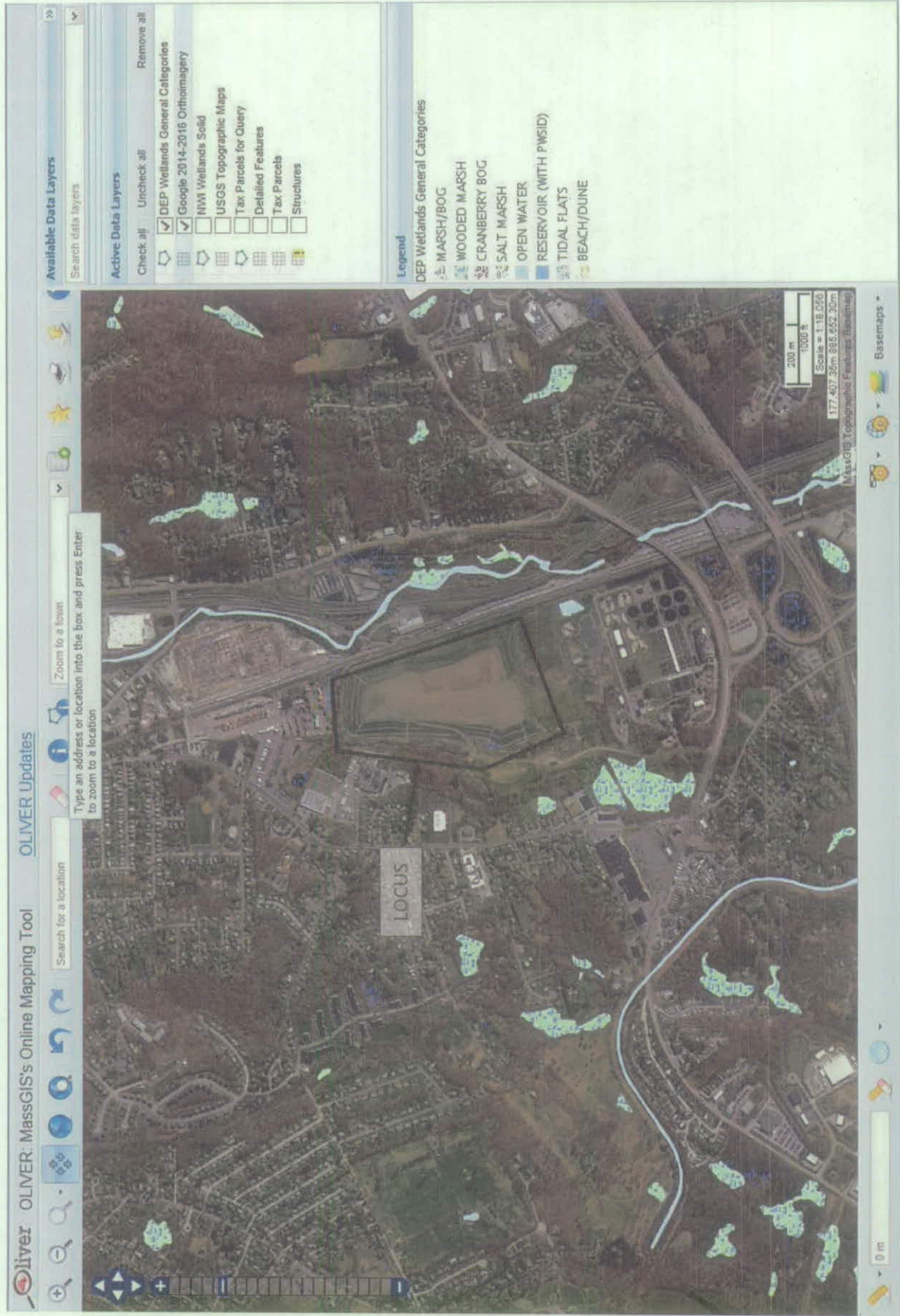


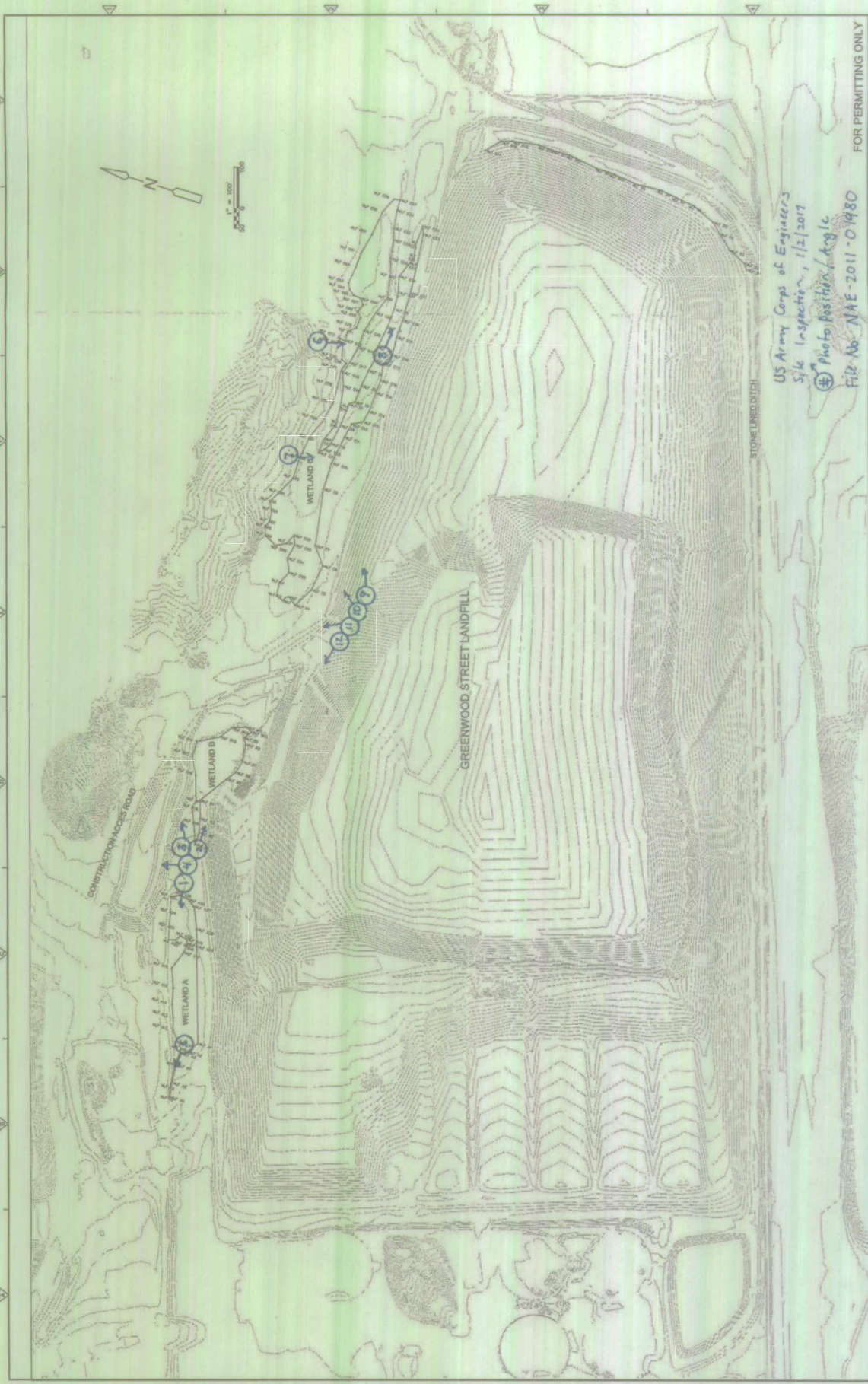
Figure 6: MA DEP Wetlands overlain on 2014 Aerial Photograph (via MassGIS)



Figure 7: NRCS Soil Survey, 2009 overlain on MassGIS base map.



Figure 8. FEMA data overlain on 2014 aerial photograph.



US Army Corps of Engineers
 Site Inspection, 11/21/2017
 Photo Position Log
 File No. NAE-2011-01980

FOR PERMITTING ONLY

PROJECT NO. NAE-2011-01980	SHEET NO. C-1	PROJECT NAME GREENWOOD STREET LANDFILL	PROJECT LOCATION WORCESTER, MASSACHUSETTS	PROJECT DESCRIPTION GREENWOOD STREET LANDFILL CLOSURE AND RE-USE	CDM CDM CONSULTING 1000 WEST STREET WORCESTER, MA 01601 TEL: 508.853.1234 WWW.CDM.COM	APPROVED BY A. FRYER DATE 11/21/2017	REVISIONS	DATE	BY	CHKD	APPD

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(1) Wetland A, looking S, from recently constructed access point.



(2) Wetland B, looking N.



(3) Wetland B, looking NNW



(4) Access crossing between Wetlands A & B, looking W from landfill edge.



(5) Southern extent of Wetland A. This seeming drainageway abruptly dead-ends at this point. Water was still and I was unable to locate a culvert or other conveyance.



(6) Looking E across Wetland C at Greenwood St. Landfill. Culverted upland (arrow) separating "forks" of wetland appears to be remnant of road found on 1948 USGS quad.



(7) Looking E across Wetland C. City has begun installing solar panels atop now closed landfill.



(8) East "fork" of Wetland C, looking N.



(9) N end of Wetland C from landfill access road, looking NNW.



(10) Continuation of Photo (9) looking WNW across middle portion of Wetland C.



(11) Continuation of Photo 10 Looking WSW at Southern portion of Wetland C.



(12) Continuation of Photo 11 looking SSW from Construction access Road. Wetland B is barely visible across access road (arrow).



US Army Corps of Engineers
Site Inspection, 1/2/2017
Photo Position / Angle
File No. NAE-2011-01980

FOR PERMITTING ONLY				GREENWOOD STREET LANDFILL		PROJECT NO. XXXX-XXXX FILE NAME: 0001STPL	SHEET NO. C-1
WORCESTER, MASSACHUSETTS				GREENWOOD STREET LANDFILL CLOSURE AND RE-USE			
DESIGNED BY: A. POYANT				CDM Camp Dresser & McKee 100 Cambridge Street Cambridge, MA 02142 Tel: (617) 452-6000 consulting • engineering • construction • operations			
DRAWN BY: M. TOWN							
SHEET CHECKED BY: A. POYANT							
CROSS CHECKED BY: P. POYANT							
APPROVED BY: JUNE 2011							
DATE: JUNE 2011							
REV. NO.				DATE	DRWN	CHKD	REMARKS

Xrefs: [CDM, 2456, 0001STPL, EXPLODED, 2008 SITE SURVEY 083120-1, BE0142XEST BASIN, BE0142XEL, 012 CLOSURE] Images: []
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