BEFORE THE GAINESVILLE CITY COMMISSION

IN THE MATTER OF:
PETITION PB-15-115 PDA
NEW GENERATION HOMES, LLC, APPLICANT

_____/

STATE OF FLORIDA
COUNTY OF ALACHUA

AFFIDAVIT OF PETER M. WALLACE

BEFORE ME, THE UNDERSIGNED AUTHORITY, personally appeared PETER M. WALLACE, who being first duly sworn, under oath deposed and said:

1. I am over 18 years of age, have personal knowledge of the facts contained in this Affidavit, have no legal disabilities, and have never been adjudged mentally incompetent.

2. I offer this statement because I am unable, due to pre-arranged out of state travel, to attend the Gainesville City Commission's hearing on this matter in August 2016.

3. I am the owner and principal biologist and wetlands ecologist with Ecosystem Research Corporation (ERC), a Florida corporation founded in 1992 that specializes in services related to wetland jurisdiction assessments, wetland/upland plant community mapping, plant community surveys, wetland creation, wetland monitoring, permitting, and environmental consulting. From 1980 to 1992, I was a solo practitioner in the same fields.

4. I received a Master's of Science degree in Systems Ecology in 1988 from the University of Florida, Center for Wetlands & Environmental Engineering Services. I also hold a Bachelor of Science (*cum laude*) in biology from Virginia Polytechnic Institute and State University (1979).

5. I have approximately 36 years of experience working in Florida's ecosystems, including ground-truthing and aerial photo interpretation, threatened and endangered species surveys, wetlands jurisdictional determinations, plant community mapping, wetlands mitigation and environmental resource permitting.

6. Representative local projects (Alachua County, Florida) include: (a) wetland, upland and plant community boundary mapping, species surveying, and conducting an environmental features inventory of a 2,342-acre site for the City of Gainesville's Deerhaven Power Plant Land Annexation; (b) wetlands jurisdiction, mitigation and permitting on a 117-acre site for the City of Gainesville's GRU Eastside Maintenance Facility; and (c) wetlands surveying, plant community boundary mapping, and conducting an environmental features inventory on a 750-acre site west of Paynes Prairie for the *Alachua County Special Area Study: Paynes Prairie West Strategic Ecosystem*.

7. I have performed development-related services within my areas of expertise on more than 1,000 projects, including preparing technical reports related to environmental resources contained within proposed development projects.

8. I have, through ERC, performed services in my expertise on projects for the Florida Department of Agriculture and Consumer Services in St. Johns County and Lake County, Florida. I also have provided these services to local government and private clients in more than 30 jurisdictions, including the City of Alachua, Hillsborough County, Orange County, City of Jasper, and Levy County, Florida.

9. As part of my work, I routinely review and apply regulatory, statutory and code provisions pertaining to environmental matters.

10. I was retained by New Generation Home Builders, Inc. in the matter of the company's application for an amendment to the Blues Creek Planned Development (Application No. PB-15-115 PDA) (the "Project") to perform environmental services.

11. In the course of working on the Project, I have reviewed various documents, regulations and materials, including but not limited to the following: relevant portions of the City of Gainesville Comprehensive Plan and Land Development Code; the application and supporting materials for the Project; the proposed Blues Creek Master Plan; the geotechnical report of the Project site by GSE Engineering & Consulting, Inc. (see attached copy); topographic and drainage information about the Project site; Lidar (aerial) images of the Project vicinity; Gainesville Regional Utility diagrams of existing utility and infrastructure locations in the Blues Creek PD subdivision; water management district documents; Federal Emergency Management Agency floodplain maps; and, National Resource Conservation Service soils maps.

12. I have also conducted an extensive field inspection of the Project site, and have prepared an environmental assessment plus photographic documentation of certain features at the Project site. And, I prepared a series of maps, which are attached hereto.

13. Based on my personal observations and review of the above-referenced documents and materials, it is my opinion:

A. Based on the topography and elevation of the site, and the LiDAR topographic maps I prepared and analyzed, stormwater from the Project will flow "downhill" to the east into the 90-acre drainage easement at the center of the Blues Creek PD. There will be no direct discharge to the Blues Creek Ravine property to the west or "uphill" to existing homes in Blues Creek Unit 2 to the south. By the time the Project's stormwater, if any, percolates from the 90-acre drainage easement south to Blues Creek, it will be indistinguishable from the larger

volume of stormwater discharge into the creek originating with other existing development and the University of Florida's IFAS property. (I prepared a figure, attached, that shows the general drainage pattern into the creek.) As a result, it is not reasonable to conclude that stormwater runoff from the Project will transport exotics or pollutants onto adjacent parcels or into the downstream portions of Blues Creek. Moreover, for nearly 30 years, stormwater has been added to Blues Creek from upstream developments, adjacent residential developments with untreated stormwater and septic discharges, and substantial untreated agricultural discharges – none of which stopped a conservation group's acquisition of the adjacent Blues Creek Ravine and current characterization of Blues Creek as pristine. It is my opinion that the addition of stormwater from development of Unit 5 Phase 2 and 3 will be *de minimis* and otherwise undetectable in impact.

B. The installation of utility lines using the "jack and bore" method is not expected to cause adverse impacts to the environmental conditions of Blues Creek or associated wetlands and trees. I conducted a visual inspection in May 2016 of wetlands overlying existing, previously excavated and trenched utility pipes in Unit 3 of Blues Creek PD[1] along the perimeter of the 90-acre drainage easement, and there was no evidence of disturbance of the wetlands habitat or vegetation, or subsidence/collapse of soils.[2] Notably, I could not locate the

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[1] One portion of the existing sewer pipe is located about 2.5 +/- feet above the stream bottom and within the high water elevation of the creek, bounded by two box culverts, and has caused no adverse impacts to the water quality of Blues Creek or associated wetlands (see attached photographs). A sewage pump station and the box culverts likewise have resulted in no adverse impacts to the water quality of Blues Creek or associated wetlands. And, a spillway structure and other flow-control structures installed in the 1980s at the southwest corner of the Blues Creek PD (see photographs attached), adjacent to Blues Creek Ravine, did not preclude acquisition of that adjacent property for conservation purposes.

[2] The Project would be constructed on soils similar to other existing developed property in the subdivision and adjacent subdivisions (see NRCS Soils Map attached).

underground pipes by any evidence from the ground surface or vegetation.[3] Moreover, I have prepared two figures (attached) that show the extensive length of buried stormwater and wastewater pipes in and around the Project site. There is no documentation – or even complaint -- of collapse due to any of these existing underground pipes in Blues Creek PD. It is my opinion that the less intrusive, proposed jack-and-bore installation – which is slated to commence and terminate on uplands distant from Blues Creek – will result in no adverse impacts to Blues Creek or associated wetlands. It is also my opinion that the root systems of any trees near the proposed underground utility line installation will be unaffected because the utility lines are several feet deeper that the root zones, which themselves are very shallow and widely extended in the upper sandy layer to avoid the subsurface clays (see photographic evidence of typical root systems in the 90-acre drainage easement, attached). Based on the geotechnical report by GSE (attached), the Project site is underlain by a thick layer of clays of the Hawthorn formation, which in turn semi-confines the Floridan aquifer at a depth of 70 to 100 feet bls.

C. Because of the relative elevations of the Blues Creek PD, as discussed above, and the fact that the entire Blues Creek PD drains to the central 90-acre drainage easement, as it is supposed to do, the Project cannot physically flood properties north, south or east of the Project site.

D. The developer and its immediate predecessor acquired approvals to develop Blues Creek PD in the early 1980s, prior to wetlands and uplands regulations. Due to the subsequent adoption of state and local wetlands and uplands regulations over the past 35 years,

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[3] If I were asked to assess the environmental impacts of the existing or proposed underground utility pipe construction in the Blues Creek PD, I would have to employ the UMAM method (Chapter 62-345 Fla. Admin. Code Uniform Mitigation Assessment Method) prescribed by state law, and the analysis under UMAM would conclude there are and would be no measureable impacts to wetlands overtop the utility lines, respectively.

the developer has experienced a marked and repeated reduction in buildable areas of the subdivision, including losing about half of this last portion (Unit 5-phases 2 and 3). This is not consistent with any suggestion that the developer is overreaching in its attempt to finish its long-planned subdivision.

FURTHER AFFIANT SAYETH NAUGHT.

Peter M. Wallace

PETER M. WALLACE, AFFIANT

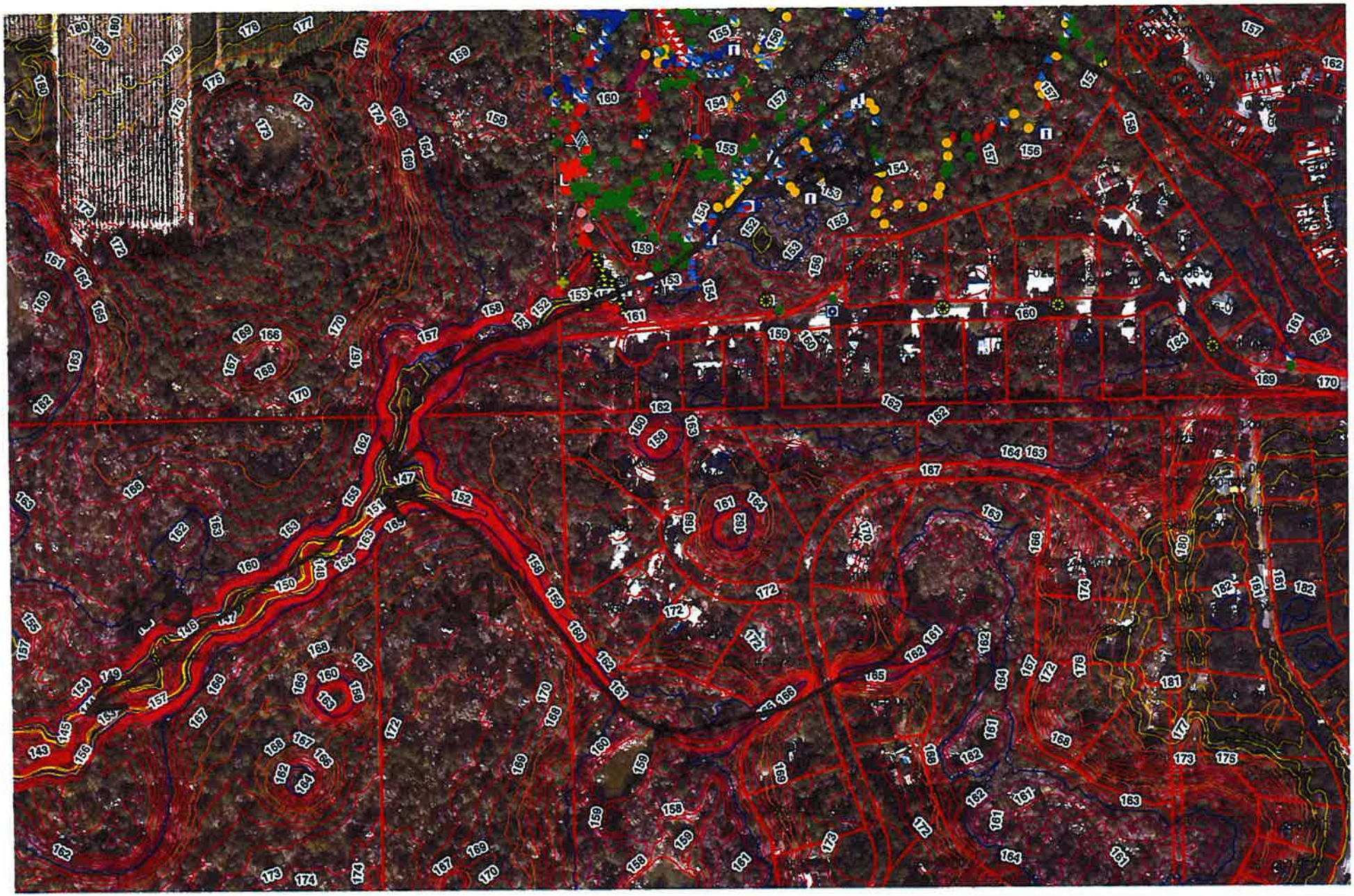
STATE OF FLORIDA
COUNTY OF ALACHUA

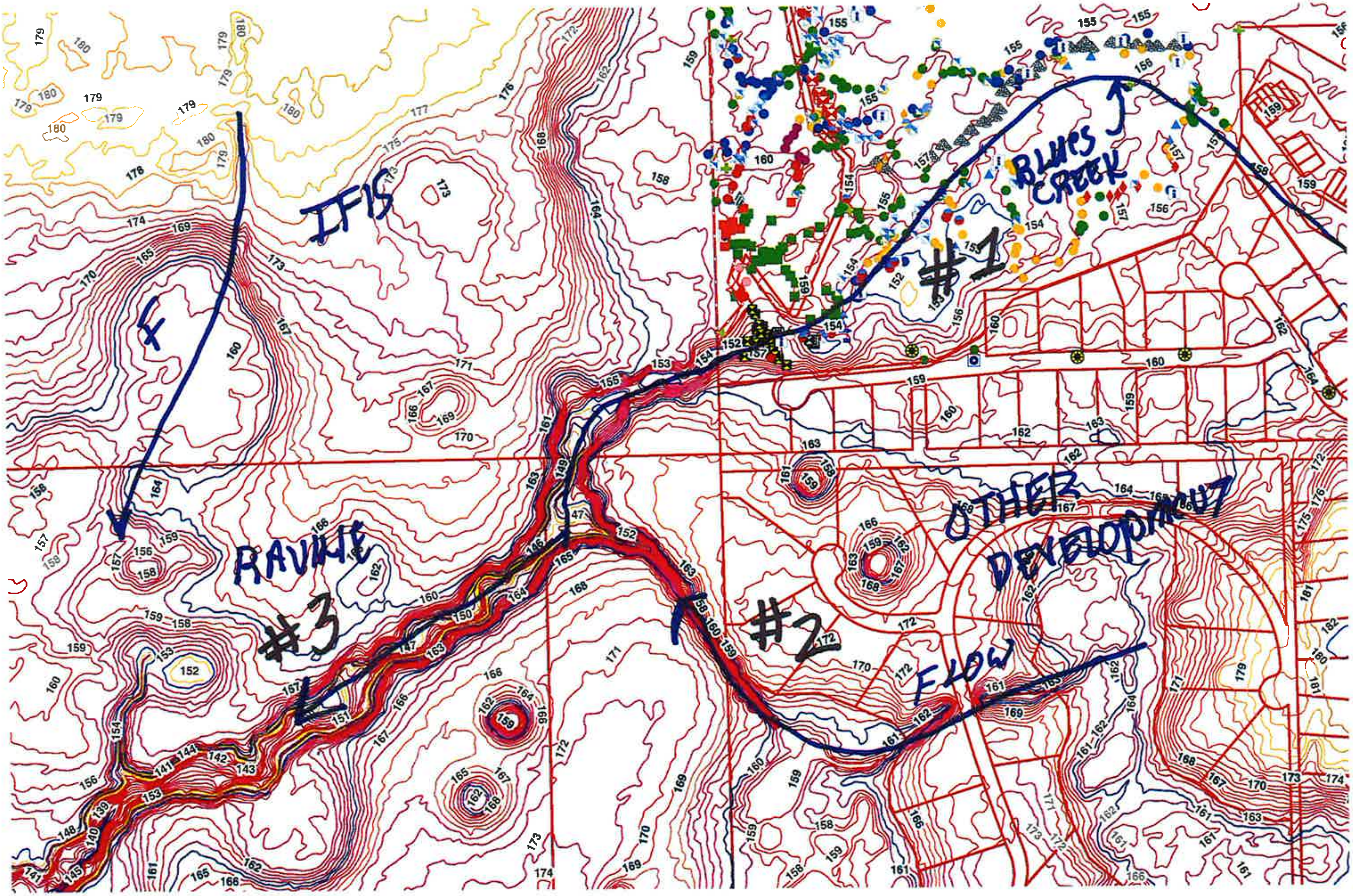
The foregoing instrument was acknowledged before me this 25th day of July 2016, by PETER M. WALLACE, who is personally known to me or who has produced a Florida driver's license as identification.

PATRICE BOYES
MY COMMISSION # FF950416
EXPIRES February 07, 2020
(407) 398-0153 FloridaNotaryService.com

Patrice Boyes

NOTARY PUBLIC
Printed Name: PATRICE BOYES
Commission Expires: 2-7-2020
Commission No.: FF950416

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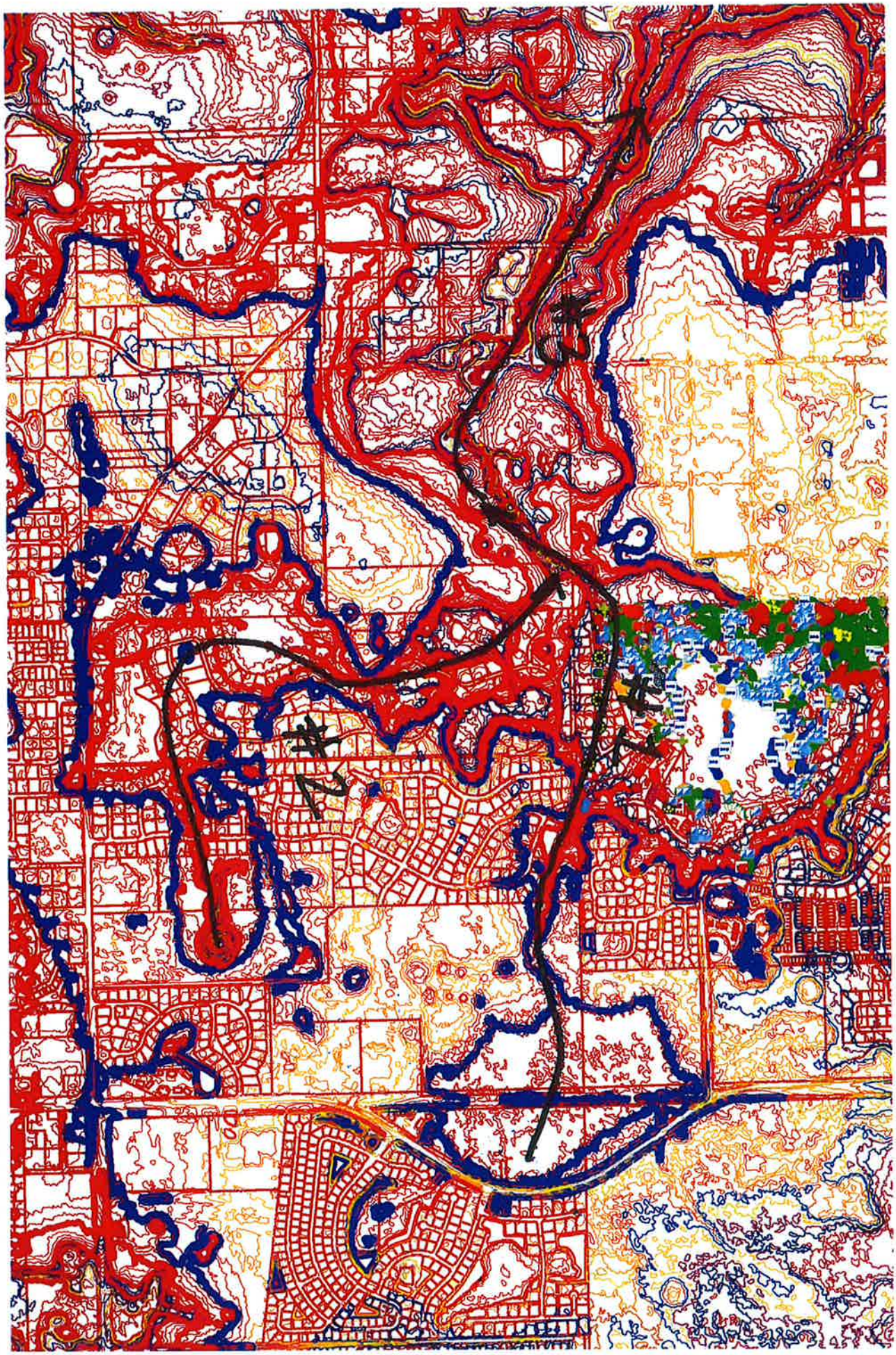

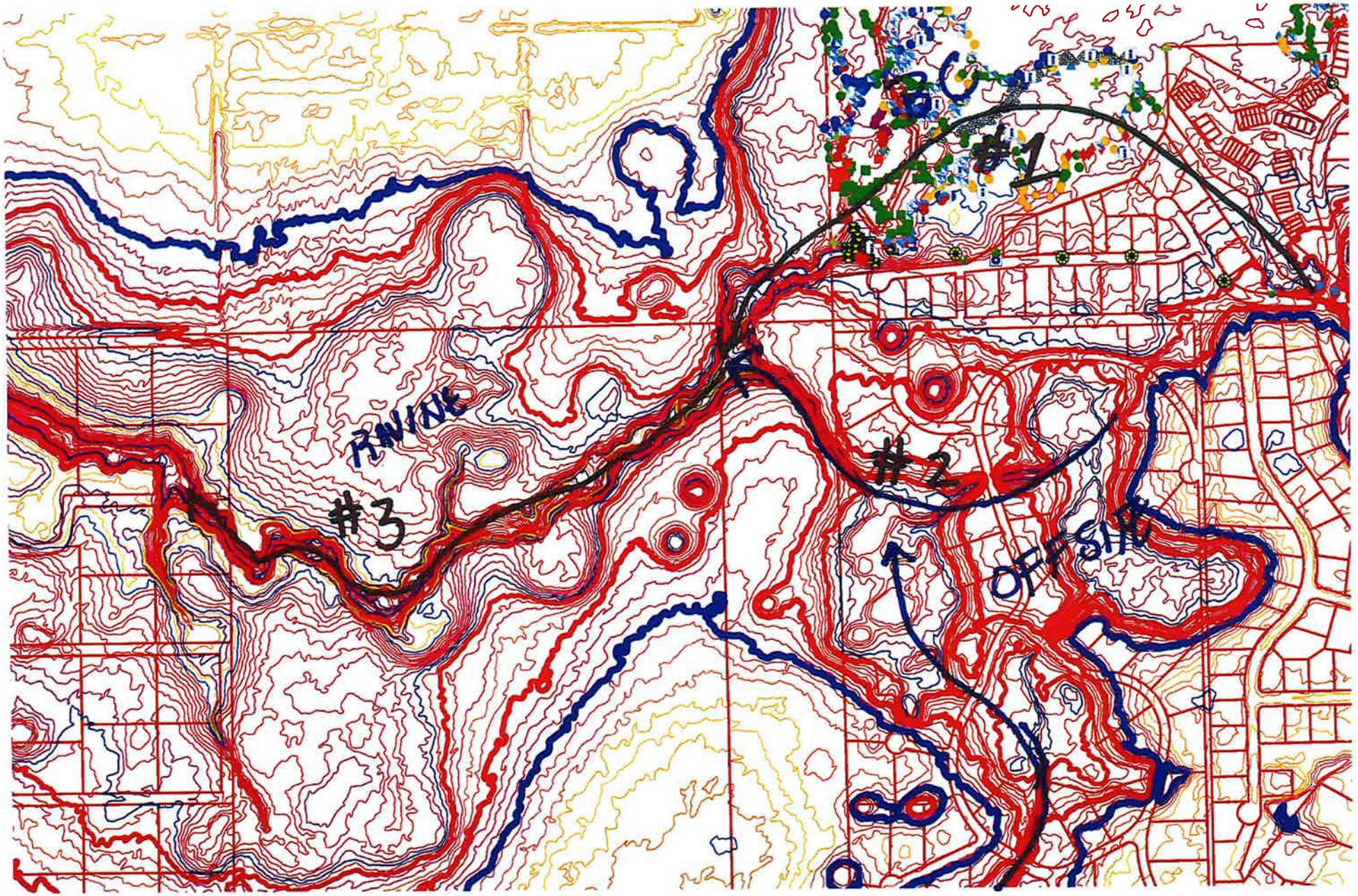
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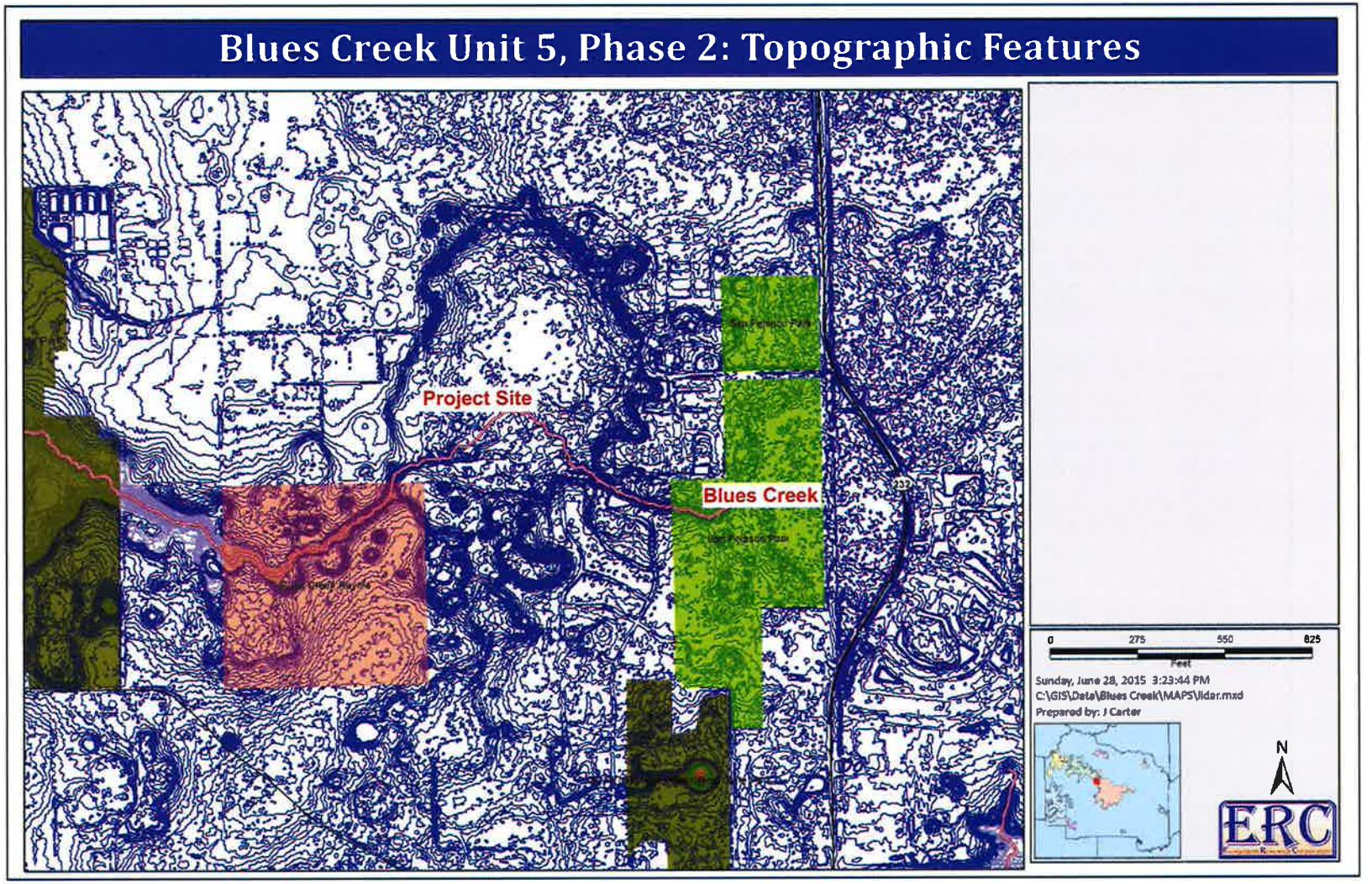
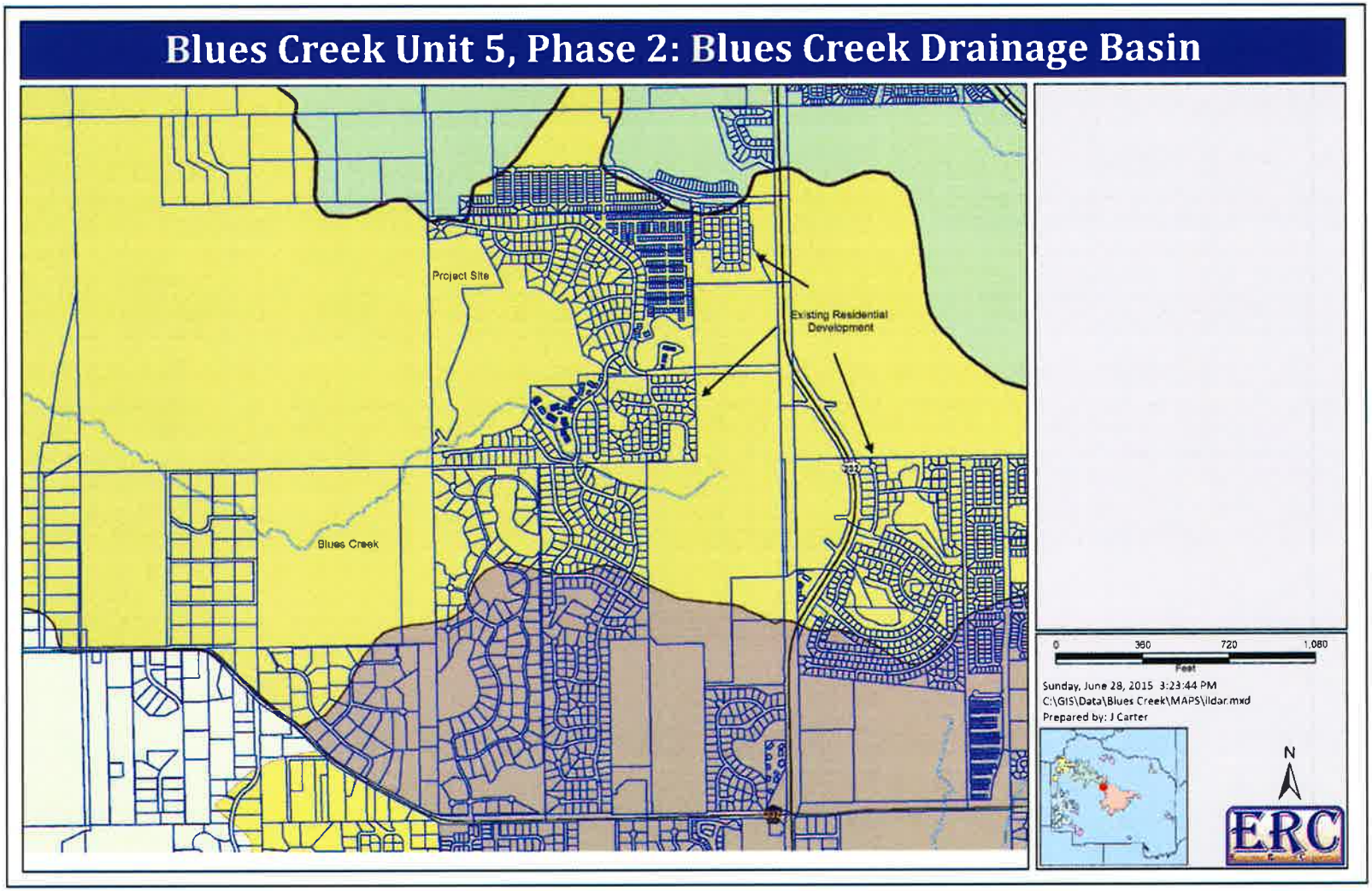
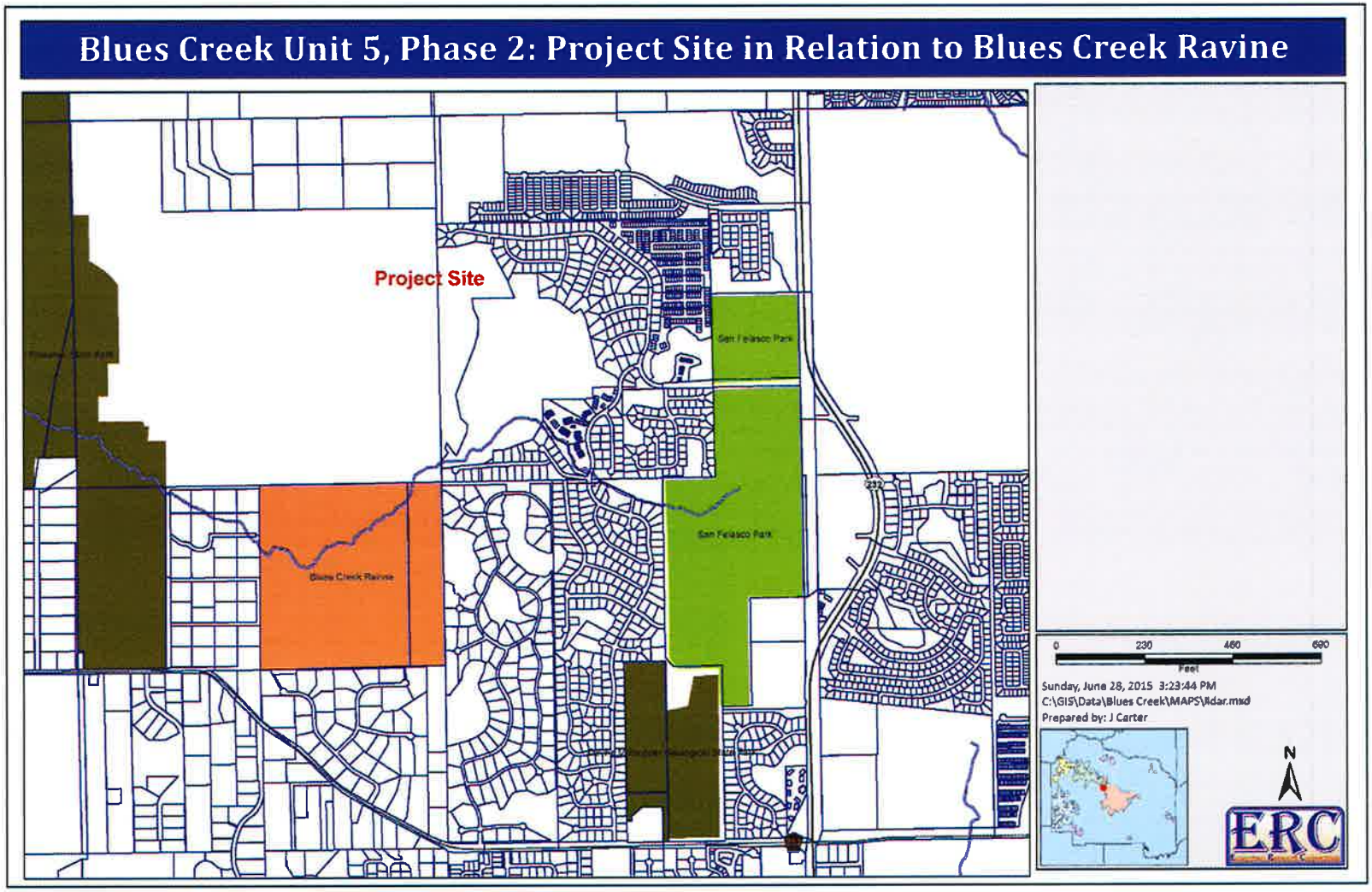
Extent of Blues Creek as related to topographic features within and adjacent to the drainage basin.



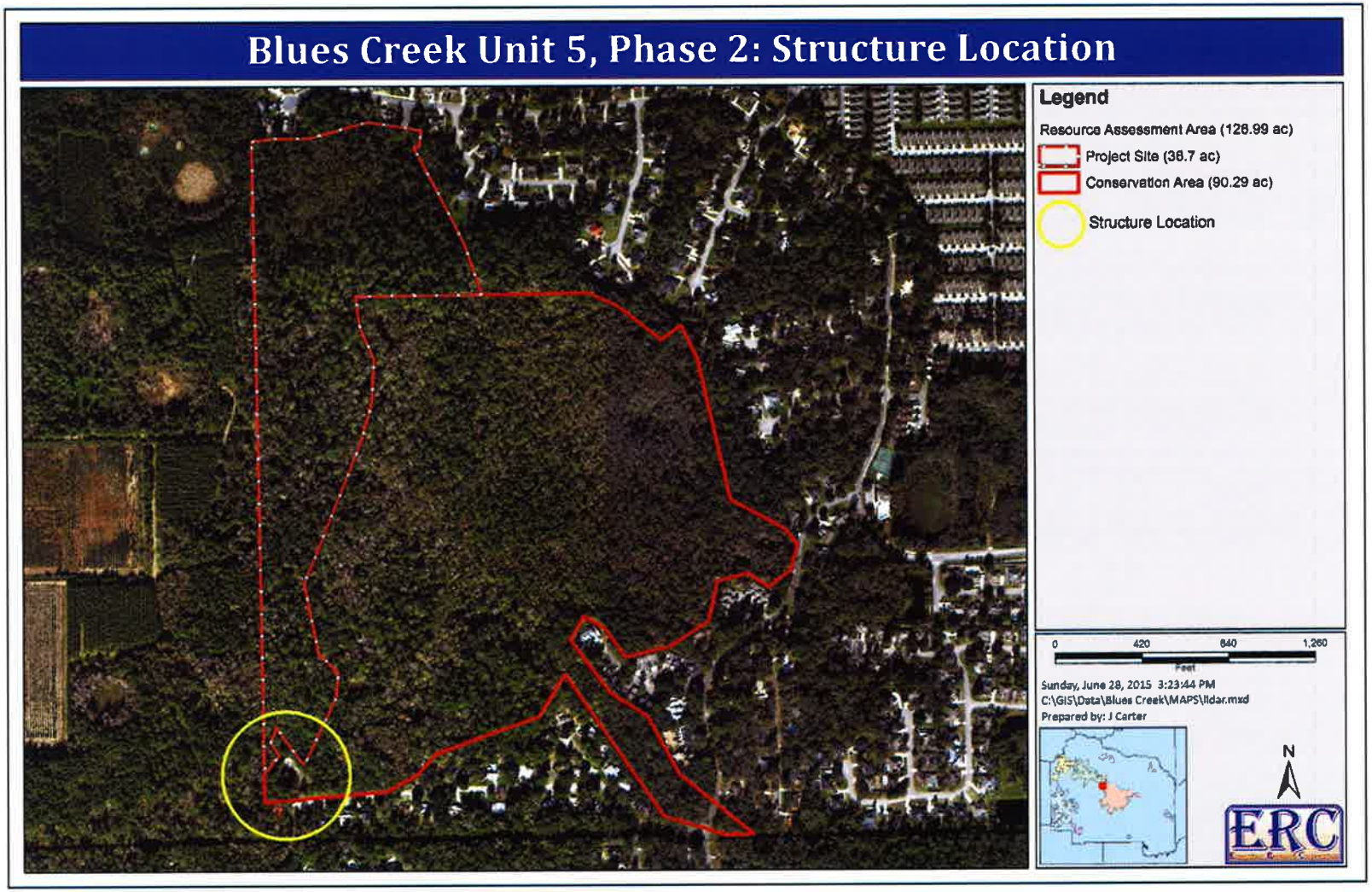
Blues Creek drainage basin.



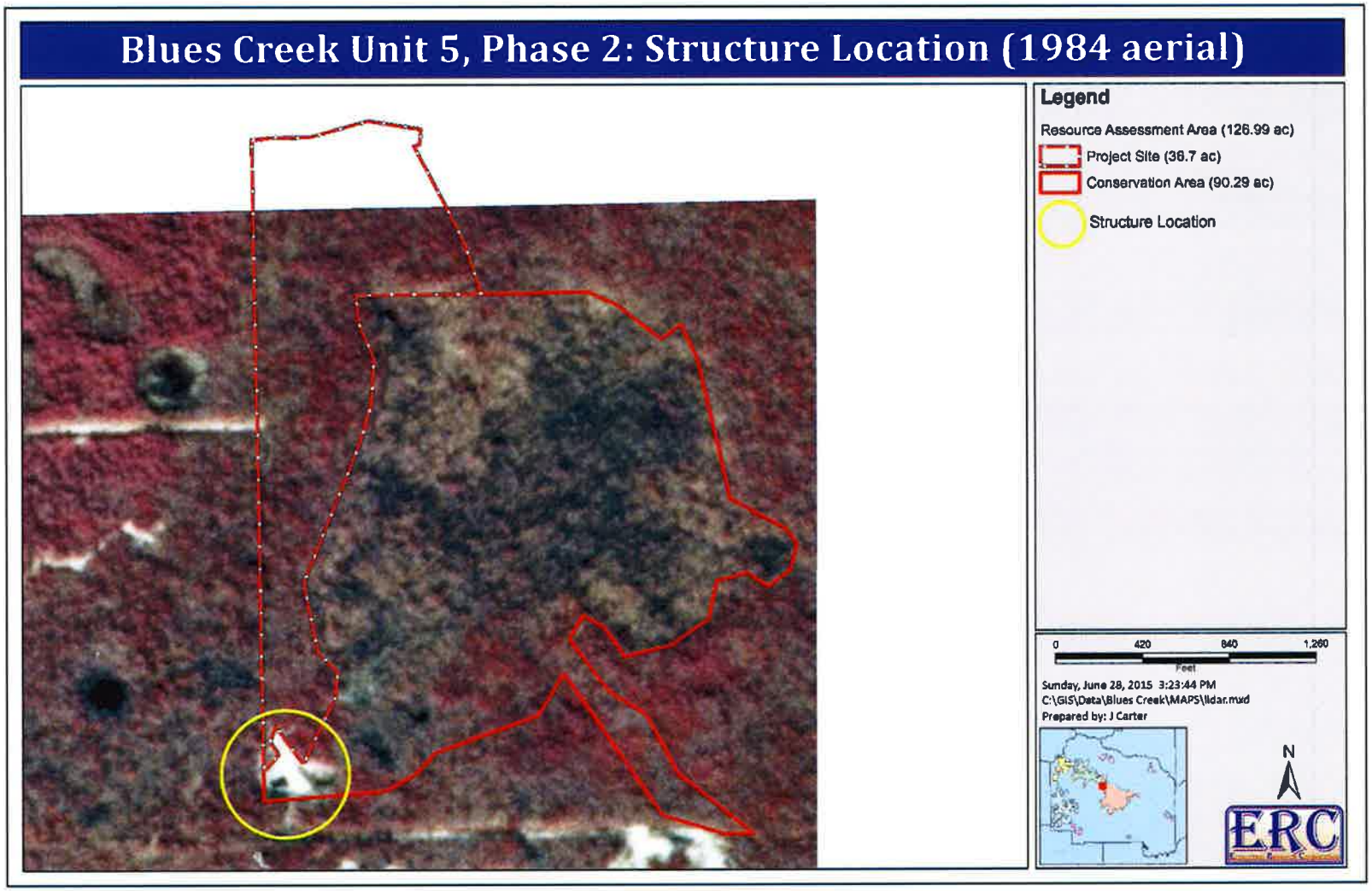
Blues Creek and project site in relation to Blues Creek Ravine Preserve.



Location of flow-control structure (spillway) within Blues Creek.



1984 false color infrared aerial showing recent construction of flow-control structure.



Photographs of flow control structure (spillway) within Blues Creek.

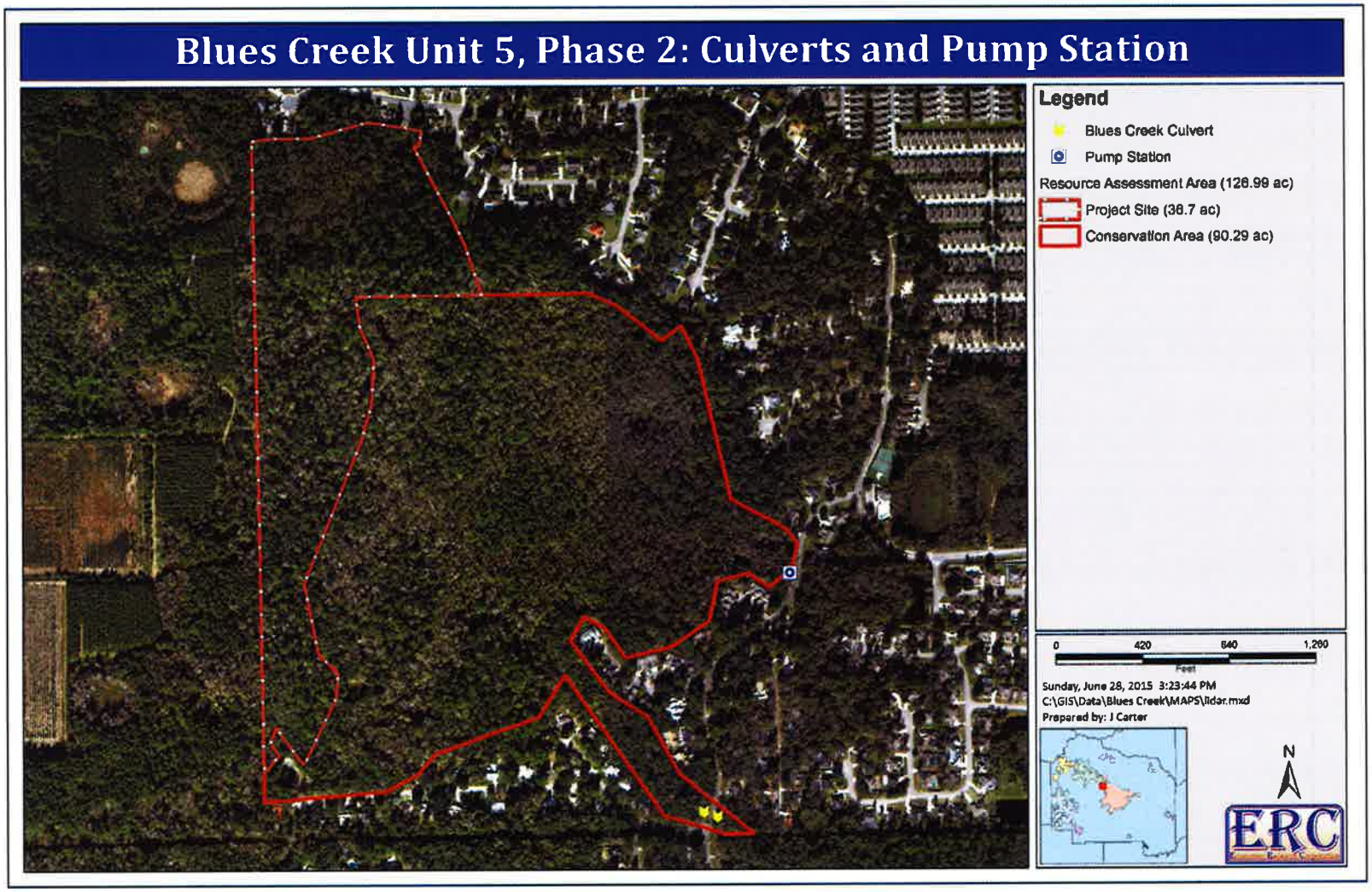
(a) Spillway structure

(b) Flow-control structure (upstream)

(c) Inside of flow-control structure

(d) Effluent culvert located on downstream side of structure

Location of pump station and sewer pipe in Blues Creek.



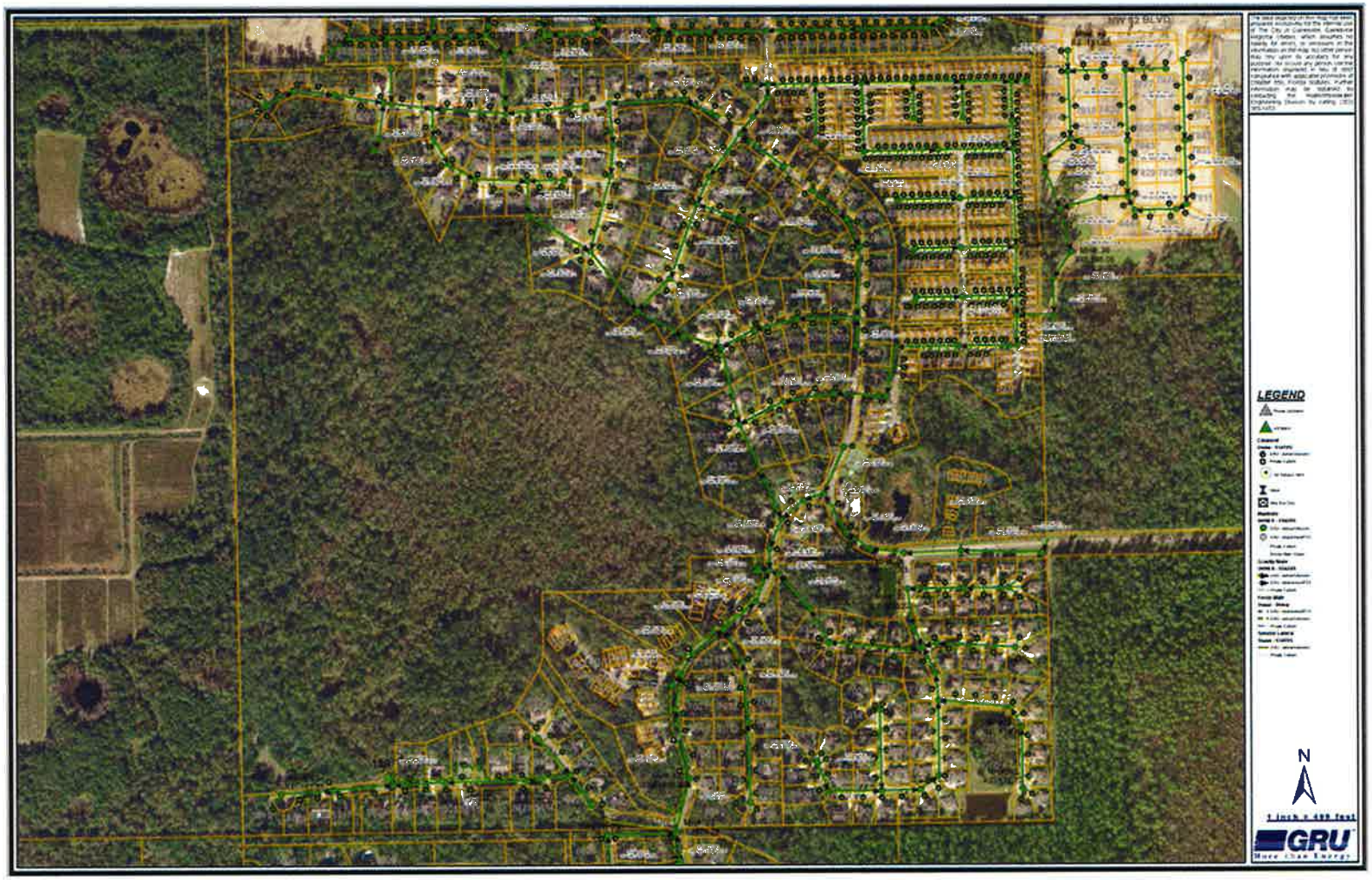
Structures located within Conservation Area.

(a) Pump station

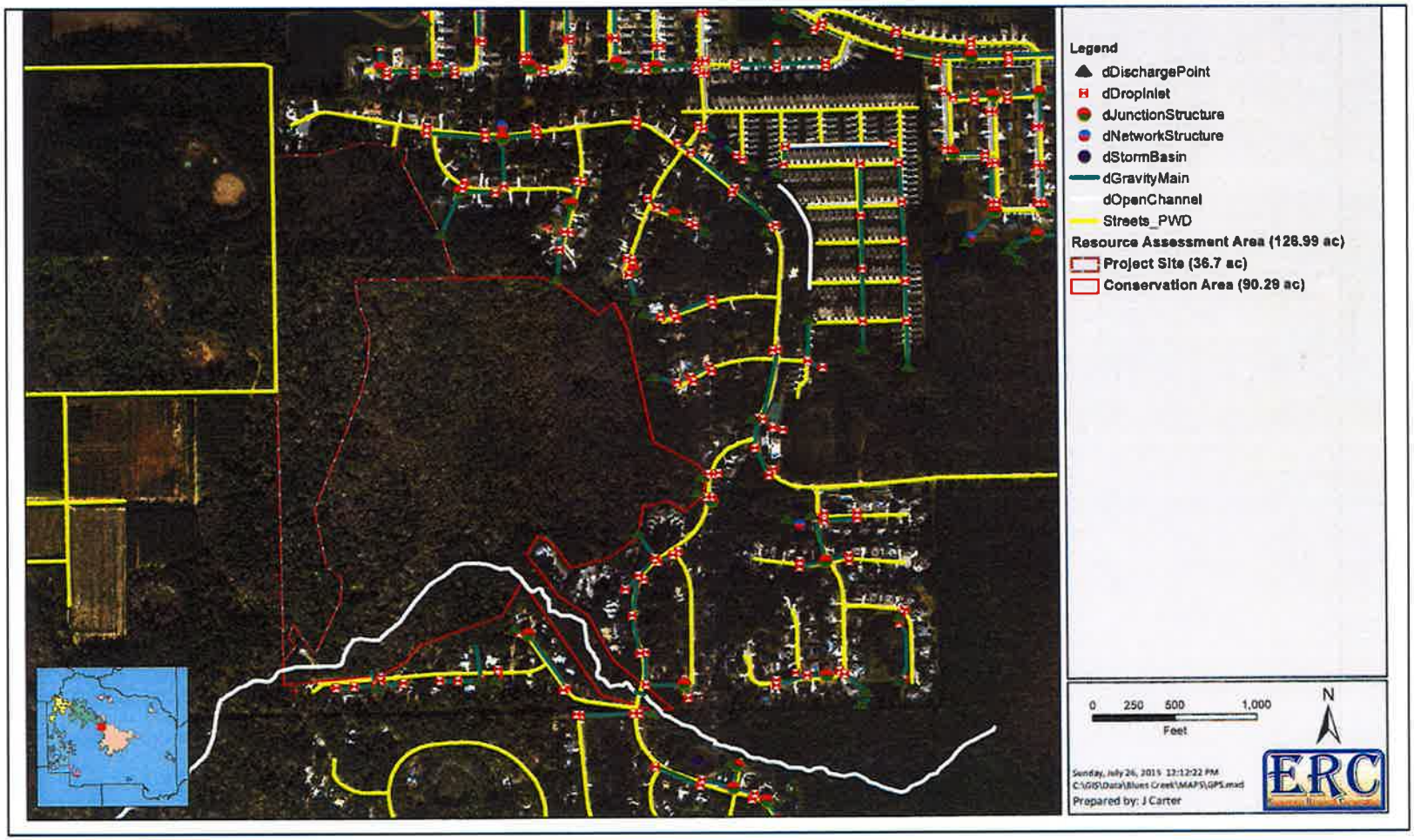
(b) Box culvert (NW 52nd Terrace)

(c) Sewer pipe located ±2.5 ft above stream bottom and within high water elevation of fence.

Location of underground sewer pipes and other sewage disposal infrastructure within the Blues Creek Development.

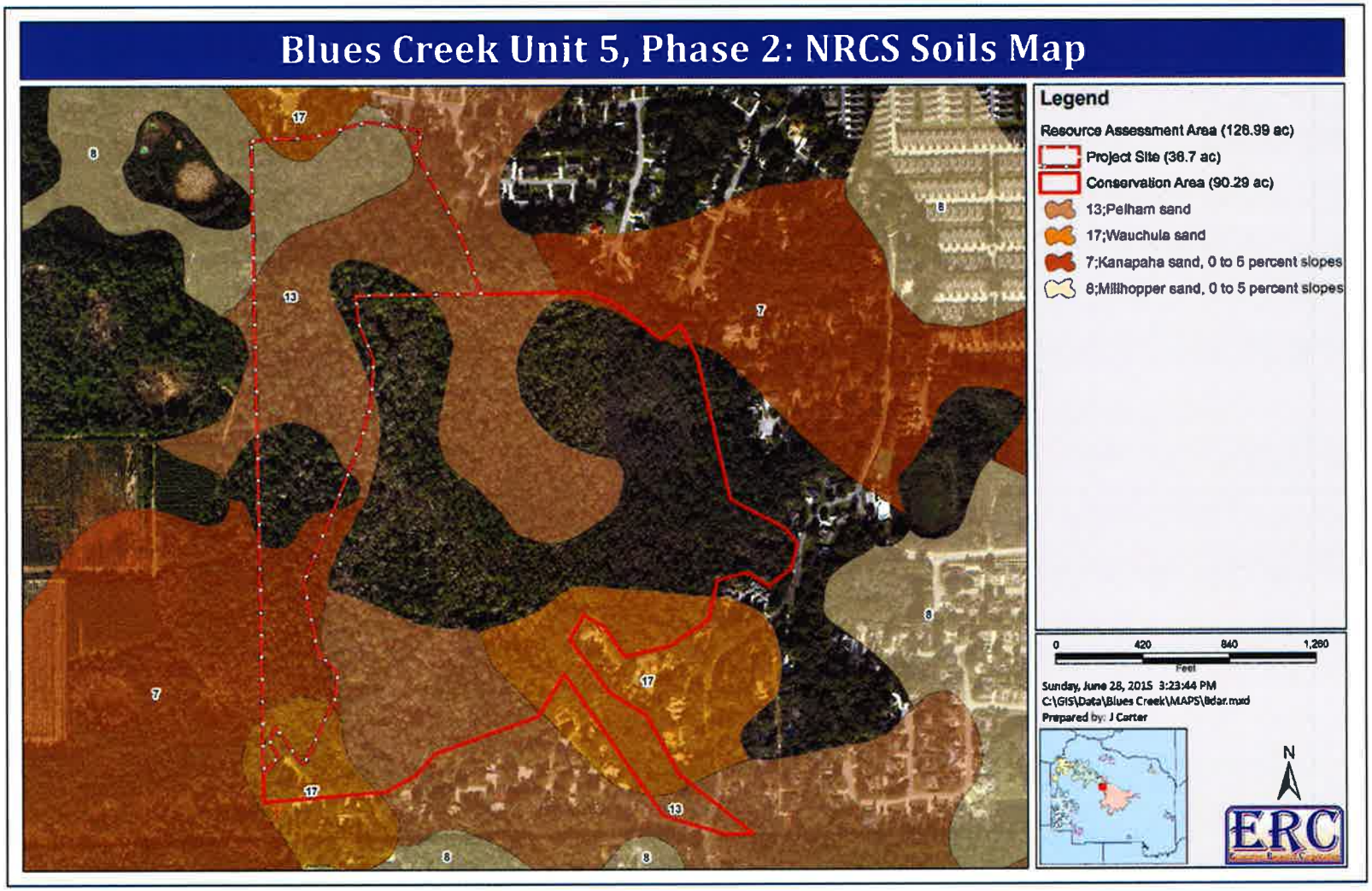


Location of underground stormwater pipes and other stormwater structures within the Blues Creek development.

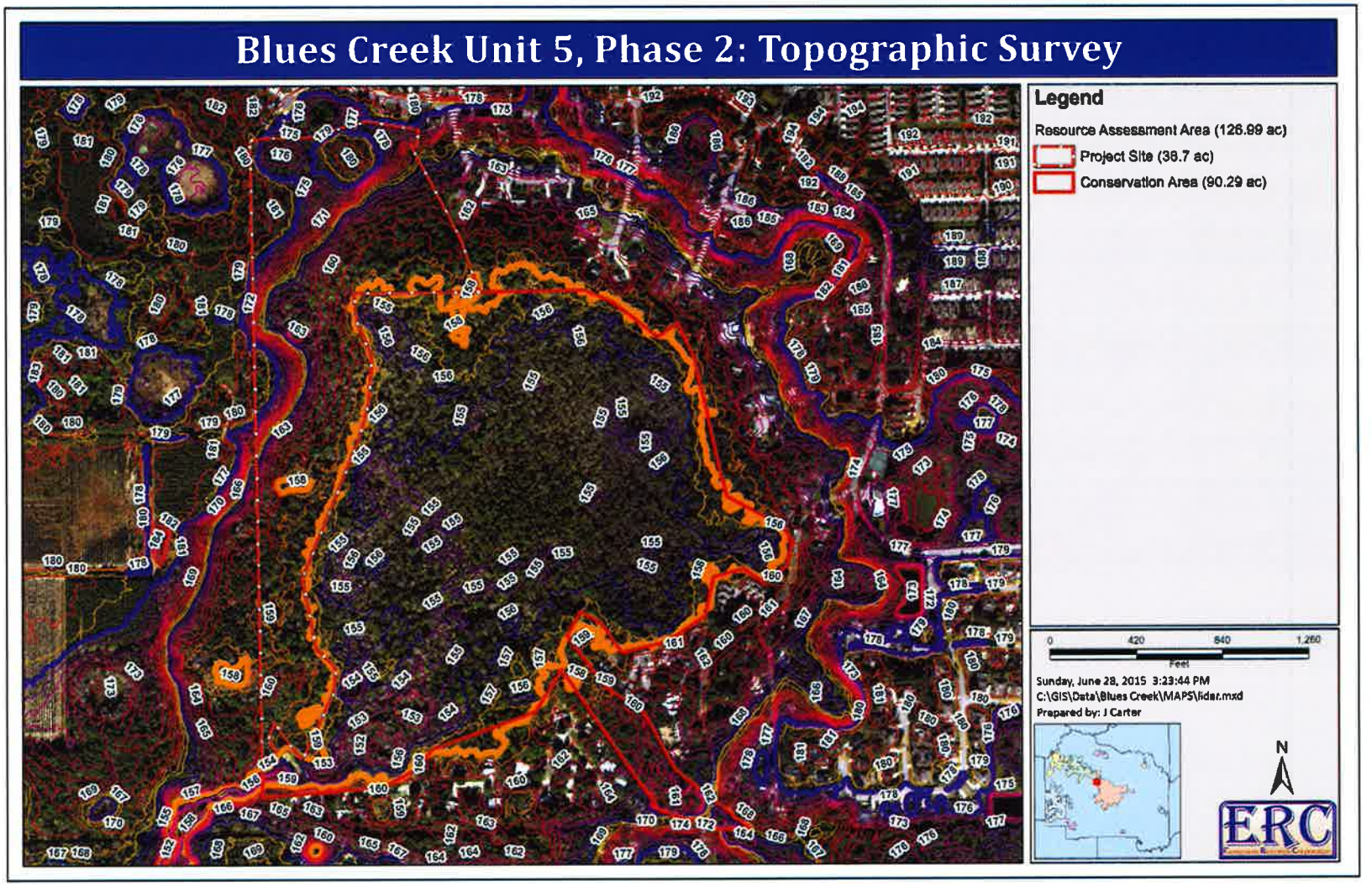


Examples of tree fall showing extent of exposed roots and depth of roots.

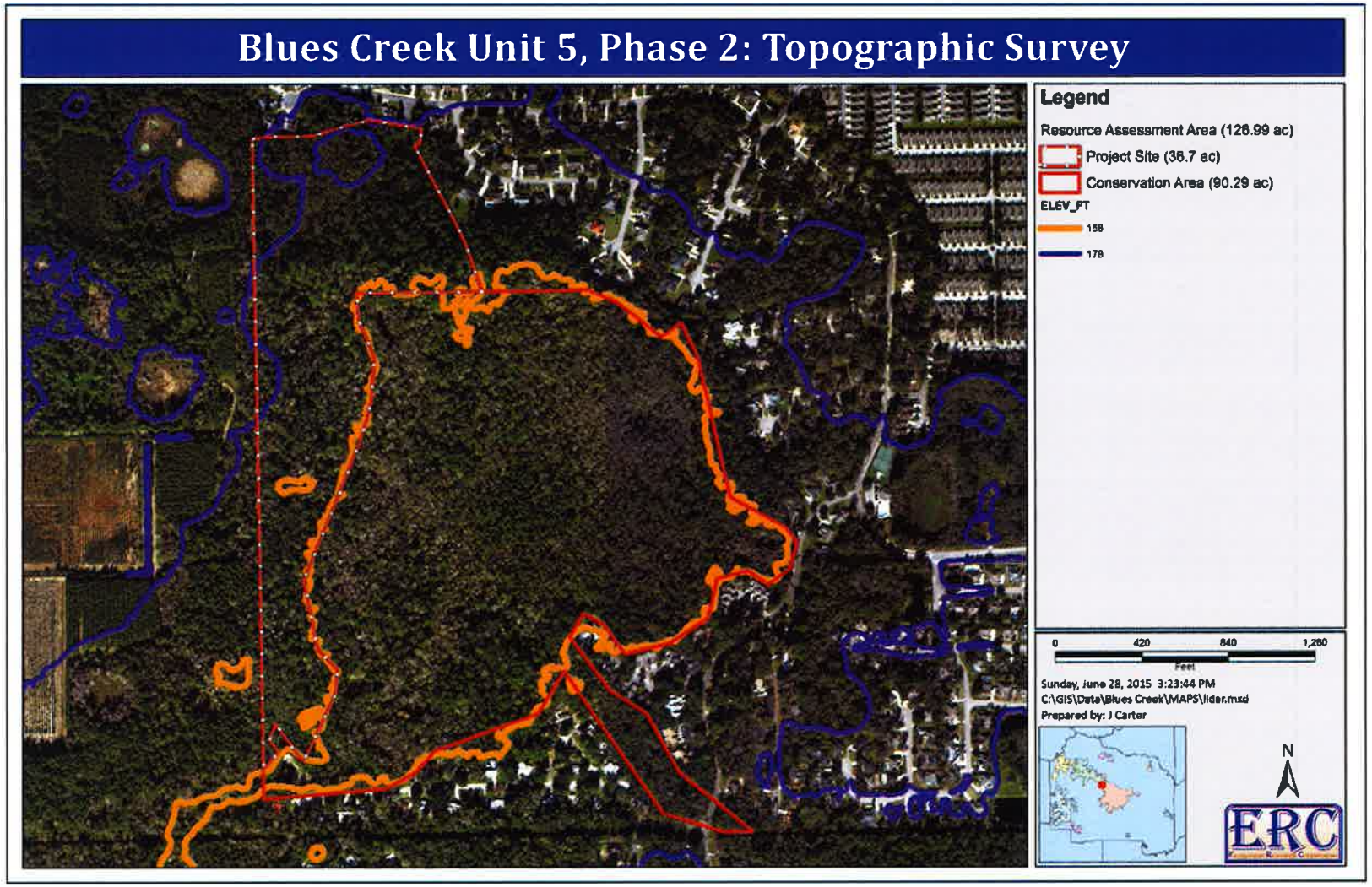
Soils map of soil mapping units distributed in Blues Creek Phase 2, Unit 5 project site and adjacent development.



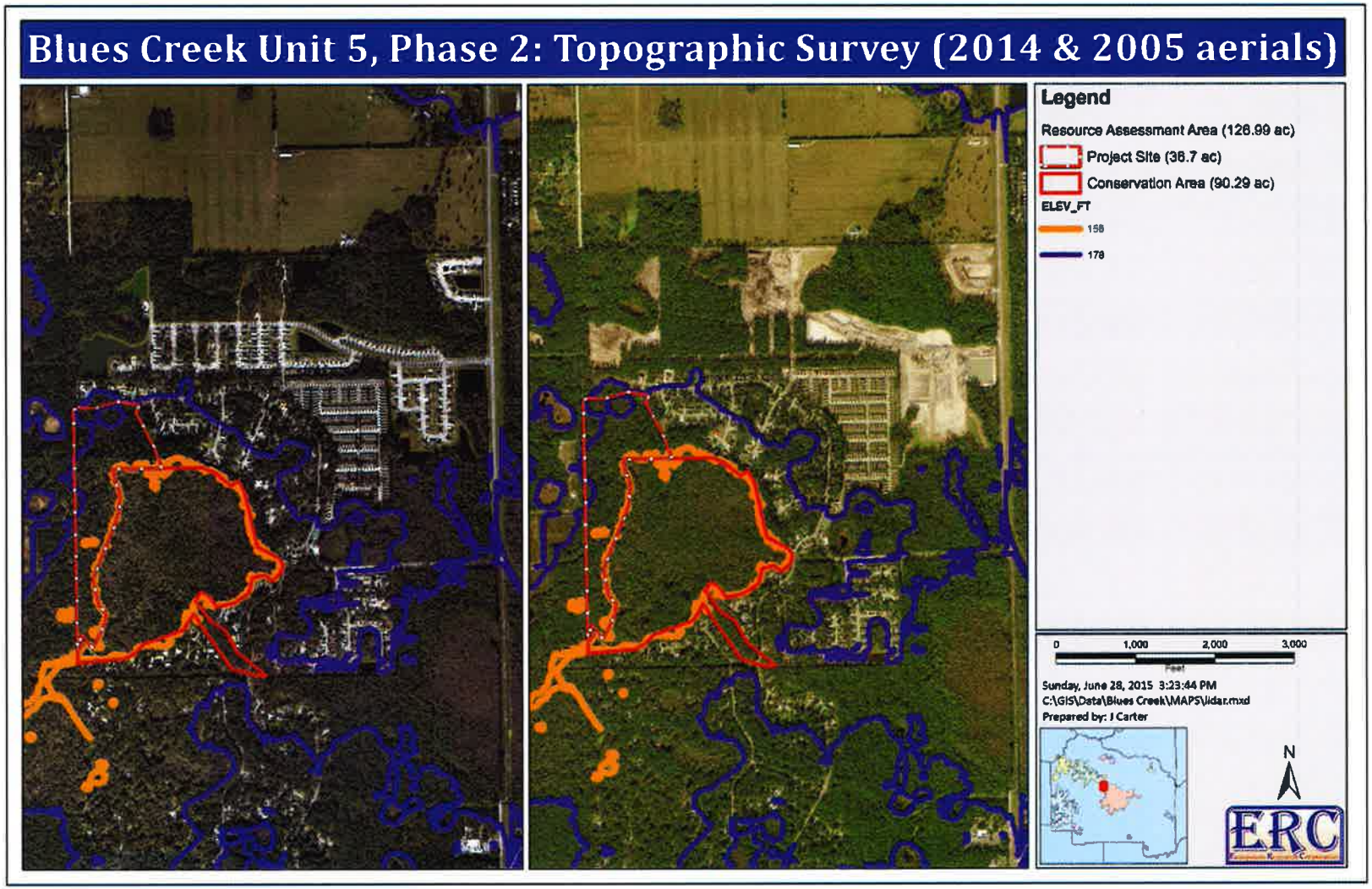
Topographic map showing contours of Blues Creek project area. The 178 and 158-ft contours are highlighted.



Extent of project site and Blues Creek Development area between the 158 and 178-ft contours.



2014 and 2005 aerials showing development in the areas adjacent to the project site that have occurred during the time in which this project development has been contested.



GSE Engineering & Consulting, Inc.

February 17, 2016

Mr. Scot Ross
New Generation Home Builders, Inc.
14184 SW 4th Place
Gainesville, Florida 32669

Summary of Surface and Subsurface Conditions Overview
Blues Creek Unit 5 – Phase 2
Gainesville, Alachua County, Florida
GSE Project No. 12680

Dear Mr. Ross:

GSE Engineering & Consulting, Inc. (GSE) has performed a review of surface and subsurface conditions and features in the area of the proposed Blues Creek Unit 5 – Phase 2 subdivision as it relates to the roadway and utility corridor improvements.

This evaluation has been performed to meet the intent of a request by Mr. Clay Sweger of EDA. We met with Mr. Sweger, Mr. Sergio Reyes, P.E., and Ms. Onelia Lazzari, AICP with EDA on February 12, 2015 to discuss the project. The remainder of this report summarizes background information, review of published data, and associated evaluation and conclusions.

Background Information

The site consists of the Blues Creek Unit 5 – Phase 2 subdivision proposed infrastructure improvements in Gainesville, Alachua County, Florida. We understand that as part of the development phase, roadway and underground utility improvements will occur between NW 69th Lane and NW 80th Avenue generally west of the existing Blues Creek subdivision development. EDA furnished a Master Utility Plan and Utility Plan 3, which illustrates the proposed roadway and utility alignment. In addition, a proposed underground sanitary sewer and water supply utility corridor that would pass through an existing wetland and creek is also shown on the southern portion of the project.

We understand that in order to avoid trenching through the surface of the existing wetland and creek area, the "jack and bore" method is proposed. Concerns have been raised about the implications of this method as it relates to potential detrimental environmental impact to the existing wetland and creek. There is also concern that sinkhole development could occur during or post improvement in this and other areas of the proposed road alignment.

GSE was furnished with a document the authors of this correspondence prepared while employed by SDII Global Corporation (SDII). GSE reviewed the provided *Preliminary Geotechnical Site Exploration* report dated August 11, 2005 (SDII Project No. 3011979), and considered the findings, evaluations and conclusions as it relates to the subject project.

GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
352-377-3233 Phone • 352-377-0335 Fax
www.gseengineering.com
Certificate of Authorization No. 27430

The remainder of this document provides an overview of readily available published information related to surface and subsurface conditions in the area of the proposed project, and an evaluation of the potential for the proposed activities to adversely affect the environment or to contribute to the development of sinkholes.

General Site Description and Area Topography

A review of recent aerial photography of the area indicates the existing corridor is mostly undeveloped wooded land. Based on Alachua County Growth Management published information, surface elevations in the proposed roadway and utility corridor alignment range between 150 and 180 feet NGVD. Overall, surface elevations in the area slope down towards the south. Published St. Johns Water Management District (SJWMD) information indicates the Florida Aquifer elevation is on the order of 40 to 50 feet NGVD in the Blues Creek area (i.e. 100+ feet below existing grades).

Multiple closed depressional features are illustrated by the topography in this portion of the Blues Creek development. The bottom elevations of these depressional features range from about 150 to 175 feet NGVD. The more pronounced features in the immediate area of the proposed new subdivision phase occur a few hundred feet west of the proposed roadway alignment along the north side of the existing Blues Creek development at the western end of NW 80th Avenue. Existing homes and the roadway alignment are present in immediate and close proximity to these features.

Summary of Published Geological Information

Alachua County straddles two physiographic provinces: Northern Highlands and Coastal Lowlands. A broad karst escarpment known as the Cody Scarp separates these two provinces. The Blues Creek area occurs in the general area of transition between the Upland Highlands and Cody Scarp.

The Northern Highlands, which lie north and east of the Cody Scarp, are underlain by a thick sequence of relatively impermeable Miocene to Pleistocene sediments. Because of this thick sequence of sediments, the Northern Highlands Province contains few karst features. This upland plateau is nearly level, sloping gently to the west, north and east. Elevation ranges from about 150 to 200 feet above sea level. The plateau, which originally extended completely across the county, has many swamps. Sinkholes are not common within the plateau, but a few are found near its margin. The subject Blues Creek area generally falls within this elevation range.

The Cody Scarp, which separates the Northern Highlands from the Coastal Lowlands, contains large sinkholes, sinking streams, and other karst features. The bottoms of the karst features often penetrate to the Ocala Limestone and the depressions are usually filled with organic soils, fluvial and lacustrine sediments, and clay-rich soils. The hills within the scarp contain Miocene sediments similar to the Northern Highlands Province. Many of the large, flat-bottomed lakes and wet prairies are associated with the scarp and represent coalescent sinkholes known as poljes and uvalas. Many of these level prairies and lakes, most of which are near or below 60 feet NGVD, are associated with ground water levels. These lower elevations are not present in the subject Blues Creek area.

Thin Plio-Pleistocene sediments overlying thin and discontinuous, residual Miocene strata and Eocene limestone characterize the Lowlands. Karst features are numerous in the Lowlands. The western plains region has low relief. Elevation ranges from about 50 to 80 feet above sea level. The plain is devoid of stream channels, but it is dotted with sinks and limestone mines. While the Ocala Limestone is essentially near the surface in this region, many of the old sinks have become filled (some to a depth of 250 feet) with sand, clayey sand, and sandy clay. These soil materials come from marine submergence, soil creep and slumping, and stream transport from the Northern Highlands. This sinkhole fill tends to mask many of the karst irregularities of the Ocala surface. The subject Blues Creek area is not located within the Coastal Lowlands.

Summary of Alachua County Soil Survey Review

The Alachua County Soil Survey[1] maps multiple soil types in the area of the proposed roadway and utility alignment. There were not sinkhole related symbols identified on the Soil Survey map in the immediate area of the proposed Blues Creek Unit 5 – Phase 2 area. There are sinkhole symbols in the general area of existing Blues Creek development to the east.

Dominant mapped soil series in the proposed development area include the following:

Wauchula sand – This nearly level, poorly drained soil is in broad areas of the flatwoods. Slopes are nearly smooth and range from 0 to 2 percent. This soil is in small and large, irregularly shaped or meandering areas that range from about 20 to 800 acres.

Typically, the surface layer is sand about 8 inches thick. The upper 5 inches is black, and the lower 3 inches is dark gray. The subsurface layer is light brownish gray sand about 6 inches thick. The upper part of the subsoil is 4 inches of dark reddish brown loamy sand, in which many sand grains have an organic coating, and 5 inches of dark brown sand. Below this is a leached layer of pale brown, mottled fine sand about 5 inches thick. The lower part of the subsoil is a loamy layer that extends to a depth of 62 inches. The upper 9 inches is gray, mottled fine sandy loam; the next 19 inches is light brownish gray, mottled loamy sand; and the lower 6 inches is light gray, mottled fine sandy loam. Between depths of 62 and 80 inches, the underlying material is light gray, mottled sandy clay loam.

Included with this soil in mapping are small areas of Mulat, Newnan, Pelham, Pomona, Riviera, and Sparr soils. Also included are small areas of poorly drained soils that have a brownish stain in the subsurface layer. The sand grains are uncoated or only thinly coated. Total included areas are 15 percent or less.

The Wauchula soil has a water table that is at a depth of less than 10 inches for 1 to 4 months and is at a depth of 10 to 40 inches for about 6 months. During driest seasons, the water table recedes to a depth of more than 40 inches. The available water capacity is low to medium in the surface layer, very low to low in the subsurface layer, low to high in the upper part of the subsoil, and medium to high in the lower part. Permeability is moderately rapid to rapid in the surface and subsurface layers, moderate to moderately rapid in the upper part of the subsoil, and slow to moderately slow in the lower part. Organic matter content is low.

[1] United States Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey.

Pelham sand – This nearly level, poorly drained soil is in small and large areas in the flatwoods. Slopes are nearly smooth and range from 0 to 2 percent. The areas are irregular in shape and range from 10 to 50 acres.

Typically, the surface layer is sand about 7 inches thick. The upper 4 inches is very dark gray, and the lower 3 inches is dark gray. The subsurface layer is sand about 22 inches thick. The upper 7 inches is light brownish gray and has gray mottles, and the lower 15 inches is gray. The subsoil extends to a depth of 69 inches. The upper 3 inches is gray sandy loam, and the lower 37 inches is gray, mottled sandy clay loam. Between depths of 69 and 80 inches, the underlying material is gray, mottled sandy loam.

Included with this soil in mapping are small areas of Mulat, Pomona, Riviera, Surrency, and Wauchula soils. Some mapped areas of this soil along Hogtown Creek and its tributaries in the western part of Gainesville are occasionally flooded. Total included areas are less than 15 percent.

This Pelham soil has a water table that is less than 10 inches below the surface for 1 to 4 months during most years. The water table recedes below a depth of 40 inches during dry seasons. Surface runoff is slow. The available water capacity is low in the surface and subsurface layers and medium in the loamy subsoil. Permeability is rapid in the surface and subsurface layers and moderate in the loamy subsoil. Natural fertility is low in the upper 29 inches and medium below 29 inches. The organic matter content is moderately low.

Surrency sand – This nearly level, very poorly drained soil is in ponds and depressional areas in the broad flatwoods and in areas of wet prairie on uplands. Slopes are less than 1 percent. The areas are relatively small and range from about 10 to 40 acres.

Typically, the surface layer is black sand about 15 inches thick. The subsurface layer is light gray sand to a depth of 28 inches. Between 28 and 80 inches, the subsoil is sandy clay loam. The upper 27 inches is gray, and the lower 25 inches is light gray.

Included with this soil in mapping are small areas of Monteocha, Pomona, Samsula, and Wauberg soils. Also included are small areas of soils that have a 10- to 24-inch, black or very dark gray sand or loamy sand surface layer over a gray sandy clay loam subsoil. In some delineations are small areas of soils which are similar to this Surrency soil but which have 3 to 10 inches of well-decomposed organic material covering the surface. In some small areas the subsoil decreases in clay content by 20 percent or more at a depth of about 55 to 60 inches. Total included areas are about 20 percent or less.

This Surrency soil has a water table that is within 10 inches of the surface for about 6 months or more during most years. Water is on the surface for 4 months or more. The available water capacity ranges from low to high in the surface and subsurface layers and from low to medium in the subsoil. Permeability is moderately rapid to rapid in the sandy surface and subsurface layers and slow to moderately slow in the loamy subsoil. Natural fertility is medium in the surface layer and is low in the subsurface layer and subsoil. Organic matter content is high to very high in the surface layer.

Kanapaha sand, 0 to 5 percent slopes – This nearly level to gently sloping, poorly drained soil is in small to relatively large areas on uplands. Slopes are nearly smooth to slightly convex. The areas are irregular in shape and range from about 10 to 200 acres.

Typically, the surface layer is dark gray sand about 8 inches thick. The subsurface layer is sand about 36 inches thick. The upper 5 inches is light brownish gray, and the lower 31 inches is light gray. The subsoil is sandy clay loam to a depth of 80 inches or more. The upper 6 inches is light brownish gray, and the lower 30 inches is gray.

Included with this soil in mapping are small areas of Blichton, Bivans, Lochloosa, and Wacahoota soils. Also included are small areas of soils which are similar to the Kanapaha soils except that the weighted average is more than 35 percent clay in the upper 20 inches of the subsoil. Small areas of Kanapaha soils which have 5 to 8 percent slopes are included. Also included are about 20 acres along the Santa Fe River that are occasionally flooded. Total included areas are about 20 percent or less.

This Kanapaha soil has a water table that is less than 10 inches below the surface for 1 to 3 months during most years. Surface runoff is slow. The available water capacity is very low to low in the sandy surface and subsurface layers, and it is low to medium in the subsoil. Permeability is moderately rapid in the surface and subsurface layers and is slow to moderately slow in the subsoil. Natural fertility is low to medium. Organic matter content of the surface layer ranges from moderately low to moderate.

Blichton sand, 5 to 8 percent slopes – This sloping, poorly drained soil is on the rolling uplands. The areas are irregular in shape and elongated and range from about 5 to 45 acres.

Typically, the surface layer is dark gray sand about 5 inches thick. It is about 2 percent nodules of ironstone and fragments of phosphatic limestone. The subsurface layer is sand to a depth of 31 inches. The upper 21 inches is gray. The lower 5 inches is light gray. It is about 2 percent nodules of ironstone and fragments of phosphatic limestone. The subsoil extends to a depth of 78 inches. The upper 6 inches is light brownish gray sandy loam. It is about 4 percent nodules of ironstone and fragments of phosphatic limestone. The next 12 inches is light brownish gray sandy clay loam and is about 2 percent nodules of ironstone and fragments of phosphatic limestone. It is about 6 percent plinthite, by volume. The next 17 inches is light gray sandy clay loam and is about 1 percent nodules of ironstone and weathered fragments of phosphatic limestone. About 8 percent is plinthite, by volume. The lower 12 inches is light gray sandy clay loam. Between depths of 78 and 80 inches, the underlying material is gray sandy clay loam.

Included with this soil in mapping are small areas of Bivans, Boardman, Lochloosa, and Wacahoota soils. Small areas of Blichton soils that have 2 to 5 percent slopes or have less than 5 percent plinthite are included. Total included areas are about 15 percent or less.

This Blichton soil is saturated by a perched water table within 10 inches of the surface for 1 to 4 months during most years. Wetness is caused by hillside seepage. Surface runoff is rapid. The available water capacity is low in the sandy surface and subsurface layers, and it is low to medium in the loamy subsoil. Permeability is rapid in the sandy surface and subsurface layers. It is slow to moderately slow in the loamy subsoil. Natural fertility is low to medium, and organic matter content is moderately low.

Evaluation

The subject area is located near the transition between Northern Highlands and Cody Scarp. Surface elevations in the area are generally reflective of the Northern Highlands. The near surface mapped soil is also indicative of the Northern Highlands. The presence of a near surface perched watertable in the area is indicative of an underlying continuous clay-rich soil layer. This represents the Hawthorne clay rich formation, which services as a confining layer (relatively impermeable layer) overlying the deeper limestone formation.

Considering the elevation range of approximately 150 to 180 feet NGVD, it is anticipated that the Hawthorne formation is on the order of 50 to 100+ feet thick in the area of proposed development. Due to the presence of this formation, the potential for active sinkhole development is characterized as low in this area of Alachua County.

There are multiple relic (ancient infilled features) sinkholes in the area of Blues Creek both in the area of the existing and near the proposed new phase of the development. The bottom elevation of these features indicates they are infilled to elevations (150 to 175 feet NGVD) well above the estimated Florida Aquifer elevation of 40 to 50 feet NGVD in the Blues Creek area. As a result, a direct connection between these features and the underlying limestone formation is not expected to be present.

The subject area being proposed for development is at no higher risk for sinkhole development than the surrounding existing development. The infilled area geological relic sinkhole features are not expected to increase in size. Furthermore, development of new sinkhole related features in this area of Alachua County is characterized as low. GSE has conducted well over 100 sinkhole investigations in Alachua County, mostly in the western portions of the County where sinkholes more commonly occur. GSE has not identified sinkhole activity in the Blues Creek area.

The proposed "jack and bore" method for the installation of the sanitary sewer and water supply lines is considered an appropriate method for advancing the piping and avoiding impacts to the ground surface through the wetland and creek area. The creek and wetland area in question is located near the southern portion of the proposed subdivision phase.

The soil survey information indicates that Wauchula and Pelham sands are present in the proposed "jack and bore" area. The soil profile can be generally characterized as having a think near surface sand layer underlain by clay-rich soils within 6 feet of the existing ground surface. This represents the confining layer previously described upon which the near surface watertable is perched.

It is anticipated that the "jack and bore" will occur within or possibly just above this clay-rich layer. The "jack and bore" method is widely utilized in areas of existing development under and along roadways. This method is performed while traffic is moving over or along these areas. The Florida Department of Transportation (FDOT) standard specification related to this method is summarized in Section 556 Jack and Bore.

Conclusions

GSE has completed this review of the surface and subsurface conditions in the area of proposed roadway and utility improvements.

Geologically the subject site is located in the Northern Highlands just north of the Cody Scarp. Area surface elevations ranging between approximately 150 and 180 are indicative of the Northern Highlands geology. In addition, soil survey information confirms the presence of near surface soils that are also consistent with the Northern Highlands geology. Near surface soils in the area of proposed improvement are generally characterized as consisting of a surficial sandy soil underlain by clay-rich soils within 6 feet of the existing ground surface. This represents the upper portion of the thick deposit of the Hawthorne clay-rich formation that overlies the limestone formation in this area. The top of the limestone formation is interpreted as being at least 70 to 100 feet below existing grade overlain by the Hawthorne formation. The potential for sinkhole development in this area of Alachua County is characterized as low.

There is no imminent threat of surface collapse as a result of this method when conducted in accordance with industry standards. It is not expected that the ground surface in the area of the creek or wetland would be subject to surface collapse as a result of the proposed "jack and bore" technique. In fact, it appears to be an environmentally sensitive and appropriate alternative approach to leave these features undisturbed.

Development of sinkholes during or following improvements using the "jack and bore" method is considered improbable and unlikely in the area of Blues Creek. This near surface improvement activity would have no effect on the deep limestone formation (estimated to be at least 70 to 100 feet below existing grade) considering the near surface nature of improvements and the presence of the underlying Hawthorne formation confining layer. There will be no underground "connection" between the near surface soil and deep limestone formation as a result of the proposed improvement method.

Closure

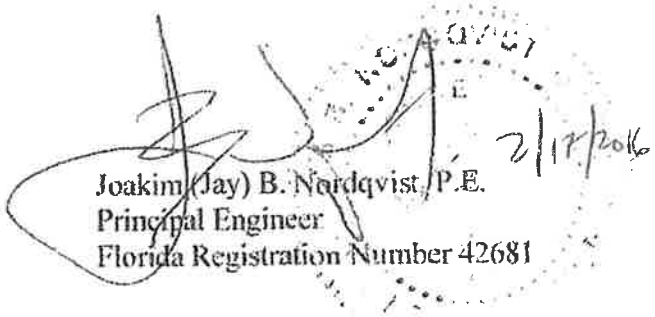
GSE appreciates this opportunity to provide this surface and subsurface characterization for this important project. If you have any questions, or if we can provide any additional information or clarifications, please contact us.

Sincerely,

GSE Engineering & Consulting, Inc.

Kenneth L. Hill, P.E. | lj

Kenneth L. Hill, P.E.
Principal Engineer
Florida Registration No. 40146



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