Alachua County
Board of County Commissioners

August 30, 2024

The Honorable Gib Coerper, Mayor
City of Alachua
15100 NW 142 Terrace
Alachua, FL 32615

Re: Affected Party Status at City's Planning and Zoning Board hearing September 10, 2024

Dear Mayor Coerper,

The Alachua County Board of County Commissioners appreciates the City of Alachua's continued dedication to sound planning and protection of our community's shared water resources. At its August 13, 2024, regular meeting, the County Board directed staff to provide data and reports to the City related to Mill Creek Sink and its sensitive connection to our springs and Floridan aquifer, as many of the reports are currently offline as we update our website. In furtherance of these shared interests, and pursuant to Section 2.3.1 of the City's Land Development Regulations, the County hereby requests affected party status and the opportunity to present testimony and evidence for the Tara April Special Exception Permit item on the City's Planning and Zoning Board's September 10, 2024 agenda. The County is a substantially affected party due to its position as receiver and operator of the public water utility named the Santa Fe Hills Water System and its status as the beneficial holder of a conservation easement covering approximately 198 acres of Camp Kulaqua in northwestern Alachua County. In 2005 and 2006, a dye trace study was performed in the Mill Creek Sink area and demonstrated the direct hydrological connection between Mill Creek Sink and the Santa Fe Hills Water System, as well as Camp Kulaqua. Impacts to the Mill Creek Sink from the Tara April development, as well as associated developments, could more directly or more significantly harm the County's property interests when compared to the general impacts on the public at large. A copy of the dye trace study is attached to this correspondence for your review. Please advise regarding any requirements on affected parties for submitting proposed evidence prior to the hearing on the Tara April Special Exception, including any applicable timelines.

In support of your efforts to protect these shared resources, the County encourages the City to request the County's technical, fiscal, and other resources (including expert staff in the County's Environmental Protection Department) to assist your staff with the review of upcoming projects with the potential to adversely affect the health, safety, and welfare of our shared residents (*i.e.,* Tara Forest West, Tomaka Hills, and Tara Phoenicia). Our Environmental Protection Department staff are available to consult with your professional staff and answer questions on the sensitivity of this area if that would be helpful.

Prior to the hearing, we will provide a copy of several known reports and available data to the city related to the sensitivity of Mill Creek Sink and its associated watershed, and the connection of this system to our shared springs and aquifer.

If you are interested, please contact me or Stephen Hofstetter, Director of our Environmental Protection Department. I look forward to hearing from you and working together to preserve our community and protect our water resources.

Sincerely,

Mary C. Alford, Chair
Alachua County Board of County Commissioners
Chr24.051

Enclosure

cc: Board of County Commissioners
Michele L. Lieberman, County Manager
Sylvia Torres, County Attorney
Stephen Hofstetter, County Environmental Protection Department Director
Mike DaRoza, Manager, City of Alachua
Marian Rush, City Attorney

MILL CREEK and LEE SINKS
DYE TRACE
ALACHUA COUNTY, FLORIDA
JULY-DECEMBER, 2005

Prepared for:
Alachua County Environmental Protection Department
201 SE 2nd Avenue, Suite 201
Gainesville, FL 32601

Prepared by:
Peter L. Butt, Stephen Boyes, P.G. and Thomas L. Morris

Karst Environmental Services, Inc.
5779 NE County Road 340,
High Springs, FL 32643

June 7, 2006

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REPORT CERTIFICATION

Re: Mill Creek and Lee Sinks Dye Trace, Alachua County, Florida
July-December, 2005

This report was prepared by Karst Environmental Services, Inc. under the supervision of Stephen R. Boyes a Florida-licensed Professional Geologist.

The information contained herein and the interpretations derived follow accepted and approved professional practice in the field of hydrogeology, and are true and correct to the best of our knowledge.

SIGNATURE: _____

Stephen R. Boyes, P.G.
Florida License No: 184

Date: June 7, 2006

EXECUTIVE SUMMARY

The Mill Creek and Lee Sinks Dye Trace was undertaken by Karst Environmental Services, Inc. (KES) to investigate potential connections between Mill Creek Sink and Lee Sink and springs on the Santa Fe River and wells located near and down gradient of the two disappearing stream systems. The investigation was performed under contract with the Alachua County Environmental Protection Department.

Mill Creek Sink is the swallet (sinkhole that swallows the stream) for Mill Creek, and Lee Sink is the swallet for Cellon Creek. Both sinks lie along the northwestern reach of the Cross-County Fracture Zone in northwest Alachua County. The Cross-County Fracture Zone is one of Alachua County's most prominent hydrogeologic features and extends from Orange Lake, southwest of Gainesville to the Santa Fe River area. Other significant features associated with the fracture system are Hornsby Spring, Splitrock Sink and Big Otter (Moose's Echo) Sink within the San Felasco State Preserve, the Devils Millhopper and Alachua Sink in Paines Prairie.

Twenty pounds of fluorescein dye were released at Lee Sink and twenty pounds of rhodamine WT dye were released at Mill Creek Sink on July 26, 2005 (Day Zero) by KES personnel. Water samples and charcoal dye samplers were placed, collected and replaced at scheduled intervals at eleven spring and five river monitoring locations and from thirteen water supply wells in the study area. Nine-hundred and eighteen (918) charcoal samplers and water samples were collected and of those 194 were analyzed.

The first detection of dye was rhodamine WT, from Mill Creek Sink, at Hornsby Spring and the River Ranch Well between days 12 and 13. The positive detection indicates a direct hydrologic connection between Mill Creek Sink and the Hornsby Spring Cave System. Hornsby Spring is located 6.09 miles and the River Ranch Well 5.69 miles from Mill Creek Sink.

Fluorescein dye, from Lee Sink, was detected at Hornsby Spring and the River Ranch Well between days 28 and 31. The positive detection of fluorescein dye documents a direct hydrologic connection between Lee Sink and the Hornsby Spring Cave System. Hornsby Spring is located 8.9 miles and the River Ranch Well 8.5 miles from Lee Sink.

The detection of both dyes at the River Ranch Well clearly indicates hydrologic connection of the north branch of passage in the Hornsby Cave System to both sinks. Both dyes continued to be detected at Hornsby Spring as late as Day 154, (December 27, 2005).

One water supply well sampling station, a public supply well in Santa Fe Hills Subdivision, detected the arrival of rhodamine WT between days 24 and 28. This well is located 1.27 miles from Mill Creek Sink. No dye was detected in samples collected from the Alachua and High Springs municipal supply wells.

Rhodamine WT was also detected at Darby Spring between Days 31 and 38. Darby Spring is located 6.82 miles from Mill Creek Sink. This may demonstrate a hydrologic connection between Mill Creek Sink and Darby Spring, however, observations made during the study may indicate the potential for an indirect connection.

The dye trace investigation indicates a direct hydrologic connection between two recharge features on the Cross-County Fracture Zone and a spring discharge feature on the same fracture system. The apparent measured rate of groundwater flow in the fracture system is between 1,400 to 2,400 feet per day.

ACKNOWLEDGMENTS

Karst Environmental Services, Inc. would like to acknowledge and thank the following individuals and organizations for their support and contributions to the success of this study:

Phil Yountz, Mike Hopkins, their staff and the Seventh-Day Adventist Conference in Florida for their generous assistance and access to Camp Kulaqua and Hornsby Spring.

The National Speleological Society and its Cave Diving Section for access to the Mill Creek Sink Nature Preserve.

Mike New, Scott Roane and Horace Jenkins; City of Alachua Public Works Department.

Jim Drumm, Lavern Hodge and Don Deadwiler; City of High Springs Public Works Department.

Leonard Withee; Alachua County Public Works – Santa Fe Hills Water System.

The staff of Poe Springs County Park.

Staff of the Division of Recreation and Parks; Bureau of Parks, District 2.

Randy Brown, Park Manager, and Sam Cole, Park Biologist; San Felasco State Preserve.

Dale Kendrick, Park Manager; O'Leno State Park.

Edward Bell, Copeland Farms.

Jim Fleming, Tropic Tradition, Inc.

The Alachua Progress Center; Innovation Partners and Regeneration Technologies.

Cindy Butler; for use of Mill Creek Sink Cave underwater photographs and cave information.

John Moseley; cartographic assistance.

Wayne Kinard; volunteer cave diver.

Diana Gijselaers; GIS and ArcView assistance.

Tom Mirti and the Suwannee River Water Management District.

Tom Greenhalgh and the Florida Geologic Survey.

Tim Hazlett; Hazlett-Kincaid, Inc.

John Davis, PG.; Florida Dept. of Environmental Protection NE District Office.

Stephen J. Emmons; Surveyor, Alachua County Public Works Dept.

Robin R. Hallbourg, P.G. and James L. Myles; Alachua County Environmental Protection Department.

Karst Environmental Services, Inc. staff;
Mark Long
Georgia Shemitz

INTRODUCTION

Authorization

Karst Environmental Services, Inc. (KES) was contracted by the Alachua County to perform a qualitative dye trace to determine any hydrogeologic connections of Mill Creek Sink and Lee Sink with Hornsby Spring, Poe Spring, Darby Spring and other springs along the Santa Fe River. This work was authorized by Alachua County Contract Number 42189, executed on September 30, 2004. Coordination and administration of this project for Alachua County was with the Alachua County Environmental Protection Department (ACEPD).

Purpose and Scope

The primary purpose of this study was to determine the hydrogeologic connections of Mill Creek Sink (also known as Alachua Sink) and Lee Sink with Hornsby Spring, Poe, Darby and other springs along the Santa Fe River through the use of a qualitative dye trace. Secondary goals included: determining connections with selected public and private water supply wells, determining the approximate arrival time of the dye at the springs and wells, the relative strength of dyes present, and duration of dye.

The scope of this qualitative dye trace included the following elements:

1. Dye trace design, planning and logistics: coordination and scheduling of personnel; identification of dye introduction and sampling locations/stations; development of sampling schedules; obtaining site and well access permissions (where needed); securing FDEP approvals; notification of the Alachua County Health Dept. and other public agencies.

2. Establish dye sampling stations and conduct background sampling and analysis.

3. Introduction of the dyes into the groundwater at the Mill Creek Sink and Lee Sink sites.

4. Dye sampler collection and replacement and water sample collection during the study period, along with sampler handling and preparation and shipment to the analytical laboratory.

5. Analyses of dye samplers and water samples.

6. Data management and reporting.

Personnel

This study was designed, organized and supervised by Peter L. Butt and Stephen Boyes, Florida P.G. #184. Dye release was conducted by Pete Butt, Mark Long and Tom Morris, with assistance form ACEPD staff. Charcoal sampler and water sample collection was conducted by Peter Butt, Tom Morris and KES staff. This report was prepared by Peter Butt, Stephen Boyes and Tom Morris.

Location

The study area is located in northwestern Alachua County, and includes the cities of Alachua, High Springs and surrounding area. See Figures 1 and 2. Sampling sites were also located in extreme northeast Gilchrist County and southern Columbia County. The Santa Fe River forms the boundary between Alachua and Gilchrist Counties on its south and east side with Columbia County on the north and west side in the study area. All springs in this study discharge into the Santa Fe River.

Mill Creek Sink is located approximately 1.1 miles northwest of the City of Alachua, in the northeast quadrant of the Interstate 75 and Highway 441 interchange. Lee Sink is located approximately 1.85 miles southeast of the City of Alachua, south of the Progress Center Industrial Park and within the western section of the San Felasco Hammock State Preserve. Hornsby Spring is located approximately 1.6 miles north of High Springs, and within the grounds of Camp Kulaqua. Poe Spring is located approximately 3.1 miles west of High Springs, within the Poe Springs County Park.

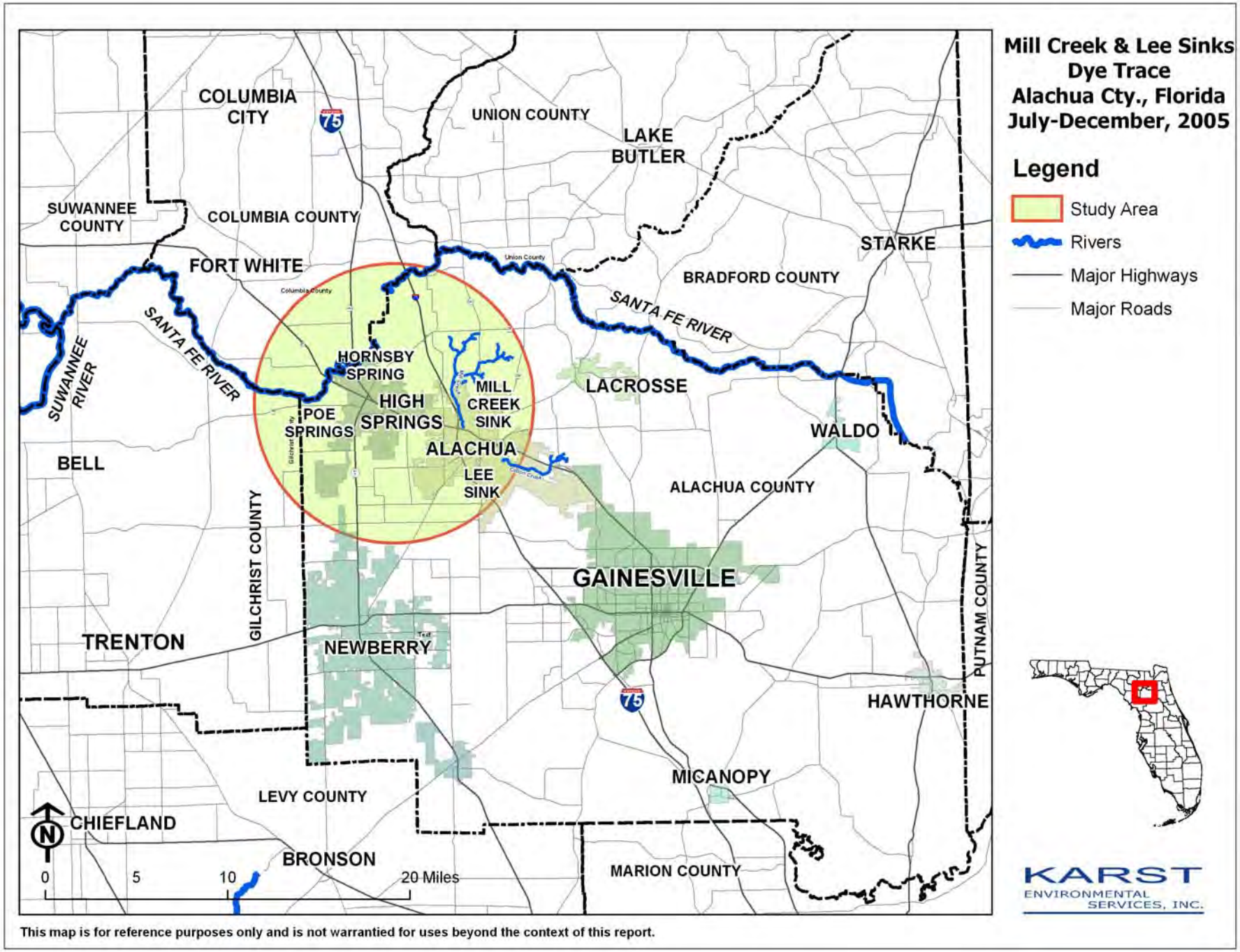
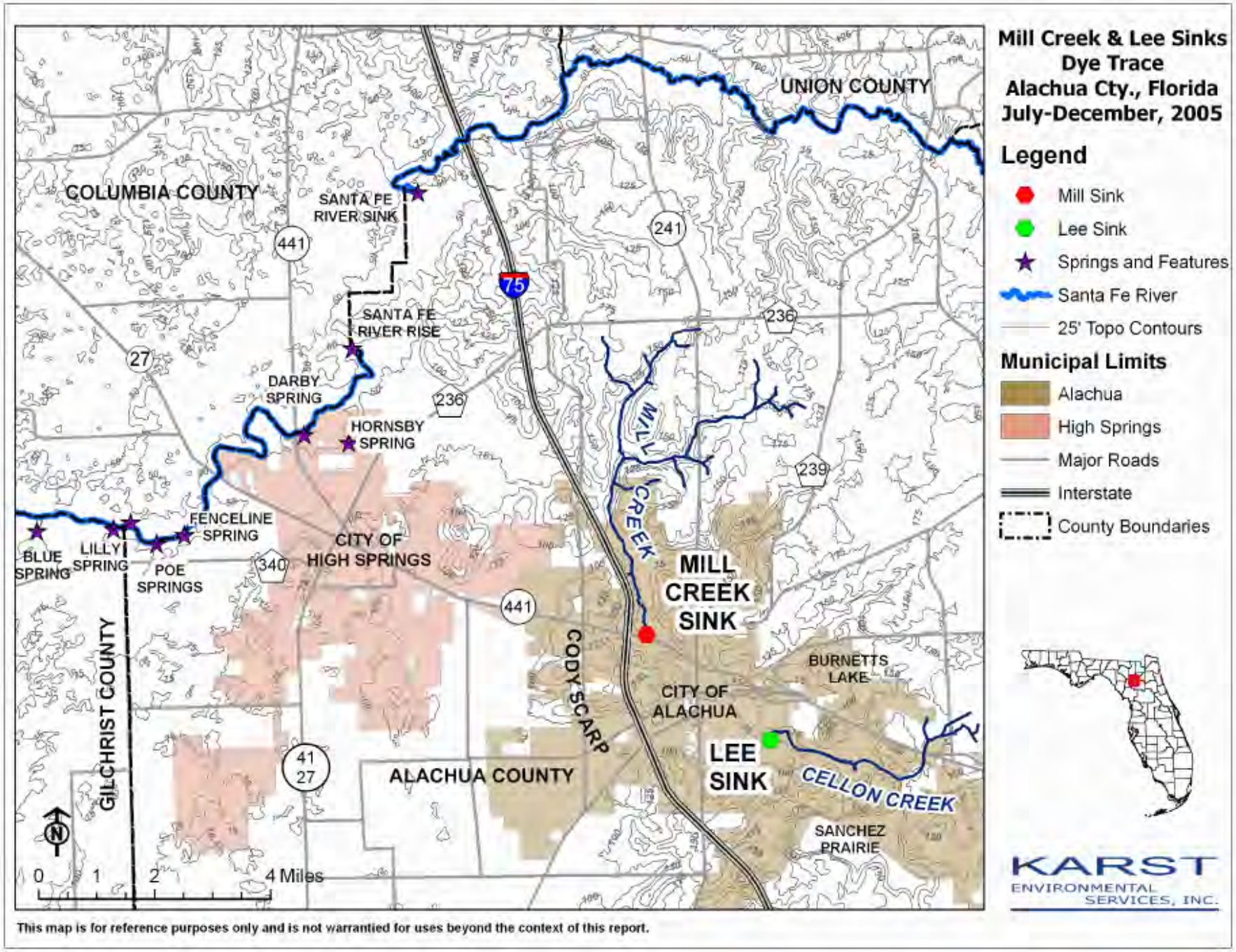


Figure 1. Location and General Vicinity Map.



Study Area Surface Features Map.

Figure 2.

HYDROGEOLOGIC SETTING

The study area falls in the Northern Highlands Marginal Zone, the Western Valley and the High Springs Gap. " The Northern Highlands are separated from several ridges of the Central Highlands of the Florida peninsula…the Northern Highlands are separated from the northern end of the Brooksville Ridge only by the High Springs Gap some 12 miles across… All of the Highlands seem to be dissevered remnants of a once continuous residual highland" (White, 1970). "The topographic character of the Northern Highlands east of the Suwannee River is various…In general the terrain is maturely dissected in a gentle rolling manner for some 10 to 20 miles back from the toe of the (Cody) scarp zone… In the flatter undisected parts of the area toward the north, streams in general have little freeboard and flow in shallow channels essentially at the level of the surrounding terrain. In the dissected peripheral zone (dye trace study area) … the streams trend to be incised and with surprising frequency go underground into cavernous subterranean avenues as they approach the toe of the scarp" (White, 1970).

This study focuses on features located within this transition area: Mill Creek Sink, Lee Sink, Hornsby and Darby Springs, the Santa Fe River Sink and Rise, Poe Springs, and other springs on the Santa Fe River. Figure 2 provides a partial copy of the topographic map (25 foot contour interval) of the study area. Figure 3 provides a physiographic map, modified from Williams, 1977, in which the study area is located. The Northern Highlands Marginal Zone is characterized by layers of undifferentiated sediments overlying clayey sediments of the Hawthorn Group. This association of overlying sediments and limestone bedrock leads to a well defined system of streams which disappear into sinks as the streams approach the toe of the (Cody) scarp and the Hawthorn Group materials are thin and are breached by sinkholes. The Western Valley is a subdued limestone plain overlain by a thin mantle of soil and residual hills containing remnants of Hawthorn Group sediments.

The Alachua Stream System is located in the vicinity of the City of Alachua, and is a stream system dissected by the formation of sinkholes. Figure 4 provides a map of the Alachua Stream system (Williams, 1977). The system of multiple disappearing streams drains a basin of over 70 square miles. The system as a whole contains more than ten swallet holes that divert water underground and directly recharge the Floridan aquifer. The Alachua Stream System includes Mill, Cellon, Turkey, and Blues Creeks, Townsend Branch, Bad Dog Branch and others. Sinkhole and other features here include Mill Creek, Lee, Splitrock and Big Otter Swallets, and Burnetts Lake and Sanchez Prairie. Both Mill Creek and Cellon Creek emanate from and drain portions of the Northern Highlands. These creeks disappear near the Cody Scarp and the karst terrain of the Western Valley.

Investigation by Macesich, 1988 provides an interpretation of the aquifer pollution potential in Alachua County and names this transition area where streams are captured the perforated zone. "The perforated zone trends (from the northwest) southeastward in a variable, one-to-five mile wide band roughly paralleling Interstate 75. Sediments underlying the perforated zone may contain substantial thickness of clays, but are perforated by numerous karst features. These features allow direct hydraulic access to the aquifer" (Macesich, 1988).

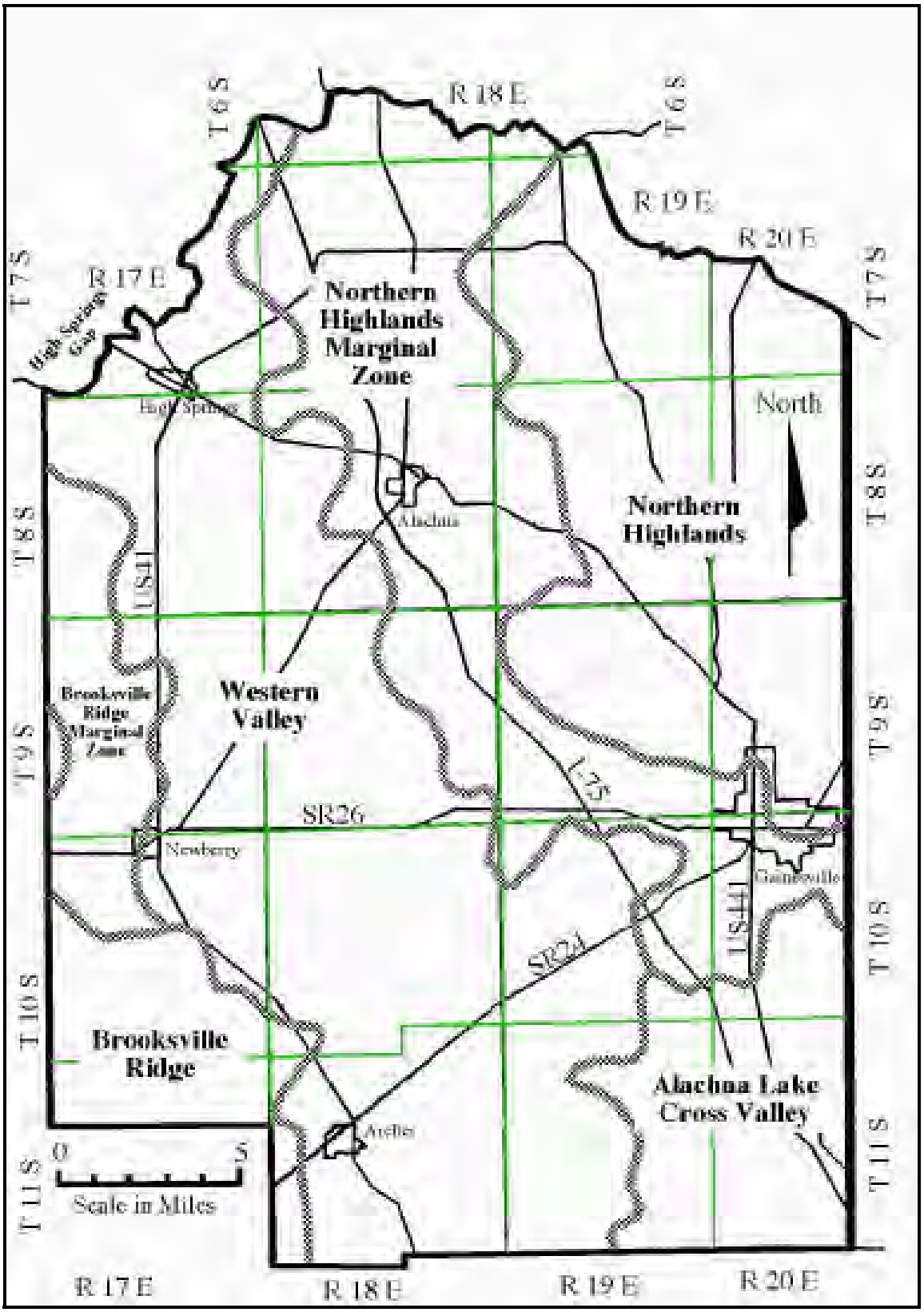


Figure 3. Physiographic Zones, Western Alachua County (after Williams, 1977, Modified).

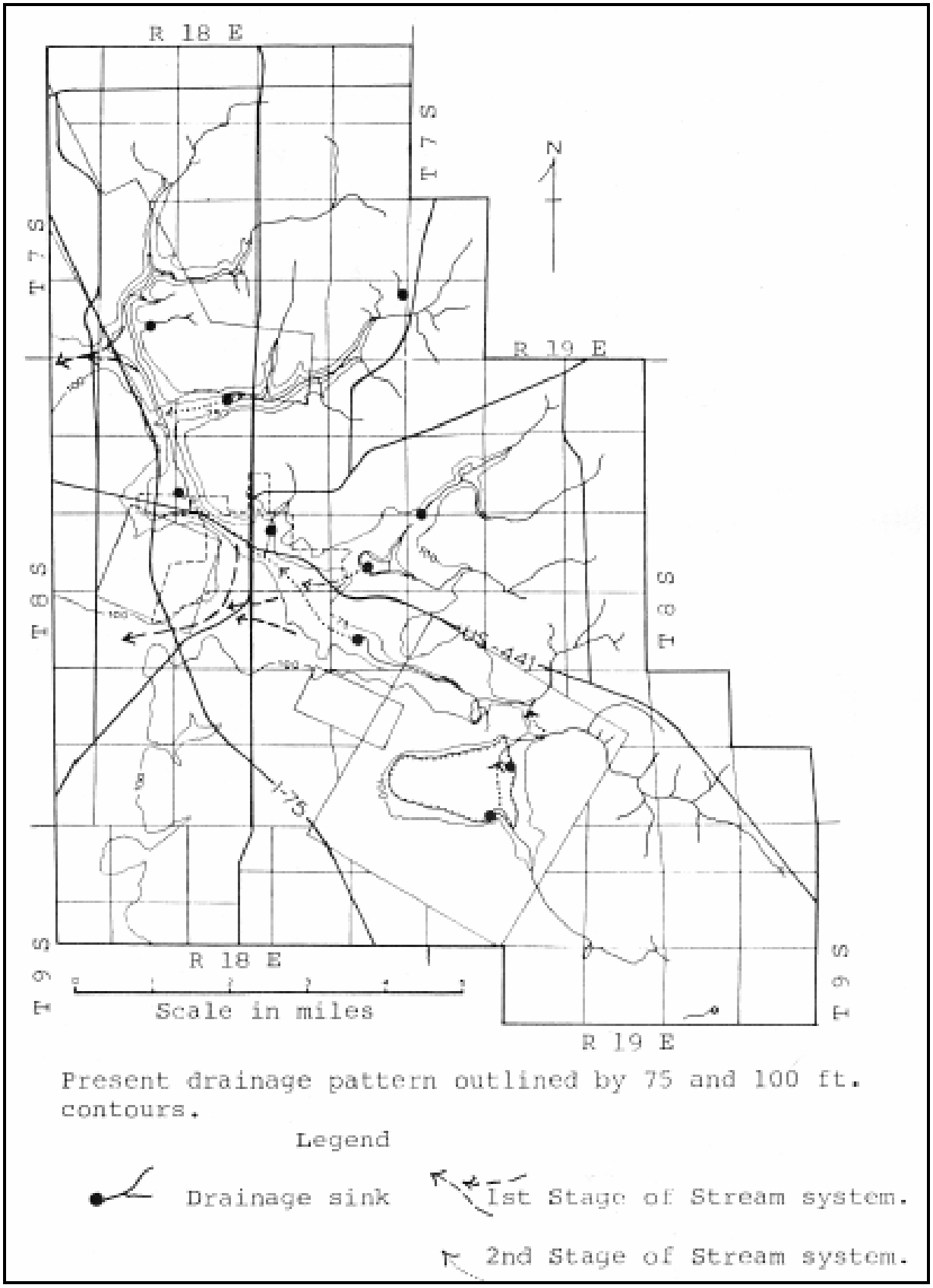


Figure 4. Alachua Stream System. Figure is from Williams, et.al., 1977; Florida Bureau of Geology Report of Investigations No. 85.

Figure 5a provides a stratigraphic column for the study area and Figure 5b provides a hydrostratigraphic column applicable for the area. In the study area, undifferentiated sediments composed of sands and clayey sands, overlie a thin to absent Hawthorn Group. The Eocene-aged Ocala Limestones (formerly "Ocala Group") underlie the entire area. The undifferentiated sands and clays are of varying thickness and are found at the surface in both the Northern Highlands and the Gulf Coastal Lowlands. These sediments are predominantly fine and medium sands and contain discontinuous lenses of clayey sands.

The Hawthorn Group underlies the undifferentiated sediments in the Northern Highlands and is reported to be between 60 and 150 feet thick. The erosional front of the Hawthorn Group is termed the Cody Scarp and defines the boundary of the Northern Highlands and the Western Valley Gulf Coastal Lowlands.

The Hawthorn Group is comprised of clays, phosphatic sands, limestone and dolomite. In areas where the Hawthorn Group is sufficiently thick it forms the intermediate aquifer system and intermediate confining bed. The Hawthorn Group as a whole behaves as an aquitard overlying of the Floridan aquifer. In the study area the Hawthorn Group is thin to absent and where present behaves as an aquitard perching water above the regional water table, the potentiometric surface of the Floridan aquifer.

The Floridan aquifer is the only aquifer present through the entire study area. The aquifer is composed of fractured and cavernous limestones and is approximately 1,300 feet thick in the study area. The direction of groundwater flow is to the northwest toward the Santa Fe River.

In the Western Valley, High Springs Gap and the Gulf Coastal Lowlands erosion removed much of the sediments younger than the Eocene-aged Ocala Limestone and subsequent deposition created the thin veneer of undifferentiated sediments, sands and clayey sands, overlying the limestones.

The dominant structural features present in the study area are joints. Joints are vertical breaks, fractures in the limestone, that have shown no displacement. These structures provide flow paths for the movement of water in the subsurface. The joints and bedding planes present in the limestone erode and chemically dissolve by the circulation of water within them to form (secondary porosity) caverns and solution channels. The caverns and solution channels over time enlarge and become the dominant groundwater flow paths within the limestone.

Structurally the study area is impacted by the Ocala platform (formerly "uplift") . "The crest of the uplift is extensively fractured…The western part of Alachua County is on the northeastern flank of the Ocala uplift" Williams, 1977). The Cross-County Fracture Zone is a "lineation of karst solution features within Alachua County that extends from Orange Lake to the south, northwest to the Santa Fe River Sink in a direction of N 40 W" (Williams, 1977). Figure 6 provides a map of the cross Cross-County Fracture Zone presented by Williams, 1977. The drainage sinks and discharge mapped by this investigation occur in the Cross-County Fracture Zone.

System	Series	Formation
Quaternary	Holocene	Undiferentiated Sands and Clays
	Pleistocene	
Tertiary	Pliocene	
	Miocene	Hawthorn Group
	Oligocene	absent
	Eocene	Ocala Limestone
		Avon Park Formation

Figure 5a. Stratigraphic Column for the study area. Figure is adapted from Hoenstine, et.al., 1991; Florida Geological Survey Special Publication No. 33.

Hydrostratigraphic Unit	Geologic Unit	Series
Surficial aquifer system	undiferentiated terrace, marine and fluvial deposits	Post-Miocene
Intermediate aquifer system or Intermediate confining unit	Hawthorn Group	Miocene
Floridan aquifer system	Ocala Limestone	Eocene
	Avon Park Formation	

Figure 5b. Hydrographic correlation chart for the study area (modified from Southeastern Geological Society Ad Hoc Committee, 1985). Figure is adapted from Hoenstine, et.al., 1991; Florida Geological Survey Special Publication No. 33.

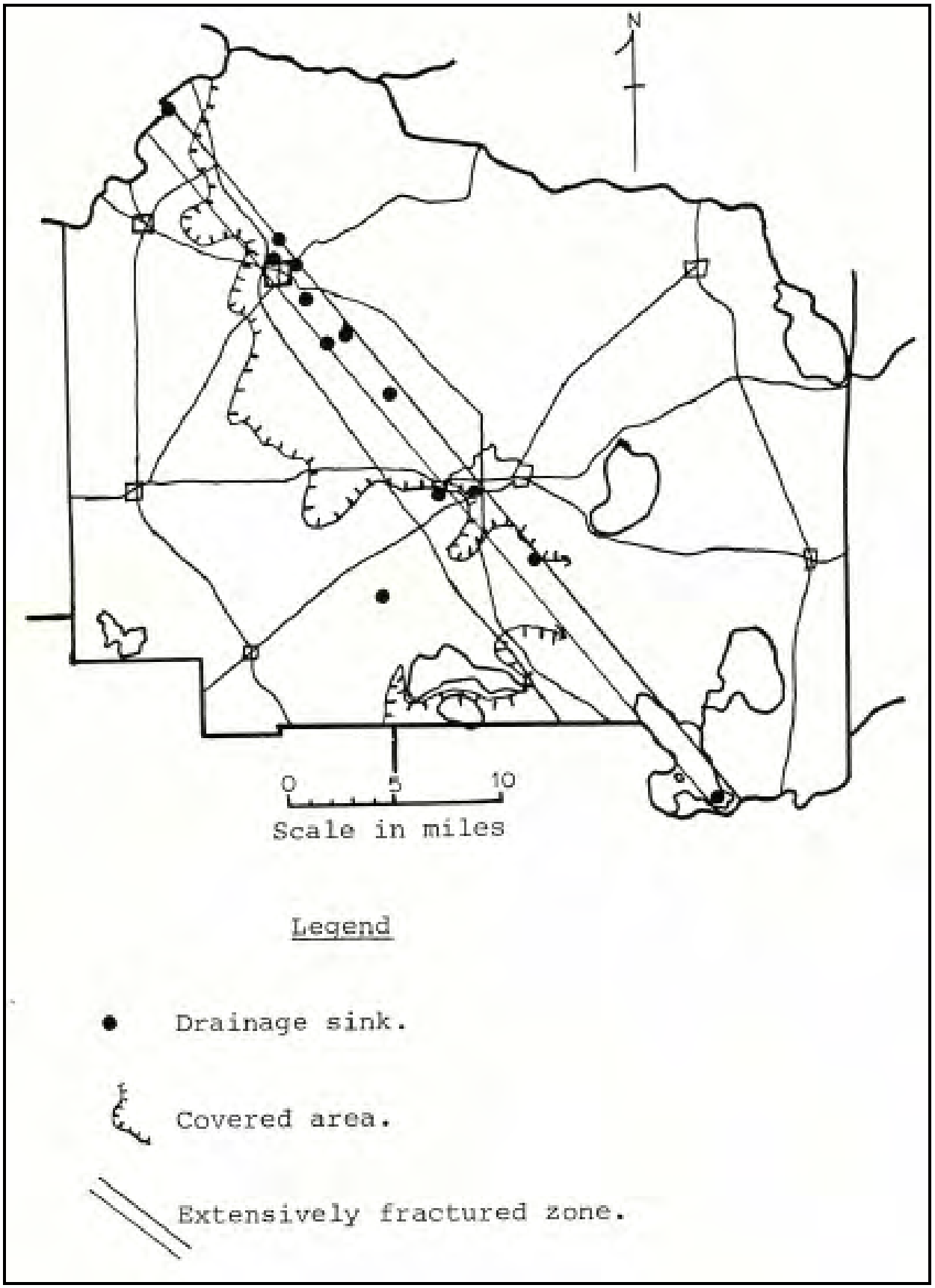


Figure 6. Cross-County Fracture Zone. Figure is from Williams, et.al., 1977; Florida Bureau of Geology Report of Investigations No. 85.

The Cross-County Fracture Zone originally formed as a result of fracturing related to the Ocala platform. In recent geologic time the fracture zone underwent extensive solution development in relation to runoff recharge flowing into it from the Northern Highlands. The Cross-County Fracture Zone is one of Alachua County's most prominent hydrogeologic features. In the county the fracture zone includes portions of the Santa Fe River (Sink and Rise), a large sink in Orange Lake 45 miles southeast of the Santa Fe River, Alachua Sink which is the predominant drain for Paynes Prairie, a number of sinks on the campus of the University of Florida, the Devils Mill Hopper and the Alachua Stream System which includes the sinks investigated in this report. The Cross-County Fracture Zone receives much of the runoff generated from the northeastern half of Alachua County.

The project area is completely underlain by the Floridan aquifer. Figures 7a and 7b provide recent potentiometric surface maps of the area. The thin veneer of undifferentiated sediments do not provide for the formation of the Surficial or Intermediate Aquifer systems, nor do they form a confining layer over the Floridan aquifer. In the study area, the Floridan aquifer is unconfined. The potentiometric surface of the aquifer and the water table are the same. The disappearing streams flow directly into the Floridan aquifer.

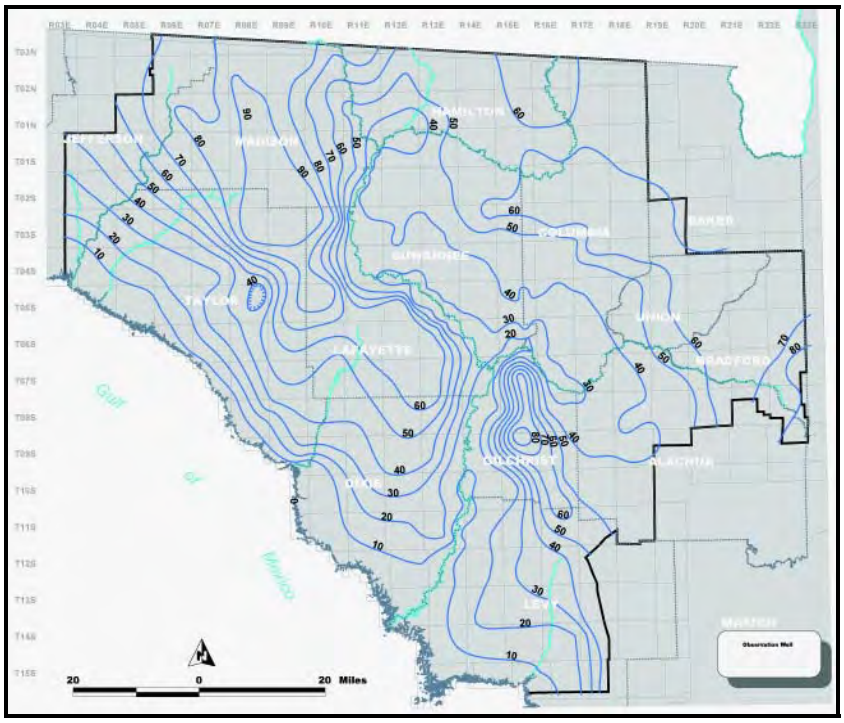


Figure 7a. Potentiometric Surface of the Upper Floridan Aquifer in the Suwannee River Water Management District, May 2005 (SRWMD, 2005).

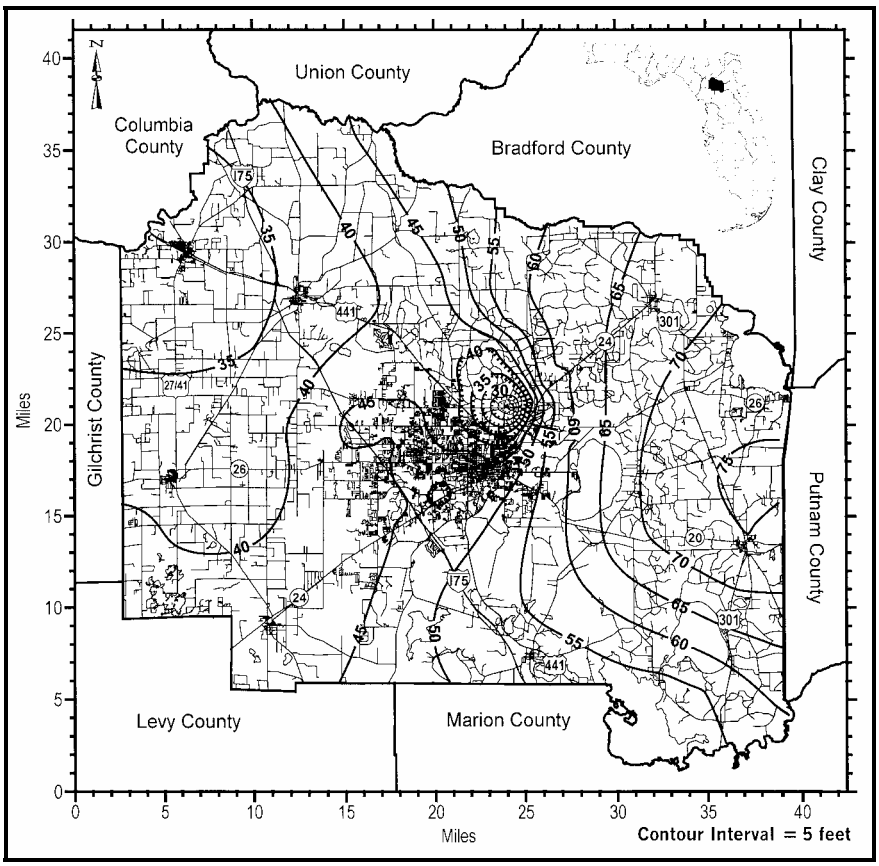


Figure 7b. May 2004 Floridan Aquifer potentiometric surface map in Alachua County (ACEPD, 2005).

DESCRIPTION OF THE STUDY AREA

All features discussed within this report are located within Alachua County with the exception of "The Crack" and Twin Cypress Springs, which are located in Columbia County, and Lilly, Pickard and Blue Springs, which are located in Gilchrist County. Please refer to Figure 2.

Water depths presented in the following descriptions are approximate, and represent the conditions usually encountered by divers during normal water levels in these locations. The variation in the levels of the water table, creeks and the Santa Fe River will affect depth gauge readings. There are also minor variations between the individual depth gauges used.

Mill Creek Sink, Swallet and Cave

Mill Creek Sink and Swallet are the present day endpoints of Mill Creek. Mill Creek and its northern tributary, theTownsend Branch, currently drain about 13 square miles northwest of the city of Alachua. The Mill Creek drainage was part of the ancient Alachua Stream System (Williams, et.al., 1977). See Figure 4. This formerly integrated surface drainage system has been reduced to localized segments that end at swallets, including Mill, Lee, Splitrock and Big Otter swallets and Burnetts Lake. Mill Creek Sink and Swallet were the most downstream of these drainage features.

Mill Creek is an ephemeral stream with highly variable flow. It drains into a large, closed basin with several ponds, and flows through a cypress swamp and into Mill Creek Swallet. See Plate 1. The swallet connects to the Sink via an underground passage, about 200 feet long, and running at a depth of about 40 feet. This passage opens into the north side of Mill Creek Sink's large vertical passage. See Figures 8 and 18.

Mill Creek Sink, located on the north side of State Highway 441, is within 100 feet of that roadway, and the water surface is typically about 35 feet below the sinkhole rim. See Plate 2. Mill Creek Sink and Swallet are owned by the National Speleological Society (NSS), and with the surrounding property, comprise the NSS' Mill Creek Sink Nature Preserve. The NSS has installed stairs to allow divers to access the sink.

The large vertical passage, or cavern, within Mill Creek Sink is the beginning and entrance into Mill Creek Sink Cave. This cavern continues to a depth of 150 feet, where a junction divides the cave conduit into upstream and downstream passages. See Plates 3 and 4. The upstream conduit continues to the northeast from the junction for about 40 feet, where it opens into a large room. This room spans about 50 feet across and the ceiling reaches a water depth of about 70 feet. A large, partially eroded bank of clay on the floor is the salient feature dominating this room. See Plate 5.

The passage continues beyond this room, narrowing to about 10 feet wide by 7 feet high. It then opens into a second room, about 30 feet wide by 15 feet high by 50 feet long. The passage again narrows until it reaches a third room. Beyond this point, passage dimensions get smaller, and two drops in cave depth are encountered, the first to 185 feet deep, followed within 400 feet to a drop to 215 feet. The cave passage has several branches at this point, and becomes complex. The present limit of exploration and survey is in this area. Plate 6 shows passage typical of the upstream cave.

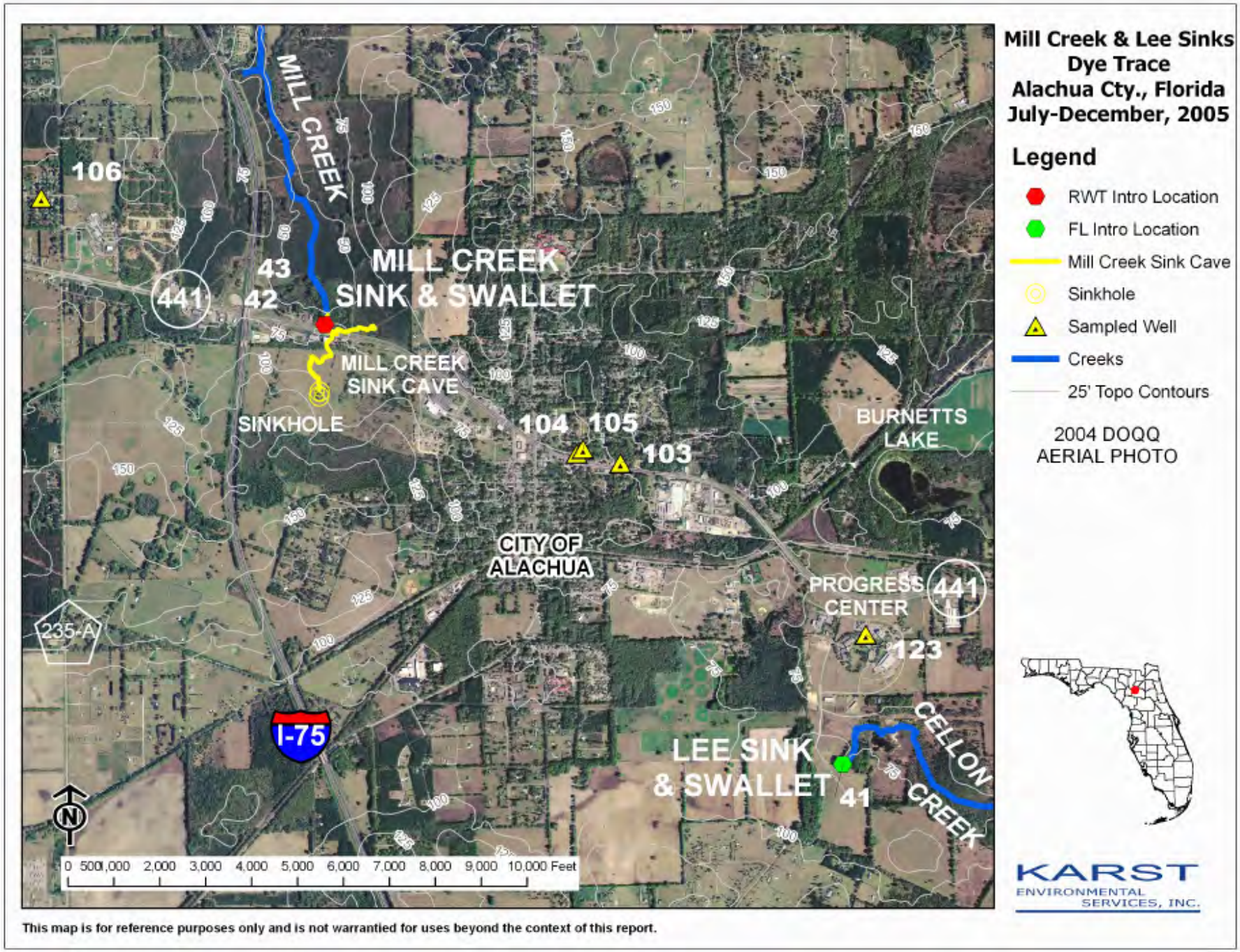


Figure 8. Mill Creek Sink Cave and Lee Sink

The downstream passage drops quickly from 150 feet deep at the junction to 190 feet deep. After a short distance (30 feet) it continues back up along a sediment bank to a depth of 120 feet, where the passage levels off. It continues at that depth for about 100 feet and then drops to 160 feet and into a section of passage known to divers as the "Subway". Beyond the Subway, the cave rises to a depth of 100 feet and runs at that depth for 300 feet until it again descends into a narrow passage about 200 feet deep. This passage continues for about 150 feet until it reaches a section that has a ceiling with narrowing walls that extends upwards to a water depth of 70 feet. There is also a breakdown or debris pile here. This section opens into the "Terminal Room", and is a complex section of this cave. This subterranean room has been recently identified through the use of a radiolocation device to be in the vicinity of a sinkhole on the surface. See Plate 7. Beyond the Terminal Room, the cave splits into three distributary passages. This area represents the present extent of exploration of the downstream section.

Lee Sink and Swallet

Lee Sink is the surface endpoint for Cellon Creek, and lies at the western end of the San Felasco Hammock State Preserve. See Figure 8 and Plate 8. The area collectively referred to as "Lee Sink" is composed of two features: the swallet where the incoming flow from Cellon Creek flows underground and the large sink immediately to the west of the swallet. These features are separated by a ridge. Casual observations during this dye trace indicated that when the swallet water level was high, the sink level was lower. There was always water in the sink.

For the purposes of this study, references made herein to Lee Sink specifically refer to the swallet portion. The swallet was the point of dye introduction. During late November, Cellon Creek ceased to flow into the swallet, and many of the normally submerged features there were exposed. See Plate 9. Two "peninsulas" jut in from both sides of the channel around the active section of the swallet, and may be man-made. It was speculated that the materials in these features were brought in to create a barrier to retard flow into the swallet, probably for agricultural water needs. This barrier is now breached, and the water flows freely into the swallet. Eyewitness accounts from prior droughts indicate that the depression in the bottom of the swallet dries up but remains covered with a mantle of alluvium.

Santa Fe River

The Santa Fe River was the primary axis for almost all of the natural features sampled during this dye trace. The portion of the Santa Fe River that was included in this study ran from just above the river sink at O'Leno State Park to the river rise (about 3 miles of natural bridge) and then downstream to Blue Springs in Gilchrist County (about 10 river miles). The river is the discharge point for all springs monitored during this study.

This river is the boundary between Alachua County and adjacent Gilchrist County on its east and southern banks, and Columbia County on its north bank. The bridges for State Highways 27 and 441 cross the river within the study site, west of the City of High Springs. The SRWMD water level gauge and recorder at the Highway 441 bridge location was utilized in this study. See Plate 10.

The Santa Fe River contains many unique features in the study area, including: the river sink, natural bridge and rise at O'Leno State Park; several river swallets and rises; and, numerous springs including Hornsby, Darby, Poe, Watermelon, Fenceline, Twin Cypress, The Crack, and

Lilly Springs. During periods of low water, this river receives most, and sometimes all, of its water from groundwater sources.

Hornsby Spring and Cave

Hornsby Spring is located on the southeast side of the Santa Fe River, with 4,200 feet of run to the river. See Plate 11. It lies within Camp Kulaqua, a privately-owned park northwest of the city of High Springs. Hornsby Spring is classed a first magnitude spring, with discharges measurements as high as 250 cubic feet per second (CFS) (Scott, et.al., 2004). The spring itself is the recreational waterfront for the park. It flows from a 35 foot deep pool surrounded by limestone ledges. The water is clear, but tends to be greenish and sometimes dark-brown in color. The run flows out into a bottomland swamp towards the Santa Fe River. Some of the water in the run enters at least four known swallets. There are two swallets, one of which is known as Treehouse Swallet, that share a cave system that has been explored by divers. This cave is extensive and runs towards the river, but with no known point of discharge. Two more swallets with relatively short caves are located further down the run. One of these discharges is at Treehouse Spring on the Santa Fe River, and the other discharges back into the lower section of the Hornsby Spring Run.

The spring is fed by a network of cave passages that have been explored and surveyed by cave divers since the 1970's. See Figure 9. Near the spring, the passage runs south and then east, where a passage splits off of the main passage and runs south. The main passage continues to run east for 1,400 feet to a large sink. This sink is open to the cave, and is often used as an entry point for explorers. This main cave passage continues to run east for about 900 feet where it splits into a north and south passage. These passages continue to run east, beyond County Road 236.

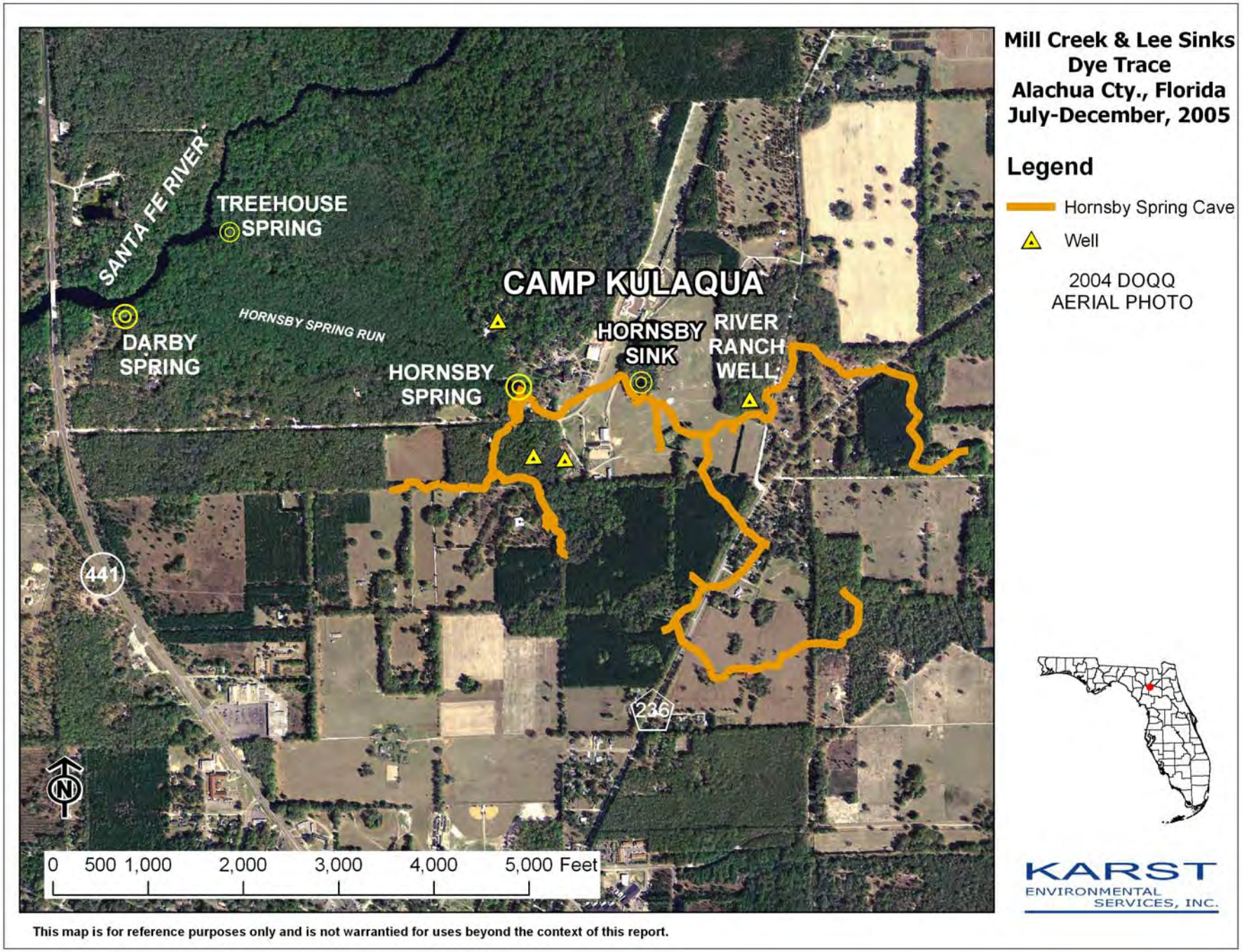
Darby Spring

Darby Spring is located on the south bank of a small island in the Santa Fe River, about 800 feet upstream from the Highway 441 bridge. See Plate 12. The spring opens to a channel on the south side of the island. This channel is part of a man-made system that is connected further upstream to the Hornsby Spring Run. The property on the south bank is owned by Camp Kulaqua.

This spring has no noticeable discharge, and is reported by cave divers to be colder than any other area springs. It opens to a small, winding passage that runs beneath the island, looping west and then back east for over 3,000 feet to beneath another small un-named spring on the Columbia County side of the river. This un-named spring is located about 350 feet northeast of Darby Spring, and has been given the catalog number of COL428981 by the Suwannee River Water Management District (SRWMD). Observations made by cave divers indicate that this smaller spring may also function as a swallet at higher river levels. The cave passage runs at depths of 60 to 80 feet deep, and is very silty.

Poe Springs Area

Poe Springs is the largest spring of a group of springs along the Santa Fe River that lie 2.5 to 4 miles west of High Springs. These springs all have a greenish color to their waters, suggesting an influence by tannin-stained surface waters. Except for Poe Spring and "The Crack", none of these springs are known to have any enterable cave passage.



Hornsby Spring Cave Map.

Figure 9.

Poe Springs is located within Poe Springs County Park, and is the focus of recreation activities there. See Plate 13. It has a 120 foot diameter circular head pool, with a depth of about 19 feet. There are numerous vents in the exposed limestone bedrock within the head pool area. A small, restrictive cave has been explored for about 50 feet, to a depth of about 50 feet. A 75 foot run flows to the Santa Fe River. Poe Spring's discharges have been measured as high as 93.1 CFS, and as low as 6.1 CFS (Scott, et.al., 2004). The water is clear, but tends to have a greenish color.

Other springs within the park include Watermelon Spring, located about 300 feet west of Poe Spring Run. This small spring discharges into a long run that flows west and parallel to the river. Watermelon Spring #2 is a much stronger spring located on the bottom of the Santa Fe River, just out from the riverbank near Watermelon Spring. This vent produces a noticeable raised boil on the surface of the river under normal water conditions.

Upstream of Poe Spring, there are three springs identified for this study. Fenceline Spring is about 2,600 feet upstream of Poe, and discharges from the bottom of the river near the Alachua County side. "The Crack" spring is located on the Columbia County side, about 1,000 feet upstream of Poe Spring. It is a limestone fissure about 30 feet long and 30 feet deep. It has cave passages that have been explored for at least 700 feet, to a depth of about 60 feet. The cave passage is small, silty and is considered and advanced cave dive. Twin Cypress Spring discharges from the bottom of the river along the Columbia County bank, and is about 700 feet upstream of Poe Spring.

The run from Seven Sisters Spring discharges on the Columbia County side, about 3,500 feet down-river from Poe Springs. The Seven Sisters Spring is a complex group of vents that are located in the bottomland floodplain forest flanking the river, about 450 feet north of the river. The water discharged here is typically greenish-brown in color.

Lilly Spring and Pickard Spring are located 4,700 and 4,900 feet, respectively, downstream of Poe Spring, on the Gilchrist County side. Lilly Springs discharges waters with a greenish-brown color, while the waters at the nearly adjacent Pickard Springs appear to be less colored. Neither of these springs have explorable cave passage.

METHODS

Planning and Logistics

Key planning elements for this study included: the selection of appropriate dye introduction and sampling points; selection of dyes and quantity to be used; methods for dye recovery and analyses; observation and anticipation of weather and water conditions. Logistical concerns included: scheduling of staff, background sampling, dye release, and the collection, preservation and shipping of samples. Procedures generally followed those as outlined in the "Groundwater Tracing Handbook" (Aley, 1999) and "Procedures And Criteria - Analysis of Fluorescein, Eosine, Rhodamine WT, Sulforhodamine B, and Pyranine Dyes In Water and Charcoal Samplers" (Aley, 2003).

Weather and Water Conditions

The pre-conditions considered desirable for the success of this dye trace included falling river hydrographs and at least some inflow into the sinks selected for dye release. These desirable conditions were in place during July of 2005. Rainfall, that earlier in the year had raised river levels, ceased after mid-July. The total rainfall for July was measured at 5.98 inches; at least 75 percent of this amount fell during the first half of that month. The rainfall data cited here was provided by SRWMD (2006[1]), and was collected at the High Springs Forestry Tower, about six miles south of High Springs.

This previous rainfall had delivered enough water locally to maintain a flow from Cellon Creek into Lee Sink of 2.45 CFS, as measured on July 1. See Table 1. Santa Fe River levels peaked during mid-July, and began a slow drop as monitored at the Highway 441 bridge water level gauge (SRWMD, 2006[1]). This created optimal conditions for a late July or early August dye release.

Inflowing water conditions were present at Lee Sink Swallet during the dye introduction on July 26, 2005, even through the flow in Cellon Creek had dropped (0.11 CFS on July 27, 2005). There was no flow from Mill Creek into the Mill Creek Swallet on July 27, and evidence of only very minimal inflow was observed on a few occasions after that.

Rainfall was below average during the study, with 3.05 inches recorded for August, no rainfall recorded for September, 3.21 inches in October, and 1.95 inches recorded for November (SRWMD, 2006[1]). Cellon Creek maintained flow, measured once more by KES, at 0.39 CFS on October 5. See Table 1. After that, the water dropped significantly at Lee Sink. Levels dropped below the study staff gauge and the sink basin all but dryed up during late November and early December. See Plate 9.

Two routine discharge measurements were made by the SRWMD at Hornsby Spring during the study. The first was discharge measured was 190 CFS on August 24, 2005, and the second was 150 CFS, measured on October 11, 2005 (SRWMD, 2006[2]).

TABLE 1. WATER LEVEL and DISCHARGE MEASUREMENTS											
Mill Creek and Lee Sinks Dye Trace, Alachua County, Florida, July-December, 2005											
Summary Table of Water Level, Rainfall and Discharge Measurements Recorded During the Study.											
	441 Bridge		**Mill Creek Swallet**					**Lee Sink Swallet**			**Misc.**
		Gauge**	**Staff Gauge***			**Elevation**		**Staff Gauge***		**Elevation**	**Discharge**
Date:	**Time:**	**Reading:**	**Time:**	**Reading:**	**NGVD:**	**Difference:**	**Time:**	**Reading:**	**NGVD:**	**Difference:**	**Msmnts.:**
7/1/2005	14:00	33.32	-	-	-	**-**	13:35	2.02	**63.28**	**29.96**	**2.45 CFS***
7/13/2005	11:00	34.391	-	-	-	**-**	11:10	4.29	65.55	**31.159**	(Cellon Creek)
7/19/2005	12:00	34.199	11:42	2.43	39.11	**4.911**	11:53	4.11	65.37	**31.171**	
7/25/2005	14:00	33.57	-	-	-	**-**	14:04	3.4	64.66	**31.09**	
7/26/2005	11:00	33.48	12:04	2.4	39.08	**5.6**	10:48	3.3	64.56	**31.08**	
7/27/2005	14:00	33.41	11:45	2.41	39.09	**5.68**	14:30	3.11	**64.37**	**30.96**	**0.11 CFS***
8/1/2005	12:00	33.15	12:50	2.33	39.01	**5.86**	11:57	2.5	63.76	**30.61**	(Cellon Creek)
8/2/2005	16:00	33.18	15:32	2.35	39.03	**5.85**	-	-	-	**-**	
8/3/2005	14:00	33.18	17:59	2.41	39.09	**5.91**	14:25	2.18	63.44	**30.26**	
8/4/2005	17:00	33.16	17:00	2.41	39.09	**5.93**	-	-	-	**-**	
8/5/2005	14:00	33.18	-	-	-	**-**	13:50	1.9	63.16	**29.98**	
8/7/2005	19:00	33.26	19:15	2.41	39.09	**5.83**	-	-	-	**-**	
8/8/2005	14:00	33.34	-	-	-	**-**	13:50	3.1	64.36	**31.02**	
8/9/2005	14:00	33.381	13:53	2.38	39.06	**5.679**	-	-	-	**-**	
8/11/2005	16:00	33.461	-	-	-	**-**	16:15	3.15	64.41	**30.949**	
8/13/2005	18:00	33.381	18:05	2.36	39.04	**5.659**	-	-	-	**-**	
8/15/2005	16:00	33.23	-	-	-	**-**	16:30	2.98	64.24	**31.01**	
8/17/2005	17:00	33.1	17:27	2.34	39.02	**5.92**	-	-	-	**-**	
8/23/2005	16:00	32.869	**-**	-	-	**-**	15:45	2.17	63.43	**30.561**	
8/24/2005	12:00	**32.859**	**-**	-	-	**-**	-	-	-	**-**	**190 CFS****
8/26/2005	18:00	32.859	**-**	-	-	**-**	17:45	2.51	63.77	**30.911**	(Hornsby Spring)
8/29/2005	17:00	32.82	17:25	2.25	38.93	**6.11**	17:05	3.04	64.3	**31.48**	
8/31/2005	13:00	32.83	12:03	2.22	38.9	**6.07**	13:06	3.56	64.82	**31.99**	
9/2/2005	18:00	32.859	17:30	2.38	39.06	**6.201**	18:10	4.5	65.76	**32.901**	
9/9/2005	19:00	32.77	17:36	2.21	38.89	**6.12**	18:45	4.2	65.46	**32.69**	
9/16/2005	14:00	32.66	14:40	2.07	38.75	**6.09**	14:15	3.37	64.63	**31.97**	
9/23/2009	17:00	32.58	**-**	-	-	**-**	17:25	2.34	63.6	**31.02**	
9/30/2005	16:00	32.51	16:45	1.9	38.58	**6.07**	16:15	1.19	62.45	**29.94**	(Cellon Creek)
10/5/2005	15:00	32.5	16:32	1.93	38.61	**6.11**	15:00	0.25	**61.51**	**29.01**	**0.39 CFS***
10/11/2005	12:00	**32.82**	**-**	-	-	**-**	-	-	-	**-**	**150 CFS****
10/14/2005	14:00	32.779	14:03	1.78	38.46	**5.681**	13:52	1.99	63.25	**30.471**	(Hornsby Spring)
10/25/2005	13:00	32.49	13:47	1.62	38.3	**5.81**	13:30	0.84	62.1	**29.61**	
Study Averages:		**33.12**			**38.91**	**5.85**			**64.01**	**30.91**	
Monthly Rainfall Averages (2005)**				Lee Sink (Swallet) Staff Gauge:				Mill Creek Swallet Staff Gauge:			
(in inches)				6.60' on Gauge = 67.86'				6.60' on Gauge = 43.28'			
July:	**5.98**			0' on Gauge = 61.26'				0' on Gauge = 36.68'			
August:	**3.05**			Reference monument elevation = 67.92'				Reference monument elevation = 42.68'			
September:	**0**			Elevation data for staff gauges provided by Alachua County Public Works Department.							
October:	**3.21**										
November:	**1.95**										
(Rainfall recorded at the High Spring Forestry Tower.)											
Notes:	All elevations are NGVD 1929.			* Data Collected by KES.				** Unpublished data provided by SRWMD.			

Water Level Elevations

Water level elevations were monitored at the dye introduction sites and at river and spring locations to observe hydrologic gradients during the study. Prior to dye release, KES installed enamel staff gauges at each swallet. Alachua County surveyors then installed elevation benchmarks, and provided an elevation conversion for each staff gauge. Water levels on these staff gauges were recorded whenever the sites were visited during the study. The record of these levels through late October are presented in Table 1, where they are compared with the simultaneous levels of the Santa Fe River at the Highway 441 Bridge water level gauge and recorder, just downstream of Hornsby Spring (SRWMD, 2006[1]).

An average of readings taken during the study indicates that the water level at Mill Creek Sink was at an elevation of about 5-6 feet higher than the water level at Hornsby Spring. These readings also showed that the Lee Sink Swallet pool water level maintained an elevation of about 30-31 feet higher than the water level at Hornsby Spring.

Dye Selection

The dyes selected for this study were rhodamine WT and fluorescein. These dyes are the most economical of all available dyes and are used routinely throughout the United States for water tracing studies. Rhodamine WT and fluorescein dyes ultimately dissipate and deteriorate in the natural environment. When these are analyzed using a synchronous scan protocol they produce separate and distinct fluorescence peaks.

Dyes for this study were supplied by Ozark Underground Laboratory (OUL) of Protem Missouri. This is also useful as OUL performed all of the sample analyses for this study. For the dye obtained from OUL, the fluorescein is a mixture of 75% dye and 25% diluent, and the rhodamine WT is a 20% solution.

A large quantity of rhodamine WT was used at O'Leno State Park during a separate and un-related dye trace in June, 2005. It was anticipated that this dye would be flushed from the cave system and Santa Fe River by the start of this trace; the results of that trace and analyses of background samples taken after its completion indicated that this was the case.

Rhodamine WT, also called Fluorescent Red, has a color index name of Acid Red 388, and is available in liquid form. Rhodamine WT was chosen for release at Mill Creek Sink Cave. Twenty pounds of liquid in pre-measured containers were obtained from OUL.

Fluorescein, also called sodium fluorescein or uranine, has a color index name of Acid Yellow 73 and comes in a powder form. In high concentrations, this dye will appear bright green under sunlight or in a beam of artificial light. Fluorescein was selected for release at Lee Sink. Fluorescein is known to have the greatest resistance to adsorption onto inorganic materials, show up better in wells, and perform better in low flow areas. Twenty pounds of powder in pre-measured containers were obtained from OUL.

Dye Release

Both dyes were released on Tuesday, July 26, 2005 (Day Zero). See Plate 14. The first dye introduction was done at Lee Sink Swallet. The weighted end of a hose was placed on the bottom of the swallet basin, and a large funnel used at the upper end to receive the dye. Twenty pounds of pre-measured fluorescein was mixed and poured via the hose into the dye introduction point beginning at 10:06 hours. Jugs of water were used to chase residual dye from the funnel and hose used for dye introduction, with release and cleanup completed by 10:30 hours. A plume of dye was visible on the surface for a relatively short period of time, with all visible traces of the dye gone by 14:00 hours, indicating that the dye had been successfully pulled underground with the incoming water from Cellon Creek.

Twenty pounds of rhodamine WT liquid, from twenty, one-pound containers was introduced into the dye introduction tube at Mill Creek Sink at 11:34 hours. See Plate 15. A system of tygon tubing previously placed by cave divers for this purpose was used to deliver the dye to the intersection of the entrance cavern and cave passage at approximately 150 feet of depth, where the dye flowed into the downstream passage. A small pump was used to assist the introduction of the dye. Jugs of water were used to chase residual dye from the mixing bucket, pump and hose used for the dye introduction. Dye release and cleanup was completed by 12:18 hours. Residual dye remained in the tubing, but no significant amount of dye was released into the sink basin.

At both dye release sites, all containers, bags, personal protective equipment and other dye-contaminated materials were collected and sealed in trash bags for proper disposal or cleaning. A mild bleach spray was used to further eliminate any dye contamination on equipment and surfaces, and all personnel involved did not have contact with any sampling sites, devices, or samplers until they had fully bathed, changed clothing and otherwise removed all traces of any residual dye.

TABLE 2. DYE INTRODUCTION SITES LOCATIONS and DISTANCES.

Mill Creek and Lee Sinks Dye Trace, Alachua County, Florida, July-December, 2005

		GPS Coordinates*			
	Station	DECIMAL MINUTES		Distance From:	
STATION NAME:	Number	LATITUDE	LONGITUDE	Mill Creek Sink	Lee Sink
Lee Sink Swallet	**41**	N 29° 46.448'	W 82° 28.413'	2.82 Miles	-
(ridge between sink and swallet)					
Mill Creek Sink/Swallet	**42**	N 29° 48.079'	W 82° 30.518'	-	2.82 Miles
(ridge between sink and swallet)					
Mill Creek Sink Cave Entrance	**43**	N 29° 48.079'	W 82° 30.518'	-	2.82 Miles
Sinkhole in vicinity of "Terminal Room"	**-**	N 29° 47.803'	W 82° 30.542'	1750 Feet	2.64 Miles
(Determined from in-cave radiolocation.)					

*From hand-held GPS positions taken during this study, WGS 84 Map Datum; distances are estimated from these positions.

Sampling Procedures

Charcoal packets and water sample vials were used to sample for the presence or absence of dye. Charcoal packets, containing activated carbon, were used to accumulate dye at a sampling station through the sampling interval. Analysis of the charcoal packet indicates the presence or absence of dye during that sampling interval. The packets are especially useful for performing initial qualitative traces, if the dye is present in very small concentrations, and to monitor sites with a low sampling frequency.

Charcoal packets supplied by OUL are envelopes of fiberglass window screen about two inches by four inches in size, filled with 4.25 grams of Barneby and Sutcliffe activated coconut shell carbon, size 6 to 12 mesh. The packets are heat-sealed.

At spring sites, bricks or similar weights with a large loop of stiff wire were used to secure the charcoal packets. These allowed for maximum exposure of the packet to the water flow. These samplers were either lowered into position underwater with a length of cord, or placed directly by wading or snorkeling. Efforts taken to conceal the samplers from disturbance or vandalism were successful; very few were disturbed during the study, and two were destroyed by animals.

At water-well sample stations, water was routed through a specialized PVC packet holder that facilitated packet change-out. Water flow through the holder was controlled with a gate valve, and one-way valves that prevented backflow were used as appropriate on any public water supply. The packet holders were connected upstream of any chlorinators. Water would flow through these holders only when the pump was in operation; only two wells allowed for the use of a continuous flow. Plate 16 shows the River Ranch Well (Station 111) set up for sampling.

Whirlpak® bags were used to isolate, transport, and store charcoal packets between sample locations. Each Whirlpak® bag was labeled with the sample station number. The sample station number, location, date, and time for each sample was recorded on the Sample Collection Data Sheet. Samples were isolated from sunlight in the field to prevent photodegradation of the dye.

Water samples were collected simultaneously with each charcoal packet change-out in plastic vials supplied by OUL. Analysis of the water samples will yield the concentration of dye in that water, at that location, at that point in time.

As this was a qualitative trace, analysis of the charcoal packets took priority; the water samples collected provided a back-up for the charcoal packets.

A suitable number of background samples (both charcoal and water) were collected at each sampling station to show conditions prior to any release of dye. These were available as needed for analysis. Background samples from Hornsby Spring and the River Rise were analyzed prior to dye release, and confirmed the absence of any dye that might bias sampling results. None of the other background sampler packets were analyzed because the results of any dye-positive stations were preceded by dye-negative sampler packets collected after the dyes were released. These dye-negative samplers functioned as de-facto background samples.

All samples were shipped to OUL via Federal Express, with a Sample Collection Data Sheet that was signed and returned by OUL Staff, providing a chain of custody from KES to OUL.

Sampling Frequency and Intervals

Background sampling was typically conducted in rounds of at least one week. After dye release, samples were collected at varying intervals for each category of site. Intervals used were typically semi-weekly (twice per 7 day period) or weekly (once per seven day period). Daily sampling was used at a few selected stations early in the trace, and multi-weekly intervals were used at some locations late in the trace.

As Hornsby Spring was the primary focus of this dye trace, samplers here were collected at more frequent intervals. This included a daily sampling station, along with semi-weekly intervals at most stations in this area. The semi-weekly sampling rounds continued to about Day 60, with weekly sampling continuing past Day 90. Multi-week sampling intervals continued until Day 179, the termination of the study. The River Ranch Well (Station 111) was sampled semi-weekly though Day 31, and then weekly until Day 66. Darby Spring and the other Camp Kulaqua wells were sampled at weekly intervals beyond Day 60.

The selected vents at Poe Springs and Watermelon Spring #2 were sampled on a semi-weekly basis through Day 59. Weekly sampling then continued to Day 79. Sampling at Poe Spring Run was performed weekly from Day 15 through Day 88. The surrounding upstream and downstream Poe-area springs, and Blue Springs, were sampled on a weekly basis until Day 59.

Municipal wells at three sites were sampled on a semi-weekly basis for at least 30 days. Weekly sampling continued at these sites beyond Day 66. Private wells were sampled weekly until Day 66.

Sampling stations at the Santa Fe River Sink and Rise, and at the three river locations, were sampled on a weekly basis until Day 71.

Water sampling was performed at Mill Creek Sink to observe for the fluorescein dye released to the east at Lee Sink. The injection line used to release the rhodamine WT into the cave was pumped and sampled on a nearly daily basis until Day 24, and for two additional intervals until Day 45.

The Sample Collection Data Sheets and the OUL Certificate of Analysis sheets show the exact placement and collection times for each specific sample.

Sampling Locations

Samples were collected at the following numbered stations. See Figures 10 and 11, and Tables 3 and 4. Specific information relative to each of the sites is presented, along with the number and name assigned to them during this study.

Hornsby Spring Area (Camp Kulaqua)

1) Hornsby Spring Main: Initially, the packet holder was placed on the bottom of the spring pool to the left of the diving area and tethered with a cord attached a tree on the bank. It was later moved to the floating deck were it was suspended in mid-water by a cord.

2) Hornsby Spring Canoe Landing: This station functioned as a back-up and quality control station for Station 1. The packet holder was placed on the run bottom and tethered with a cord attached to the upstream end of the canoe launch dock.

3) Hornsby Spring Daily: Charcoal and water samples were collected here at least once per day during the first eighteen days of the trace. The packet holder was suspended in mid-water from the floating dock by a cord.

4) Darby Spring: The packet holder was lowered into the entrance of the cave and tethered with a cord attached to the bank. This station was serviced by snorkeling.

5) Hornsby Spring South: This station was established after the trace began to monitor any differences in the south cave entrance. The packet holder was placed on the spring pool bottom in the south cave entrance, and tethered with a cord attached to the deck.

Poe Springs Area

11) Poe Spring (Shallow Vent): The packet holder was placed inside of a small, shallow vent on the east side of the spring pool. It was hidden from view, and not tethered. This station was serviced by snorkeling.

12) Poe Spring (Gauge Vent): Analysis of samples collected at this spring was contingent on the results of the Poe Springs Shallow Vent or Run. The packet holder was placed inside of a vent in front of the water level recorder on the west side of the spring pool. It was hidden from view, and not tethered. This station was serviced by snorkeling.

13) Watermelon Spring #2: Analysis of samples collected at this spring was contingent on the results of Poe Springs. The packet holder was placed inside of a vent on the bottom of the river. It was hidden from view, and not tethered. This station was serviced by snorkeling.

17) Poe Spring Run: This station was established after the trace began to provide better collective monitoring of the Poe Springs vents. The packet holder was wired to the base of a sign on the east side of the lower end of the spring run. This station was serviced by snorkeling and wading.

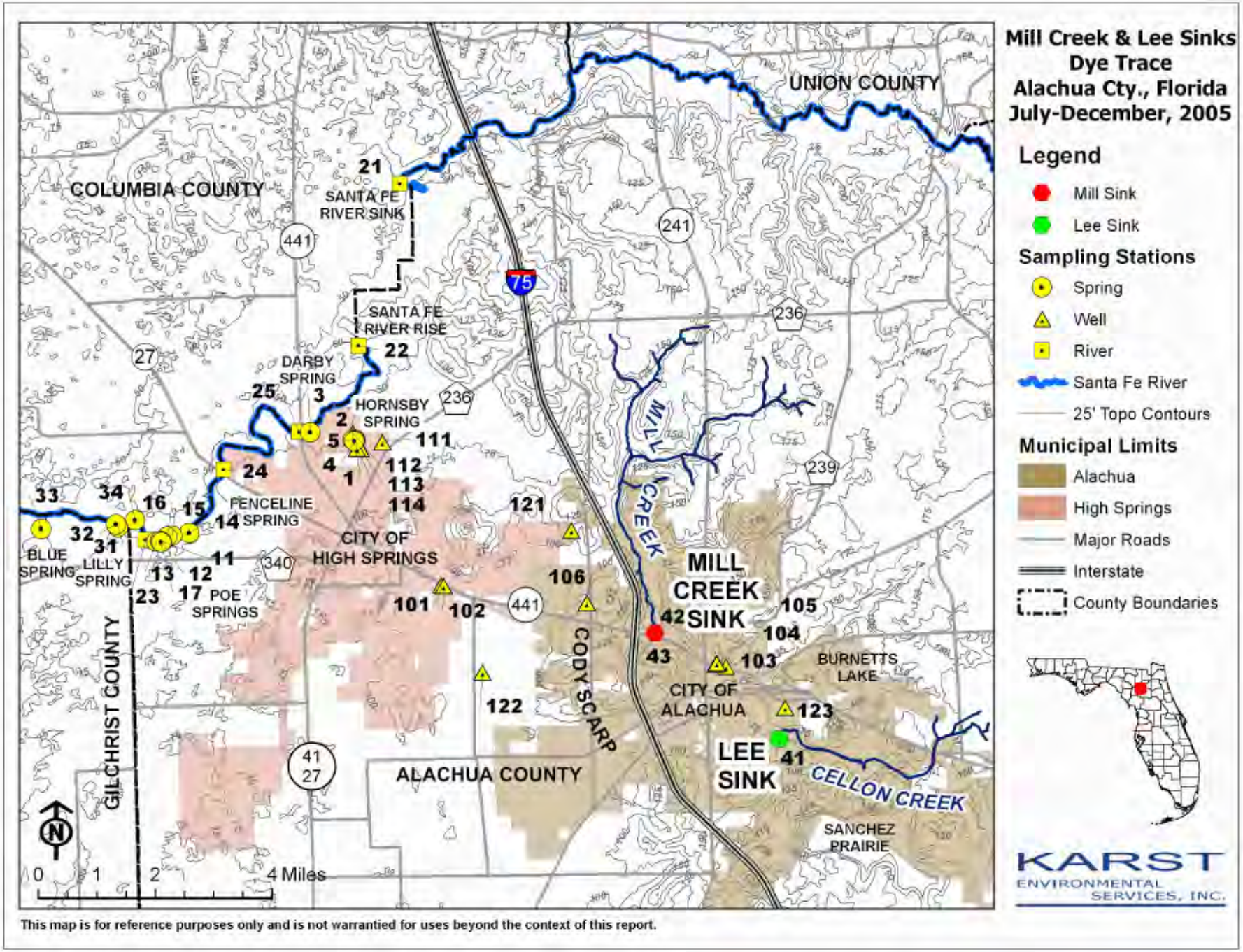
14) Fenceline Spring: Analysis of samples collected at this spring was contingent on the results of Poe Springs. The packet holder was placed on the spring vent bottom and tethered with a cord attached to a tree trunk in the river. This station was serviced by watercraft.

15) "The Crack" Spring: Analysis of samples collected at this spring was contingent on the results of Poe Springs. The packet holder was placed on a ledge on the north wall of this vertical fissure. This station was serviced by watercraft and snorkeling.

16) Twin Cypress Spring: Analysis of samples collected at this spring was contingent on the results of Poe Springs. The packet holder was placed on the spring vent bottom and tethered with a cord attached to a tree on the bank. This station was serviced by watercraft.

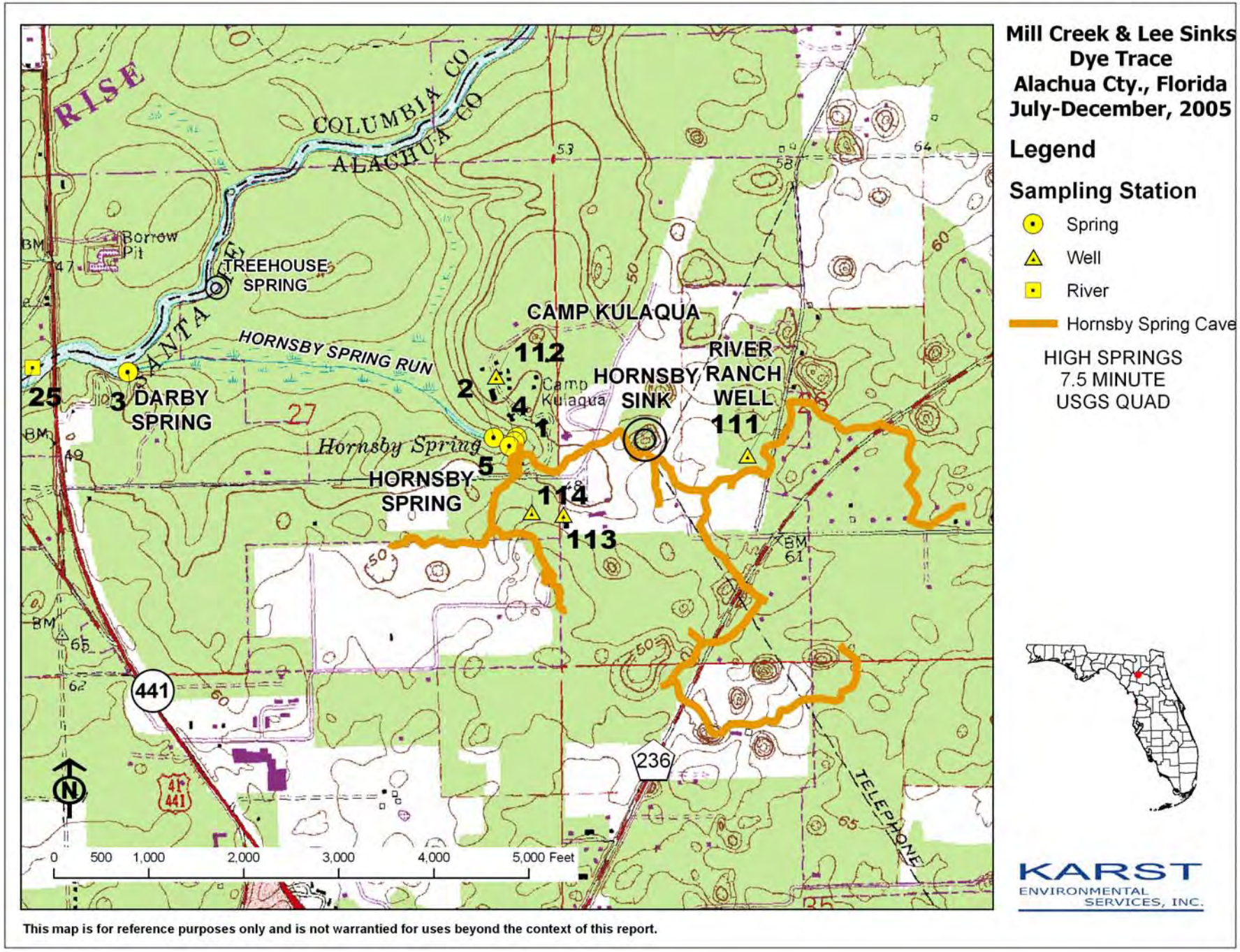
TABLE 3. SAMPLING STATION LOCATIONS and DISTANCES.								
Mill Creek and Lee Sinks Dye Trace, Alachua County, Florida, July-December, 2005								
						Santa Fe		
		GPS Coordinates*				River		
	Station	DECIMAL MINUTES		Distance (In Miles) From:		Bank Side		SRWMD
SAMPLING STATION NAME:	Number	LATITUDE	LONGITUDE	Mill Creek Sink	Lee Sink	Position	County	Name/Number
HORNSBY SPRING AREA								
Hornsby Spring Main	1	N 29° 51.023'	W 82° 35.587'	6.09	8.9	Left	Alachua	Hornsby
Hornsby Spring Run(Canoe Launch)	2	N 29° 51.023'	W 82° 35.633'	6.13	8.94	Left	Alachua	Hornsby
Hornsby Spring Daily	4	N 29° 51.016'	W 82° 35.592'	6.09	8.9	Left	Alachua	Hornsby
Darby Spring	3	N 29° 51.147'	W 82° 36.360'	6.82	9.61	Left	Alachua	Darby
Hornsby Spring South	5	N 29° 51.008'	W 82° 35.602'	6.09	8.9	Left	Alachua	Hornsby
POE SPRINGS AREA								
Poe Spring (Shallow Vent)	11	N 29° 49.553'	W 82° 38.935'	8.58	11.11	Left	Alachua	Poe
Poe Spring (Gauge Vent)	12	N 29° 49.546'	W 82° 38.941'	8.58	11.11	Left	Alachua	Poe
Watermelon #2 Spring (in river)	13	N 29° 49.544'	W 82° 39.022'	8.65	11.17	Left	Alachua	Not Listed
Poe Spring Run	17	N 29° 49.564'	W 82° 38.961'	n/a	n/a	Left	Alachua	n/a
Fenceline Spring	14	N 29° 49.676'	W 82° 38.455'	8.14	10.7	Left	Alachua	ALA930971
"The Crack" Spring	15	N 29° 49.643'	W 82° 38.756'	8.44	10.97	Right	Columbia	COL 428982
Twin Cypress Spring	16	N 29° 49.625'	W 82° 38.838'	8.51	11.05	Right	Columbia	Not Listed
SANTA FE RIVER SITES								
Santa Fe River Sink	21	N 29° 54.840'	W 82° 34.758'	8.57	11.25	Right	Columbia	n/a
Santa Fe River Rise	22	N 29° 52.434'	W 82° 35.462'	7.06	9.88	Left	Columbia	Santa Fe Rise
Santa Fe River D/S of Poe	23	N 29° 49.588'	W 82° 39.206'	n/a	n/a	Left	Alachua	n/a
Santa Fe River at 27 Bridge	24	N 29° 50.614'	W 82° 37.856'	n/a	n/a	Right	Columbia	n/a
Santa Fe River at 441 Bridge	25	N 29° 51.158'	W 82° 36.549'	n/a	n/a	Left	Alachua	n/a
OTHER SPRINGS/FEATURES								
Lilly Spring	31	N 29° 49.780'	W 82° 39.674'	9.36	11.89	Left	Gilchrist	Lilly
Pickard Spring	32	N 29° 49.821'	W 82° 39.707'	9.4	11.94	Left	Gilchrist	Pickard
Gilchrist Blue Spring	33	N 29° 49.818'	W 82° 40.948'	10.64	13.14	Left	Gilchrist	Gilchrist Blue
Seven Sisters Springs	(34)	N 29° 49.883'	W 82° 39.376'	9.09	11.65	Right	Columbia	COL930971
Seven Sisters Run at Santa Fe River	34	N 29° 49.809'	W 82° 39.443'	n/a	n/a	Right	Columbia	COL930971
*From hand-held GPS positions taken during this study, WGS 84 Map Datum; distances are estimated from these positions.								

TABLE 4. WELL SAMPLING STATION LOCATIONS and DISTANCES.								
Mill Creek and Lee Sinks Dye Trace, Alachua County, Florida, July-December, 2005								
		GPS Coordinates**		Approximate Distance		Well	Casing	Well
	Station	DECIMAL MINUTES		(in miles) of station from:		Depth	Depth	Diameter
WELL SAMPLING STATION NAME:	Number	LATITUDE	LONGITUDE	Mill Creek Sink	Lee Sink	(In Feet)	(In Feet)	(In Inches)
Municipal Wells								
High Springs # 1 (West Well)	101	N 29° 48.831'	W 82° 34.155'	3.74	6.36	250	110	12
High Springs # 2 (East Well)	102	N 29° 48.818'	W 82° 34.119'	3.7	6.32	250	120	12
Alachua Well #1	103	N 29° 47.544'	W 82° 29.307'	1.37	1.55	220	95*	12
Alachua Well #2	104	N 29° 47.580'	W 82° 29.485'	1.18	1.69	<220*	unknown	12
Alachua Well #3	105	N 29° 47.596'	W 82° 29.460'	1.2	1.69	<220*	unknown	12
Santa Fe Hills Subdivision System Well	106	N 29° 48.533'	W 82° 31.673'	1.27	4.05	238	unknown	8
Camp Kulaqua Wells								
River Ranch Well	111	N 29° 50.985'	W 82° 35.128'	5.69	8.5	165	113	6
Main Shop Well	112	N 29° 51.129'	W 82° 35.626'	6.19	9	120*	68*	6
Residence 6 Well	113	N 29° 50.887'	W 82° 35.497'	5.93	8.73	120*	100*	4
Chalet Well	114	N 29° 50.893'	W 82° 35.560'	5.99	8.79	100*	80*	4
Private Wells								
Copeland Well	121	N 29° 49.618'	W 82° 31.914'	2.25	5.05	205*	105*	4
Tropic Traditions Well	122	N 29° 47.522'	W 82° 33.481'	3.03	5.21	175	105	6
Progress Center Well (1)	123	N 29° 46.912'	W 82° 28.309'	2.59	2860 feet	unknown	unknown	unknown
Notes: All sites located in Alachua County.								
* Best estimate based on available records; may not be accurate.								
**From hand-held GPS positions taken during this study, WGS 84 Map Datum; distances are estimated from these positions.								
(1) System tap used; well was not located.								



Sampling Stations and Dye Introduction Sites Map.

Figure 10.



Sampling Stations Map, Hornsby Spring Area.

Figure 11.

Santa Fe River Sites

21) Santa Fe River Sink: Analysis of samples collected at this station was contingent on any ambiguous results that would occur downstream. The packet holder was placed on the river bottom and tethered with a cord attached to a floating dock or tree on the bank.

22) Santa Fe River Rise: The packet holder was placed on the river bottom and tethered with a cord attached to a tree along the riverbank.

23) Santa Fe River Downstream of Poe Spring: Analysis of samples collected at this location was contingent on the results of the various springs. The packet holder was placed on the river bottom and tethered with a cord attached to a floating dock.

24) Santa Fe River at Hwy 27 Bridge: Analysis of samples collected at this location was contingent on the results of the various springs. The packet holder was placed on the river bottom and tethered with a cord attached to exposed roots along the riverbank. This station was serviced by wading.

25) Santa Fe River at Hwy 441 Bridge: Analysis of samples collected at this location was contingent on the results of the various springs. The packet holder was placed on the river bottom and tethered with a cord attached to a floating dock.

Other Springs and Features

31) Lilly Spring: Analysis of samples collected at this spring was contingent on the results of Poe Springs. The packet holder was placed into one of the main vents in the head pool and tethered to the bank with a cord. This station was serviced by watercraft.

32) Pickard Spring: Analysis of samples collected at this spring was contingent on the results of Poe Springs. The packet holder was placed into a vent in the spring basin and tethered to the bank with a cord. This station was serviced by watercraft.

33) Blue Spring (Gilchrist County): Analysis of samples collected at this spring was contingent on the results of Poe Springs. The packet holder was placed into the spring run and tethered to the boardwalk with a cord.

34) Seven Sisters Spring Run: Analysis of samples collected at this spring was contingent on the results of Poe Springs. The packets were attached to a wire loop around roots on the right bank of the spring run, just upstream of the Santa Fe River. This station was serviced by watercraft and wading.

41) Lee Sink Swallet: Analysis of samples collected at this station would be contingent on any ambiguous results, should any occur downstream. The packet holder was placed in the swallet pool and tethered to the bank with a cord.

42) Mill Creek Sink Swallet: Analysis of samples collected at this station would be contingent on any ambiguous results, should any occur downstream. The packet holder was placed in the creek above the swallet and tethered to the bank with a cord.

Municipal Wells

101) High Springs #1 (West Well): This was selected as the primary sampling well. Packets were placed in a flow-through packet holder with the appropriate connections and fittings. Water usage was recorded by High Springs Department of Public Works.

102) High Springs #2 (East Well): Analysis of samples collected at this well was contingent on the results of High Springs #1 (101). Packets were placed in a flow-through packet holder with the appropriate connections and fittings. Water usage was recorded by High Springs Department of Public Works.

103) Alachua Well #1: Analysis of samples collected at this well was contingent on the results of Alachua Well #2 (104). Packets were placed in a flow-through packet holder with the appropriate connections and fittings. Water usage was recorded by High Springs Department of Public Works.

104) Alachua Well #2: This was selected as the primary sampling well. Packets were placed in a flow-through packet holder with the appropriate connections and fittings. Water usage was recorded by Alachua Department of Public Works.

105) Alachua Well #3: Analysis of samples collected at this well was contingent on the results of Alachua Well #2 (104). Packets were placed in a flow-through packet holder with the appropriate connections and fittings. Water usage was recorded by Alachua Department of Public Works.

106) Santa Fe Hills Subdivision Well (South Well): This well was selected as it was the well operating in rotation when the study began, and because of ease of hookup. Packets were placed in a flow-through packet holder with the appropriate connections and fittings. A water meter log was maintained by KES during the study.

Camp Kulaqua Wells

111) River Ranch Well: Packets were placed in a flow-through packet holder with the appropriate connections and fittings. A water meter log was maintained by KES during the study.

112) Main Shop Well: Packets were placed in a flow-through packet holder with the appropriate connections and fittings. A water meter log was maintained by KES during the study.

113) Residence #6 Well: Packets were placed in a flow-through packet holder with the appropriate connections and fittings. No water meter was available.

114) Chalet Well: Packets were placed in a flow-through packet holder with the appropriate connections and fittings. A water meter log was maintained by KES during the study.

Other Private Wells

121) Copeland Well: Packets were placed in a flow-through packet holder with the appropriate connections and fittings. No water meter was available.

122) Tropic Traditions Well: Packets were placed in a flow-through packet holder with the appropriate connections and fittings. No water meter was available.

123) Progress Center Well: The actual location of the well was never identified. Only water samples were collected here from a system bib. No water meter was available.

Sampling Inventory

A total of 918 samples were collected and logged during this study. Of this total, 533 were charcoal sampler packets and 385 were water samples.

A total of 158 charcoal samplers were analyzed. Two of these were background samples. Of these 156 samplers, a total of 51 tested positive for rhodamine WT, of which 26 tested also tested positive for fluorescein.

A total of 36 water samples were analyzed. All of these were samples where the associated charcoal sample had tested positive for dye. Of these 36 samplers, a total of nine tested positive for rhodamine WT. None tested positive for fluorescein. An additional ten samples taken at the Mill Creek Sink Cave (Station 43) tested positive for rhodamine WT; this was expected as it was the release point for that dye. The target dye there was fluorescein.

Duplicate Samples

Duplicate samples were collected from selected sites, and stored in case of shipping losses or to be analyzed in the case of ambiguous results.

Selection Rationale for Sample Analysis

This study was an initial qualitative dye trace attempting to identify as many connections as possible with the two dye release sites. There were many springs and wells that had potential for dye recovery. With dye travel rates unknown, this meant planning for a large number of samples. However, there were budget limitations governing the number of samples that could be analyzed within the scope of this study.

Therefore, strategies were designed to allow for a maximum return of information from the finite number of laboratory analyses that could be performed, without jeopardizing the study's goals. These strategies included the measures described below to provide economy while maintaining effectiveness.

Except for a few initial background sample analyses, background samples were held pending analyses of post-dye release samples. Typically, stations with positive dye results had pre-arrival samples analyzed so as to function as de-facto background samples.

Samples from stations on the Santa Fe River (23, 24 and 25) were held pending any negative results at the springs; the positive results at Hornsby Spring ultimately made all river samples redundant for the purposes of this qualitative trace. Also, as there were no anomalies seen in the samples analyzed from the River Rise (22), none of the River Swallet (21) samples collected were analyzed.

Poe Spring was selected as the primary indicator for dye arrival within the Poe Springs area group of springs. Selected vents and the run were monitored at Poe Spring, but all samples collected from Fenceline Spring downstream to Blue Spring were held pending the identification of dye at Poe. As the presence of dye was never confirmed there, the focus for analyses was shifted to the Hornsby Spring area.

Finally, at the Cities of Alachua and High Springs municipal wells, one well was selected from each group for consecutive analyses. Any positive result at these wells would have prompted the systematic analyses of the adjacent wells.

Sample Analysis

All samples were analyzed using a synchronous scan protocol on a spectrofluorophotometer at Ozark Underground Laboratory. The recovery of dye in concentrations high enough to provide a visual result was not anticipated, and no evaluations of that type were performed.

Charcoal packets collect dye by adsorbing it to the charcoal particles; therefore, prior to sample analysis the dye must be released from the charcoal. This process is known as elution. An eluent is added to the charcoal and the resulting elutant can be analyzed via "direct injection" by a spectrofluorophotometer.

A Shimadzu RF 5000U Spectrofluorophotometer operated with a synchronous scan protocol was used to analyze all samples recovered during this study. The detection limit for rhodamine WT in elutant is 0.155 part per billion, with a normal acceptable emission wavelength range of 561.7 to 568.9 nanometers. The detection limit for rhodamine WT in water is 0.007 parts per billion, with a normal acceptable emission wavelength range of 569.4 to 574.8 nanometers.

The detection limit of this instrument for fluorescein in elutant is 0.01 part per billion, with a normal acceptable emission wavelength range of 510.7 to 515.0 nanometer. The detection limit for fluorescein in water is 0.0005 parts per billion, with a normal acceptable emission wavelength range of 505.6 to 510.5 nanometers.

Results of analyses were presented by OUL as Certificates of Analysis that include a Summary of Results Table and graphs for each sample analyzed. The Certificates of Analysis and Summary of Results Table are found in Appendix IIA. The graphs for the analyses of charcoal packets are presented in Appendix IIB, and for water samples in Appendix IIC..

The results of analyses as interpreted by OUL are used as the basis for the discussion and conclusions reached in this report.

RESULTS

This study is the first fully documented dye trace performed at Mill Creek and Lee Sinks. As this was an initial qualitative dye trace, sampling periods were designed to measure a potential rapid arrival time of the dye. A dye trace was reportedly performed in this area in early 1976 but documentation is incomplete. The arrival time in that investigation was one day (Fisk and Exley, 1976).

Municipal wells near to the dye introduction sites were of special concern. The wells had the potential for a rapid and strong arrival of dye. The wells were closely monitored and there were no visible detections of dye in the municipal wells.

Results of Spectrofluorophotometer Analysis

One-hundred and fifty-eight (158) charcoal samplers and 36 water samples from selected sampling stations were analyzed. Table 5 provides a summary of the results of analysis from dye-positive stations. The numbered days in Table 5 are sequential from the day of dye introduction, Day Zero. The maps in Figures 12 and 13 show the positive results at sampling stations. Figures 14, 15 and 16 provide examples of spectrofluorophotometer analytical graphics indicating positive detections of rhodamine WT and fluorescein. Descriptions of the results from dye-positive stations are included below. Station groupings with positive results are discussed first.

The Certificates of Analysis from OUL listing the results of these analyses are presented in Appendix IIA. A complete record of all analytical graphs is included in Appendixes IIB and IIC.

The asterix (*) symbol is used in the descriptions below and in Table 5 to indicate the presence of a fluorescence peak that does not meet all the criteria for a positive dye result, but has been calculated as though it were dye.

Hornsby Spring Area Springs (Camp Kulaqua)

1) Hornsby Spring Main: No dye was detected in analyzed samples collected through August 7 (Day 12). Rhodamine WT was initially detected at a concentration of 14.4 ppb in the August 7-10 (Days 12-15) packet. During the next four semi-weekly sampling intervals, from Day 15 through Day 28 (August 23), the rhodamine WT concentration increased, with the highest concentration of 54.2 ppb being detected in the Day 24-28 packet.

Fluorescein was initially detected at a concentration of 1.48 ppb in the August 23-26 (Days 28-31) packet, with rhodamine WT also present at 24.8 ppb. During the next eight semi-weekly sampling intervals, from Day 31 through Day 59 (September 23), the fluorescein concentration increased, with the highest concentration of 4.85 ppb being detected in the Day 55-59 packet. Figure 14 shows the detection of both dyes in the analytical results of the Days 38-42 packet. Strong, but decreasing concentrations of rhodamine WT were also detected during this period.

After September 23 (Day 59) sampling intervals were changed from semi-weekly to weekly. Concentrations for both dyes were detected in generally decreasing amounts. After October 28 (Day 94) sampling intervals were changed to bi-weekly. Concentrations for both dyes continued to be detected in generally decreasing amounts. The final two intervals analyzed, Days 125-139

and Days 139-154, showed detections for both dyes that yielded fluorescence peaks that did not meet all the criteria for a positive dye result, but were calculated as though they were dye. The detections of dye for the final interval (Days 139-154) were 5.77 ppb * rhodamine WT and 3.17 ppb* fluorescein.

2) Hornsby Spring Canoe Landing: No dye was detected in analyzed samples collected through August 7 (Day 12). Rhodamine WT was initially detected at a concentration of 13.3 ppb in the August 7-10 (Days 12-15) packet. During the next two semi-weekly sampling intervals, from Day 15 through Day 21 (August 16), the rhodamine WT concentration increased, with the highest concentration of 38.4 ppb being detected in the Day 15-18 packet. The Day 21-24 interval was not analyzed. The remaining three sampling intervals analyzed (Days 24-34) showed a decrease in the rhodamine WT concentration. No fluorescein was detected in the samples analyzed from this station.

3) Darby Spring: No dye was detected in analyzed samples collected through August 15 (Day 20). Rhodamine WT was initially detected at a concentration of 2.27 ppb* in the August 15-19 (Days 20-24) packet. No dye was detected in the August 19-26 (Days 24-31) packet. During the next four weekly sampling intervals, from Day 31 through Day 59 (September 23), rhodamine WT was detected, with the highest concentration of 2.93 ppb being detected in the Day 31-38 packet.

4) Hornsby Spring Daily: No dye was detected in analyzed samples collected through August 7 (Day 12). Rhodamine WT was initially detected at a concentration of 4.35 ppb in the August 7-8 (Days 12-13) packet. That increased to 6.28 ppb in the August 8-9 (Days 13-14) packet. The final sample analyzed here showed a detection of 12.1 ppb in the August 9-10 (Days 14-15) packet. The results from this station provide the most accurate indication that dye arrived here at some time on Day 12 or 13.

The initial water sample that showed a positive detection for rhodamine WT was taken on August 10 (Day 15), with a concentration of 0.093 ppb. Results of the next three daily consecutive samples showed an increase in dye concentration. Figure 15 shows the detection of rhodamine WT in the analytical results of the Day 16 sample. Additional water samples were analyzed for the period of time when fluorescein arrival was confirmed in the charcoal samplers; no fluorescein was detected. A final rhodamine WT detection of 0.165 ppb* was made on August 26 (Day 31). Four additional water samples were collected and analyzed with no dye being detected. The final water sample analyzed was collected on September 9 (Day 45).

5) Hornsby Spring South: Three samples were analyzed, and all showed the presence of both dyes. Rhodamine WT was detected at the highest concentrations here of 34.5 ppb, and fluorescein at 3.26 ppb, in the August 26-September 2 (Days 31-38) packet. Concentrations for both dyes decreased in the following two samples, with final rhodamine WT and fluorescein detections of 4.31 ppb* and 1.41 ppb, respectively, being made in the September 9-15 (Day 45-51) packet.

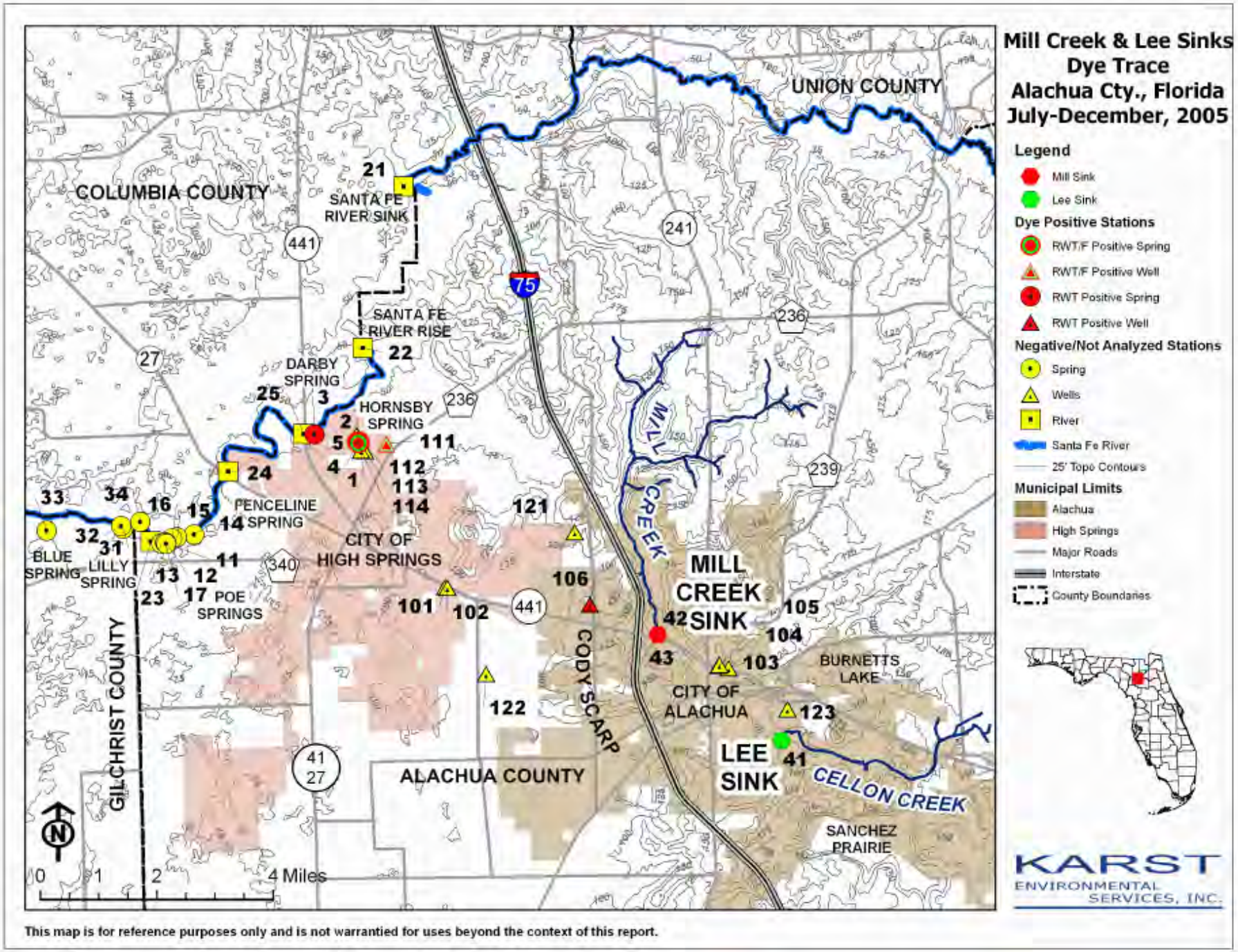
Camp Kulaqua Wells

111) River Ranch Well: No dye was detected in samples collected through August 7 (Day 12). Rhodamine WT was initially detected at a concentration of 15.4 ppb in the August 7-10 (Days

TABLE 5. RESULTS OF DYE-POSITIVE SAMPLING STATIONS							(PAGE 1 of 3)							
Mill Creek and Lee Sinks Dye Trace, Alachua County, Florida, July-December, 2005														
			Lee Sink Dye (fluorescein) Release:							7/26/2005		10:06 - 10:30		
	Day 0 = July 26, 2005		Mill Creek Sink Dye (rhodamine WT) Release:							7/26/2005		11:34 - 12:18		
	DAY #:	3	6	9	10	11	12	13	14	15	16	17	18	20
	DATE:	29-Jul	1-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug	11-Aug	12-Aug	13-Aug	15-Aug
Station #	Station Name:	Friday	Monday	Thurs.	Friday	Sat.	Sun.	Monday	Tues.	Wed.	Thurs.	Friday	Sat.	Monday
1	Hornsby Spring Main;	ND	ND	ND	-	-	ND	-	-	14.4	-	-	37.2	-
	Charcoal	ND	ND	ND	-	-	ND	-	-	ND	-	-	ND	-
2	Hornsby Spring Run;	ND	ND	ND	-	-	ND	-	-	13.3	-	-	38.4	-
	Charcoal	ND	ND	ND	-	-	ND	-	-	ND	-	-	ND	-
3	Darby Spring;	-		-	-	-		-	-	-	-	-	-	
	Charcoal	-		-	-	-		-	-	-	-	-	-	
4	Hornsby Spring Daily;	na	na	na	na	ND	ND	4.35	6.28	12.1	na	na	na	na
	Charcoal	na	na	na	na	ND	ND	ND	ND	ND	na	na	na	na
4	Hornsby Spring Daily;	na	na	ND	ND	ND	ND	ND	ND	0.093	0.209	0.198	0.247	na
	Water	na	na	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	na
5	Hornsby Spring South;	-	-	-	-	-	-	-	-	-	-	-	-	-
	Charcoal	-	-	-	-	-	-	-	-	-	-	-	-	-
106	Santa Fe Hill Subdv.	ND	ND	na	-	-	ND	-	-	ND	-	-	ND	-
	System Well; Charcoal	ND	ND	na	-	-	ND	-	-	ND	-	-	ND	-
111	Camp Kulaqua River	na	na	ND	-	-	ND	-	-	15.4	-	-	-	71.1
	Ranch Well; Charcoal	na	na	ND	-	-	ND	-	-	ND	-	-	-	ND
111	Camp Kulaqua River	na	na	na	-	-	ND	-	-	0.201	-	-	-	na
	Ranch Well; Water	na	na	na	-	-	ND	-	-	ND	-	-	-	na
	DAY #:	3	6	9	10	11	12	13	14	15	16	17	18	20
Notes:	Rhodamine WT =	Top value, in red.				ND =	No Detection (of dye)							
	Fluorescein =	Bottom value, in green italic.				na =	not analyzed							
	*Indicates the presence of a fluorescence peak that does not meet all the criteria for a positive dye result, but have been calculated as though it were dye.													
	Only stations that had positive recoveries of dye are included in this table.													

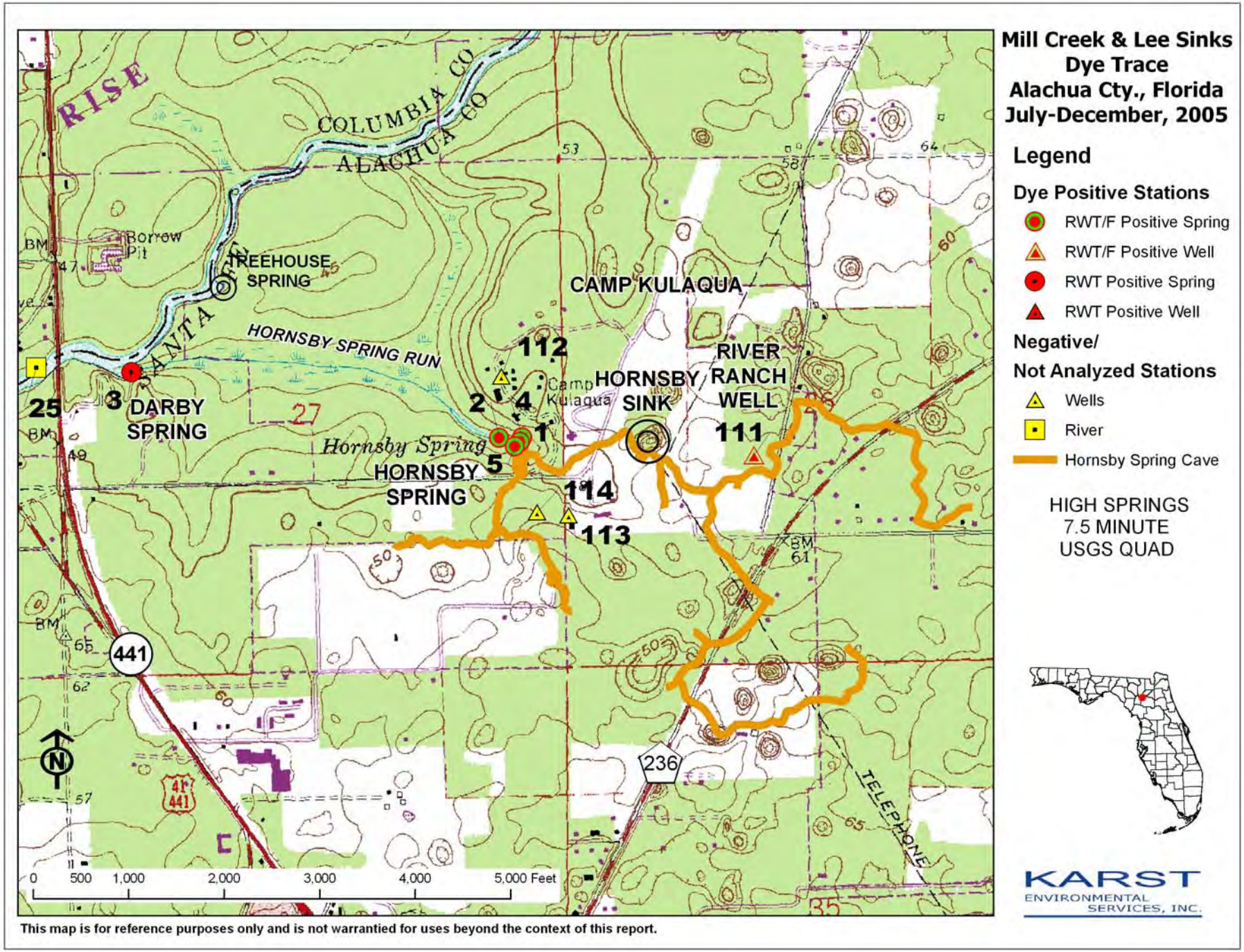
TABLE 5. RESULTS OF DYE-POSITIVE SAMPLING STATIONS					(PAGE 2 of 3)							
Mill Creek and Lee Sinks Dye Trace, Alachua County, Florida, July-December, 2005												
	DAY #:	21	24	28	31	32	34	38	42	45	48	51	52
	DATE:	16-Aug	19-Aug	23-Aug	26-Aug	27-Aug	29-Aug	2-Sep	6-Sep	9-Sep	12-Sep	15-Sep	16-Sep
Station #	Station Name:	Tues.	Friday	Tues.	Friday	Sat.	Monday	Friday	Tuesday	Friday	Monday	Thurs.	Friday
1	Hornsby Spring Main;	27.9	30	54.2	24.8	-	21.2	27.7	18.1	7.29	8.24	5.9	-
	Charcoal	ND	ND	ND	*1.48**	-	*1.91*	*3.36*	*4.09*	*2.24*	*2.83*	*3.13*	-
2	Hornsby Spring Run;	30.3	-	34.8	14.3	-	14.8	-	-	-	-	-	-
	Charcoal	ND	-	ND	ND	-	ND	-	-	-	-	-	-
3	Darby Spring;	-	2.27*	-	ND	-	-	2.93	-	2.5	-	1.84*	-
	Charcoal	-	ND	-	ND	-	-	ND	-	ND	-	ND	-
4	Hornsby Spring Daily;	na	na	na	na	-	na	na	na	na	-	na	-
	Charcoal	na	na	na	na	-	na	na	na	na	-	na	-
4	Hornsby Spring Daily;	na	0.199	0.128*	0.165*	-	ND	ND	ND	ND	-	-	-
	Water	na	ND	ND	ND	-	ND	ND	ND	ND	-	-	-
5	Hornsby Spring South;	-	-	-	-	-	-	34.5	-	14.3	-	4.31*	-
	Charcoal	-	-	-	-	-	-	*3.26*	-	*2.55*	-	*1.41*	-
106	Santa Fe Hill Subdv.	ND	ND	2.49	-	ND	-	2.71	-	ND	-	-	ND
	System Well; Charcoal	ND	ND	ND	-	ND	-	ND	-	ND	-	-	ND
111	Camp Kulaqua River	-	47.3	30.4	15.3	-	-	42.4	-	21	-	7.98	-
	Ranch Well; Charcoal	-	ND	ND	*0.824**	-	-	*3.43*	-	*2.94*	-	*1.88*	-
111	Camp Kulaqua River	-	na	na	0.145	-	-	ND	-	ND	-	na	-
	Ranch Well; Water	-	na	na	ND	-	-	ND	-	ND	-	na	-
	DAY #:	21	24	28	31	32	34	38	42	45	48	51	52
Notes:	Rhodamine WT =	Top value, in red.				ND =	No Detection (of dye)						
	Fluorescein =	Bottom value, in green italic.				na =	not analyzed						
	*Indicates the presence of a fluorescence peak that does not meet all the criteria for a positive dye result, but have been calculated as though it were dye.												
	Only station that had positive recoveries of dye are included in this table.												

TABLE 5. RESULTS OF DYE-POSITIVE SAMPLING STATIONS									(PAGE 3 of 3)				
Mill Creek and Lee Sinks Dye Trace, Alachua County, Florida, July-December, 2005													
	DAY #:	55	57	59	66	73	79	86	94	111	125	139	154
	DATE:	19-Sep	21-Sep	23-Sep	30-Sep	7-Oct	13-Oct	20-Oct	28-Oct	14-Nov	28-Nov	12-Dec	27-Dec
Station #	Station Name:	Monday	Wed.	Friday	Friday	Friday	Thurs.	Thurs.	Friday	Monday	Monday	Monday	Tuesday
1	Hornsby Spring Main;	5.91	-	9.54	11	8.04	4.15	5.65	3.75	5.17	6.72	5.31*	5.77*
	Charcoal	*3.32*	-	*4.85*	*4.61*	*4.28*	*2.32*	*3.11*	*2.09*	*2.74**	*3.10**	*2.75**	*3.17**
2	Hornsby Spring Run;	-	-	-	-	-	-	-	-	-	-	-	-
	Charcoal	-	-	-	-	-	-	-	-	-	-	-	-
3	Darby Spring;	-	-	2.22*	-	-	-	-	-	-	-	-	-
	Charcoal	-	-	ND	-	-	-	-	-	-	-	-	-
4	Hornsby Spring Daily;	-	-	na	na	na	na	na	na	-	-	-	-
	Charcoal	-	-	na	na	na	na	na	na	-	-	-	-
4	Hornsby Spring Daily;	-	-	-	-	-	-	-	-	-	-	-	-
	Water	-	-	-	-	-	-	-	-	-	-	-	-
5	Hornsby Spring South;	-	-	-	na	na	na	na	na	-	-	-	-
	Charcoal	-	-	-	na	na	na	na	na	-	-	-	-
106	Santa Fe Hill Subdv.	-	ND	-	na	-	-	-	-	-	-	-	-
	System Well; Charcoal	-	ND	-	na	-	-	-	-	-	-	-	-
111	Camp Kulaqua River	-	-	na	11.2	-	-	-	-	-	-	-	-
	Ranch Well; Charcoal	-	-	na	*3.51*	-	-	-	-	-	-	-	-
111	Camp Kulaqua River	-	-	na	na	-	-	-	-	-	-	-	-
	Ranch Well; Water	-	-	na	na	-	-	-	-	-	-	-	-
	DAY #:	55	57	59	66	73	79	86	94	111	125	139	154
Notes:	Rhodamine WT =	Top value, in red.				ND =	No Detection (of dye)						
	Fluorescein =	Bottom value, in green italic.				na =	not analyzed						
	*Indicates the presence of a fluorescence peak that does not meet all the criteria for a positive dye result, but have been calculated as though it were dye.												
	Only station that had positive recoveries of dye are included in this table.												



Sampling Stations Results Map

Figure 12.



Sampling Stations Results Map; Hornsby Spring Area.

Figure 13.

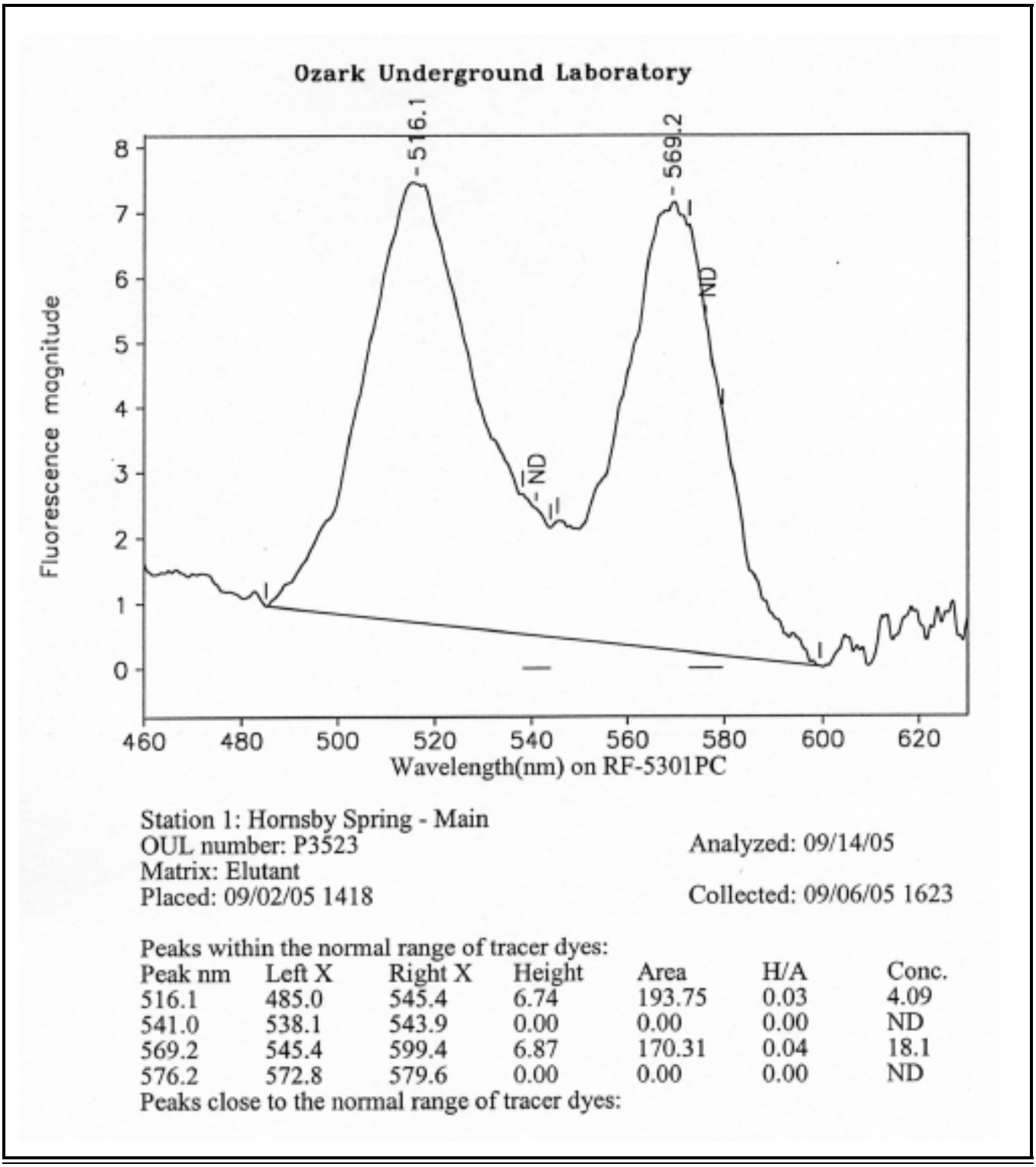
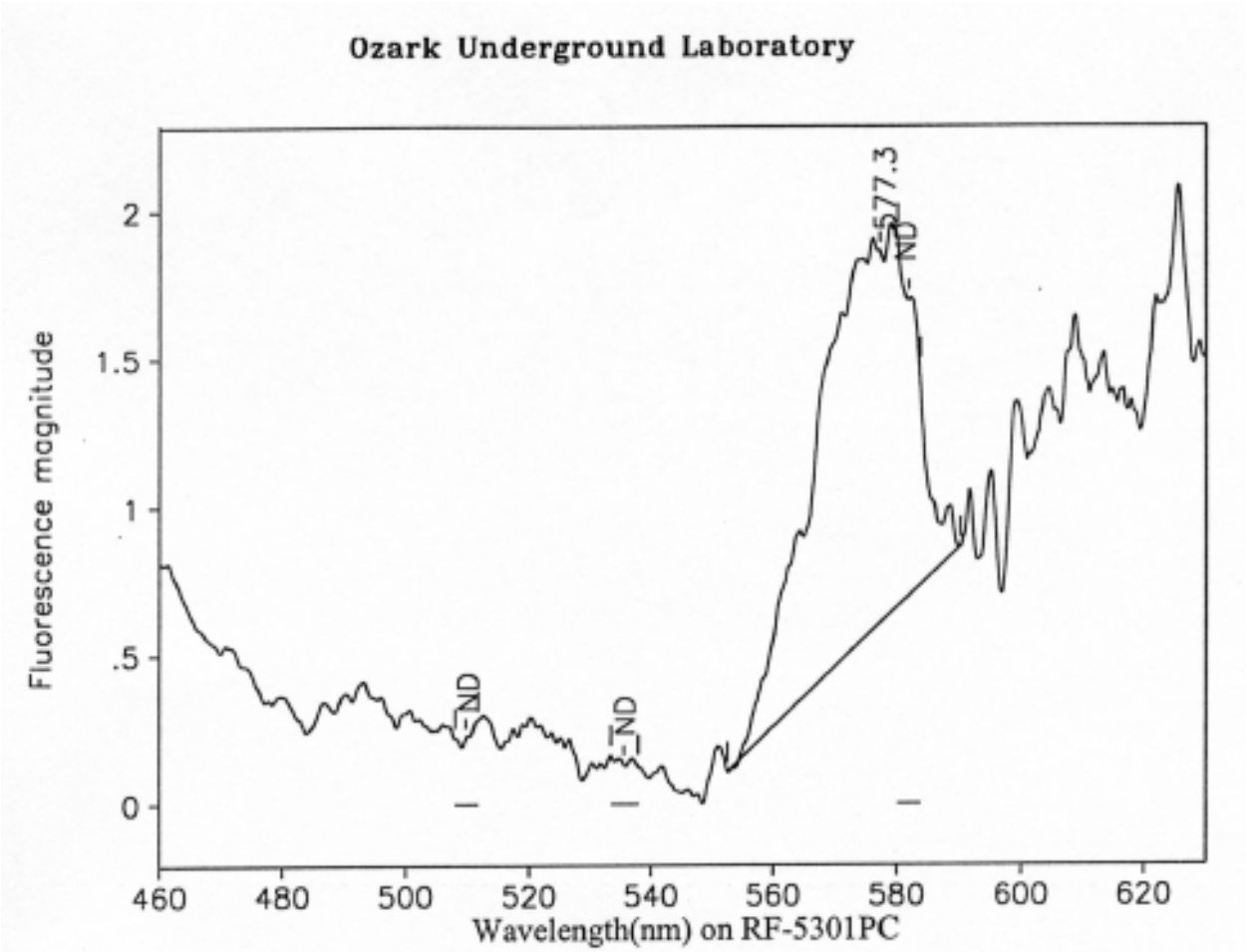


Figure 14. Example of Spectrofluorophotometer Analytical Graph. This graph indicates a positive detection for rhodamine WT and fluorescein dyes from a charcoal sampler placed at Hornsby Spring. The wavelength peak indicates the specific dyes present, and the fluorescence magnitude is used to calculate concentration in the sample.



Station 4: Hornsby Spring Daily
OUL number: P3568
Matrix: Water
Collected: 08/11/05 1529

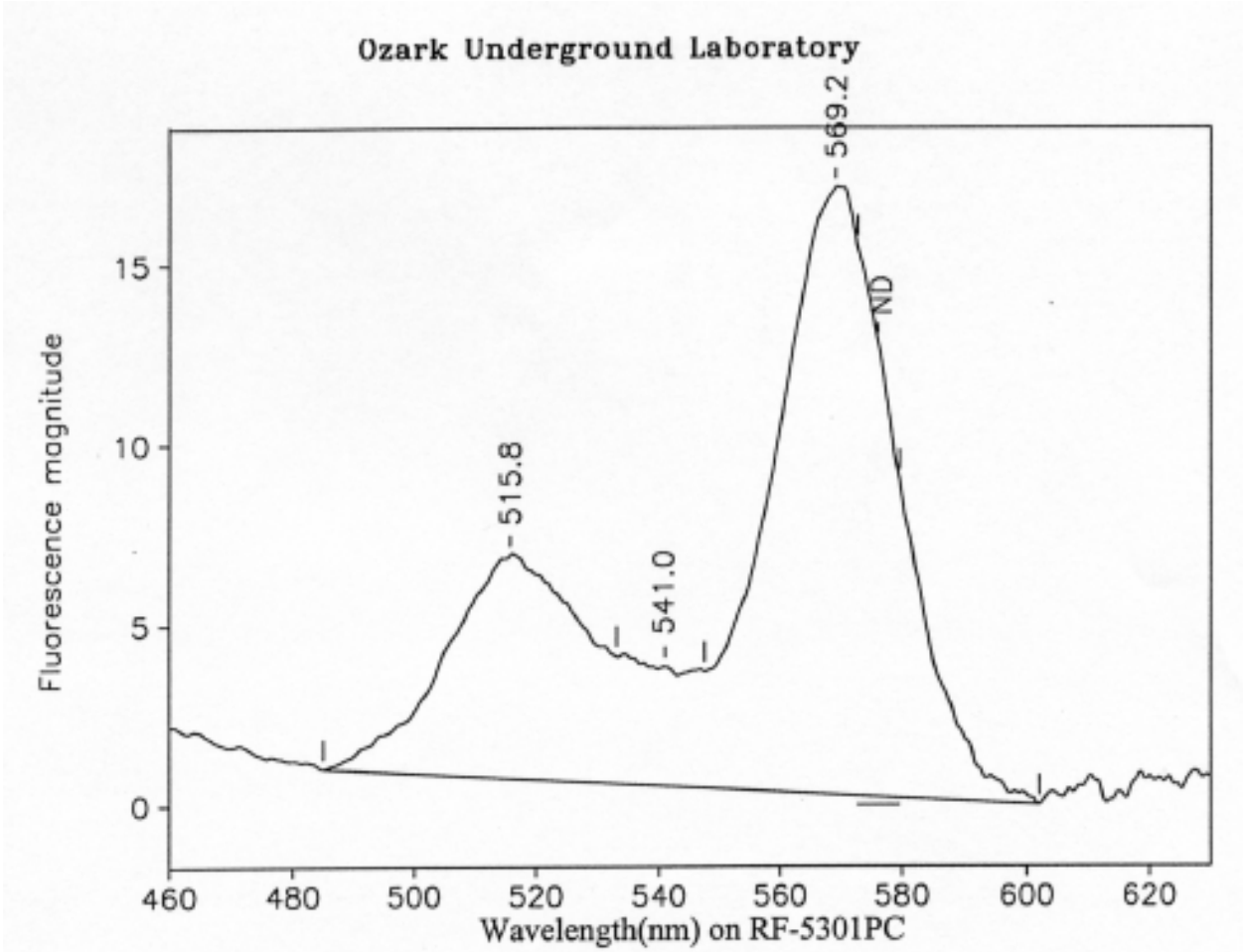
Analyzed: 09/16/05

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
577.3	552.6	590.2	1.25	24.87	0.05	0.209
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Figure 15. Example of Spectrofluorophotometer Analytical Graph. This graph indicates a positive detection for rhodamine WT dye from a water sample taken at Hornsby Spring. The wavelength peak indicates the specific dye present, and the fluorescence magnitude is used to calculate concentration in the sample.



Station 111: River Ranch Well
OUL number: P3527
Matrix: Elutant
Placed: 08/26/05 1548

Analyzed: 09/14/05

Collected: 09/02/05 1443

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	485.0	533.1	6.18	162.17	0.04	3.43
541.0	533.1	547.5	3.31	48.37	0.07	~~1.39~~
569.2	547.5	602.0	16.81	399.87	0.04	42.4
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

Figure 16. Example of Spectrofluorophotometer Analytical Graph. This graph indicates a positive detection for rhodamine WT and fluorescein dyes from a charcoal sampler placed at the Camp Kulaqua River Ranch Well. The wavelength peak indicates the specific dyes present, and the fluorescence magnitude is used to calculate concentration in the sample.

12-15) packet. The next semi-weekly sampling interval, Days 15-20, had the highest rhodamine WT concentration recorded here of 71.1 ppb. (This was a slightly longer than usual five-day sampling interval.) During the next three semi-weekly sampling intervals, from Day 20 through Day 31 (August 26), the rhodamine WT concentration decreased.

Fluorescein was initially detected at a concentration of 0.824 ppb* in the August 23-26 (Days 28-31) packet, with rhodamine WT also present at 15.3 ppb. The next weekly sampling interval, Days 31-38, had a fluorescein detection of 3.43 ppb. Figure 16 shows this detection along with that for rhodamine WT in the analytical results of that packet.

After August 26 (Day 31) sampling intervals were changed from semi-weekly to weekly. Concentrations for both dyes were detected in generally decreasing amounts. The dye concentrations in the final interval analyzed, Days 59-66, showed a detection of rhodamine WT of 11.2 ppb and fluorescein of 3.51 ppb (the highest detection here of fluorescein).

The initial water sample that showed a positive detection for rhodamine WT was taken on August 10 (Day 15), with a concentration of 0.201 ppb. The last detection of rhodamine WT was made on August 26 (Day 31) at 0.145 ppb. This water sample, along with the following two, were analyzed for the period of time when fluorescein arrival was confirmed in the charcoal samplers; no fluorescein was detected. The final water sample analyzed was collected on September 3 (Day 66), with no dye being detected.

This well typically pumped an average of 25,000 gallons per day during August and September. Total water pumped for August was over 830,000 gallons, and approximately 600,000 gallons for September.

112) Main Shop Well: No dye was detected in the samples analyzed.

113) Residence #6 Well: No dye was detected in the samples analyzed.

114) Chalet Well: No dye was detected in the samples analyzed.

Municipal Wells

101) High Springs #1 (West Well): No dye was detected in the samples analyzed.
This water system (Wells 1 and 2) typically pumped an average of 460,000 gallons per day (MGD) during the July, August, September and October. Total water pumped for August was 13.640 million gallons, 14.02 million gallons for September and 14.111 million gallons for October (HSDPW, 2006).

102) High Springs #2 (East Well): All samples were held pending positive analyses results at Station 101.

103) Alachua Well #1: No dye was detected in the samples analyzed. Remaining samples were held pending positive analyses results at Station 104.

104) Alachua Well #2: No dye was detected in the samples analyzed.

This water system (Wells 1, 2 and 3) typically pumped an average of 1.3 million gallons per day (MGD) during the July, August and September, and 1.25 MGD for October. Total water pumped for August was 41.463 million gallons, 40.864 million gallons for September and 38.792 million gallons for October (ADPW, 2006).

105) Alachua Well #3: All samples were held pending positive analyses results at Station 104.

106) Santa Fe Hills Subdivision Well (South Well): No dye was detected in samples collected through August 19 (Day 24). Rhodamine WT was initially detected at a concentration of 2.49 ppb in the August 19-23 (Days 24-28) packet. No dye was detected for the next semi-weekly interval, Days 28-32. A detection of 2.71 ppb* was made during the next sampling interval, Days 32-38 (August 27-September 2). No dye was detected in the three weekly samplers that followed Day 38. No detections of fluorescein were made at this well.

A water sample was collected from a tap supplying treated water from this system on September 21 (Day 57); no dye was detected.

This well typically pumped between 11,000 to 14,000 gallons per day during August and September. Total water pumped for August was over 400,000 gallons, and approximately 350,000 gallons for September.

Poe Springs Area Springs

11) Poe Spring (Shallow Vent): No dye was detected in the samples analyzed.

12) Poe Spring (Gauge Vent): No dye was detected in the samples analyzed. Remaining samples were held pending positive analyses results at Poe Spring.

13) Watermelon Spring #2: All samples were held pending positive analyses results at Poe Spring. As no dye was detected at Poe Spring, no samples from this station were analyzed.

17) Poe Spring Run: No dye was detected in the samples analyzed.

14) Fenceline Spring: No dye was detected in the samples analyzed. Remaining samples were held pending positive analyses results at Poe Spring.

15) "The Crack" Spring: All samples were held pending positive analyses results at Poe Spring. As no dye was detected at Poe Spring, no samples from this station were analyzed.

16) Twin Cypress Spring: All samples were held pending positive analyses results at Poe Spring. As no dye was detected at Poe Spring, no samples from this station were analyzed.

Santa Fe River Sites

21) Santa Fe River Sink: All samples were held pending any anomalous positive results found in downstream stations. As no anomalous results were seen, no samples from this station were analyzed.

22) Santa Fe River Rise: No dye was detected in the samples analyzed.

23) Santa Fe River Downstream of Poe Spring: All samples were held pending any negative results in all upstream stations. As both dyes were detected at, and discharged by, Hornsby Spring, no samples from this station were analyzed.

24) Santa Fe River at Hwy 27 Bridge: All samples were held pending any negative results in all upstream stations. As both dyes were detected at, and discharged by, Hornsby Spring, no samples from this station were analyzed.

25) Santa Fe River at Hwy 441 Bridge: All samples were held pending any negative results in all upstream stations. As both dyes were detected at, and discharged by, Hornsby Spring, no samples from this station were analyzed.

Other Springs and Features

31) Lilly Spring: All samples were held pending positive analyses results at Poe Spring. As no dye was detected at Poe Spring, no samples from this station were analyzed.

32) Pickard Spring: All samples were held pending positive analyses results at Poe Spring. As no dye was detected at Poe Spring, no samples from this station were analyzed.

33) Blue Spring (Gilchrist County): All samples were held pending positive analyses results at Poe Spring. As no dye was detected at Poe Spring, no samples from this station were analyzed.

34) Seven Sisters Spring Run: All samples were held pending positive analyses results at Poe Spring. As no dye was detected at Poe Spring, no samples from this station were analyzed.

41) Lee Sink Swallet (Cellon Creek Inflow): All samples were held pending any anomalous positive results found in down-gradient stations. As no anomalous results were seen, no samples from this station were analyzed.

42) Mill Creek Sink Swallet (Mill Creek Inflow): All samples were held pending any anomalous positive results found in down-gradient stations. As no anomalous results were seen, no samples from this station were analyzed.

43) Mill Creek Sink Cave: All samples (water only) tested were positive for rhodamine WT as was expected; this was the introduction point for that dye. No fluorescein was detected.

Other Private Wells

121) Copeland Well: No dye was detected in the samples analyzed.

122) Tropic Traditions Well: No dye was detected in the samples analyzed.

123) Progress Center Well: No water samples collected here were analyzed; this well was monitored for a visual positive with negative results.

CONCLUSIONS

The dye trace investigation indicates a direct hydrologic connection between two recharge features on the Cross-County Fracture Zone and a spring discharge feature on the same fracture system. The apparent measured rate of groundwater flow in the fracture system is between 1,400 to 2,400 feet per day.

Hornsby Spring and the River Ranch Well

The results of this study indicate that Mill Creek Sink and Lee Sink are connected to Hornsby Spring. Detections of both rhodamine WT and fluorescein that were both strong in concentration and long in duration provide confirmation of that connection. Detection of rhodamine WT in water samples provided additional confirmation, and all Hornsby Spring area sites analyzed corroborated each other regarding arrival times and relative concentrations of both dyes. Figures 17 and 18 illustrate the connections and general flow directions of the dyes.

The most definitive result was obtained from the Hornsby Spring Daily (Station 4) sampler that showed the arrival of rhodamine WT from Mill Creek Sink at some time during Days 12 and 13. This was corroborated by the samplers collected at the Hornsby Spring Landing (Station 2) and the River Ranch Well (Station 111) during the Day 12 to 15 sampling interval. An initial positive detection from water was then confirmed on Day 15 from both the Hornsby Spring Daily (Station 2) and River Ranch Well (Station 111).

The other definitive result was obtained from the Hornsby Spring Main (Station 1) sampler that showed the arrival of fluorescein from Lee Sink at some time between Days 28 and 31. This was corroborated by the positive detection of fluorescein in the sampler at the River Ranch Well (Station 111) also during the Days 28 to 31 sampling interval. As this dye appeared to arrive at a concentration much lower than the rhodamine WT, no positive detection was obtained from water samples.

A detection of both dyes was made as late as the Day 139 to Day 154 sampler at the Hornsby Spring Main (Station 1).

Santa Fe Hills Subdivision System Well

The detection of rhodamine WT during two non-consecutive sampling intervals indicates that the Santa Fe Hill Subdivision Well is connected with Mill Creek Sink. This well is located only 1.27 miles northwest of Mill Creek Sink, was under constant use and is in line with Mill Sink relative to the Cross-County Fracture Zone. This was the only public supply well that tested positive for dye in the samples analyzed.

While the results were not as definitive as those at the Camp Kulaqua River Ranch Well, this study provides evidence that the surface waters entering Mill Creek Swallet may exert an influence on some wells in this area. During this study, surface water input into the swallet was minimal or non-existent, with upstream groundwaters in the cave receiving and moving the dye. A higher inflow of stream and stormwaters into this swallet may deliver a different level of impact to this well (and the adjacent system well).

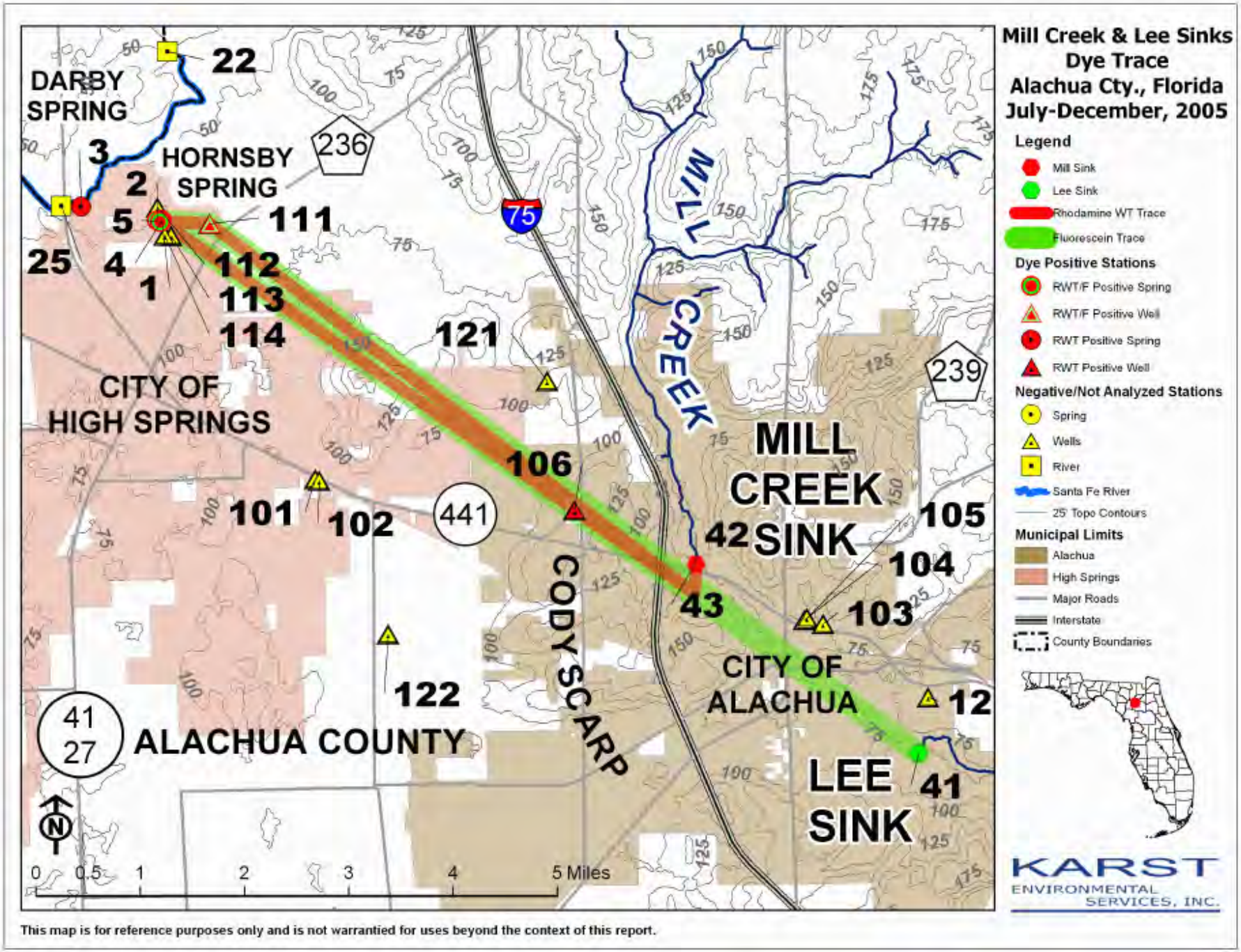
Darby Spring

The results of this study indicate that Mill Creek Sink is potentially connected to Darby Spring. However, the positive results obtained for rhodamine WT from Darby Spring may not necessarily be proof of a direct underground connection with Mill Creek Sink. Based on the results at nearby Hornsby Spring and observations made during the dye trace, three possibilities can be considered regarding the detection of dye at this location.

First, it is a possibility that dye discharged from Hornsby Spring has mixed in these waters and was picked up by the samplers at this site. The cave is silty and the water visibility limited. These conditions were not conducive to easy sampler replacement and recover, so the sampler was lowered by a cord over the spring ledge and into the colder water of the entrance. Although Darby Spring was observed to maintain a lens of colder water in and around its entrance, it has very little flow, and a channel of water from Hornsby Spring Run and the river enters the Darby Spring Pool from upstream, and then flows past the spring pool creating a potential for the mixing of these waters.

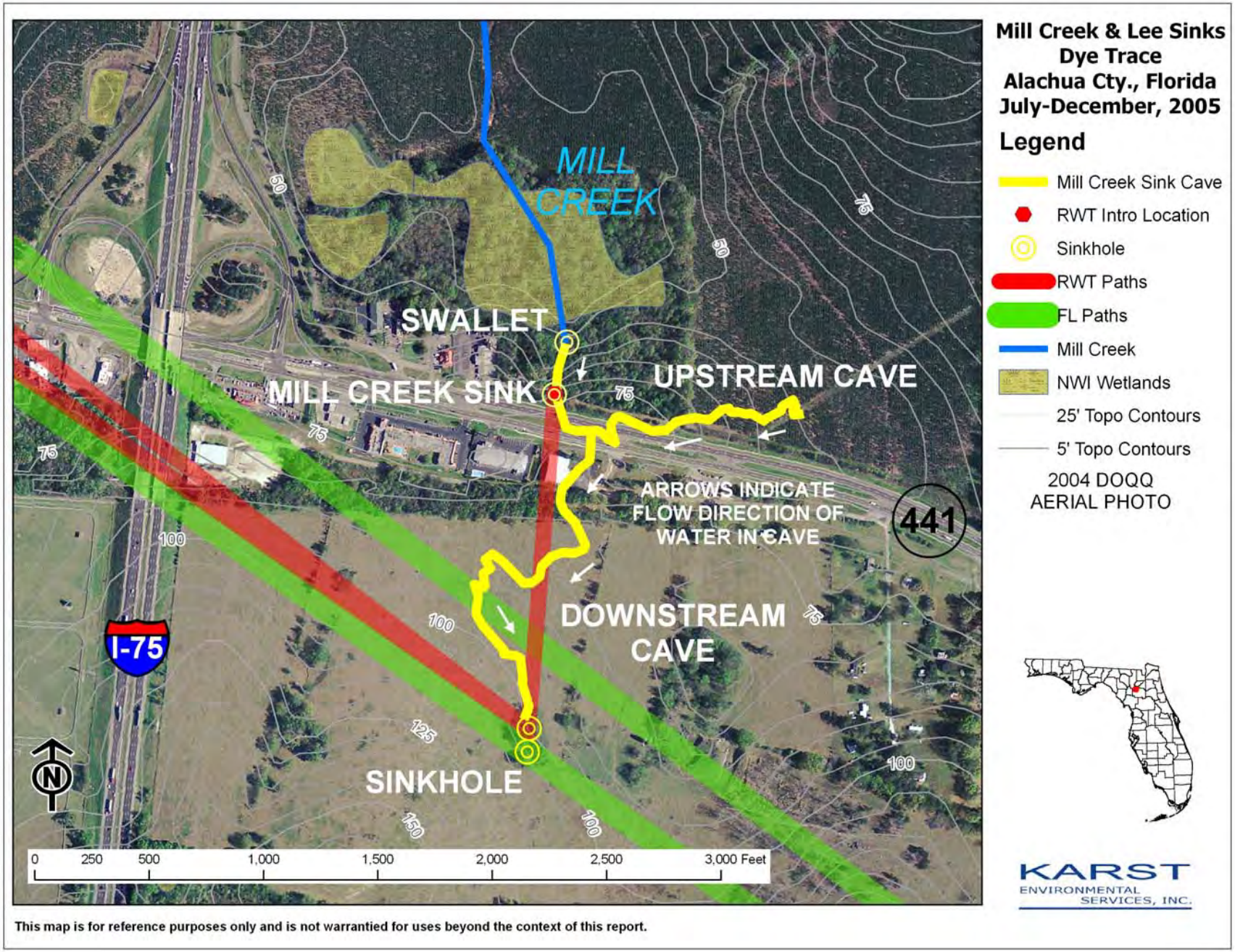
The second possibility takes into account that dye-laden waters from Hornsby Spring have entered up-gradient swallet systems, with a portion of that water making its way into the cave passages that connect to Darby Spring. There are numerous swallets located within the Hornsby Spring Run that channel waters discharged at that spring back underground. At least four swallets are known to divers, and all have extensive cave passage, with one discharging directly back into the river at Treehouse Spring upstream of Darby Spring. Darby Spring has an extensive loop of cave passage connecting to a second, smaller spring, and is located in relatively close proximity downstream of these swallets and their caves.

The third possibility is that there is a direct underground connection from Mill Creek Sink. In light of the above, it would be imprudent at this time to assume this. If future dye studies are conducted in this area, sampling procedures should take these observations into account when designing sampling protocols here.



Study Area Results Map.

Figure 17.



Study Area Results Map; Mill Creek Sink Cave Area.

RECOMMENDATIONS

The following should be considered when conducting future dye traces in this area.

1. A fracture trace analysis should be performed. This analysis would provide better identification of springs, wells and other locations that could be used as dye monitoring stations, as well as dye release locations. This would also provide a framework and hierarchy for planning consecutive dye traces.

2. As there is now a better understanding of the connections to Hornsby Spring, future dye traces may want to consider the inclusion of various in-river "rises" that occur within the Santa Fe River in this area. These may require the use of cave divers to establish sampling stations at various conduit junctions that may be present within these caves. These could include such in-river rise discharges as Columbia Spring, Alligator Rise and Treehouse Spring.

3. The authors believe that the results obtained at Darby Spring during this dye trace may not necessarily confirm a direct connection with Mill Creek Sink. There are at least two other scenarios that could explain the positive detections of dye. To address these alternative explanations, it would be prudent to conduct sampling further back into the cave to minimize the chances of dye contamination from the Santa Fe River and Hornsby Spring Run in any future trace here. To determine if there is an indirect path for dye via the various Hornsby Spring Run swallet caves, a trace could be conducted by releasing dyes directly into those swallet caves; Darby Spring could then be monitored to determine if subterranean connections exist.

4. The water level in the Lee Sink Swallet, unlike that at Mill Creek Swallet, is much more variable, and appears at times to be at an elevation higher than that of the surrounding groundwater level. It would be prudent to place an additional gauge within Lee Sink, and to utilize a nearby monitor well for depth-to-water measurements. This would be easily facilitated by the elevation bench that has been established near the Swallet.

5. Establish staff gauges and water level monitoring at all sampling and discharge locations prior to dye release and for the period of the investigation.

6. Measure the in-conduit flow rates within the upstream cave passages at Mill Creek Sink Cave and Hornsby Spring Cave.

7. Develop a mass balance for the Cross-county Fracture Zone, to better understand the quantities of water entering and being discharged.

8. Select additional water level data points for Alachua County potentiometric surface contour maps to better correlate the relationship of this area to the Santa Fe River. The staff gauge established during this study at Mill Sink Swallet can be included among such additions.

REFERENCES

ACEPD, 2004. May 2004 Floridan Aquifer Potentiometric Surface Map in Alachua County. Alachua County Environmental Protection Department, Gainesville, Florida.

ADPW, 2006. Unpublished data; monthly pumping records for municipal wells. City of Alachua Dept. of Public Works, High Springs, Florida.

Aley, T., 1999. Groundwater Tracing Handbook. Ozark Underground Laboratory, Protem, MO, 35 pp.

Aley, T., 2003. Procedures And Criteria - Analysis of Fluorescein, Eosine, Rhodamine WT, Sulforhodamine B, and Pyranine Dyes In Water and Charcoal Samplers. Ozark Underground Laboratory, Protem, MO, 21 pp.

Clark, W.E.., Musgrove, R.H., Menke, C.G., and Cagle, J.W., Jr., 1964. Water Resources of Alachua, Bradford, Clay and Union Counties, Florida. Report of Investigations No. 35, Florida Geological Survey, Tallahassee, Florida, 170 pp.

Fisk, D.W., and Exley, I.S., 1976, Unpublished report. Alachua County Environmental Protection Department file document. 2 pp.

Hoenstine, and Lane, E., 1991. Environmental Geology and Hydrogeology of the Gainesville Area, Florida. Special Publication No. 33, Florida Geological Survey, Tallahassee, Florida, 70 pp.

Hornsby, D., and Ceryak, R., 1998, Springs of the Santa Fe River Basin in Florida. WR99-02, Suwannee River Water Management District, Live Oak, Florida, 178 pp.

HSDPW, 2006. Unpublished data; monthly pumping records for municipal wells. City of High Springs Dept. of Public Works, High Springs, Florida.

Macesich, M., 1988. Geologic Interpretation of the Aquifer Pollution Potential in Alachua County, Florida. Open File Report No. 21, Florida Geological Survey, Tallahassee, Florida, 25 pp.

Rosenau, J.C., Faulkner, G.L., Hendry, C.W., Jr., and Hull, R.W., 1977, Springs of Florida. Geological Bulletin No. 31 (rev.), Florida Bureau of Geology, Tallahassee, Florida , 461 pp.

Scott, T.M., Means, G.H., Means, R.C., and Meegan, R.P., 2002, First Magnitude Springs of Florida. Open File Report No. 85, Florida Geological Survey, Tallahassee, Florida, 138 pp.

Scott, T.M., Means, G.H., Meegan, R.P., Means, R.C., Upchurch, S.B., Copeland, R E., Jones, J., Roberts, T., and Willet, A., 2004, Springs of Florida. Geological Bulletin No. 66, Florida Geological Survey, Tallahassee, Florida, 377 pp.

Southeastern Geological Society, 1986. Hydrogeological Units of Florida. Special Publication No. 28, Florida Geological Survey, Tallahassee, Florida, 9 pp.

SRWMD, 2005. Potentiometric Surface of the Upper Floridan Aquifer in the Suwannee River Water Management District, May 2005. Suwannee River Water Management District, Live Oak, Florida.

SRWMD, 2006[1]. Unpublished raw data; data from water level and rainfall recording stations. Suwannee River Water Management District, Live Oak, Florida.

SRWMD, 2006[2]. Unpublished data; Hornsby Spring discharge measurements. Suwannee River Water Management District, Live Oak, Florida.

White, W.A., 1970. The Geomorphology of the Florida Peninsula. Geological Bulletin No. 51, Florida Bureau of Geology, Tallahassee, Florida, 164 pp.

Williams, K.E., Nicola, D., and Randazzo, A.F., 1977, The Geology of the Western Part of Alachua County, Florida. Report of Investigations No. 85, Florida Bureau of Geology, Tallahassee, Florida, 98 pp.

APPENDIX I

PHOTOGRAPHIC PLATES

Plate 1. Mill Creek Sink Swallet.

Plate 2. Mill Creek Sink.

Plate 3. Mill Creek Sink Cave. Divers descending into the cavern. Photo courtesy of Cindy Butler.

Plate 4. Mill Creek Sink Cave. Bottom of the cavern at 150 feet of depth. Rhodamine WT was released into the downstream passage just beyond this location. Photo courtesy of Cindy Butler.

Plate 5. Mill Creek Sink Cave. Large room immediately upstream of the Sink, at 140 feet of depth. Note the diver hovering over a thick bank of clay and other sediments. Photo courtesy of Cindy Butler.

Plate 6. Mill Creek Sink Cave. Divers in the cave passage upstream of Sink, at 160 feet of depth. Photo courtesy of Cindy Butler.

Plate 7. Sinkhole above and in the vicinity of the Terminal Room of the Mill Creek Sink Cave.

Plate 8. Lee Sink Swallet.

Plate 9. Lee Sink Swallet during dry conditions.

Plate 10. Santa Fe River and water level gauge and recorder. View is looking upstream at the Highway 441 Bridge.

Plate 11. Hornsby Spring and Run.

Plate 12. Darby Spring.

Plate 13. Poe Spring.

Plate 14. Dye release at Lee Sink. Photo courtesy of Steve Boyes.

Plate 15. Dye release at Mill Creek Sink. Photo courtesy of Steve Boyes.

Plate 16. River Ranch Well.

APPENDIX IIA

ANALYTICAL RESULTS
(Including Certificates of Analysis)

Ozark
UNDERGROUND
LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 ouk@tri-lakes.net

July 20, 2005

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
P. O. Box 1368
High Springs, Florida 32643

RE: Mill Creek/Lee Sinks Dye Trace, BG-1
Analysis results for charcoal samplers shipped on July 8, 2005
Ozark Underground Laboratory (OUL) numbers P2519 through P2521.

Dear Peter:

We have completed analysis of the charcoal samplers received at the OUL on July 12, 2005. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal samplers
2) Sample Collection Data Sheet
3) Sample analysis graphs

f:\docs\coal\kes39.doc

Ozark Underground Laboratory, Inc. for
Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace, BG-1
Samples collected by: KES staff
Date samples shipped: July 8, 2005
Date samples rec'd at OUL: July 12, 2005
Date samples analyzed by OUL: July 14, 2005

Table 1. Results for charcoal samplers analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein Results		RWT Results	
			2005	2005	Peak	Conc.	Peak	Conc.
P2519	22	Santa Fe River Rise	6/30 1653	7/7 1620	ND		ND	
P2520	Laboratory control charcoal blank							
P2521	1	Hornsby Spring - Main	6/30 1615	7/7 1455	ND		ND	

FOOTNOTES:

ND = None Detected

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@ozk-lakes.net

August 10, 2005

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
P. O. Box 1368
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace, Week 1
Analysis results for charcoal and water samples shipped on August 3, 2005
Ozark Underground Laboratory (OUL) numbers P2795 through P2814.

Dear Peter:

We have completed analysis of the charcoal and water samples received at the OUL on August 4, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal and water samples
2) Sample Collection Data Sheets
3) Sample analysis graphs

f:\docs\coa\kes40.doc

Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace, Week 1
Samples collected by: KES staff
Date samples shipped: August 3, 2005
Date samples rec'd at OUL: August 4, 2005
Date samples analyzed by OUL: August 5, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein Results		RWT Results	
					Peak	Conc.	Peak	Conc.
P2795	1	Hornsby Spring -Main	7/25 1529	7/29 1358	ND		ND	
P2796	1	Hornsby Spring - Main	7/29 1358	8/1 1506	ND		ND	
P2797	2	Hornsby Spring Landing	7/25 1533	7/29 1407	ND		ND	
P2798	2	Hornsby Spring Landing	7/29 1407	8/1 1504	ND		ND	
P2799	11	Poe Spring Shallow Vent	7/25 1800	8/1 1856	ND		ND	
P2800	Laboratory control charcoal blank							
P2801	12	Poe Spring Gauge Vent	7/25 1757	8/1 1901	ND		ND	
P2802	101	High Springs Well # 1 (West)	7/25 1309	7/29 1506	ND		ND	
P2803	101	High Springs Well # 1 (West)	7/29 1506	8/1 1131	ND		ND	
P2804	122	Tropic Traditions Well	7/25 1324	8/1 1146	ND		ND	
P2805	103	Alachua Well # 1	7/25 1427	7/29 1628	ND		ND	
P2806	103	Alachua Well # 1	7/29 1628	8/1 1208	ND		ND	
P2807	104	Alachua Well # 2	7/25 1416	7/29 1635	ND		ND	
P2808	104	Alachua Well # 2	7/29 1635	8/1 1220	ND		ND	
P2809	106	Santa Fe Hills Subdivision Well	7/26 1620	7/29 1540	ND		ND	
P2810	106	Santa Fe Hills Subdivision Well	7/29 1540	8/1 1329	ND		ND	

(Footnotes at end of Table) (continued)

Ozark Underground Laboratory, Inc. for
Karst Environmental Services, Inc.

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein Results		RWT Results	
					Peak	Conc.	Peak	Conc.
(continued)								
P2811	121	Copeland Well	7/25 1344	8/1 1338	ND		ND	
P2812	22	Santa Fe River Rise	7/26 1740	8/1 1638	ND		ND	
P2813	43	Mill Creek Sink Cave	**Water**	7/29 1722	ND		574.1	11.3
P2814	43	Mill Creek Sink Cave	**Water**	7/31 1800	ND		574.1	5.16

FOOTNOTES:

ND = None Detected

Ozark
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1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

August 17, 2005

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
P. O. Box 1368
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace, Week 2
Analysis results for charcoal and water samples shipped on August 10, 2005
Ozark Underground Laboratory (OUL) numbers P2899 through P2912

Dear Peter:

We have completed analysis of the charcoal and water samples received at the OUL on August 11, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal and water samples
2) Sample Collection Data Sheets
3) Sample analysis graphs

f:\docs\coal\kes41.doc

Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace, Week 2
Samples collected by: KES staff
Date samples shipped: August 10, 2005
Date samples rec'd at OUL: August 11, 2005
Date samples analyzed by OUL: August 12, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein Results		RWT Results	
					Peak	Conc.	Peak	Conc.
P2899	2	Hornsby Spring Landing	8/1 1504	8/4 1401	ND		ND	
P2900	Laboratory control charcoal blank							
P2901	2	Hornsby Spring Landing	8/4 1401	8/7 1600	ND		ND	
P2902	11	Poe Spring Shallow Vent	8/1 1856	8/4 1748	ND		ND	
P2903	11	Poe Spring Shallow Vent	8/4 1748	8/7 1432	ND		ND	
P2904	101	High Springs Well # 1 (West)	8/1 1131	8/4 1439	ND		ND	
P2905	101	High Springs Well # 1 (West)	8/4 1439	8/7 1825	ND		ND	
P2906	106	Santa Fe Hills Subdivision Well	8/4 1514	8/7 1830	ND		ND	
P2907	122	Tropic Traditions Well	8/1 1146	8/8 1458	ND		ND	
P2908	104	Alachua Well # 2	8/1 1220	8/4 1608	ND		ND	
P2909	104	Alachua Well # 2	8/4 1608	8/7 1903	ND		ND	
P2910	43	Mill Creek Sink Cave	**Water**	8/3 1759	ND		574.3	5.69
P2911	43	Mill Creek Sink Cave	**Water**	8/5 1449	ND		574.3	4.78
P2912	43	Mill Creek Sink Cave	**Water**	8/8 1710	ND		574.5	2.33

FOOTNOTES:

ND = None Detected

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

August 31, 2005

CERTIFICATE OF ANALYSIS

Mr. Peter Batt
Karst Environmental Services, Inc.
P. O. Box 1368
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace, Weeks 2, 3 and 4
Analysis results for charcoal and water samples shipped on August 18, 2005 and additional charcoal samplers from those shipped on August 10, 2005
Ozark Underground Laboratory (OUL) numbers P2998 through P3021 and P3171 through P3181

Dear Peter:

We have completed analysis of the charcoal and water samples you selected from those received at the OUL on August 19, 2005 and additional charcoal samplers received at the OUL on August 11, 2005 per your verbal request of August 25, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal and water samples
2) Sample Collection Data Sheets
3) Discrepancy sheet
4) Sample analysis graphs

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Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace, Weeks 2, 3 and 4
Samples collected by: KES staff
Date samples shipped: August 10 and 18, 2005
Date samples rec'd at OUL: August 11 and 19, 2005
Date samples analyzed by OUL: August 24 and 31, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein Results		RWT Results	
					Peak	Conc.	Peak	Conc.
P2998	2	Hornsby Spring Landing	8/7 1600	8/10 1239	ND		568.8	13.3
P2999	2	Hornsby Spring Landing	8/10 1239	8/13 1536	ND		569.3	38.4
P3000	Laboratory Control Charcoal Blank							
P3001	2	Hornsby Spring Landing	8/13 1536	8/16 1310	ND		569.3	30.3
P3002	22	Santa Fe River Rise	8/7 1736	8/13 1629	ND		ND	
P3003	11	Poe Spring Shallow Vent	8/7 1432	8/10 1530	ND		ND	
P3004	11	Poe Spring Shallow Vent	8/10 1530	8/13 1432	ND		ND	
P3005	11	Poe Spring Shallow Vent	8/13 1432	8/16 1601	ND		ND	
P3006	14	Fenceline Spring	8/7 1420	8/13 1408	ND		ND	
P3007	17	Poe Spring Run	8/10 1548	8/16 1614	ND		ND	
P3008	101	High Springs Well # 1 (West)	8/7 1825	8/10 1312	ND		ND	
P3009	101	High Springs Well # 1 (West)	8/10 1312	8/13 1719	ND		ND	
P3010	101	High Springs Well # 1 (West)	8/13 1719	8/16 1326	ND		ND	
P3011	106	Santa Fe Hills Subdivision Well	8/7 1830	8/10 1353	ND		ND	
P3012	106	Santa Fe Hills Subdivision Well	8/10 1353	8/13 1842	ND		ND	
P3013	106	Santa Fe Hills Subdivision Well	8/13 1842	8/16 1450	ND		ND	

(Footnotes at end of Table) (continued)

Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed 2005	Date/Time Collected 2005	Fluorescein Results		RWT Results	
					Peak	Conc.	Peak	Conc.
(continued)								
P3014	121	Copeland Well	8/8 1618	8/15 1558	ND		ND	
P3015	122	Tropic Traditions Well	8/8 1458	8/13 1728	ND		ND	
P3016	104	Alachua Well # 2	8/7 1903	8/10 1431	ND		ND	
P3017	104	Alachua Well # 2	8/10 1431	8/13 1746	ND		ND	
P3018	104	Alachua Well # 2	8/13 1746	8/16 1419	ND		ND	
P3019	43	Mill Creek Sink Cave	**Water**	8/11 1653	ND		574.7	1.84
P3020	Laboratory Control Water Blank							
P3021	43	Mill Creek Sink Cave	**Water**	8/15 1709	ND		574.3	1.67
P3171	1	Hornsby Spring - Main	8/7 1553	8/10 1230	ND		568.9	14.4
P3172	1	Hornsby Spring - Main	8/10 1230	8/13 1537	ND		570.0	37.2
P3173	1	Hornsby Spring - Main	8/13 1537	8/16 1307	ND		570.1	27.9
P3174	111	River Ranch Well	8/7 1623	8/10 1255	ND		570.1	15.4
P3175	111	River Ranch Well	8/10 1255	8/15 1445	ND		569.9	71.1
P3176	4	Hornsby Spring Daily	8/9 1248	8/10 1228	ND		570.0	12.1
P3177	4	Hornsby Spring Daily	8/8 1421	8/9 1248	ND		569.3	6.28
P3178	4	Hornsby Spring Daily	8/7 1551	8/8 1421	ND		569.5	4.35
P3179	4	Hornsby Spring Daily	8/6 1227	8/7 1551	ND		ND	
P3180	Laboratory Control Charcoal Blank							
P3181	4	Hornsby Spring Daily	8/5 1306	8/6 1227	ND		ND	

FOOTNOTES:

ND = None Detected

Ozark
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1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 ozl@ozl-labs.net

September 19, 2005

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
P. O. Box 1368
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace, Weeks 4-6
Analysis results for charcoal and water samples shipped on September 7, 2005.
Ozark Underground Laboratory (OUL) numbers P3517 through P3553, P3568 and P3569.

Dear Mr. Butt:

We have completed analysis of the charcoal and water samples you selected from those received at the OUL on September 9, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal and water samples
2) Sample Collection Data Sheets
3) Sample analysis graphs

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Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace, Weeks 4-5
Samples collected by: KES staff
Date samples shipped: September 7, 2005
Date samples rec'd at OUL: September 9, 2005
Date samples analyzed by OUL: September 14 and 16, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
P3517	1	Hornsby Spring - Main	8/16/05 1307	8/19/05 1410	ND		569.5	30.0
P3518	1	Hornsby Spring - Main	8/19/05 1410	8/23/05 1423	ND		569.5	54.2
P3519	1	Hornsby Spring - Main	8/23/05 1423	8/26/05 1510	517.6 *	1.48	569.4	24.8
P3520	Laboratory control charcoal blank							
P3521	1	Hornsby Spring - Main	8/26/05 1510	8/29/05 1558	516.4	1.91	569.6	21.2
P3522	1	Hornsby Spring - Main	8/29/05 1558	9/2/05 1418	516.4	3.36	569.8	27.7
P3523	1	Hornsby Spring - Main	9/2/05 1418	9/6/05 1623	516.1	4.09	569.2	18.1
P3524	111	River Ranch Well	8/15/05 1445	8/19/05 1430	ND		569.5	47.3
P3525	111	River Ranch Well	8/19/05 1430	8/23/05 1438	ND		569.8	30.4
P3526	111	River Ranch Well	8/23/05 1438	8/26/05 1548	517.2 *	0.824	570.0	15.3
P3527	111	River Ranch Well	8/26/05 1548	9/2/05 1443	515.8	3.43	569.2	42.4
P3528	22	Santa Fe River Rise	8/13/05 1620	8/19/05 1603	ND		ND	
P3529	22	Santa Fe River Rise	8/19/05 1603	8/25/05 1612	ND		ND	
P3530	22	Santa Fe River Rise	8/25/05 1612	9/2/05 1536	ND		ND	
P3531	4	Hornsby Spring Daily	**Water**	8/5/05 1306	ND		ND	
P3532	4	Hornsby Spring Daily	**Water**	8/6/05 1227	ND		ND	
P3533	4	Hornsby Spring Daily	**Water**	8/7/05 1551	ND		ND	

(Footnotes at end of table) (continued)

Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
(continued)								
P3534	4	Hornsby Spring Daily	**Water**	8/8/05 1421	ND		ND	
P3535	4	Hornsby Spring Daily	**Water**	8/9/05 1248	ND		ND	
P3536	4	Hornsby Spring Daily	**Water**	8/10/05 1228	ND		576.8	0.093
P3568	4	Hornsby Spring Daily	**Water**	8/11/05 1529	ND		577.3	0.209
P3569	4	Hornsby Spring Daily	**Water**	8/12/05 1509	ND		574.6	0.198
P3537	4	Hornsby Spring Daily	**Water**	8/13/05 1535	ND		575.8	0.247
P3538	17	Poe Spring Run	8/16/05 1614	8/23/05 1330	ND		ND	
P3539	17	Poe Spring Run	8/23/05 1330	8/29/05 1831	ND		ND	
P3540	Laboratory control charcoal blank							
P3541	17	Poe Spring Run	8/29/05 1831	9/6/05 1526	ND		ND	
P3542	106	Santa Fe Hills Subdivision Well	8/19/05 1710	8/23/05 1622	ND		570.6	2.49
P3543	106	Santa Fe Hills Subdivision Well	8/27/05 1411	9/2/05 1646	ND		571.6*	2.71
P3544	121	Copeland Well	8/25/05 1520	9/2/05 1632	ND		ND	
P3545	122	Tropic Traditions Well	8/25/05 1505	9/2/05 1642	ND		ND	
P3546	101	High Springs Well # 1 (West)	8/16/05 1326	8/19/05 1648	ND		ND	
P3547	101	High Springs Well # 1 (West)	8/19/05 1648	8/23/05 1458	ND		ND	
P3548	101	High Springs Well # 1 (West)	8/23/05 1458	8/26/05 1721	ND		ND	
P3549	101	High Springs Well # 1 (West)	8/26/05 1721	9/2/05 1624	ND		ND	
P3550	104	Alachua Well # 2	8/19/05 1737	8/23/05 1601	ND		ND	
P3551	104	Alachua Well # 2	8/26/05 1755	9/2/05 1709	ND		ND	

Footnotes at end of table (continued)

Ozark Underground Laboratory, Inc. for
Karst Environmental Services, Inc.

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
(continued)								
P3552	43	Mill Creek Sink Cave	**Water**	8/19/05 1750	ND		574.5	1.71
P3553	43	Mill Creek Sink Cave	**Water**	9/2/05 1730	ND		575.3	3.64

FOOTNOTES:

ND = None Detected

* = A fluorescence peak is present which does not meet all the criteria for a positive dye result. However, it has been calculated as though it were the tracer dye.

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@mtnlakes.net

September 23, 2005

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
P. O. Box 1368
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace, archived samples from weeks 2-6.
Analysis results for selected archived charcoal and water samples shipped August 10, 2005 and September 7, 2005.
Ozark Underground Laboratory (OUL) numbers P3654 through P3668.

Dear Mr. Butt:

We have completed analysis of the archived charcoal and water samples you selected from those received at the OUL on August 11 and September 9, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal and water samples
2) Sample Collection Data Sheets
3) Sample analysis graphs

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Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: **Mill Creek/Lee Sinks Dye Trace, archived samples from Weeks 2-6**
Samples collected by: **KES staff**
Date samples shipped: **August 10 and September 7, 2005**
Date samples rec'd at OUL: **August 11 and September 9, 2005**
Date samples analyzed by OUL: **September 21, 2005**

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
P3654	1	Hornsby Spring -Main	8/1/05 1506	8/4/05 1353	ND		ND	
P3655	1	Hornsby Spring -Main	8/4/05 1353	8/7/05 1553	ND		ND	
P3656	111	River Ranch Well	8/1/05 1528	8/4/05 1417	ND		ND	
P3657	111	River Ranch Well	8/4/05 1417	8/7/05 1623	ND		ND	
P3658	2	Hornsby Spring Landing	8/19/05 1413	8/23/05 1427	ND		569.4	34.8
P3659	2	Hornsby Spring Landing	8/23/05 1427	8/26/05 1517	ND		569.0	14.3
P3660	Laboratory control charcoal blank							
P3661	2	Hornsby Spring Landing	8/26/05 1517	8/29/05 1600	ND		569.2	14.8
P3662	106	Santa Fe Hills Subdivision Well	8/16/05 1450	8/19/05 1710	ND		ND	
P3663	106	Santa Fe Hills Subdivision Well	8/23/05 1622	8/27/05 1411	ND		ND	
P3664	121	Copeland Well	8/15/05 1558	8/19/05 1656	ND		ND	
P3665	121	Copeland Well	8/19/05 1656	8/25/05 1520	ND		ND	
P3666	4	Hornsby Spring Daily	**Water**	8/19/05 1408	ND		577.2	0.199
P3667	4	Hornsby Spring Daily	**Water**	8/23/05 1421	ND		576.8 *	0.128
P3668	4	Hornsby Spring Daily	**Water**	8/26/05 1507	ND		577.8 *	0.165

FOOTNOTES:
ND = None Detected
* = A fluorescence peak is present which does not meet all the criteria for a positive dye result. However, it has been calculated as though it were the tracer dye.

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@mtnlakes.net

September 28, 2005

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
P. O. Box 1368
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace, archived samples from weeks 7-8.
Analysis results for charcoal and water samples shipped September 22, 2005.
Ozark Underground Laboratory (OUL) numbers P3719 through P3748.

Dear Mr. Butt:

We have completed analysis of the charcoal and water samples you selected from those received at the OUL on September 23, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal and water samples
2) Sample Collection Data Sheets
4) Discrepancy sheet
3) Sample analysis graphs

E:\docs\coal\kes45.doc

Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace, Weeks 7-8
Samples collected by: KES staff
Date samples shipped: September 22, 2005
Date samples rec'd at OUL: September 23, 2005
Date samples analyzed by OUL: September 26, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
P3719	1	Hornsby Spring - Main	9/6/05 1623	9/9/05 1435	516.7	2.24	570.5	7.29
P3720	Laboratory control charcoal blank							
P3721	1	Hornsby Spring - Main	9/9/05 1435	9/12/05 1518	516.3	2.83	570.0	8.24
P3722	1	Hornsby Spring - Main	9/12/05 1518	9/15/05 1416	516.3	3.13	569.7	5.90
P3723	1	Hornsby Spring - Main	9/15/05 1416	9/19/05 1631	515.4	3.32	569.1	5.91
P3724	5	Hornsby Spring South	8/26/05 1620	9/2/05 1423	516.1	3.26	568.5	34.5
P3725	5	Hornsby Spring South	9/2/05 1423	9/9/05 1439	515.6	2.55	569.1	14.3
P3726	5	Hornsby Spring South	9/9/05 1439	9/15/05 1510	515.8	1.41	570.6	4.31 *
P3727	111	River Ranch Well	9/2/05 1443	9/9/05 1500	515.4	2.94	568.5	21.0
P3728	111	River Ranch Well	9/9/05 1500	9/15/05 1559	515.3	1.88	570.1	7.98
P3729	106	Santa Fe Hills Subdivision Well	9/2/05 1646	9/9/05 1659	ND		ND	
P3730	106	Santa Fe Hills Subdivision Well	9/9/05 1659	9/16/05 1517	ND		ND	
P3731	106	Santa Fe Hills Subdivision Well	9/16/05 1517	9/21/05 1339	ND		ND	
P3732	121	Copeland Well	9/2/05 1632	9/9/05 1648	ND		ND	
P3733	121	Copeland Well	9/9/05 1648	9/16/05 1503	ND		ND	
P3734	122	Tropic Traditions Well	9/9/05 1714	9/16/05 1348	ND		ND	
P3735	22	Santa Fe River Rise	9/2/05 1536	9/9/05 1600	ND		ND	
P3736	22	Santa Fe River Rise	9/9/05 1600	9/16/05 1625	ND		ND	
P3737	111	River Ranch Well	**Water**	8/7/05 1623	ND		ND	

Ozark Underground Laboratory, Inc. for
Karst Environmental Services, Inc.

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
P3738	111	River Ranch Well	**Water**	8/10/05 1255	ND		576.8	0.201
P3739	106	Santa Fe Hills Subdivision Well	**Water**	8/19/05 1710	ND		ND	
P3740	Laboratory control water blank							
P3741	106T	Santa Fe Hills Subdivision Well - System Tap Water	**Water**	9/21/05 1339	ND		ND	
P3742	43	Mill Creek Sink Cave	**Water**	9/9/05 1736	ND		575.2	1.46
P3743	17	Poe Spring Run	9/6/05 1526	9/12/05 1430	ND		ND	
P3744	17	Poe Spring Run	9/12/05 1430	9/19/05 1724	ND		ND	
P3745	101	High Springs Well # 1 (West)	9/2/05 1624	9/9/05 1654	ND		ND	
P3746	101	High Springs Well # 1 (West)	9/9/05 1654	9/16/05 1338	ND		ND	
P3747	104	Alachua Well # 2	9/2/05 1709	9/9/05 1740	ND		ND	
P3748	104	Alachua Well # 2	9/9/05 1740	9/16/05 1429	ND		ND	

FOOTNOTES:

ND = None Detected

* = A fluorescence peak is present which does not meet all the criteria for a positive dye result. However, it has been calculated as though it were the tracer dye.

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@mtnlakes.net

October 14, 2005

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
P. O. Box 1368
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace, weeks 7-8 and 9-10.
Analysis results for additional charcoal & water samples from those shipped 9/22/2005, per telephone request from Peter Butt on 10/5/2005, & charcoal & water samples shipped 10/7/05.
Ozark Underground Laboratory (OUL) numbers P3882 through P3888 and P3904 through P3926.

Dear Mr. Butt:

We have completed analysis of the additional charcoal and water samples you selected from those received at the OUL on September 23, 2005, and for those received on October 7, 2005. We have indicated the OUL number for each of these samples on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal and water samples
2) Sample Collection Data Sheets
4) Discrepancy sheet
3) Sample analysis graphs

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Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace, Weeks 7-8 and 9-10
Samples collected by: KES staff
Date samples shipped: September 22 and October 6, 2005
Date samples rec'd at OUL: September 23 and October 7, 2005
Date samples analyzed by OUL: October 10 and 11, 2005

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
P3882	4	Hornsby Spring Daily	**Water**	8/29/05 1555	ND		ND	
P3883	4	Hornsby Spring Daily	**Water**	9/2/05 1415	ND		ND	
P3884	4	Hornsby Spring Daily	**Water**	9/6/05 1620	ND		ND	
P3885	4	Hornsby Spring Daily	**Water**	9/9/05 1437	ND		ND	
P3886	111	River Ranch Well	**Water**	8/26/05 1548	ND		577.4	0.145
P3887	111	River Ranch Well	**Water**	9/2/05 1443	ND		ND	
P3888	111	River Ranch Well	**Water**	9/9/05 1500	ND		ND	
P3904	1	Hornsby Spring - Main	9/19/05 1631	9/23/05 1413	515.9	4.85	568.8	9.54
P3905	1	Hornsby Spring - Main	9/23/05 1413	9/30/05 1405	516.3	4.61	568.4	11.0
P3906	3	Darby Spring	8/26/05 1635	9/2/05 1358	ND		570.1	2.93
P3907	3	Darby Spring	9/2/05 1358	9/9/05 1418	ND		570.0	2.50
P3908	111	River Ranch Well	9/23/05 1439	9/30/05 1511	516.1	3.51	568.8	11.2
P3909	112	Main Shop Well	8/26/05 1533	9/2/05 1432	ND		ND	
P3910	112	Main Shop Well	9/2/05 1432	9/9/05 1446	ND		ND	
P3911	113	Residence 6 Well	8/26/05 1538	9/2/05 1451	ND		ND	
P3912	113	Residence 6 Well	9/2/05 1451	9/9/05 1510	ND		ND	
P3913	114	Chalet Well	8/26/05 1604	9/2/05 1456	ND		ND	

(Footnotes at end of Table) (continued)

Ozark Underground Laboratory, Inc. for
Karst Environmental Services, Inc.

Table 1. Results for charcoal and water samples analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb). All results are for charcoal unless otherwise indicated.

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
(continued)								
P3914	114	Chalet Well	9/2/05 1456	9/9/05 1515	ND		ND	
P3915	121	Copeland Well	9/16/05 1503	9/23/05 1635	ND		ND	
P3916	121	Copeland Well	9/23/05 1635	9/30/05 1727	ND		ND	
P3917	122	Tropic Traditions Well	9/23/05 1637	9/30/05 1541	ND		ND	
P3918	22	Santa Fe River Rise	9/16/05 1625	9/23/05 1532	ND		ND	
P3919	22	Santa Fe River Rise	9/23/05 1532	10/5/05 1408	ND		ND	
P3920	Laboratory control charcoal blank							
P3921	17	Poe Spring Run	9/19/05 1724	9/28/05 1824	ND		ND	
P3922	17	Poe Spring Run	9/28/05 1824	10/5/05 1216	ND		ND	
P3923	101	High Springs Well # 1 (West)	9/16/05 1338	9/23/05 1620	ND		ND	
P3924	101	High Springs Well # 1 (West)	9/23/05 1620	10/3/05 1543	ND		ND	
P3925	104	Alachua Well # 2	9/23/05 1658	10/3/05 1431	ND		ND	
P3926	111T	River Ranch Well Water System	**Water**	9/30/05 1507	ND		ND	

FOOTNOTES:

ND = None Detected

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@sti-lakes.net

November 1, 2005

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
5779 NE County Road 340
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace, weeks 9-10 and 11-13
Analysis results for charcoal samplers shipped October 25, 2005 and additional archived charcoal samplers shipped on October 6, 2005
Ozark Underground Laboratory (OUL) numbers P4163 through P4170 and P4259 through P4262

Dear Mr. Butt:

We have completed analysis of selected charcoal samplers received at the OUL on October 26, 2005, and additional archived charcoal samplers received on October 7, 2005 per your telephone request on October 28, 2005. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal samplers
2) Sample Collection Data Sheets
3) Sample analysis graphs

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Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace, Weeks 9-10 and 11-13
Samples collected by: KES staff
Date samples shipped: October 6 and 25
Date samples rec'd at OUL: October 7 and 26, 2005
Date samples analyzed by OUL: October 27 and November 1, 2005

Table 1. Results for charcoal samplers analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
P4163	1	Hornsby Spring - Main	9/30/05 1405	10/7/05 1409	516.5	4.28	568.7	8.04
P4164	1	Hornsby Spring - Main	10/7/05 1409	10/13/05 1350	516.7	2.32	571.1	4.15
P4165	1	Hornsby Spring - Main	10/13/05 1350	10/20/05 1619	516.4	3.11	569.0	5.65
P4166	17	Poe Spring Run	10/5/05 1216	10/13/05 1448	ND		ND	
P4167	17	Poe Spring Run	10/13/05 1448	10/22/05 1512	ND		ND	
P4168	101	High Springs Well # 1 (West)	10/3/05 1543	10/13/05 1312	ND		ND	
P4169	101	High Springs Well # 1 (West)	10/13/05 1312	10/20/05 1554	ND		ND	
P4170	3	Darby Spring	8/19/05 1500	8/26/05 1635	ND		ND	
P4259	3	Darby Spring	9/9/05 1418	9/15/05 1627	ND		569.0 *	1.84
P4261	3	Darby Spring	8/15/05 1520	8/19/05 1500	ND		568.6 *	2.27
P4262	3	Darby Spring	9/15/05 1627	9/23/05 1355	ND		567.8 *	2.22

FOOTNOTES:

ND = None Detected\

* = A fluorescence peak is present which does not meet all the criteria for a positive dye result. However, it has been calculated as though it were the tracer dye.

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@tri-lakes.net

January 18, 2006

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
5779 NE County Road 340
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace, weeks 14+
Analysis results for charcoal samplers shipped January 10, 2006
Ozark Underground Laboratory (OUL) numbers P5526 through P5530

Dear Mr. Butt:

We have completed analysis of charcoal samplers received at the OUL on January 12, 2006. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal samplers
2) Sample Collection Data Sheet
3) Discrepancy sheet
4) Sample analysis graphs

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Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace, Weeks 14+
Samples collected by: KES staff
Date samples shipped: January 10, 2006
Date samples rec'd at OUL: January 12, 2006
Date samples analyzed by OUL: January 16, 2006

Table 1. Results for charcoal samplers analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes. Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
P5526	1	Hornsby Spring - Main	10/20/05 1619	10/28/05 1342	516.2	2.09	567.8	3.75
P5527	1	Hornsby Spring - Main	10/28/05 1342	11/14/05 1624	516.4 *	2.74	566.8	5.17
P5528	1	Hornsby Spring - Main	11/14/05 1624	11/28/05 1535	515.6 *	3.10	566.5	6.72
P5529	1	Hornsby Spring - Main	11/28/05 1535	12/12/05 1435	515.7 *	2.75	566.4 *	5.31
P5530	1	Hornsby Spring - Main	12/12/05 1435	12/27/05 1338	516.5 *	3.17	566.0 *	5.77

FOOTNOTES:

ND = None Detected\

* = A fluorescence peak is present which does not meet all the criteria for a positive dye result. However, it has been calculated as though it were the tracer dye.

Ozark UNDERGROUND LABORATORY 1572 Aley Lane Protem, MO 65733 (417) 785-4289 fax (417) 785-4290 oul@rti-lakes.net

April 3, 2006

CERTIFICATE OF ANALYSIS

Mr. Peter Butt
Karst Environmental Services, Inc.
5779 NE County Road 340
High Springs, Florida 32643

RE: Mill Creek / Lee Sinks Dye Trace
Analysis results for archived charcoal samplers shipped October 25, 2005
Ozark Underground Laboratory (OUL) numbers P6528 through P6529

Dear Mr. Butt:

We have completed the analysis you requested of two archived charcoal samplers from those received at the OUL on October 26, 2005. We have indicated the OUL number for each of these samplers on the enclosed table.

The fluorescein and rhodamine WT (RWT) dye concentrations are based upon standards routinely used at the OUL. The fluorescein is a mixture of 75% dye and 25% diluent; the RWT is a 20% solution. The concentrations are based upon the as-sold weight of the dye.

A summary of the results is presented in Table 1. Additional sampling information is available on the enclosed analysis graphs.

Sincerely,

Thomas J. Aley

Thomas J. Aley, PHG and RG

Enclosures:
1) Table 1 - Analysis results for charcoal samplers
2) Sample Collection Data Sheet
3) Sample analysis graphs

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Ozark Underground Laboratory, Inc. for Karst Environmental Services, Inc.

Project name: Mill Creek/Lee Sinks Dye Trace
Samples collected by: KES staff
Date samples shipped: October 25, 2005
Date samples rec'd at OUL: October 26, 2005
Date samples analyzed by OUL: archived samples on March 31, 2006

Table 1. Results for archived charcoal samplers analyzed for the presence of fluorescein and rhodamine WT (RWT) dyes.
Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

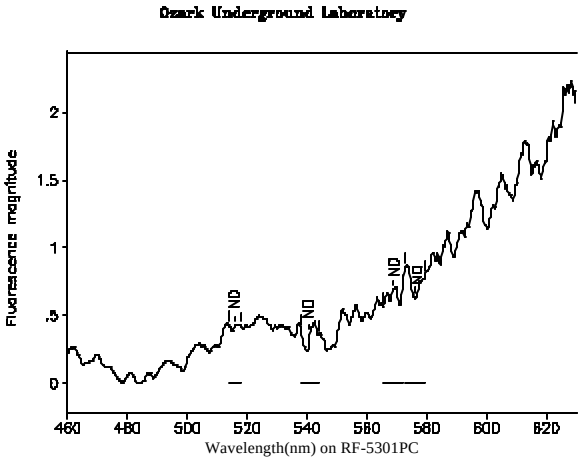
OUL #	Stn. #	Station Name	Date/Time Placed	Date/Time Collected	Fluorescein		RWT	
					Peak	Conc.	Peak	Conc.
P6528	3	Darby Spring	8/1/05 1708	8/7/05 1531	ND		ND	
P6529	3	Darby Spring	8/7/05 1531	8/15/05 1520	ND		ND	

FOOTNOTES:

ND = None Detected

APPENDIX IIB

ANALYTICAL GRAPHS
OF ANALYZED CHARCOAL SAMPLES

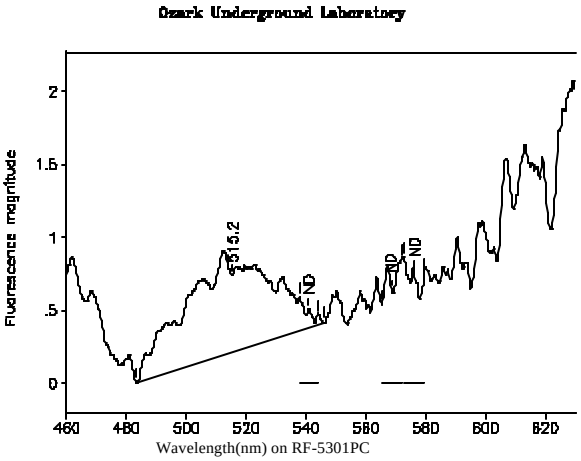


Station 1: Hornsby Spring - Main
OUL number: P2521 Analyzed: 07/14/05
Matrix: Elutant
Placed: 06/30/05 1615 Collected: 07/07/05 1455

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

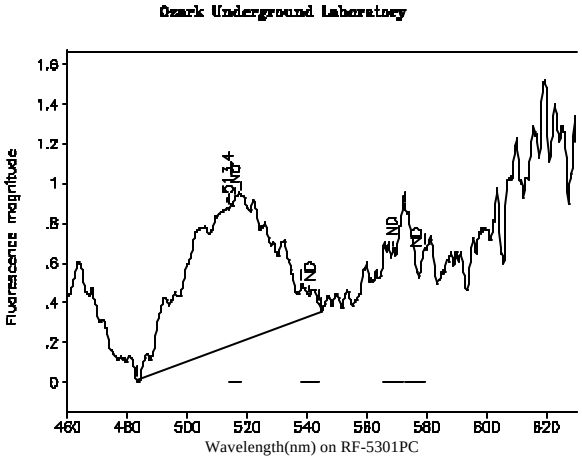


Station 1: Hornsby Spring - Main
OUL number: P2795 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/25/05 1529 Collected: 07/29/05 1358

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.2	483.2	546.0	0.52	22.94	0.02	0.468
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



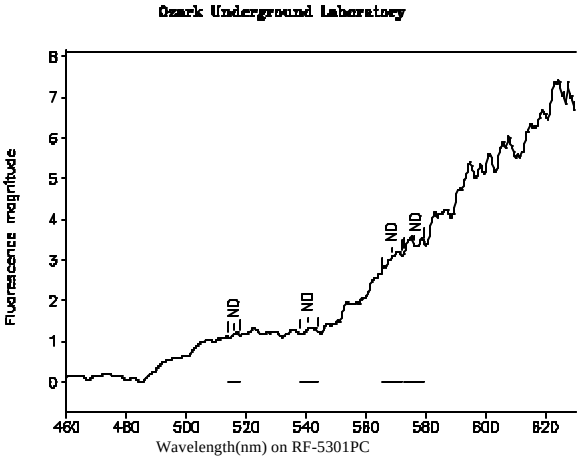
Station 1: Hornsby Spring - Main
OUL number: P2796 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/29/05 1358 Collected: 08/01/05 1506

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

513.4	483.2	545.0	0.70	25.97	0.03	0.530

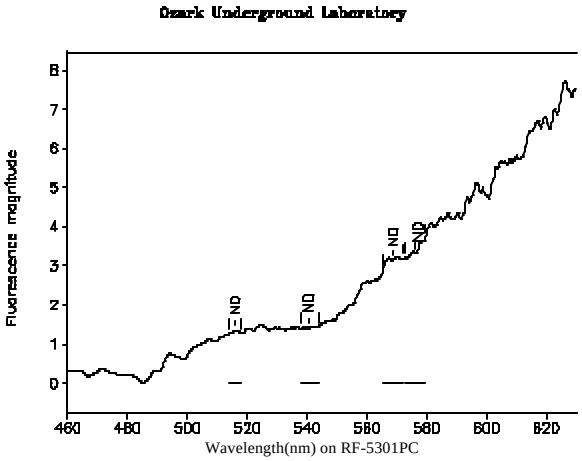


Station 1: Hornsby Spring - Main
OUL number: P3654 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/01/05 1506 Collected: 08/04/05 1353

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

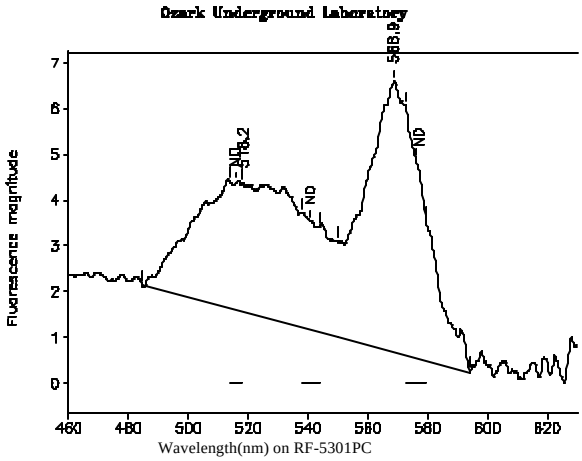


Station 1: Hornsby Spring - Main
OUL number: P3655 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/04/05 1353 Collected: 08/07/05 1553

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



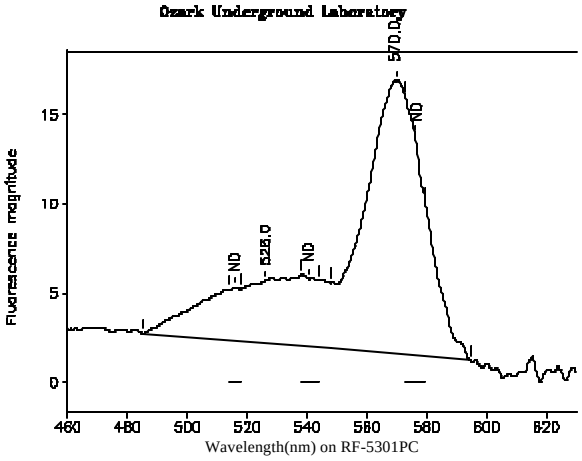
Station 1: Hornsby Spring - Main
OUL number: P3171 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/07/05 1553 Collected: 08/10/05 1230

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.9	550.3	594.2	5.92	138.87	0.04	14.4
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

518.2	484.6	550.3	2.82	135.87	0.02	2.82



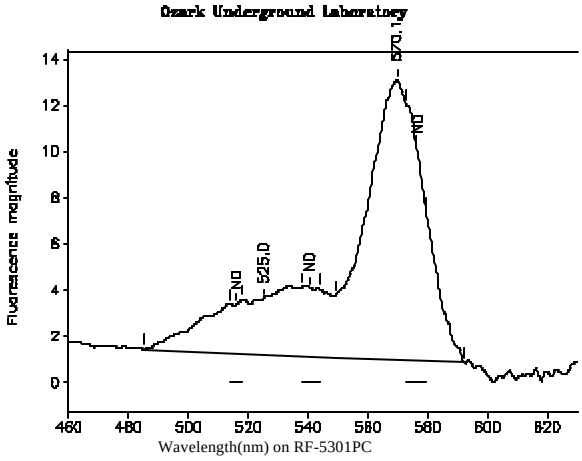
Station 1: Hornsby Spring - Main
OUL number: P3172 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/10/05 1230 Collected: 08/13/05 1537

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.0	547.9	594.6	15.31	359.53	0.04	37.2
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

526.0	485.2	547.9	3.52	163.47	0.02	3.40



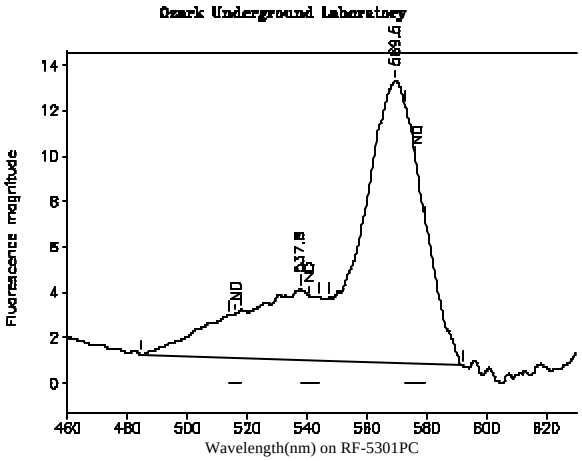
Station 1: Hornsby Spring - Main
OUL number: P3173 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/13/05 1537 Collected: 08/16/05 1307

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.1	549.1	592.4	12.11	270.29	0.04	27.9
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

525.0	485.0	549.1	2.41	121.84	0.02	2.53



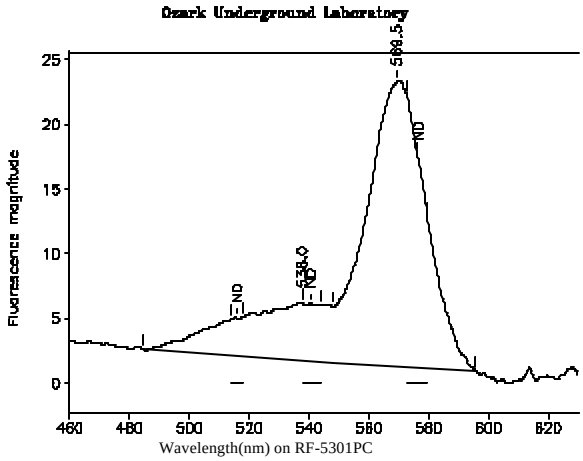
Station 1: Hornsby Spring - Main
OUL number: P3517 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/16/05 1307 Collected: 08/19/05 1410

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.5	547.1	592.0	12.41	282.55	0.04	30.0
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

537.8	484.4	547.1	3.11	109.74	0.03	3.16



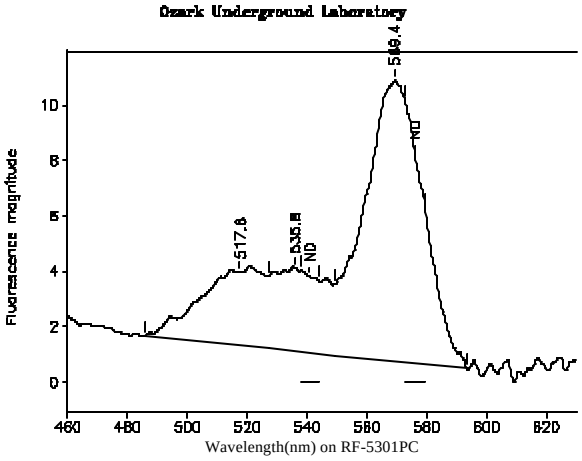
Station 1: Hornsby Spring - Main
OUL number: P3518 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/19/05 1410 Collected: 08/23/05 1423

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.5	548.2	595.8	22.01	511.08	0.04	54.2
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

538.0	484.6	548.2	4.36	167.86	0.03	4.83



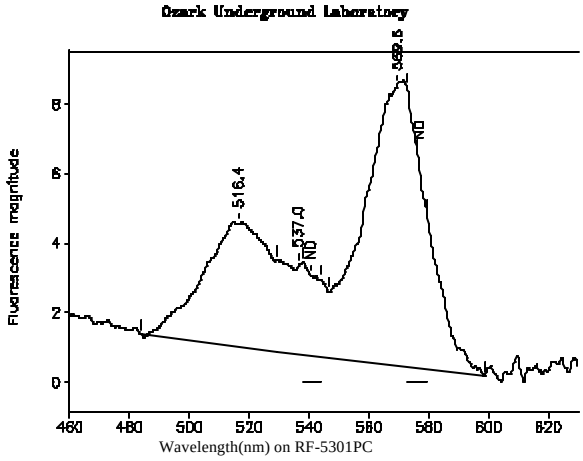
Station 1: Hornsby Spring - Main
OUL number: P3519 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/23/05 1423 Collected: 08/26/05 1510

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	485.8	527.1	2.67	69.86	0.04	1.48
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.4	549.1	593.6	10.14	234.28	0.04	24.8
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

535.8	527.1	549.1	3.02	61.81	0.05	1.78



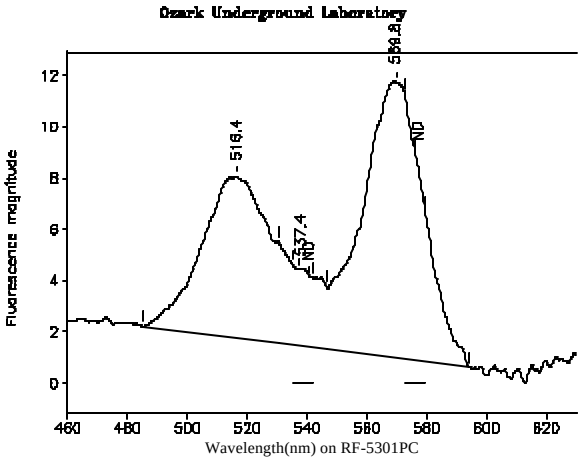
Station 1: Hornsby Spring - Main
OUL number: P3521 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/26/05 1510 Collected: 08/29/05 1558

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	484.0	529.2	3.55	90.28	0.04	1.91
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.6	546.6	598.8	8.07	200.28	0.04	21.2
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

537.0	529.2	546.6	2.59	42.15	0.06	1.21



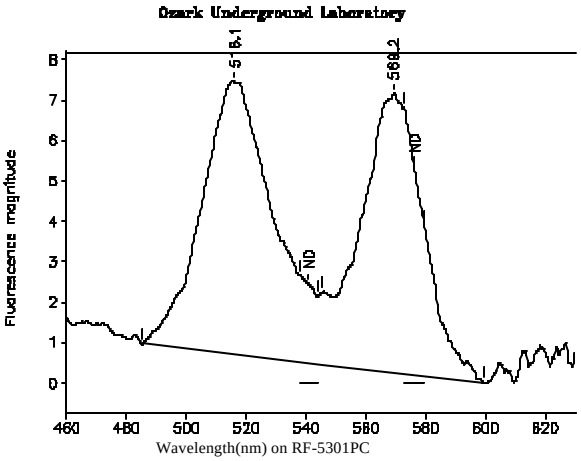
Station 1: Hornsby Spring - Main
OUL number: P3522 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/29/05 1558 Collected: 09/02/05 1418

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	485.2	530.6	6.30	159.22	0.04	3.36
541.0	535.2	541.8	0.00	0.00	0.00	ND
569.8	546.6	594.2	10.79	260.84	0.04	27.7
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

537.4	530.6	546.6	2.99	49.17	0.06	1.41

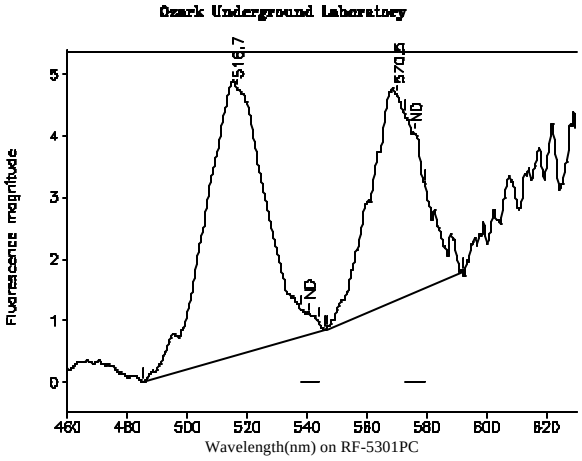


Station 1: Hornsby Spring - Main
OUL number: P3523 Analyzed: 09/14/05
Matrix: Elutant
Placed: 09/02/05 1418 Collected: 09/06/05 1623

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.1	485.0	545.4	6.74	193.75	0.03	4.09
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.2	545.4	599.4	6.87	170.31	0.04	18.1
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

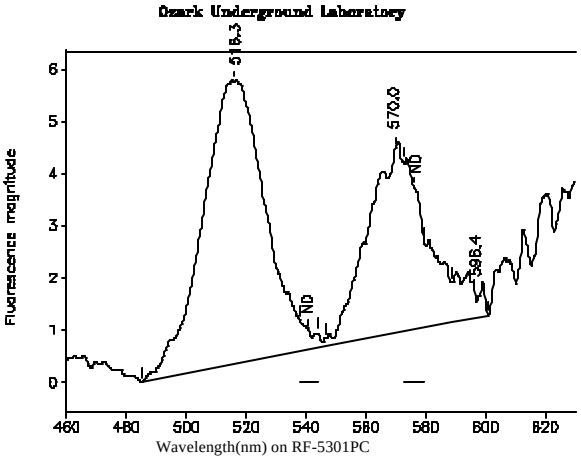


Station 1: Hornsby Spring - Main
OUL number: P3719 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/06/05 1623 Collected: 09/09/05 1435

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	485.4	546.2	4.34	105.06	0.04	2.24
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.5	546.4	592.2	3.31	69.99	0.05	7.29
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



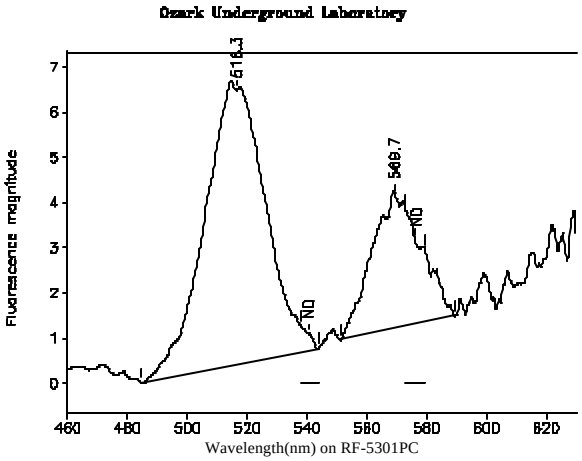
Station 1: Hornsby Spring - Main
OUL number: P3721 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/09/05 1435 Collected: 09/12/05 1518

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.3	485.0	547.0	5.43	132.53	0.04	2.83
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.0	547.0	589.0	3.54	79.07	0.04	8.24
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

596.4	589.0	600.8	0.53	7.46	0.07	0.000

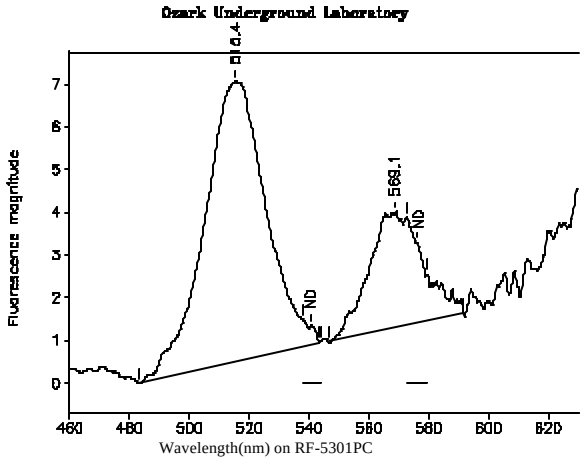


Station 1: Hornsby Spring - Main
OUL number: P3722 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/12/05 1518 Collected: 09/15/05 1416

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.3	484.6	543.8	6.07	146.56	0.04	3.13
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.7	551.4	589.4	2.94	56.64	0.05	5.90
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

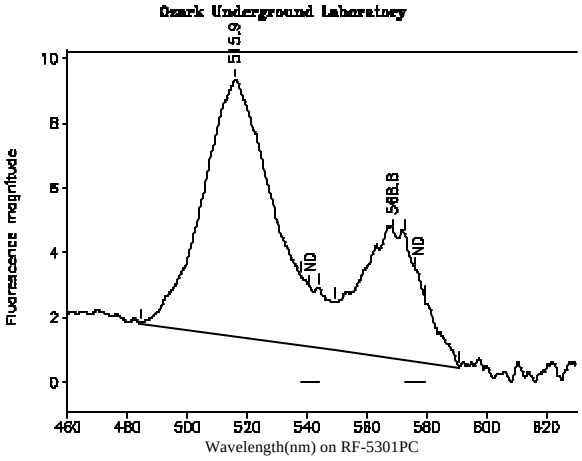


Station 1: Hornsby Spring - Main
OUL number: P3723 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/15/05 1416 Collected: 09/19/05 1631

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	483.4	543.6	6.56	155.63	0.04	3.32
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.1	546.6	591.8	2.69	56.70	0.05	5.91
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

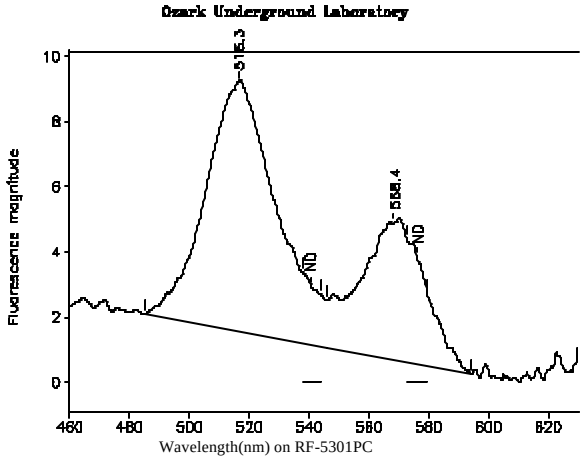


Station 1: Hornsby Spring - Main
OUL number: P3904 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/19/05 1631 Collected: 09/23/05 1413

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.9	484.2	549.1	7.92	226.57	0.03	4.85
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.8	549.1	591.0	3.96	96.53	0.04	9.54
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

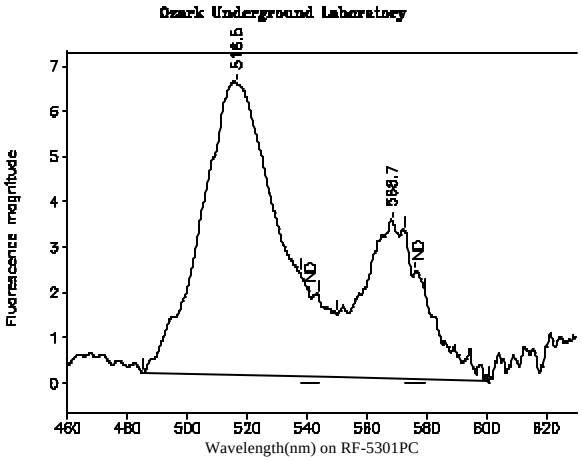


Station 1: Hornsby Spring - Main
OUL number: P3905 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/23/05 1413 Collected: 09/30/05 1405

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.3	485.0	546.1	7.65	215.37	0.04	4.61
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.4	546.1	594.2	4.22	110.93	0.04	11.0
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

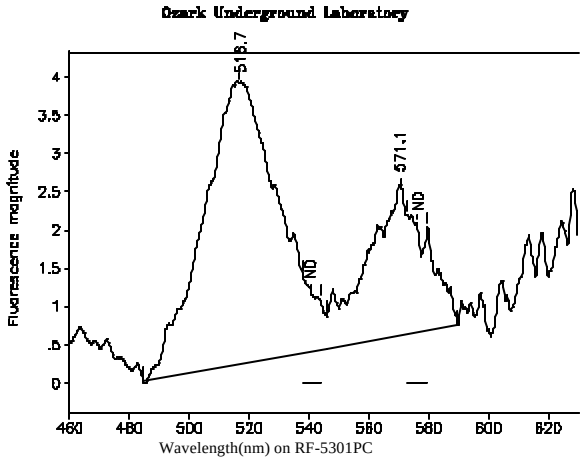


Station 1: Hornsby Spring - Main
OUL number: P4163 Analyzed: 10/27/05
Matrix: Elutant
Placed: 09/30/05 1405 Collected: 10/07/05 1409

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	485.0	550.0	6.44	200.49	0.03	4.28
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.7	550.0	601.0	3.46	86.92	0.04	8.04
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

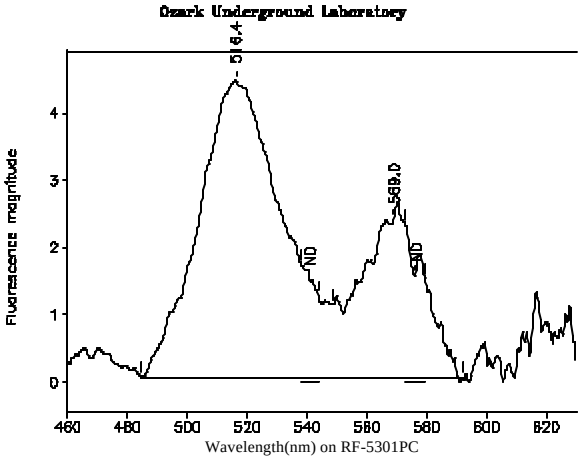


Station 1: Hornsby Spring - Main
OUL number: P4164 Analyzed: 10/27/05
Matrix: Elutant
Placed: 10/07/05 1409 Collected: 10/13/05 1350

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	484.6	546.2	3.67	108.72	0.03	2.32
540.9	538.1	543.9	0.00	0.00	0.00	ND
571.1	546.2	589.8	1.91	44.91	0.04	4.15
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

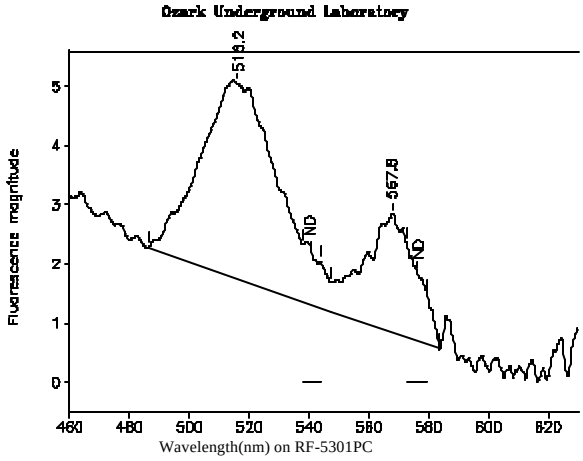


Station 1: Hornsby Spring - Main
OUL number: P4165 Analyzed: 10/27/05
Matrix: Elutant
Placed: 10/13/05 1350 Collected: 10/20/05 1619

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	484.8	548.9	4.41	145.72	0.03	3.11
540.9	538.1	543.9	0.00	0.00	0.00	ND
569.0	548.9	592.0	2.36	61.16	0.04	5.65
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

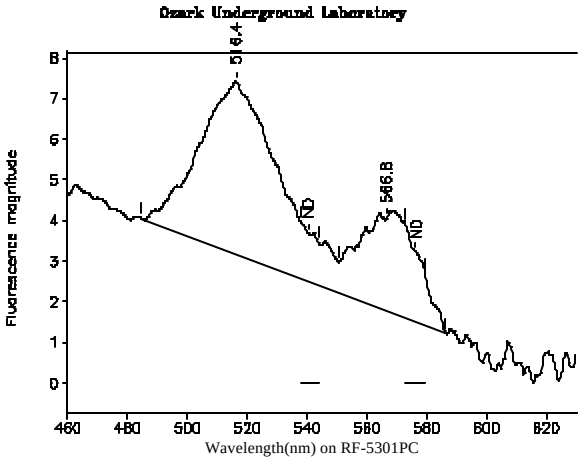


Station 1: Hornsby Spring - Main
OUL number: P5526 Analyzed: 01/16/06
Matrix: Elutant
Placed: 10/20/05 1619 Collected: 10/28/05 1342

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.2	486.2	547.4	3.31	103.54	0.03	2.09
540.9	538.1	543.9	0.00	0.00	0.00	ND
567.8	547.4	583.6	1.99	40.61	0.05	3.75
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

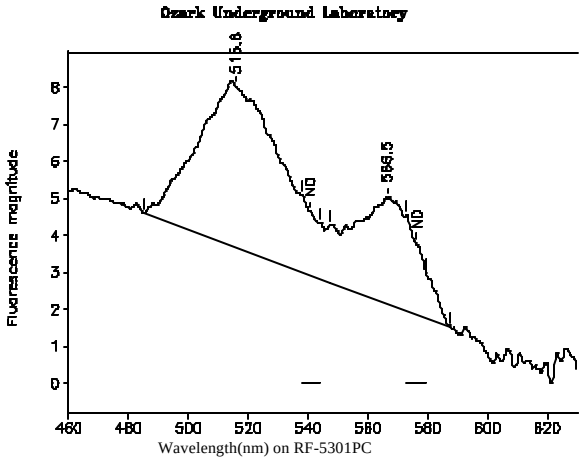


Station 1: Hornsby Spring - Main
OUL number: P5527 Analyzed: 01/16/06
Matrix: Elutant
Placed: 10/28/05 1342 Collected: 11/14/05 1624

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	484.6	550.8	4.24	135.58	0.03	2.74
540.9	538.1	543.9	0.00	0.00	0.00	ND
566.8	550.8	586.4	2.27	55.91	0.04	5.17
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

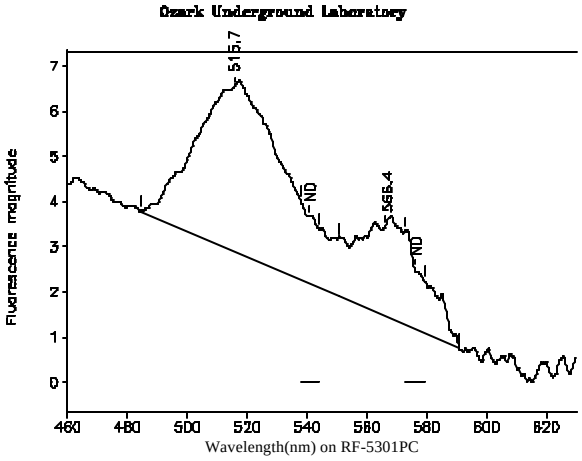


Station 1: Hornsby Spring - Main
OUL number: P5528 Analyzed: 01/16/06
Matrix: Elutant
Placed: 11/14/05 1624 Collected: 11/28/05 1535

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	485.2	547.6	4.36	153.24	0.03	3.10
540.9	538.1	543.9	0.00	0.00	0.00	ND
566.5	547.6	587.8	2.86	72.70	0.04	6.72
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

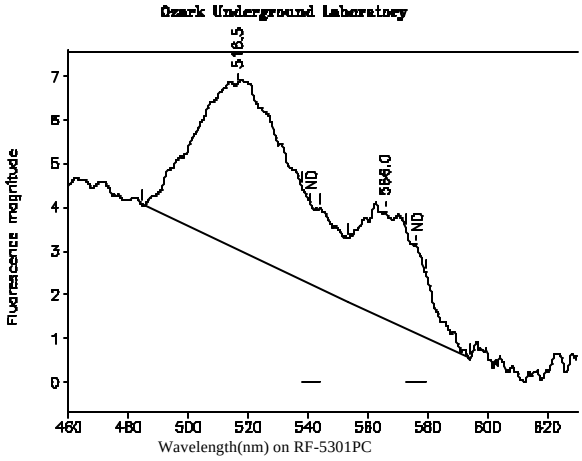


Station 1: Hornsby Spring - Main
OUL number: P5529 Analyzed: 01/16/06
Matrix: Elutant
Placed: 11/28/05 1535 Collected: 12/12/05 1435

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.7	484.6	550.5	3.63	136.25	0.03	2.75
540.9	538.1	543.9	0.00	0.00	0.00	ND
566.4	550.5	591.0	2.02	57.50	0.04	5.31
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

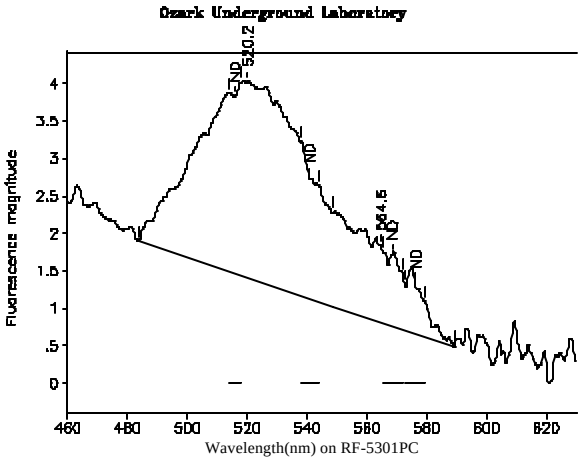


Station 1: Hornsby Spring - Main
OUL number: P5530 Analyzed: 01/16/06
Matrix: Elutant
Placed: 12/12/05 1435 Collected: 12/27/05 1338

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.5	484.4	553.4	3.79	156.61	0.02	3.17
540.9	538.1	543.9	0.00	0.00	0.00	ND
566.0	553.4	594.2	2.46	62.48	0.04	5.77
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



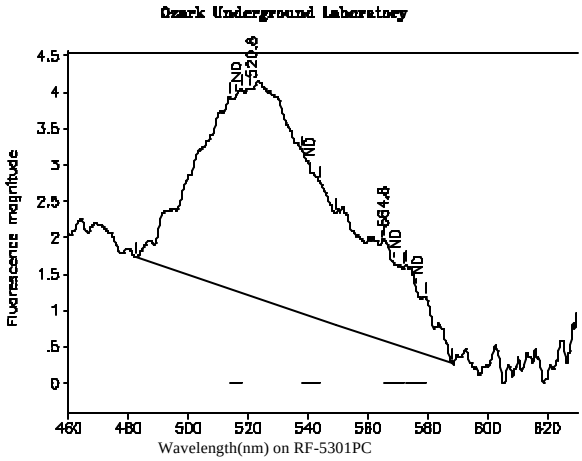
Station 2: Hornsby Spring Landing
OUL number: P2797 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/25/05 1533 Collected: 07/29/05 1407

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

520.2	483.6	549.0	2.62	111.28	0.02	2.27
564.6	549.0	589.2	1.02	30.45	0.03	2.89



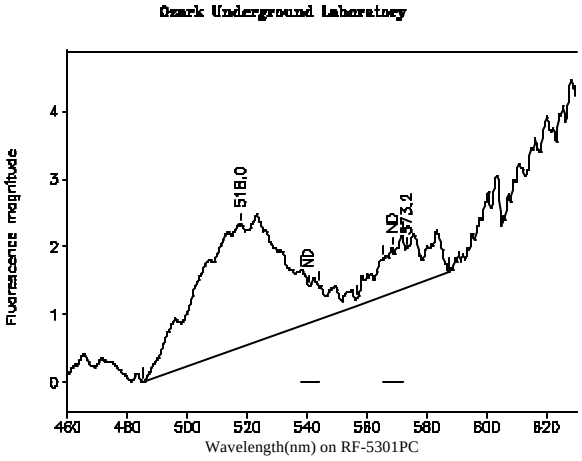
Station 2: Hornsby Spring Landing
OUL number: P2798 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/29/05 1407 Collected: 08/01/05 1504

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

520.8	482.2	549.4	2.84	125.05	0.02	2.55
564.8	549.4	588.4	1.36	40.74	0.03	3.87

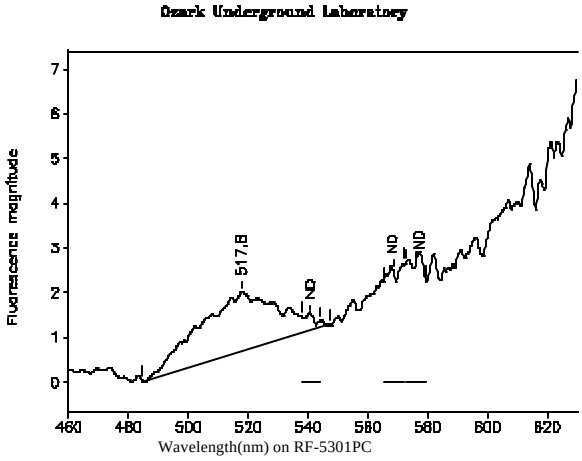


Station 2: Hornsby Spring Landing
OUL number: P2899 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/01/05 1504 Collected: 08/04/05 1401

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
518.0	485.0	556.4	1.81	67.20	0.03	1.37
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
573.2	556.4	587.4	0.57	14.49	0.04	0.828

Peaks close to the normal range of tracer dyes:

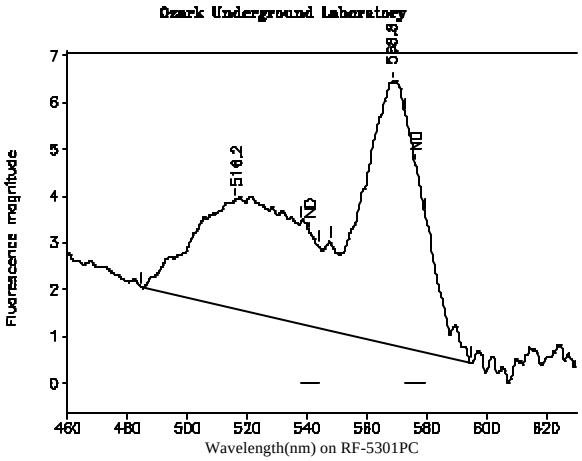


Station 2: Hornsby Spring Landing
OUL number: P2901 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/04/05 1401 Collected: 08/07/05 1600

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	484.8	547.4	1.33	41.78	0.03	0.855
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

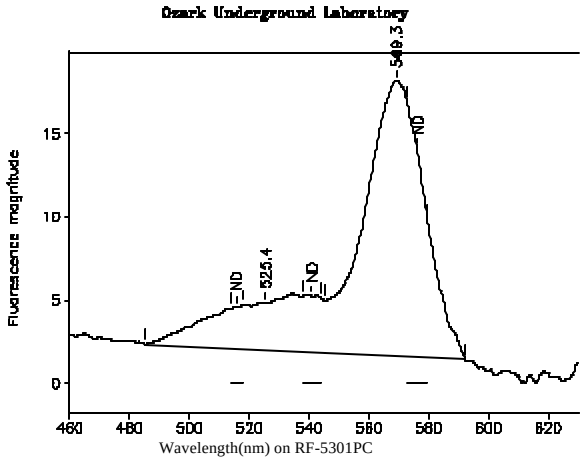


Station 2: Hornsby Spring Landing
OUL number: P2998 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/07/05 1600 Collected: 08/10/05 1239

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.2	484.8	547.7	2.33	106.66	0.02	2.21
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.8	547.7	594.8	5.61	133.75	0.04	13.3
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



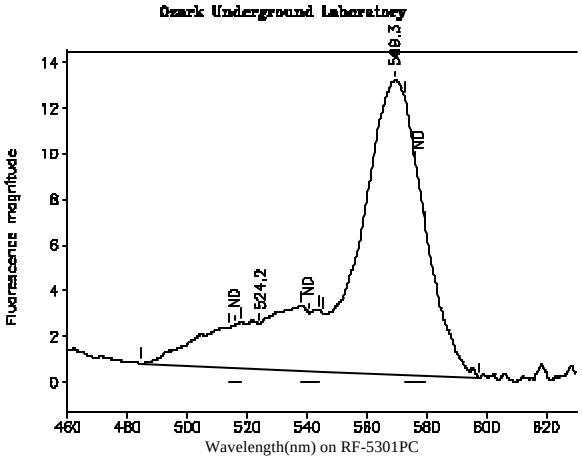
Station 2: Hornsby Spring Landing
OUL number: P2999 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/10/05 1239 Collected: 08/13/05 1536

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.3	545.3	592.2	16.52	385.95	0.04	38.4
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

525.4	485.2	545.3	2.83	128.10	0.02	2.65



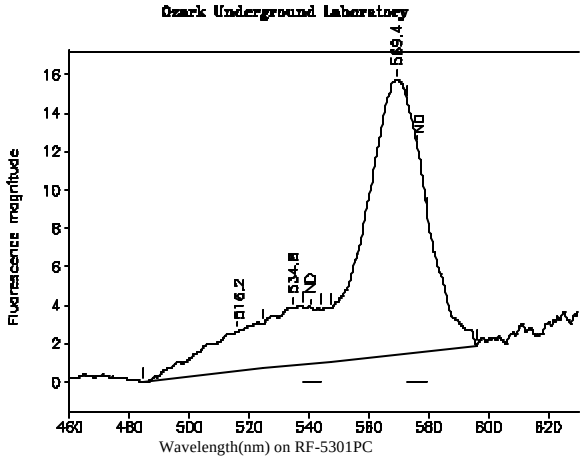
Station 2: Hornsby Spring Landing
OUL number: P3001 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/13/05 1536 Collected: 08/16/05 1310

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.3	545.6	597.4	12.85	305.00	0.04	30.3
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

524.2	484.6	545.6	1.94	100.60	0.02	2.08



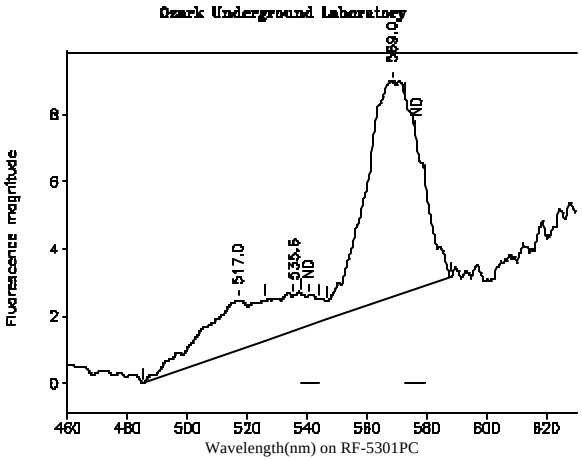
Station 2: Hornsby Spring Landing
OUL number: P3658 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/19/05 1413 Collected: 08/23/05 1427

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.2	484.6	524.8	2.08	52.61	0.04	1.12
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.4	547.2	596.0	14.24	331.61	0.04	34.8
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

534.8	524.8	547.2	2.97	63.30	0.05	1.83



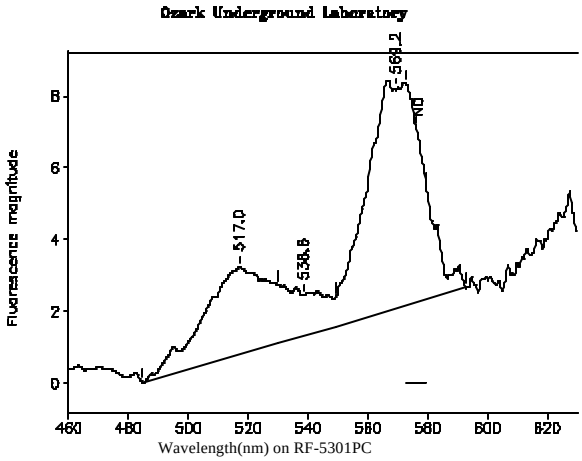
Station 2: Hornsby Spring Landing
OUL number: P3659 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/23/05 1427 Collected: 08/26/05 1517

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	485.2	526.1	1.47	34.86	0.04	0.741
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.0	546.6	588.0	6.39	136.24	0.05	14.3
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

535.6	526.1	546.6	1.07	20.13	0.05	0.582

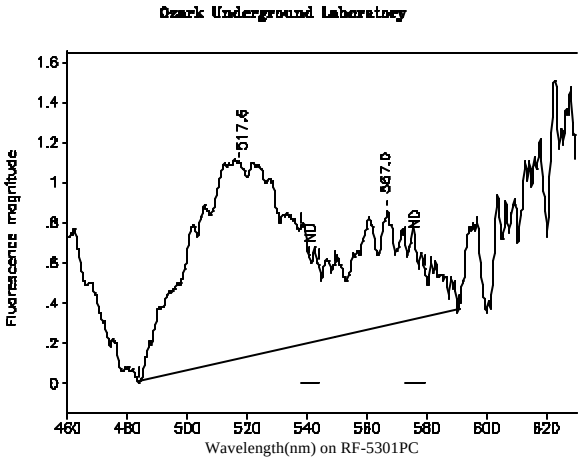


Station 2: Hornsby Spring Landing
OUL number: P3661 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/26/05 1517 Collected: 08/29/05 1600

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	484.8	529.8	2.43	61.07	0.04	1.30
538.6	529.8	549.1	1.12	22.74	0.05	0.657
569.2	549.1	592.8	6.13	141.30	0.04	14.8
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

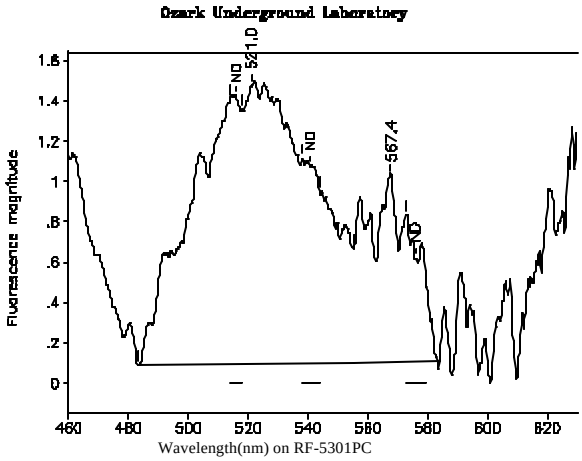


Station 3: Darby Spring
OUL number: P6528 Analyzed: 03/31/06
Matrix: Elutant
Placed: 08/01/05 1708 Collected: 08/07/05 1531

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	484.0	549.1	0.98	40.78	0.02	0.822
540.9	538.1	543.9	0.00	0.00	0.00	ND
567.0	549.1	590.6	0.57	14.07	0.04	1.18
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



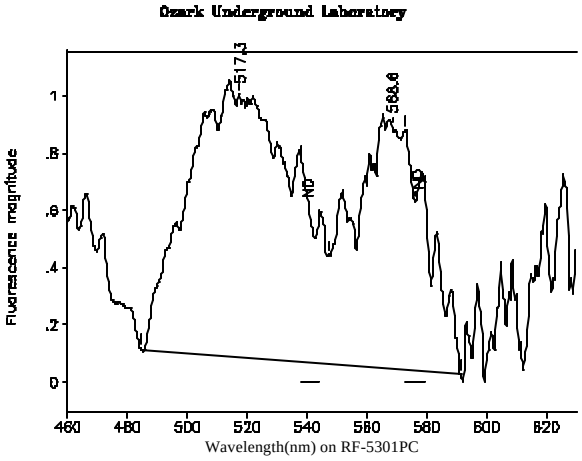
Station 3: Darby Spring
OUL number: P6529 Analyzed: 03/31/06
Matrix: Elutant
Placed: 08/07/05 1531 Collected: 08/15/05 1520

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.9	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
567.4	555.3	584.0	0.93	16.93	0.05	1.42
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

521.0	483.2	555.3	1.38	65.73	0.02	1.32

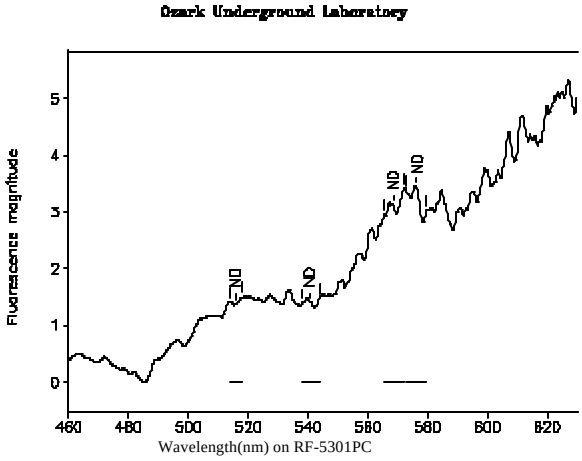


Station 3: Darby Spring
OUL number: P4261 Analyzed: 11/01/05
Matrix: Elutant
Placed: 08/15/05 1520 Collected: 08/19/05 1500

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.3	484.8	547.5	0.92	39.55	0.02	0.844
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	547.5	591.6	0.84	24.82	0.03	2.27
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

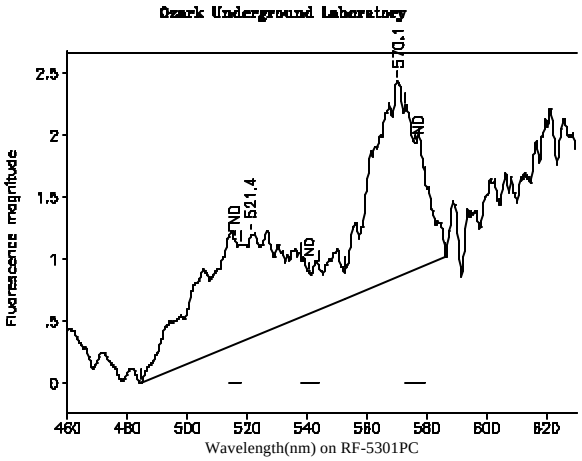


Station 3: Darby Spring
OUL number: P4170 Analyzed: 10/27/05
Matrix: Elutant
Placed: 08/19/05 1500 Collected: 08/26/05 1635

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.9	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



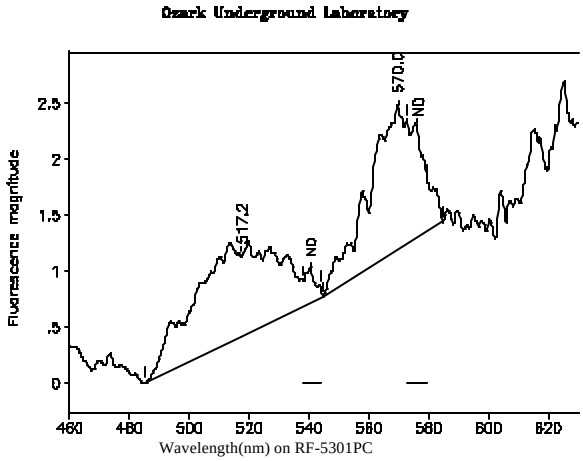
Station 3: Darby Spring
OUL number: P3906 Analyzed: 10/11/05
Matrix: Elutant
Placed: 08/26/05 1635 Collected: 09/02/05 1358

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
570.1	552.4	586.4	1.58	29.61	0.05	2.93
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

521.4	484.4	552.4	0.83	35.07	0.02	0.000

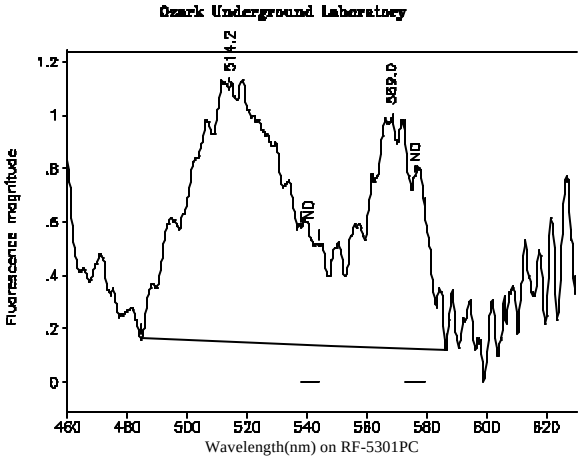


Station 3: Darby Spring
OUL number: P3907 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/02/05 1358 Collected: 09/09/05 1418

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	485.0	544.8	0.71	28.69	0.02	0.614
540.9	538.1	543.9	0.00	0.00	0.00	ND
570.0	544.8	584.6	1.24	25.33	0.05	2.50
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

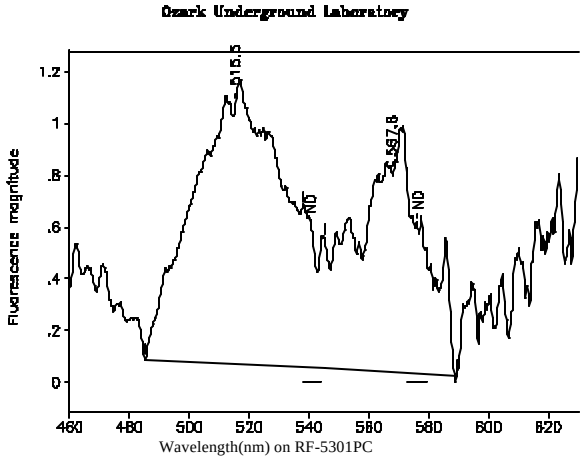


Station 3: Darby Spring
OUL number: P4259 Analyzed: 11/01/05
Matrix: Elutant
Placed: 09/09/05 1418 Collected: 09/15/05 1627

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.2	484.2	547.8	0.95	37.76	0.03	0.806
540.9	538.1	543.9	0.00	0.00	0.00	ND
569.0	547.8	586.6	0.84	20.14	0.04	1.84
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

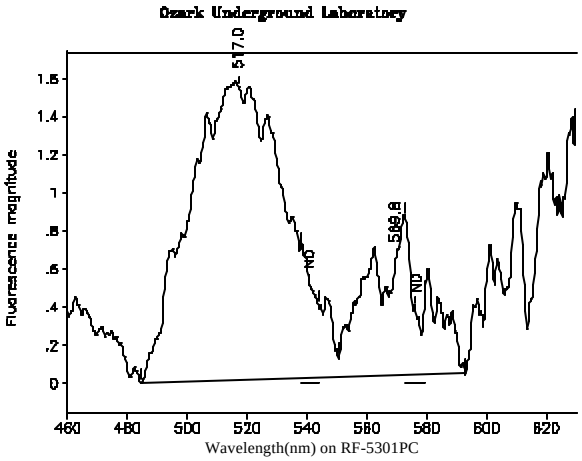


Station 3: Darby Spring
OUL number: P4262 Analyzed: 11/01/05
Matrix: Elutant
Placed: 09/15/05 1627 Collected: 09/23/05 1355

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.5	485.2	545.2	1.01	40.01	0.03	0.854
540.9	538.1	543.9	0.00	0.00	0.00	ND
567.8	545.2	589.2	0.77	24.34	0.03	2.22
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

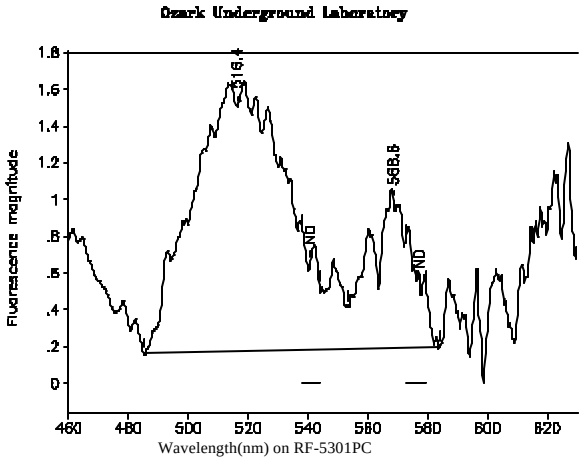


Station 4: Hornsby Spring Daily
OUL number: P3181 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/05/05 1306 Collected: 08/06/05 1227

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	484.4	550.6	1.54	59.60	0.03	1.24
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.8	550.6	593.0	0.61	17.20	0.04	1.78
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

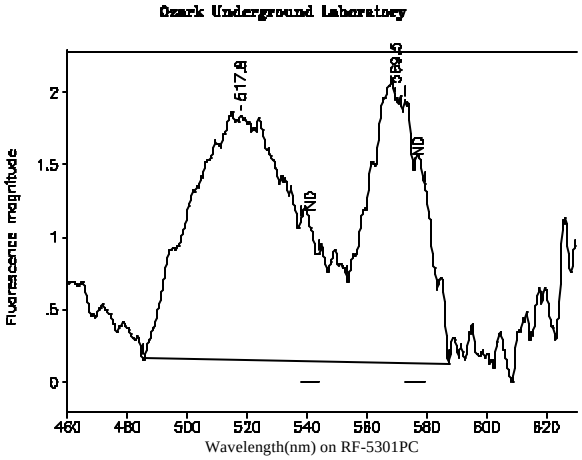


Station 4: Hornsby Spring Daily
OUL number: P3179 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/06/05 1227 Collected: 08/07/05 1551

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	485.0	553.4	1.33	55.48	0.02	1.15
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.6	553.4	584.0	0.80	14.13	0.06	1.46
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

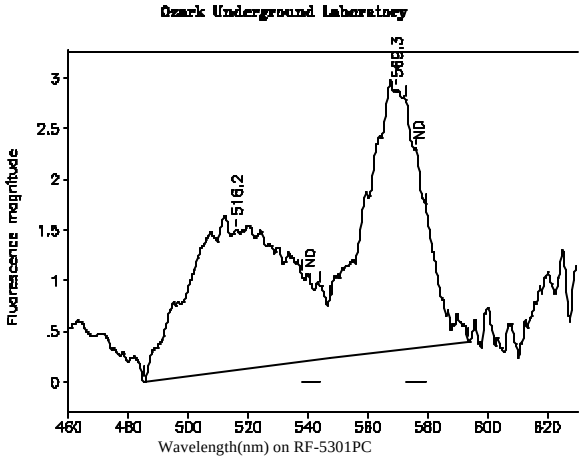


Station 4: Hornsby Spring Daily
OUL number: P3178 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/07/05 1551 Collected: 08/08/05 1421

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	485.0	553.4	1.69	73.12	0.02	1.52
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.5	553.4	587.4	1.84	42.03	0.04	4.35
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

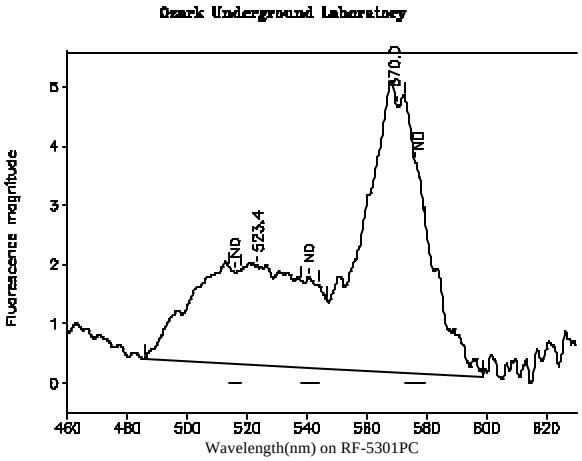


Station 4: Hornsby Spring Daily
OUL number: P3177 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/08/05 1421 Collected: 08/09/05 1248

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.2	485.0	547.1	1.38	60.69	0.02	1.26
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.3	547.1	593.8	2.57	60.75	0.04	6.28
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



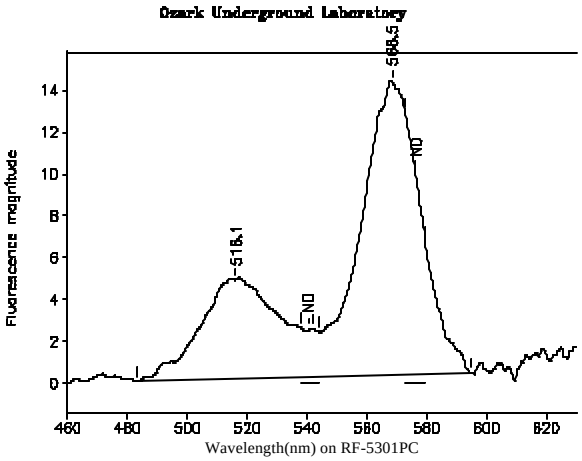
Station 4: Hornsby Spring Daily
OUL number: P3176 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/09/05 1248 Collected: 08/10/05 1228

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.0	546.8	599.0	4.49	116.73	0.04	12.1
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

523.4	485.8	546.8	1.67	77.42	0.02	1.61

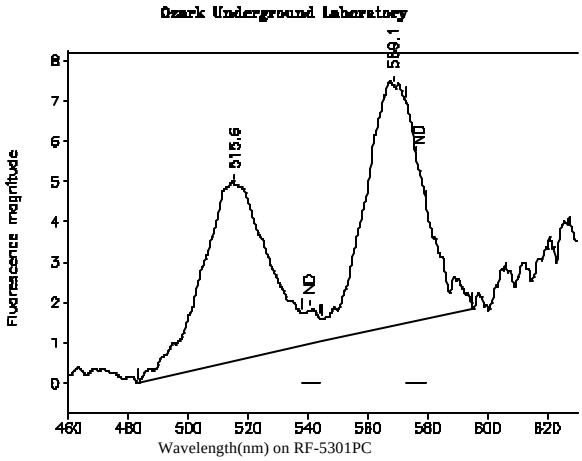


Station 5: Hornsby Spring South
OUL number: P3724 Analyzed: 09/26/05
Matrix: Elutant
Placed: 08/26/05 1620 Collected: 09/02/05 1423

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.1	483.2	541.8	4.76	152.58	0.03	3.26
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.5	541.8	594.6	14.03	331.04	0.04	34.5
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

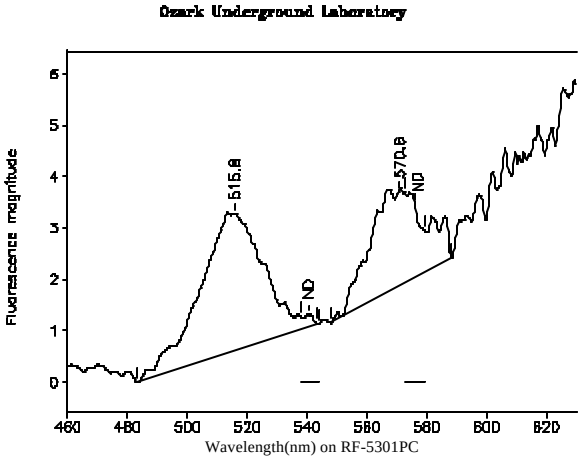


Station 5: Hornsby Spring South
OUL number: P3725 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/02/05 1423 Collected: 09/09/05 1439

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	483.4	544.7	4.39	119.38	0.04	2.55
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.1	544.7	595.2	5.94	137.32	0.04	14.3
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

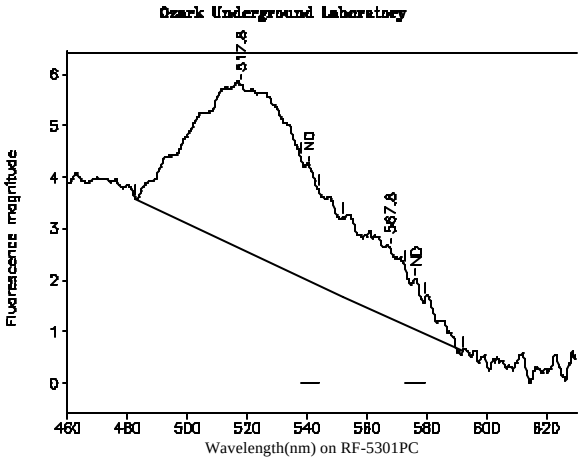


Station 5: Hornsby Spring South
OUL number: P3726 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/09/05 1439 Collected: 09/15/05 1510

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	483.4	543.2	2.65	66.09	0.04	1.41
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.6	548.2	588.4	1.85	41.35	0.04	4.31
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

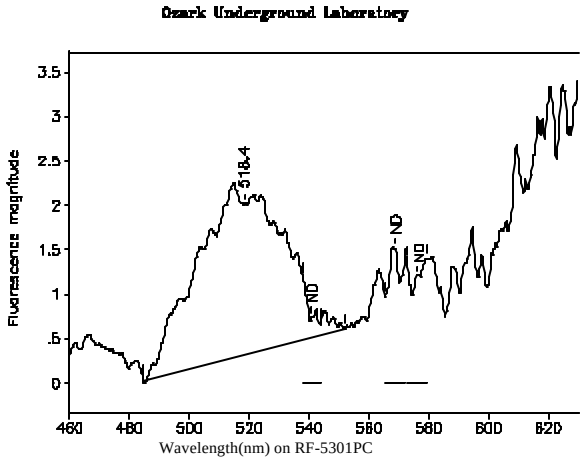


Station 11: Poe Spring Shallow Vent
OUL number: P2799 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/25/05 1800 Collected: 08/01/05 1856

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.8	482.8	552.2	3.18	146.25	0.02	2.99
541.0	538.1	543.9	0.00	0.00	0.00	ND
567.8	552.2	592.0	1.36	38.50	0.04	3.66
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

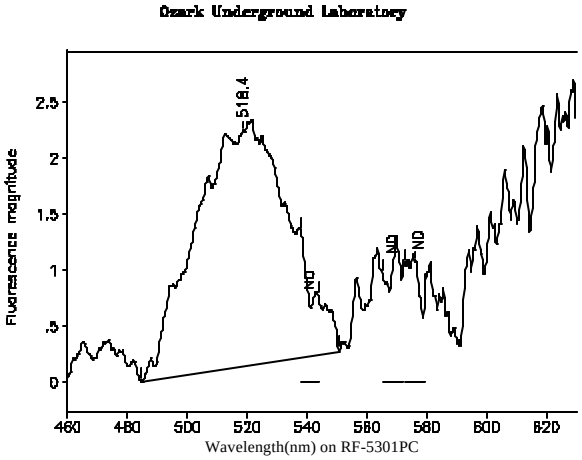


Station 11: Poe Spring Shallow Vent
OUL number: P2902 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/01/05 1856 Collected: 08/04/05 1748

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
518.4	484.6	551.8	1.69	64.66	0.03	1.32
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

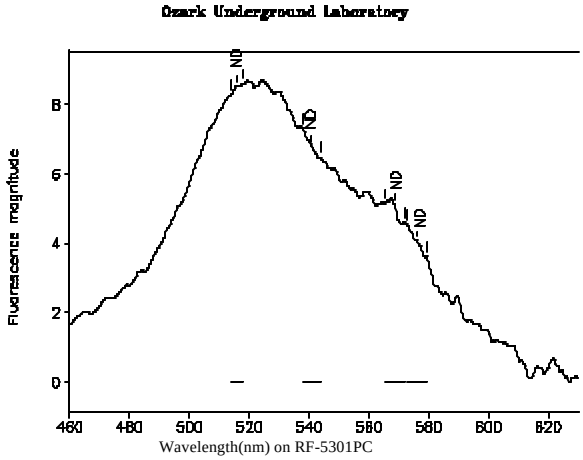


Station 11: Poe Spring Shallow Vent
OUL number: P2903 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/04/05 1748 Collected: 08/07/05 1432

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
518.4	484.6	551.0	2.09	78.88	0.03	1.61
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

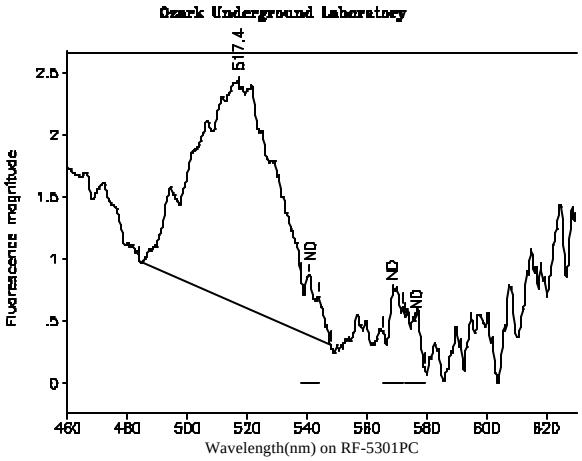


Station 11: Poe Spring Shallow Vent
OUL number: P3003 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/07/05 1432 Collected: 08/10/05 1530

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

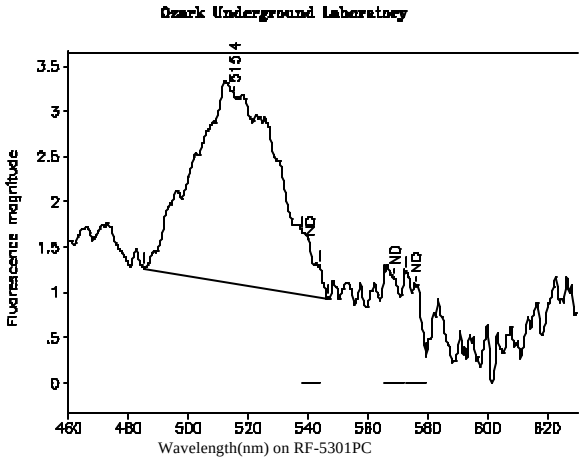


Station 11: Poe Spring Shallow Vent
OUL number: P3004 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/10/05 1530 Collected: 08/13/05 1432

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	484.0	547.8	1.75	59.62	0.03	1.23
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

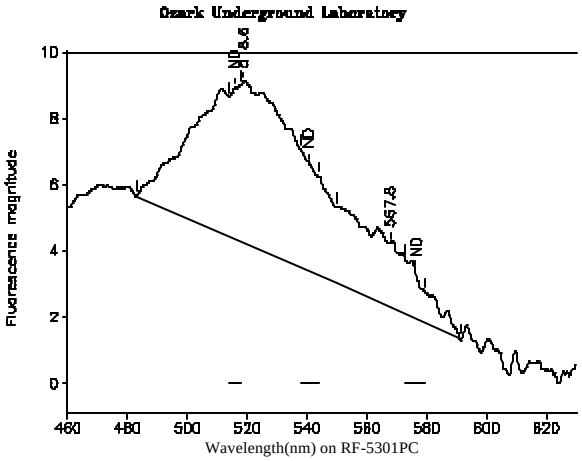


Station 11: Poe Spring Shallow Vent
OUL number: P3005 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/13/05 1432 Collected: 08/16/05 1601

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	485.2	546.4	2.06	72.52	0.03	1.50
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



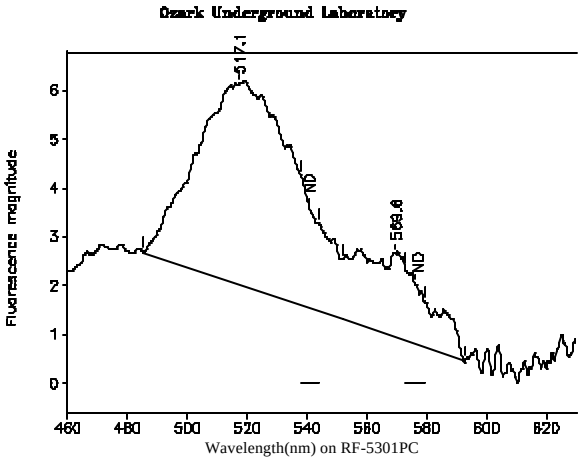
Station 12: Poe Spring Gauge Vent
OUL number: P2801 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/25/05 1757 Collected: 08/01/05 1901

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
567.8	549.8	591.8	1.94	63.30	0.03	6.02
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

518.6	483.0	549.8	4.84	210.13	0.02	4.29

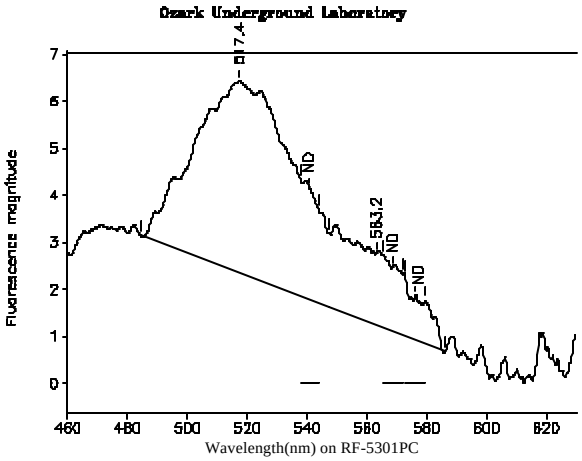


Station 14: Fenceline Spring
OUL number: P3006 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/07/05 1420 Collected: 08/13/05 1408

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.1	485.2	551.8	4.11	167.79	0.02	3.47
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.6	551.8	593.0	1.71	47.69	0.04	4.74
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



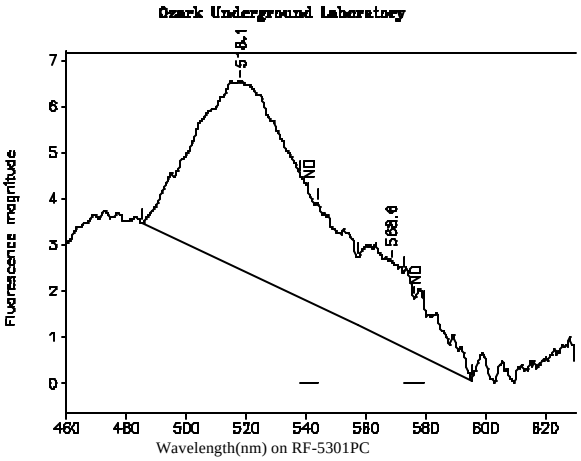
Station 17: Poe Spring Run
OUL number: P3007 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/10/05 1548 Collected: 08/16/05 1614

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	484.2	547.6	4.09	162.24	0.03	3.36
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

563.2	547.6	586.2	1.53	48.05	0.03	4.78

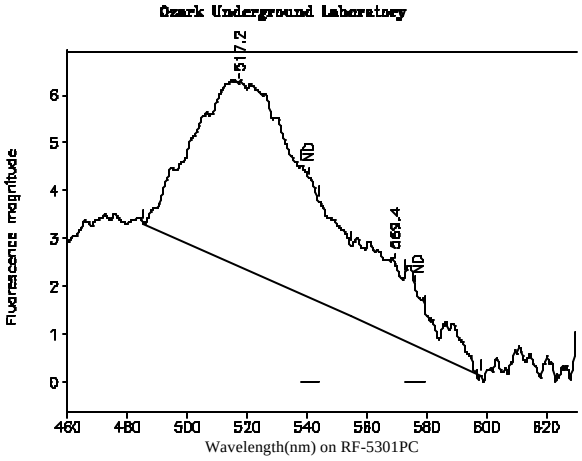


Station 17: Poe Spring Run
OUL number: P3538 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/16/05 1614 Collected: 08/23/05 1330

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
518.1	485.2	557.3	4.09	182.92	0.02	3.86
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.6	557.3	595.4	1.75	48.04	0.04	5.09
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

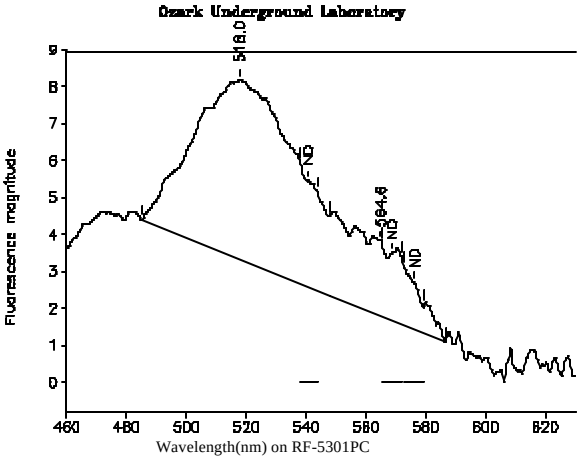


Station 17: Poe Spring Run
OUL number: P3539 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/23/05 1330 Collected: 08/29/05 1831

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	485.4	554.7	3.83	172.77	0.02	3.65
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.4	554.7	598.2	1.53	45.89	0.03	4.87
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



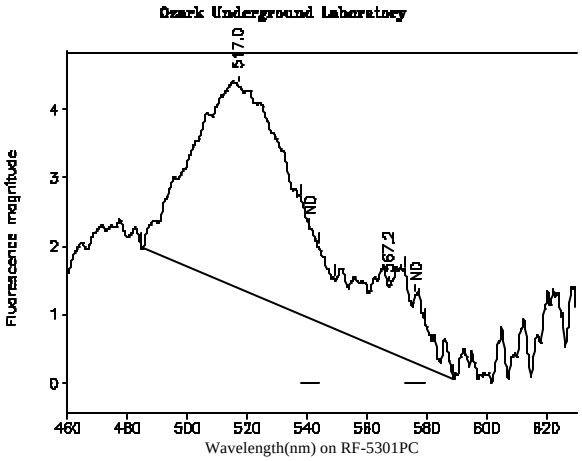
Station 17: Poe Spring Run
OUL number: P3541 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/29/05 1831 Collected: 09/06/05 1526

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
518.0	485.0	547.7	4.85	196.69	0.02	4.15
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

564.6	547.7	586.6	2.02	61.33	0.03	6.50

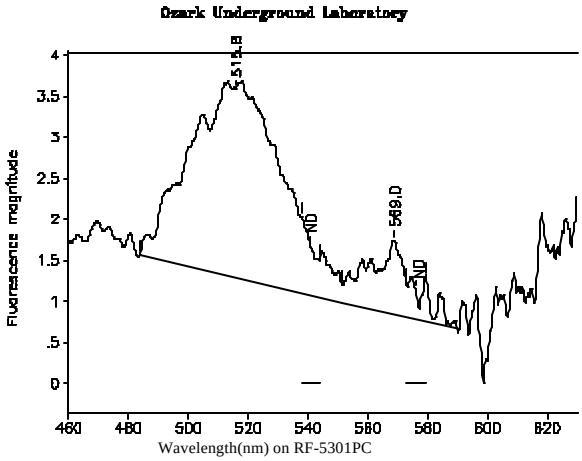


Station 17: Poe Spring Run
OUL number: P3743 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/06/05 1526 Collected: 09/12/05 1430

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	484.6	549.6	2.95	117.52	0.03	2.51
541.0	538.1	543.9	0.00	0.00	0.00	ND
567.2	549.6	588.8	0.95	32.00	0.03	3.33
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

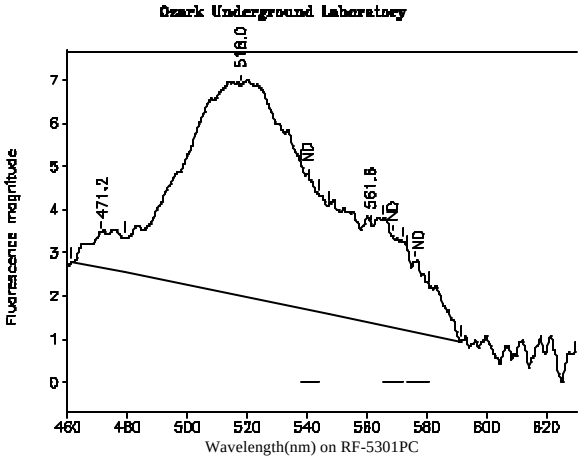


Station 17: Poe Spring Run
OUL number: P3744 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/12/05 1430 Collected: 09/19/05 1724

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	483.6	551.6	2.29	87.61	0.03	1.87
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.0	551.6	590.6	0.90	15.67	0.06	1.63
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



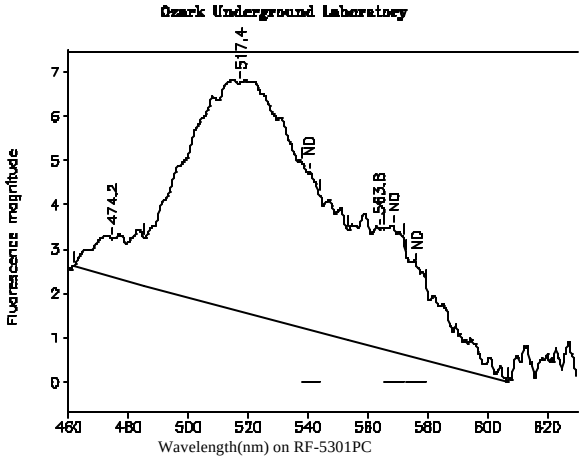
Station 17: Poe Spring Run
OUL number: P3921 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/19/05 1724 Collected: 09/28/05 1824

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
518.0	479.1	547.2	4.89	227.54	0.02	4.87
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

471.2	461.4	479.1	0.83	10.64	0.08	0.000
561.6	547.2	591.6	2.27	79.65	0.03	0.000



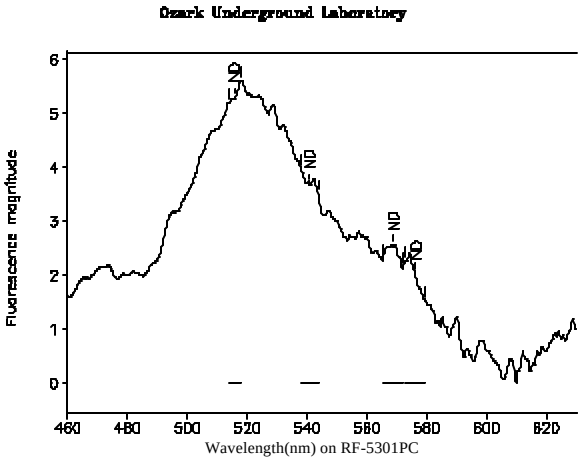
Station 17: Poe Spring Run
OUL number: P3922 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/28/05 1824 Collected: 10/05/05 1216

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	485.4	553.6	5.15	253.69	0.02	5.43
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

474.2	461.6	485.4	0.86	17.58	0.05	0.000
563.8	553.6	606.8	2.68	85.85	0.03	0.000

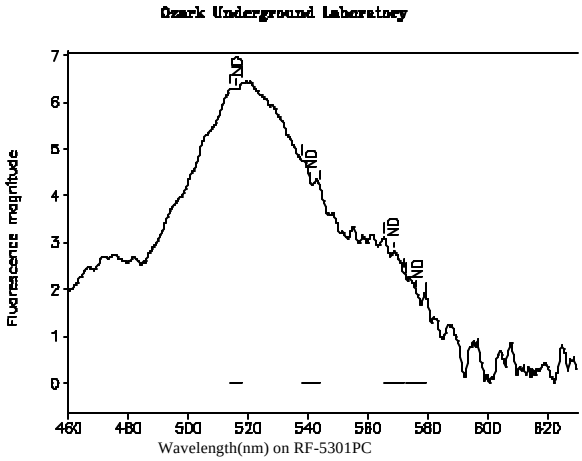


Station 17: Poe Spring Run
OUL number: P4166 Analyzed: 10/27/05
Matrix: Elutant
Placed: 10/05/05 1216 Collected: 10/13/05 1448

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.9	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

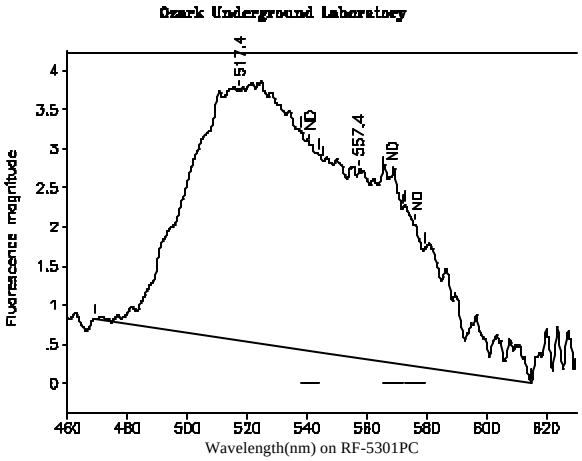


Station 17: Poe Spring Run
OUL number: P4167 Analyzed: 10/27/05
Matrix: Elutant
Placed: 10/13/05 1448 Collected: 10/22/05 1512

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.9	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



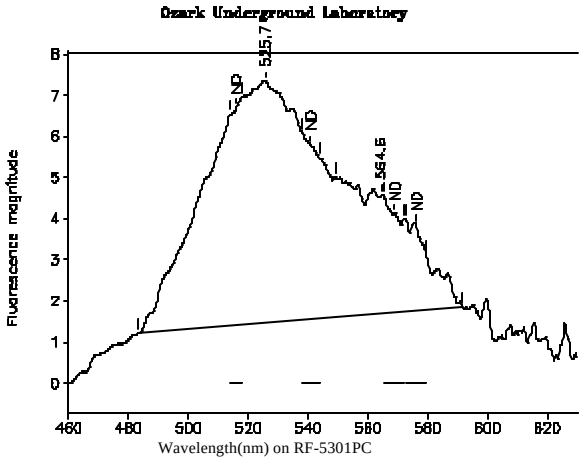
Station 22: Santa Fe River Rise
OUL number: P2519 Analyzed: 07/14/05
Matrix: Elutant
Placed: 06/30/05 1653 Collected: 07/07/05 1620

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.4	469.0	545.4	3.20	149.72	0.02	3.00
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

557.4	545.4	615.2	2.39	101.41	0.02	0.000



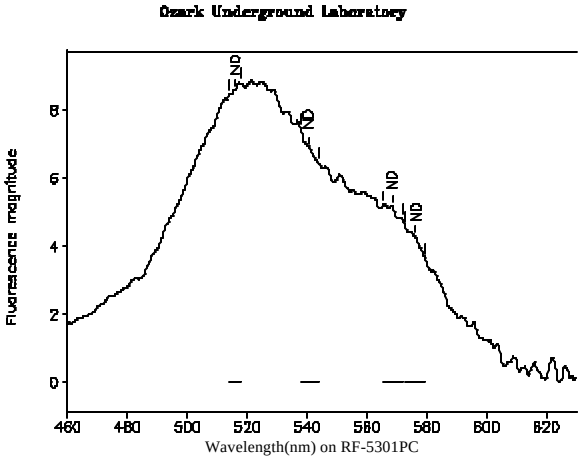
Station 22: Santa Fe River Rise
OUL number: P2812 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/26/05 1740 Collected: 08/01/05 1638

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

525.7	483.0	549.3	5.88	247.49	0.02	5.05
564.6	549.3	591.8	2.89	88.46	0.03	8.41

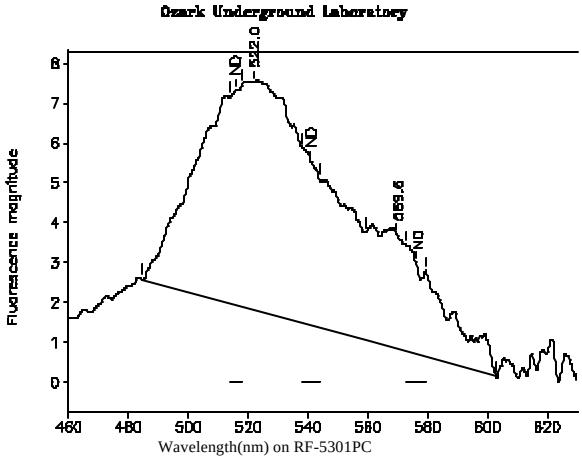


Station 22: Santa Fe River Rise
OUL number: P3002 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/07/05 1736 Collected: 08/13/05 1629

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



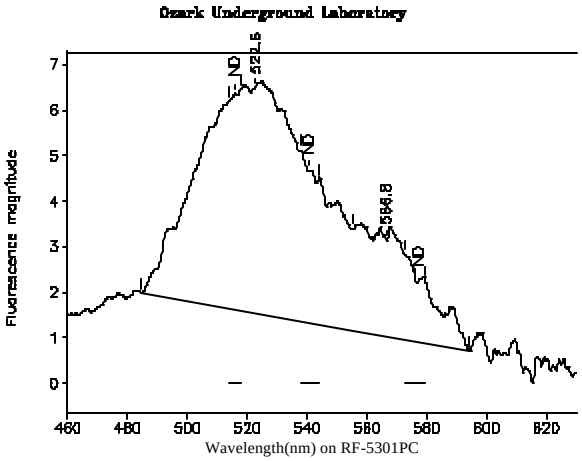
Station 22: Santa Fe River Rise
OUL number: P3528 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/13/05 1620 Collected: 08/19/05 1603

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.6	559.4	602.8	2.88	79.25	0.04	8.40
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

522.0	484.2	559.4	5.71	282.83	0.02	5.97



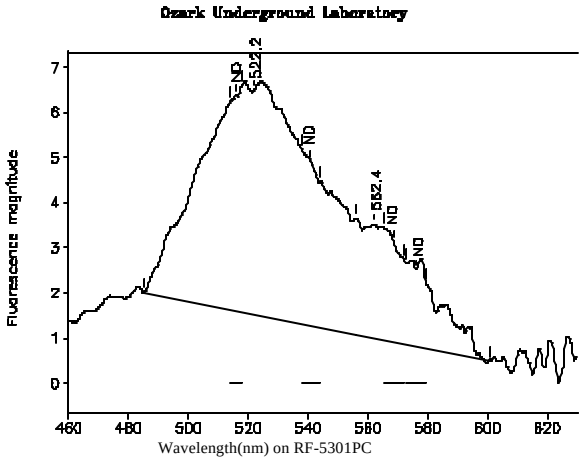
Station 22: Santa Fe River Rise
OUL number: P3529 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/19/05 1603 Collected: 08/25/05 1612

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
566.8	555.3	594.4	2.12	60.26	0.04	6.39
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

522.6	484.6	555.3	4.97	230.87	0.02	4.88



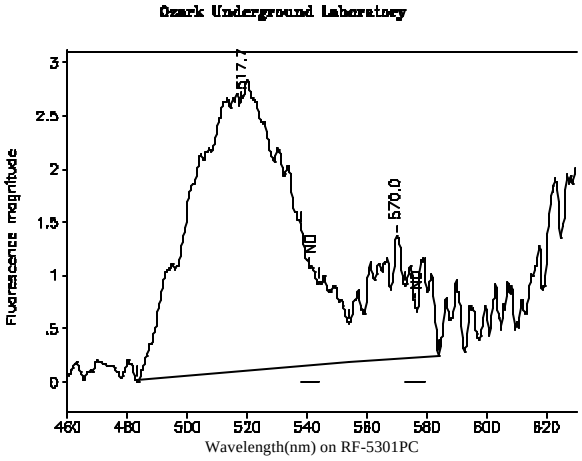
Station 22: Santa Fe River Rise
OUL number: P3530 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/25/05 1612 Collected: 09/02/05 1536

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

522.2	485.0	556.1	4.98	236.62	0.02	5.00
562.4	556.1	601.2	2.53	65.15	0.04	6.91

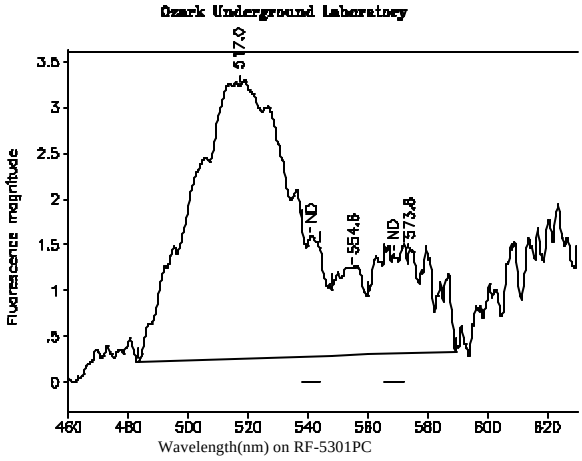


Station 22: Santa Fe River Rise
OUL number: P3735 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/02/05 1536 Collected: 09/09/05 1600

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.7	483.0	554.1	2.53	106.63	0.02	2.28
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.0	554.1	584.0	1.15	21.27	0.05	2.22
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



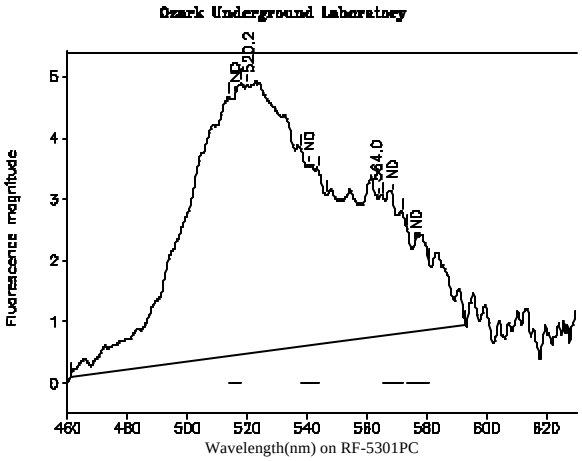
Station 22: Santa Fe River Rise
OUL number: P3736 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/09/05 1600 Collected: 09/16/05 1625

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	483.2	547.8	2.98	118.24	0.03	2.52
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
573.8	560.1	589.4	1.09	26.24	0.04	1.56

Peaks close to the normal range of tracer dyes:

554.6	547.8	560.1	0.95	10.76	0.09	0.000



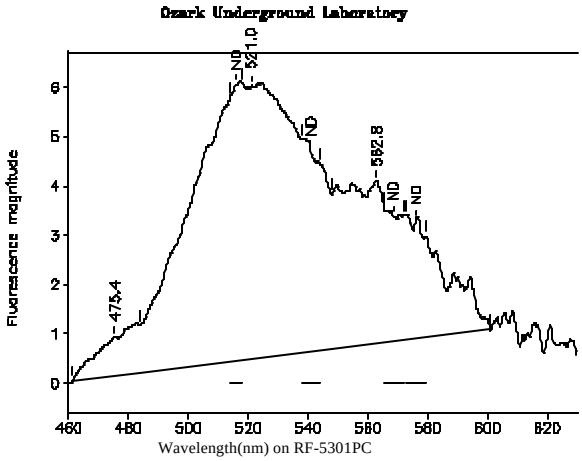
Station 22: Santa Fe River Rise
OUL number: P3918 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/16/05 1625 Collected: 09/23/05 1532

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	573.8	580.8	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

520.2	460.8	546.6	4.38	201.04	0.02	4.30
564.0	546.6	593.2	2.27	81.83	0.03	8.09



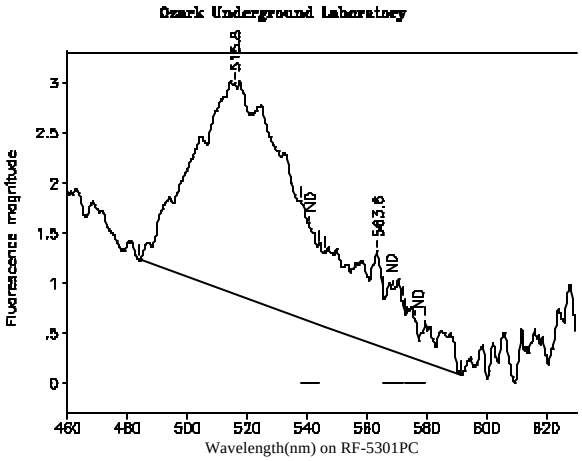
Station 22: Santa Fe River Rise
OUL number: P3919 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/23/05 1532 Collected: 10/05/05 1408

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

475.4	461.2	483.8	0.78	13.79	0.06	0.000
521.0	483.8	547.8	5.52	256.25	0.02	5.48
562.8	547.8	601.0	3.30	111.66	0.03	0.000



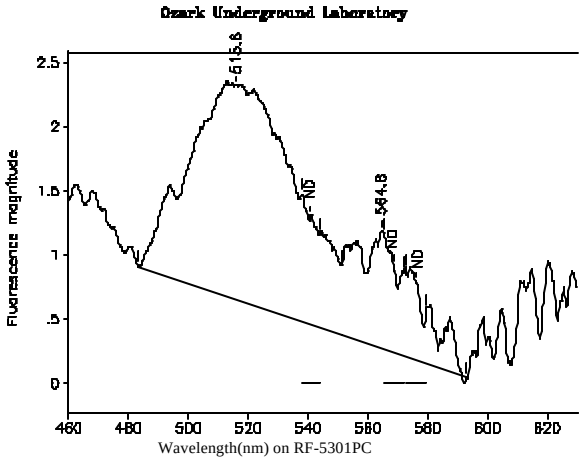
Station 101: High Springs Well # 1 (West)
OUL number: P2802 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/25/05 1309 Collected: 07/29/05 1506

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	484.0	546.1	2.10	79.42	0.03	1.62
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

563.6	546.1	591.8	0.94	24.59	0.04	2.34



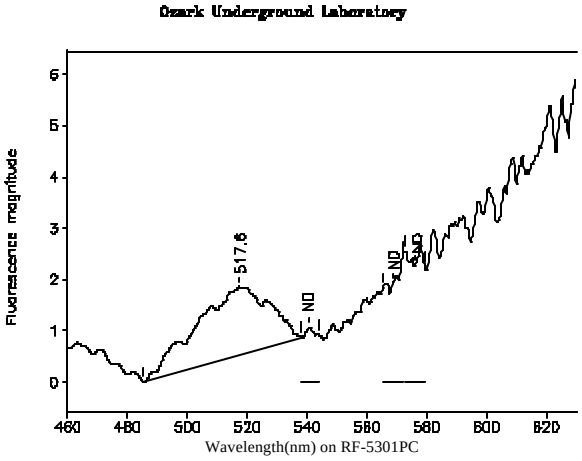
Station 101: High Springs Well # 1 (West)
OUL number: P2803 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/29/05 1506 Collected: 08/01/05 1131

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	483.2	551.2	1.66	71.31	0.02	1.46
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

564.8	551.2	593.0	0.91	22.19	0.04	2.11

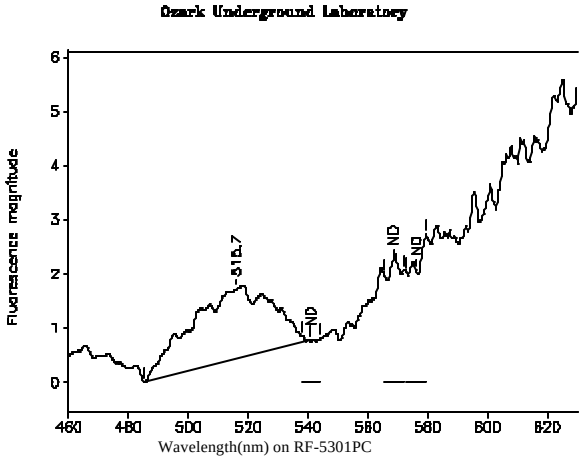


Station 101: High Springs Well # 1 (West)
OUL number: P2904 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/01/05 1131 Collected: 08/04/05 1439

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.6	485.2	538.2	1.31	37.85	0.03	0.774
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

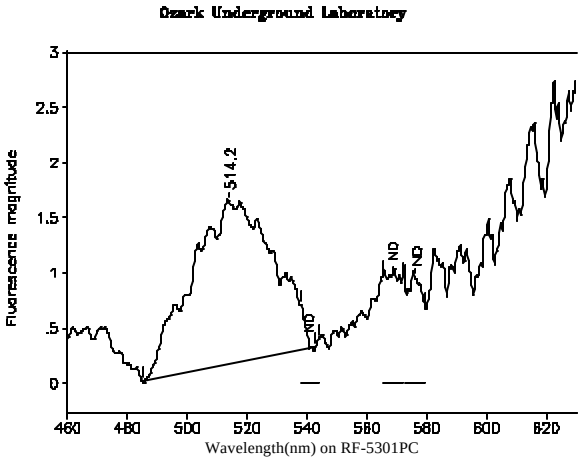


Station 101: High Springs Well # 1 (West)
OUL number: P2905 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/04/05 1439 Collected: 08/07/05 1825

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.7	485.2	540.6	1.28	42.18	0.03	0.863
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

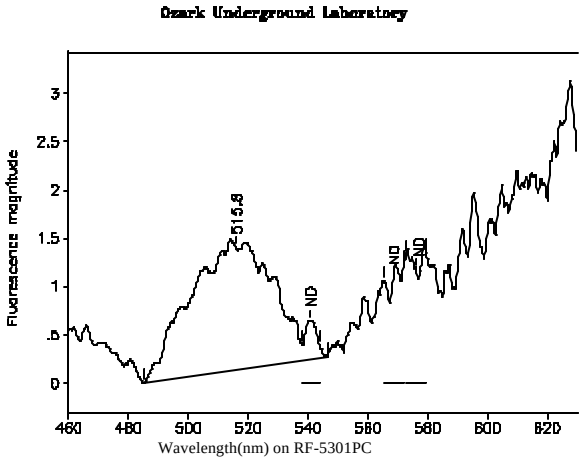


Station 101: High Springs Well # 1 (West)
OUL number: P3008 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/07/05 1825 Collected: 08/10/05 1312

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.2	485.0	542.8	1.40	47.15	0.03	0.976
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

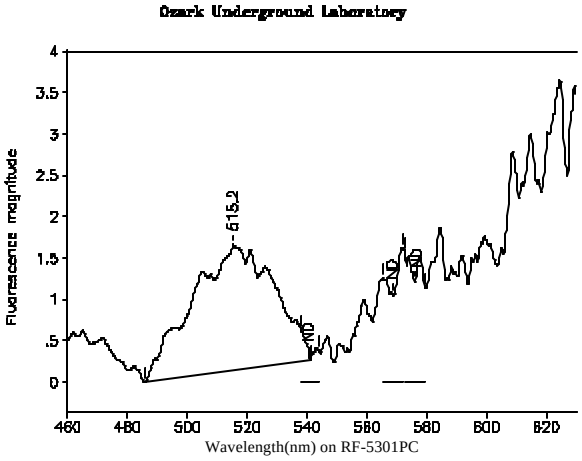


Station 101: High Springs Well # 1 (West)
OUL number: P3009 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/10/05 1312 Collected: 08/13/05 1719

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	485.2	546.4	1.27	44.63	0.03	0.923
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

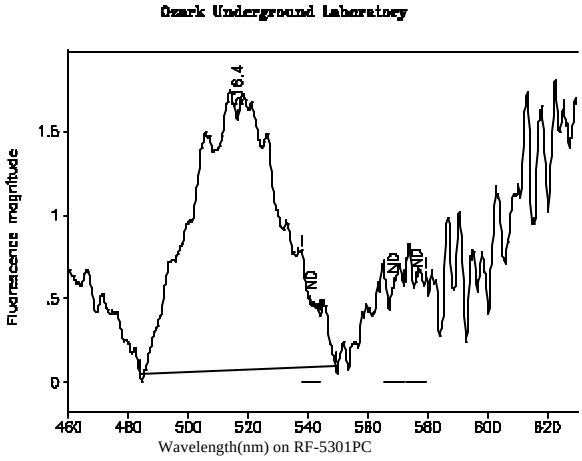


Station 101: High Springs Well # 1 (West)
OUL number: P3010 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/13/05 1719 Collected: 08/16/05 1326

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.2	485.6	541.2	1.51	48.02	0.03	0.994
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

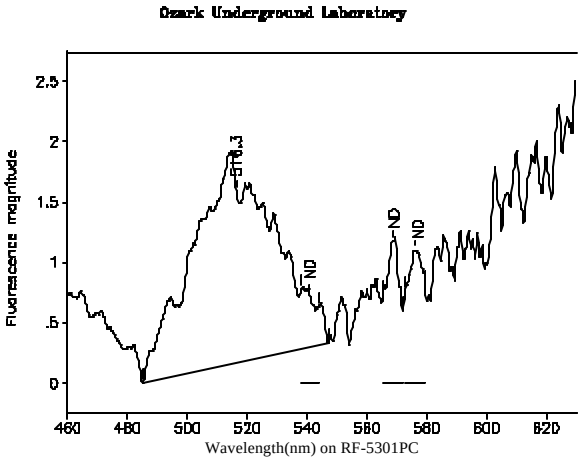


Station 101: High Springs Well # 1 (West)
OUL number: P3546 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/16/05 1326 Collected: 08/19/05 1648

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	483.8	549.4	1.50	58.44	0.03	1.23
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

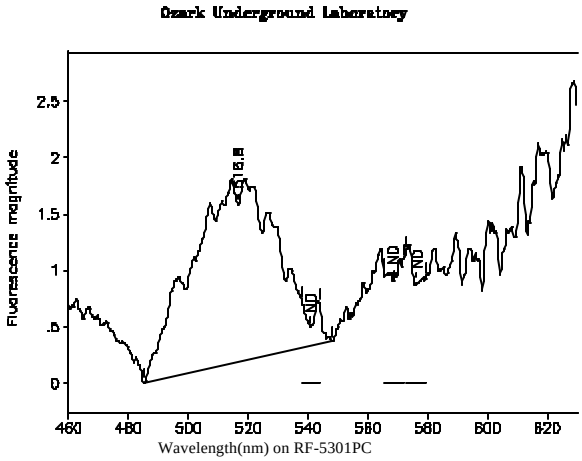


Station 101: High Springs Well # 1 (West)
OUL number: P3547 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/19/05 1648 Collected: 08/23/05 1458

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.3	485.0	547.2	1.42	55.33	0.03	1.17
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

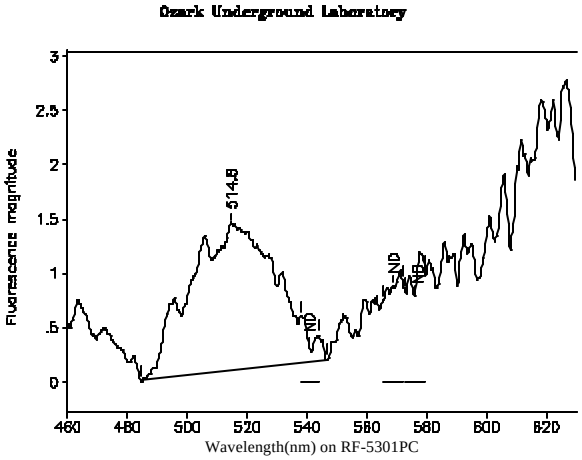


Station 101: High Springs Well # 1 (West)
OUL number: P3548 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/23/05 1458 Collected: 08/26/05 1721

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	485.4	548.0	1.40	54.62	0.03	1.15
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

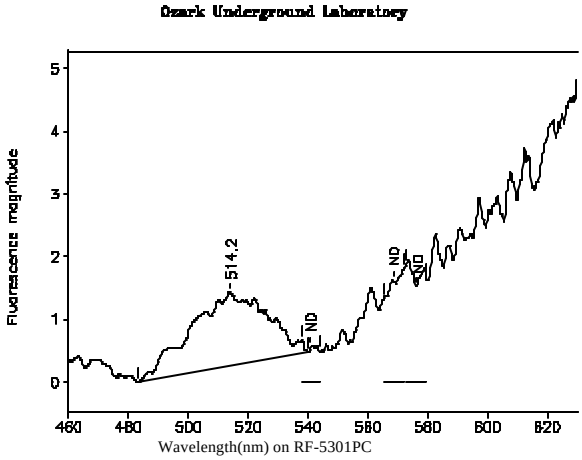


Station 101: High Springs Well # 1 (West)
OUL number: P3549 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/26/05 1721 Collected: 09/02/05 1624

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.8	484.2	547.0	1.34	45.54	0.03	0.962
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

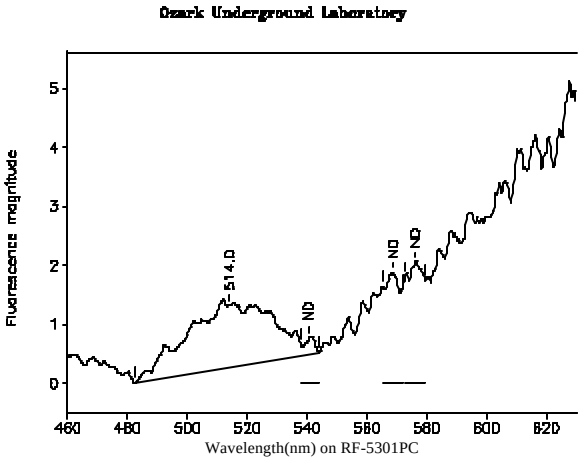


Station 101: High Springs Well # 1 (West)
OUL number: P3745 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/02/05 1624 Collected: 09/09/05 1654

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.2	483.2	540.0	1.18	34.65	0.03	0.740
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

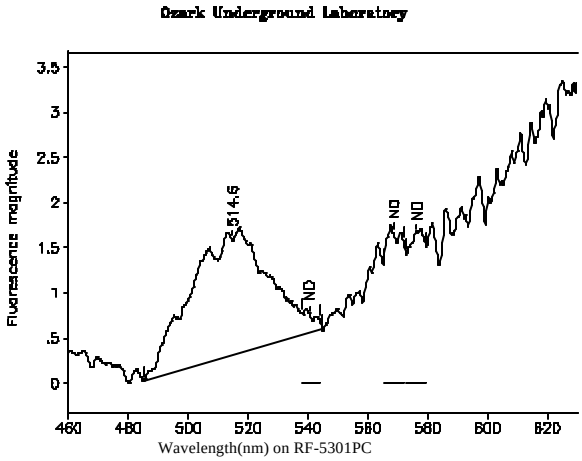


Station 101: High Springs Well # 1 (West)
OUL number: P3746 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/09/05 1654 Collected: 09/16/05 1338

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.0	482.8	544.2	1.04	37.47	0.03	0.800
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

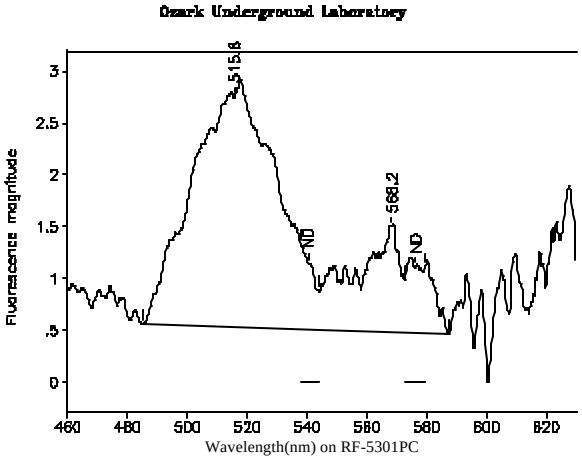


Station 101: High Springs Well # 1 (West)
OUL number: P3923 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/16/05 1338 Collected: 09/23/05 1620

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.6	485.0	544.8	1.28	42.62	0.03	0.912
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

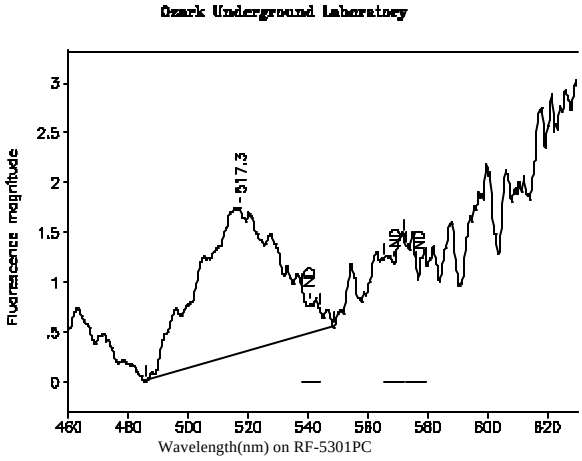


Station 101: High Springs Well # 1 (West)
OUL number: P3924 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/23/05 1620 Collected: 10/03/05 1543

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	485.0	543.8	2.22	78.17	0.03	1.67
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.2	543.8	587.2	1.01	25.43	0.04	2.51
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

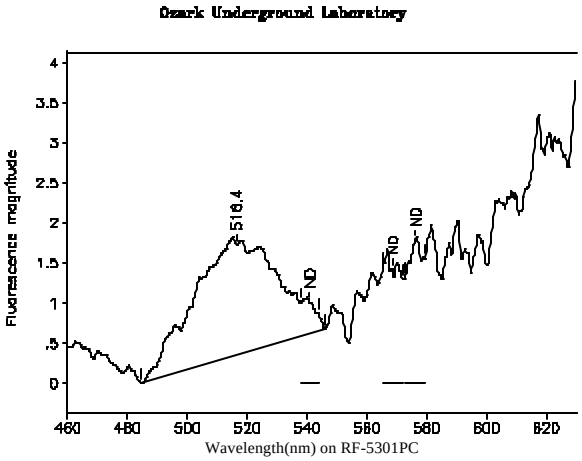


Station 101: High Springs Well # 1 (West)
OUL number: P4168 Analyzed: 10/27/05
Matrix: Elutant
Placed: 10/03/05 1543 Collected: 10/13/05 1312

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.3	486.0	548.4	1.46	47.01	0.03	1.00
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

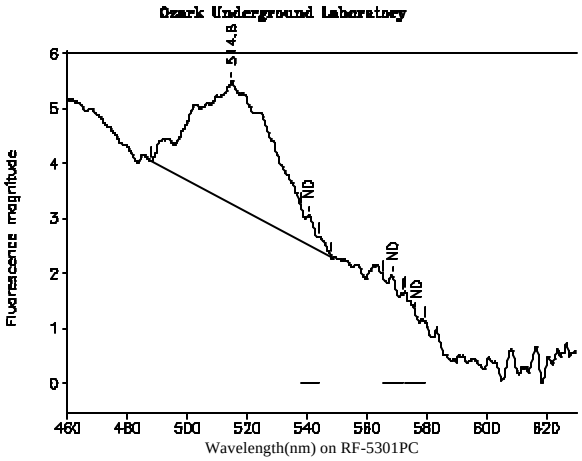


Station 101: High Springs Well # 1 (West)
OUL number: P4169 Analyzed: 10/27/05
Matrix: Elutant
Placed: 10/13/05 1312 Collected: 10/20/05 1554

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.4	484.8	546.2	1.38	48.17	0.03	1.03
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

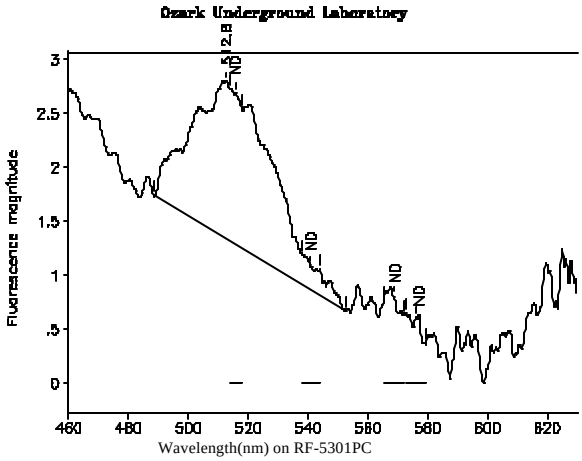


Station 103: Alachua Well # 1
OUL number: P2805 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/25/05 1427 Collected: 07/29/05 1628

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.8	487.6	548.2	2.23	70.44	0.03	1.44
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



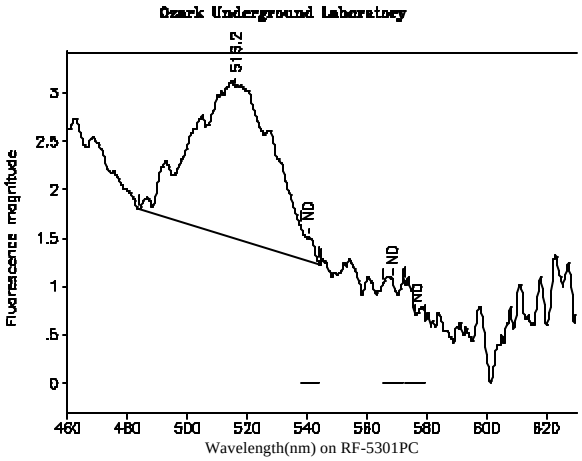
Station 103: Alachua Well # 1
OUL number: P2806 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/29/05 1628 Collected: 08/01/05 1208

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

512.8	488.6	552.6	1.46	47.21	0.03	0.964

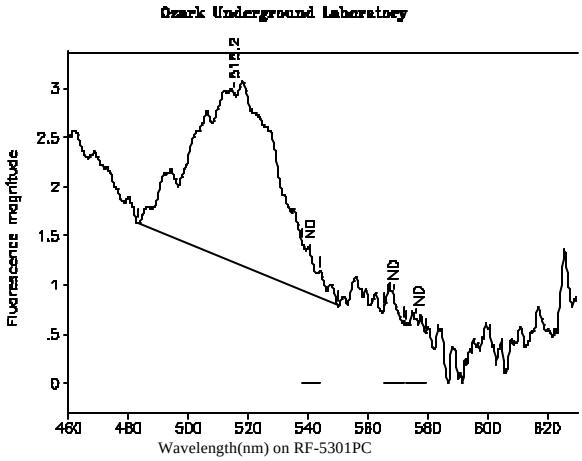


Station 104: Alachua Well # 2
OUL number: P2807 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/25/05 1416 Collected: 07/29/05 1635

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.2	483.6	544.4	1.56	51.35	0.03	1.05
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

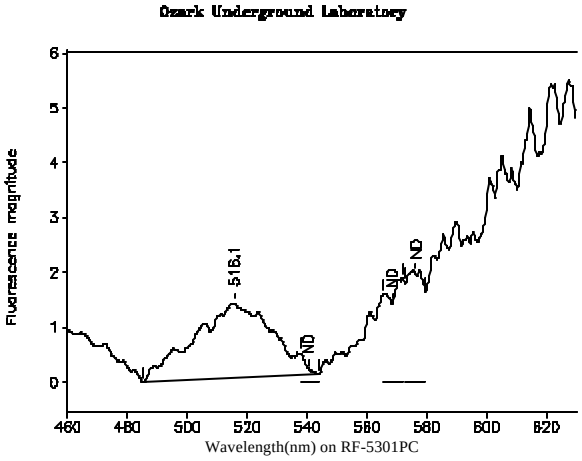


Station 104: Alachua Well # 2
OUL number: P2808 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/29/05 1635 Collected: 08/01/05 1220

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.2	483.2	550.2	1.73	61.54	0.03	1.26
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

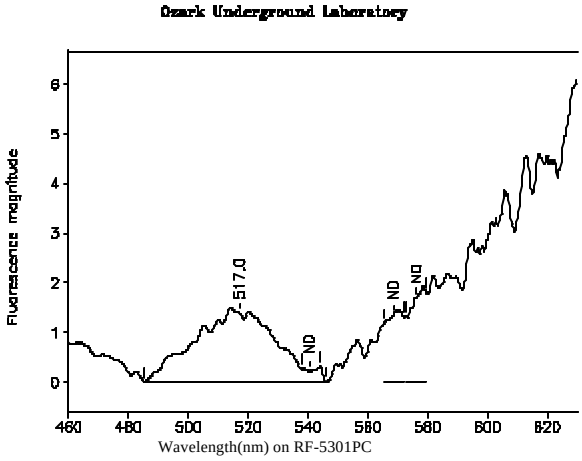


Station 104: Alachua Well # 2
OUL number: P2908 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/01/05 1220 Collected: 08/04/05 1608

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.1	485.3	543.8	1.36	41.68	0.03	0.853
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

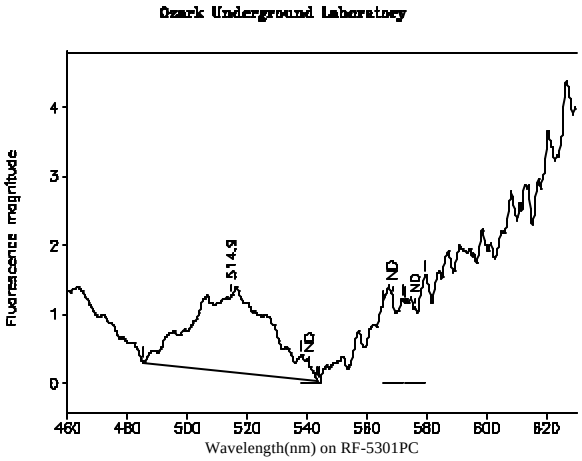


Station 104: Alachua Well # 2
OUL number: P2909 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/04/05 1608 Collected: 08/07/05 1903

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.0	485.4	546.0	1.38	46.39	0.03	0.949
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

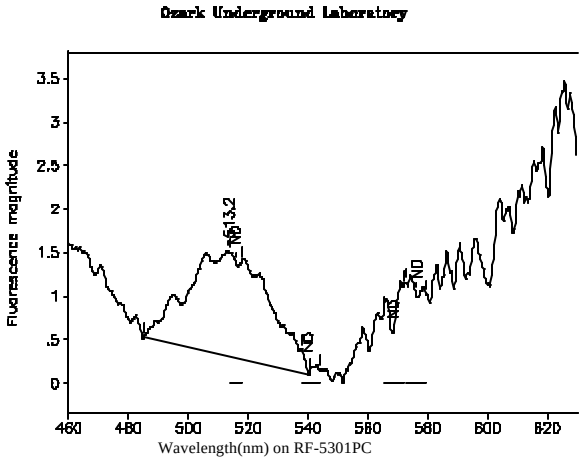


Station 104: Alachua Well # 2
OUL number: P3016 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/07/05 1903 Collected: 08/10/05 1431

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.9	485.2	543.4	1.10	36.39	0.03	0.753
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



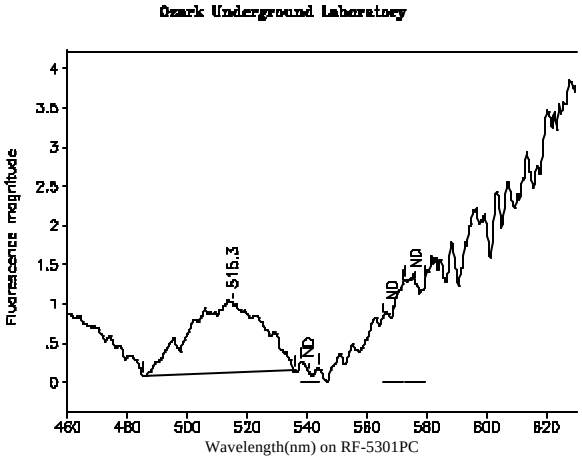
Station 104: Alachua Well # 2
OUL number: P3017 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/10/05 1431 Collected: 08/13/05 1746

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

513.2	485.0	540.4	1.22	38.67	0.03	0.800

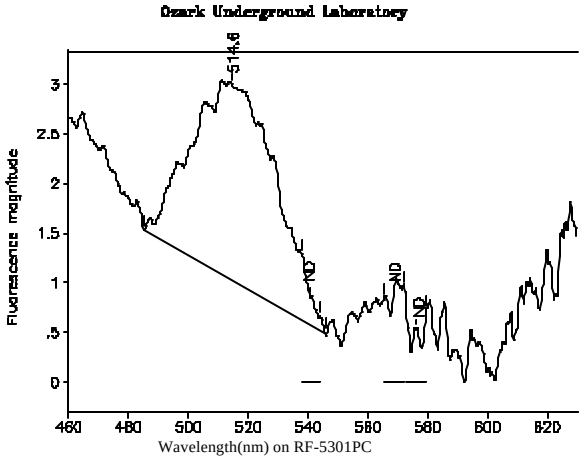


Station 104: Alachua Well # 2
OUL number: P3018 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/13/05 1746 Collected: 08/16/05 1419

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.3	485.2	536.2	0.89	26.89	0.03	0.556
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

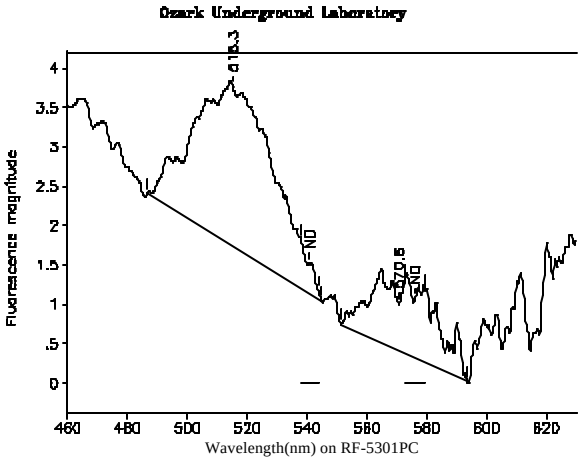


Station 104: Alachua Well # 2
OUL number: P3550 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/19/05 1737 Collected: 08/23/05 1601

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.6	485.4	545.8	1.97	66.29	0.03	1.40
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

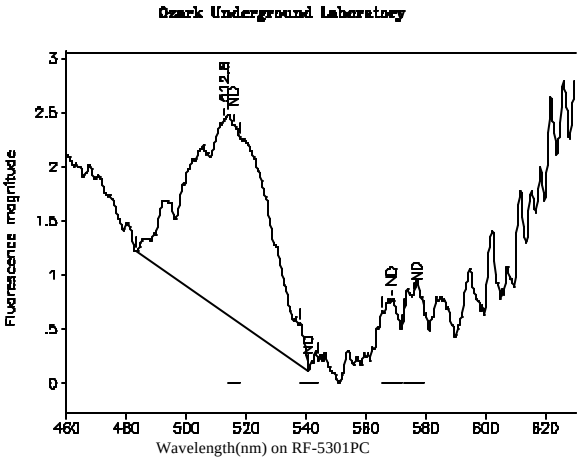


Station 104: Alachua Well # 2
OUL number: P3551 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/26/05 1755 Collected: 09/02/05 1709

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.3	486.6	544.8	2.03	65.25	0.03	1.38
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.6	551.4	593.6	0.60	23.81	0.03	2.52
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



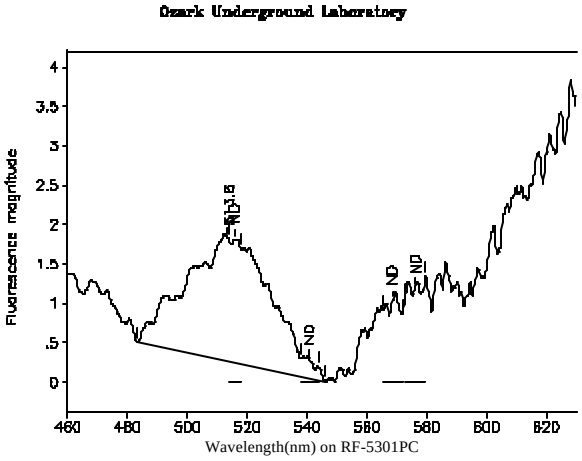
Station 104: Alachua Well # 2
OUL number: P3747 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/02/05 1709 Collected: 09/09/05 1740

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

512.8	483.0	541.0	1.79	57.50	0.03	1.23



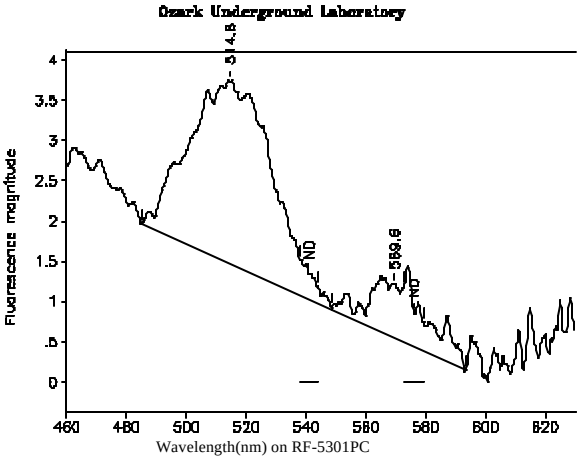
Station 104: Alachua Well # 2
OUL number: P3748 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/09/05 1740 Collected: 09/16/05 1429

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

513.6	483.2	546.0	1.56	52.19	0.03	1.11

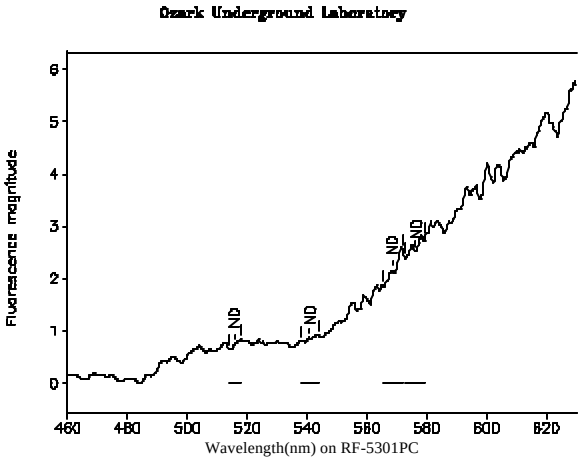


Station 104: Alachua Well # 2
OUL number: P3925 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/23/05 1658 Collected: 10/03/05 1431

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.8	485.0	548.7	2.27	74.51	0.03	1.59
540.9	538.1	543.9	0.00	0.00	0.00	ND
569.6	548.7	593.4	0.67	17.62	0.04	1.74
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

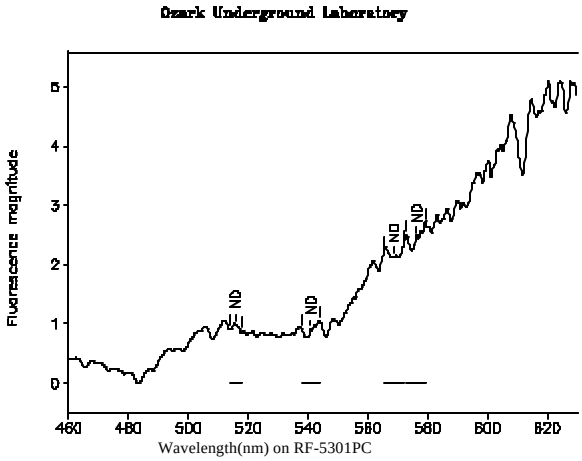


Station 106: Santa Fe Hills Subdivision Well
OUL number: P2809 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/26/05 1620 Collected: 07/29/05 1540

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

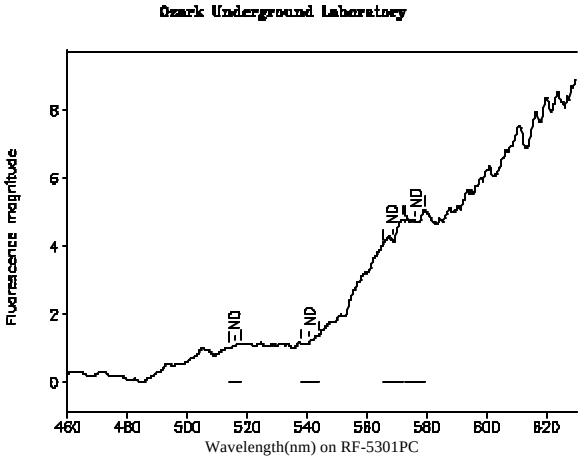


Station 106: Santa Fe Hills Subdivision Well
OUL number: P2810 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/29/05 1540 Collected: 08/01/05 1329

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

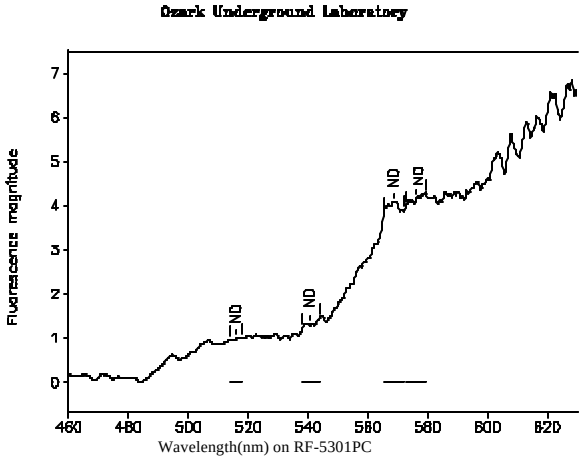


Station 106: Santa Fe Hills Subdivision Well
OUL number: P2906 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/04/05 1514 Collected: 08/07/05 1830

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

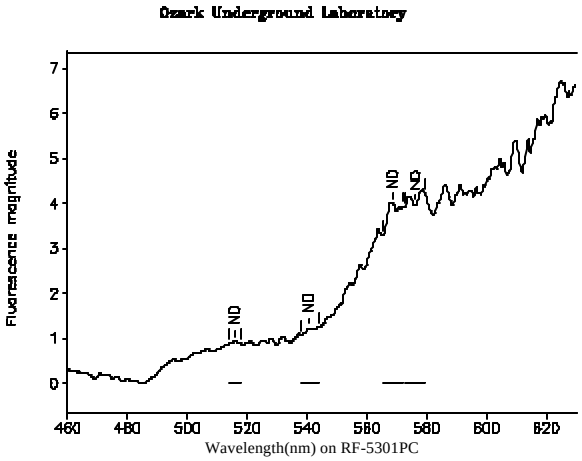


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3011 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/07/05 1830 Collected: 08/10/05 1353

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

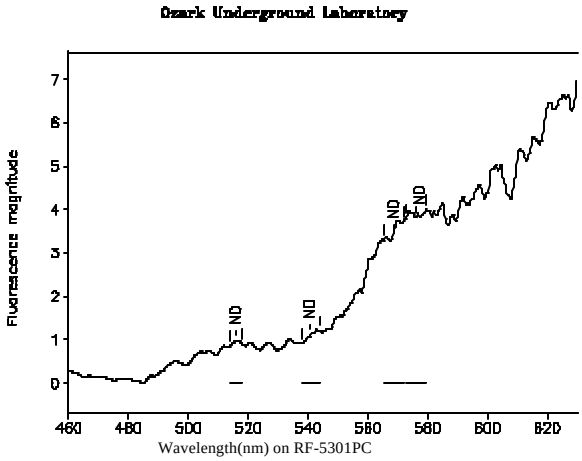


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3012 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/10/05 1353 Collected: 08/13/05 1842

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

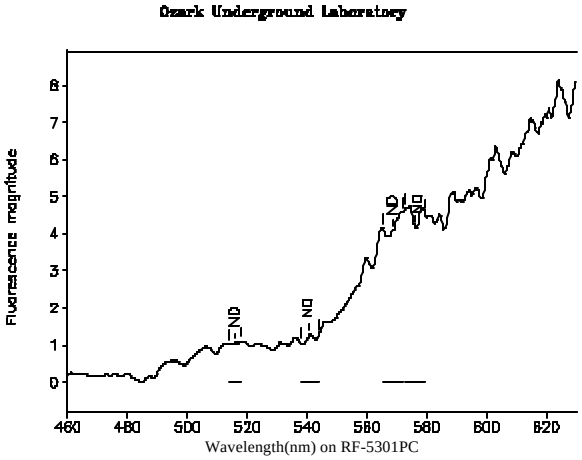


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3013 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/13/05 1842 Collected: 08/16/05 1450

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

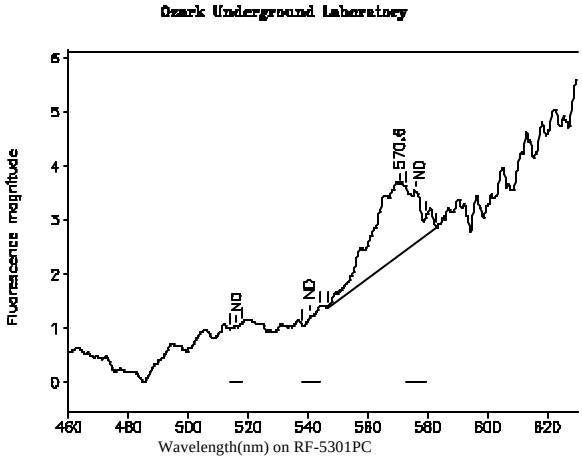


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3662 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/16/05 1450 Collected: 08/19/05 1710

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

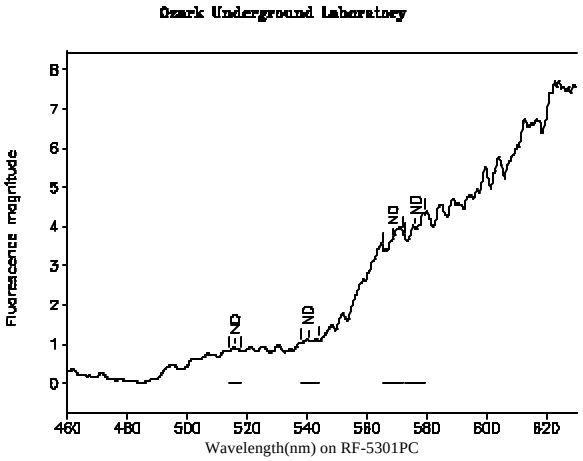


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3542 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/19/05 1710 Collected: 08/23/05 1622

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.6	546.4	582.8	1.29	23.52	0.05	2.49
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

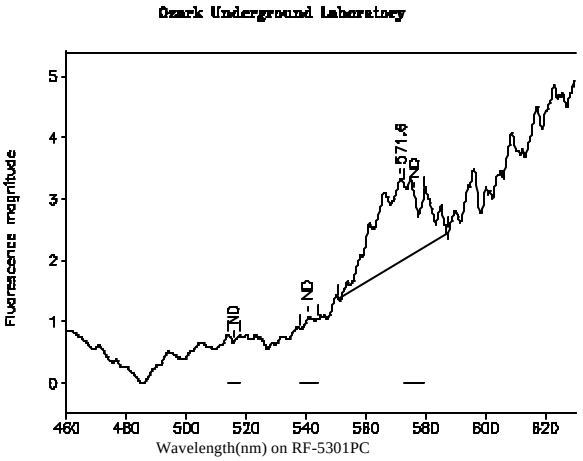


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3663 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/23/05 1622 Collected: 08/27/05 1411

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

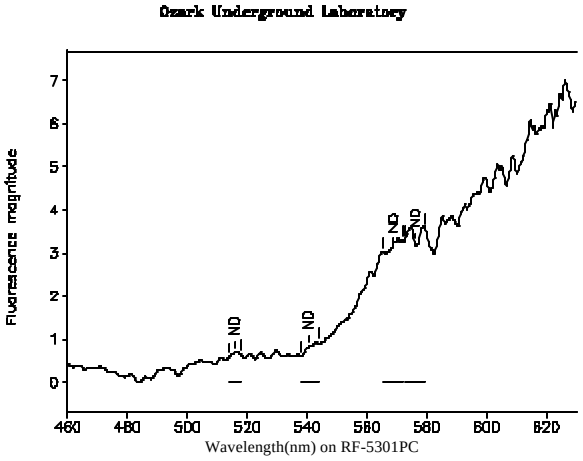


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3543 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/27/05 1411 Collected: 09/02/05 1646

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
571.6	551.0	587.8	1.36	25.60	0.05	2.71
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

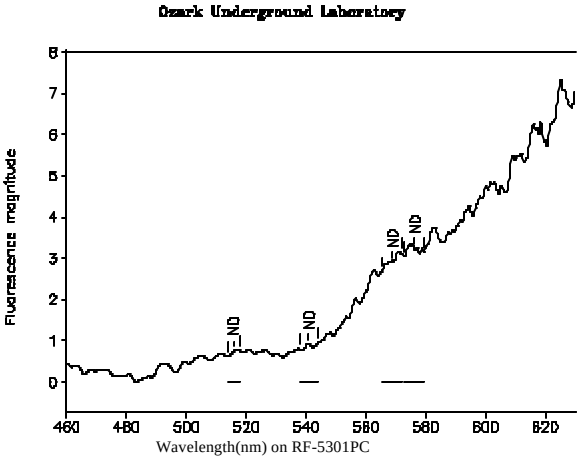


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3729 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/02/05 1646 Collected: 09/09/05 1659

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

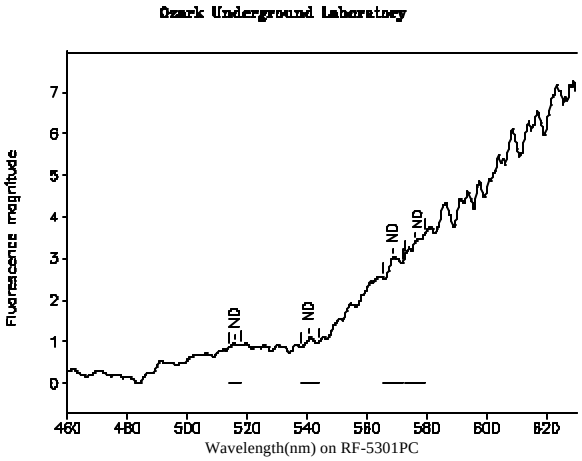


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3730 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/09/05 1659 Collected: 09/16/05 1517

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

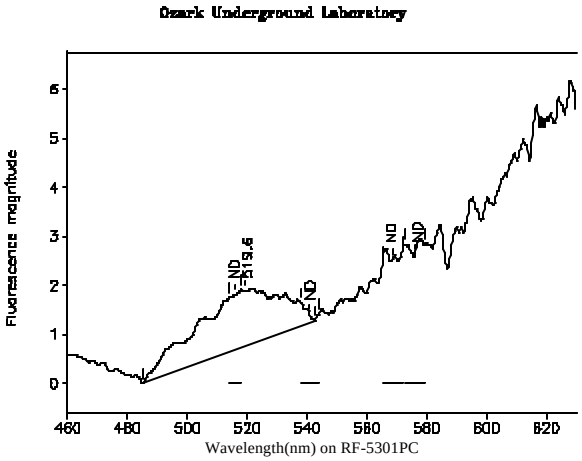


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3731 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/16/05 1517 Collected: 09/21/05 1339

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



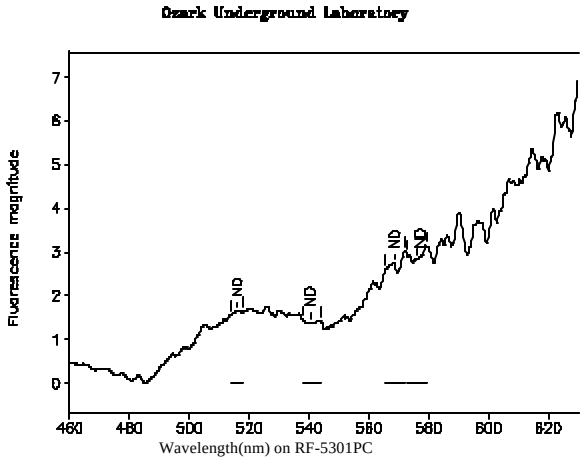
Station 111: River Ranch Well
OUL number: P3656 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/01/05 1528 Collected: 08/04/05 1417

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

519.6	485.0	542.4	1.12	39.75	0.03	0.845

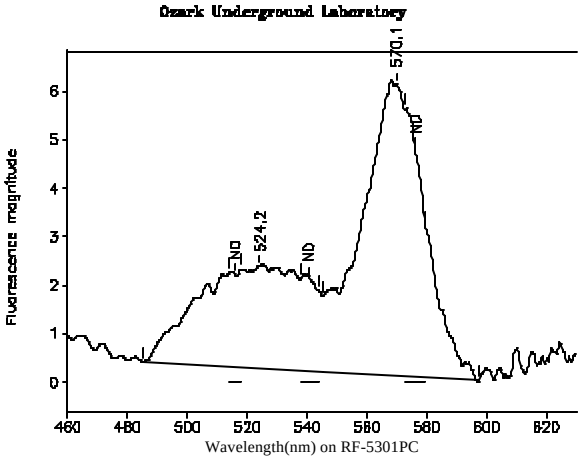


Station 111: River Ranch Well
OUL number: P3657 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/04/05 1417 Collected: 08/07/05 1623

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



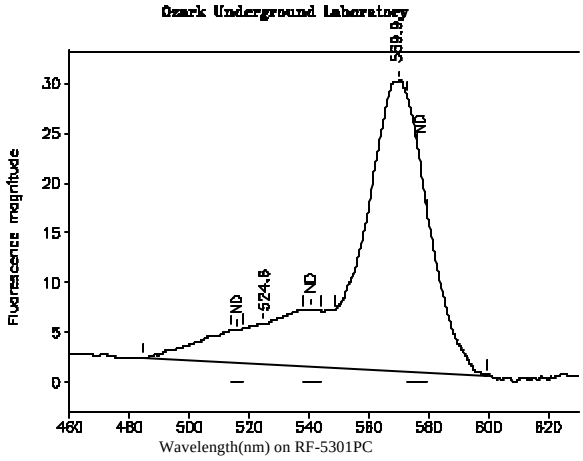
Station 111: River Ranch Well
OUL number: P3174 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/07/05 1623 Collected: 08/10/05 1255

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.1	545.3	597.8	6.01	148.72	0.04	15.4
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

524.2	485.2	545.3	2.09	91.71	0.02	1.91



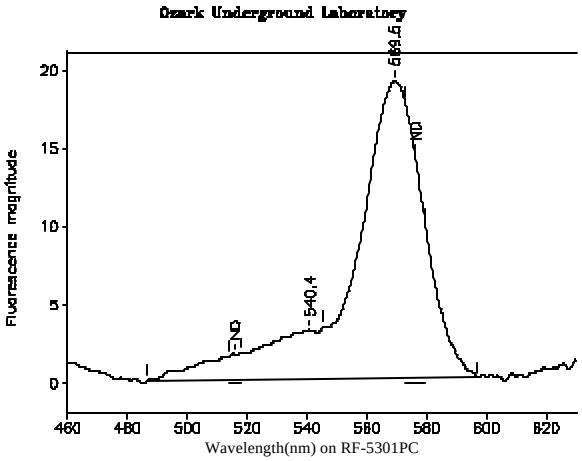
Station 111: River Ranch Well
OUL number: P3175 Analyzed: 08/31/05
Matrix: Elutant
Placed: 08/10/05 1255 Collected: 08/15/05 1445

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
569.9	548.4	599.4	29.09	687.67	0.04	71.1
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

524.6	484.2	548.4	4.03	207.78	0.02	4.32

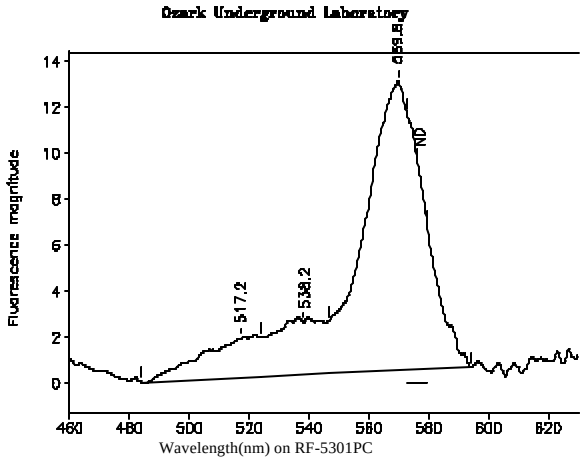


Station 111: River Ranch Well
OUL number: P3524 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/15/05 1445 Collected: 08/19/05 1430

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.4	486.8	545.5	3.12	97.38	0.03	2.80
569.5	545.5	596.8	18.96	446.16	0.04	47.3
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

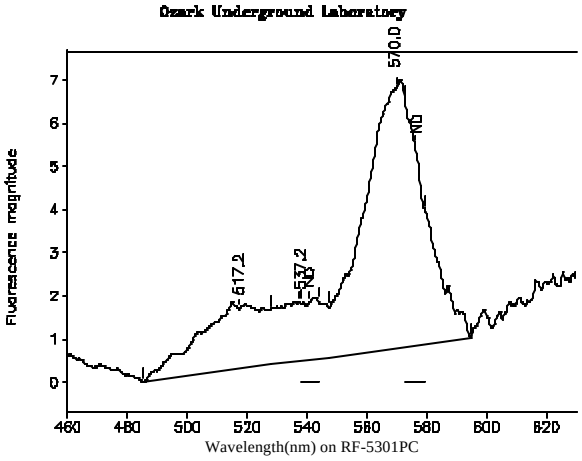


Station 111: River Ranch Well
OUL number: P3525 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/19/05 1430 Collected: 08/23/05 1438

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	484.0	524.0	1.72	40.38	0.04	0.853
538.2	524.0	546.6	2.30	49.73	0.05	1.43
569.8	546.6	594.0	12.60	287.06	0.04	30.4
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



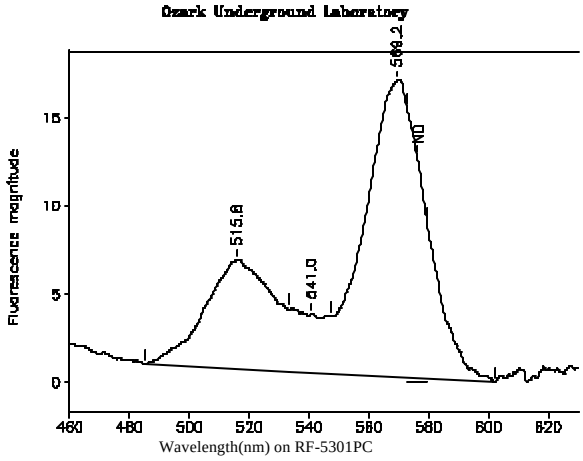
Station 111: River Ranch Well
OUL number: P3526 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/23/05 1438 Collected: 08/26/05 1548

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
517.2	485.0	527.7	1.38	39.01	0.04	0.824
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.0	547.3	594.6	6.03	144.41	0.04	15.3
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

537.2	527.7	547.3	1.36	25.96	0.05	0.747

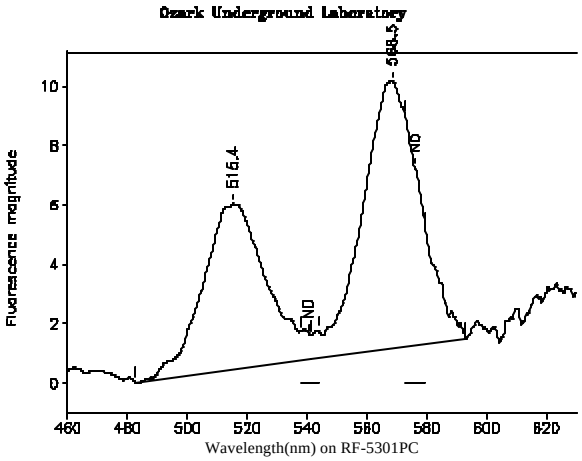


Station 111: River Ranch Well
OUL number: P3527 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/26/05 1548 Collected: 09/02/05 1443

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	485.0	533.1	6.18	162.17	0.04	3.43
541.0	533.1	547.5	3.31	48.37	0.07	1.39
569.2	547.5	602.0	16.81	399.87	0.04	42.4
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

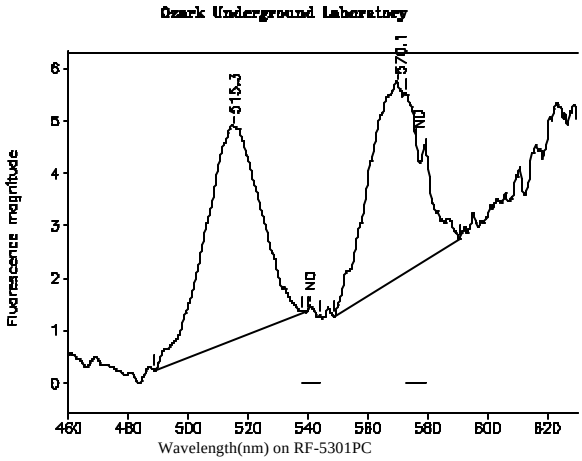


Station 111: River Ranch Well
OUL number: P3727 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/02/05 1443 Collected: 09/09/05 1500

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.4	482.5	541.6	5.57	137.75	0.04	2.94
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.5	541.7	593.2	8.97	201.74	0.04	21.0
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

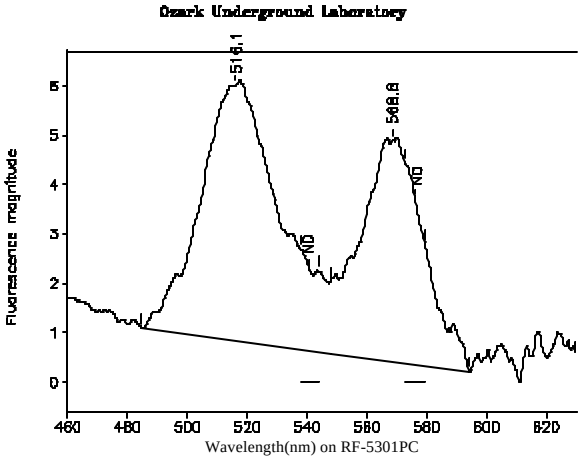


Station 111: River Ranch Well
OUL number: P3728 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/09/05 1500 Collected: 09/15/05 1559

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.3	488.6	539.8	4.05	87.89	0.05	1.88
541.0	538.1	543.9	0.00	0.00	0.00	ND
570.1	548.6	590.8	3.68	76.56	0.05	7.98
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

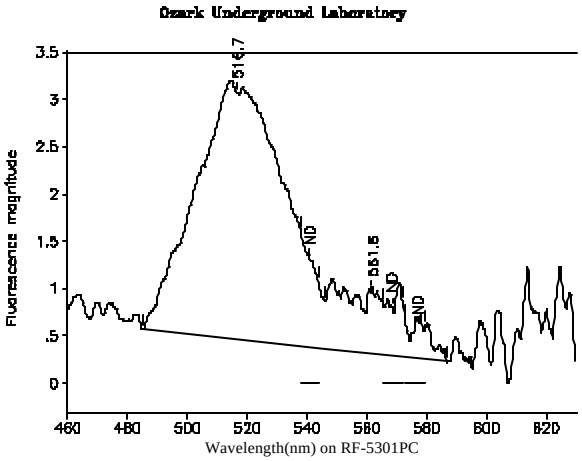


Station 111: River Ranch Well
OUL number: P3908 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/23/05 1439 Collected: 09/30/05 1511

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.1	484.6	547.7	5.17	164.01	0.03	3.51
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.8	547.7	594.4	4.49	113.71	0.04	11.2
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



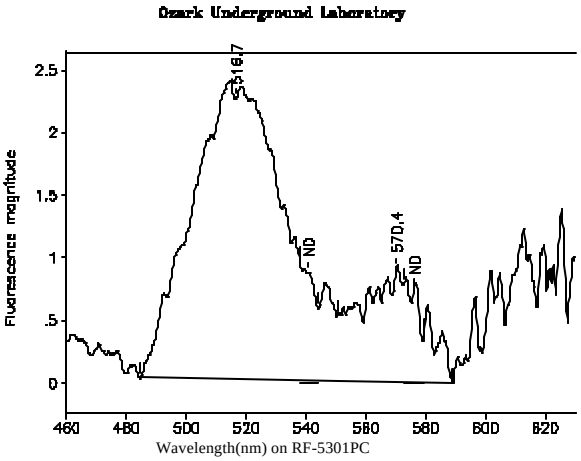
Station 112: Main Shop Well
OUL number: P3909 Analyzed: 10/11/05
Matrix: Elutant
Placed: 08/26/05 1533 Collected: 09/02/05 1432

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	485.0	546.1	2.60	94.54	0.03	2.02
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

561.6	546.1	586.6	0.67	19.04	0.04	0.000

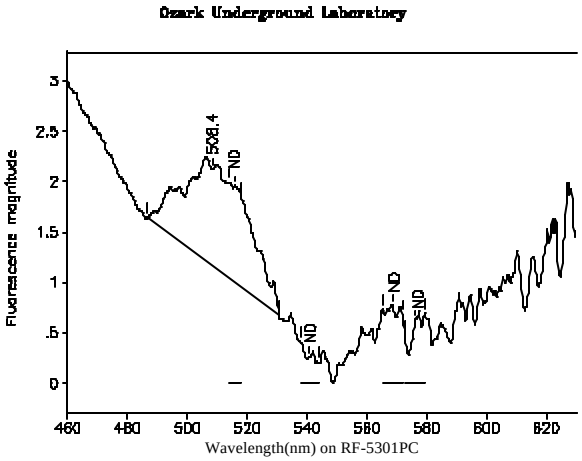


Station 112: Main Shop Well
OUL number: P3910 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/02/05 1432 Collected: 09/09/05 1446

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.7	484.2	550.6	2.24	87.99	0.03	1.88
540.9	538.1	543.9	0.00	0.00	0.00	ND
570.4	550.6	589.0	0.91	22.53	0.04	2.23
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



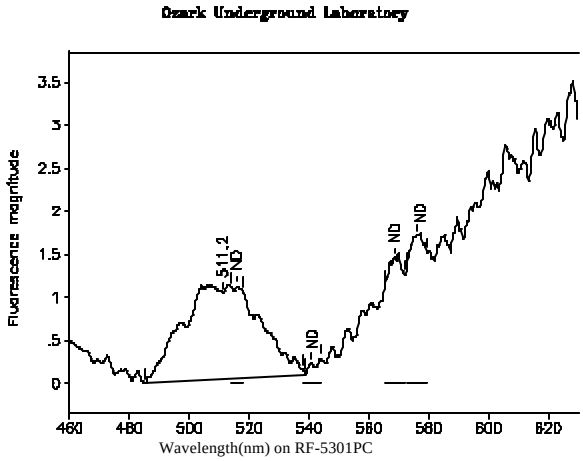
Station 113: Residence 6 Well
OUL number: P3911 Analyzed: 10/11/05
Matrix: Elutant
Placed: 08/26/05 1538 Collected: 09/02/05 1451

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

508.4	486.4	530.8	0.96	26.62	0.04	0.570



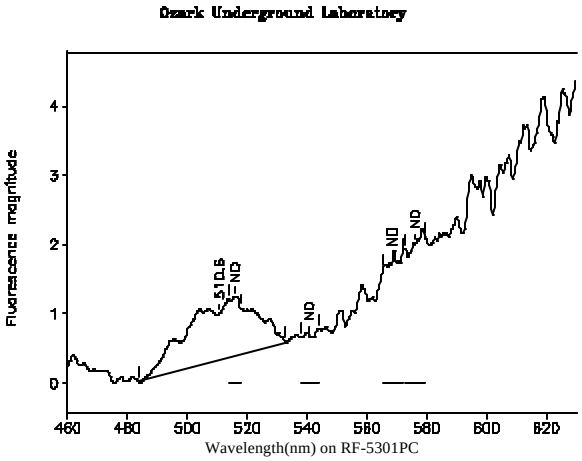
Station 113: Residence 6 Well
OUL number: P3912 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/02/05 1451 Collected: 09/09/05 1510

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

511.2	485.0	538.8	1.00	33.21	0.03	0.711



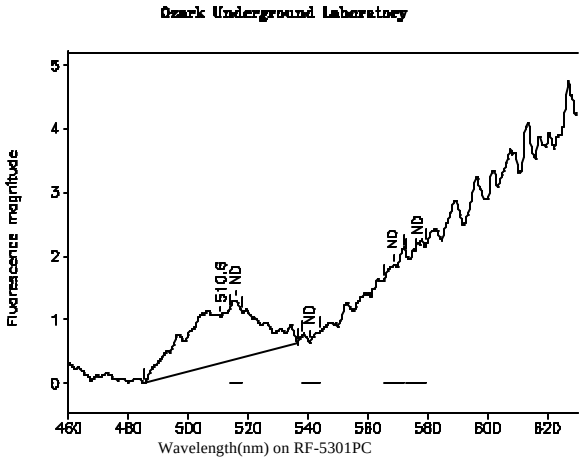
Station 114: Chalet Well
OUL number: P3913 Analyzed: 10/11/05
Matrix: Elutant
Placed: 08/26/05 1604 Collected: 09/02/05 1456

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

510.6	483.6	532.6	0.82	23.53	0.03	0.504



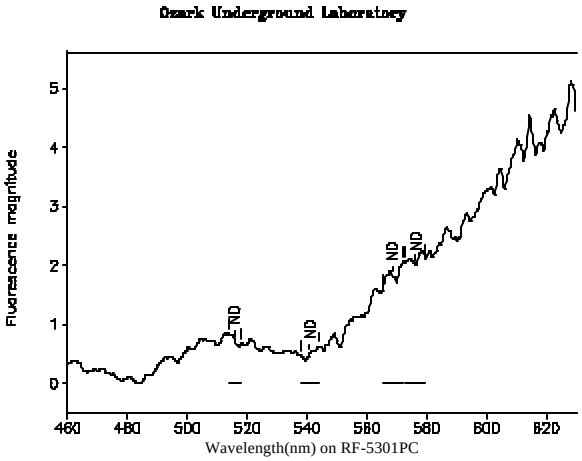
Station 114: Chalet Well
OUL number: P3914 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/02/05 1456 Collected: 09/09/05 1515

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

510.6	485.0	536.4	0.75	26.89	0.03	0.575

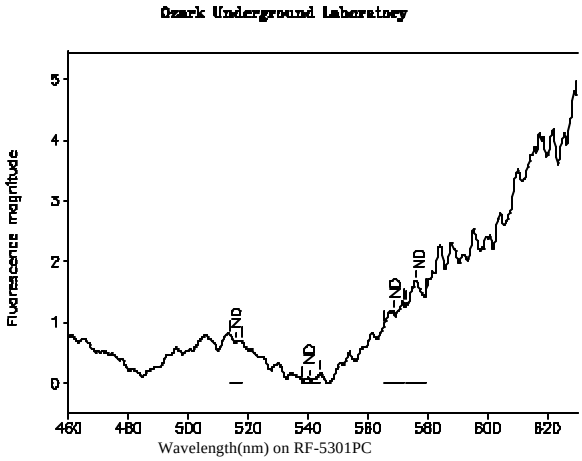


Station 121: Copeland Well
OUL number: P2811 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/25/05 1344 Collected: 08/01/05 1338

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

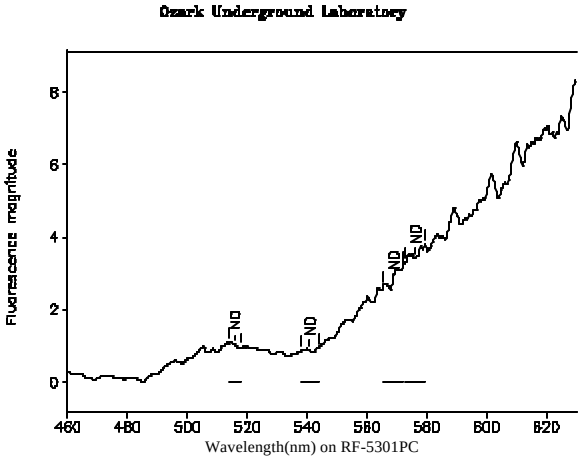


Station 121: Copeland Well
OUL number: P3014 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/08/05 1618 Collected: 08/15/05 1558

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

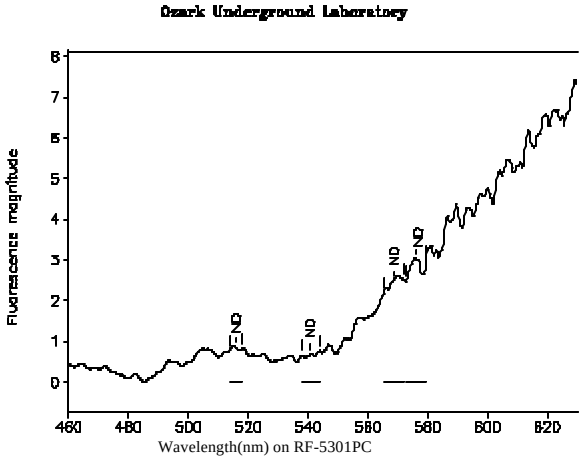


Station 121: Copeland Well
OUL number: P3664 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/15/05 1558 Collected: 08/19/05 1656

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

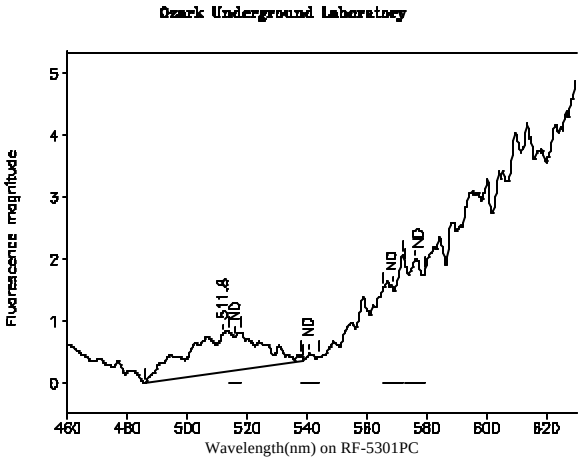


Station 121: Copeland Well
OUL number: P3665 Analyzed: 09/21/05
Matrix: Elutant
Placed: 08/19/05 1656 Collected: 08/25/05 1520

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



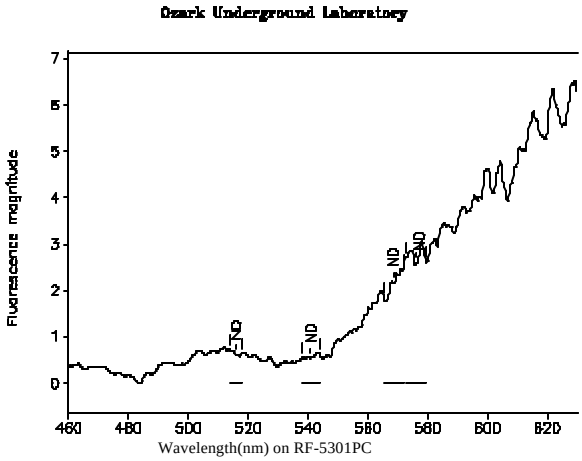
Station 121: Copeland Well
OUL number: P3544 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/25/05 1520 Collected: 09/02/05 1632

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

511.8	485.8	539.0	0.61	18.83	0.03	0.398

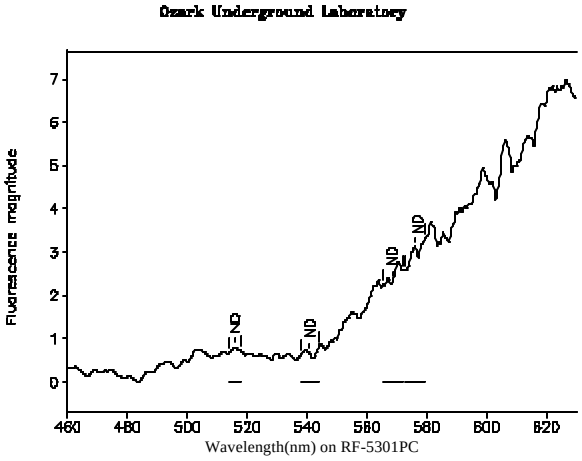


Station 121: Copeland Well
OUL number: P3732 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/02/05 1632 Collected: 09/09/05 1648

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

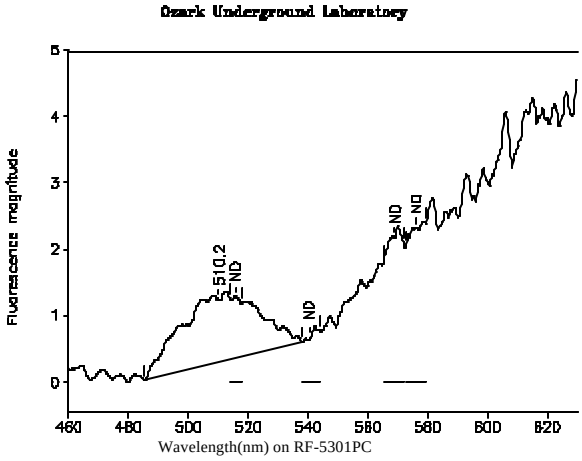


Station 121: Copeland Well
OUL number: P3733 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/09/05 1648 Collected: 09/16/05 1503

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



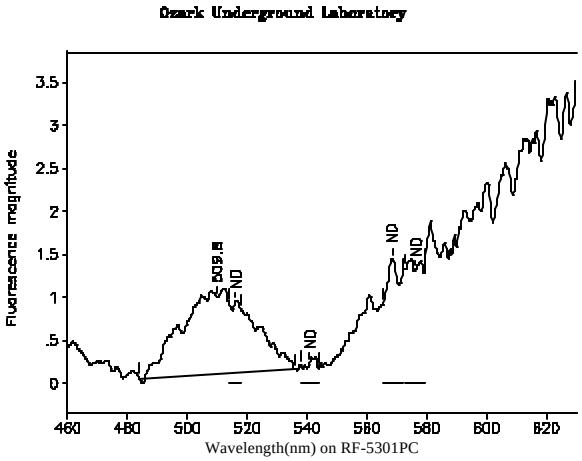
Station 121: Copeland Well
OUL number: P3915 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/16/05 1503 Collected: 09/23/05 1635

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

510.2	485.2	538.0	0.94	31.32	0.03	0.670



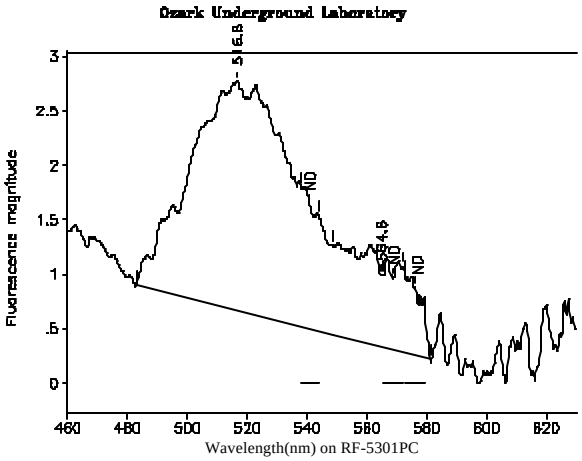
Station 121: Copeland Well
OUL number: P3916 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/23/05 1635 Collected: 09/30/05 1727

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	514.0	518.1	0.00	0.00	0.00	ND
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	565.4	572.0	0.00	0.00	0.00	ND
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

509.8	483.8	536.0	0.90	27.05	0.03	0.579



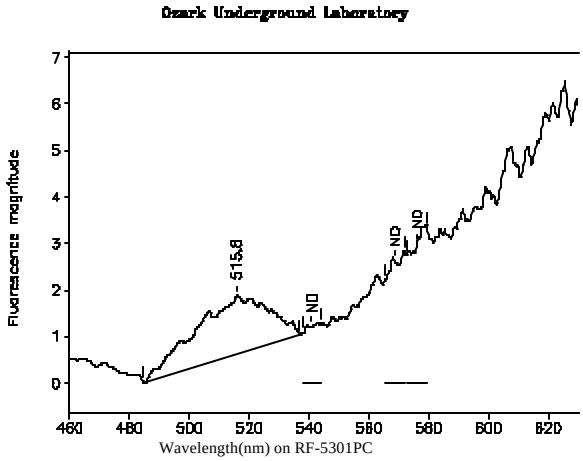
Station 122: Tropic Traditions Well
OUL number: P2804 Analyzed: 08/05/05
Matrix: Elutant
Placed: 07/25/05 1324 Collected: 08/01/05 1146

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.8	483.0	548.5	2.11	87.44	0.02	1.78
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

564.6	548.5	581.2	0.66	23.91	0.03	2.27

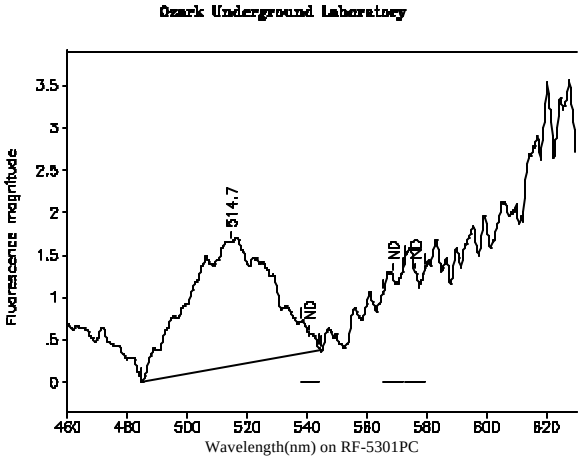


Station 122: Tropic Traditions Well
OUL number: P2907 Analyzed: 08/12/05
Matrix: Elutant
Placed: 08/01/05 1146 Collected: 08/08/05 1458

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	484.6	537.0	1.26	36.21	0.03	0.741
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

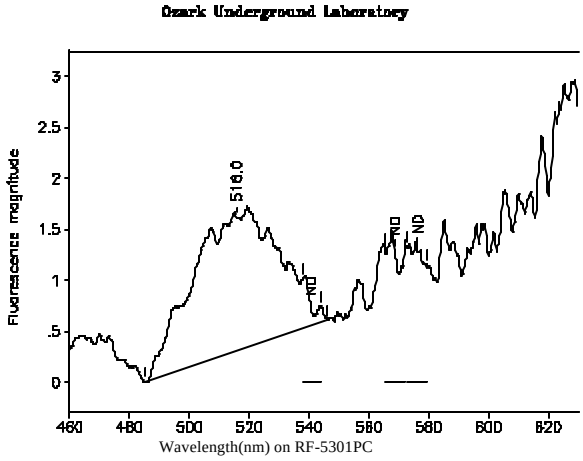


Station 122: Tropic Traditions Well
OUL number: P3015 Analyzed: 08/24/05
Matrix: Elutant
Placed: 08/08/05 1458 Collected: 08/13/05 1728

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
514.7	484.8	544.8	1.46	49.57	0.03	1.03
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

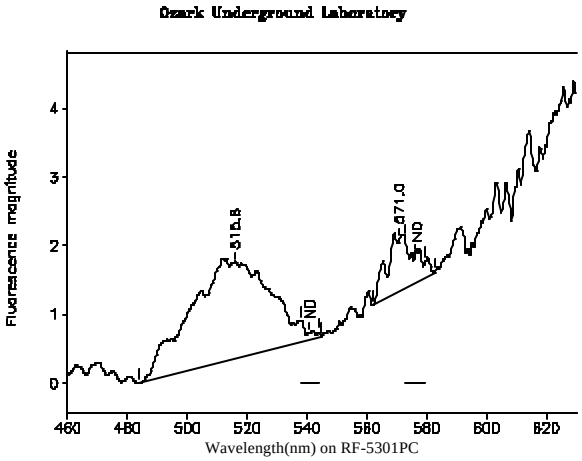


Station 122: Tropic Traditions Well
OUL number: P3545 Analyzed: 09/14/05
Matrix: Elutant
Placed: 08/25/05 1505 Collected: 09/02/05 1642

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
516.0	485.4	546.2	1.31	46.87	0.03	0.990
541.0	538.1	543.9	0.00	0.00	0.00	ND
568.7	565.4	572.0	0.00	0.00	0.00	ND
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

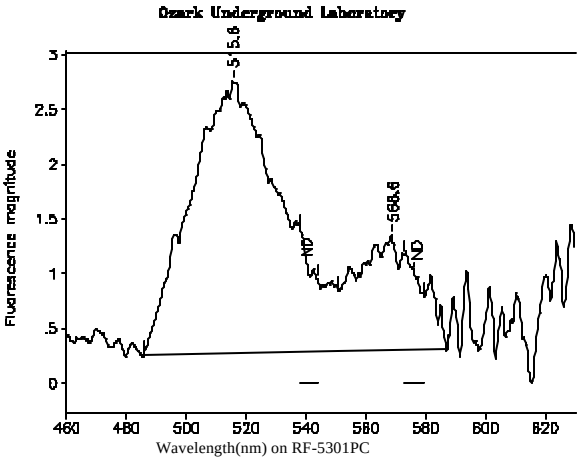


Station 122: Tropic Traditions Well
OUL number: P3734 Analyzed: 09/26/05
Matrix: Elutant
Placed: 09/09/05 1714 Collected: 09/16/05 1348

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.8	484.0	544.8	1.39	45.45	0.03	0.970
541.0	538.1	543.9	0.00	0.00	0.00	ND
571.0	562.0	582.6	0.75	8.49	0.09	0.885
576.2	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



Station 122: Tropic Traditions Well
OUL number: P3917 Analyzed: 10/11/05
Matrix: Elutant
Placed: 09/23/05 1637 Collected: 09/30/05 1541

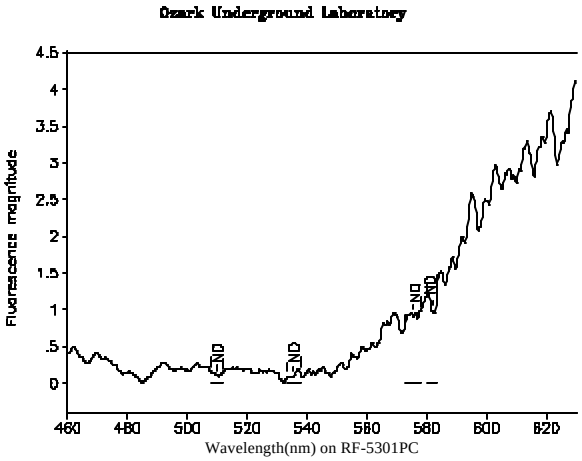
Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
515.6	485.6	551.0	2.50	89.19	0.03	1.91
540.9	538.1	543.9	0.00	0.00	0.00	ND
568.6	551.0	587.2	1.05	25.56	0.04	2.53
576.1	572.8	579.6	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

APPENDIX IIC

ANALYTICAL GRAPHS
OF ANALYZED WATER SAMPLES

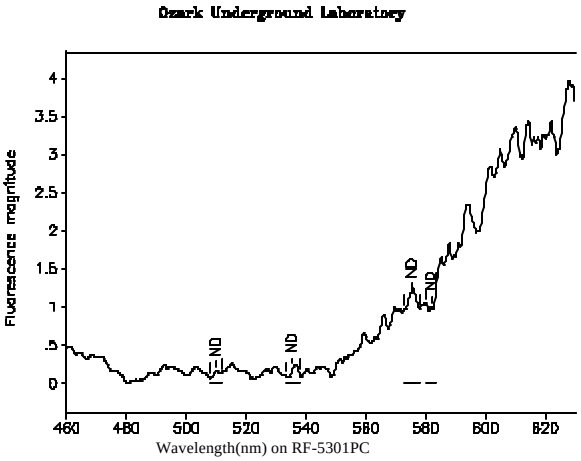


Station 4: Hornsby Spring Daily
OUL number: P3531 Analyzed: 09/14/05
Matrix: Water
Collected: 08/05/05 1306

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

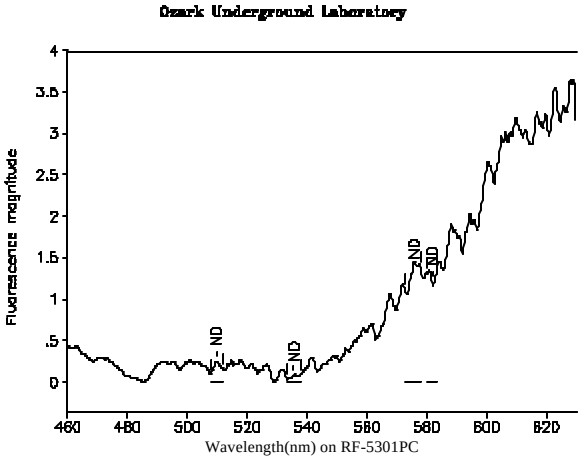


Station 4: Hornsby Spring Daily
OUL number: P3532 Analyzed: 09/14/05
Matrix: Water
Collected: 08/06/05 1227

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

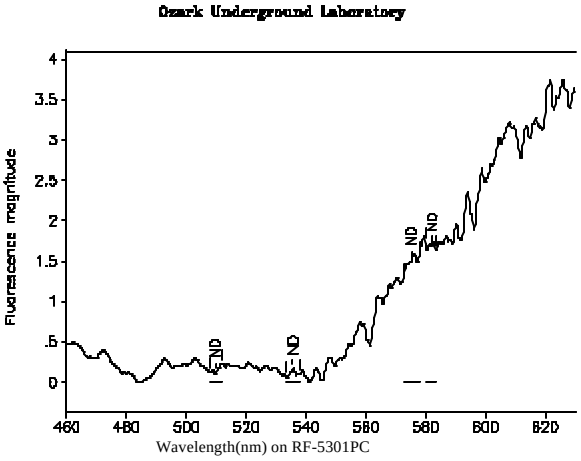


Station 4: Hornsby Spring Daily
OUL number: P3533 Analyzed: 09/14/05
Matrix: Water
Collected: 08/07/05 1551

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

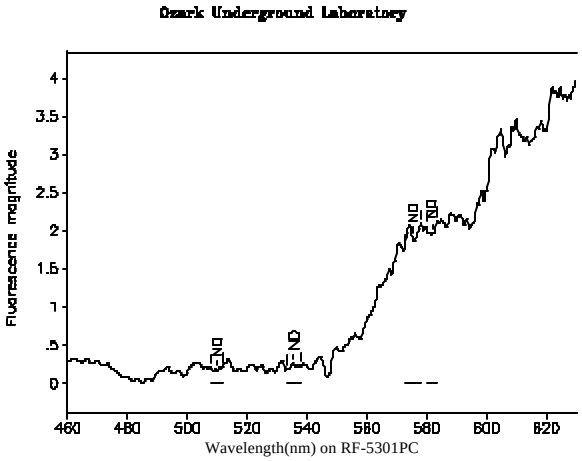


Station 4: Hornsby Spring Daily
OUL number: P3534 Analyzed: 09/14/05
Matrix: Water
Collected: 08/08/05 1421

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

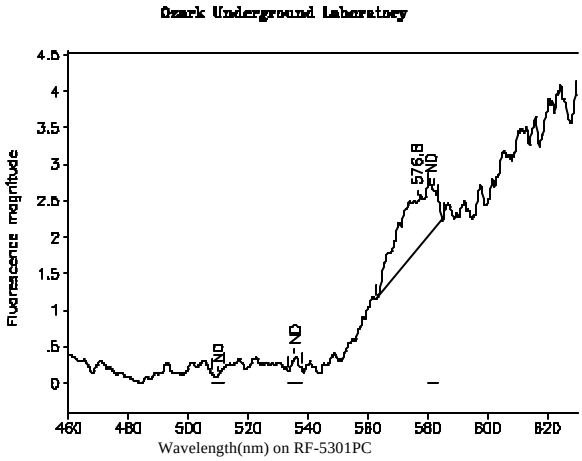


Station 4: Hornsby Spring Daily
OUL number: P3535 Analyzed: 09/14/05
Matrix: Water
Collected: 08/09/05 1248

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

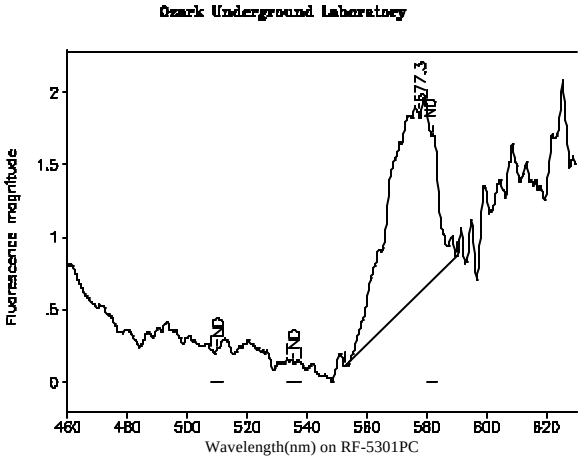


Station 4: Hornsby Spring Daily
OUL number: P3536 Analyzed: 09/14/05
Matrix: Water
Collected: 08/10/05 1228

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
576.8	563.0	585.4	0.66	10.96	0.06	0.093
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

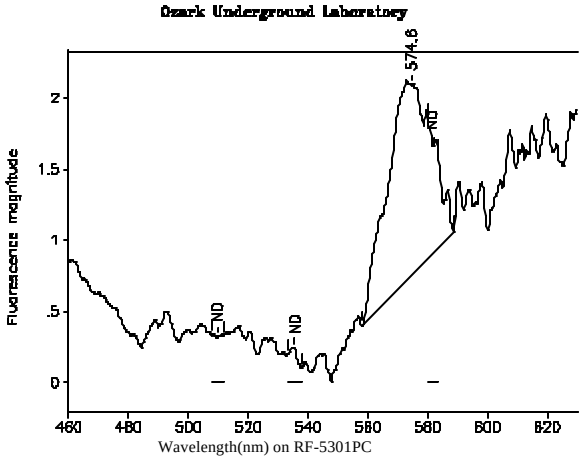


Station 4: Hornsby Spring Daily
OUL number: P3568 Analyzed: 09/16/05
Matrix: Water
Collected: 08/11/05 1529

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
577.3	552.6	590.2	1.25	24.87	0.05	0.209
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

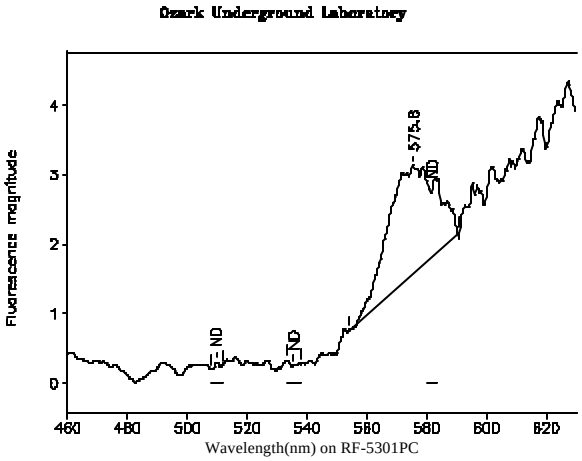


Station 4: Hornsby Spring Daily
OUL number: P3569 Analyzed: 09/16/05
Matrix: Water
Collected: 08/12/05 1509

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
574.6	558.2	588.8	1.34	23.51	0.06	0.198
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

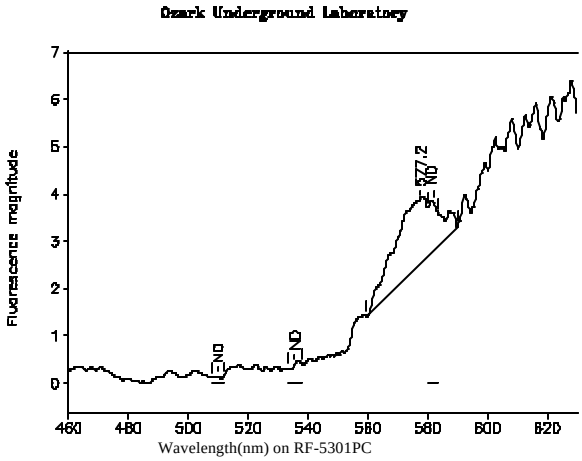


Station 4: Hornsby Spring Daily
OUL number: P3537 Analyzed: 09/14/05
Matrix: Water
Collected: 08/13/05 1535

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.8	554.0	591.2	1.53	29.23	0.05	0.247
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

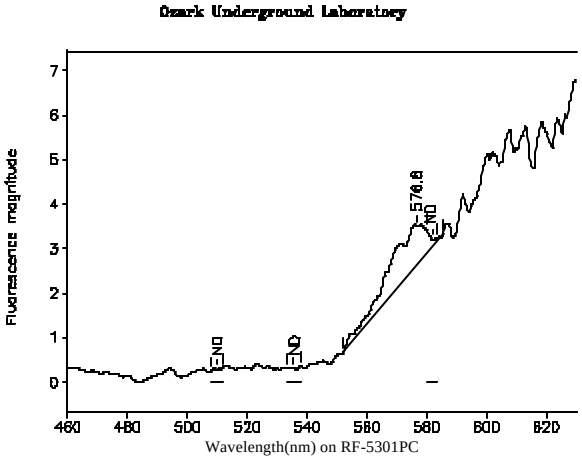


Station 4: Hornsby Spring Daily
OUL number: P3666 Analyzed: 09/21/05
Matrix: Water
Collected: 08/19/05 1408

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
577.2	559.6	590.0	1.36	23.59	0.06	0.199
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

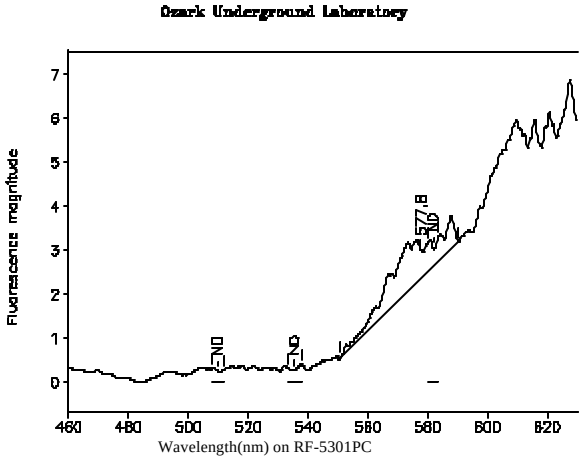


Station 4: Hornsby Spring Daily
OUL number: P3667 Analyzed: 09/21/05
Matrix: Water
Collected: 08/23/05 1421

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
576.8	552.2	585.4	0.88	15.20	0.06	0.128
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

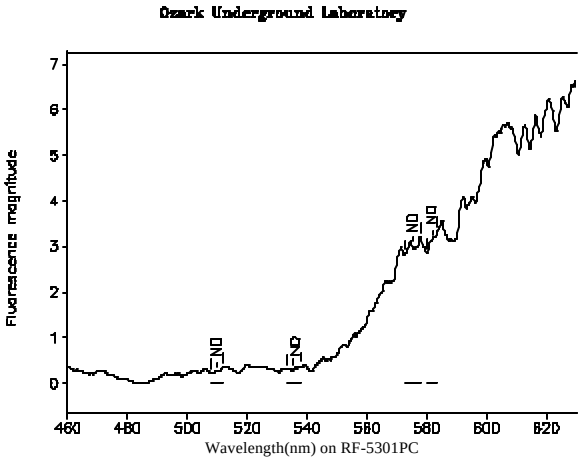


Station 4: Hornsby Spring Daily
OUL number: P3668 Analyzed: 09/21/05
Matrix: Water
Collected: 08/26/05 1507

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
577.8	551.0	590.2	0.65	19.54	0.03	0.165
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

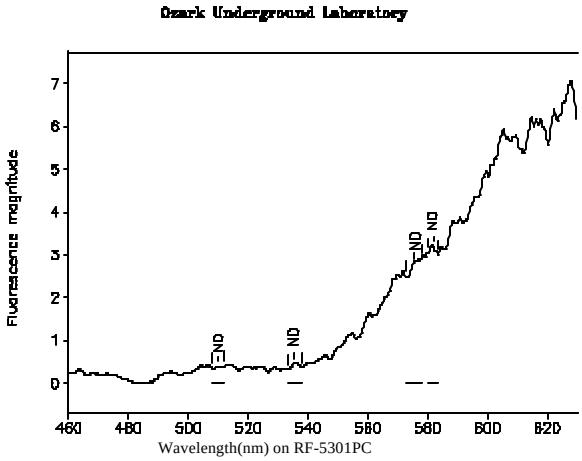


Station 4: Hornsby Spring Daily
OUL number: P3882 Analyzed: 10/10/05
Matrix: Water
Collected: 08/29/05 1555

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

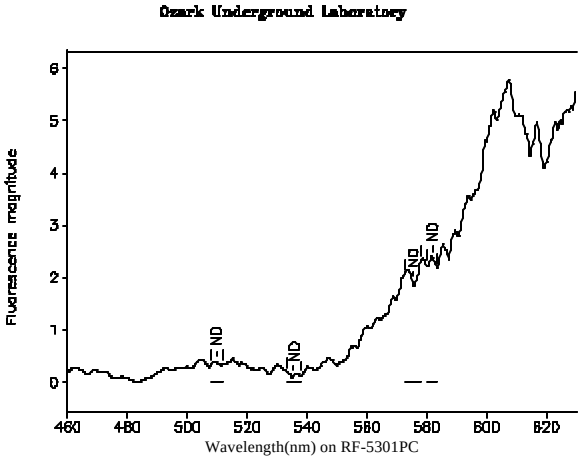


Station 4: Hornsby Spring Daily
OUL number: P3883 Analyzed: 10/10/05
Matrix: Water
Collected: 09/02/05 1415

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

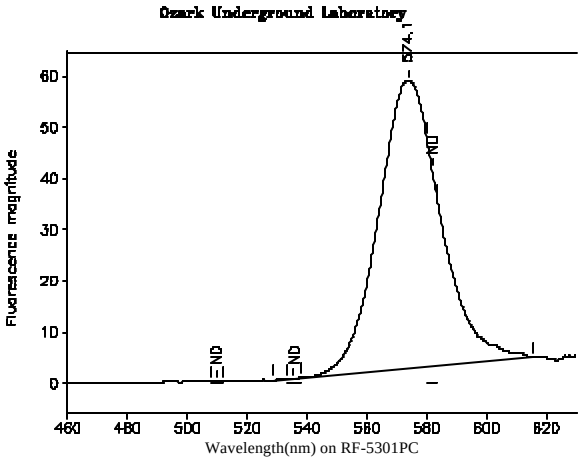


Station 4: Hornsby Spring Daily
OUL number: P3885 Analyzed: 10/11/05
Matrix: Water
Collected: 09/09/05 1437

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

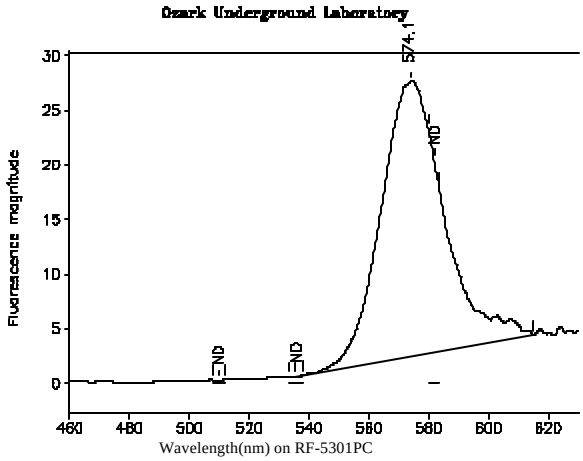


Station 43: Mill Creek Sink Cave
OUL number: P2813 Analyzed: 08/05/05
Matrix: Water
Collected: 07/29/05 1722

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
574.1	528.8	615.4	56.17	1,353.33	0.04	11.3
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

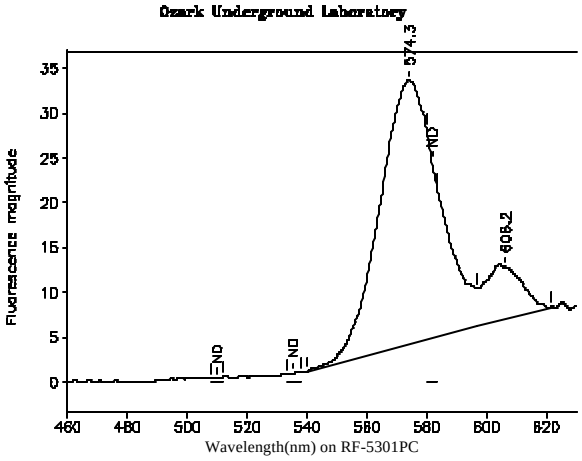


Station 43: Mill Creek Sink Cave
OUL number: P2814 Analyzed: 08/05/05
Matrix: Water
Collected: 07/31/05 1800

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
574.1	535.2	615.2	25.15	617.38	0.04	5.16
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



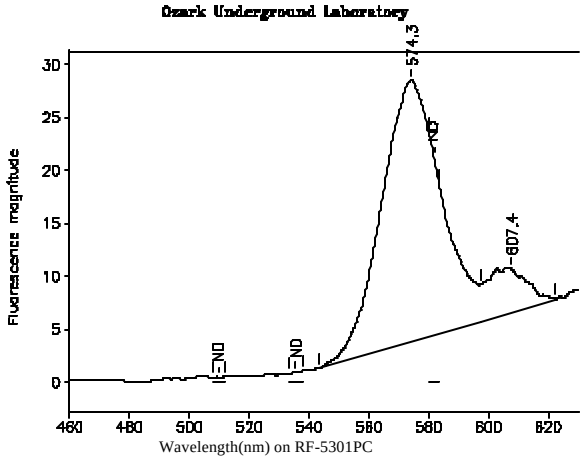
Station 43: Mill Creek Sink Cave
OUL number: P2910 Analyzed: 08/12/05
Matrix: Water
Collected: 08/03/05 1759

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
574.3	539.8	596.6	29.42	675.83	0.04	5.69
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

606.2	596.6	621.4	5.85	90.31	0.06	0.000



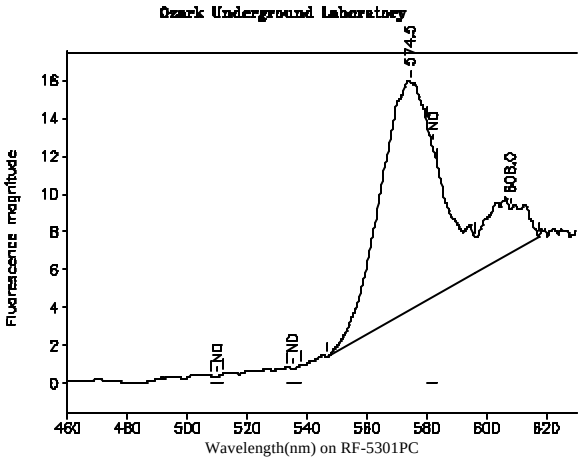
Station 43: Mill Creek Sink Cave
OUL number: P2911 Analyzed: 08/12/05
Matrix: Water
Collected: 08/05/05 1449

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
574.3	543.2	597.4	24.66	568.30	0.04	4.78
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

607.4	597.4	622.6	4.20	67.47	0.06	0.000



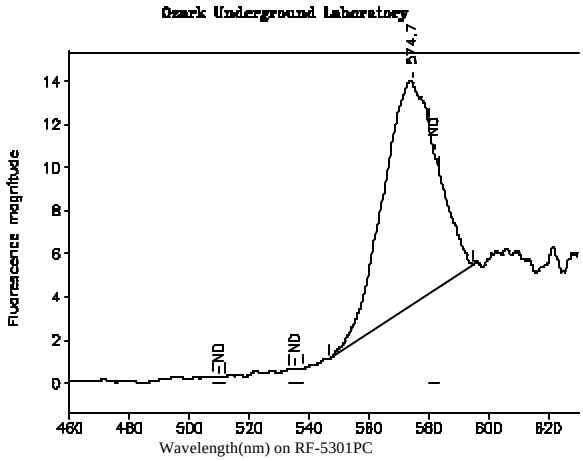
Station 43: Mill Creek Sink Cave
OUL number: P2912 Analyzed: 08/12/05
Matrix: Water
Collected: 08/08/05 1710

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
574.5	546.6	596.2	12.06	276.66	0.04	2.33
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

608.0	596.2	617.6	2.36	45.24	0.05	0.000

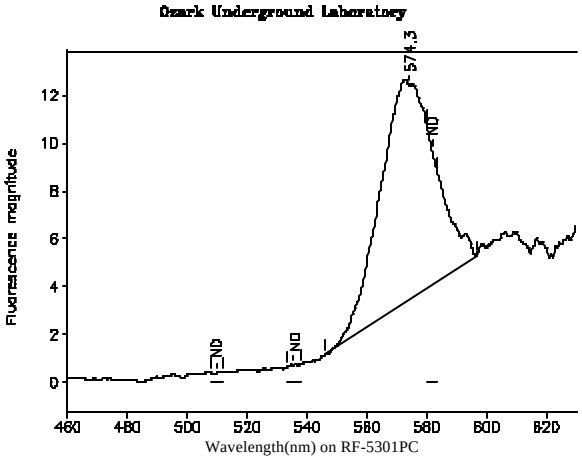


Station 43: Mill Creek Sink Cave
OUL number: P3019 Analyzed: 08/24/05
Matrix: Water
Collected: 08/11/05 1653

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
574.7	546.4	595.0	10.30	216.42	0.05	1.84
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

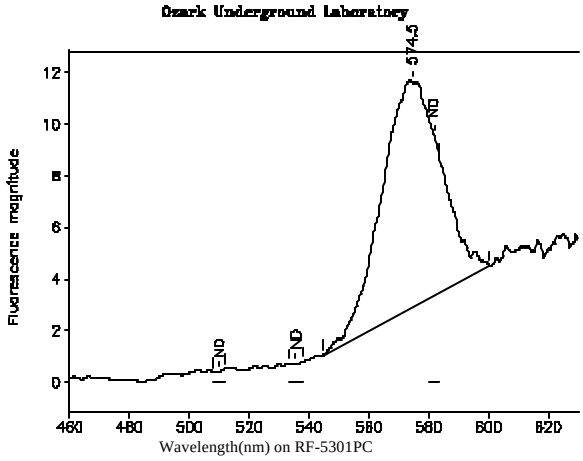


Station 43: Mill Creek Sink Cave
OUL number: P3021 Analyzed: 08/24/05
Matrix: Water
Collected: 08/15/05 1709

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
574.3	546.0	596.6	8.96	196.59	0.05	1.67
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

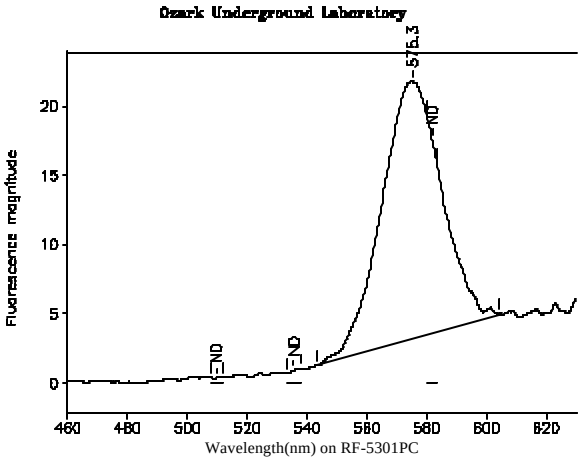


Station 43: Mill Creek Sink Cave
OUL number: P3552 Analyzed: 09/14/05
Matrix: Water
Collected: 08/19/05 1750

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
574.5	544.8	600.4	8.77	202.54	0.04	1.71
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

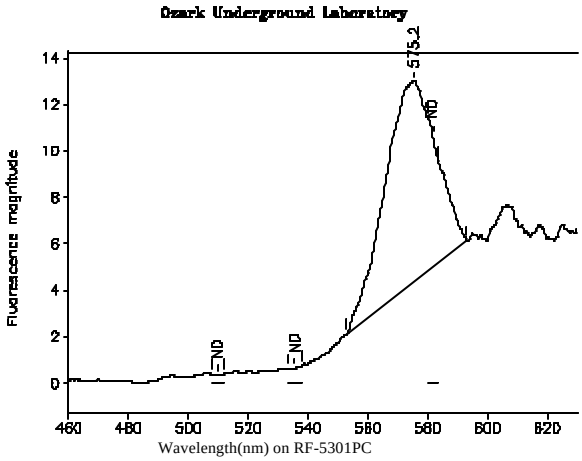


Station 43: Mill Creek Sink Cave
OUL number: P3553 Analyzed: 09/14/05
Matrix: Water
Collected: 09/02/05 1730

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	543.4	604.2	18.57	430.81	0.04	3.64
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

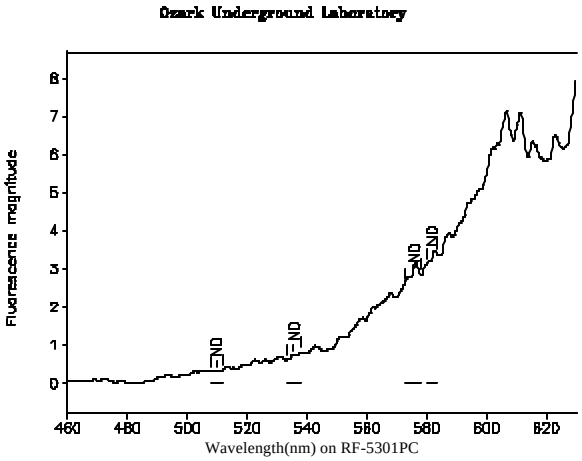


Station 43: Mill Creek Sink Cave
OUL number: P3742 Analyzed: 09/26/05
Matrix: Water
Collected: 09/09/05 1736

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.2	553.0	593.2	8.65	172.74	0.05	1.46
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

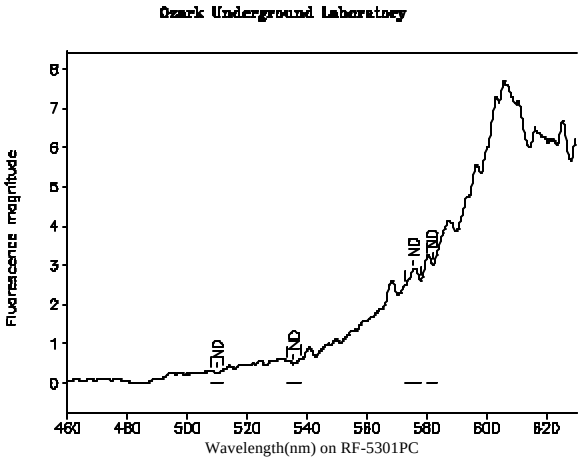


Station 106: Santa Fe Hills Subdivision Well
OUL number: P3739 Analyzed: 09/26/05
Matrix: Water
Collected: 08/19/05 1710

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

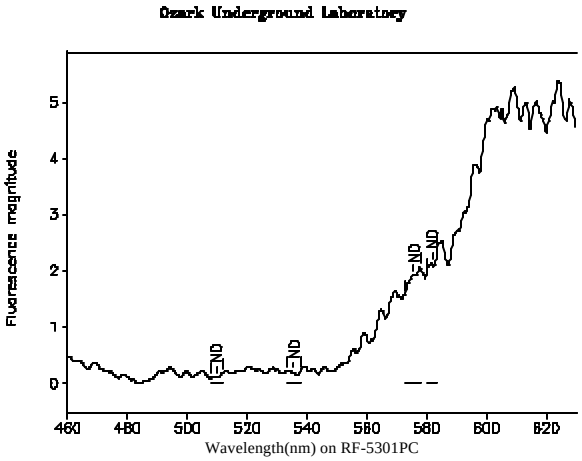


Station 106T: Santa Fe Hills Subdivision Well - System Tap Water
OUL number: P3741 Analyzed: 09/26/05
Matrix: Water
Collected: 09/21/05 1339

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

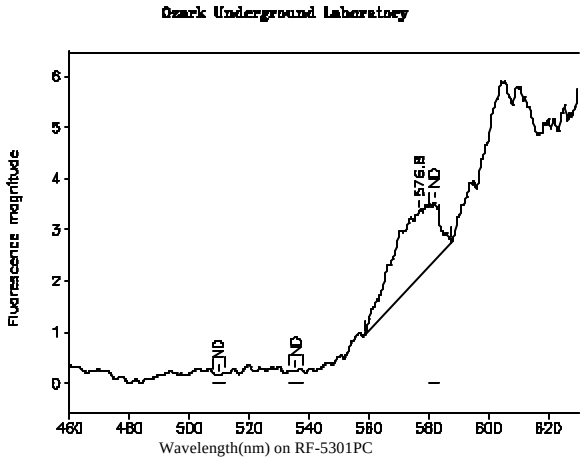


Station 111: River Ranch Well
OUL number: P3737 Analyzed: 09/26/05
Matrix: Water
Collected: 08/07/05 1623

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

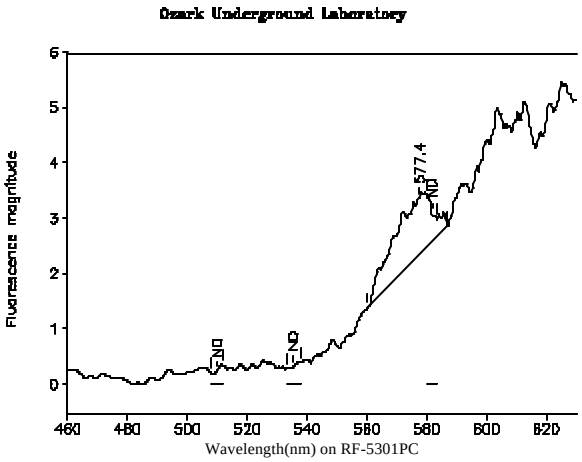


Station 111: River Ranch Well
OUL number: P3738 Analyzed: 09/26/05
Matrix: Water
Collected: 08/10/05 1255

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
576.8	558.6	587.8	1.29	23.85	0.05	0.201
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

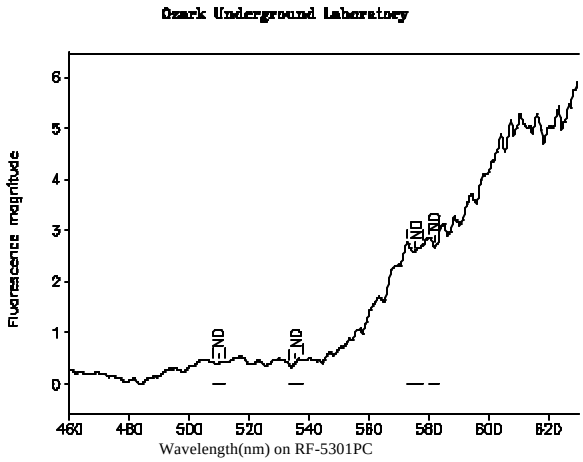


Station 111: River Ranch Well
OUL number: P3886 Analyzed: 10/11/05
Matrix: Water
Collected: 08/26/05 1548

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
577.4	560.2	587.0	1.04	16.93	0.06	0.145
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

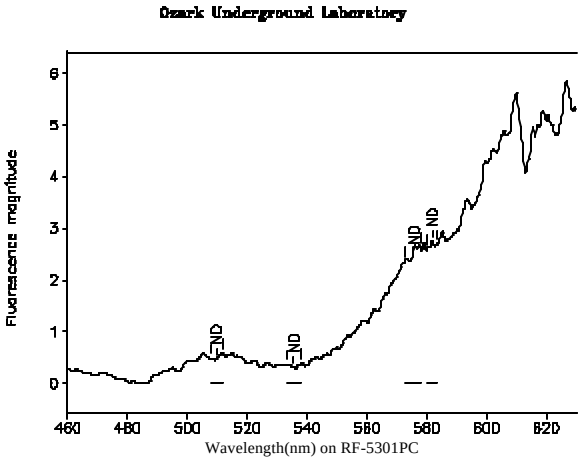


Station 111: River Ranch Well
OUL number: P3887 Analyzed: 10/11/05
Matrix: Water
Collected: 09/02/05 1443

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

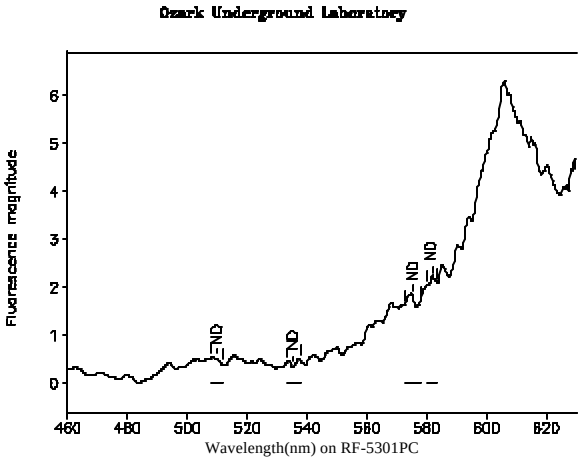


Station 111: River Ranch Well
OUL number: P3888 Analyzed: 10/11/05
Matrix: Water
Collected: 09/09/05 1500

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:



Station 111T: River Ranch Well Water System
OUL number: P3926 Analyzed: 10/11/05
Matrix: Water
Collected: 09/30/05 1507

Peaks within the normal range of tracer dyes:

Peak nm	Left X	Right X	Height	Area	H/A	Conc.
509.8	508.0	511.7	0.00	0.00	0.00	ND
535.6	533.4	537.9	0.00	0.00	0.00	ND
575.3	572.7	578.0	0.00	0.00	0.00	ND
581.9	580.1	583.7	0.00	0.00	0.00	ND

Peaks close to the normal range of tracer dyes:

APPENDIX III

MISCELLANEOUS DOCUMENTS

SRWMD Discharge Msmt. Notes; Hornsby Spring, August 24, 2005.
SRWMD Discharge Msmt. Notes; Hornsby Spring, October 11, 2005.
KES Discharge Measurement; Cellon Creek, July 1, 2005.
KES Discharge Measurement; Cellon Creek, July 27, 2005.
KES Discharge Measurement; Cellon Creek, October 5, 2005.
Alachua County Public Works Dept.; letter with staff gauge elevation data.
Alachua County Environmental Protection Department file document (2 pages); unpublished report referencing 1976 dye trace by D.W. Fisk and I.S. Exley.

SRWMD
Dec. 1979

SUWANNEE RIVER

Meas. No. e46

Comp. by

Checked by

DISCHARGE MEASUREMENT NOTES

P. 2
NO. 6438
SRWMD 386-362-1056
APR. 17. 2006 11:20AM

e No. HORDICI

Hornsby Spring @ Camp Kulaqua

te 8-24 1965 Party BK/KT

idth 6.7 Area 2.40 Vel. 0.79 G. H. _____ Disch. 1.90

thod _____ No. secs. _____ G. H. change _____ in _____ hrs. Susp. Rod

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

Type of meter Price AA-1 CST

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. OK after OK

Meas. plots ____ % diff. from rating _____

Wading, cable, ice, boat, upstr., downstr., side bridge 2120 feet, mile, above, below gage, and Vent

Check-bar, found _____ changed to _____ at _____

Correct _____

Levels obtained _____

GAGE READINGS

Time	B.P	Recorder	Inside	Outside
0847	0.81			
1047	0.81			

Weighted M. G. H. _____

G. H. correction _____

ect M. G. H. _____

asurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following

onditions: Cross section _____

_____ Weather _____

er _____ Air _____°F@ _____

e _____ Water _____°F@ _____

_____ Record removed _____ Intake flushed U

Observer _____

trol TRS Flow-Low

arks Flow width 65.50

L of zero flow _____ ft.

SW-309A

SRWMD
Dec. 1979

Meas. No. e47

Comp. by

Checked by

DISCHARGE MEASUREMENT NOTES

P: 4

NO. 6438

386-362-1056: SRWMD

APR. 17. 2006 11:20AM

i. No. HOR0101

Hornsby Springs @ Camp Dulaqua

te 10-11-2005 19— Party BGIET

dth 22.0' Area 22.4 Vel. 0.67 G. H. _____ Disch. 150

thod 2, 6, 8 No. secs. _____ G. H. change _____ in _____ hrs. Susp. Rod

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS				
Time		Recorder	Inside	Outside
1129	0.98			
1341	0.98			
Weighted M. G. H.				
correction				
M. G. H.				

Type of meter Price AA 1:1 572

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. OK after OK

Meas. plots ____ % diff. from rating _____

(Wading), cable, ice, (boat), upstr., downstr., side bridge ≈ 110 (feet), mile, above, (below) gage, and vent.

Check-bar, found _____

changed to _____ at _____

Correct _____

Levels obtained _____

urement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following

ditions: Cross section _____

_____ Weather _____

_____ Air _____ °F@ _____

_____ Water _____ °F@ _____

_____ Record removed _____ Intake flushed U L

bserver _____

_____

l _____

_____

s Trans: 2 REW-LEW

Flow Width 63'

_____

_____

if zero flow _____ ft.

SW-309A

	KARST ENVIRONMENTAL SERVICES, INC.							
	DISCHARGE MEASUREMENT							
	Location:	**Cellon Creek**		**San Felasco State Preserve**				
	CFS:	**2.45**				**Date:**	**7/1/2005**	
	MGD:	**1.58**				**Time Start:**	**12:53**	
	GPM:	**1099**				**Time End:**	**13:15**	
	Total Width:		**11.7**	Feet		**Side Start:**	**REW**	
	Total Area:		**2.94**	Square Feet		**Personnel:**	**PLB,ML**	
	Avg. Velocity:		**0.83**	Ft./Sec.		**Access:**	**Wading**	
	No. of Secs.:							
	Method:		**0.6**					
	Instrument:		**Marsh Mcbirney Flo-Mate Model 2000**					
			Electronic flowmeter					
	Lee Sink Staff Gauge:		**Time:**	**13:25**	**Reading:**	**2.02**	**FSL,NGVD:**	**63.28**
Station #	**DIP**	**Station Width**	**Depth**	**OD**	**PV**	**Mean PV**	**Area**	**Discharge**
0	0							
1	0.5	0.75	0.3	0.6		0.78	0.225	0.1755
2	1	0.5	0.35	0.6		0.96	0.175	0.168
3	1.5	0.375	0.35	0.6		1.18	0.13125	0.154875
4	1.75	0.25	0.35	0.6		1.19	0.0875	0.104125
5	2	0.25	0.35	0.6		1.17	0.0875	0.102375
6	2.25	0.25	0.35	0.6		1.19	0.0875	0.104125
7	2.5	0.375	0.35	0.6		1.09	0.13125	0.1430625
8	3	0.5	0.3	0.6		0.95	0.15	0.1425
9	3.5	0.5	0.3	0.6		0.83	0.15	0.1245
10	4	0.5	0.3	0.6		0.84	0.15	0.126
11	4.5	0.5	0.3	0.6		0.86	0.15	0.129
12	5	0.5	0.35	0.6		0.97	0.175	0.16975
13	5.5	0.5	0.3	0.6		0.82	0.15	0.123
14	6	0.5	0.25	0.6		0.7	0.125	0.0875
15	6.5	0.5	0.25	0.6		0.75	0.125	0.09375
16	7	0.5	0.2	0.6		0.65	0.1	0.065
17	7.5	0.5	0.2	0.6		0.62	0.1	0.062
18	8	0.5	0.2	0.6		0.58	0.1	0.058
19	8.5	0.5	0.15	0.6		0.61	0.075	0.04575
20	9	0.5	0.2	0.6		0.56	0.1	0.056
21	9.5	0.5	0.15	0.6		0.62	0.075	0.0465
22	10	0.5	0.15	0.6		0.58	0.075	0.0435
23	10.5	1.45	0.15	0.6		0.57	0.2175	0.123975
	11.7	END						
	Stream Cross-section located at:							
	N 29° 46.275'							
	W 82° 27.945'							

	KARST ENVIRONMENTAL SERVICES, INC.							
	DISCHARGE MEASUREMENT							
	Location:	**Cellon Creek**		**San Felasco State Preserve**				
	CFS:	**0.11**				**Date:**	**7/27/2005**	
	MGD:	**0.07**				**Time Start:**	**13:50**	
	GPM:	**47**				**Time End:**	**16:03**	
	Total Width:		**2.8**	Feet		**Side Start:**	**REW**	
	Total Area:		**0.59**	Square Feet		**Personnel:**	**PLB,TLM**	
	Avg. Velocity:		**0.16**	Ft./Sec.		**Access:**	**Wading**	
	No. of Secs.:		**10**					
	Method:		**0.6**					
	Instrument:		**Marsh Mcbirney Flo-Mate Model 2000**					
			Electronic flowmeter					
	Lee Sink Staff Gauge:		**Time:**	**14:30**	**Reading:**	**3.11**	**FSL,NGVD:**	**64.37**
Station #	**DIP**	**Station Width**	**Depth**	**OD**	**PV**	**Mean PV**	**Area**	**Discharge**
0	0							
1	0.25	0.25	0.1	0.6		0	0.025	0
2	0.5	0.25	0.2	0.6		0.01	0.05	0.0005
3	0.75	0.25	0.2	0.6		0.09	0.05	0.0045
4	1	0.25	0.25	0.6		0.18	0.0625	0.01125
5	1.25	0.25	0.25	0.6		0.19	0.0625	0.011875
6	1.5	0.25	0.275	0.6		0.22	0.06875	0.015125
7	1.75	0.25	0.3	0.6		0.23	0.075	0.01725
8	2	0.25	0.3	0.6		0.24	0.075	0.018
9	2.25	0.25	0.3	0.6		0.26	0.075	0.0195
10	2.5	0.25	0.2	0.6		0.14	0.05	0.007
	2.8	END						
	Stream Cross-section located at:							
	N 29° 46.275'							
	W 82° 27.945'							

	KARST ENVIRONMENTAL SERVICES, INC.							
	DISCHARGE MEASUREMENT							
	Location:	**Cellon Creek**		**San Felasco State Preserve**				
	CFS:	**0.39**				**Date:**	**10/5/2005**	
	MGD:	**0.25**				**Time Start:**	**15:41**	
	GPM:	**177**				**Time End:**	**15:57**	
	Total Width:		**3.9**	Feet		**Side Start:**	**REW**	
	Total Area:		**0.97**	Square Feet		**Personnel:**	**PLB**	
	Avg. Velocity:		**0.34**	Ft./Sec.		**Access:**	**Wading**	
	No. of Secs.:		**15**					
	Method:		**0.6**					
	Instrument:		**Marsh Mcbirney Flo-Mate Model 2000**					
			Electronic flowmeter					
	Lee Sink Staff Gauge:		**Time:**	**15:00**	**Reading:**	**0.25**	**FSL,NGVD:**	**61.51**
Station #	**DIP**	**Station Width**	**Depth**	**OD**	**PV**	**Mean PV**	**Area**	**Discharge**
0	0							
1	0.25	0.375	0	0		0	0	0
2	0.5	0.25	0.2	0.6		0.04	0.05	0.002
3	0.75	0.25	0.2	0.6		0.12	0.05	0.006
4	1	0.25	0.25	0.6		0.3	0.0625	0.01875
5	1.25	0.25	0.25	0.6		0.52	0.0625	0.0325
6	1.5	0.25	0.3	0.6		0.59	0.075	0.04425
7	1.75	0.25	0.35	0.6		0.54	0.0875	0.04725
8	2	0.25	0.35	0.6		0.55	0.0875	0.048125
9	2.25	0.25	0.35	0.6		0.6	0.0875	0.0525
10	2.5	0.25	0.35	0.6		0.59	0.0875	0.051625
11	2.75	0.25	0.35	0.6		0.43	0.0875	0.037625
12	3	0.25	0.3	0.6		0.3	0.075	0.0225
13	3.25	0.25	0.25	0.6		0.27	0.0625	0.016875
14	3.5	0.25	0.2	0.6		0.23	0.05	0.0115
15	3.75	0.275	0.15	0.6		0.07	0.04125	0.0028875
	3.9	END						
	Stream Cross-section located at:							
	N 29° 46.275'							
	W 82° 27.945'							

ALACHUA COUNTY
PUBLIC WORKS DEPARTMENT
TRANSPORTATION & DEVELOPMENT DIVISION

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September 20, 2005

Jim Myles
Senior Environmental Specialist
Alachua County Environmental Protection Department
201 SE 2nd Ave. Suite 201
Gainesville, Fl. 32601

Subject: Requested Elevation Information

Dear Jim,

The elevations at the 3 sites requested are as follows:

1) **Olson Well:**

Top of 4" well casing = 143.94

2) **Lee Sink:**

Elevation at "6.60" at top of staff gauge = 67.86

Top of set concrete monument which bears N 80° W, 119.02' from staff gauge = 67.92

3) **Mill Creek Sink:**

Elevation at "6.60" at top of staff gauge = 43.28

Top of set concrete monument which bears East, 27.61' from staff gauge = 42.68

Note: All elevations are based on NGVD 1929 Datum.

Stephen J. Emmons, P.L.S.
Senior Survey Technician
Public Works Department

File : groundwater

The attached time schedule for a proposed rhodamine WT dye tracer project in western Alachua County is based on conclusions drawn after an independent tracer study from Alachua Sink (west) to Hornesby Springs on February 6-10, 1976. This test was conducted independently of SRWMD by D. W. Fisk and I. S. Exley for the sole purpose of determining if a hydrologic connection of Alachua Sink and Hornesby Springs exists. The data collected from that study are listed below.

Distance from Alachua Sink to Hornesby Springs - approx. 6 mi.
Estimated velocity of water - 0.5 ft/sec.
Dye released at - rhodamine WT 6:05 PM 2/8/76
- flourescien 7:50 PM 2/8/76

Results of Sampling

		Time of Sample	Approximate Elapsed Time from Release	ppm
Rhodamine	2/9/76	1:30 PM	19.5 hrs.	0.0
		5:30 PM	23.5 hrs.	.17
	2/10/76	8:00 AM	38 hrs.	0.0
Flouresien	2/9/76	1:30 PM	17.3 hrs.	0.0
		5:30 PM	21.3 hrs.	.42
	2/10/76	8:00 AM	36.3 hrs.	.32
		1:00 PM	41.3 hrs.	0.0

From this data, an assumed minimum time of travel of 20 hours is made for dye traveling from Alachua Sink to Hornesby Springs. The flouresien dye was released in a surface stream which connects to the Alahcua-Hornesby System via the Mill Creek Ponor at a point between the sink and the spring, about 100 yards downstream from the sink. From an assumed travel time of 20 hours and distrance of 6 miles, a maximum velocity of .3 mph was obtained.

PROPOSED TIME SCHEDULING FOR DYE TRACING STUDY

OF WESTERN ALACHUA COUNTY, FLORIDA

Monday, March 2	Begin collection daily background samples at Hornesby Springs (continue through Saturday, March 7)
Friday, March 6 PM	All Dunn Bug filters and sampling equipment in place. Key to Sanches Prairie gates secured from DNR.
Saturday, March 7 4:00 PM	Release 10 pounds of rhodamine WT at Split Rock Sink and 10 pounds of rhodamine WT at Alachua Sink simultaneously
12:00 PM	Begin collection of 1 hour samples from Alachua Sink (end sampling at 6:00 PM, March 8)
Sunday, March 8	
5:30 AM	Minimum expected time for dye released from Split Rock Sink to reach Alachua Sink (maximum hour estimated at 10:00 AM, March 8)
8:00 AM	Begin collection of 30 minute samples from Hornesby Springs (end sampling 12:00 noon, March 9)
12:00 noon	Minimum expected time for dye released from Alachua Sink to reach Hornesby Spring (maximum hour estimated at 4:00 PM, March 8)
Monday, March 9	
1:30 AM	Minimum expected time for dye released from Split Rock Sink to reach Hornesby Spring via Alachua Sink (maximum hour estimated at 10:00 AM, March 9)
4:00 PM	End all sampling Collect all filters Disassemble all sampling equipment