APPENDIX L

STREAM ASSESSMENT REPORT

Tier 2 Environmental Impact Statement

I-69 Section 6

Martinsville to Indianapolis

November 14, 2017

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1 – INTRODUCTION

In March of 2004 the Tier 1 Record of Decision (ROD) for I-69 was issued identifying Alternative 3C as the preferred corridor for I-69 and paving the way for the initiation of Tier 2 studies. The 142-mile long I-69 project corridor (approximately 2,000 feet wide) from Evansville to Indianapolis was divided into six sections for the purpose of these studies. Each of the first five I-69 Tier 2 studies has determined the final alignment of the interstate in that section. This document includes an evaluation of streams for I-69 Section 6.

The termini of I-69 Section 6, as approved in the 2004 Tier 1 ROD, are located at SR 37 just south of SR 39 in Morgan County and I-465 in Indianapolis, Marion County. The I-69 Section 6 corridor is centered on existing SR 37, a four-lane divided highway, and will upgrade the existing arterial roadway to interstate standards. The impacts, benefits, and costs of alternatives are evaluated in the Final Environmental Impact Statement (FEIS) for I-69 Section 6. The FEIS recognizes that many of the stream features described in this report have been affected by the existing highway.

I-69 Section 6 is approximately 26 miles in length and is within the jurisdiction of the Louisville District of the Army Corps of Engineers (USACE). **Appendix A of** this report depicts the relationship of the alternatives on United States Geological Survey (USGS) topographic maps and aerial photographs, respectively.

The Upper White River Watershed, is the 8-digit watershed crossed by the I-69 Section 6 project. The I-69 Section 6 project crosses 16 sub-watersheds of the Upper White River Watershed. The 16 sub-watersheds are listed below.

1. State Ditch (HUC14 05120201130070): The State Ditch sub-watershed encompasses approximately 6,863 acres. This sub-watershed drains the northwestern terminus of I-69 Section 6 east to just west of the White River along I-465.
2. Lick Creek–Beech Creek (HUC14 05120201130060): The Lick Creek–Beech Creek sub-watershed encompasses approximately 9,765 acres. This sub-watershed drains the northeastern terminus of I-69 Section 6 west to just west of Bluff Road along I-465.
3. White River–Hide Creek (HUC14 05120201130080): The White River–Hide Creek sub-watershed encompasses approximately 10,128 acres. This sub-watershed drains the northern 1.57 miles of I-69 Section 6 from the I-465 interchange to Banta Road.
4. Little Buck Creek (Southport) (HUC14 05120201130090): The Little Buck Creek (Southport) sub-watershed encompasses approximately 11,073 acres. This sub-watershed drains I-69 Section 6 from Banta Road south to Southport Road.
5. White River–Mann Creek/Harness Ditch (HUC14 05120201130100): The White River–Mann Creek/Harness Ditch sub-watershed encompasses approximately 8,684 acres. This sub-watershed drains I-69 Section 6 from Southport Road south to just north of Wicker Road.

6. Pleasant Run Creek–Buffalo Creek (HUC14 05120201130110): The Pleasant Run Creek–Buffalo Creek sub-watershed encompasses approximately 15,111 acres. This sub-watershed drains I-69 Section 6 from just north of Wicker Road south to just south of Fairview Road.
7. Honey Creek–Turkey Pen Creek (HUC14 05120201140010): The Honey Creek–Turkey Pen Creek sub-watershed encompasses approximately 11,853 acres. This sub-watershed drains I-69 Section 6 from just south of Fairview Road south to Smith Valley Road.
8. White River–North Bluff/Bluff Creeks (HUC14 05120201140030): The White River–North Bluff/Bluff Creeks sub-watershed encompasses approximately 10,140 acres. This sub-watershed drains I-69 Section 6 from Smith Valley Road south to just north of Whiteland Road.
9. White River–Sinking Creek (HUC14 05120201140040): The White River–Sinking Creek sub-watershed encompasses approximately 8,976 acres. This sub-watershed drains I-69 Section 6 from just north of Whiteland Road south to just north of Crooked Creek.
10. Crooked Creek–Banta Creek (HUC14 05120201140050): The Crooked Creek–Banta Creek sub-watershed encompasses approximately 10,179 acres. This sub-watershed drains I-69 Section 6 from just north of Crooked Creek south to Perry Road.
11. White River–North Trib (Centenary Church) (HUC14 05120201140060): The White River–North Trib (Centenary Church) sub-watershed encompasses approximately 4,533 acres. This sub-watershed drains I-69 Section 6 from Perry Road south to Stotts Creek.
12. Stotts Creek–Exchange (HUC14 05120201140120): The Stotts Creek–Exchange sub-watershed encompasses approximately 2,897 acres. This sub-watershed drains I-69 Section 6 at the confluence of Stotts Creek and the White River.
13. White River–Henderson Bridge (HUC14 05120201140130): The White River–Henderson Bridge sub-watershed encompasses approximately 3,743 acres. This sub-watershed drains I-69 Section 6 from Stotts Creek south to Egbert Road.
14. Clear Creek–East/West/Grassy Forks (HUC14 05120201140140): The Clear Creek–East/West/Grassy Forks sub-watershed encompasses approximately 14,666 acres. This sub-watershed drains I-69 Section 6 from Egbert Road south to SR 44.
15. Indian Creek–Sand Creek (HUC14 05120201170070): The Indian Creek–Sand Creek sub-watershed encompasses approximately 7,835 acres. This sub-watershed drains I-69 Section 6 from SR 44 south to the southern terminus of I-69 Section 6.
16. White River–Martinsville (HUC14 05120201160060): The White River–Martinsville sub-watershed encompasses approximately 10,072 acres. This sub-watershed drains I-69 Section 6 west of SR 37 in Martinsville near proposed access roads adjacent to Rogers Road and Morton Avenue.

I-69 Section 6 entails upgrading an existing multi-lane, divided transportation facility to a limited access freeway. Most of the right of way required for the I-69 Section 6 project is already devoted to transportation use. This stream assessment report identifies the streams that would be

impacted by these four alternatives carried forward for detailed analysis in the I-69 Section 6 DEIS and the Refined Preferred Alternative (RPA) developed for the FEIS. The RPA is a refinement of Alternative C4, identified as the preferred alternative in the DEIS.

In some cases, this report differentiates those stream impacts which occur within the existing right of way for SR 37 and other transportation facilities from those which occur outside the right of way for SR 37. Many of the streams discussed in this report have been previously modified and impacted, i.e., captured in ditches, concrete channels, pipes, culverts, and/or bridges. Stream segments within existing SR 37 structures that would be altered as a result of the I-69 conversion are considered previously impacted by construction. Many of the remaining impacts would result from extensions of the existing structures i.e. lengthening of existing culverts, widening of existing bridges, re-routing of concrete channels, etc.

All non-encapsulated stream segments with an Ordinary High Water Mark (OHWM) that are crossed by the alternatives were surveyed. A single stream impact may have more than one stream assessment segment if the habitat along the length of the stream changed. In these cases, a separate assessment was made. However, if the habitat along the entire impacted length of the stream did not change only one assessment segment was completed. If two or more alternatives cross a stream in the same location and the habitat was consistent throughout the stream reach, only one assessment was made.

A total of 181 stream segments were identified and surveyed using the Qualitative Habitat Evaluation Index (QHEI) (Rankin, 1979) or the Headwater Habitat Evaluation Index (HHEI) (Ohio EPA, 2012) depending on drainage area and maximum pool depth of each stream segment. Surveys were performed in accordance with the Indiana Department of Environmental Management's (IDEM's) Standard Operating Procedure. Water chemistry and biological sampling were not performed in this survey.

The information compiled in this report will serve as a data source for the evaluation of project alternatives, future environmental reports and ultimately for the preparation of required waterway permits.

2 – REGULATORY DEFINITIONS

To comply with the requirements of the National Environmental Policy Act, 1969 (NEPA), the potential impacts on sensitive resources must be examined and considered for proposed federal transportation facilities. These resources include, but are not limited to, floodplains, wetlands, endangered species, historic and archeological sites, parklands, air quality, wildlife habitat, waters of the U.S. and others.

The term "waters of the U.S." is defined in the CWA (40 CFR §122.2) and means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds; the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the U.S. under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act (CWA) are not waters of the U.S.

“Waters of the State” means accumulations of waters that are within, partially within, or border on the State of Indiana. The term includes both surface and underground waters, natural and artificial waters, and public and private waters. However, the term does not include any private pond, or any pond, reservoir, or facility built for the reduction or control of pollution. Nor does it include ponds, reservoirs, or facilities built for the cooling of water prior to discharge unless the discharge causes or threatens to cause water pollution.

“Waters of the State” are defined in Indiana Code 13-11-2-265 as meaning:

(a) "Waters", for purposes of water pollution control laws and environmental management laws, means:

(1) The accumulations of water, surface and underground, natural and artificial, public and private; or

(2) A part of the accumulations of water;

(b) That are wholly or partially within, flow through, or border upon Indiana.

(c) The term "waters" does not include:

(1) An exempt isolated wetland;

(2) A private pond; or

(3) An off-stream pond, reservoir, wetland, or other facility built for reduction or control of pollution or cooling of water before discharge.

(d) The term includes all waters of the U.S., as defined in Section 602(7) of the federal Clean Water Act (33 U.S.C. §1362(7)), that are located in Indiana.

(e) As added by P.L.1-1996, SEC.1. Amended by P.L.183-2002, SEC.1; P.L.282-2003, SEC.31; P.L.52-2004, SEC.4.

The waters of the U.S. and the waters of the state may include perennial, intermittent, and ephemeral streams as defined below.

Perennial Streams: Perennial streams are streams that flow throughout the majority of the year (greater than 90 percent of the time) and flow in a well-defined channel. However, perennial streams can "dry up", particularly during extended periods of drought. All streams that were identified on the USGS maps by a solid blue line were considered perennial streams for this report.

Intermittent Streams: An intermittent stream is a stream that flows only during wet periods of the year (30 to 90 percent of the time) and flows in a continuous well-defined channel. During dry periods, especially in summer months, intermittent streams may go down to a trickle of water and appear dry when, in fact, there is water flowing through the stream bottom or "substrate". All streams that were identified on the USGS maps by a broken blue line were considered intermittent streams for this report.

Ephemeral Streams: An ephemeral stream is a stream that flows only during and for short periods following precipitation (less than 30 percent of the time); and flows in low areas that may or may not have a well-defined channel. Some commonly used names for ephemeral streams include: storm water channel, drain, swale, gully, hollow, or saddle. Since ephemeral streams are often headwater streams, it is typically recommended that roads, site-prep, and other soil disturbing activities be minimized in ephemeral streams to avoid erosion and sedimentation of storm water runoff that will flow downstream to larger streams or water bodies. All streams identified in the field that were not represented on the USGS maps were classified as ephemeral streams for this report.

3 – POTENTIAL HABITAT QUALITY IMPACTS

The I-69 Section 6 field survey study area is a boundary that includes the right of way of all five alternatives plus an approximate 50-foot buffer from these alternatives. This area was investigated for natural resources such as wetlands, streams, forests and wildlife habitat. The field survey study area consists of three primary land uses including forest, developed land, and agricultural land. Developed areas consist mainly of residential areas along with businesses.

Land use and land cover within the I-69 Section 6 field survey study area are dominated by developed land in the southern and northern portions in Martinsville and Indianapolis, respectively. Agricultural land, forest, and scattered residential and commercial properties can be

found in between. Developed land accounts for about 54 percent of the land cover in the field survey study area while upland habitats account for about 17 percent of the land cover. Agricultural lands, primarily row crops, account for approximately 23 percent of the I-69 Section 6 land use. Water and wetlands comprise about 3 percent while sand/gravel operations and limestone quarry companies make up the remaining 3 percent of the land cover. The existing pavement, shoulders, structures, side slopes and right of way of SR 37 make up a significant portion of the I-69 Section 6 field survey study area.

I-69 Section 6 entails upgrading an existing multi-lane, divided transportation facility to a full freeway design. Expected habitat impacts to the streams in the I-69 Section 6 field survey study area would result from highway construction and operation. Typical impacts may include: direct habitat loss, channelization, relocation, removal of instream cover, bank stabilization and fill, removal or narrowing of riparian zones, sedimentation, nutrification, and other impacts relating to highway runoff. Most of the right of way used for the I-69 Section 6 project is already devoted to transportation use. Many of the impacted streams are currently roadside ditches within existing transportation right of way.

4 – METHODOLOGY

4.1 Location of Survey Sites

Survey sites were located by finding the intersections of the alternative alignments with each ephemeral, intermittent, and perennial stream. Surveys were performed by qualified members of the I-69 Section 6 project team.

A combination of techniques was used to identify streams, including the use of topographic maps, aerial photography, soil surveys, digital elevation models, geographic information system (GIS) layers, and on-site field verification. These data sources were used to compile an updated GIS layer of jurisdictional waterways within the field survey study area.

Prior to beginning fieldwork, the type of evaluation (QHEI or HHEI) required for each stream within the preliminary work limits was determined based on watershed size and was subsequently confirmed on-site. A minimum of one evaluation was completed for each non-culverted stream falling within an impact footprint of any of the alternatives. The assessment reach was generally centered approximately at the point the alternative centerline crossed the waterway.

Additional evaluations were completed for streams if dramatic changes in function (i.e. channel, flow, substrate, cover) occurred within the section of waterway impacted. For example, a stream that originates as a channelized agricultural ditch, which then flows into a forest where it becomes a natural channel, received one evaluation for the modified channel and a second evaluation for the natural channel. In addition, evaluations were performed on either side of a culvert or pipe regardless of a change in habitat. Multiple evaluations were performed in

instances where an individual alternative crossed a stream in more than one location or where multiple alternatives crossed the same stream segment in more than one location.

4.2 Delineation of Watersheds

The USGS StreamStats Interactive Map (version 4.0, 2016)[1] was used as the basis for developing the watersheds of several of the major streams within the field survey study area. Drainage areas reported for streams within the study area ranged from 0.01 square mile for some small ephemeral channels to 1,904 square miles for the White River.

4.3 Field Surveys

Each site was located in the field using aerial photographs and a global positioning satellite (GPS) receiver. Sites were examined to determine if a bed and bank were present. Grassy swales were not surveyed because they did not meet the definition of Waters of the U.S. or Waters of the State. Grassy swales do not display OHWM characteristics and therefore do not meet the definition of a jurisdictional water. Sites were identified and a 200-foot reach (or maximum length of stream segment if less than 200 feet available) was measured off with the site at the center of the reach. Photographs upstream and downstream of each site were taken using a digital camera. Alterations to drainage channels that deviated from the mapped channels were noted and the altered channels were located by GPS for revision to the GIS data. Additional channels that did not appear on the aerial photo field maps were located by GPS and the site was surveyed using either the QHEI or HHEI standardized forms.

Data collected in the field were entered into database tables. The project maps were updated from digitally corrected GPS files and additional channels were added to the GIS project data.

Tabulated data included the following.

1. Site identification number
2. GPS coordinates
3. Quarter-section, Section, Township, and Range
4. 7.5-minute Quadrangle name
5. County
6. Date of survey
7. Type of survey, QHEI or HHEI
8. Survey score

[1] http://water.usgs.gov/osw/streamstats/

9. Watershed area
10. Stream gradient
11. Stream flow (perennial, intermittent, or ephemeral)
12. Classification code (Cowardin, 1979)
13. Associated alternative(s)

5 – ANALYSIS

A total of 275 stream segments were identified within the I-69 Section 6 alternatives. QHEI surveys were performed on 49 of the sites and HHEI surveys were performed on 132 of these reaches. QHEI and HHEI evaluations were not completed for encapsulated (culvert) or bridged portions of streams. **Appendix A** of this report contain maps showing the survey site locations.

The Ohio Environmental Protection Agency (OEPA) developed the QHEI for streams and rivers in Ohio (Rankin 1989, 1995). QHEI was selected as the methodology for this study in consultation with the permitting agencies because it was currently being used by IDEM to assess habitat quality. The QHEI is a physical habitat index designed to provide an empirical, quantified evaluation of the general lotic macrohabitat (OEPA, 2006). Although the OEPA originally developed the QHEI to evaluate fish habitat in streams, IDEM uses the QHEI as a measure of general habitat quality. The QHEI is composed of six metrics including substrate composition, in-stream cover, channel morphology, riparian zone and bank erosion, pool/glide and riffle/run quality, and map gradient. Each metric is individually scored and then summed to provide the total QHEI score. The highest possible score is 100.

The QHEI evaluates the characteristics of a stream segment, as opposed to the characteristics of a single sampling site. Thus, the QHEI provides an averaged quality index over the length of a reach instead of a site score that may be influenced by a localized disturbance. QHEI scores from hundreds of stream segments in Ohio have indicated that values greater than 60 are generally conducive to the existence of warm water faunas. Scores greater than 75 typify habitat conditions that have the ability to support exceptional warm water faunas (OEPA, 2006). Rankin (1989) had indicated that stream QHEI's scoring less than 33 were not meeting designated uses for aquatic life in Ohio.

QHEI scores are classified by the OEPA as:

>75	Exceptional Warm Water Habitat
60-75	Suitable for Warm Water Habitat without use impairment
45-60	Warm Water Habitat under some circumstance, but may show level of impairment that requires reclassification as Modified Warm Water Habitat
32-45	Modified Warm Water Habitat

<32 Modified Warm Water Habitat if watershed area is greater than 3 square miles, otherwise Limited Resource Water.

The OEPA developed the HHEI for the extreme headwater habitats of rivers and streams in Ohio Primary Headwater Habitat (PHWH). Ohio defines these extreme headwaters as primary headwater habitat streams having a defined bed and bank, with either continuous or periodic flowing water, with watershed areas less than or equal to 1-square mile, and maximum depth of water pools equal to or less than 40 centimeters (approximately 15.7 inches). The HHEI is based on three physical measurements that have been found to correlate well with biological measures of stream quality; substrate, maximum pool depth, and bank full width (OEPA, 2009).

OEPA (2012) classified headwater streams as Class I, II, or III habitats. The HHEI classifications were based on habitat scoring. In some instances, the HHEI classification guidelines would require additional biological evaluations to verify the classification.

Class I PHWH - A certain percentage of the primary headwater stream channels were observed to be normally dry, with little or no aquatic life present. This type of primary headwater is normally identified as an ephemeral stream, with water present for short periods of time due to infiltration from snow melt or storm water runoff, is herein referred to as a Class I PHWH stream (HHEI score less than 30). If a Class I PHWH stream is no longer in its natural channel it is considered a Modified Class I PHWH stream.

Class II – PHWH – These streams were found to have a moderately diverse community of warm-water adapted native fauna either present seasonally or on an annual basis. The native fauna of these streams is characterized by species of vertebrates (fish or salamanders) and/or benthic macroinvertebrates that are pioneering, headwater, temporary, and/or temperature facultative. This type of PHWH stream is herein referred to as a Class II PHWH stream. Scores for Class II PHWH natural channels generally range from 30 to 49, but can be as high as 69 in instances when the stream is not flowing and the watershed is greater than 0.1 square miles. If a Class II-PHWH stream is no longer in its natural channel it is considered a Modified Class II PHWH stream if the HHEI score is 70 or greater.

Class III – PHWH – These streams are found to have native fauna adapted to cool-cold perennial flowing water characterized by a community of vertebrates (either cold water adapted species of headwater fish and/or obligate aquatic species of salamanders from the lungless family Plethodontidae), and/or a diverse community of benthic macroinvertebrates including cool water taxa, with larval life stages resident in the stream continuously on an annual basis. This type of PHWH stream is herein referred to as a Class III PHWH stream. Scores for Class III PHWH natural channels are typically 70 or greater. In flowing stream instances where the score is between 50 and 69, with more than 10 percent of the substrate being cobble, boulder, boulder/slab, or bedrock, the stream may also be classified as Class III PHWH. Modified stream channels cannot be classified as Class III PHWH.

Rheocrene Potential - Rheocrene springs have groundwater emerging at the surface. For the purposes of the HHEI evaluation, the designation of rheocrene potential is made if the stream has

constantly flowing water, a well-defined bed and bank, and has a watershed size of less than 0.1 square mile.

5.1 Results

Appendix B of this report contains the stream impacts and stream relocation lengths by alternative in tabular form.

Appendix C of this report contains Stream Impact site forms and QHEI or HHEI site forms.

5.1.1 Headwater Streams

Most headwater habitat streams (watersheds <1 square mile) in the study area contained low water or water only was present in isolated pools. As expected from the glacial till region that the majority of I-69 Section 6 lies within, the predominant substrate materials were sand and silt. Stream gradients ranged from flat to severe. HHEI scores ranged from 6 to 78 with an overall average score of 32.78 (see **Appendix B** of this report).

5.1.2 Perennial Streams

Streams for which QHEI surveys were performed had gravel, hardpan, sand, and silt substrates. QHEI scores ranged from 18 to 64.5 with an overall average score of 45.37. Streams that qualified for evaluation using the HHEI had hardpan and sand/silt substrates. HHEI scores for perennial streams ranged from 42 to 67 with an overall average of 55.00. (See **Appendix B** of this report). Reported below are the perennial stream reaches within the I-69 Section 6 right of way for all alternatives. In cases where all contiguous lengths of a stream are not the same hydrologic regime (ephemeral, intermittent, perennial) these reaches will be reported with those that make up the majority of the length.

Indian Creek (S6S001a-d) - Indian Creek flows southeast to northwest under SR 37 at the southern limits of the project. Segments S6S001a and S6S001c represent the upstream and downstream channels within the survey area. Segments S6S001b and S6S001d are the segments beneath the SR 37 and Old SR 37 bridges. This stream is a perennial stream with fair habitat development and low sinuosity. The predominant substrate consists of sand. The stream reach surveyed has a moderate to wide riparian corridor and the adjacent floodplain is dominated with forest. The QHEI scores of 55.25 downstream and 60 upstream are reflective of a warm water habitat.

Sartor Ditch (S6S008a-o) - Sartor Ditch is an excavated roadside ditch feature that, within the proposed right of way, runs from approximately South Street, west of SR 37, to south of E. Southview Drive, south of SR 37. Fifteen perennial segments were observed, resulting in eight QHEI evaluations (Segments S6S008a, S6S008b, S6S008d, S6S008g, S6S008h, S6S008j, S6S008l, and S6S008o) of the daylighted portions. The seven remaining segments (Segments

S6S008c, S6S008e, S6S008f, S6S008i, S6S008k, S6S008m, and S6S008n) were contained within culverts and were not evaluated. This is a perennial stream with fair habitat development and no sinuosity. The predominant substrates within the eight evaluated reaches were sand and silt. The stream reach surveyed has no riparian corridor and the adjacent floodplain is dominated by urban and industrial land use. An average QHEI score of 30.94 is reflective of a modified warm water habitat. Ten of the fifteen identified reaches of this stream are reported within **Appendix B** of this report. The other five reaches were evaluated during field surveys, but they are not anticipated to be impacted by the project.

West Fork Clear Creek (S6S031a-c) – The West Fork Clear Creek flows northwest to southeast. Segments S6S031a and S6S031b are natural channels within the survey area north of the Cikana State Fish Hatchery. Segment S6S031c is a perennial reach encapsulated in a culvert under a local drive. This is a perennial stream with fair habitat development and low to moderate sinuosity. The predominant substrate consists of cobble, gravel and sand. The stream reach surveyed has a moderate riparian corridor and the adjacent floodplain is dominated by forest and agricultural land use. The QHEI score of 56.5 for Segment S6S031a and 53 for Segment S6S031b is reflective of a probable warm water habitat.

West Fork Clear Creek (S6S040a-c) - The West Fork Clear Creek flows southwest to northeast parallel to the east side of SR 37. Segments S6S040a and S6S040b are natural channels within the survey area north of Teeters Road. Segment S6S031c is a perennial reach encapsulated in a culvert beneath Teeters Road. This is a perennial stream with good habitat development and low sinuosity. The predominant substrate consists of sand. The stream reach surveyed has a narrow riparian corridor and the adjacent floodplain is dominated by agricultural land use. The QHEI score of 61.5 for Segment S6S040a is indicative of a warm water habitat. The score of 49 for Segment S6S040b is reflective of a probable warm water habitat.

UNT 14 to West Fork Clear Creek (S6S042a-b) - This stream segment flows west to east into the Ozark fish hatchery property. Segment S6S042a represents the reach to the east of SR 37, while S6S042b is the encapsulated reach under the SR 37. The substrates in this reach are predominantly sand and muck, and the narrow riparian corridor is surrounded by residential and new field lands. The HHEI score of 53 indicates that this stream is potentially a rheocrene habitat feature.

Clear Creek (S6S045a-e) - Clear Creek flows east to west under SR 37. Segments S6S045a, S6S045c, and S6S045d represent natural channels within the survey area. Segment S6S045e is the bridge segment under the SR 37 bridge. Segment S6S045b is the bridged segment of Clear Creek under Old SR 37. This is a perennial stream with good to fair habitat development and moderate sinuosity. The predominant substrate consists of sand. The stream reach surveyed ranges from significant to no riparian corridor and the adjacent floodplain is dominated by residential, forest, scrub, and open pasture use lands. The QHEI scores of 46.25 to 58.25 is indicative of a probable warm water habitat. The score of 62 is representative of a warm water habitat.

UNT 18 to Clear Creek (S6S048a) - This UNT to Clear Creek flows southeast to northwest. Segment S6S048a represents natural channels within the survey area. This is a perennial stream with good habitat development and moderate to high sinuosity. The predominant substrate consists of sand. The stream reach surveyed has a wide riparian corridor and the adjacent floodplain is dominated by forest. The QHEI score of 43.5 is reflective of a modified warm water habitat.

UNT 1 to the White River (S6S050a-f) - This UNT to the White River flows from south to north under SR 37. Segment S6S050a is the roadside ditch along the west side of Henderson Ford Road. Segment S6S050b is the encapsulated reach through the culvert at Henderson Ford Road. Segment S6S050c flows northwest from SR 37 to Henderson Ford Road. Segment S6S050d is the encapsulated segment under SR 37. Segments S6S050e and S6S050f represent the natural channels upstream of SR 37. This is a perennial stream with fair habitat development and no to low sinuosity. The predominant substrate consists of sand and gravel. The stream reaches surveyed range from narrow to no riparian corridor and the adjacent floodplain is dominated by agricultural, forest, open pasture, and residential use lands. The QHEI scores of 38 to 38.5 for Segments S6S050a and S6S050c are reflective of a modified warm water habitat. The HHEI scores of 53 and 62 for Segments S6S050e and S6S050f, respectively, is reflective of a Class II PHWH habitat.

Stotts Creek (S6S053a-b) - Stotts Creek flows southeast to northwest under SR 37. Segment S6S053b represents the natural channel upstream of SR 37. Segment S6S053a is the bridged segment downstream of SR 37. This is a perennial stream with good habitat development and moderate sinuosity. The predominant substrate consists of sand. The stream reach surveyed has a moderate riparian corridor and the adjacent floodplain is dominated by forest and open pasture land use. The QHEI score of 57.25 is reflective of a probable warm water habitat. Stotts Creek is a 303(d) Listed Impaired Water according to the Indiana Department of Environmental Management (IDEM) for *Escherichia coli* (*E. coli*) (IDEM, 2014).

UNT 4 to the White River (S6S055a-d) - This UNT to the White River flows southeast to northwest under SR 37. Segments S6S055a and S6S055c represent the natural channel downstream and upstream of SR 37, respectively. Segments S6S055b and S6S055d are the encapsulated segments under SR 37 and Cragen Road, respectively. This perennial stream has fair habitat development, but low sinuosity. The predominant substrate consists of gravel and sand. The stream reach surveyed has a wide to narrow riparian corridor and the adjacent floodplain is dominated by residential land use. The HHEI score of 42 and 67 for segments S6S055a and S6S055c, respectively, are reflective of a Class II PHWH habitat.

Crooked Creek (S6S064a-c) - Crooked Creek flows southeast to northwest under SR 37. Segment S6S064a represents the natural channel within the survey area. Segments S6S064b and S6S1064c are the bridged segments under SR 37 and a local drive. This is a perennial stream with fair habitat development with low sinuosity. The predominant substrate consists of gravel and sand. The stream reach surveyed has a narrow riparian corridor and the adjacent floodplain is dominated by open pasture land. The QHEI score of 53 is reflective of a probable warm water

habitat. Crooked Creek is a 303(d) Listed Impaired Water according to IDEM for *E. coli* (IDEM, 2016).

UNT 1 to Bluff Creek (S6S086a-d) - This UNT to Bluff Creek flows southeast to northwest under SR 37. Segments S6S086a, S6S086b, and S6S086d represent natural channels within the survey area. Segment S6S086c is the encapsulated segment under SR 37. This is a perennial stream with fair habitat development with moderate to low sinuosity. The predominant substrate consists of cobble, gravel and sand. The stream reach surveyed has a wide riparian corridor and the adjacent floodplain is dominated by forest land use. The HHEI score of 58 for Segment S6S086ais reflective of a Class III PHWH. The HHEI scores of 48 and 57 for Segments S6S086b and S6S086d, respectively, are reflective of a rheocrene potential habitat.

Bluff Creek (S6S090a-d) - Bluff Creek flows east to west under SR 37. Segments S6S090a and S6S090d represent natural channels within the survey area. Segments S6S090b and S6S090c are the bridged segments under Huggin Hollow Road and SR 37, respectively. This is a perennial stream with fair habitat development and moderate to low sinuosity. The predominant substrate consists of muck and silt. The stream reach surveyed has narrow to very narrow riparian corridor and the adjacent floodplain is dominated by scrub and forest use lands. The QHEI score of 32 for Segment S6S090a is reflective of a modified warm water habitat. The QHEI score of 46 for Segment S6S090d is reflective of a probable warm water habitat.

Travis Creek (S6S099a-c) - Travis Creek flows southeast to northwest under SR 37. Segments S6S099a and S6S099c represent the natural channel within the survey area. Segment S6S099b is the encapsulated portion under SR 37. This is a perennial stream with fair habitat development within a recovering channelized reach (i.e. moderate sinuosity). The predominant substrate consists of gravel and sand. The stream reach surveyed has wide to very narrow riparian corridor and the adjacent floodplain is dominated by scrub, forest, and residential land use. The QHEI score of 51 for Segment S6S099a downstream of SR 37 is reflective of a probable warm water habitat. Segment S6S099c upstream of SR 37 has a QHEI score of 43, indicating a modified warm water habitat.

North Bluff Creek (S6S100a-d) - North Bluff Creek flows east to west under SR 37. Segments S6S100a and S6S100b represent natural channels within the survey area. Segment S6S100c is the encapsulated segment under SR 37. Segment S6S100d is the channelized ditch upstream of SR 37. This stream is a perennial stream with fair habitat development within a recovering channelized reach (i.e. moderate to no sinuosity). The predominant substrate consists of sand and gravel. The stream reach surveyed has moderate to no riparian corridor and the adjacent floodplain is dominated by open pasture, forest, and residential land use. The QHEI score of 45 for Segment S6S100a and 43 for Segment S6S100b is reflective of a modified warm water habitat. The QHEI score of 27 for Segment S6S100d is reflective of a limited warm water habitat.

Honey Creek (S6S101a-c) - Honey Creek flows southeast to northwest under SR 37. Segments S6S101a and S6S101c represent natural channels within the survey area. Segment S6S101b is the encapsulated segment under the SR 37 bridge. This is a perennial stream with fair habitat

development and low sinuosity. The predominant substrate consists of gravel and sand. The stream reach surveyed has a very narrow to narrow riparian corridor and the adjacent floodplain is dominated by forest and residential lands. The QHEI scores of 47.5 for segment S6S101a and 48 for S6S101c are reflective of a probable warm water habitat.

Pleasant Run Creek (S6S102a-c) - Pleasant Run Creek flows from east to west under SR 37. Segment S6S102a represents the natural upstream and downstream channel within the survey area. Segments S6S102b and S6S102c are the segments under the SR 37 and Bluff Road, respectively. This is a perennial stream with fair habitat development with no sinuosity. The predominant substrate consists of cobble and sand. The stream reach surveyed has minimal riparian corridor and the adjacent floodplain is dominated by residential and commercial land use. The QHEI score of 56 is reflective of a probable warm water habitat. Pleasant Run Creek is a 303(d) Listed Impaired Water according to IDEM for impaired biotic communities (IDEM, 2016).

Little Buck Creek (S6S104a-b) - Little Buck Creek flows east to west under SR 37 and north of Southport Road. Segment S6S104a represents the upstream and downstream natural channel within the survey area. Segment S6S104b represents the segment under the SR 37 and Belmont Avenue bridges. This is a perennial stream with good habitat development and moderate sinuosity. The predominant substrate consists of sand and gravel. The stream reach surveyed has no riparian corridor and the adjacent floodplain is dominated by residential and old field lands. The QHEI score of 49 is reflective of a probable warm water habitat.

White River (S6S107a-b) – The White River flows from north to south under I-465. Segment S6S107a represents the upstream and downstream channel within the survey area. Segment S6S107b is the segment under the I-465 bridges. This is a perennial stream with fair habitat development and low sinuosity within this reach. The predominant substrate consists of cobble and sand. The stream has a wide riparian corridor associated along both banks for the length of this reach. Beyond the riparian corridor, the adjacent floodplain is dominated by urban, agricultural, and residential land use. The QHEI score of 64.5 is reflective of a warm water habitat. The White River is a 303(d) Listed Impaired Water according to IDEM for nutrients, polychlorinated biphenyls (PCBs) in fish tissue, and impaired biotic communities (IDEM, 2016).

UNT 23 to the White River (S6S108a) - This UNT to the White River flows from east to west and is located north of the I-465 westbound lanes. Segment S6S108a represents the entire length of the feature within the survey area. This feature is a channelized ditch, cut to convey drainage from a sand and gravel operation to the east. This is a perennial stream with fair habitat development and moderate sinuosity. The predominant substrate consists of silt and sand. The stream has a no riparian corridor along both banks for the length of this reach. The adjacent floodplain is dominated by urban land use. The QHEI score of 28.5 is reflective of a modified warm water habitat.

State Ditch (S6S111a-b) - State Ditch flows from north to south under I-465. Segment S6S111a represents the upstream and downstream channel within the survey area. Segment S6S111b is the segment under the I-465 bridges. This is a perennial stream with fair habitat development and

moderate sinuosity. The predominant substrate consists of gravel and sand. The stream has a moderate riparian corridor along both banks for the length of this reach. Beyond the riparian corridor, the adjacent floodplain is dominated by urban and residential land use. The QHEI score of 56.5 is reflective of a probable warm water habitat. State Ditch is a 303(d) Listed Impaired Water for *E. coli* according to IDEM for Impaired Biotic Communities (IDEM, 2016).

Lick Creek (S6S113a-c) - Lick Creek flows east to west under I-465 and within the median between the eastbound and westbound lanes at the I-465/US 31 interchange. Segments S6S113a and S6S113c represent the upstream and downstream channel within the survey area. Segment S6S111b is the segment under the I-465 bridge. This is a perennial stream with fair habitat development and low sinuosity. The predominant substrate consists of gravel and sand. The stream reach surveyed has no riparian corridor. The QHEI score of 43 is reflective of a modified warm water habitat.

5.1.3 Intermittent Streams

The majority of intermittent streams within the field survey study area met the criteria for evaluation using the HHEI, the exception being Orme Ditch, Haueisen Ditch, and an UNT to the White River which were evaluated using the QHEI. These were identified as intermittent via field verification and/or reference to the USGS Topographic Map (i.e. stream features identified as USGS blueline streams). HHEI scores ranged from 11 to 78 with an overall average of 37.70. The eight reaches of intermittent streams evaluated using the QHEI protocol were scored between 24 and 48 with an average of 34.83.

UNT 3 to Sartor Ditch (S6S011a-f) - This UNT to Sartor Ditch flows east to west under Robert Curry Drive just east of SR 37, under SR 37, and under Outer Drive just west of SR 37. Segments S6S011a, S6S011d, and S6S011f represent the upstream and downstream channels within the survey area. Segment S6S011b represents the encapsulated segment under Outer Drive. Segment S6S011c represents the encapsulated segment under SR 37. Segment S6S011e represents the encapsulated segment under Robert Curry Drive. Segment S6S011a downstream of SR 37 is an intermittent stream within a channelized ditch (i.e. no sinuosity). The predominant substrate consists of gravel and sand. The stream reach surveyed has no riparian corridor and the adjacent floodplain is dominated by residential land use. The HHEI score of 63 is reflective of Modified Class II PHWH habitat. Segment S6S011d is upstream and east of SR 37 within a channelized ditch (i.e. no sinuosity). The predominant substrate consists of silt and sand. The stream reach surveyed has no riparian corridor and the adjacent floodplain is dominated by urban and industrial land uses. The HHEI score of 61 is reflective of Modified Class II PHWH habitat. Segment S6S011f represents an intermittent stream within a channelized ditch (i.e. no sinuosity). The predominant substrate consists of silt and sand. The stream reach surveyed has a moderate riparian corridor along the left bank and narrow riparian corridor along the right bank. The adjacent floodplain is dominated by immature forest along the left bank and urban land use along the right bank. The HHEI score of 51 is reflective of Modified Class II PHWH habitat.

UNT 5 to Indian Creek (S6S013a-b) – The UNT to Indian Creek flows north to south along a residential subdivision east of SR 37. Segments S6S013a and S6S013b represent channel ditches within the survey area. This is an intermittent stream with no sinuosity. The predominant substrate consists of hardpan, sand, and silt. The stream reach surveyed has no riparian corridor and the adjacent floodplain is dominated by residential and agricultural land use. The QHEI score of 23.5 for the downstream reach is reflective of a limited warm water habitat. The QHEI score of 34 for the upstream reach is reflective of a modified warm water habitat.

UNT 5 to Sartor Ditch (S6S014a-c) - The UNT to Sartor Ditch originates within the roadside of the intersection of Grand Valley Boulevard and SR 37. Flow likely contributes to Sartor Ditch from a retention pond north of Grand Valley Boulevard. Segments S6S014a and S6S014c represent channelized ditches, while Segment S6S014b is encapsulated within a culvert under SR 37. This is an intermittent stream with no sinuosity. The predominant substrate consists of sand. The stream reach surveyed has a narrow riparian corridor west of SR 37 and the adjacent floodplain is dominated by residential land use. The HHEI score of 68 for Segment S6S014A is reflective of a Modified Class II PHWH. The HHEI score of 70 for Segment S6S014c is considered to be unclassified for this modified channel.

UNT 2 to West Fork Clear Creek (S6S028a-c) - This UNT flows west to east toward the West Fork of Clear Creek. Segments S6S028a and S6S028c represent the natural channels east and west of SR 37. Segment S6S028b represents the encapsulated portion under SR 37. The predominant substrate consists of cobble and sand. The stream reach surveyed has moderate riparian corridor and the adjacent floodplain is dominated by immature forest. The HHEI score of 40 for Segment S6S028a is reflective of a Class II PHWH. The HHEI score of 26 for Segment S6S028c is indicative of a Class I PHWH.

UNT 4 to West Fork Clear Creek (S6S030a) – This short UNT flows from a pasture pond west of SR 37 toward a culvert inlet under SR 37. Predominate substrate is hardpan and the floodplain was dominated by open pasture on the left bank. The HHEI score of 11 indicates a Modified Class I PHWH.

UNT 4 to West Fork Clear Creek (S6S035a) – This UNT flows west to east from a pasture to the inlet of a SR 37 culvert. This is an intermittent stream segment within a channelized ditch. The substrate is hardpan and the floodplain was dominated by open pasture on the left bank. The HHEI score of 22 indicates a Modified Class I PHWH.

UNT 9 to West Fork Clear Creek (S6S036a-d) - This UNT to West Fork Clear Creek flows south to north along the west side of SR 37. Segments S6S036a, S6S036b, and S6S036d represent natural channels within the survey area. Segment S6S036c represents a long-encapsulated portion of the stream through a field. Segment S6S036a represents an intermittent stream with moderate sinuosity. The predominant substrate consists of hardpan. The stream reach surveyed has a narrow riparian corridor. The adjacent floodplain is dominated by immature forest and residential land uses. The HHEI score of 31 is reflective of Class II PHWH. Segment S6S036b represents an intermittent stream with moderate sinuosity. The predominant substrate consists of hardpan. The stream reach surveyed has a narrow riparian corridor along the right

bank and no riparian corridor along the left bank. The adjacent floodplain is dominated by residential and old field land uses. The HHEI score of 21 is reflective of Class I PHWH. Segment S6S036d represents an intermittent stream with moderate sinuosity. The predominant substrate consists of hardpan. The stream reach surveyed has a narrow riparian corridor. The adjacent floodplain is dominated by immature forest. The HHEI score of 21 is reflective of Class I PHWH. S6S036 and S6S037 converge at the inlet of a culvert under SR 37.

UNT 10 to West Fork Clear Creek (S6S037a) – This UNT to West Fork Clear Creek flows north to south along the west side of SR 37. Segment S6S037a represents an intermittent stream within a roadside ditch. The predominant substrate consists of hardpan. The stream reach surveyed has no riparian corridor. The adjacent floodplain is dominated by residential land along the right bank and transportation land use along the left bank. The HHEI score of 11 is reflective of Modified Class I PHWH. S6S036 and S6S037 converge at the inlet of a culvert under SR 37.

UNT 13 to West Fork Clear Creek (S6S041a) – This UNT to West Fork Clear Creek flows south to north from a wetland to its confluence with the West Fork Clear Creek (Segment S6S040a). It is an intermittent stream with low sinuosity. The predominant substrate consists of muck. The stream reach surveyed has a wide riparian corridor and the adjacent floodplain is dominated by wetland forest and agricultural land use. The HHEI score of 21 is reflective of Class I PHWH.

UNT 16 to West Fork Clear Creek (S6S044a) - This UNT to West Fork Clear Creek flows north to south into a forested wetland west of SR 37. It is an intermittent stream with moderate sinuosity. The predominant substrate consists of muck. The stream reach surveyed has a wide riparian corridor and the adjacent floodplain is dominated by mature forest. The HHEI score of 11 is reflective of Class I PHWH.

UNT 17 to West Fork Clear Creek (S6S046a) – This UNT to West Fork Clear Creek flows east along the north side of Teeters Road toward West Fork of Clear Creek. This is an intermittent stream within a channelized reach (i.e. no sinuosity). The predominant substrate consists of sand. The stream reach surveyed has a moderate to wide riparian corridor. The adjacent floodplain is composed of immature forest. The HHEI score of 58 is reflective of a Class II PHWH.

UNT 1 to Stotts Creek (S6S054a-c) - This UNT to Stotts Creek flows south to north under New Harmony Road on the southeast of SR 37. Segments S6S054a and S6S054c represent the upstream and downstream natural channels, respectively, within the survey area. Segment S6S054b is encapsulated under New Harmony Road. This is an intermittent stream with moderate sinuosity downstream (Segment S6S054a) and high sinuosity upstream (Segment S6S054c). The predominant substrate consists of sand. Segment S6S054a has a narrow riparian corridor and the adjacent floodplain is dominated by immature forest and open pasture land use. Segment S6S054c has a narrow riparian corridor along the left bank and a wide riparian corridor along the right bank. The adjacent floodplain upstream is dominated by residential land and immature forest. The HHEI score of 43 for both segments is reflective of Modified Class II PHWH.

UNT 11 to the White River (S6S062a-k) – This UNT to the White River flows south to north along Perry Road and then west under SR 37. Segments S6S062a, S6S036c, S6S036e, S6S062f, and S6S062h are natural channels within the survey area. Segments S6S062b and S6s062d are encapsulated under a field entrance. Segment S6S062g is encapsulated under SR 37 Segments S6S062i and S6S062jare encapsulated under a drive entrance. Segment S6S062k is encapsulated under Perry Road. The predominant substrate is composed of cobble, gravel, and sand with a variable width riparian corridor of mature forest. Segment S6S062h has an HHEI score of 78 indicative of Class III PHWH. Segments S6S062a, S6S062c, and S6S062f have HHEI scores of 40, 37 and 40 indicative of Class II PHWH. Segment S6S062e has an HHEI score of 23 representative of Class I PHWH.

UNT 18 to the White River (S6S075a-f) – This UNT to the White River flows east to west under SR 37 and CR 650/Big Bend Road. Segments S6S075a, S6S075c, and S6S075e represent the daylighted upstream and downstream channels within the survey area. Segment S6S075b is encapsulated under CR 650/Big Bend Road on the north side of SR 37. Segment S6S075d is encapsulated under SR 37. Segment S6S075f is encapsulated under CR 650/Big Bend Road on the south side of SR 37. Segment S6S075a represents an intermittent natural stream with no sinuosity. The predominant substrate consists of cobble and sand. The stream reach surveyed has a wide riparian corridor. The adjacent floodplain is dominated by mature forest along the right bank and immature forest along the left bank. The HHEI score of 61 is reflective of Modified Class II PHWH. Segment S6S075c represents a channelized ditch with no sinuosity. The predominant substrate consists of muck and hardpan. The stream reach surveyed has a narrow riparian corridor along the left bank and no riparian corridor along the right bank. The adjacent floodplain is dominated by residential land use along the right bank and transportation use along the left bank. The HHEI score of 32 is reflective of a Modified Class II PHWH. Segment S6S075e represents a roadside ditch with no sinuosity. The predominant substrate consists of sand and hardpan. The stream reach surveyed has a narrow riparian corridor. The adjacent floodplain is dominated by urban and industrial land uses. The HHEI score of 18 is reflective of a Class I PHWH.

UNT 20 to the White River (S6S083a-b) - This UNT to the White River flows southeast to northwest under SR 37. Segment S6S083a represents a channelized ditch within the survey area. Segment S6S083b is encapsulated under SR 37. This is an intermittent stream with fair habitat development with no sinuosity. The predominant substrate consists of silt and muck. The stream reach surveyed has no riparian corridor and the adjacent floodplain is dominated by residential land use. The HHEI score of 35 is reflective of a Class II PHWH.

UNT 22 to the White River (S6S085a-b) – This UNT to the White River flows east to west under CR 850/Waverly Road, northwest of SR 37. Segment S6S085a represents the upstream and downstream channels. Segment S6S085b is encapsulated under CR 850/Waverly Road. This is an intermittent stream with low sinuosity. The predominant substrate consists of hardpan and gravel. The stream reach surveyed has a narrow riparian corridor and the adjacent floodplain is dominated by residential land use. The HHEI score of 41 is reflective of a Class II PHWH.

UNT 2 to Bluff Creek (S6S087a) - This UNT to Bluff Creek flows southwest to northeast along the northwest side of SR 37. This is an intermittent natural stream with moderate sinuosity. The predominant substrate consists of sand and silt. The stream reach surveyed has a wide riparian corridor and the adjacent floodplain is dominated by forested land. The HHEI score of 60 is reflective of Class III PHWH.

UNT 3 to Bluff Creek (S6S088a) – This UNT to Bluff Creek flows south to north on the southeast side of SR 37. This is a channelized reach (i.e. no sinuosity). The predominant substrate consists of sand and muck. The stream reach surveyed has a narrow riparian corridor and the adjacent floodplain is dominated by immature forest along the right bank and open pasture along the left bank. The HHEI score of 28 is reflective of Class I PHWH.

UNT 6 to Bluff Creek (S6S092a-b) – This UNT to Bluff Creek flows northeast to southwest under CR 144. Segment S6S092a is an intermittent natural channel with low sinuosity. The predominant substrate consists of silt. The stream reach surveyed has a riparian corridor that ranges from none to narrow with the adjacent floodplain dominated by residential and agricultural land use. The HHEI score of 13 is indicative of Class I PHWH. Segment S6S092b is encapsulated under CR 144.

UNT 8 to Bluff Creek (S6S094a-e) - This UNT to Bluff Creek flows east to west under SR 37 just north of the proposed SR 144 interchange. Segments S6S094a, S6S094b, S6S094d, and S6S094e represent the channels upstream and downstream of SR 37 within the survey area. Segment S6S094c is encapsulated under SR 37. Segment S6S094a is a channelized ditch with a predominant of clay and artificial materials. The stream reach surveyed has no riparian corridor and the adjacent floodplain is dominated by urban and industrial lands. The HHEI score of 25 is reflective of a Class I PHWH. Segment S6S094b is a natural channel with predominant substrates of sand, and clay. The stream reach surveyed has no riparian corridor and the adjacent floodplain is dominated by pasture land. The HHEI score of 53 is reflective of a Class II PHWH habitat. Segment S6S095d is a natural channel with predominant substrates of gravel and sand. The stream reach surveyed has a variable width riparian corridor and adjacent floodplain consisting of forest, residential and agricultural. The HHEI score of 42 is indicative of Class II PHWH.

Orme Ditch (S6S103a-j) - Orme Ditch flows northeast to southwest across the SR 37 right of way. A total of 10 segments of this stream were identified. Segments S6S103a, S6S103c, S6S103e, and S6S103j represent channels upstream and downstream of SR 37. Conveyance under SR 37 and local drives is via encapsulated segments S6S103b, S6S103d, S6S103d, S6S103f, S6S103g, S6S103h, and S6S103i. Segment S6S103a is a natural intermittent channel that displays fair habitat development with low sinuosity. The predominant substrate consists of sand. The stream reach surveyed has a wide riparian corridor and the adjacent floodplain is forest dominated. The QHEI score of 48 is reflective of a probable warm water habitat. Segment S6S103c is a natural intermittent channel that flows northeast to southwest and connects to the culvert under SR 37. It displays fair habitat development with low sinuosity. The predominant substrate consists of cobble and gravel. The stream reach surveyed has a moderate riparian corridor width and the adjacent floodplain is forest, residential and field land use. This reach has

a QHEI score of 46 reflective of a probable warm water habitat. Segment S6S103e is a natural intermittent channel that flows southwest along the east side of SR 37. It displays poor habitat development with low sinuosity. The predominant substrate consists of gravel and sand. The stream reach surveyed has a narrow to moderate width riparian corridor and the adjacent floodplain is forest, residential, and field land use. The reach has a QHEI score of 40 indicative of a modified warm water habitat. Segment S6S103j is a natural intermittent channel that has fair habitat development with low sinuosity. The predominant substrate consists of cobble and gravel. The stream reach surveyed has a moderately wide riparian corridor and the adjacent floodplain is dominated by forest. The QHEI score of 38.5 is reflective of a modified warm water habitat.

UNT 25 to the White River (S6S110a) - This UNT to White River flows west to east along the north side of I-465, just west of the White River. This is an intermittent roadside ditch stream with poor habitat development and no sinuosity. The predominant substrate consists of muck and silt. The stream reach surveyed has a very narrow riparian corridor along the right bank and no riparian corridor along the left bank. The adjacent floodplain is dominated by urban and industrial use along the right bank and row crop along the left bank. The QHEI score of 24.5 is reflective of a limited warm water habitat.

5.1.4 Ephemeral Streams

Eighty-four of the 114 ephemeral stream reaches that were identified within the field survey study area were evaluated using the HHEI protocol. The exception to this was a reach of Haueisen Ditch which was assessed using the QHEI. HHEI scores for ephemeral streams ranged from 6 to 68 with an overall average of 28.32. The Haueisen Ditch QHEI score of 37 is indicative of a modified warm water habitat.

5.1.5 Stream Summary

The number of impacted segments, linear feet of impact, and acres of impact for ephemeral, intermittent, and perennial streams are shown in **Table 1**. Impacts within the existing right of way for SR 37 and other transportation facilities are differentiated in **Table 1** from those which occur outside of existing right of way.

Table 1: Stream Impacts by USGS Stream Type and Alternative

USGS Stream Type	Impact	Alt C1	Alt C2	Alt C3	Alt C4	RPA
Ephemeral	Number of Impacts	57	61	59	59	64
	Linear Feet	17,142	17,336	16,877	17,242	18,512
	Acres	1.74	1.77	1.71	1.77	1.91
Intermittent	Number of Impacts	50	51	45	50	53
	Linear Feet	10,778	10,731	9,413	11,031	11,797
	Acres	1.70	1.71	1.39	1.73	1.95
Perennial	Number of Impacts	59	61	64	61	64
	Linear Feet	14,766	16,429	16,024	15,160	16,944
	Acres	9.50	11.02	10.40	9.65	10.28
Total	Number of Impacts	166	173	168	170	181
	Linear Feet	42,686	44,496	42,314	43,433	47,253
	Acres	12.94	14.50	13.50	13.15	14.14
Impacts within existing ROW	Linear Feet	23,135	23,252	22,690	23,068	24,509
	Acres	8.31	8.38	8.37	8.22	8.62
Percent New Impacts	Linear Feet	46%	48%	5346	47%	48%
	Acres	36%	42%	38%	37%	39%

5.1.6 QHEI and HHEI Score Trends

There was little variability between the average QHEI score by alternative. This trend was the same for HHEI scores. The average QHEI scores for the alternatives were: 43.90 for Alternative C1, 43.77 for Alternative C2, 44.59 for Alternative C3, 43.48 for Alternative C4, and 42.82 for the RPA. Average HHEI scores were: 34.00 for Alternative C1, 33.88 for Alternative C2, 33.23 for Alternative C3, 34.21 for Alternative C4, and 33.25 for the RPA.

In consideration of the QHEI and HHEI scores of stream segments affected by the alternatives, a weighted comparison of stream impacts was made by summing the values of stream impact lengths multiplied by habitat evaluation score. Refer to **Table 2** for a summary of stream impacts, weighted by habitat evaluation score.

Table 2: Stream Impacts by Alternatives, Weighted Habitat Evaluation Score

Habitat Evaluation Score Ranges	Linear Feet of Impact				
	Alt C1	Alt C2	Alt C3	Alt C4	RPA
HHEI Scores					
0 - 29	0 - 29	0 - 29	0 - 29	0 - 29	0 - 29
30 - 49	30 - 49	30 - 49	30 - 49	30 - 49	30 - 49
50 - 69	50 - 69	50 - 69	50 - 69	50 - 69	50 - 69
70 - 100	70 - 100	70 - 100	70 - 100	70 - 100	70 - 100
Totals	Totals	Totals	Totals	Totals	Totals
QHEI Scores					
0 - 50	0 - 50	0 - 50	0 - 50	0 - 50	0 - 50
51 - 64	51 - 64	51 - 64	51 - 64	51 - 64	51 - 64
> 64	> 64	> 64	> 64	> 64	> 64
Totals	Totals	Totals	Totals	Totals	Totals
Impact Lengths Multiplied by Habitat Evaluation Score					
HHEI	HHEI	HHEI	HHEI	HHEI	HHEI
QHEI	QHEI	QHEI	QHEI	QHEI	QHEI

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The impacted stream segment totals associated with each alternative are similar. Alternative C1 would have 166 impacted stream segments, Alternative C2 would have 173 impacted stream segments, Alternative C3 would have 168 impacted stream segments, Alternative C4 would have 170 impacted stream segments, and the RPA would have 181 impacted stream segments. The difference between the least and greatest impacts is only 15 stream segments.

Total stream impact lengths associated with the alternatives are also similar. Alternative C1 would affect 42,686 linear feet of stream, Alternative C2 would affect 44,496 linear feet of stream, Alternative C3 would affect 42,314 linear feet of stream, Alternative C4 would affect 43,433 linear feet of stream, and the RPA would affect 47,253 linear feet of stream. The difference between the least and greatest impacts is 4,939 linear feet.

Five perennial streams within the project survey area are listed in IDEM's 303(d) List of Impaired Waters. The White River is listed within Marion and Morgan counties as impaired for nutrients, PCBs in fish tissue, and impaired biotic communities. Crooked Creek is listed in Morgan County for *E. coli*. Stotts Creek is listed for *E. coli* in Morgan County. Pleasant Run Creek is listed for impaired biotic communities in Johnson County. State Ditch is listed for impaired biotic communities and *E. coli* in Marion County.

Efforts to avoid and minimize stream impacts will continue as the project moves into the design and permitting phase. A summary of stream impact data associated with the I-69 Section 6 alternatives is presented in **Table 3**. Current structure sizes within the project survey area and associated stream segments are shown in **Table 4**.

Table 3: Stream Impact Data Summary

Impact	Alt C1	Alt C2	Alt C3	Alt C4	RPA
Stream Segments Impacted	166	173	168	170	181
Stream Impact (LF)	42,686	44,496	42,314	43,433	47,253
Acres of Stream Impact	12.94	14.50	13.50	13.15	14.14
Average HHEI Score	34.00	33.88	33.23	34.21	33.25
Average QHEI Score	43.90	43.77	44.59	43.48	42.82

Table 4: Stream ID and Bridge Size and Location of I-69 Section 6

Structure Number	County	Structure Type	Description/Location	Current Length (ft)	Current Width (ft)	No. of Spans	Stream ID
Mainline Structures							
I-465-159-4456 E EBL	Marion	Bridge	I-465 EB over White River	930	66	7	S6S107a, S6S107b
I-465-159-4456 E WBL	Marion	Bridge	I-465 WB over White River	930	66	7	S6S107a, S6S107b
I465-158-4458 C EBL	Marion	Bridge	I-465 EB over State (Harmon) Ditch	117	66	1	S6S111a, S6S111b
I465-158-4458 C WBL	Marion	Bridge	I-465 WB over State (Harmon) Ditch	117	66	1	S6S111a, S6S111b
37-49-5025 B	Marion	Bridge	SR 37 NB Over Little Buck Creek	113	43	3	S6S104a, S6S104b
37-49-5025 A	Marion	Bridge	SR 37 SB Over Little Buck Creek	115	43	3	S6S104a, S6S104b
37-49-5024 A	Marion	Bridge	SR 37 NB over Pleasant Run Creek	123	43	3	S6S102a, S6S102b, S6S102c
37-49-5024 B	Marion	Bridge	SR 37 SB over Pleasant Run Creek	125	43	3	S6S102a, S6S102b, S6S102c

Structure Number	County	Structure Type	Description/Location	Current Length (ft)	Current Width (ft)	No. of Spans	Stream ID
37-41-3976 A	Johnson	Bridge	SR 37 NB over Honey Creek	104	42	3	S6S101a, S6S101b, S6S101c
37-41-3976 JA	Johnson	Bridge	SR 37 SB over Honey Creek	104	43	3	S6S101a, S6S101b, S6S101c
37-41-4516 C	Johnson	Bridge	SR 37 NB over Bluff Creek	82	64	3	S6S090a, S6S090b, S6S090c, S6S090d
37-41-4516 JB	Johnson	Bridge	SR 37 SB over Bluff Creek	82	50	3	S6S090a, S6S090b, S6S090c, S6S090d
37-55-4515 B	Morgan	Bridge	SR 37 NB over Crooked Creek	130	43	3	S6S064a, S6S064b, S6S064c
37-55-4515 JA	Morgan	Bridge	SR 37 SB over Crooked Creek	132	43	3	S6S064a, S6S064b, S6S064c
37-55-1371 B	Morgan	Bridge	SR 37 NB over Stotts Creek	198	41	3	S6S053a, S6S053b
37-55-1371 JA	Morgan	Bridge	SR 37 SB over Stotts Creek	199	43	3	S6S053a, S6S053b
37-55-4514 JA	Morgan	Bridge	SR 37 NB over Clear Creek	118	43	3	S6S045a, S6S045b, S6S045c, S6S045d, S6S045e
37-55-4514 B	Morgan	Bridge	SR 37 SB over Clear Creek	118	43	3	S6S045a, S6S045b, S6S045c, S6S045d, S6S045e
37-55-3106 C	Morgan	Bridge	SR 37 NB over Indian Creek	228	42	3	S6S001a, S6S001b, S6S001c, S6S001d
37-55-3106 JA	Morgan	Bridge	SR 37 SB over Indian Creek	228	43	3	S6S001a, S6S001b, S6S001c, S6S001d

7 – REFERENCES

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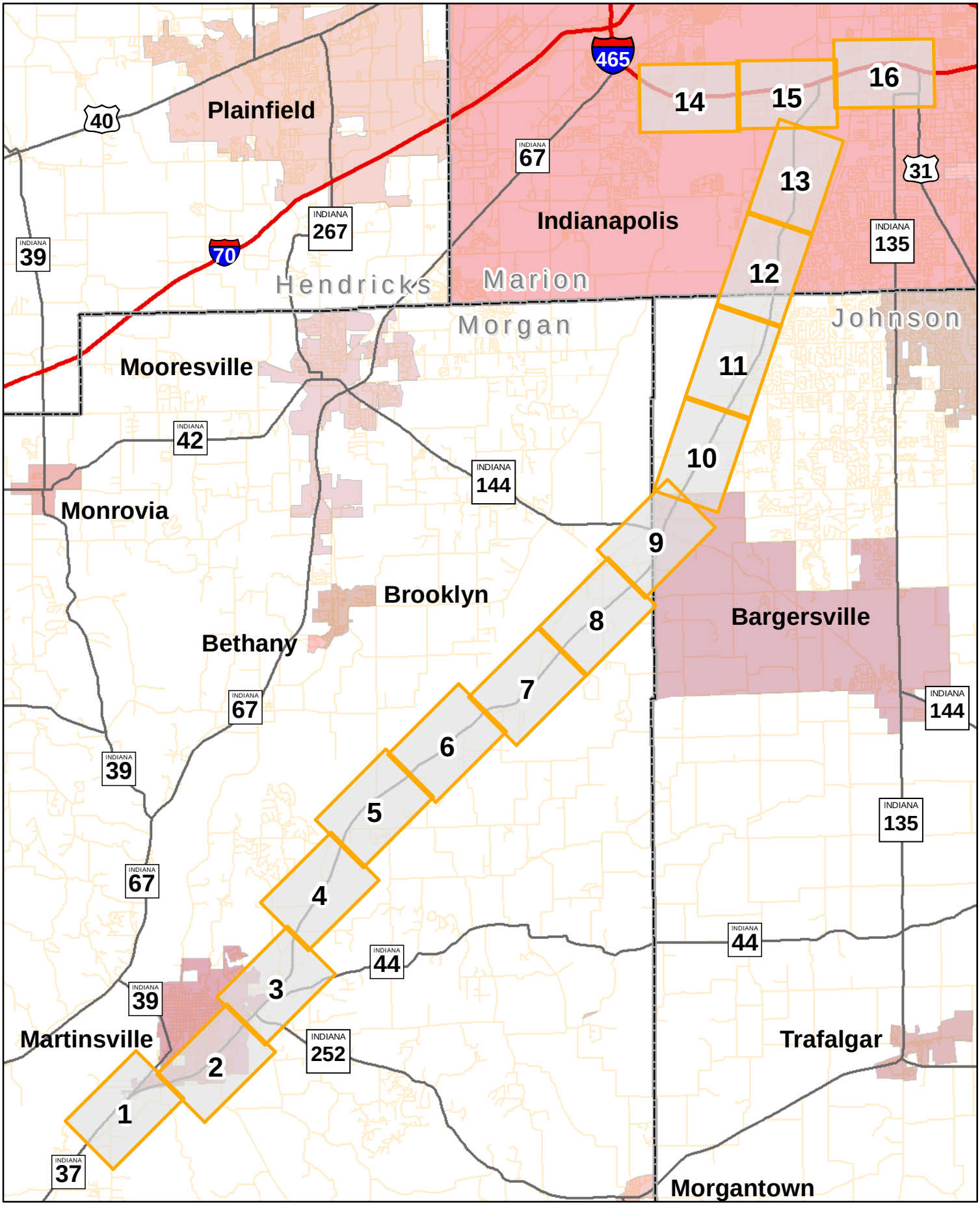
Rankin, Edward T. November 1989. *The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods and Application.* Ohio Environmental Protection Agency, Division of Water Quality Planning and Assessment. Columbus, Ohio.

APPENDIX A

Figures / USGS Topographic Map and Aerial Photograph Maps



Legend

Interstate Highways

State and US Highways

Local Roads

County Line

N

W E

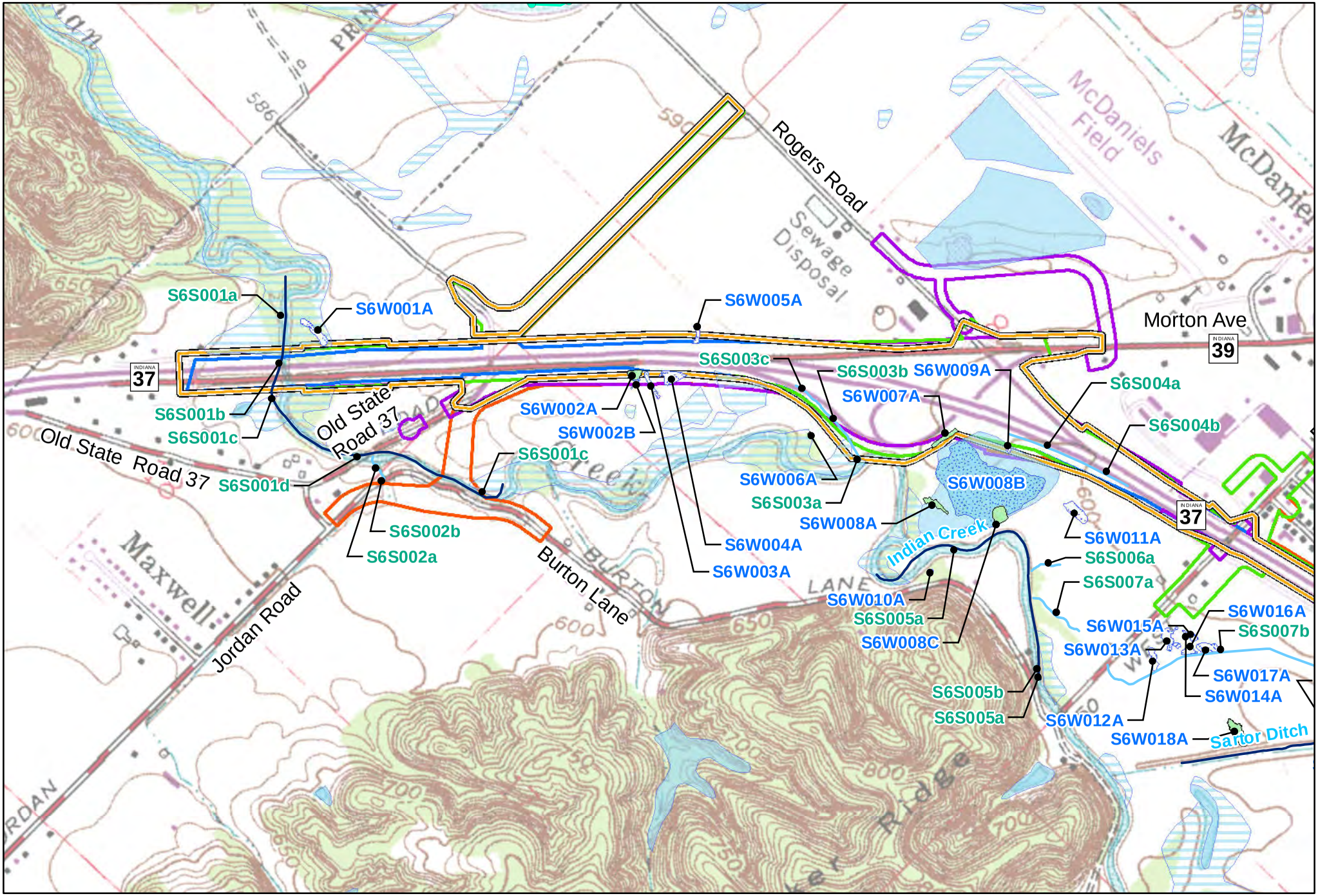
S

WATER RESOURCES

1 In = 3 Miles

0 1.5 3

Miles



NOTE: RIGHT OF WAY FOOTPRINTS OVERLAP BETWEEN ALTERNATIVES

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- Alternative C1 Right of Way
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WATER RESOURCES

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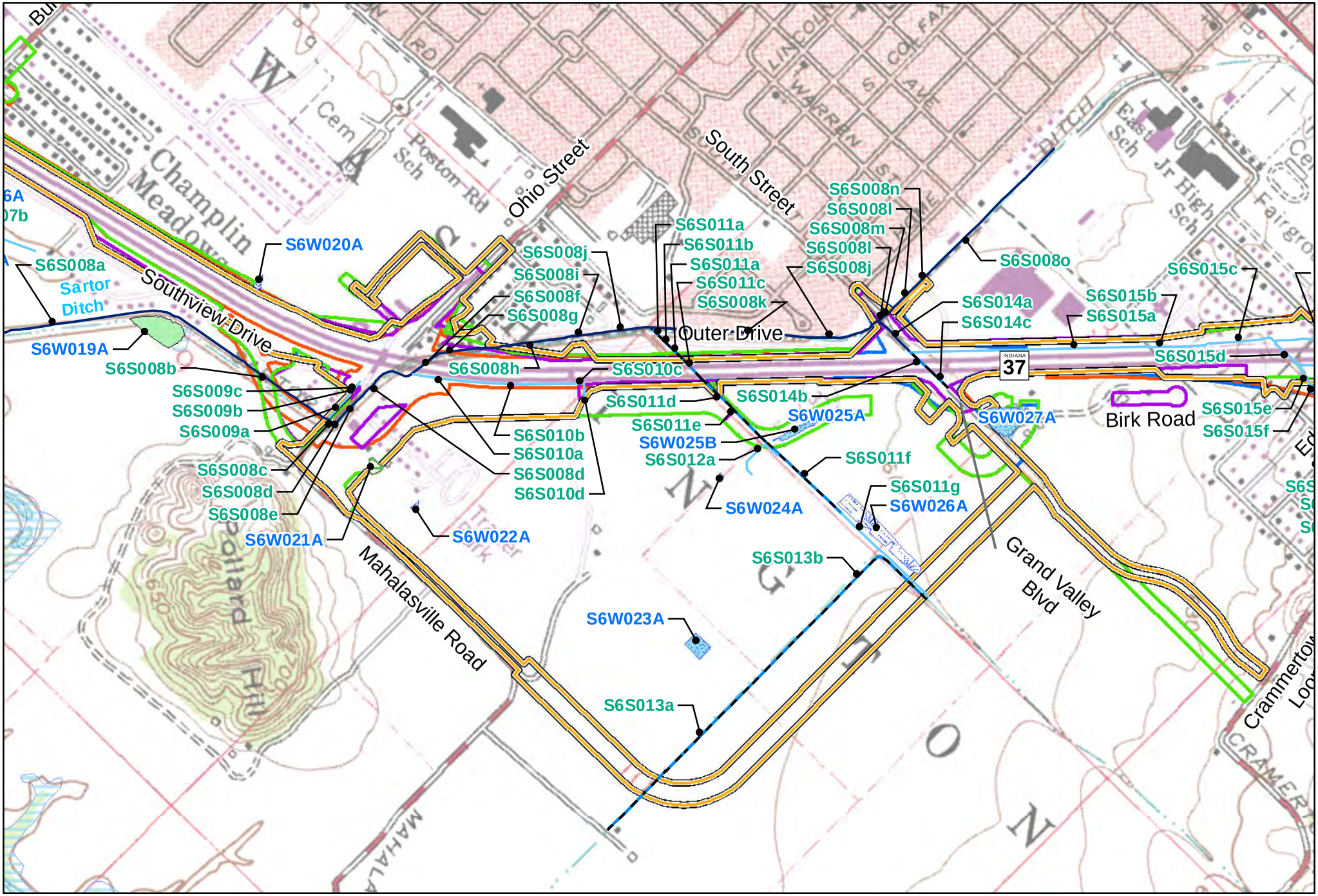
- Scrub-Shrub Wetlands (Field Identified)
- NWI Wetlands
- NWI Open Waters

1 inch = 1,000 feet

0 500 1,000

Feet



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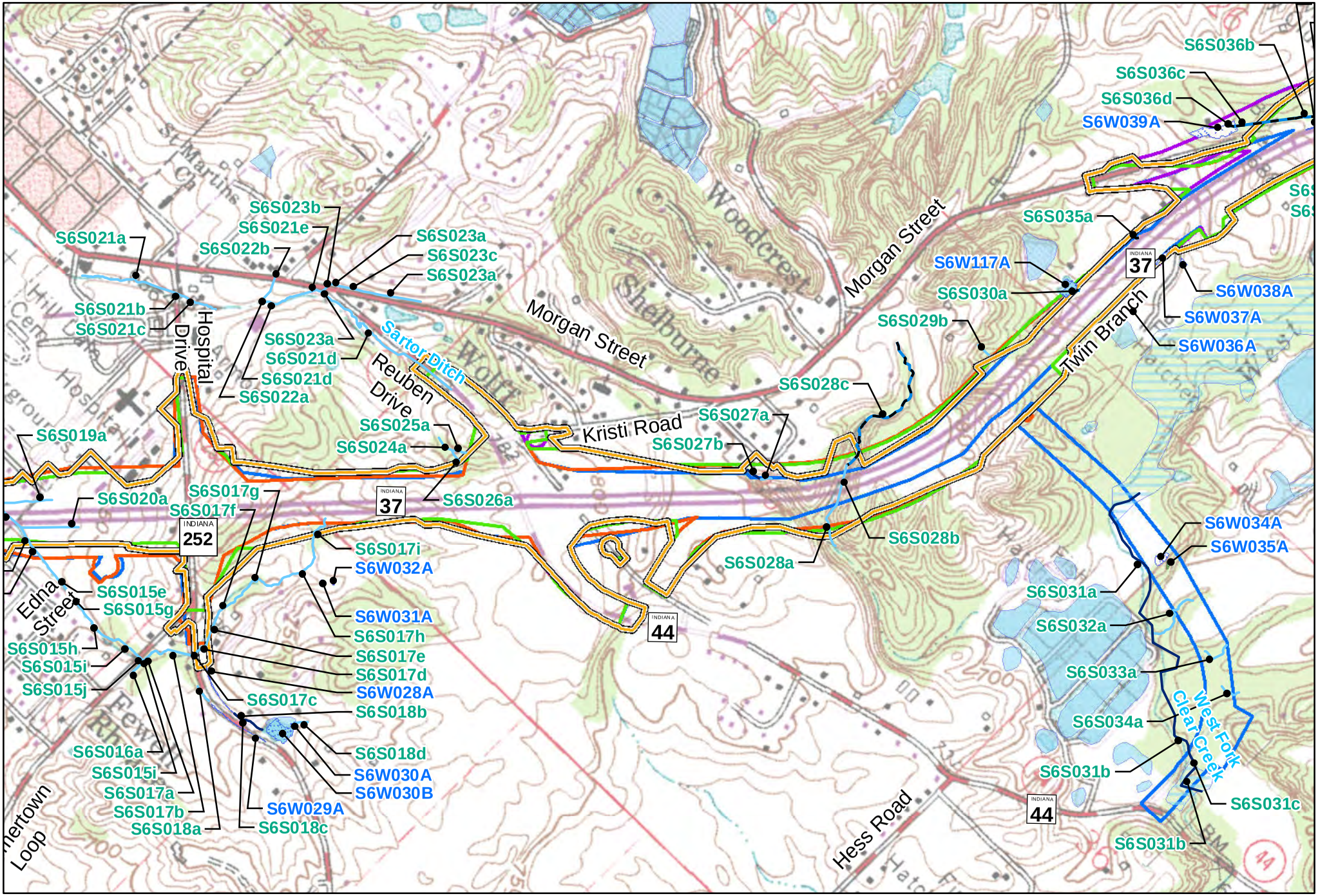

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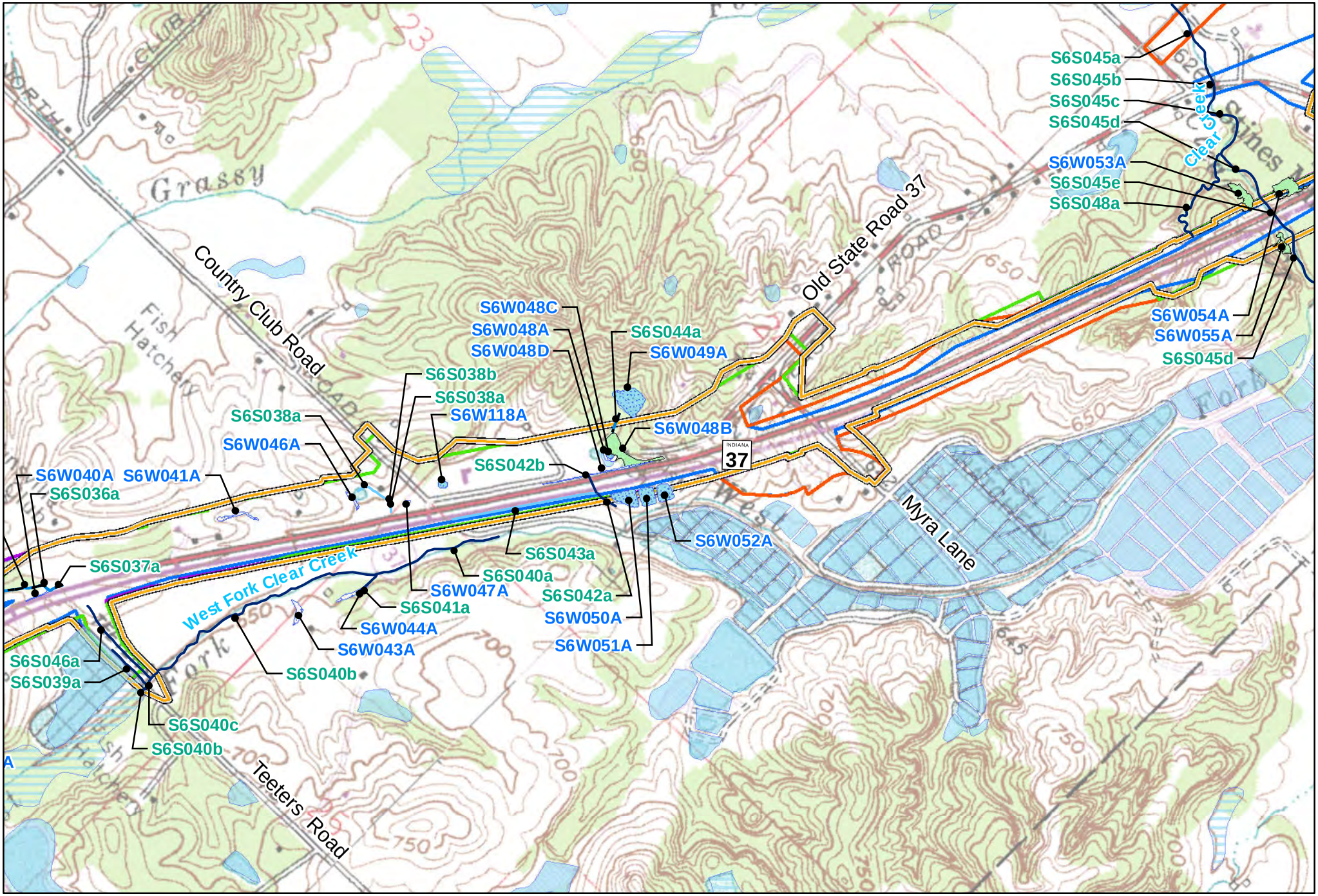

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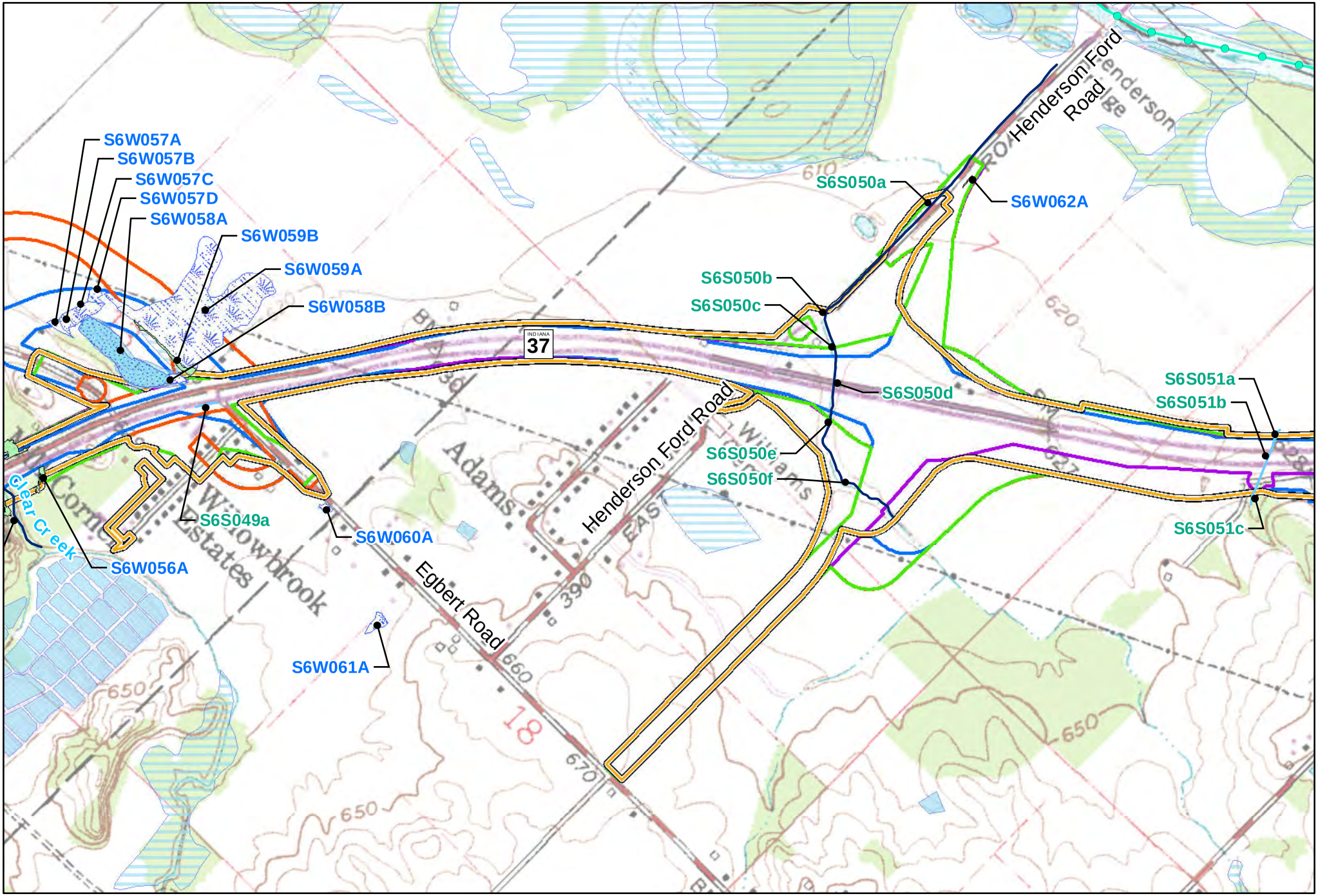

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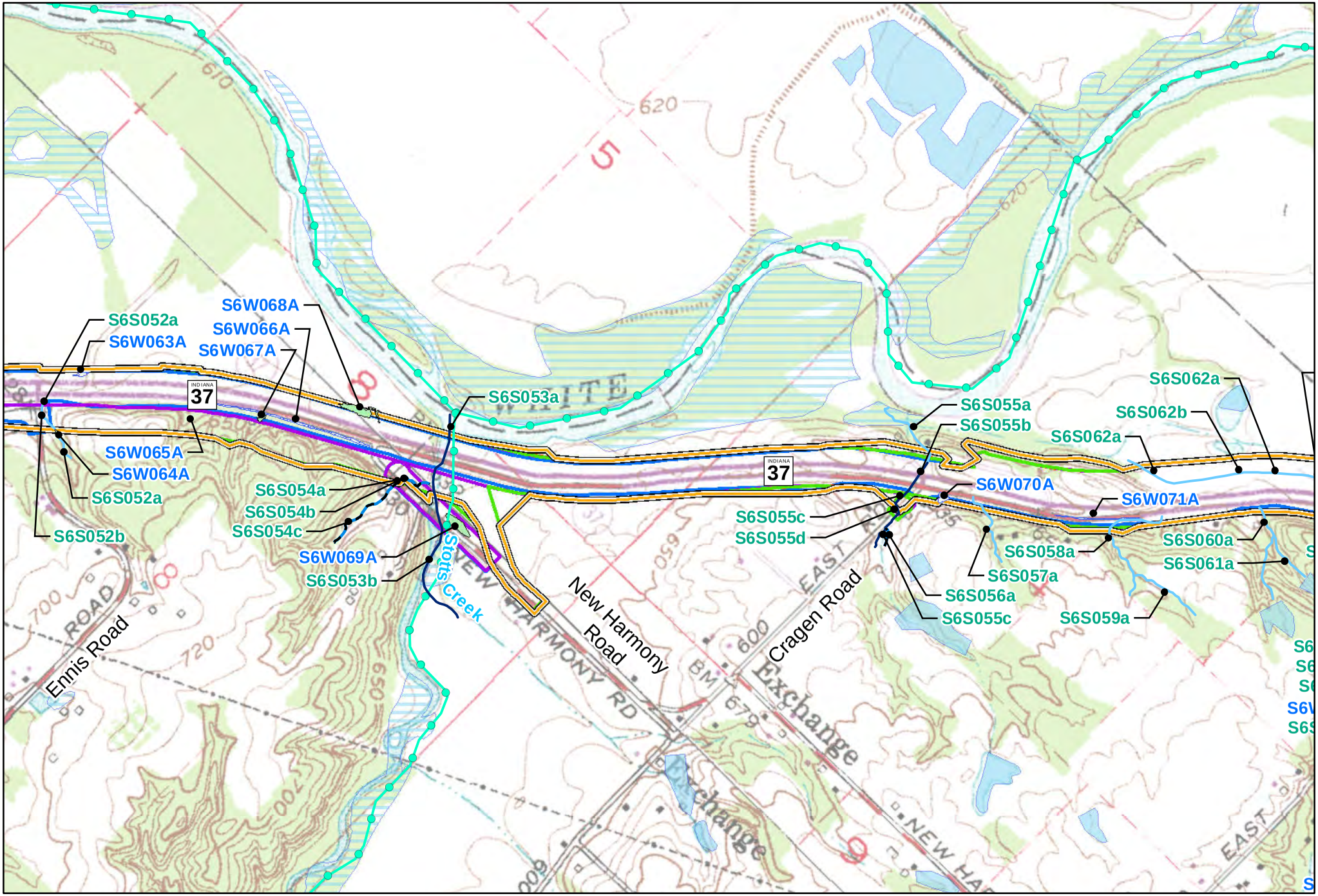

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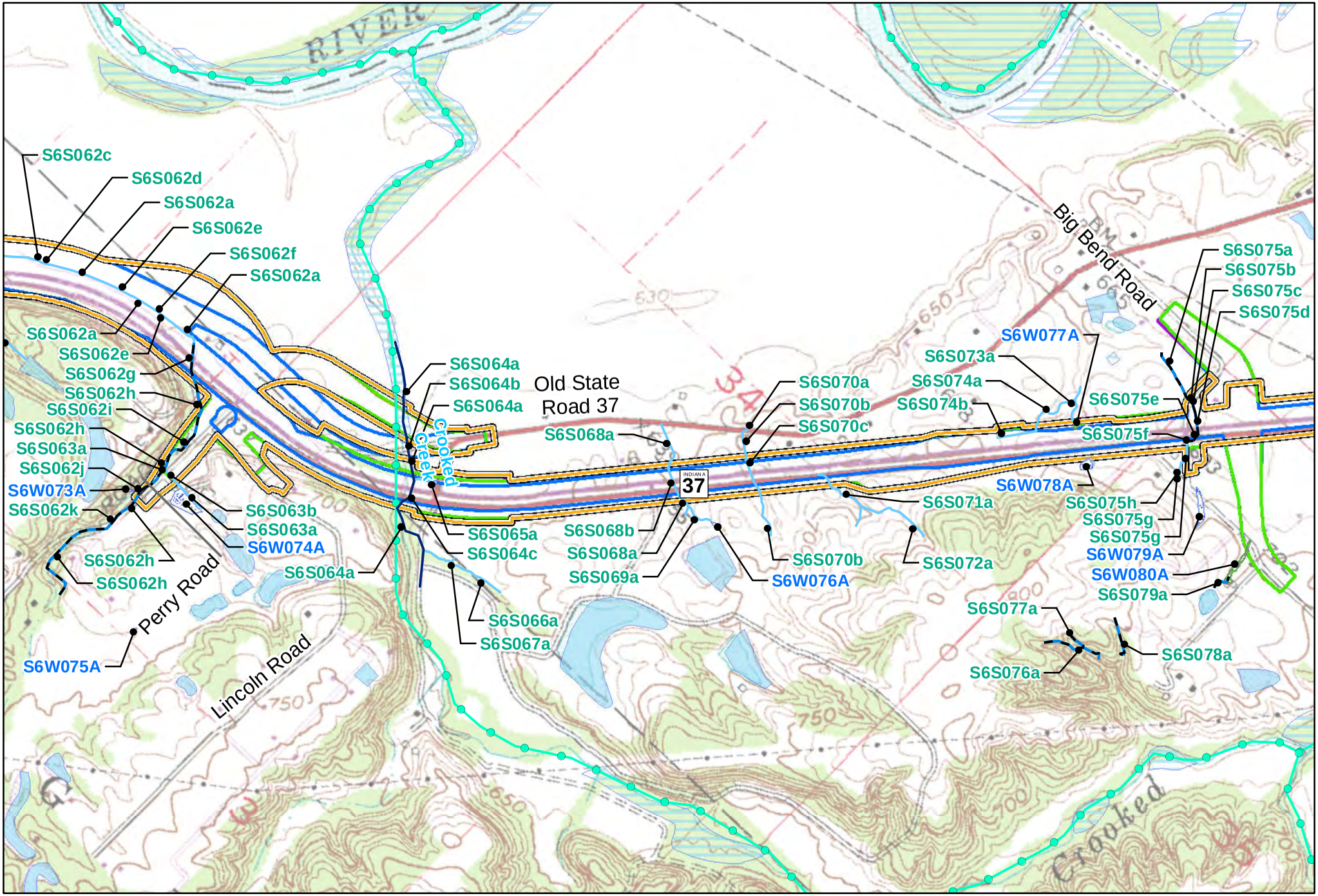

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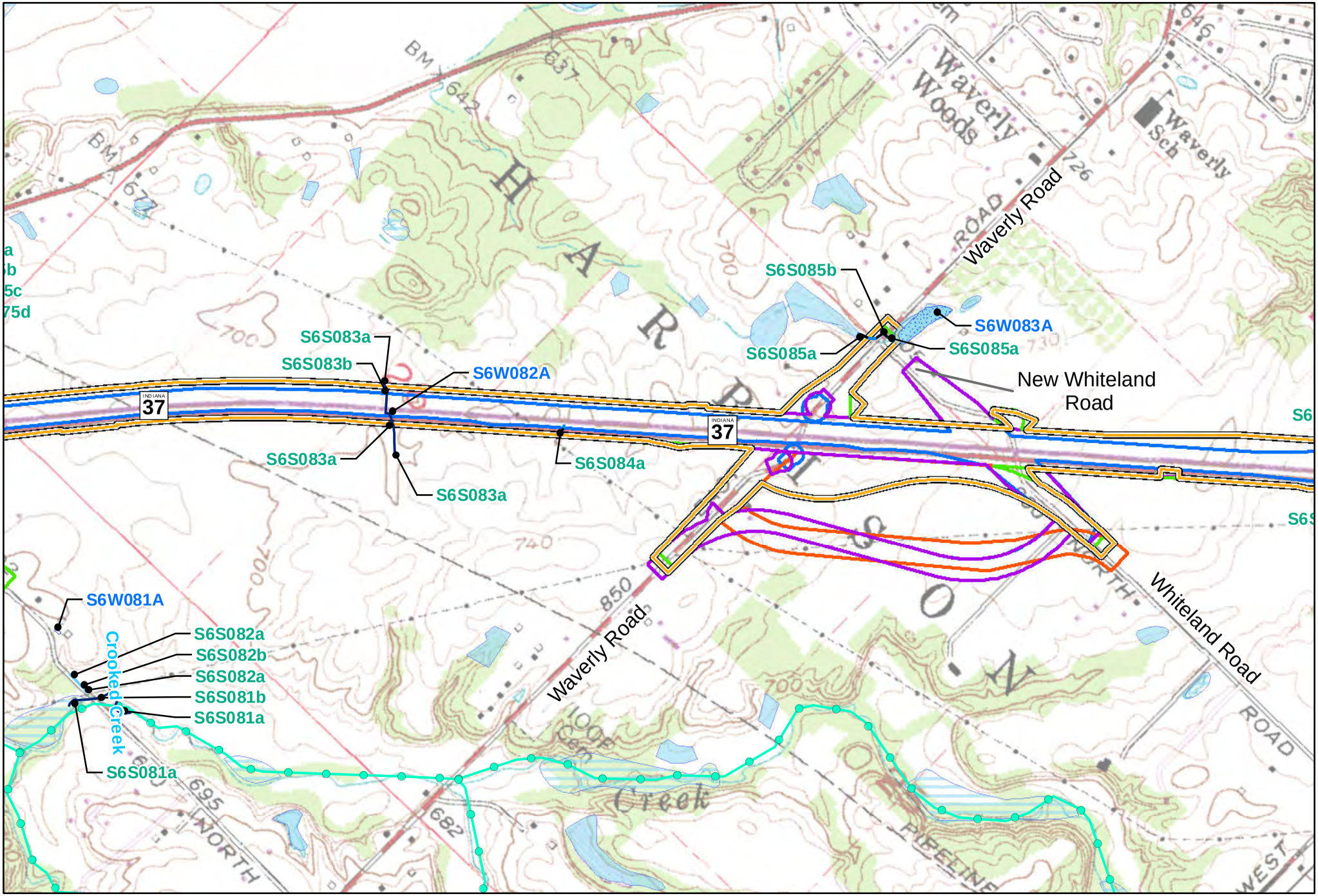

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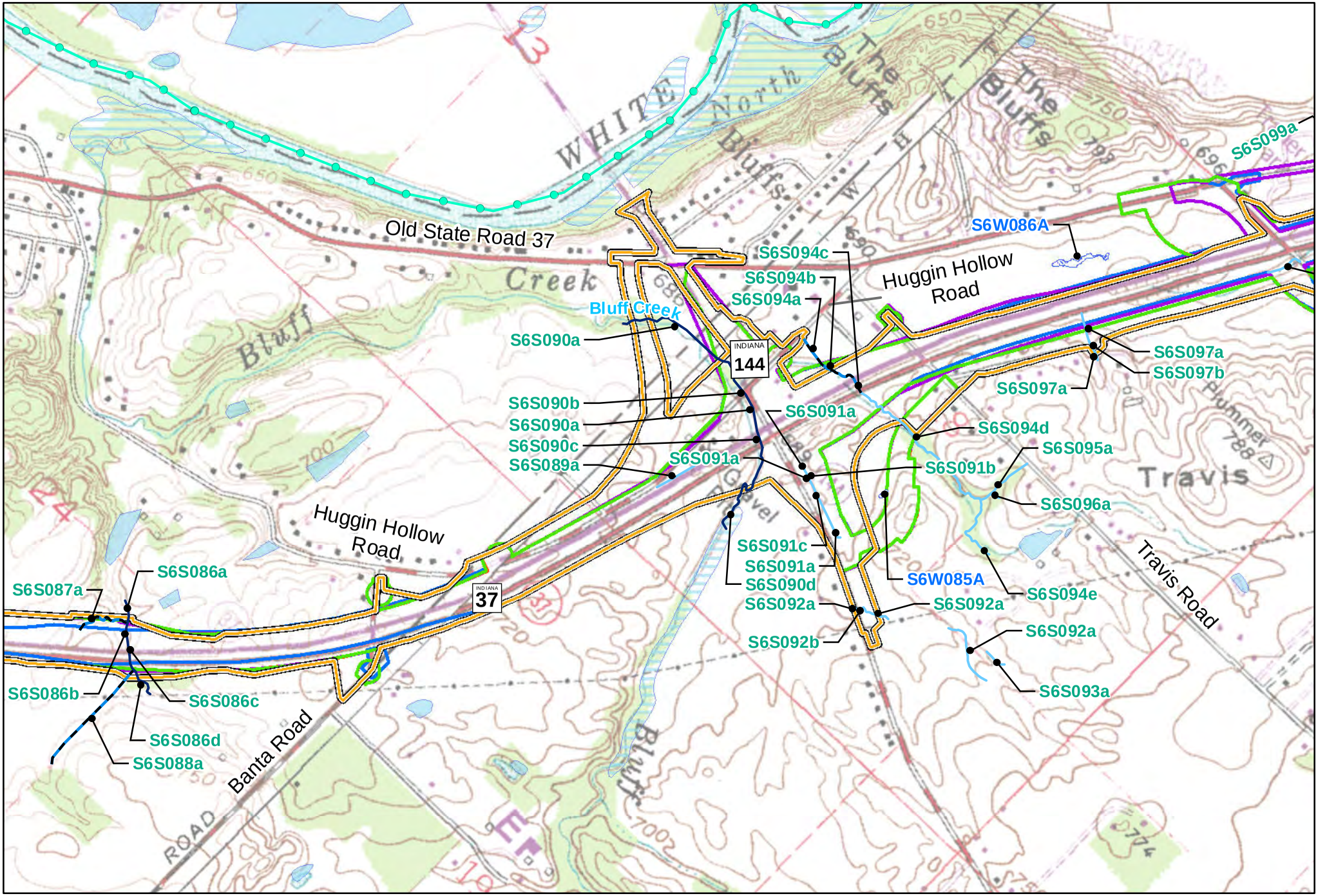

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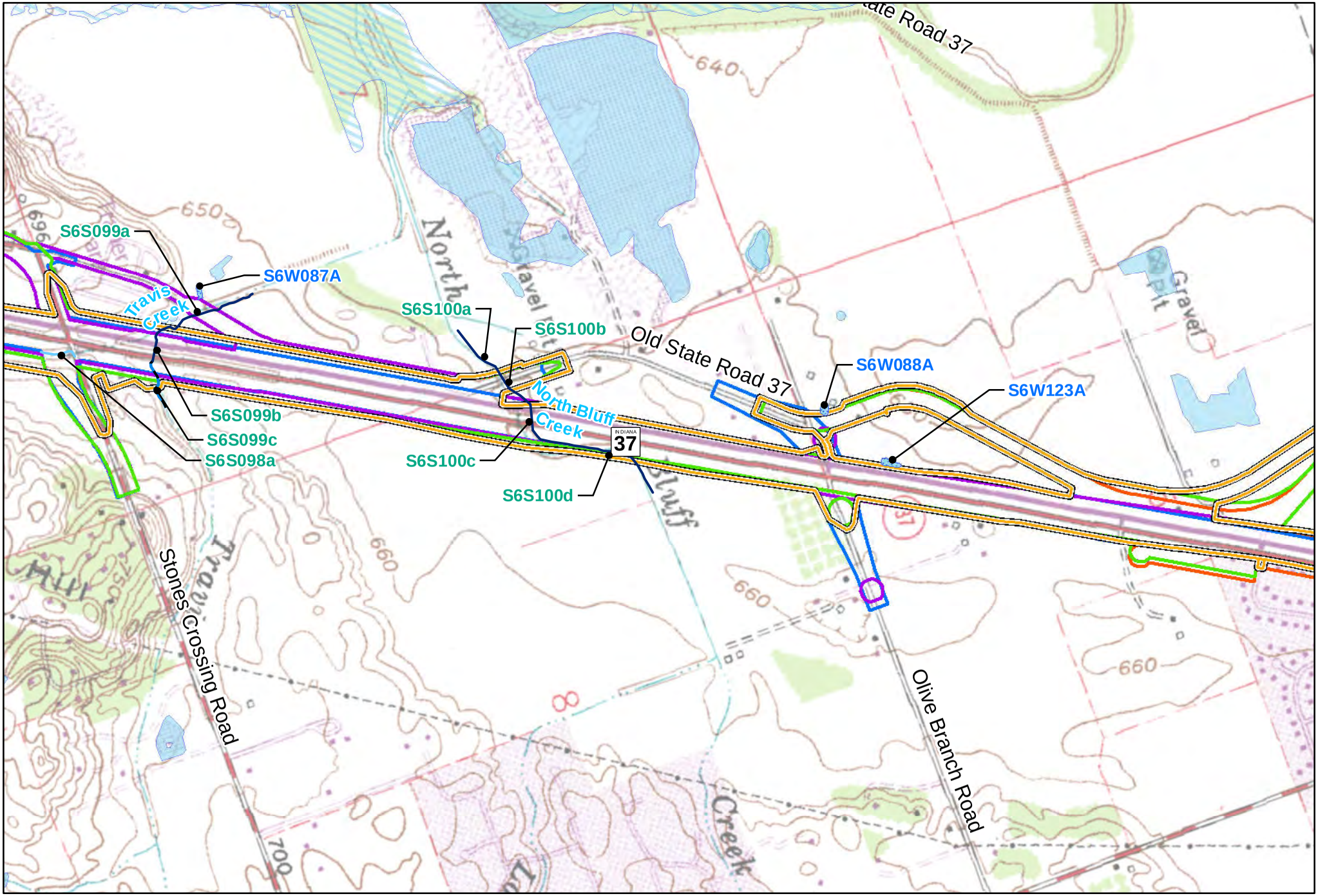

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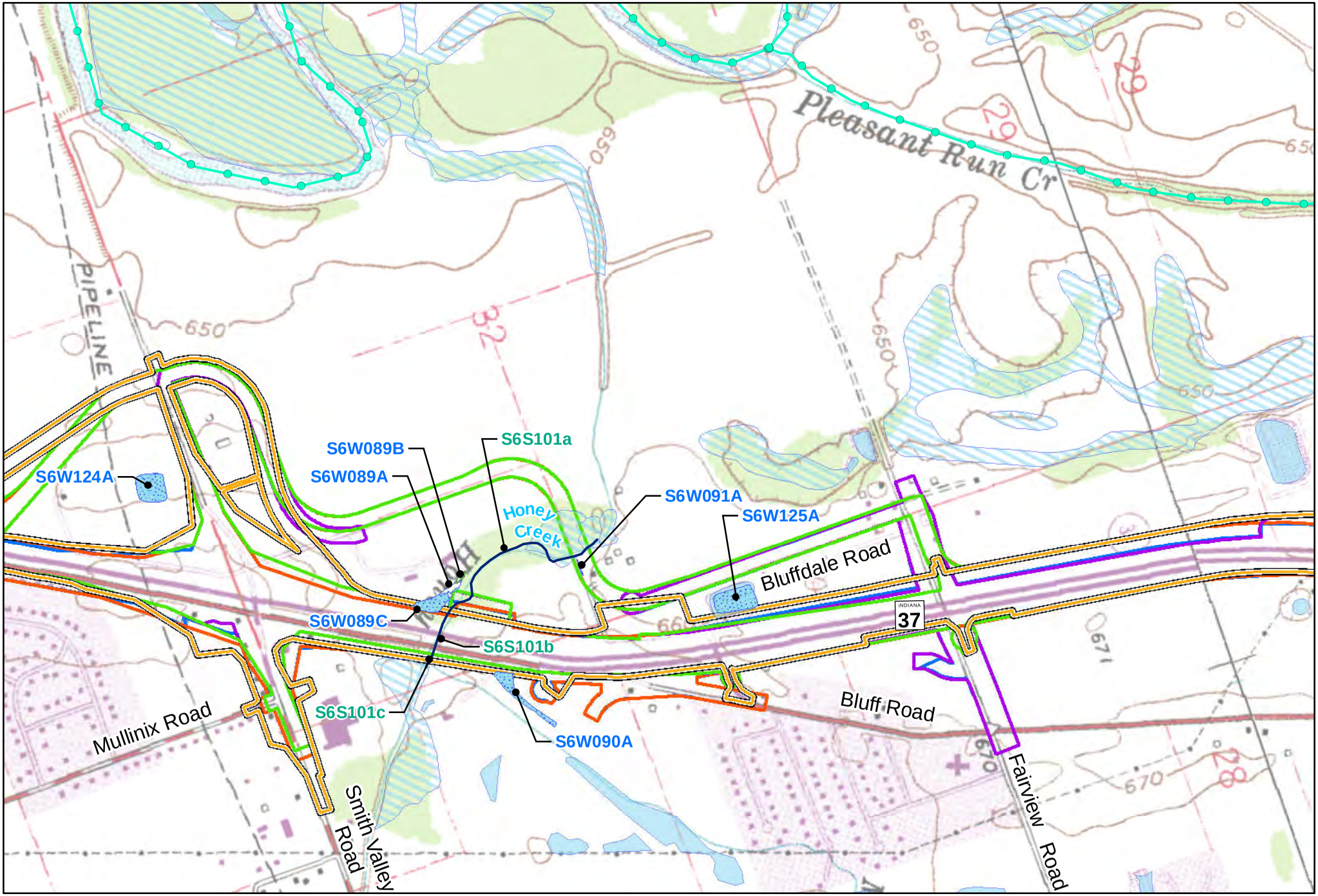

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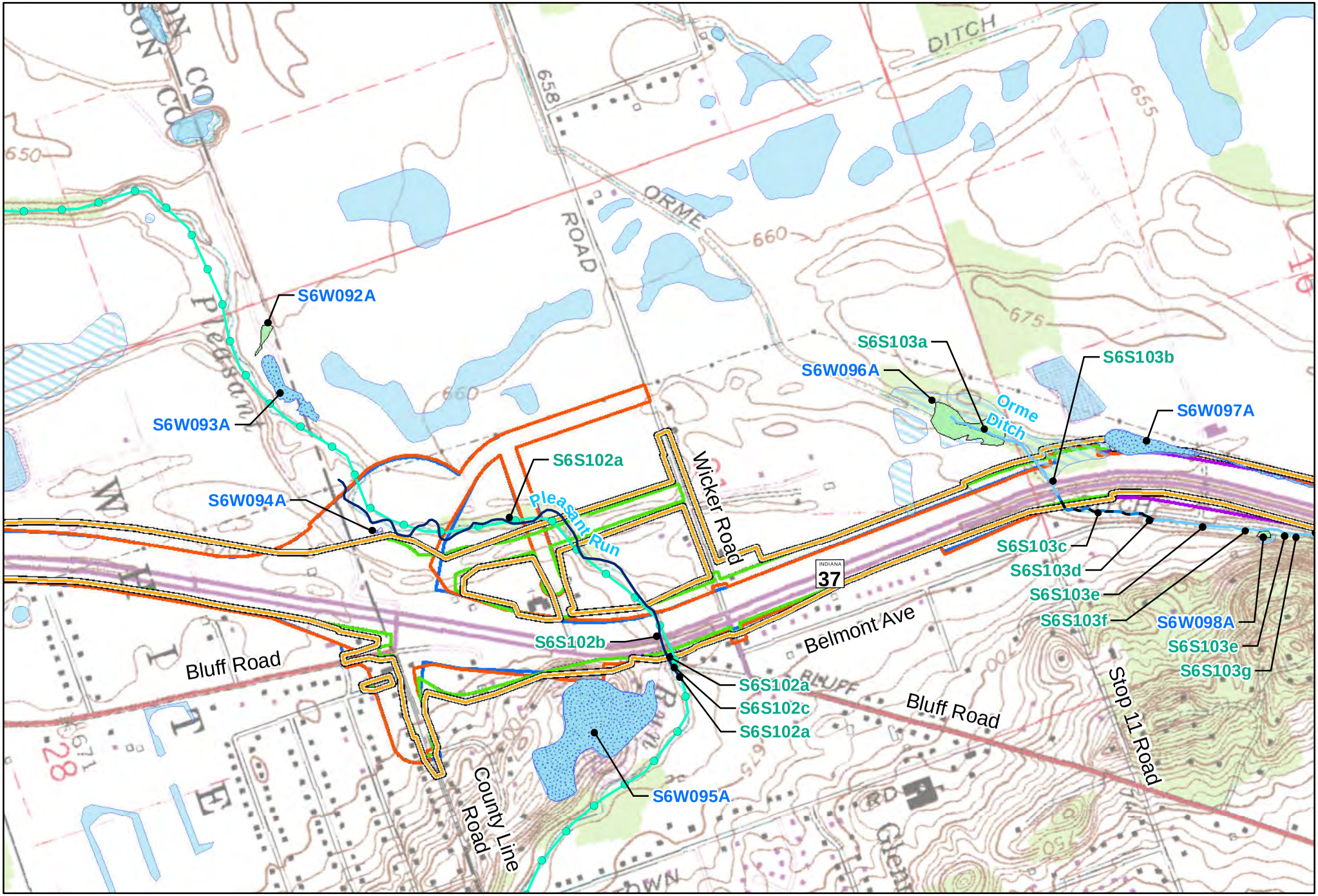

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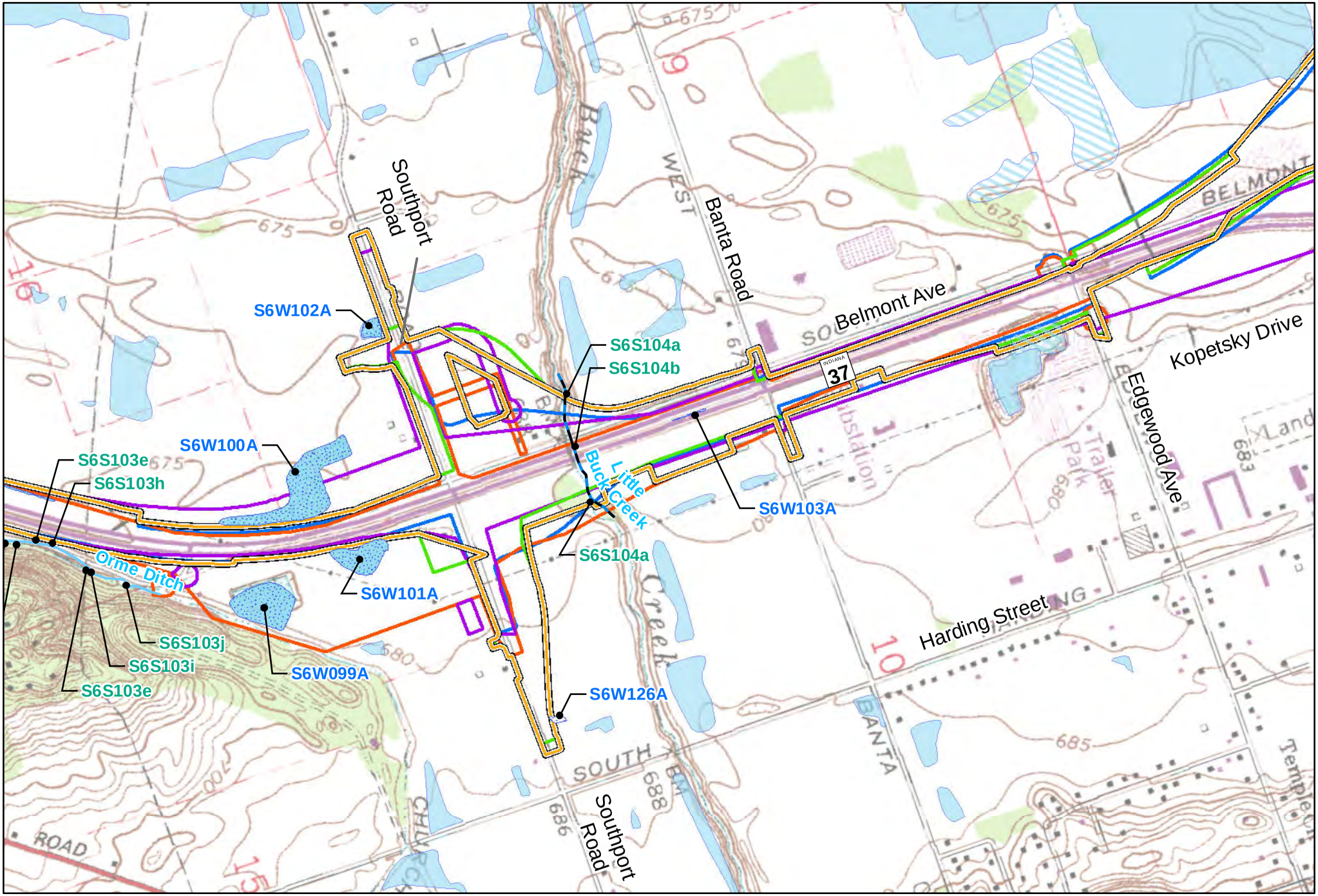

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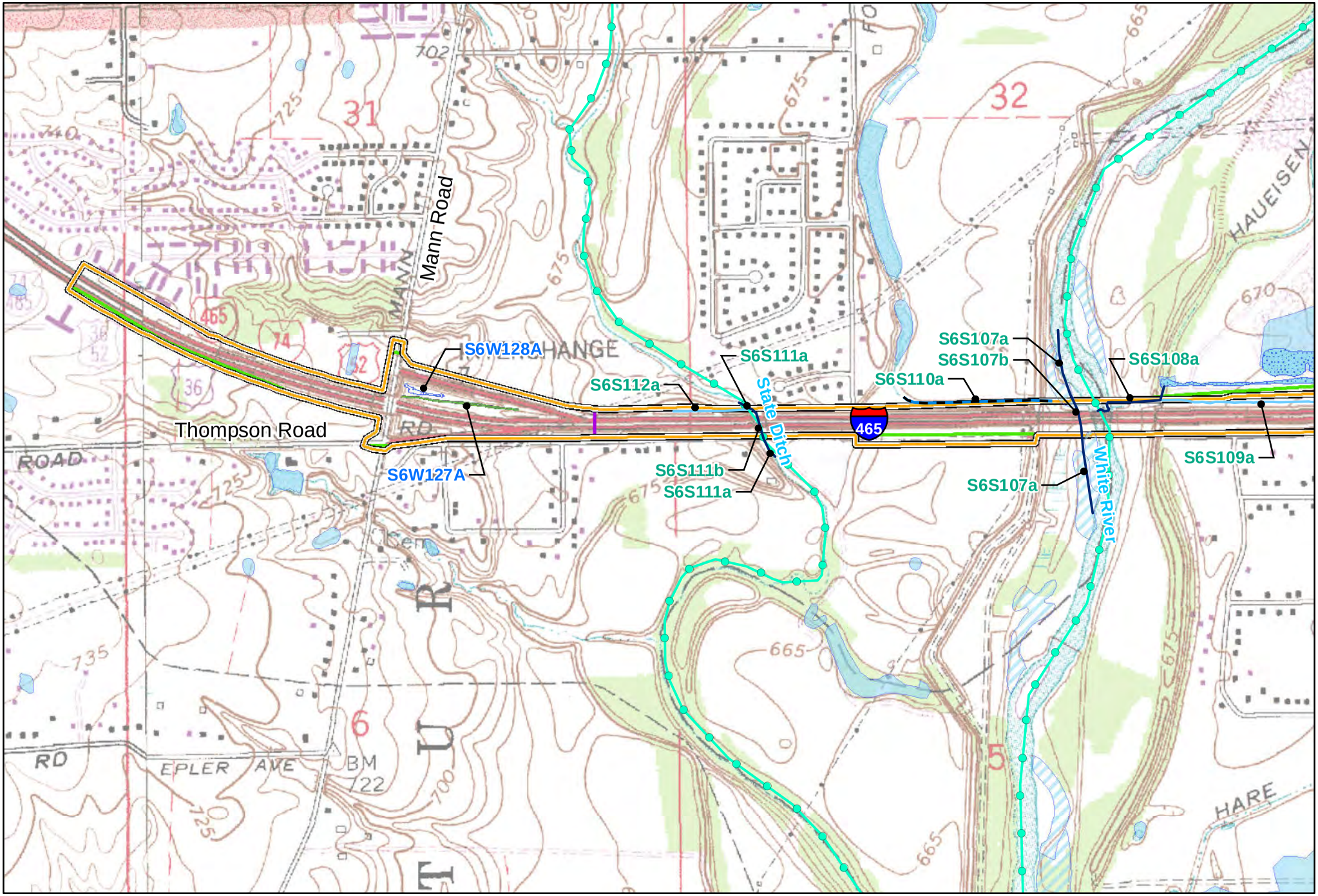

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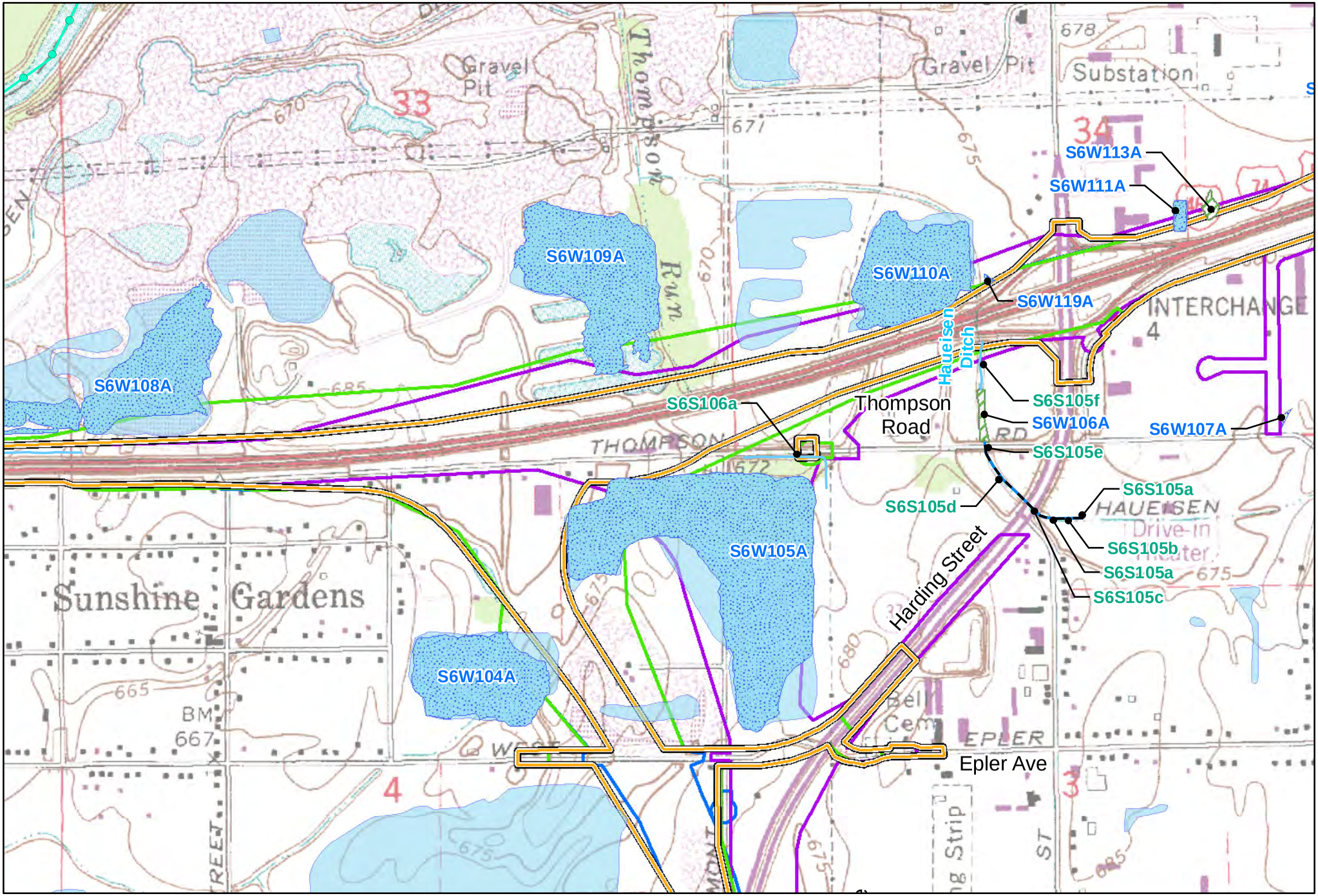

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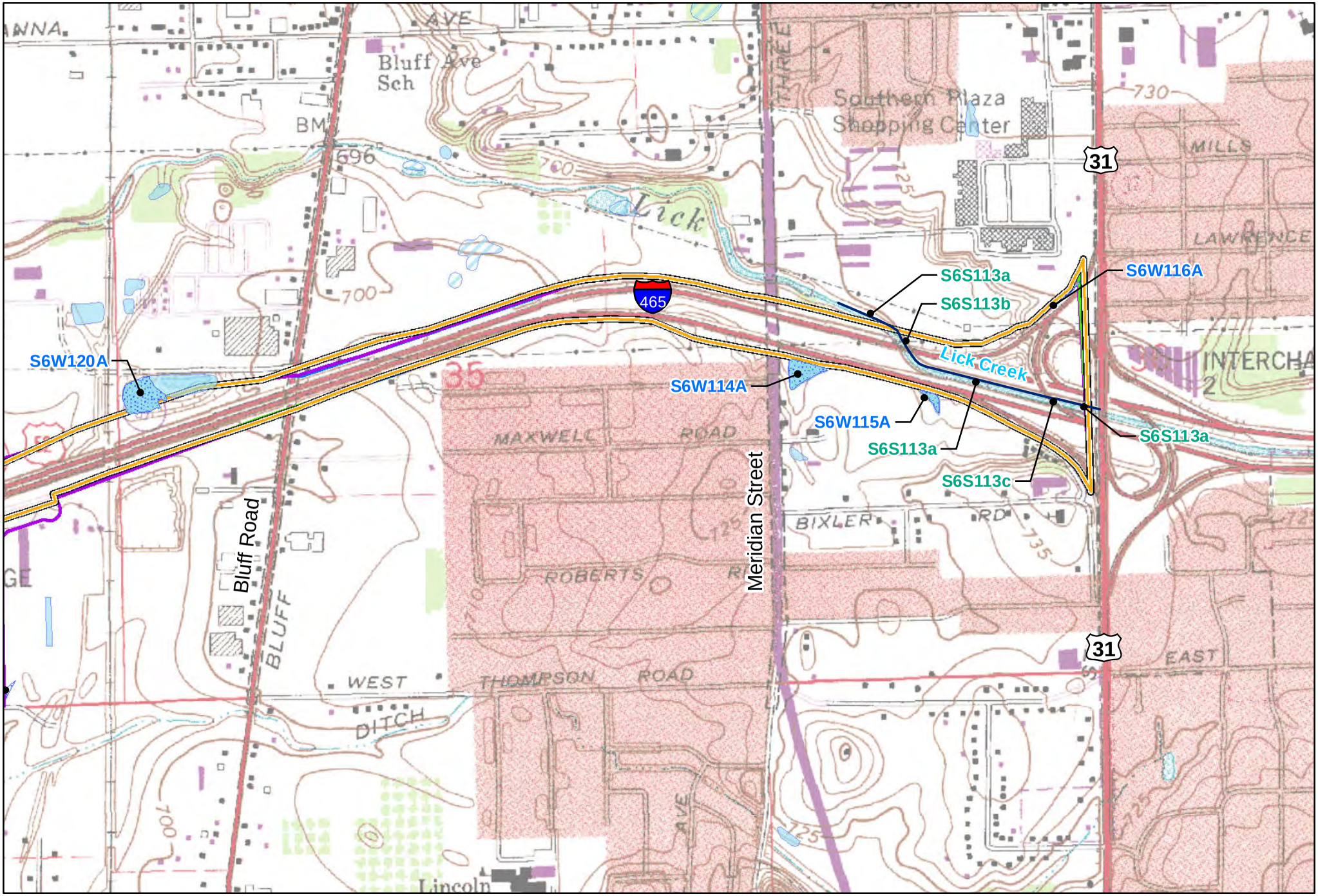
0 500 1,000 Feet



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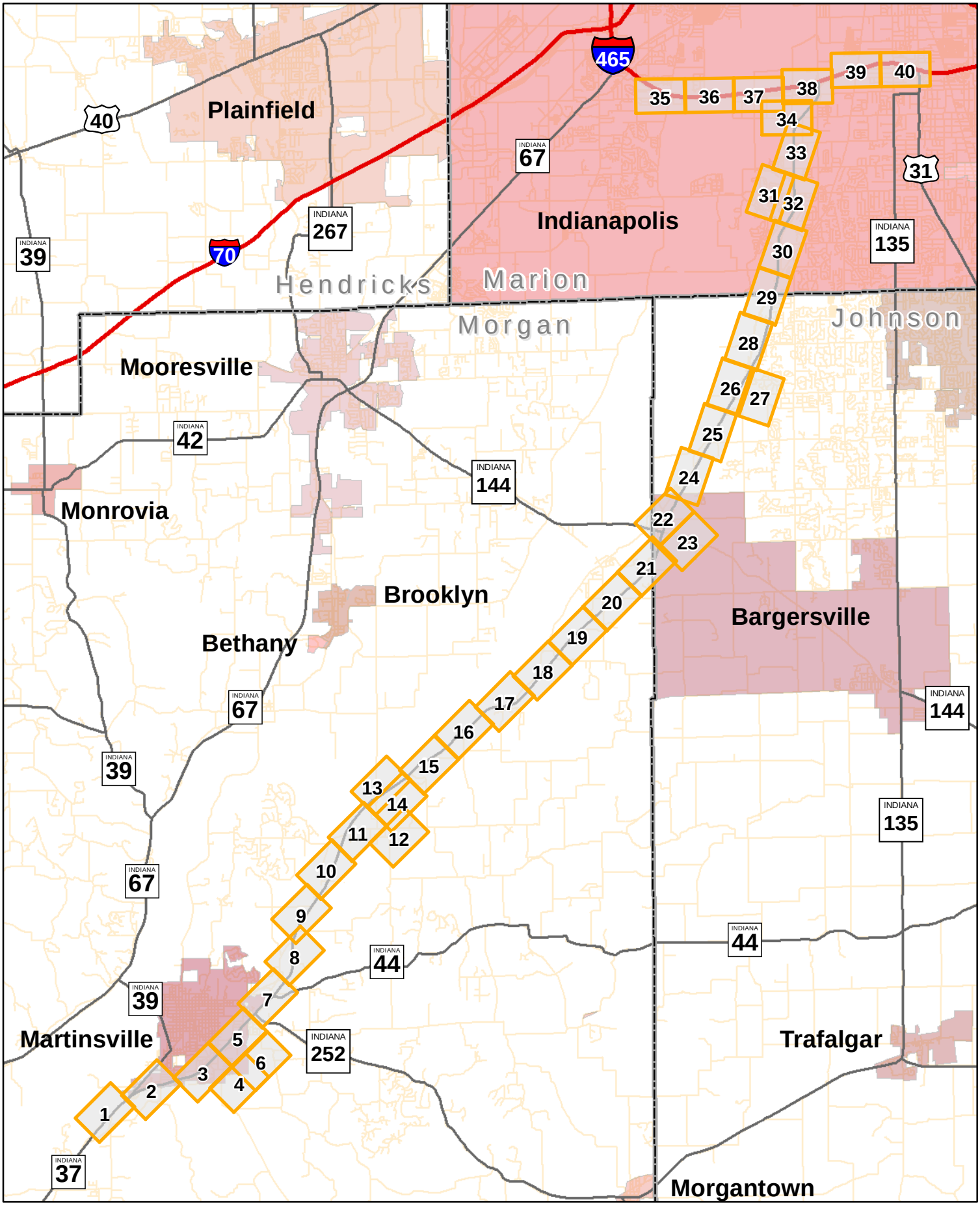
0 500 1,000

Feet



Legend

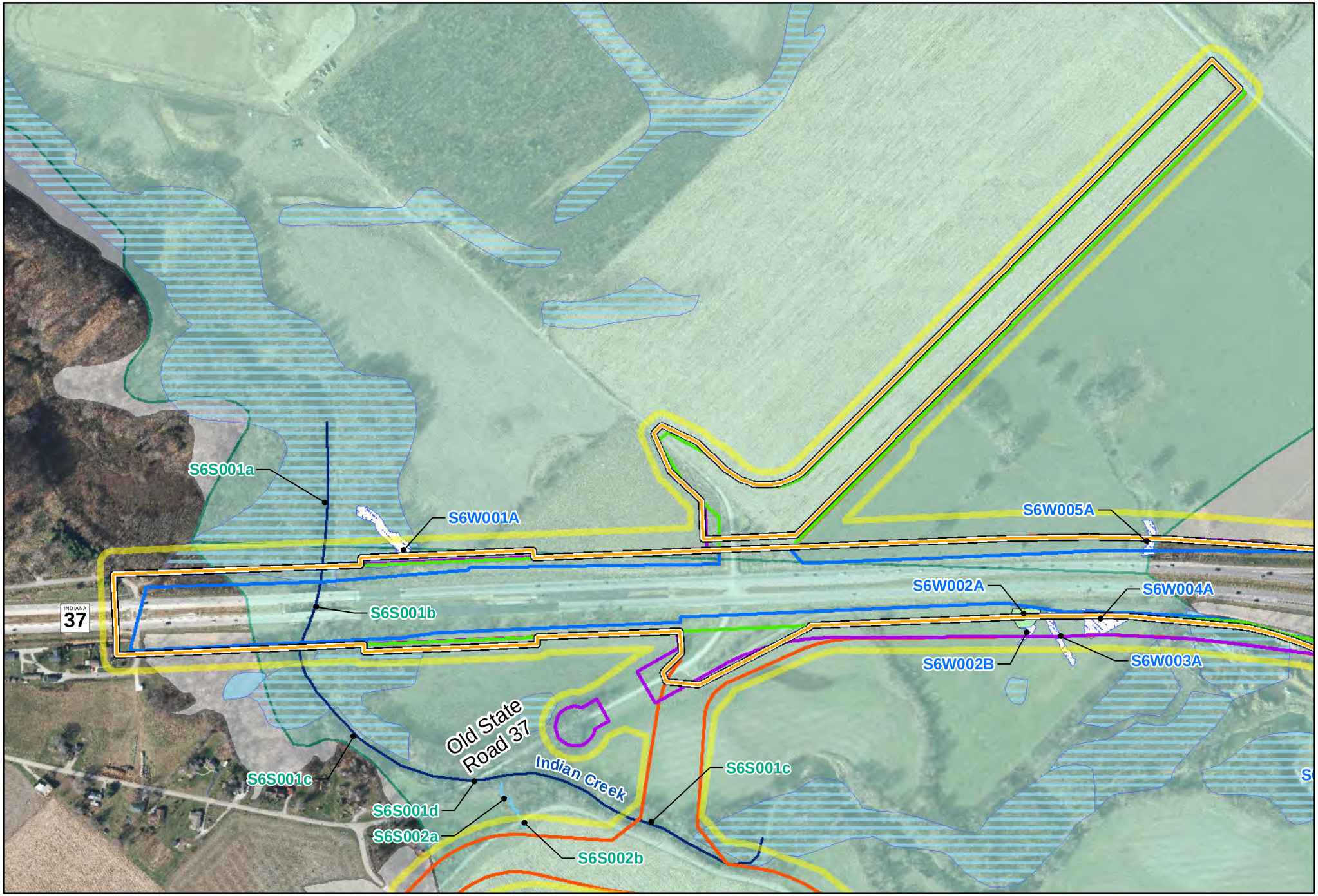
- Interstate Highways
- State and US Highways
- Local Roads
- County Line

N W E S

WATER RESOURCES

1 In = 3 Miles

0 1.5 3 Miles



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Legend

- RPA Right of Way
- Alternative C4 Right of Way
- Alternative C1 Right of Way
- Alternative C2 Right of Way
- Alternative C3 Right of Way
- Field Survey Study Area
- Floodway
- Floodplain

WATER RESOURCES

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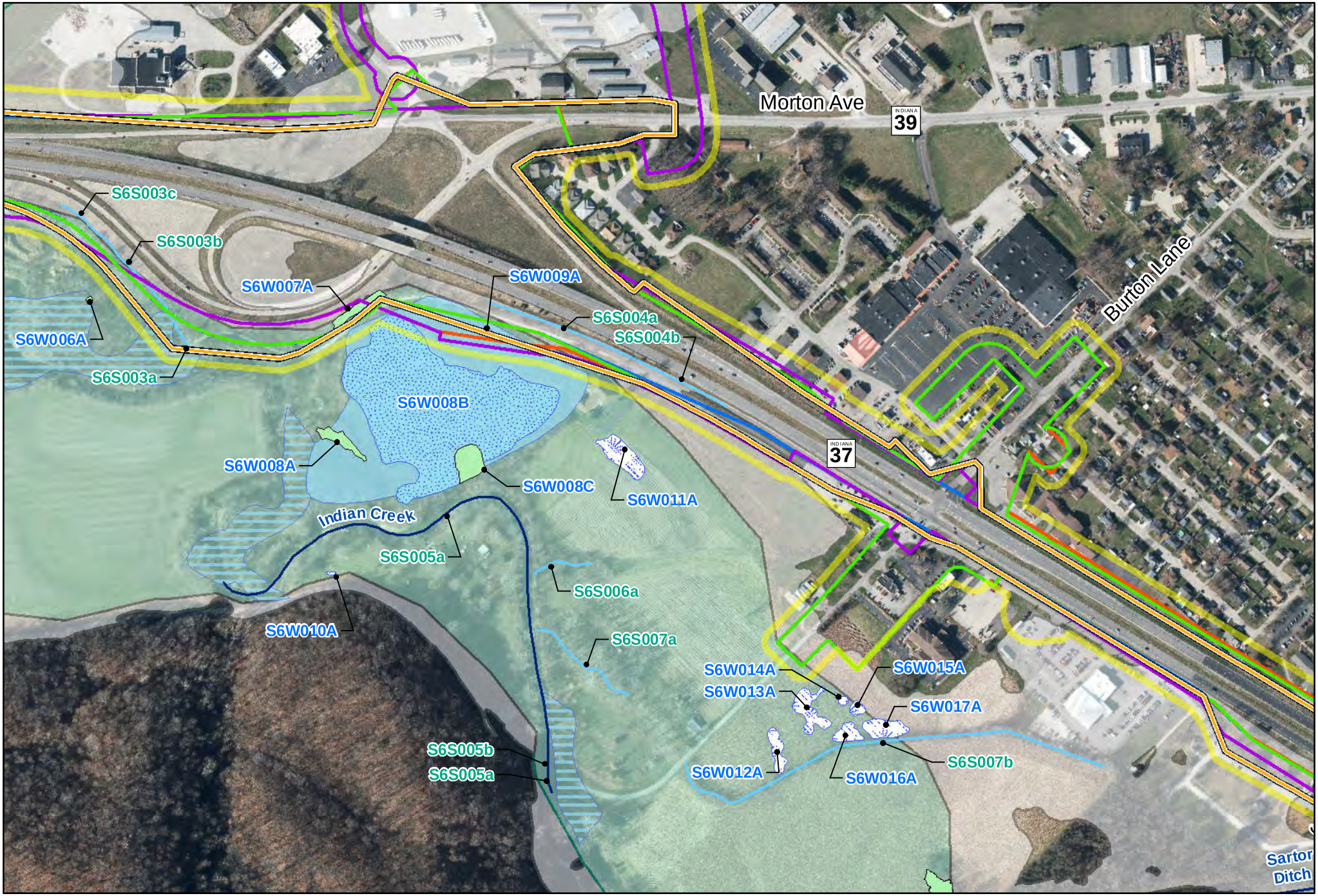
1 inch = 500 feet

0 250 500 Feet



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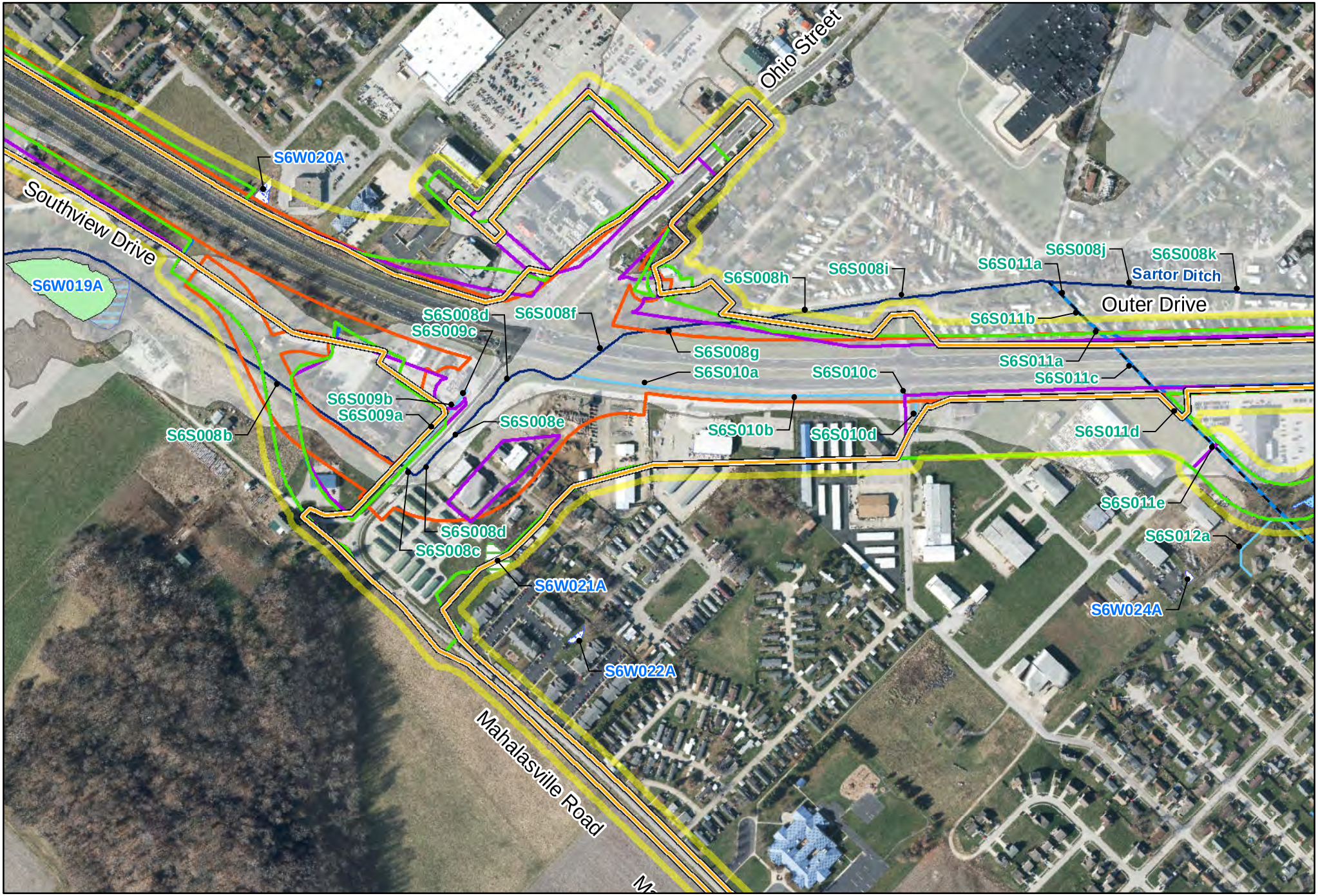

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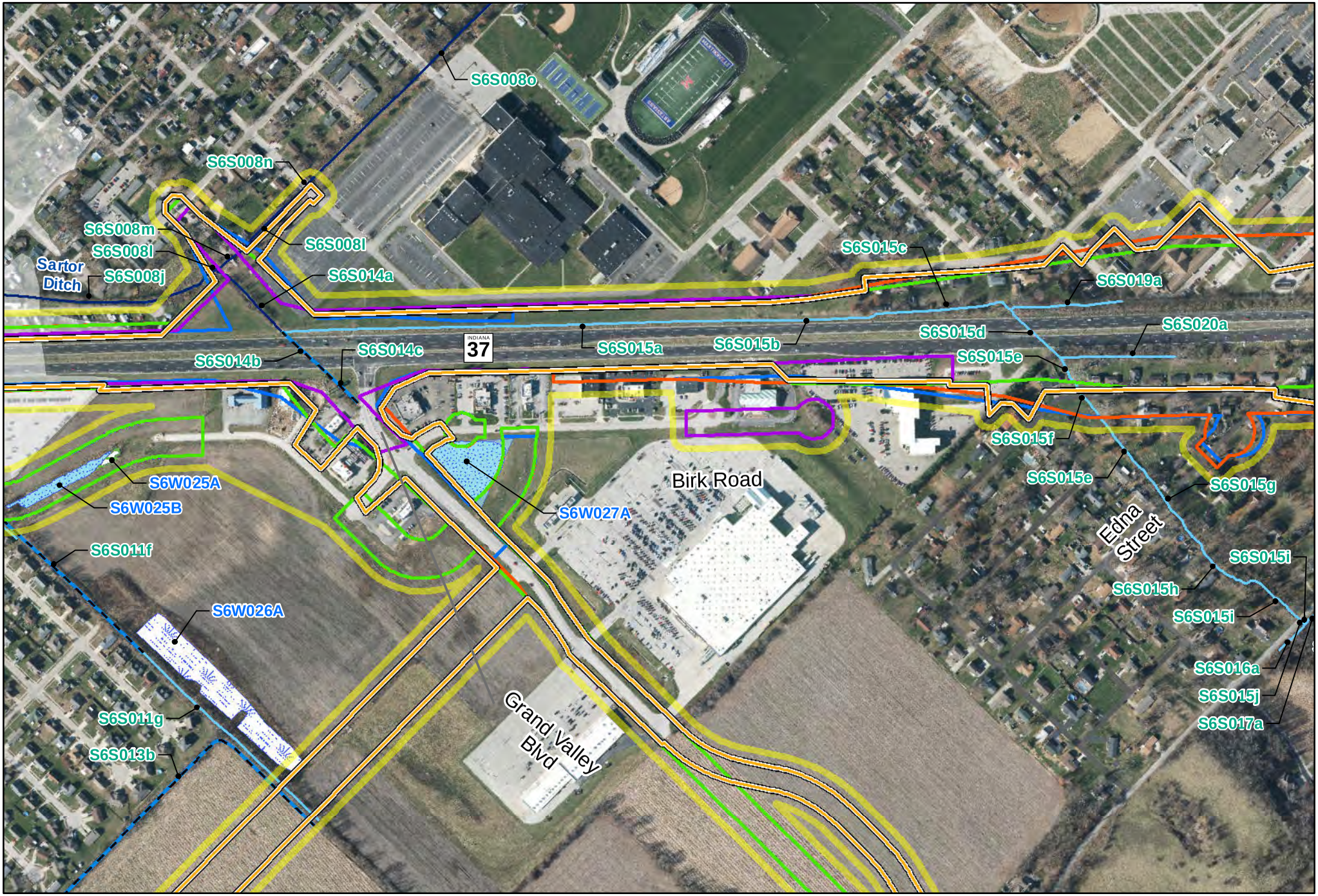

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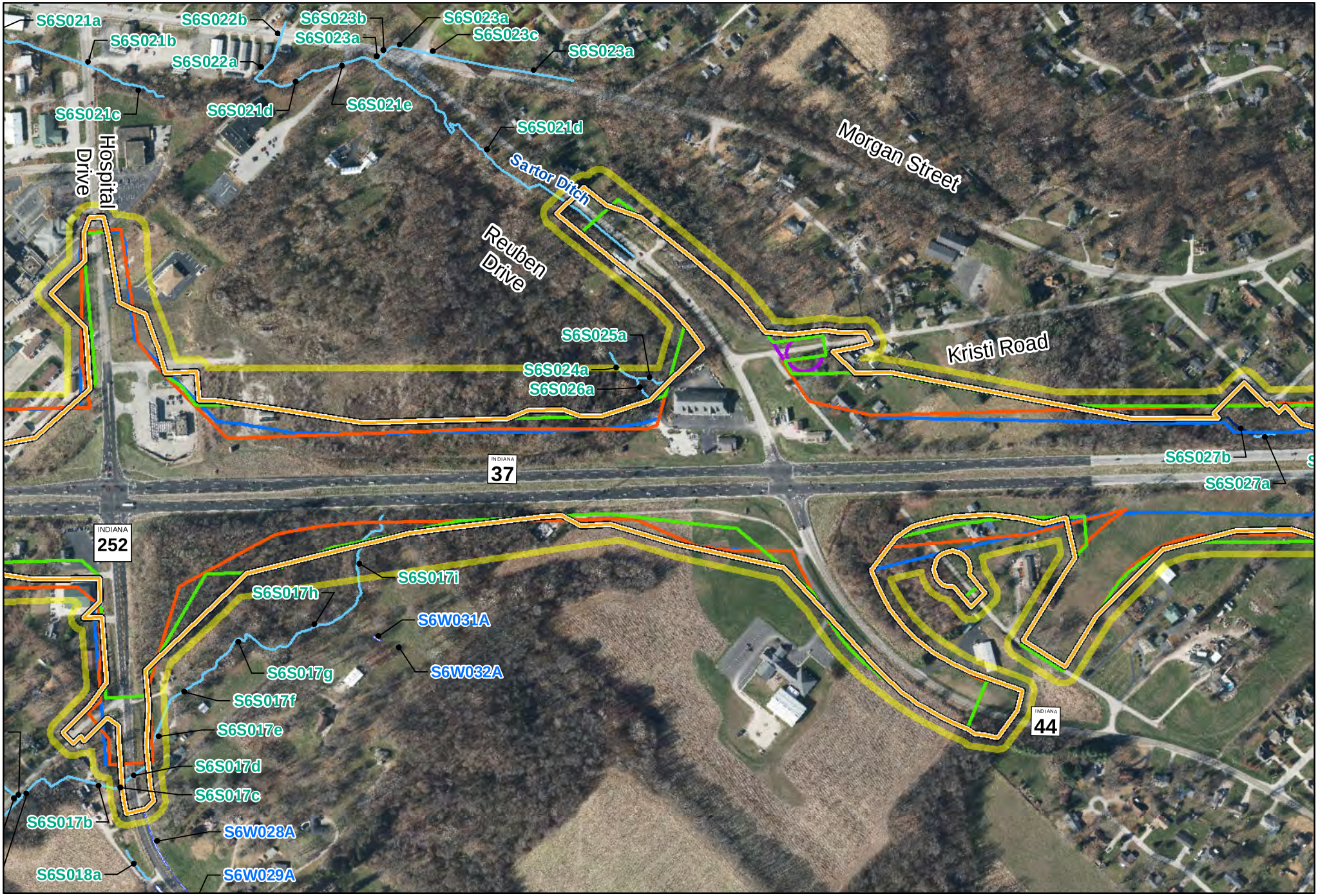

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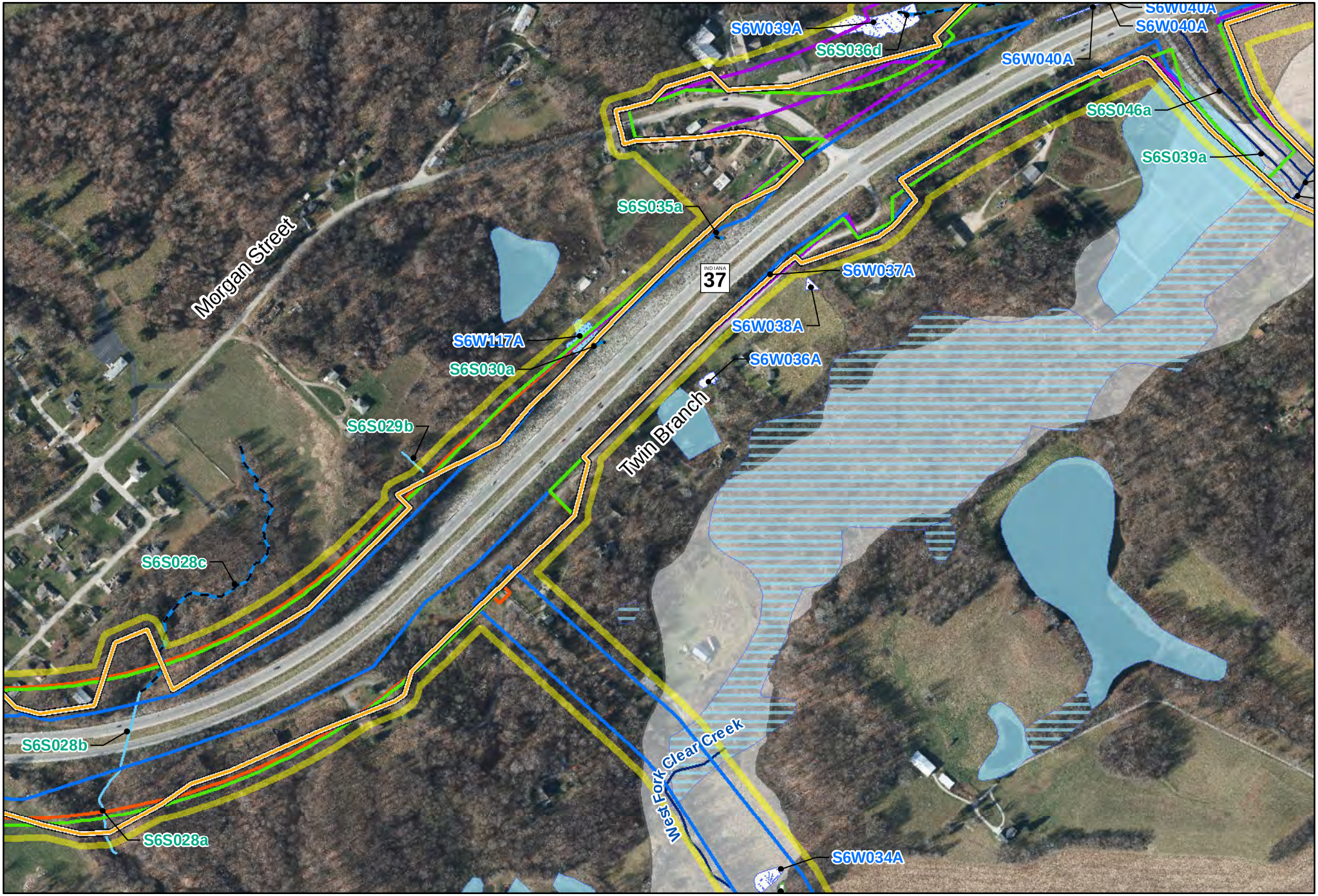

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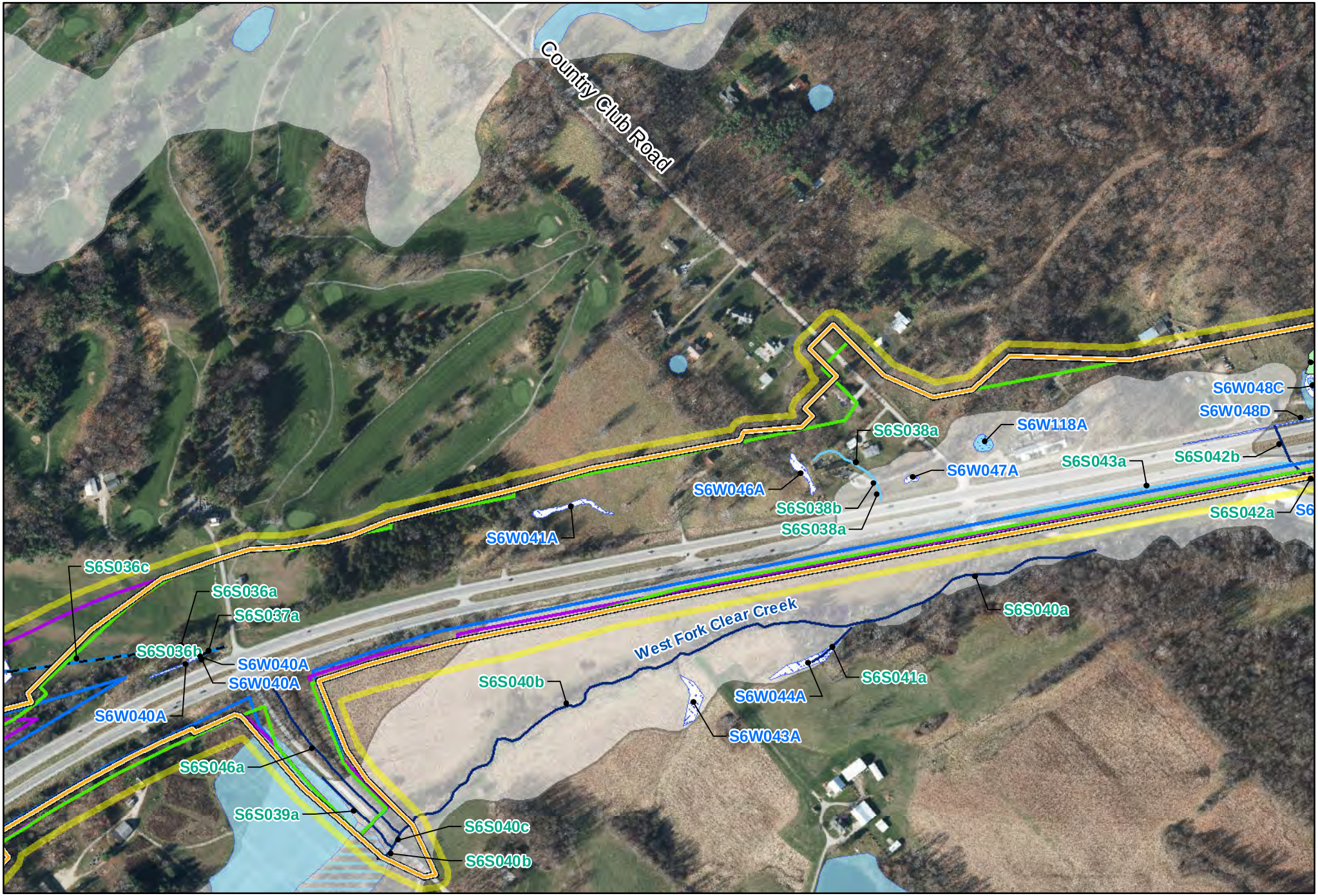

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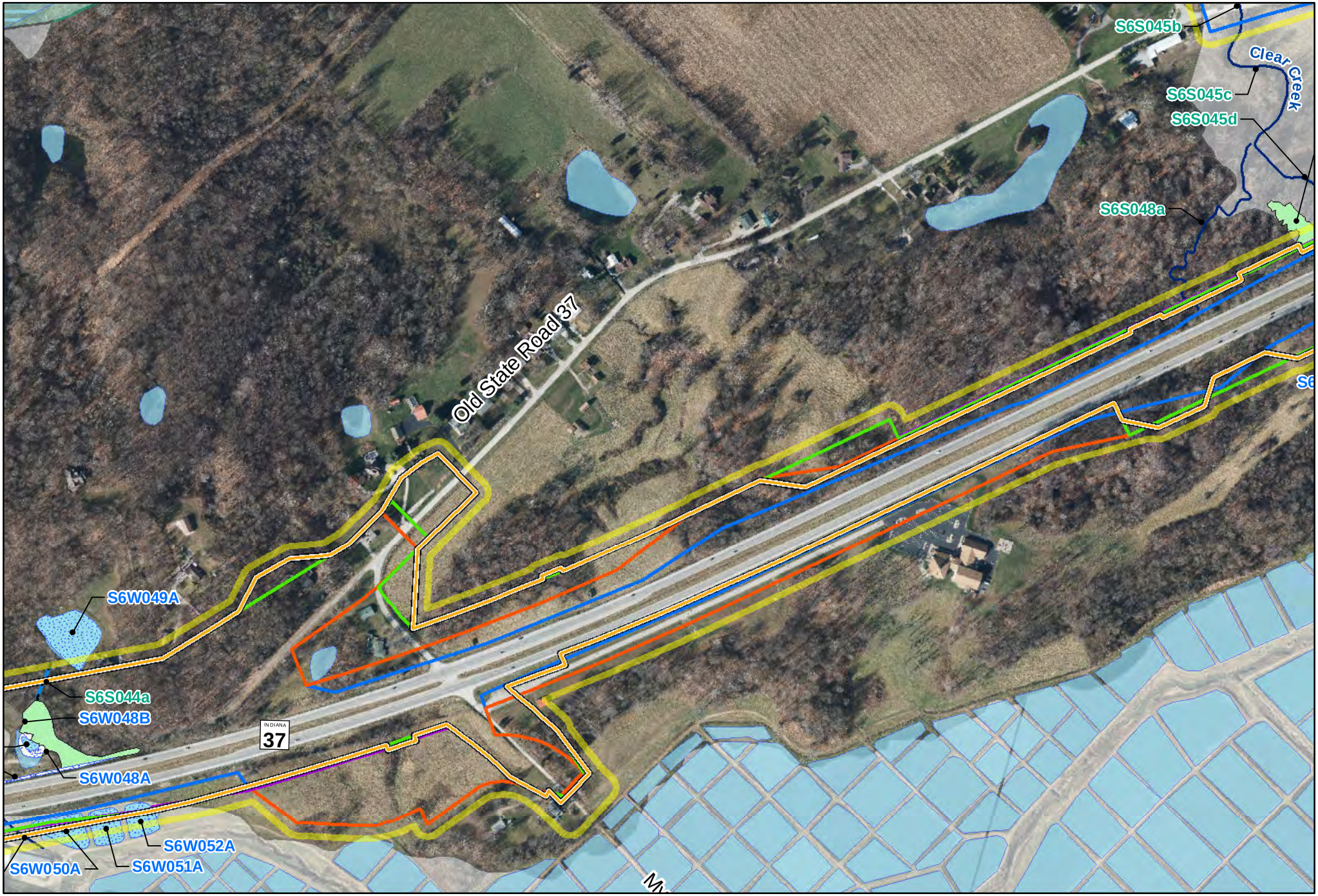

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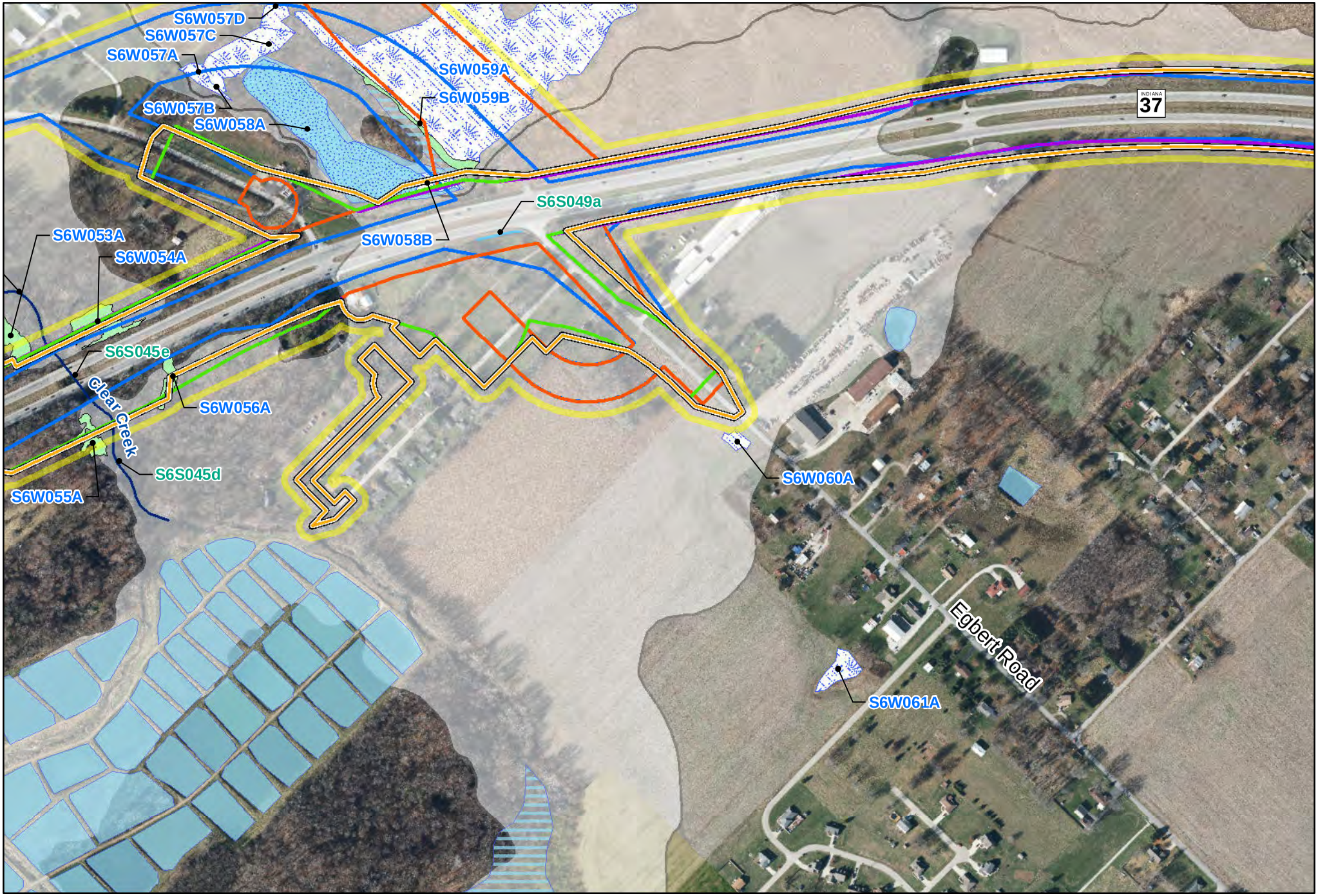

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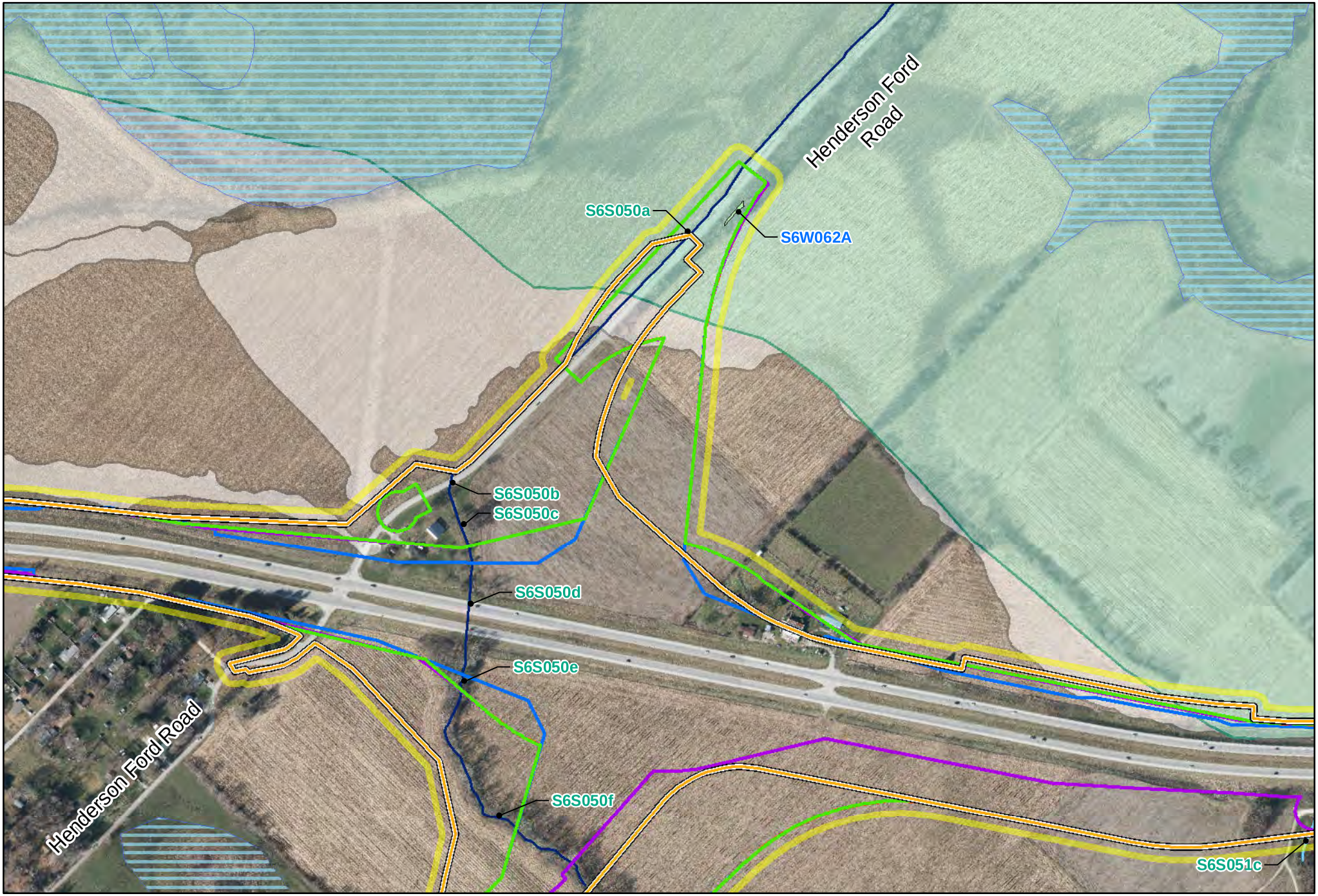

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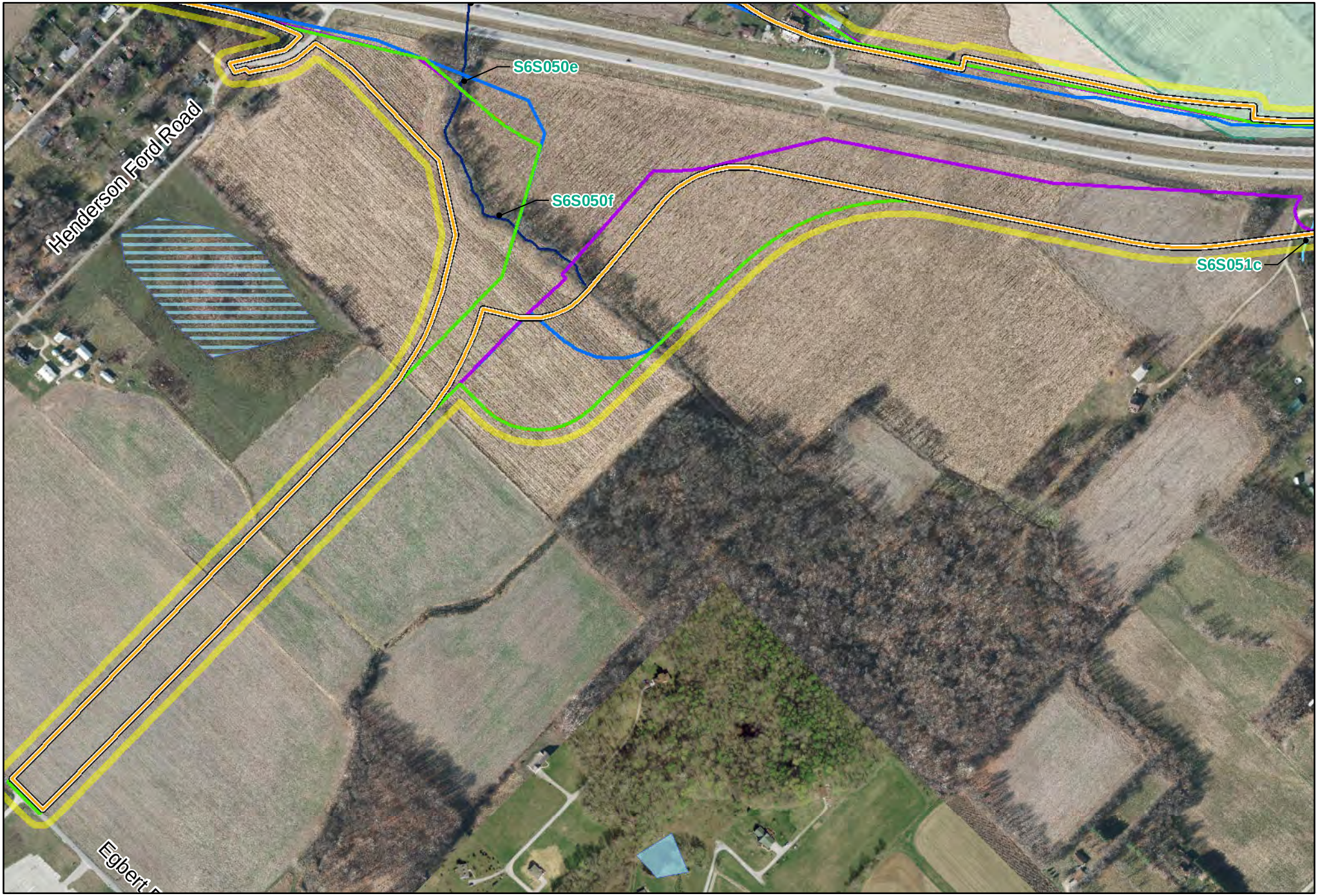

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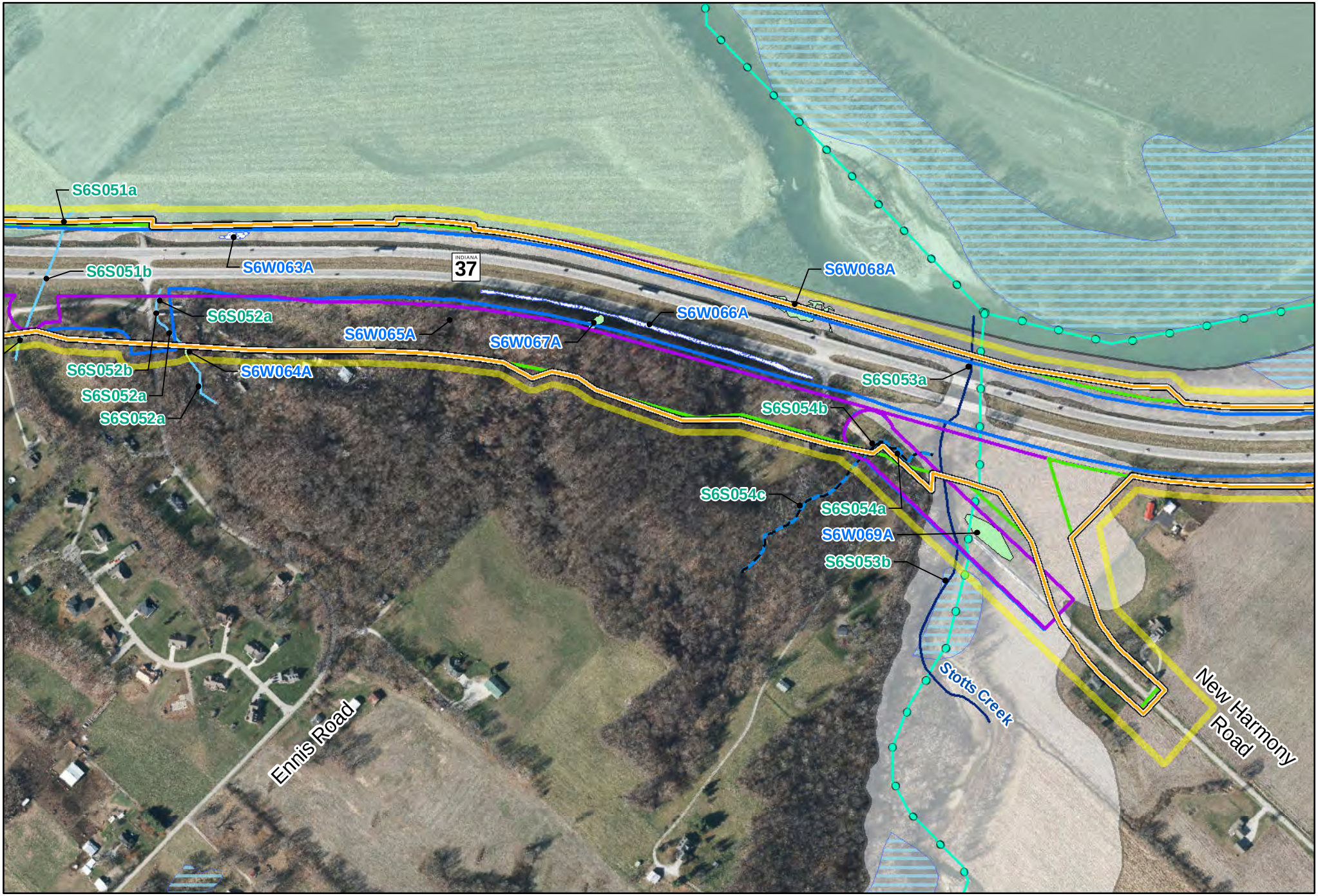

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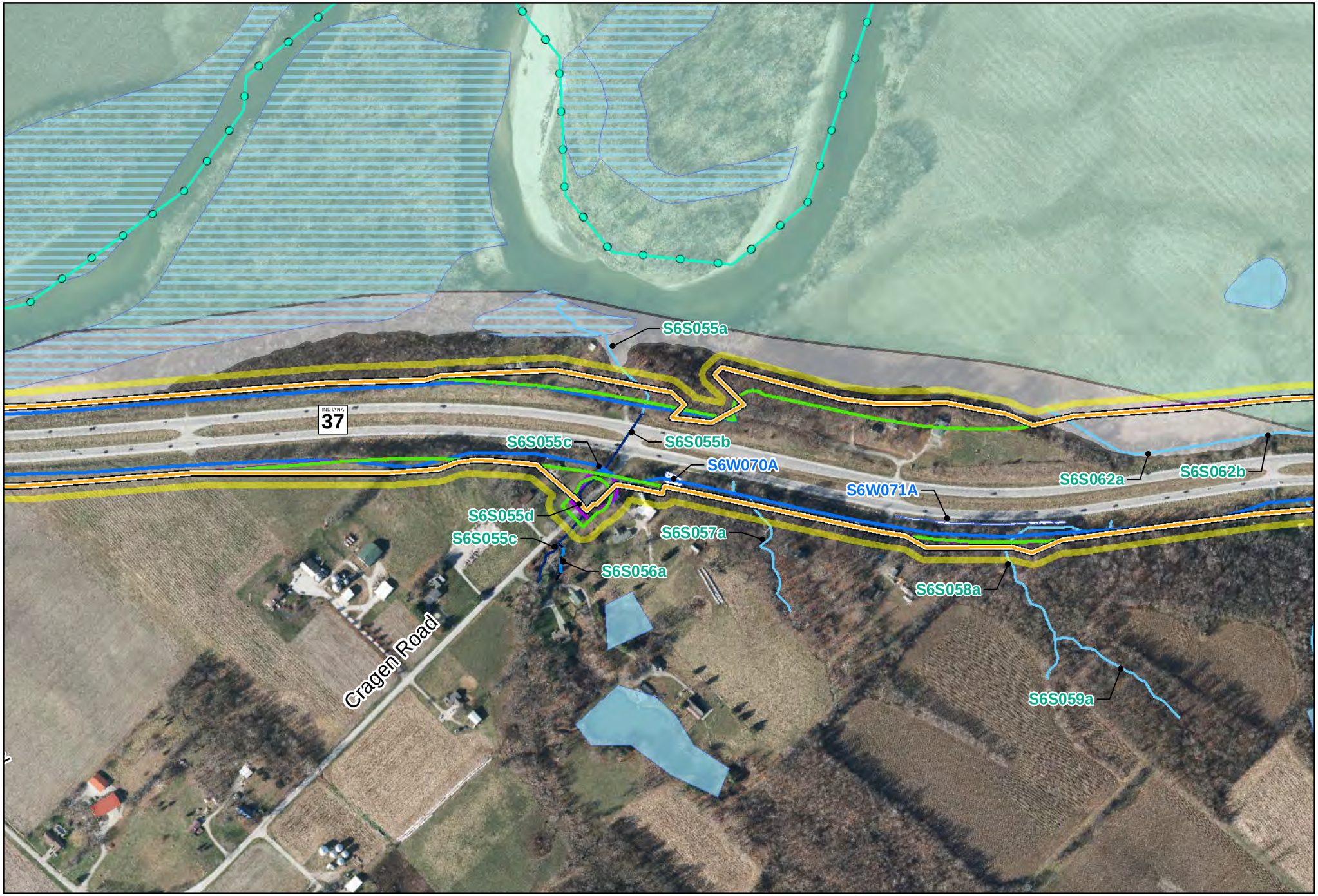

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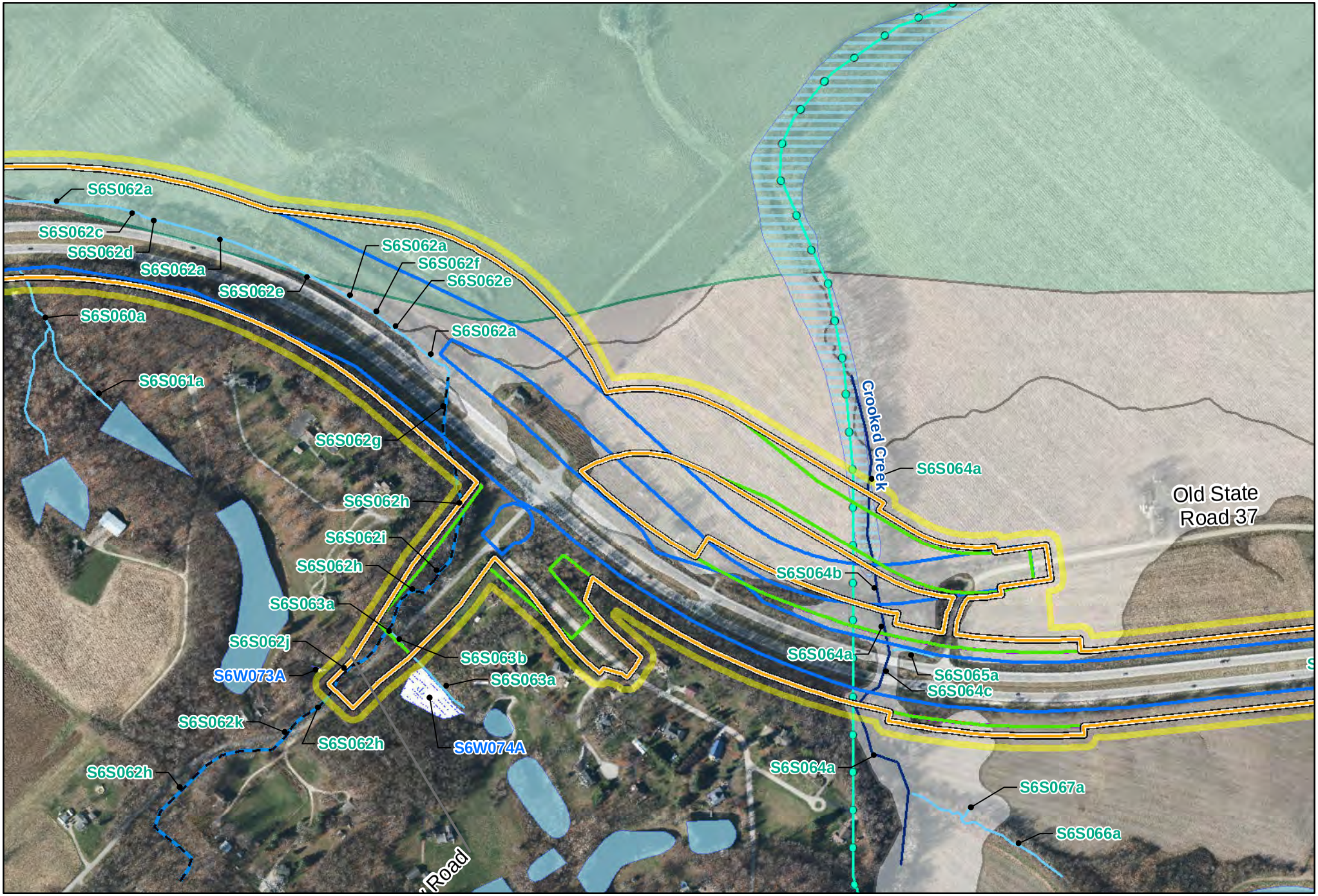

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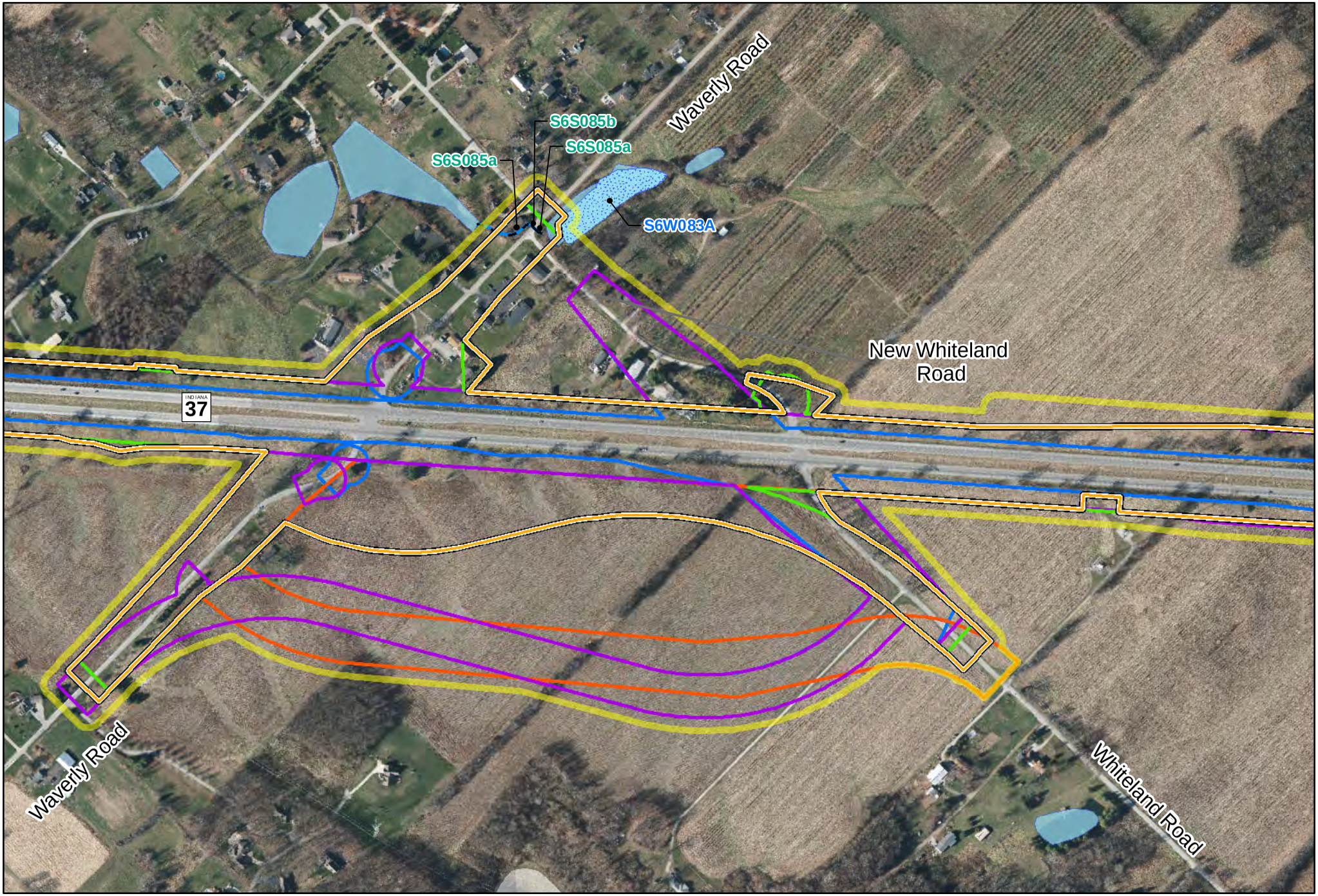

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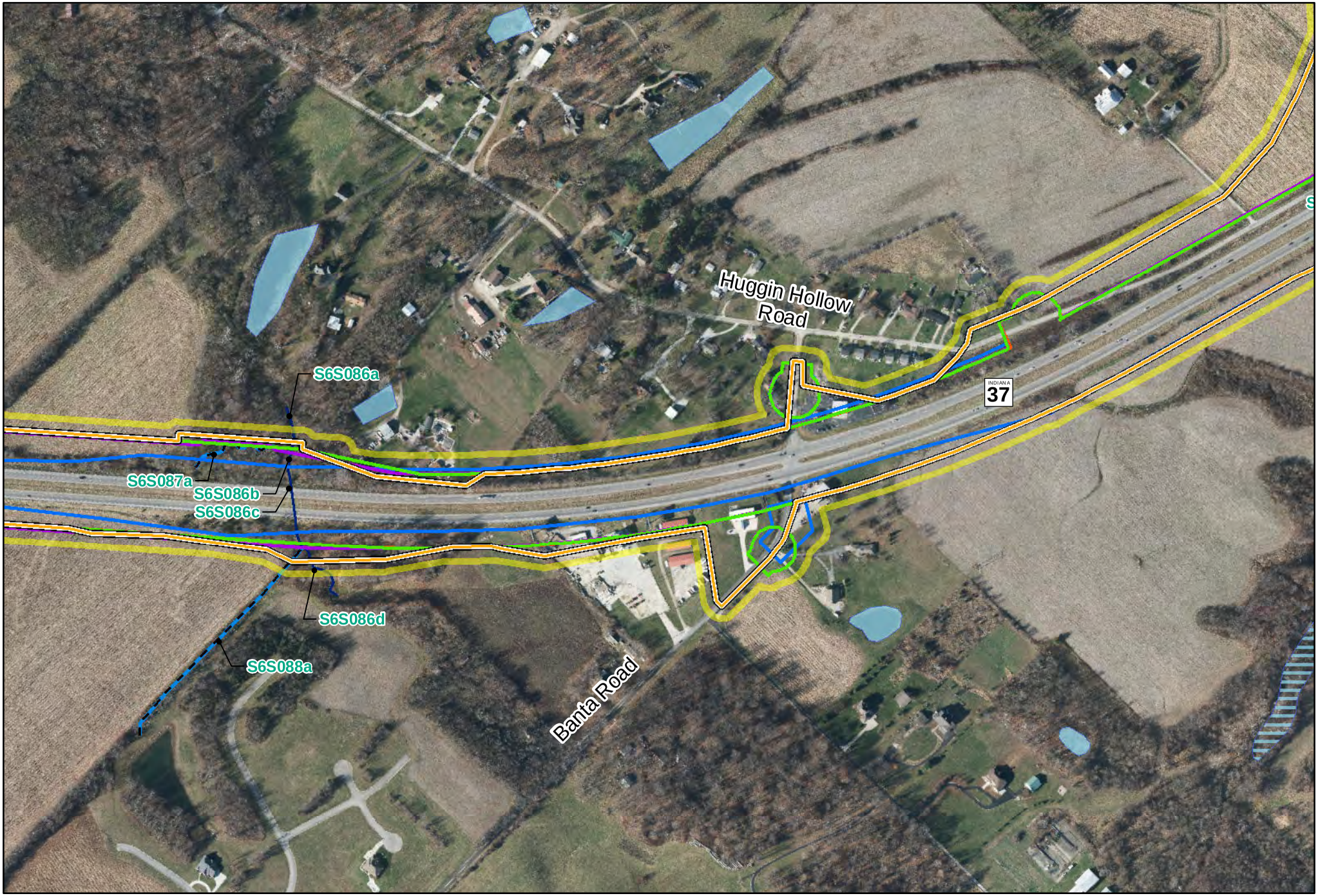

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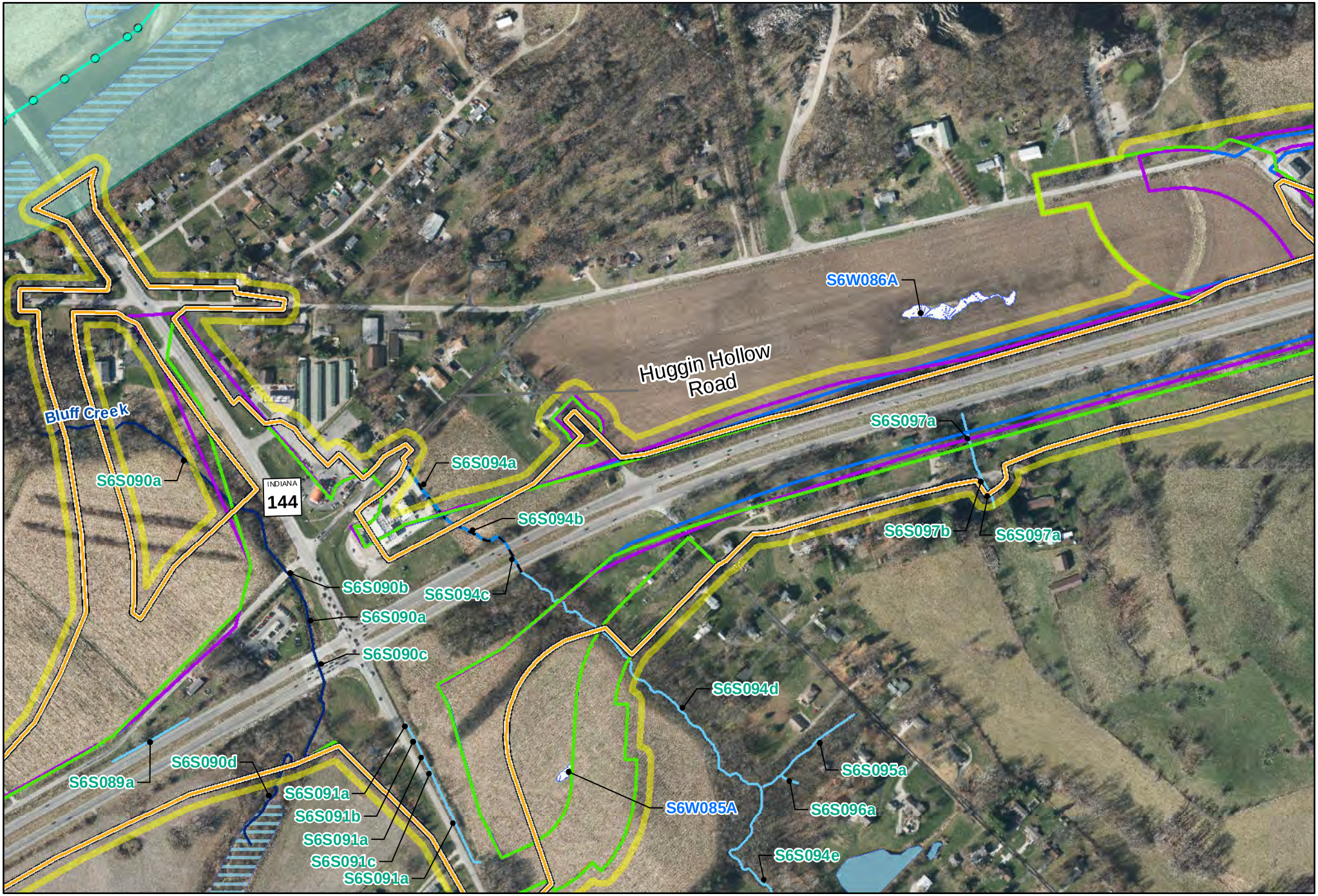

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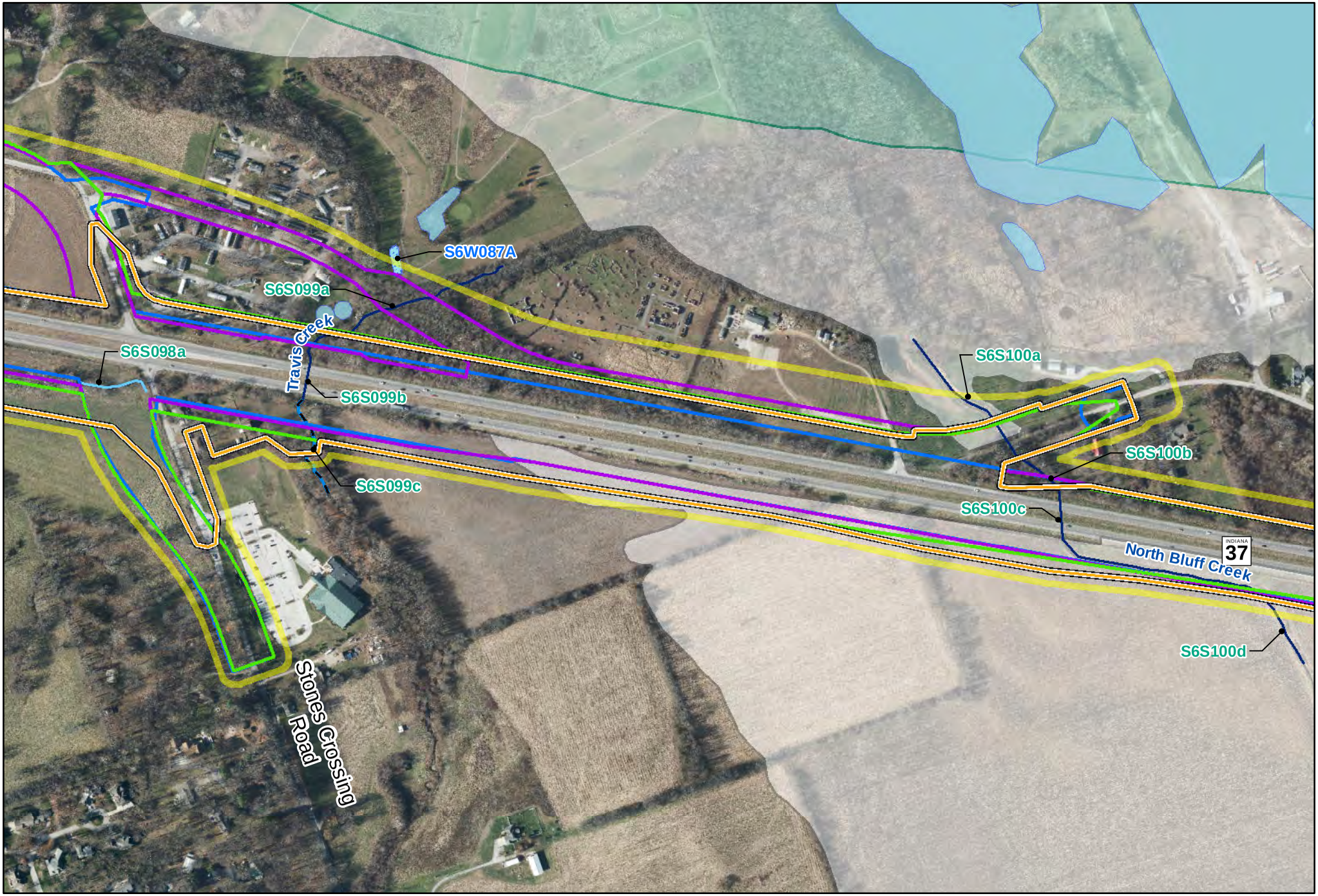

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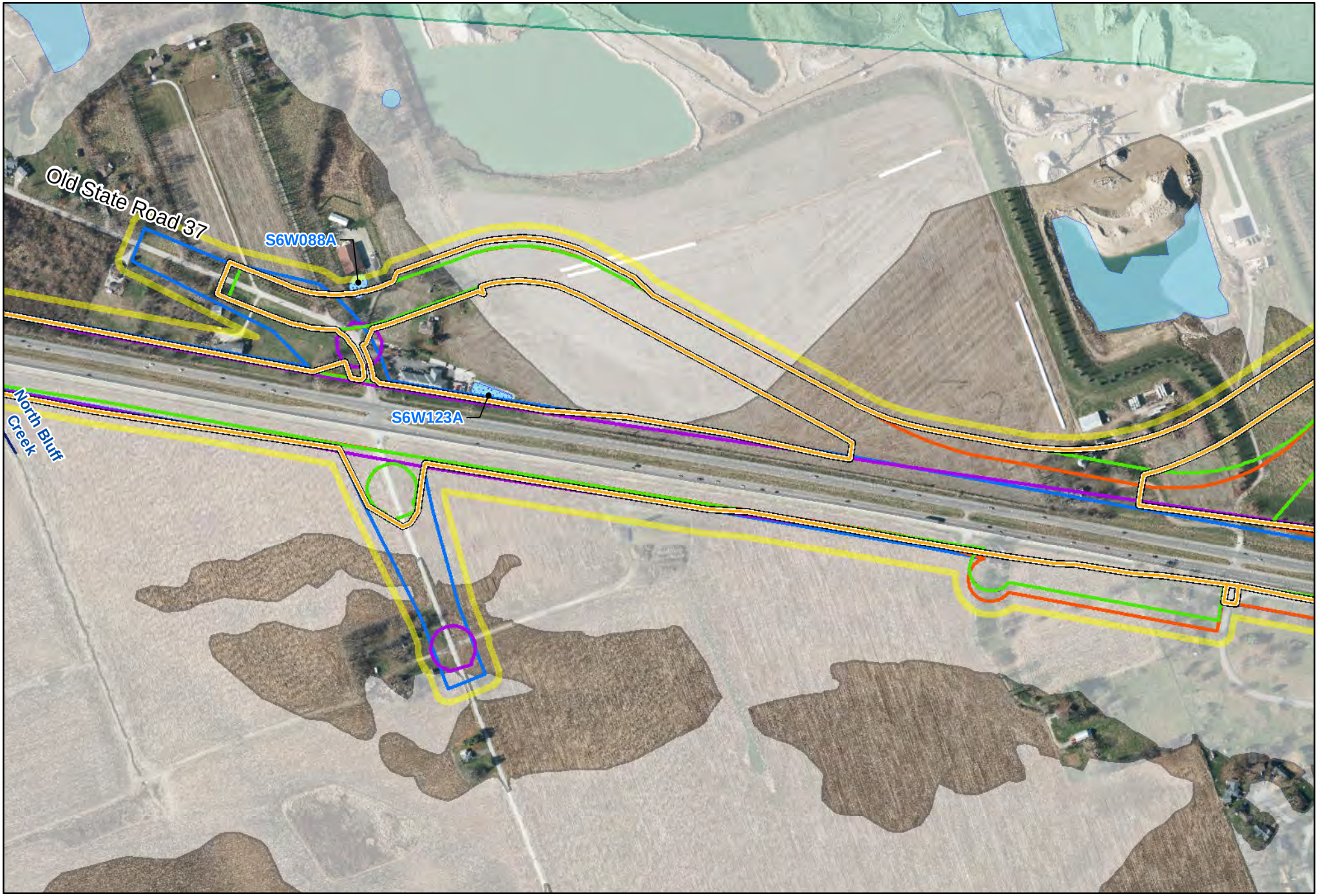

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1 inch = 500 feet

0 250 500

Feet

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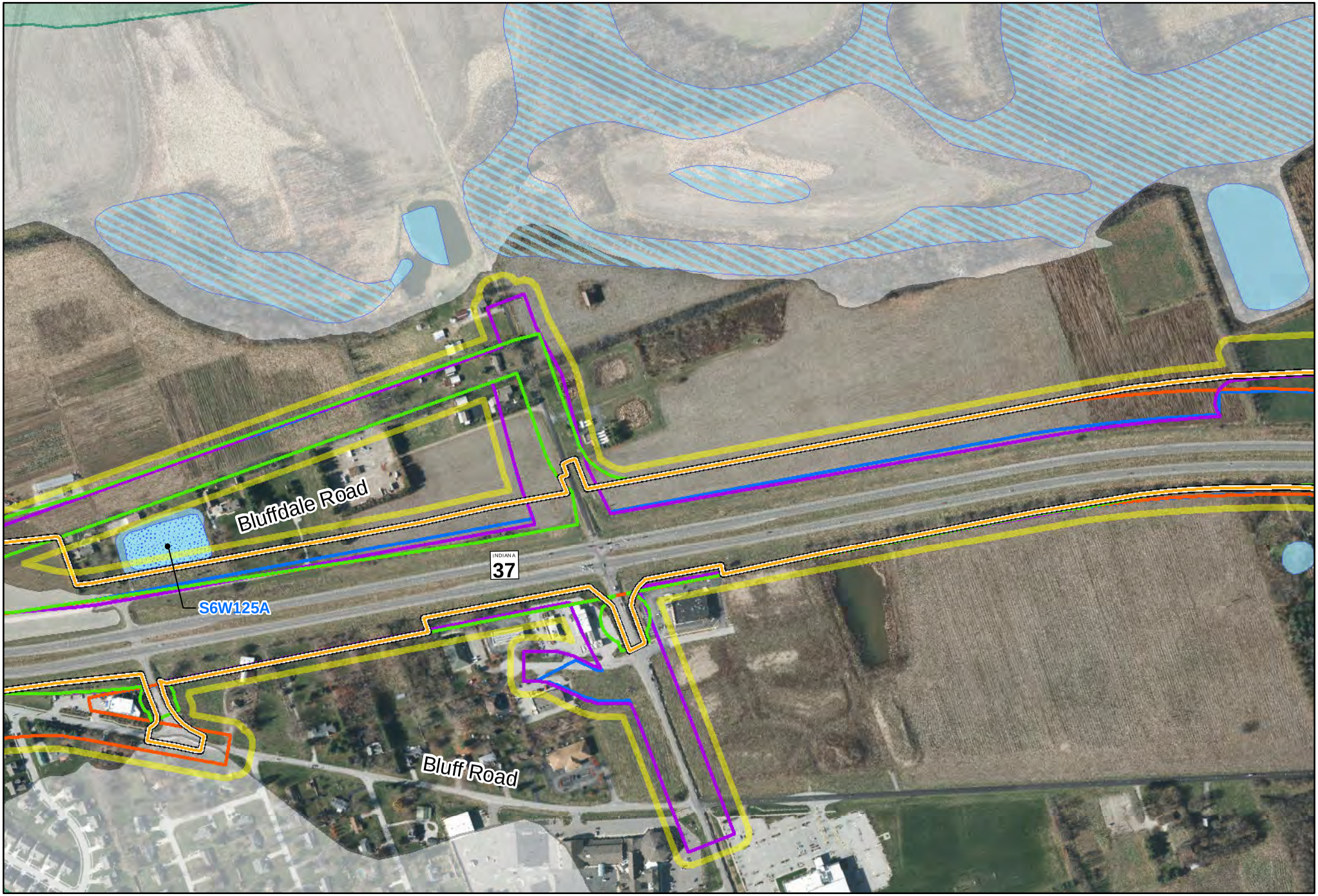

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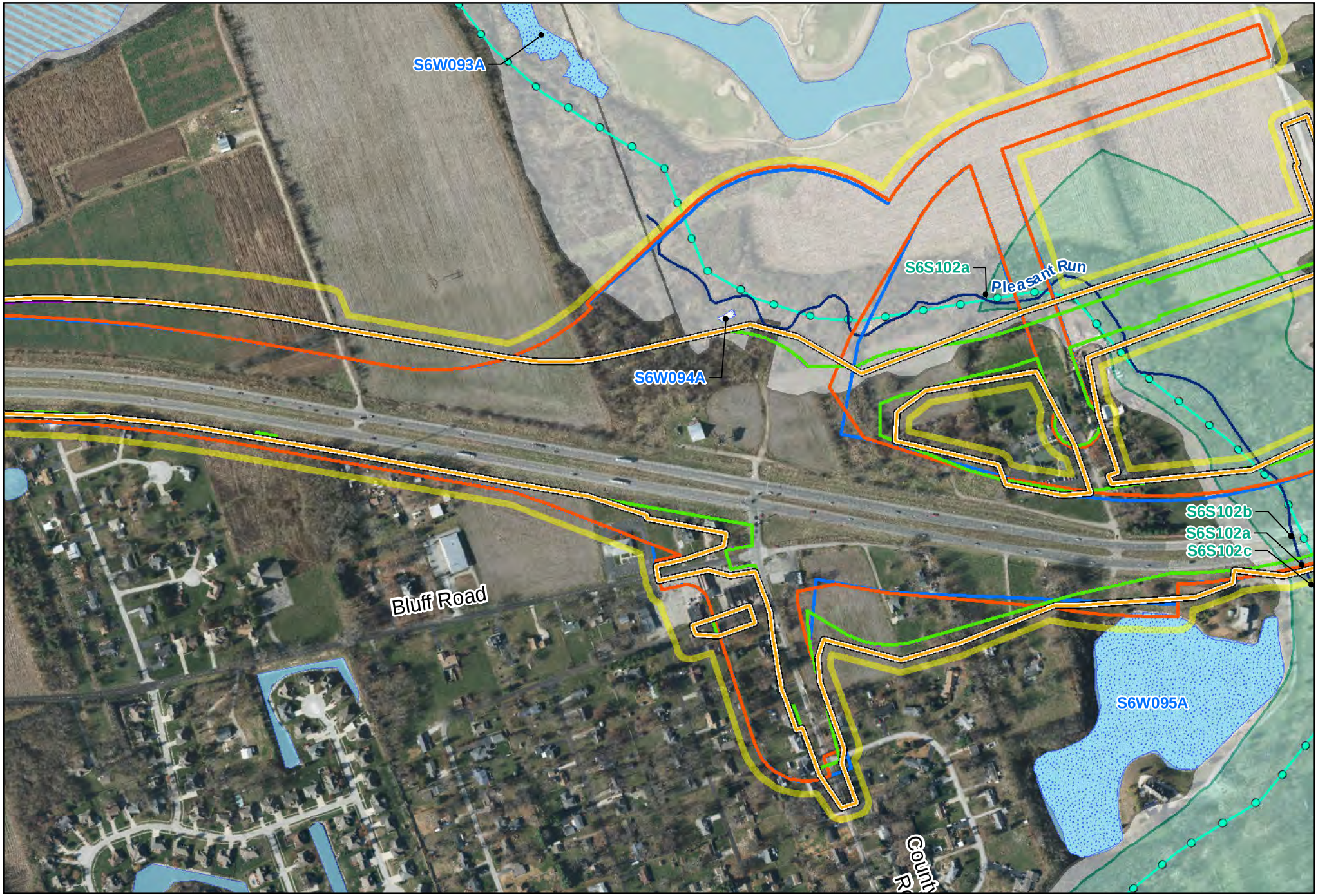

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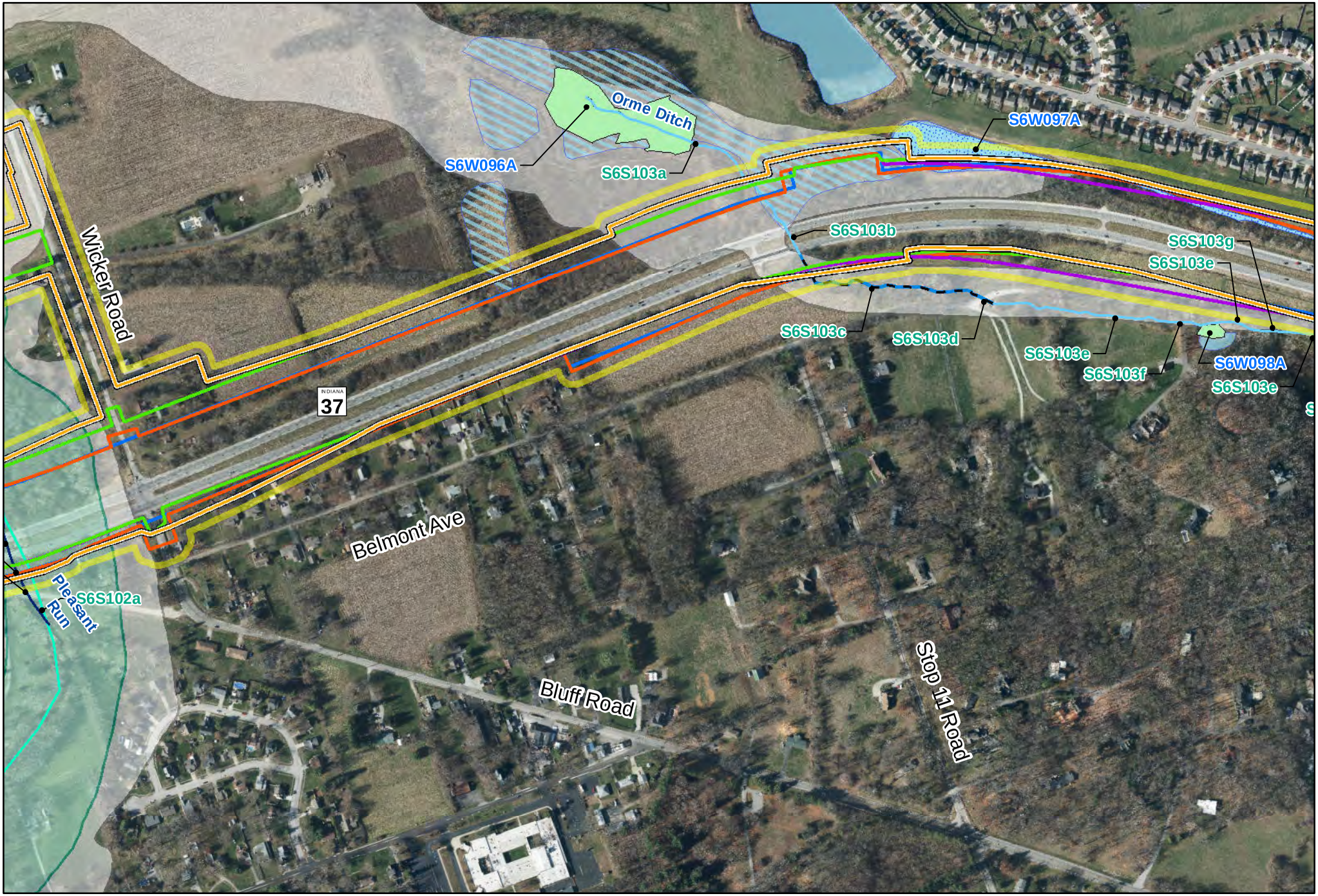

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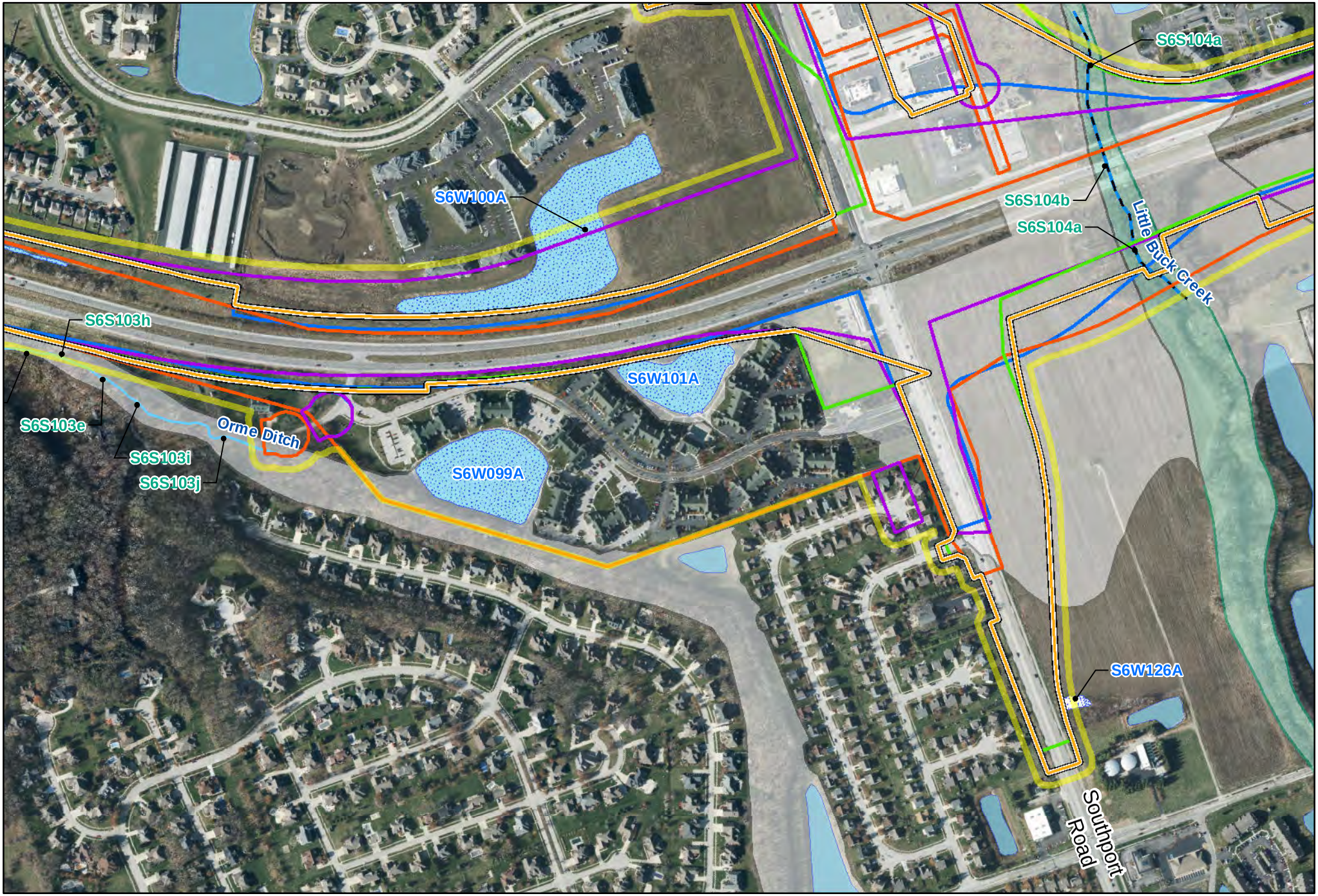

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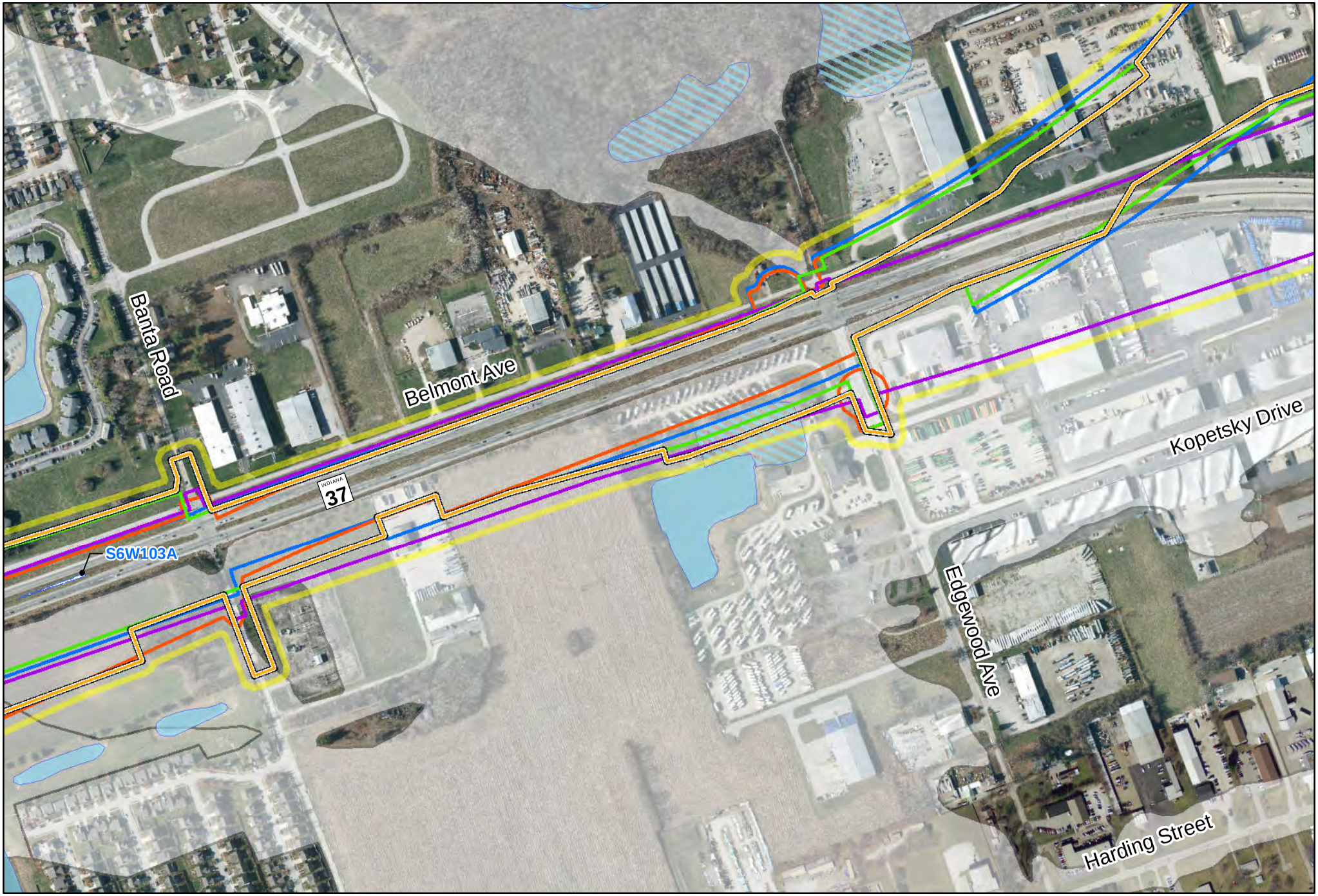

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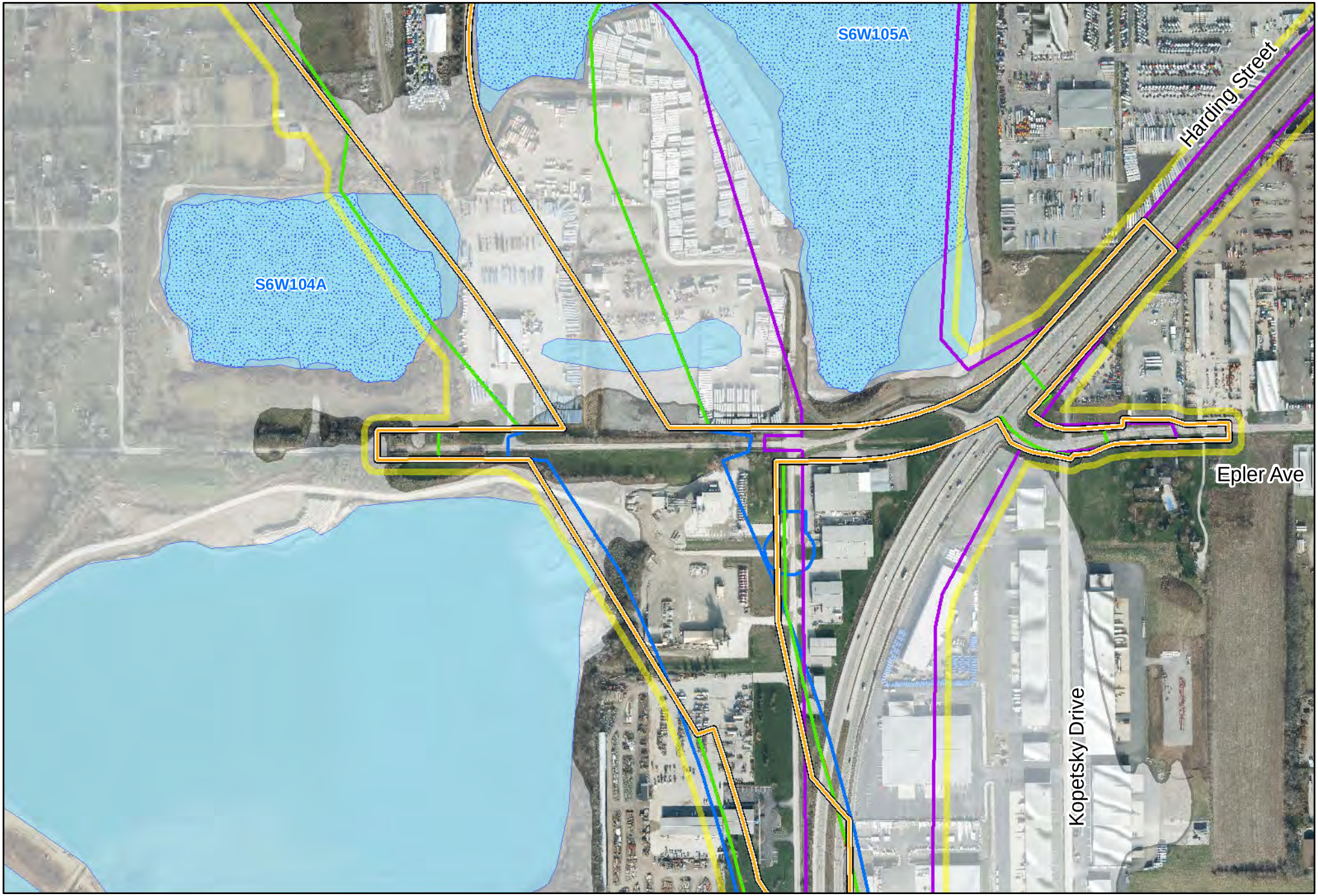

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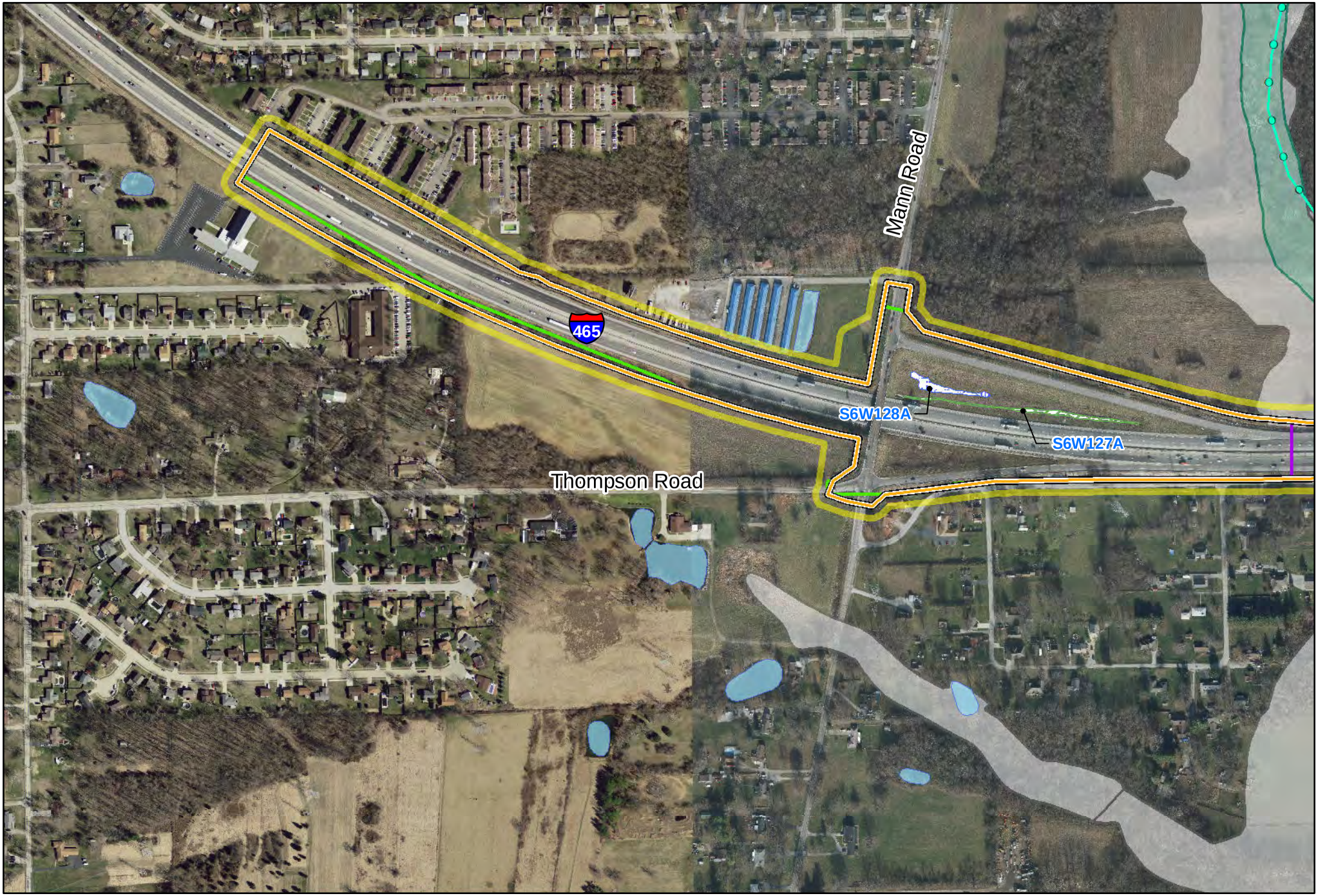

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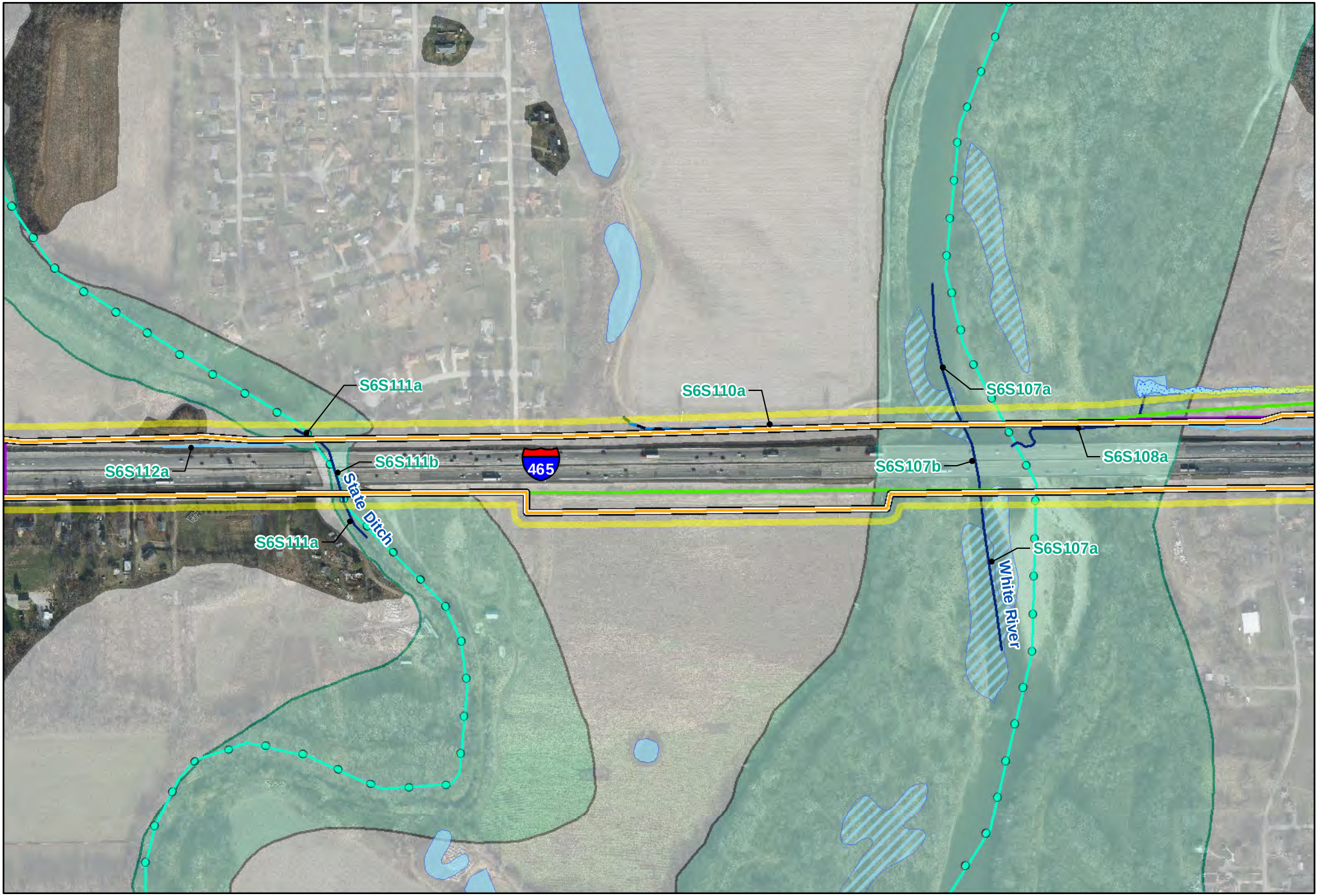

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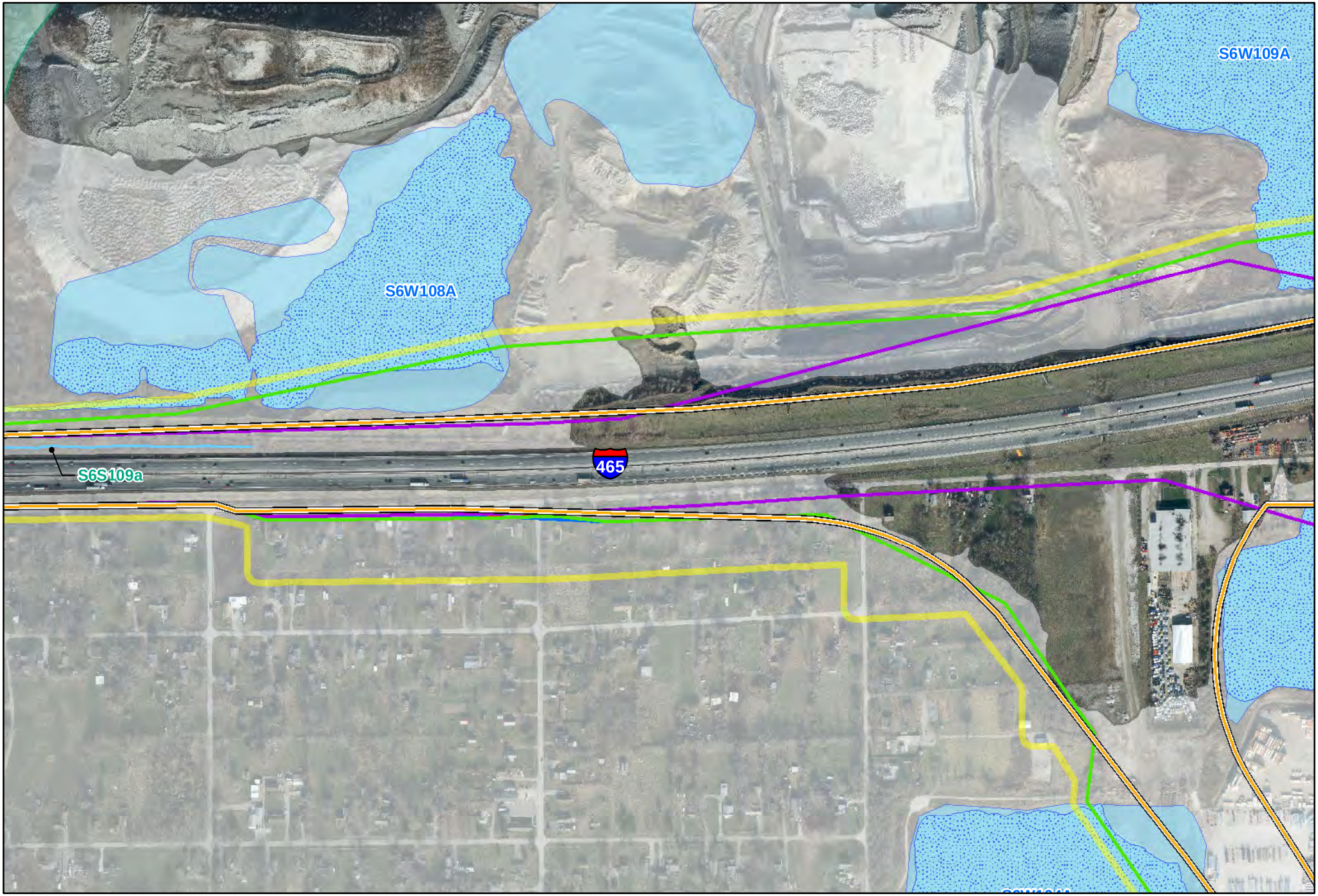

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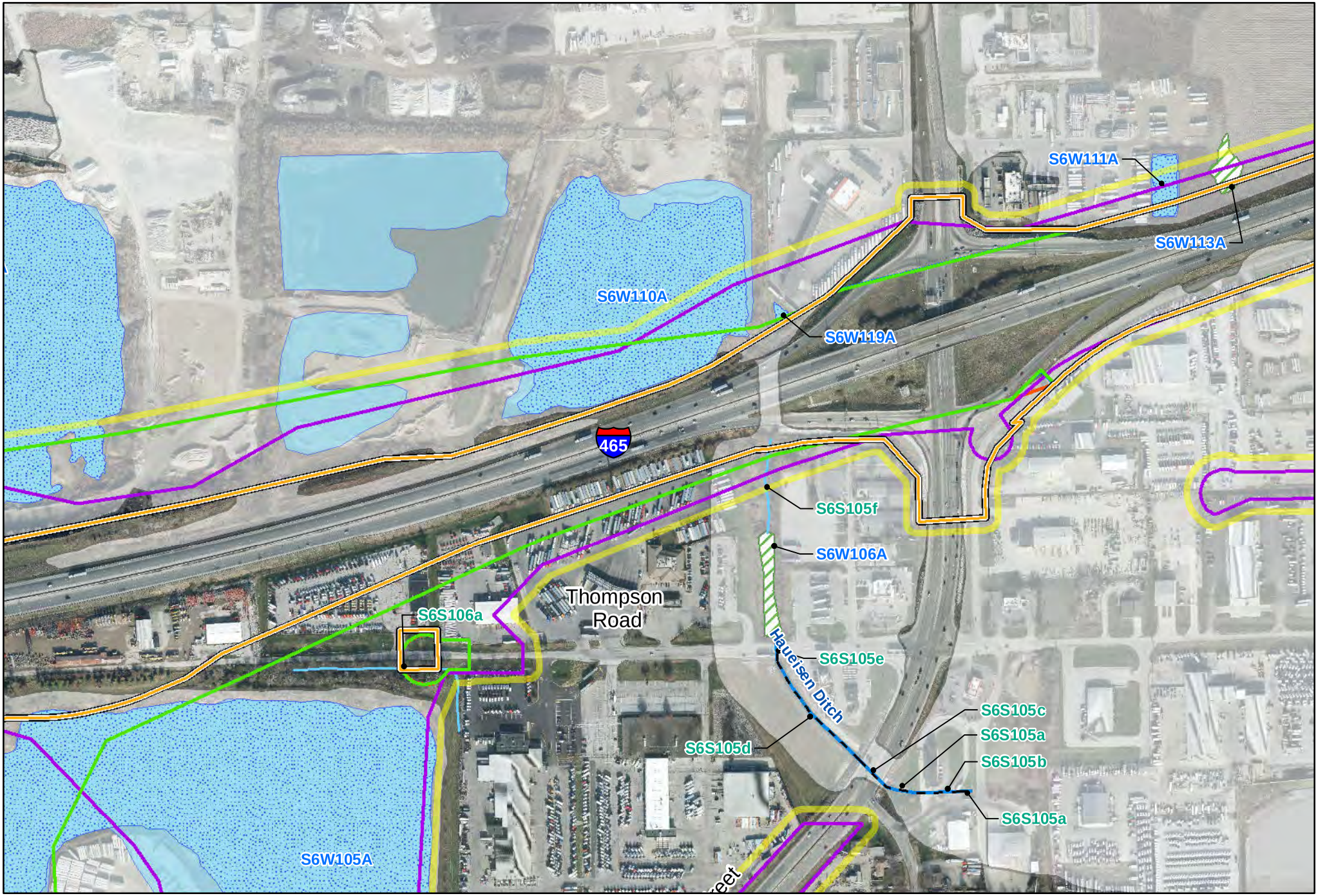

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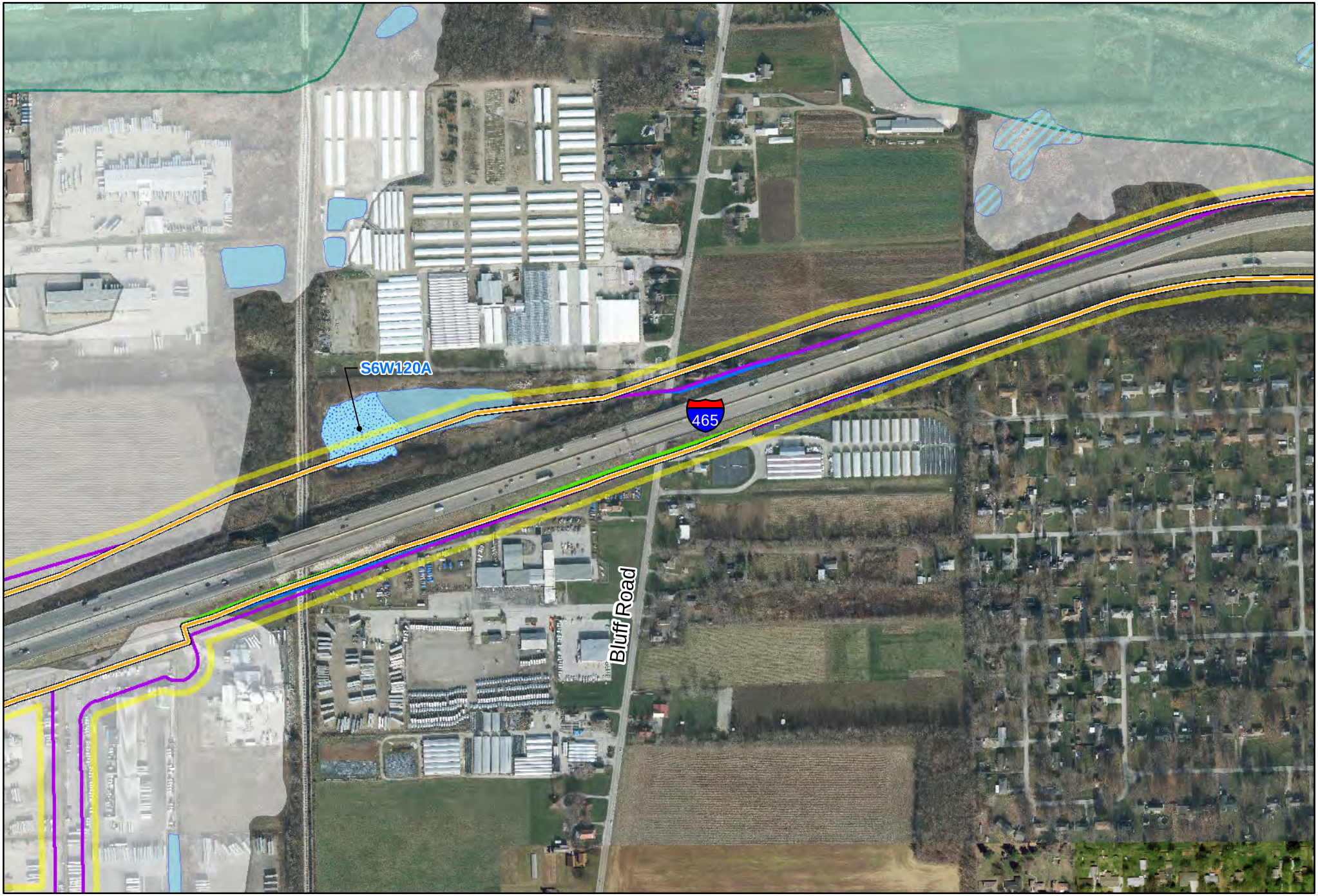

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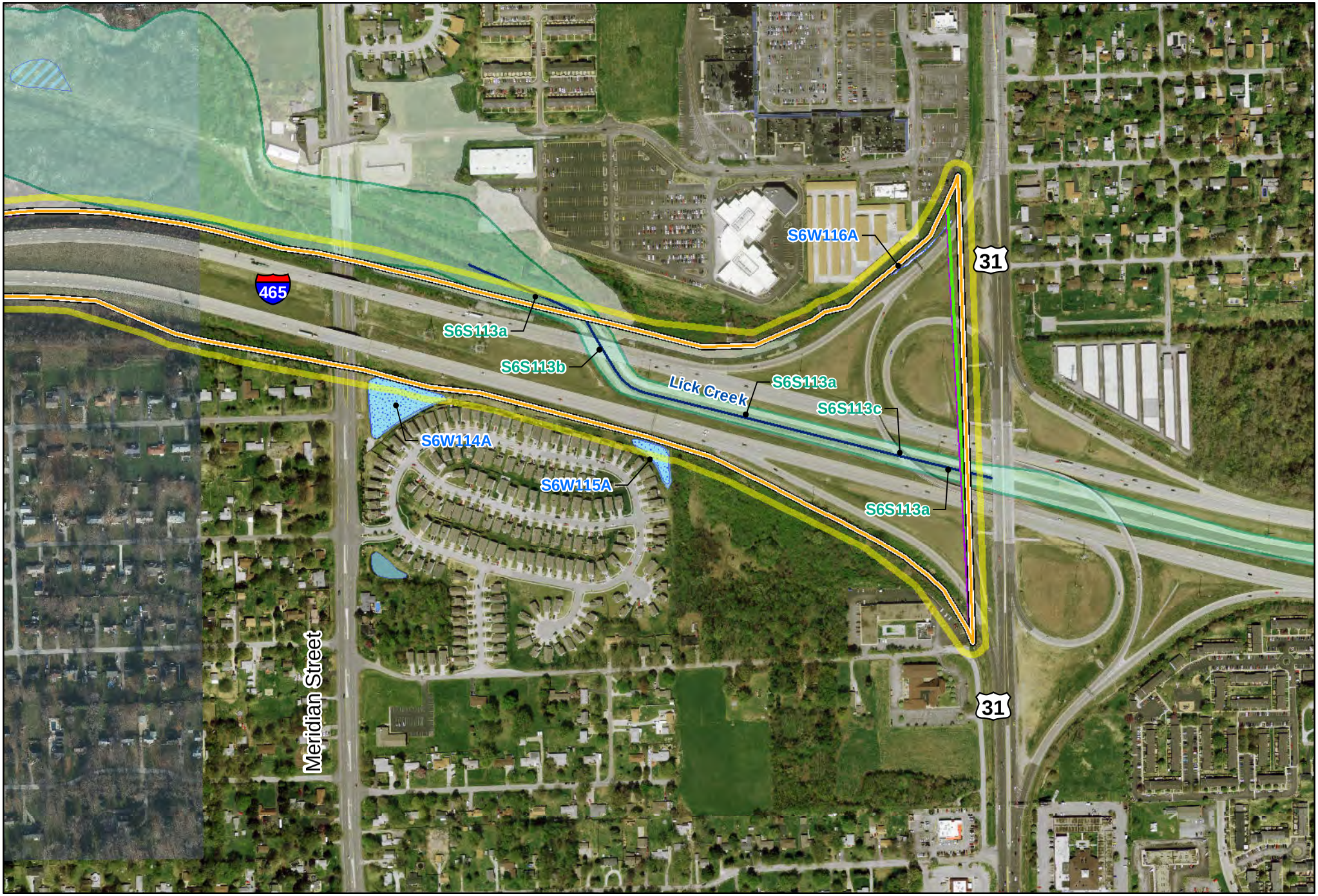

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APPENDIX B

Stream Impacts and Stream Relocation Lengths by Alternatives

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Table B -1: Stream Impacts and Stream Relocation Lengths by Alternative

Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S001a	Indian Creek	Perennial	Natural	92.99	55.25		Probable Warm Water Habitat	90	0.14	0	86	0.14	0	23	0.04	0	83	0.13	0	84	0.13	0
S6S001b	Indian Creek	Perennial	Natural Bridged	92.99				166	0.19	0	166	0.19	0	166	0.19	0	166	0.19	0	166	0.19	0
S6S001c	Indian Creek	Perennial	Natural	92.99	60		Probable Warm Water Habitat	85	0.12	0	488	0.68	0	69	0.10	0	88	0.12	0	88	0.12	0
S6S003a	UNT 2 Indian Creek	Ephemeral	Culvert	0.01				0	0	0	0	0	0	0	0	0	0	0	0	41	<0.01	41
S6S003b	UNT 2 Indian Creek	Ephemeral	Roadside Ditch	0.01		46	Modified Class II PHWH	278	0.03	278	278	0.03	278	436	0.05	436	437	0.05	437	570	0.06	570
S6S003c	UNT 2 Indian Creek	Ephemeral	Roadside Ditch	0.01		31	Modified Class II PHWH	181	0.01	0	181	0.01	181	181	0.01	181	181	0.01	181	181	0.01	181
S6S004a	UNT to lake	Ephemeral	Roadside Ditch	0.01		6	Modified Class I PHWH	644	0.03	644	643	0.03	643	643	0.03	643	643	0.03	643	643	0.03	643
S6S004b	UNT to lake	Ephemeral	Roadside Ditch	0.01		23	Modified Class I PHWH	408	0.04	408	408	0.04	408	408	0.04	408	408	0.04	408	408	0.04	408
S6S008b	Sartor Ditch	Perennial	Channelized Ditch	3.64	30.5		Modified Warm Water Habitat	162	0.05	0	387	0.13	0	162	0.05	0	162	0.05	0	36	0.01	0
S6S008c	Sartor Ditch	Perennial	Culvert	3.48				32	0.01	0	32	0.01	0	32	0.01	0	32	0.01	0	32	0.01	0
S6S008d	Sartor Ditch	Perennial	Roadside Ditch	3.48	18		Modified Warm Water Habitat	774	0.20	774	774	0.20	774	773	0.20	773	773	0.19	773	772	0.20	772
S6S008e	Sartor Ditch	Perennial	Culvert	3.48				60	0.02	60	60	0.02	60	60	0.02	60	60	0.02	60	60	0.02	60
S6S008f	Sartor Ditch	Perennial	Culvert	3.47				271	0.07	0	271	0.07	0	271	0.07		271	0.08	0	271	0.08	0
S6S008g	Sartor Ditch	Perennial	Channelized Ditch	3.47	33		Modified Warm Water Habitat	349	0.10	349	97	0.03	0	357	0.10	357	357	0.10	357	357	0.10	357
S6S008h	Sartor Ditch	Perennial	Channelized Ditch	3.42	31.5		Modified Warm Water Habitat	0	0	0	0	0	0	117	0.03	117	117	0.03	117	164	0.04	164
S6S008j	Sartor Ditch	Perennial	Channelized Ditch	3.17	42.5		Modified Warm Water Habitat	0	0	0	16	<0.01	0	42	0.01	0	16	<0.01	0	16	<0.01	0
S6S008l	Sartor Ditch	Perennial	Channelized Ditch	1.66	36.5		Modified Warm Water Habitat	82	0.04	0	136	0.07	0	162	0.08	0	136	0.07	0	136	0.07	0
S6S008m	Sartor Ditch	Perennial	Culvert	1.66				19	0.01	19	19	0.01	19	19	0.01	19	19	0.01	19	19	0.01	0
S6S009a	UNT 1 Sartor Ditch	Ephemeral	Roadside Ditch	0.01		26	Modified Class I PHWH	0	0	0	295	0.03	295	45	<0.01	45	45	<0.01	0	295	0.03	295
S6S009b	UNT 1 Sartor Ditch	Ephemeral	Culvert	0.01				31	<0.01	0	34	<0.01	34	34	<0.01	34	34	<0.01	0	34	<0.01	0

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Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S009c	UNT 1 Sartor Ditch	Ephemeral	Roadside Ditch	0.01		16	Modified Class I PHWH	64	<0.01	0	64	0.01	64	64	0.01	64	64	0.01	0	64	0.01	0
S6S010a	UNT 2 Sartor Ditch	Ephemeral	Roadside Ditch	0.01		17	Modified Class I PHWH	502	0.03	502	502	0.03	502	502	0.03	0	502	0.03	502	502	0.03	502
S6S010b	UNT 2 Sartor Ditch	Ephemeral	Roadside Ditch	0.01		17	Modified Class I PHWH	808	0.05	808	808	0.05	808	808	0.05	808	808	0.05	808	808	0.05	808
S6S010c	UNT 2 Sartor Ditch	Ephemeral	Culvert	0.01				80	0.01	0	80	0.01	80	80	0.01	80	80	0.01	80	80	0.01	80
S6S010d	UNT 2 Sartor Ditch	Ephemeral	Roadside Ditch	0.01		17	Modified Class I PHWH	4	<0.01	0	27	<0.01	0	148	0.01	148	148	0.01	148	111	<0.01	111
S6S011a	UNT 3 Sartor Ditch	Intermittent	Channelized Ditch	0.53		63	Modified Class II PHWH	31	<0.01	0	73	0.01	0	71	0.01	0	73	0.01	73	4	<0.01	0
S6S011c	UNT 3 Sartor Ditch	Intermittent	Culvert	0.05				217	0.02	0	217	0.02	0	217	0.02	0	217	0.02	0	217	0.02	0
S6S011d	UNT 3 Sartor Ditch	Intermittent	Channelized Ditch	0.05		61	Modified Class II PHWH	20	<0.01	0	58	0.01	0	337	0.04	337	337	0.04	337	188	0.02	0
S6S011e	UNT 3 Sartor Ditch	Intermittent	Culvert	0.49				19	<0.01	0	19	<0.01	0	42	<0.01	42	42	<0.01	42	0	0	0
S6S011f	UNT 3 Sartor Ditch	Intermittent	Channelized Ditch	0.49		51	Modified Class II PHWH	407	0.05	0	407	0.05	0	407	0.05	407	407	0.05	407	0	0	0
S6S011g	UNT 3 Sartor Ditch	Ephemeral	Channelized Ditch	0.39		31	Modified Class II PHWH	0	0	0	0	0	0	0	0	0	0	0	0	175	0.02	0
S6S012a	UNT 4 Sartor Ditch	Ephemeral	Concrete Gutter	0.01		47	Modified Class II PHWH	45	<0.01	45	45	<0.01	45	45	<0.01	45	46	<0.01	46	0	0	0
S6S013a	UNT 5 Indian Creek	Intermittent	Channelized Ditch	0.27	23.5		Limited Warm Water Habitat	0	0	0	0	0	0	0	0	0	0	0	0	186	0.04	0
S6S013b	UNT 5 Indian Creek	Intermittent	Channelized Ditch	0.27	34		Modified Warm Water Habitat	0	0	0	0	0	0	0	0	0	0	0	0	175	0.03	0
S6S014a	UNT 5 Sartor Ditch	Intermittent	Channelized Ditch	0.30		68	Modified Class II PHWH	337	0.08	337	361	0.09	361	361	0.08	361	361	0.09	361	361	0.09	361
S6S014b	UNT 5 Sartor Ditch	Intermittent	Culvert	0.01				230	0.04	230	230	0.04	230	230	0.04	230	230	0.04	230	230	0.04	215
S6S014c	UNT 5 Sartor Ditch	Intermittent	Channelized Ditch	0.01		70	Modified Unclassified	189	0.04	189	189	0.03	189	190	0.04	190	189	0.03	0	189	0.03	181
S6S015a	UNT 6 Sartor Ditch	Ephemeral	Roadside Ditch	0.31		19	Modified Class I PHWH	1930	0.14	1930	1930	0.13	1930	1930	0.13	1930	1930	0.13	1930	1930	0.13	1930
S6S015b	UNT 6 Sartor Ditch	Ephemeral	Roadside Ditch	0.27		16	Modified Class I PHWH	389	0.03	389	389	0.03	389	389	0.03	389	389	0.03	389	389	0.03	389

Table B -1: Stream Impacts and Stream Relocation Lengths by Alternative

Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S015c	UNT 6 Sartor Ditch	Ephemeral	Roadside Ditch	0.26		37	Modified Class II PHWH	670	0.09	670	670	0.09	670	670	0.09	670	670	0.09	670	670	0.09	670
S6S015d	UNT 6 Sartor Ditch	Ephemeral	Culvert	0.36				256	0.03	0	256	0.03	0	256	0.03	0	256	0.03	0	256	0.03	0
S6S015e	UNT 6 Sartor Ditch	Ephemeral	Natural	0.36		29	Modified Class I PHWH	116	0.01	0	251	0.03	0	248	0.03	0	116	0.01	0	154	0.02	0
S6S015f	UNT 6 Sartor Ditch	Ephemeral	Culvert	0.36				0	0	0	43	<0.01	0	43	<0.01	0	0	0	0	0	0	0
S6S017c	UNT 8 Sartor Ditch	Ephemeral	Channelized Ditch	0.14		30	Modified Class II PHWH	0	0	0	0	0	0	0	0	0	0	0	0	23	<0.01	0
S6S017d	UNT 8 Sartor Ditch	Ephemeral	Culvert	0.13				0	0	0	0	0	0	0	0	0	0	0	0	53	<0.01	0
S6S017e	UNT 8 Sartor Ditch	Ephemeral	Channelized Ditch	0.13		6	Modified Class I PHWH	0	0	0	76	<0.01	76	76	<0.01	76	0	0	0	85	<0.01	0
S6S017i	UNT 8 Sartor Ditch	Ephemeral	Natural	0.05		34	Class II PHWH	162	0.02	0	33	<0.01	33	33	<0.01	33	162	0.02	162	180	0.02	0
S6S019a	UNT 10 Sartor Ditch	Ephemeral	Roadside Ditch	0.04		50	Modified Class II PHWH	451	0.05	451	451	0.05	451	451	0.05	451	451	0.05	451	451	0.05	451
S6S020a	UNT 11 Sartor Ditch	Ephemeral	Roadside Ditch	0.01		35	Modified Class II PHWH	463	0.04	463	463	0.04	463	463	0.04	463	463	0.04	463	463	0.04	463
S6S021d	Sartor Ditch	Ephemeral	Natural	0.05		68	Class II PHWH	218	0.02	218	218	0.02	218	218	0.02	218	218	0.02	218	346	0.03	346
S6S027a	UNT 1 West Fork Clear Creek	Ephemeral	Dump Rock Gutter	0.01		12	Modified Class I PHWH	87	<0.01	87	87	<0.01	87	87	<0.01	87	87	<0.01	87	87	<0.01	87
S6S027b	UNT 1 West Fork Clear Creek	Ephemeral	Concrete Gutter	0.01		27	Modified Class I PHWH	132	0.02	132	132	0.02	132	30	<0.01	30	133	0.02	0	132	0.02	132
S6S028a	UNT 2 West Fork Clear Creek	Intermittent	Natural	0.07		40	Class II PHWH	229	0.05	0	204	0.05	0	0	0	0	230	0.05	0	290	0.06	0
S6S028b	UNT 2 West Fork Clear Creek	Intermittent	Culvert	0.07				318	0.07	0	318	0.07	0	269	0.06	0	318	0.07	0	318	0.06	0
S6S028c	UNT 2 West Fork Clear Creek	Intermittent	Natural	0.05		26	Class I PHWH	153	0.01	0	163	0.01	0	0	0	0	153	0.01	0	143	0.01	0
S6S030a	UNT 4 West Fork Clear Creek	Intermittent	Channelized Ditch	0.04		11	Modified Class I PHWH	79	<0.01	79	79	<0.01	79	70	<0.01	0	79	<0.01	79	74	<0.01	0
S6S031a	West Fork Clear Creek	Perennial	Natural	6.54	56.5		Probable Warm Water Habitat	0	0	0	0	0	0	301	0.12	301	0	0	0	0	0	0

Table B -1: Stream Impacts and Stream Relocation Lengths by Alternative

Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S031b	West Fork Clear Creek	Perennial	Natural	5.74	53		Probable Warm Water Habitat	0	0	0	0	0	0	404	0.12	0	0	0	0	0	0	0
S6S031c	West Fork Clear Creek	Perennial	Culvert	5.74				0	0	0	0	0	0	13	<0.01	0	0	0	0	0	0	0
S6S032a	UNT 5 West Fork Clear Creek	Ephemeral	Natural	0.01		22	Class I PHWH	0	0	0	0	0	0	200	0.01	0	0	0	0	0	0	0
S6S033a	UNT 6 West Fork Clear Creek	Ephemeral	Natural	0.08		22	Class I PHWH	0	0	0	0	0	0	290	0.02	0	0	0	0	0	0	0
S6S034a	UNT 7 West Fork Clear Creek	Ephemeral	Natural	0.39		32	Class II PHWH	0	0	0	0	0	0	127	0.01	0	0	0	0	0	0	0
S6S035a	UNT 8 West Fork Clear Creek	Intermittent	Channelized Ditch	0.01		11	Modified Class I PHWH	50	<0.01	50	50	<0.01	50	46	<0.01	0	50	<0.01	50	50	<0.01	0
S6S036a	UNT 9 West Fork Clear Creek	Intermittent	Natural	0.03		31	Class II PHWH	124	0.01	124	121	0.01	121	120	0.01	120	120	<0.01	120	121	0.01	121
S6S036b	UNT 9 West Fork Clear Creek	Intermittent	Natural	0.03		21	Class I PHWH	187	0.01	187	187	0.01	187	187	0.01	187	187	0.01	187	187	0.01	187
S6S036c	UNT 9 West Fork Clear Creek	Intermittent	Culvert	0.02				474	0.03	0	255	0.01	0	474	0.03	0	255	0.01	0	292	0.02	0
S6S036d	UNT 9 West Fork Clear Creek	Intermittent	Natural	0.02		21	Class I PHWH	85	<0.01	85	0	0	0	85	<0.01	85	0	0	0	0	0	0
S6S037a	UNT 10 West Fork Clear Creek	Intermittent	Roadside Ditch	0.02		11	Modified Class I PHWH	118	0.01	118	118	0.01	118	118	0.01	118	118	0.01	118	118	0.01	118
S6S038a	UNT 11 West Fork Clear Creek	Ephemeral	Channelized Ditch	0.01		11	Modified Class I PHWH	360	0.01	360	360	0.01	360	361	0.01	361	360	0.01	360	360	0.01	360
S6S038b	UNT 11 West Fork Clear Creek	Ephemeral	Culvert	0.01				27	<0.01	27	25	<0.01	25	25	<0.01	25	25	<0.01	25	25	<0.01	25
S6S039a	UNT 12 West Fork Clear Creek	Ephemeral	Roadside Ditch	<0.01		28	Class I PHWH	274	0.02	274	274	0.02	274	274	0.02	274	273	0.02	273	395	0.03	395
S6S040b	West Fork Clear Creek	Perennial	Natural	7.21	49		Probable Warm Water Habitat	0	0	0	0	0	0	0	0	0	0	0	0	164	0.05	0

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Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S040c	West Fork Clear Creek	Perennial	Culvert	7.21				0	0	0	0	0	0	0	0	0	0	0	0	22	0.01	0
S6S042a	UNT 14 West Fork Clear Creek	Perennial	Channelized Ditch	0.05		53	Rheocrene Potential	58	0.01	0	55	0.01	0	19	<0.01	0	55	0.01	0	96	0.01	0
S6S042b	UNT 14 West Fork Clear Creek	Perennial	Culvert	0.05				160	0.02	0	160	0.02	0	160	0.02	0	160	0.02	0	160	0.02	0
S6S043a	UNT 15 West Fork Clear Creek	Ephemeral	Roadside Ditch	<0.01		46	Class II PHWH	1180	0.12	1180	1180	0.12	1180	1180	0.12	1180	1180	0.12	1180	1180	0.12	1180
S6S044a	UNT 16 West Fork Clear Creek	Intermittent	Natural	0.01		11	Class I PHWH	81	<0.01	81	83	<0.01	83	83	<0.01	0	83	<0.01	0	83	<0.01	0
S6S045a	Clear Creek	Perennial	Natural	16.65	46.25		Probable Warm Water Habitat	0	0	0	210	0.12	210	67	0.04	0	0	0	0	0	0	0
S6S045b	Clear Creek	Perennial	Culvert	16.65				0	0	0	0	0	0	44	0.03	0	0	0	0	0	0	0
S6S045c	Clear Creek	Perennial	Natural	16.65	58.25		Probable Warm Water Habitat	0	0	0	0	0	0	45	0.03	0	0	0	0	0	0	0
S6S045d	Clear Creek	Perennial	Natural	16.41	62		Warm Water Habitat	284	0.23	0	281	0.22	0	122	0.10	0	281	0.22	0	278	0.22	0
S6S045e	Clear Creek	Perennial	Natural Bridged	16.41				125	0.10	0	125	0.10	0	125	0.10	0	125	0.10	0	125	0.10	0
S6S046a	UNT 17 West Fork Clear Creek	Intermittent	Channelized Ditch	<0.01		58	Class II PHWH	671	0.07	671	672	0.08	672	672	0.08	672	672	0.08	672	777	0.09	777
S6S048a	UNT 18 West Fork Clear Creek	Perennial	Natural	0.04	43.5		Modified Warm Water Habitat	58	0.01	58	54	0.01	54	0	0	0	54	0.01	54	33	<0.01	0
S6S049a	UNT 19 Clear Creek	Ephemeral	Roadside Ditch	0.06		13	Class I PHWH	181	0.01	0	181	0.01	181	181	<0.01	181	181	0.01	181	181	0.01	181
S6S050a	UNT 1 White River	Perennial	Roadside Ditch	0.79	38		Modified Warm Water Habitat	1096	0.19	1096	1096	0.19	1096	1096	0.19	1096	1096	0.19	1096	1058	0.18	1058
S6S050b	UNT 1 White River	Perennial	Culvert	0.79				0	0	0	0	0	0	0	0	0	0	0	0	70	0.01	0
S6S050c	UNT 1 White River	Perennial	Channelized Ditch	0.79	38.5		Modified Warm Water Habitat	169	0.03	0	170	0.02	0	101	0.01	0	170	0.02	0	407	0.07	0
S6S050d	UNT 1 White River	Perennial	Culvert	0.78				235	0.04	0	235	0.04	0	235	0.04	0	235	0.04	0	235	0.04	0
S6S050e	UNT 1 White River	Perennial	Natural	0.78		53	Class II PHWH	181	0.03	0	181	0.03	0	120	0.03	0	181	0.03	0	308	0.06	0

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Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S050f	UNT 1 White River	Perennial	Natural	0.66		62	Class II PHWH	277	0.03	0	383	0.04	0	383	0.04	0	383	0.04	0	967	0.12	0
S6S051a	UNT 2 White River	Ephemeral	Channelized Ditch	0.06		21	Modified Class I PHWH	83	0.01	0	80	0.01	0	63	0.01	0	80	0.01	0	93	0.01	0
S6S051b	UNT 2 White River	Ephemeral	Culvert	<0.01				332	0.07	0	333	0.08	0	332	0.08	0	333	0.08	0	332	0.08	0
S6S051c	UNT 2 White River	Ephemeral	Channelized Ditch	<0.01		6	Class I PHWH	46	0.01	0	64	0.01	0	64	0.01	0	64	0.01	0	64	0.01	0
S6S052a	UNT 3 White River	Ephemeral	Natural	0.06		32	Class II PHWH	32	<0.01	0	211	0.01	0	171	0.02	171	211	0.01	0	211	0.01	0
S6S052b	UNT 3 White River	Ephemeral	Culvert	0.06				0	0	0	58	0.01	0	58	0.01	58	58	0.01	0	58	0.01	0
S6S053a	Stotts Creek	Perennial	Natural Bridged	60.03				249	0.45	0	247	0.44	0	218	0.39	0	247	0.44	0	247	0.44	0
S6S053b	Stotts Creek	Perennial	Natural	60.03	57.25		Probable Warm Water Habitat	376	0.68	0	278	0.50	0	353	0.63	0	278	0.50	0	278	0.50	0
S6S054a	UNT 1 Stotts Creek	Intermittent	Natural	0.06		43	Modified Class II PHWH	222	0.01	222	281	0.02	281	222	0.01	222	281	0.02	281	281	0.02	281
S6S054b	UNT 1 Stotts Creek	Intermittent	Culvert	0.05				23	<0.01	23	23	<0.01	23	23	<0.01	23	23	<0.01	23	23	<0.01	23
S6S054c	UNT 1 Stotts Creek	Intermittent	Natural	0.05		43	Modified Class II PHWH	61	<0.01	61	14	<0.01	14	61	<0.01	61	14	<0.01	14	24	<0.01	24
S6S055a	UNT 8 White River	Perennial	Natural	0.30		42	Class II PHWH	51	0.03	0	51	0.03	0	33	0.02	0	51	0.03	0	125	0.07	0
S6S055b	UNT 4 White River	Perennial	Culvert	0.21				204	<0.01	0	204	<0.01	0	204	<0.01	0	204	<0.01	0	204	<0.01	0
S6S055c	UNT 4 White River	Perennial	Natural	0.21		67	Class II PHWH	222	<0.01	213	233	<0.01	188	207	<0.01	199	233	<0.01	233	211	<0.01	211
S6S055d	UNT 4 White River	Perennial	Culvert	0.21				83	<0.01	0	83	<0.01	0	83	<0.01	0	83	<0.01	0	51	<0.01	0
S6S057a	UNT 6 White River	Ephemeral	Natural	0.06		29	Class I PHWH	145	0.01	145	145	0.01	145	71	0.01	71	145	0.01	145	145	0.01	145
S6S058a	UNT 7 White River	Ephemeral	Natural	0.05		54	Class II PHWH	476	0.05	476	476	0.05	0	330	0.03	330	476	0.05	476	500	0.05	500
S6S060a	UNT 9 White River	Ephemeral	Natural	0.05		35	Class II PHWH	34	<0.01	0	34	<0.01	0	0	0	0	34	<0.01	34	34	<0.01	34
S6S062a	UNT 11 White River	Intermittent	Roadside Ditch	<0.01		40	Class II PHWH	2396	0.38	2396	2396	0.38	2396	2394	0.40	2394	2396	0.38	2396	2396	0.38	2396

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Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S062b	UNT 11 White River	Intermittent	Culvert	<0.01				56	0.01	56	56	0.01	56	56	0.01	56	56	0.01	56	56	0.01	56
S6S062c	UNT 11 White River	Intermittent	Roadside Ditch	<0.01		37	Class II PHWH	92	0.01	92	92	0.01	92	92	0.01	92	92	0.01	92	92	0.01	92
S6S062d	UNT 11 White River	Intermittent	Culvert	<0.01				87	0.01	87	87	0.01	87	87	0.01	87	87	0.01	87	87	0.01	0
S6S062e	UNT 11 White River	Intermittent	Roadside Ditch	<0.01		23	Class I PHWH	272	0.03	272	272	0.03	272	272	0.03	272	272	0.03	272	272	0.03	272
S6S062f	UNT 11 White River	Intermittent	Roadside Ditch	<0.01		40	Class II PHWH	58	0.01	0	58	0.01	0	58	0.01	0	58	0.01	0	58	0.01	58
S6S062g	UNT 11 White River	Intermittent	Culvert	0.05				225	0.08	0	225	0.08	0	225	0.08	0	225	0.08	0	225	0.08	0
S6S062h	UNT 11 White River	Intermittent	Natural	0.05		78	Class III PHWH	701	0.25	701	699	0.25	699	25	0.01	0	699	0.25	699	1000	0.36	880
S6S062i	UNT 11 White River	Intermittent	Culvert	0.05				47	0.02	47	47	0.02	47	0	0	0	47	0.02	47	47	0.02	47
S6S062j	UNT 11 White River	Intermittent	Culvert	0.05				0	0	0	0	0	0	0	0	0	0	0	0	60	0.02	60
S6S063a	UNT 12 White River	Ephemeral	Natural	0.07		13	Class I PHWH	94	0.03	0	95	0.03	0	0	0	0	95	0.03	0	95	0.03	0
S6S063b	UNT 12 White River	Ephemeral	Culvert	0.07				35	0.01	0	35	0.01	0	0	0	0	35	0.01	0	35	0.01	0
S6S064a	Crooked Creek	Perennial	Natural	15.53	53		Probable Warm Water Habitat	389	0.33	0	389	0.33	0	210	0.18	0	389	0.33	0	606	0.50	0
S6S064b	Crooked Creek	Perennial	Natural Bridged	15.53				0	0	0	0	0	0	37	0.03	0	0	0	0	0	0	0
S6S064c	Crooked Creek	Perennial	Natural Bridged	15.53				144	0.12	0	144	0.12	0	144	0.12	0	144	0.12	0	144	0.12	0
S6S065a	UNT 1 Crooked Creek	Ephemeral	Roadside Ditch	<0.01		10	Class I PHWH	165	<0.01	165	165	<0.01	165	165	<0.01	0	165	<0.01	165	165	<0.01	0
S6S068a	UNT 4 Crooked Creek	Ephemeral	Natural	0.04		37	Class II PHWH	175	<0.01	0	175	<0.01	0	55	<0.01	0	175	<0.01	0	174	<0.01	0
S6S068b	UNT 4 Crooked Creek	Ephemeral	Culvert	0.04				149	<0.01	0	149	<0.01	0	149	<0.01	0	149	<0.01	0	149	<0.01	0
S6S070b	UNT 13 White River	Ephemeral	Natural	<0.01		27	Class I PHWH	156	<0.01	0	156	<0.01	0	40	<0.01	0	156	<0.01	0	156	<0.01	0

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Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S070c	UNT 13 White River	Ephemeral	Culvert	<0.01				159	0.01	0	159	0.01	0	159	0.01	0	159	0.01	0	159	0.01	0
S6S071a	UNT 14 White River	Ephemeral	Natural	<0.01		41	Class II PHWH	135	0.01	135	135	0.01	135	63	<0.01	63	135	0.01	135	135	0.01	135
S6S073a	UNT 16 White River	Ephemeral	Natural	0.04		43	Class II PHWH	27	<0.01	27	27	<0.01	27	0	0	0	27	<0.01	27	27	<0.01	27
S6S074a	UNT 17 White River	Ephemeral	Natural	0.04		10	Class I PHWH	55	<0.01	55	55	<0.01	55	7	<0.01	7	55	<0.01	55	55	<0.01	55
S6S074b	UNT 17 White River	Ephemeral	Roadside Ditch	0.04		13	Modified Class I PHWH	318	0.02	0	318	0.02	0	318	0.02	0	318	0.02	0	318	0.02	318
S6S075a	UNT 18 White River	Intermittent	Natural	0.03		61	Modified Class II PHWH	39	<0.01	0	39	<0.01	0	39	<0.01	0	39	<0.01	0	28	<0.01	0
S6S075b	UNT 18 White River	Intermittent	Culvert	0.02				40	<0.01	0	40	<0.01	0	40	<0.01	0	40	<0.01	0	40	<0.01	0
S6S075c	UNT 18 White River	Intermittent	Channelized Ditch	0.02		32	Modified Class II PHWH	84	<0.01	0	84	<0.01	0	84	<0.01	0	84	<0.01	0	84	<0.01	0
S6S075d	UNT 18 White River	Intermittent	Culvert	0.02				180	0.01	0	180	0.01	0	180	0.01	0	180	0.01	0	180	0.01	0
S6S075e	UNT 18 White River	Intermittent	Roadside Ditch	<0.01		18	Modified Class I PHWH	61	<0.01	0	61	<0.01	0	27	<0.01	0	61	<0.01	61	61	<0.01	61
S6S075f	UNT 18 White River	Intermittent	Culvert	<0.01				56	<0.01	0	56	<0.01	0	0	0	0	56	<0.01	0	56	<0.01	0
S6S075g	UNT 18 White River	Ephemeral	Natural	<0.01		6	Modified Class I PHWH	45	<0.01	45	45	<0.01	45	0	0	0	45	<0.01	0	170	0.01	170
S6S083a	UNT 20 White River	Intermittent	Channelized Ditch	0.04		35	Class II PHWH	181	0.01	0	181	0.01	0	43	<0.01	0	181	0.01	0	181	0.01	0
S6S083b	UNT 20 White River	Intermittent	Culvert	0.04				157	0.01	0	157	0.01	0	157	0.01	0	157	0.01	0	157	0.01	0
S6S084a	UNT 21 White River	Ephemeral	Channelized Ditch	<0.01		38	Class II PHWH	95	<0.01	95	95	<0.01	95	20	<0.01	20	95	<0.01	95	95	<0.01	0
S6S085a	UNT 22 White River	Intermittent	Natural	0.08		41	Class II PHWH	0	0	0	171	0.01	171	0	0	0	171	0.01	151	171	0.01	151
S6S085b	UNT 22 White River	Intermittent	Culvert	0.08				0	0	0	45	<0.01	45	0	0	0	45	<0.01	45	45	<0.01	0
S6S086a	UNT 1 Bluff Creek	Perennial	Natural	0.17		58	Class III PHWH	1	<0.01	0	18	<0.01	0	0	0	0	18	<0.01	0	47	0.01	0
S6S086b	UNT 1 Bluff Creek	Perennial	Natural	0.07		48	Rheocrene Potential	73	0.01	73	73	0.01	73	17	<0.01	17	73	0.01	73	73	0.01	0

Table B -1: Stream Impacts and Stream Relocation Lengths by Alternative

Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S086c	UNT 1 Bluff Creek	Perennial	Culvert	0.05				255	0.02	0	255	0.02	0	251	0.02	0	255	0.02	0	255	0.02	0
S6S086d	UNT 1 Bluff Creek	Perennial	Natural	0.05		57	Rheocrene Potential	67	0.01	0	44	0.01	0	0	0	0	44	0.01	0	132	0.02	0
S6S087a	UNT 2 Bluff Creek	Intermittent	Natural	0.08		60	Class II PHWH	356	0.05	0	312	0.04	0	40	0.01	0	312	0.04	0	483	0.07	0
S6S088a	UNT 3 Bluff Creek	Intermittent	Channelized Ditch	<0.01		28	Class I PHWH	3	<0.01	0	0	0	0	0	0	0	0	0	0	79	<0.01	0
S6S089a	UNT 4 Bluff Creek	Ephemeral	Roadside Ditch	<0.01		13	Class I PHWH	352	0.01	0	352	0.01	352	352	0.01	352	352	0.01	0	352	0.01	352
S6S090a	Bluff Creek	Perennial	Natural	3.69	32		Modified Warm Water Habitat	776	0.20	0	699	0.18	0	776	0.20	0	699	0.18	0	811	0.21	0
S6S090b	Bluff Creek	Perennial	Natural Bridged	3.69				31	0.01	0	31	0.01	0	31	0.01	0	31	0.01	0	31	0.01	0
S6S090c	Bluff Creek	Perennial	Natural Bridged	3.69				135	0.04	0	135	0.04	0	135	0.04	0	135	0.04	0	135	0.04	0
S6S090d	Bluff Creek	Perennial	Natural	3.40	46		Probable Warm Water Habitat	451	0.17	0	441	0.17	0	441	0.17	0	441	0.17	0	446	0.17	0
S6S091a	UNT 5 Bluff Creek	Ephemeral	Roadside Ditch	0.01		13	Class I PHWH	588	0.01	588	588	0.01	588	588	0.01	588	588	0.01	588	588	0.01	588
S6S091b	UNT 5 Bluff Creek	Ephemeral	Culvert	0.01				32	<0.01	32	32	<0.01	32	32	<0.01	32	32	<0.01	32	32	<0.01	32
S6S091c	UNT 5 Bluff Creek	Ephemeral	Culvert	0.01				31	<0.01	31	31	<0.01	31	31	<0.01	31	31	<0.01	31	31	<0.01	31
S6S092a	UNT 6 Bluff Creek	Intermittent	Natural	0.14		13	Class I PHWH	0	0	0	0	0	0	0	0	0	0	0	0	204	0.01	0
S6S092b	UNT 6 Bluff Creek	Intermittent	Culvert	0.14				0	0	0	0	0	0	0	0	0	0	0	0	26	<0.01	0
S6S094a	UNT 8 Bluff Creek	Intermittent	Channelized Ditch	0.25		25	Class I PHWH	21	<0.01	0	18	<0.01	0	14	<0.01	0	18	<0.01	0	0	0	0
S6S094b	UNT 8 Bluff Creek	Intermittent	Natural	0.24		53	Class II PHWH	286	0.03	0	286	0.03	0	286	0.03	0	286	0.03	0	227	0.02	0
S6S094c	UNT 8 Bluff Creek	Intermittent	Culvert	0.24				139	0.01	0	139	0.01	0	139	0.01	0	139	0.01	0	139	0.01	0
S6S094d	UNT 8 Bluff Creek	Intermittent	Natural	0.22		42	Class II PHWH	400	0.20	0	381	0.18	0	385	0.19	0	381	0.19	0	427	0.21	0
S6S097a	UNT 1 Travis Creek	Ephemeral	Channelized Ditch	<0.01		6	Class I PHWH	105	0.03	105	136	0.03	136	80	0.02	80	136	0.03	136	294	0.07	208

Table B -1: Stream Impacts and Stream Relocation Lengths by Alternative

Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S097b	UNT 1 Travis Creek	Ephemeral	Culvert	<0.01				0	0	0	0	0	0	0	0	0	0	0	0	49	0.01	49
S6S098a	UNT 2 Travis Creek	Ephemeral	Natural	0.25		6	Class I PHWH	301	0.02	0	301	0.02	0	301	0.02	0	301	0.02	301	301	0.02	301
S6S099a	Travis Creek	Perennial	Natural	1.91	51		Probable Warm Water Habitat	287	0.07	0	258	0.06	0	83	0.02	0	258	0.06	0	198	0.04	0
S6S099b	Travis Creek	Perennial	Culvert	1.91				153	0.03	0	153	0.03	0	153	0.03	0	153	0.03	0	153	0.03	0
S6S099c	Travis Creek	Perennial	Natural	1.51	43		Modified Warm Water Habitat	135	0.04	0	187	0.06	0	120	0.04	0	187	0.06	0	246	0.08	0
S6S100a	North Bluff Creek	Perennial	Natural	1.57	45		Modified Warm Water Habitat	94	0.01	0	91	0.01	0	0	0	0	91	0.01	0	111	0.01	0
S6S100b	North Bluff Creek	Perennial	Natural	1.52	43		Modified Warm Water Habitat	172	0.04	0	110	0.03	0	92	0.02	0	110	0.03	0	110	0.03	0
S6S100c	North Bluff Creek	Perennial	Culvert	1.52				180	0.04	0	180	0.04	0	180	0.04	0	180	0.04	0	180	0.04	0
S6S100d	North Bluff Creek	Perennial	Channelized Ditch	1.42	27		Limited Warm Water Habitat	860	0.11	860	827	0.11	827	854	0.11	854	827	0.11	827	879	0.12	879
S6S101a	Honey Creek	Perennial	Natural	17.90	47.5		Probable Warm Water Habitat	416	0.30	0	313	0.24	0	284	0.20	0	573	0.43	0	346	0.25	0
S6S101b	Honey Creek	Perennial	Natural Bridged	17.86				128	0.10	0	128	0.10	0	128	0.10	0	128	0.10	0	128	0.10	0
S6S101c	Honey Creek	Perennial	Natural	17.86	48		Probable Warm Water Habitat	70	0.05	0	133	0.10	0	125	0.09	0	70	0.05	0	87	0.06	0
S6S102a	Pleasant Run Creek	Perennial	Natural	20.92	56		Probable Warm Water Habitat	440	0.38	0	1565	1.34	0	1588	1.36	0	440	0.38	0	612	0.52	0
S6S102b	Pleasant Run Creek	Perennial	Natural Bridged	20.92				126	0.11	0	126	0.11	0	126	0.11	0	126	0.11	0	126	0.11	0
S6S103a	Orme Ditch	Intermittent	Natural	3.65	48		Probable Warm Water Habitat	205	0.03	0	135	0.02	0	146	0.02	0	205	0.03	0	245	0.04	0
S6S103b	Orme Ditch	Intermittent	Culvert	3.65				135	0.02	0	135	0.02	0	135	0.02	0	135	0.02	0	135	0.02	0
S6S103c	Orme Ditch	Intermittent	Natural	3.53	46		Probable Warm Water Habitat	71	0.02	0	99	0.03	0	99	0.03	0	65	0.02	0	100	0.03	0
S6S103j	Orme Ditch	Intermittent	Natural	3.37	38.5		Modified Warm Water Habitat	0	0	0	53	0.01	0	0	0	0	0	0	0	0	0	0
S6S104a	Little Buck Creek	Perennial	Natural	17.06	49		Probable Warm Water Habitat	373	0.32	0	484	0.42	0	558	0.49	0	566	0.50	0	742	0.65	0
S6S104b	Little Buck Creek	Perennial	Natural Bridged	17.06				200	0.17	0	162	0.14	0	200	0.18	0	201	0.18	0	200	0.17	0

Table B -1: Stream Impacts and Stream Relocation Lengths by Alternative

Stream ID#	Stream Name	USGS Stream Type	Channel Type	Drainage Area (mi2)	QHEI Score	HHEI Score	Stream Habitat Classification	Alt C1			Alt C2			Alt C3			Alt C4			RPA		
								LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.	LF in ROW	AC in ROW	LF Relo.
S6S105f	Haueisen Ditch	Ephemeral	Natural	2.30	37		Modified Warm Water Habitat	146	0.01	146	76	<0.01	76	76	<0.01	76	76	<0.01	76	41	<0.01	0
S6S106a	UNT to 1 Little Buck Creek	Ephemeral	Roadside Ditch	0.11		50	Class II PHWH	663	0.03	663	199	0.01	199	199	0.01	199	199	0.01	199	155	0.01	0
S6S107a	White River	Perennial	Natural	1,904.00	64.5		Warm Water Habitat	145	1.04	0	145	1.04	0	145	1.04	0	145	1.04	0	153	1.10	0
S6S107b	White River	Perennial	Natural Bridged	1,904.00				137	0.98	0	137	0.98	0	137	0.98	0	137	0.98	0	137	0.98	0
S6S108a	UNT 23 White River	Perennial	Channelized Ditch	4.08	28.5		Modified Warm Water Habitat	621	0.29	621	634	0.29	634	634	0.29	634	634	0.29	634	606	0.28	606
S6S109a	UNT 24 White River	Ephemeral	Roadside Ditch	<0.01		58	Class II PHWH	1626	0.52	1626	1626	0.52	1626	1626	0.52	1626	1626	0.52	1626	1626	0.52	1626
S6S110a	UNT 25 White River	Intermittent	Roadside Ditch	1.35	24.5		Limited Warm Water Habitat	105	0.01	105	105	0.01	105	105	0.01	105	105	0.01	105	105	0.01	0
S6S111a	State Ditch	Perennial	Natural	9.17	56.5		Probable Warm Water Habitat	75	0.06	0	75	0.06	0	75	0.06	0	75	0.06	0	75	0.06	0
S6S111b	State Ditch	Perennial	Natural Bridged	9.17				179	0.13	0	179	0.13	0	179	0.13	0	179	0.13	0	182	0.13	0
S6S112a	UNT1 State Ditch	Ephemeral	Concrete Gutter	1.35		32	Modified Class II PHWH	601	0.07	601	601	0.07	601	601	0.07	601	601	0.07	601	601	0.07	601
S6S113a	Lick Creek	Perennial	Channelized Ditch	21.30	43		Modified Warm Water Habitat	1581	1.39	1346	1581	1.39	1346	1581	1.39	1346	1581	1.39	1346	1599	1.40	1599
S6S113b	Lick Creek	Perennial	Channelized Ditch Bridged	21.30				108	0.09	108	108	0.09	108	108	0.09	108	108	0.09	108	108	0.09	108
S6S113c	Lick Creek	Perennial	Channelized Ditch Bridged	21.30				46	0.04	0	46	0.04	0	46	0.04	0	46	0.04	0	46	0.04	46
TOTAL								**42,686**	**12.94**	**25,591**	**44,496**	**14.50**	**25,885**	**42,314**	**13.50**	**25,507**	**43,433**	**13.15**	**27,066**	**47,253**	**14.14**	**27,641**

Abbreviations: LF = Linear feet, USGS = United States Geological Survey, HHEI = Headwater Habitat Evaluation Index, QHEI = Qualitative Headwater Evaluation Index, Relo. = Relocation, ROW = Right of way, UNT = Unnamed Tributary

Notes: Width of the ordinary high water mark (OHWM) x linear feet of impact = acres of impact. Acres of impact below 0.01 were rounded to 0.01 acre to show an area of impact. Please see Appendix D – Stream Site Forms and Data Sheets for OHWM widths.

HHEI and QHEI were not completed on culverted segments of the stream.

Drainage areas less than 0.01 square mile were rounded to 0.01 to avoid showing a drainage area of 0 square mile.

Stream impact acreages may not match totals in other tables in this report due slight differences in rounding.