Aloma Woods Outfall
Assessment Report
Seminole County, Florida
June 2010
Inwood consulting engineers

Aloma Woods Outfall Assessment Report

Prepared for:

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Seminole County
Public Works Department
Engineering Division

June 2010

Prepared by:

Inwood consulting engineers

Aloma Woods Outfall Assessment Report

PREPARED FOR:

Department of Public Works
Engineering Division
Seminole County, Florida

June 2010

Prepared by:

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June 28, 2010

SEM-032-04

Roland Raymundo, PE, CFM - Principal Engineer
Seminole County Public Works Engineering Division
520 West Lake Mary Boulevard, Suite 200
Sanford, Florida 32773-7424

Re: Final Outfall Assessment Report for
Aloma Woods Outfall Assessment Project
Seminole County, Florida

Dear Mr. Raymundo:

Inwood Consulting Engineers, Inc. (Inwood) is pleased to submit two (2) copies of the Final Report for the above referenced project. Inwood appreciates the opportunity to provide its services to Seminole County. If you have any questions regarding the attached, please contact us at 407-971-8850.

Very truly yours,

INWOOD CONSULTING ENGINEERS, INC.

David G. Coleman

David G. Coleman, PE
Project Manager

Attachments:

Two (2) Bound Copies of Final Aloma Woods Outfall Assessment Report

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DVD

Assessment Report and Backup Data

1.0 INTRODUCTION AND BACKGROUND

1.0 INTRODUCTION

This report presents the results of the Aloma Woods outfall assessment to address flooding problems in the contributing areas of the project. Inwood Consulting Engineers, Inc. (Inwood) was tasked by Seminole County Public Works Engineering Division to conduct this project.

1.2 SITE LOCATION

The project area is comprised of approximately 740 acres and is located in south central Seminole County, within Sections 20, 29, 31 and 32 of Township 21 South, Range 31 East in the Howell Creek Watershed. The project is located within the jurisdiction of the St. Johns River Water Management District and within County Commission District 1. See Figure 1-1 – Project Vicinity Map and Figure 1-2 – Site Location Map.

1.3 PROBLEM DESCRIPTION

Flooding problems have been observed at several locations along the Aloma Woods outfall canal in the past starting from the Wentworth Estates subdivision to the culvert under State Road 426, then west of State Road 426 through the Eagle Pass Nursery, and along West Chapman Road to State Road 417, then to the terminus at Bear Gully Creek. The flooding has been apparently caused by insufficient capacity of several culverts along the Aloma Woods outfall canal as well as maintenance issues in the canal. In addition, ponding has been observed along Chapman Road west of State Road 426 due to poor grading and a lack of drainage inlets.

A previous study by Professional Engineering Consultants, Inc. (PEC) entitled *Aloma Woods Drainage Basin Study,* July 2004 evaluated several alternatives to improve the conveyance capacity of the outfall canal. However, due to the limited scope of the study, the study recommended that the impacts of increased flow rates to the canal downstream of Eagle Pass Road be evaluated prior to recommending any improvements to the upstream system.

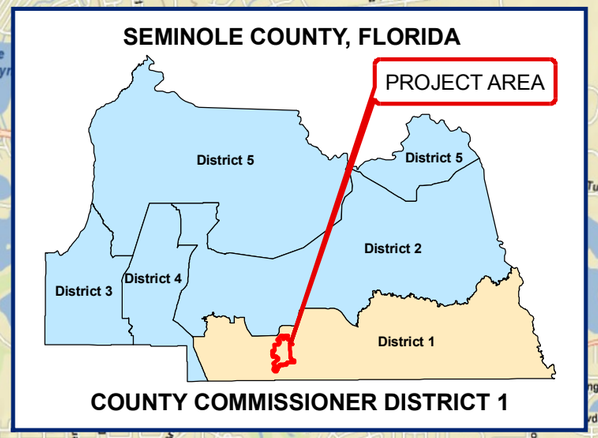
1.4 PROJECT GOALS

The goal of this project is to develop cost-effective recommendations to relieve flooding problems along the Aloma Woods outfall canal. Moreover, the project will identify water quality deficiencies and areas where erosion and sedimentation warrant action.

1.5 REPORT ORGANIZATION

The report is organized into the following sections:

- **Section 1 – Introduction:** provides an overview of the project location, problem description, and goals (this section);
- **Section 2 – Data Collection and Site Characteristics:** provides a summary of the various data collected and field investigation efforts to support this assessment;
- **Section 3 – Preliminary Ecological Assessment:** provides a summary of field observations and data review pertaining to wetlands and sensitive species;
- **Section 4 – Existing Conditions:** provides a summary of the problem areas, the existing conditions modeling efforts, and evaluation of model results.
- **Section 5 – Proposed Improvements:** conceptualizes corrective actions for improvements along the outfall canal;
- **Section 6 – Water Quality Evaluation:** provides a summary of the water quality regulations and evaluation of existing BMPs in the project area;
- **Section 7 – Summary and Recommendations:** provides specific recommendations for prioritized implementation of recommended projects.



SEMINOLE COUNTY
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0 2,000 4,000 Feet

LEGEND

PROJECT AREA

COUNTY BOUNDARY

DATA SOURCES:
COMMISIONER DISTRICTS: SEMINOLE COUNTY, 2008
BACKGROUND: STREET MAP USA, 2009

FIGURE 1-1

PROJECT VICINITY MAP

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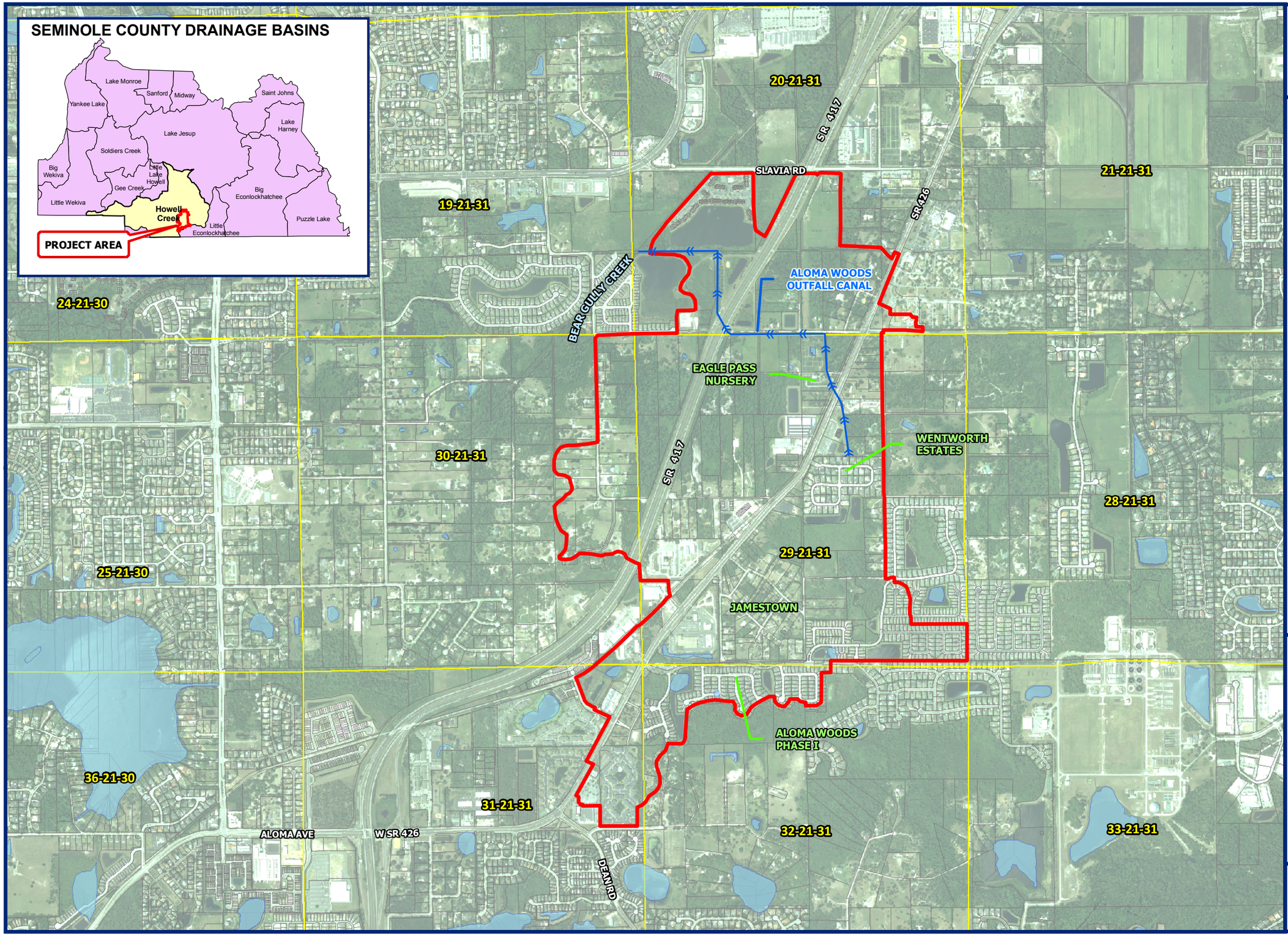

DATA SOURCES:
AERIAL IMAGERY: SEMINOLE COUNTY, 2008
DRAINAGE BASINS: SEMINOLE COUNTY, 2008
SECTION-TOWNSHIP-RANGE: SEMINOLE COUNTY, 2008
PARCELS: SEMINOLE COUNTY, 2009
STREETS: SEMINOLE COUNTY, 2004

FIGURE 1-2

SITE LOCATION MAP

Aloma Woods Outfall Assessment

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2.0 DATA COLLECTION AND SITE CHARACTERISTICS

2.1 PREVIOUS STUDIES

The following documents were used to gain better understanding of the drainage problems within the study area, to evaluate the drainage infrastructure data already available and to identify data that still needed to be gathered:

- **Aloma Woods Drainage Basin Study, by PEC, July 2004 –** After substantial flooding in the Aloma Woods Drainage Basin due to Tropical Storm "Gabrielle" in September of 2001, Seminole County requested a detailed and comprehensive analysis to evaluate the causes of the flooding problem. This study performed hydrologic and hydraulic analysis of the existing drainage infrastructure to evaluate the causes of the identified flooding problems. Topographic survey of critical drainage features was collected for the study in various areas from Aloma Woods subdivision along the outfall to SR 426 by Southeastern Surveying & Mapping Corp. (SSMC). Much of the data from the PEC study model was relied upon for the current study model. This study also involved the development of improvement alternatives to relieve flooding in the study area. The alternatives included evaluation of the impacts of a reduced tailwater condition north of Eagle Pass Road, regrading the canal north of Wentworth Estates, replacing the undersized culverts in the Eagle Pass Nursery with larger culverts to match the culvert under SR 426, and conveying additional discharge to the Little Econ River Basin. Due to likely increases in flow rates to downstream areas caused by improving the drainage infrastructure between Wentworth Estates and Eagle Pass Road, PEC recommended that the drainage basin between Eagle Pass Road and SR 417 be evaluated in more detail before recommending improvements in the study area. PEC also recommended evaluation of increasing discharge from Phase 1 of Aloma Woods to the Little Econ River watershed to improve flood protection in the vicinity of Aloma Woods.
- **Howell Creek Basin Watershed Management Plan, CDM, 2007 - 2009** – The study includes three parts and addresses the Howell Creek Basin in both Orange and Seminole Counties. Part I (completed in May 2007) was a system inventory which included additional field investigation and survey to build upon what had been developed in the past. It included an inventory of existing problem areas, physical characteristics, hydrological data, drainage structures data, water quality data, and wetlands. A preliminary model schematic was also developed based on collected data. Part II (completed in January 2008 and updated in September 2009) was an engineering analysis which included design storm event modeling using ICPR of the primary drainage systems in the basin to establish level of service of primary drainage facilities and estimate floodplains. The model's level of detail was regional in nature, building on the previous SJRWMD and County modeling efforts with some additional refinements based on newly collected survey data of key drainage structures and creek cross-sections. The model utilized data from the PEC study in the Aloma Woods area. Some cross sections of the outfall canal and pipe details were collected for CDM by SSMC for the study north of Eagle Pass Road, along West Chapman Road, and west of SR 417. Part III (not yet completed) will address recommended improvements alternatives to address identified deficiencies in the basin.

- **Flood Insurance Study (FIS), Seminole County, FEMA, 2007 –** The FIS includes updated flood risk data based on detailed study methods for several flooding sources within the incorporated and unincorporated areas of Seminole County. The FIS also included updated floodplain delineations based on updated topographic data in several areas in the County. Data from the FIS was referenced for use in the current study to determine the extent of 100-year floodplain in the study area.

Scanned copies of the above reference documents are included on the DVD with this report.

2.2 PLANS AND PERMIT REVIEW

The documents referenced below were reviewed and found to contain drainage related data such as stormwater infrastructure, drainage conveyance, storage, and subbasin boundary data that were utilized in the hydrologic and hydraulic model of this study.

- **State Road 417 Construction Plans, DRMP, 1990** – The plans obtained from the Florida Department of Transportation (FDOT), depict the drainage infrastructure along the roadway, the roadway ponds, and the culvert crossing at the Aloma Woods outfall canal at the end of Chapman Road.
- **State Road 426 Construction Plans, Consul-Tech Engineering, Inc., 1998 –** The plans obtained from the FDOT depict the drainage infrastructure along the roadway, the roadway ponds, and the culvert crossing at the Aloma Woods outfall canal south of Eagle Pass Road.
- **Environmental Resource Permit (ERP) documents obtained from SJRWMD E-Permitting website –** Information for several developments within the study area were obtained. Many of the permits downloaded contained construction plans data that was incorporated into the study. A complete listing of the plans and ERPs reviewed is included in the references section of the report.

The above referenced data was considered reasonably accurate for use in the study hydrologic and hydraulic model. The size, location, and configuration of many structures were verified in the field where accessible to confirm the accuracy of the data, however, no additional vertical elevation data was collected for verification. The vertical datum of these documents was assumed to be NGVD29. Refer to the DVD included with this report for scanned copies of the above referenced documents.

2.3 TOPOGRAPHIC SURVEY

SSMC performed a drainage inventory survey of the existing primary drainage system within selected portions of Aloma Woods, Jamestown and the wetland south of Wentworth Estates for the *Aloma Woods Drainage Basin Study* by PEC in 2004. The survey notes contain invert elevations, approximate pipe lengths, pipe diameter and material, manhole top elevation, edge of pavement elevation at the opening of curb inlet, control structure details, and ditch details. SSMC also performed elevation survey of finished floors for flood prone garages and structures. The survey was referenced to the NGVD29 vertical datum. A copy of the survey notes can be found in the PEC study report included on the DVD included with this report.

SSMC surveyed cross-sections and collected culvert details along the outfall canal north of Eagle Pass Road, along West Chapman Road, and north of SR 417 for the ongoing *Howell Creek Basin*

Watershed Management Plan by CDM. The survey was referenced to the NGVD 29 vertical datum. The survey data is included on the DVD included with this report.

Additional topographic survey data were collected by SSMC in 2009 for this study. The survey included stormwater infrastructure, roadways, channel cross-sections, and wetland cross-sections from north of the Aloma Woods subdivision northwest to the Bear Gully Creek. Stormwater infrastructure data was collected mostly in areas where data from plans or permits was not available. Also, the majority of the channel and wetland cross-sections were collected along or near the main outfall canal. The types of data collected by the survey included the following:

1. Culvert and other drainage structures data including count, dimensions, geometry type, material, invert elevations, end treatments, condition and depth of siltation.
2. Channel and floodplain cross-sections.
3. Locate ground elevation, water surface elevation and seasonal high water elevations in wetlands marked by Inwood.

The survey was referenced to the NGVD29 vertical datum. The NGVD29 vertical datum was chosen because all pre-existing survey, construction plans, and topographic data are referenced to this datum. The survey data is included on the DVD included with this report, which includes the survey plan plots and field notes of the drainage structures detailed.

The drainage infrastructure is shown on Exhibit 1. The surveyed profile and cross-sections of the outfall canal are shown on Exhibit 2.

2.4 FIELD INVESTIGATION

Field investigation was performed by Inwood personnel on August 22 and November 13, 2008 and May 21, September 10 and 30, and October 14, 2009 to inspect problems areas, to obtain additional stormwater infrastructure data not available from construction plans or from topographical survey, to confirm the existence and configuration of key drainage structures and to confirm subbasin boundaries. Pertinent data obtained in the field were incorporated into the infrastructure mapping and in the hydrologic and hydraulic model.

A preliminary ecological assessment of the project area was also conducted on June 3, 2009. The discussions and results of the ecological assessment are in Section 3 of this report.

2.5 SITE CHARACTERISITICS

Site characteristics data were collected for this project from various sources. The site characteristics are shown on the following figures:

- Exhibit E-1 – Infrastructure Map: The infrastructure data were used to gain understanding of general drainage patterns and the configuration of the stormwater collection and conveyance systems in the study area.
- Figure 2-1 – Subdivisions Map: This was used to map subdivisions in the vicinity.
- Figure 2-2 – SJRWMD Permits Map: The data was used to locate the ERPs within or near the project area.
- Figure 2-3 - Soils Map: Soils data is generally used to evaluate the surface infiltration potential of stormwater runoff based on the hydrological classification. Soils data are used in calculating the runoff curve numbers of the subbasins in the hydrologic model.

- Figure 2-4 - Land Use Map: This data provides an indication of relative imperviousness of various land uses which affect stormwater runoff volume, and also wetland areas where surface hydrology is a concern. Land use data were also used in calculating runoff curve numbers of the subbasins in the hydrologic model.
- Figure 2-5 - FEMA Floodplains Map: The FEMA floodplains data were used to determine the FEMA designated flood hazard zone of areas within the study area.
- Figure 2-6 – USGS Topographic Map: This data were used to gain an understanding of the general topography in the project vicinity
- Figure 2-7 – 1' Digital Topographic Map: This data was used to evaluate drainage patterns in more detail, to determine subbasin delineation boundaries, time of concentration flow paths, node stage-areas, and irregular cross-section data for overland weirs.

A description of outfall canal system and ownership is included on Table 2-1 below. For a depiction of the outfall canal system refer to Figure 2-8 and Exhibits 1 and 2. Also refer to Figure 2-8 for identification of the existing drainage easements, right of way, and private ownership along the outfall canal.

Table 2-1 – Outfall System Description and Ownership Information

SECTION	OUTFALL SYSTEM DESCRIPTION	OUTFALL SYSTEM OWNERSHIP DESCRIPTION
1 - From Wentworth Estates to SR 426	The outfall canal begins at the downstream end of a 54" stormsewer pipe that discharges from Wentworth Estates. The canal then flows north to a 5' x 4' box culvert under SR 426. The canal in this section receives runoff from the 54" stormsewer pipe to the south, a commercial property detention pond to the west, overtopping from wetlands on private property to the east, and inflow from a stormsewer pipe to the east.	A 15' wide County drainage easement exists on the western portion of the canal from the north side of Wentworth Estates to ~140' south of SR 426. The eastern portion of the canal in this area is within private property. The downstream ~140' of the canal up to SR 426 is within private property.
2 - From SR 426 to Chapman Road	After discharging from SR 426 the outfall canal flows north through 2 - 36" CMP culverts in series in the Eagle Pass Nursery and then through a 30" CMP culvert under Eagle Pass Road. From Eagle Pass Road the canal flows north along the east side of the Eagle Pass Nursery to a 36" CMP culvert under a driveway on the south side of Chapman Road. The canal in this section receives runoff via sheet flow from the private properties on the east and west sides of the canal. An FDOT detention pond also discharges through a control structure into the canal on the north side of Eagle Pass Road.	The canal in this section flows through the Eagle Pass Nursery which is entirely within private property.
3 - Along Chapman Road to SR 417	After discharging from the driveway culvert the canal flows west along the south side of Chapman Road to a 14.7' X 5.6' Arch CMP culvert under Chapman Road. The canal then flows northwest to a 2 X 84" CMP culvert under SR 417. The canal in this section receives runoff via sheet flow from Chapman Road to the north, sheet and channel flow from private properties to the south, pipe flow from a culvert under Chapman Road to the north, and a control structure from an FDOT detention pond on the north side of Chapman Road.	The northern half of the canal in this section appears to be within the Chapman Road right of way. The southern half of the canal in this section appears to within private property.
4 - From SR 417 to Bear Gully Creek	After discharging from SR 417 the canal flows north along the west side of an FDOT pond to the south side of a large borrow pit. The canal then flows west between two large borrow pits to the confluence with Bear Gully Creek. The canal in this section receives runoff via sheet flow from private property to the west, overtopping from a large borrow pit to the north, overtopping from a commercial pond to the west, and a control structure from an FDOT detention pond to the east.	The canal in this section is within the SR 417 right of way until it flows to the south side of a large borrow pit. After the canal turns to the west the canal appears to be partially within the SR 417 right of way on it's south side and partially within private property on it's north side.

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0 600 1,200
Feet

LEGEND

PROJECT AREA

SUBDIVISIONS

- ADRIADITCO ACRES
- ALOMA BEND
- ALOMA SQUARE
- ALOMA WOODS
- ALOMA WOODS ESTATES
- BEAR STONE
- CEDAR GLEN OF ALOMA WOODS
- HEAD AT THE ENCLAVE CYPRESS
- HOMETOWN ESTATES
- JAMES BENJAMIN
- JAMESTOWN
- KENMURE
- LOMA VISTA
- MIKLER
- MIKLER ROAD ESTATES
- OVIEDO CROSSING PH 1-B
- REGENCY ESTATES
- SLAVIA COLONY
- SLAVIA FARMS
- WENTWORTH ESTATES

DATA SOURCES:
DEVELOPMENTS AND SUBDIVISIONS:SEMINOLE COUNTY, 2008
AERIAL IMAGERY: SEMINOLE COUNTY, 2008
STREETS: SEMINOLE COUNTY, 2008

FIGURE 2-1

SUBDIVISIONS MAP

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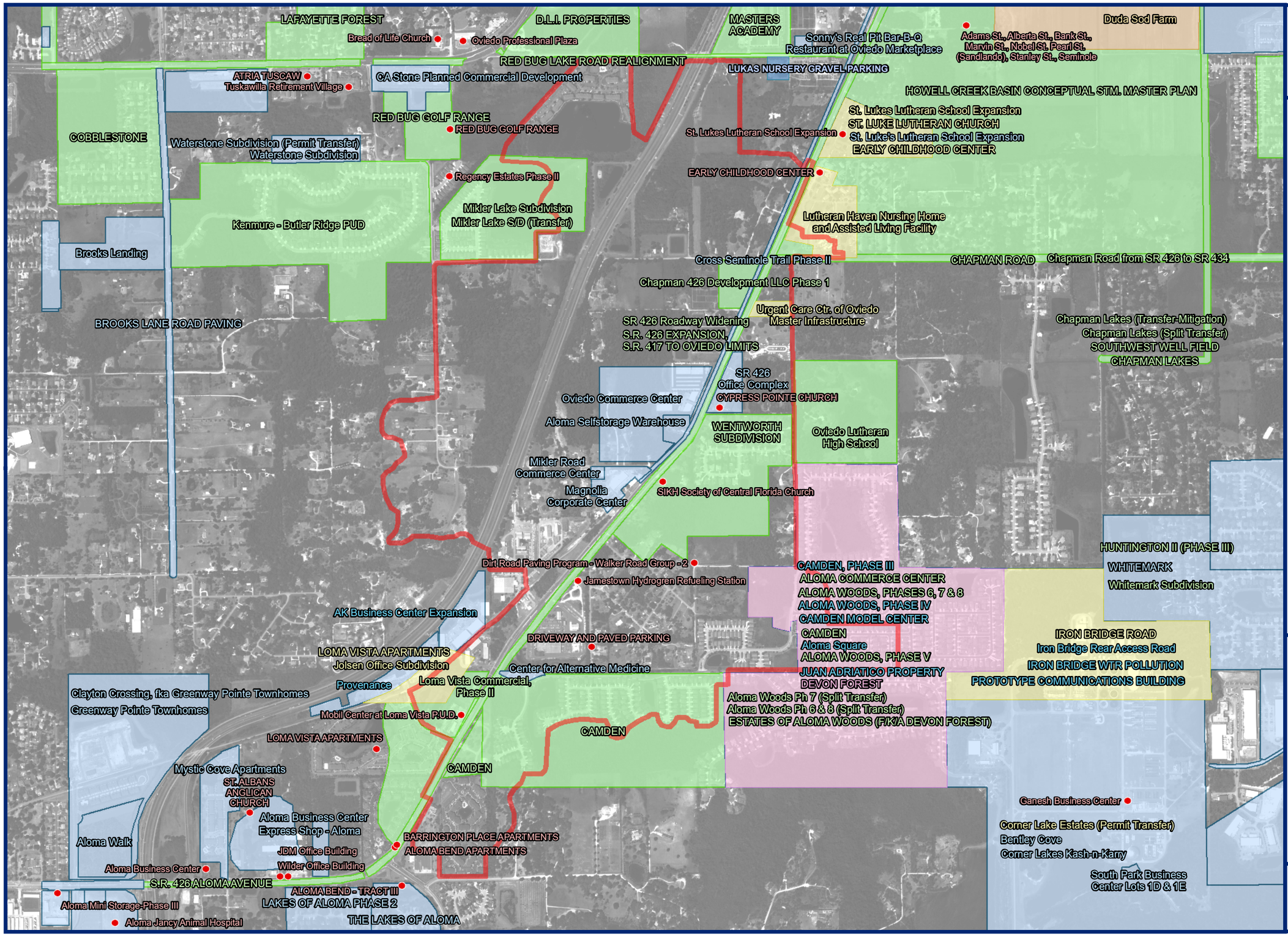

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 600 1,200
Feet

LEGEND

- PROJECT AREA

ERP

- INDIVIDUAL
- STANDARD GENERAL
- AGRICULTURAL GENERAL
- SW STANDARD GENERAL
- FORMAL WETLAND DETERM
- WRM INDIVIDUAL
- STORMWATER PERMIT

DATA SOURCES:
PERMITS: SJRWMD, 2009
STREETS:SEMINOLE COUNTY,2008
AERIAL IMAGERY:SEMINOLE COUNTY,2008

FIGURE 2-2

SJRWMD PERMITS MAP

Aloma Woods Outfall Assessment

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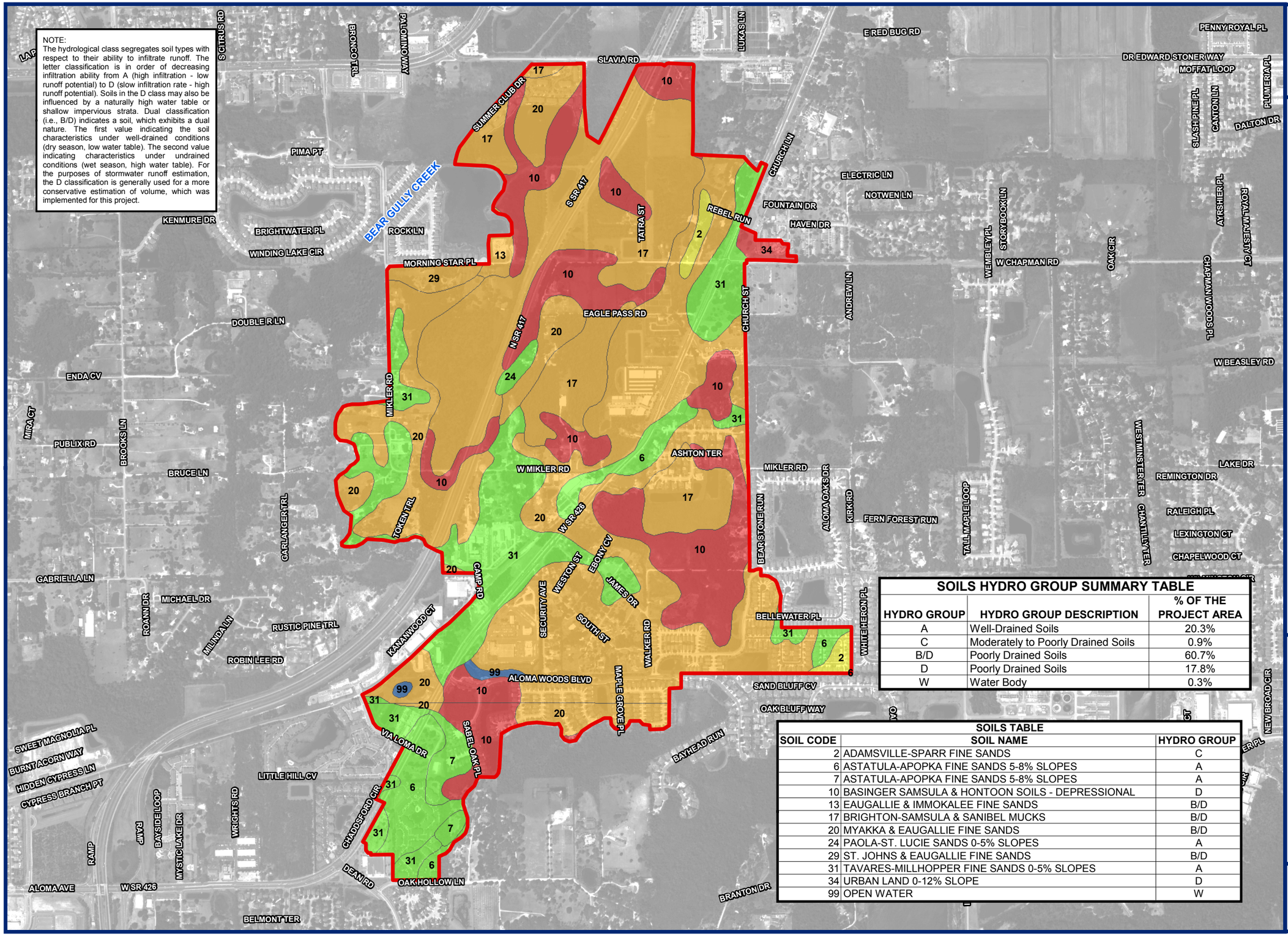
NOTE:
The hydrological class segregates soil types with respect to their ability to infiltrate runoff. The letter classification is in order of decreasing infiltration ability from A (high infiltration - low runoff potential) to D (slow infiltration rate - high runoff potential). Soils in the D class may also be influenced by a naturally high water table or shallow impervious strata. Dual classification (i.e., B/D) indicates a soil, which exhibits a dual nature. The first value indicating the soil characteristics under well-drained conditions (dry season, low water table). The second value indicating characteristics under undrained conditions (wet season, high water table). For the purposes of stormwater runoff estimation, the D classification is generally used for a more conservative estimation of volume, which was implemented for this project.



LEGEND

- PROJECT AREA

SOILS HYDROLOGIC GROUP

- A
- C
- B/D
- D
- WATER

DATA SOURCES:
SOILS: SJRWMD, 2008
STREETS:SEMINOLE COUNTY,2008
AERIALS:SEMINOLE COUNTY,2008

SOILS HYDRO GROUP SUMMARY TABLE

HYDRO GROUP	HYDRO GROUP DESCRIPTION	% OF THE PROJECT AREA
A	Well-Drained Soils	20.3%
C	Moderately to Poorly Drained Soils	0.9%
B/D	Poorly Drained Soils	60.7%
D	Poorly Drained Soils	17.8%
W	Water Body	0.3%

SOILS TABLE

SOIL CODE	SOIL NAME	HYDRO GROUP
2	ADAMSVILLE-SPARR FINE SANDS	C
6	ASTATULA-APOPKA FINE SANDS 5-8% SLOPES	A
7	ASTATULA-APOPKA FINE SANDS 5-8% SLOPES	A
10	BASINGER SAMSULA & HONTOON SOILS - DEPRESSIONAL	D
13	EAUGALLIE & IMMOKALEE FINE SANDS	B/D
17	BRIGHTON-SAMSULA & SANIBEL MUCKS	B/D
20	MYAKKA & EAUGALLIE FINE SANDS	B/D
24	PAOLA-ST. LUCIE SANDS 0-5% SLOPES	A
29	ST. JOHNS & EAUGALLIE FINE SANDS	B/D
31	TAVARES-MILLHOPPER FINE SANDS 0-5% SLOPES	A
34	URBAN LAND 0-12% SLOPE	D
99	OPEN WATER	W

FIGURE 2-3

SOILS MAP

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NOTES:
The land uses are based on data from the SJRWMD dated 2004 with site specific modifications based on the 2008 aerials and updated parcels data to reflect current conditions. The data are classified in accordance with the FDOT's Florida Land Use, Cover and Forms Classification System (FLUCFCS).

LANDUSE BASED CURVE NUMBER REFERENCE TABLE

LAND USE CODE	LAND USE DESCRIPTION	% OF THE PROJECT AREA	DESIGN CURVE NUMBERS					
			A	B	C	D	B/D	WATER
1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	6.81%	51	68	79	84	84	100
1190	LOW DENSITY UNDER CONSTRUCTION	7.84%	51	68	79	84	84	100
1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	8.93%	57	72	81	86	86	100
1300	RESIDENTIAL HIGH DENSITY	14.87%	77	85	90	92	92	100
1400	COMMERCIAL AND SERVICES	8.45%	89	92	94	95	95	100
1700	INSTITUTIONAL	0.23%	81	88	91	93	93	100
1900	OPEN LAND	1.77%	44	65	77	82	82	100
1920	INACTIVE DEVELOPMENT	3.70%	44	65	77	82	82	100
2110	IMPROVED PASTURES	1.71%	44	65	77	82	82	100
2120	UNIMPROVED PASTURES	1.82%	44	65	77	82	82	100
2130	WOODLAND PASTURE	0.04%	44	65	77	82	82	100
2430	ORNAMENTAL NURSERY	0.69%	59	74	82	86	86	100
3100	HERBACEOUS RANGELAND	0.37%	39	61	74	80	80	100
3200	SHRUB AND BRUSH RANGELAND	0.53%	43	65	76	82	82	100
3300	MIXED RANGELAND	0.87%	49	69	79	84	84	100
4000	UPLAND FOREST	1.07%	36	60	73	79	79	100
4110	PINE FLATWOODS	0.16%	36	60	73	79	79	100
4340	HARDWOOD CONIFER MIXED	4.17%	36	60	73	79	79	100
5100	STREAMS AND WATERWAYS	0.24%	100	100	100	100	100	100
5300	RESERVOIRS	5.86%	100	100	100	100	100	100
6170	MIXED WETLAND HARDWOODS	10.17%	68	79	86	89	89	100
6250	HYDRIC PINE FLATWOODS	0.09%	68	79	86	89	89	100
6300	WETLAND FORESTED MIXED	2.50%	68	79	86	89	89	100
6410	FRESHWATER MARSHES	0.47%	100	100	100	100	100	100
6430	WET PRAIRIES	0.83%	98	98	98	98	98	100
6440	EMERGENT AQUATIC VEGETATION	0.06%	98	98	98	98	98	100
6460	TREELESS HYDRIC SAVANNA	6.26%	98	98	98	98	98	100
8140	ROADS AND HIGHWAYS	8.35%	83	89	92	93	93	100
8310	ELECTRIC POWER FACILITIES	0.35%	68	79	86	89	89	100
8320	ELECTRICAL POWER TRANSMISSION LINE	0.82%	68	79	86	89	89	100

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

0 600 1,200 Feet

LEGEND

PROJECT AREA

LANDUSE

- RESIDENTIAL LOW DENSITY
- RESIDENTIAL MEDIUM DENSITY
- RESIDENTIAL HIGH DENSITY
- COMMERCIAL
- INSTITUTIONAL
- TRANSPORTATION
- AGRICULTURAL
- OPEN LAND
- RANGELAND
- UPLAND FORESTS
- UTILITIES
- WATER
- WETLANDS

DATA SOURCES:
LANDUSE: SJRWMD, 2004
STREETS:SEMINOLE COUNTY,2008

FIGURE 2-4

LANDUSE MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*
- * Referenced to the North American Vertical Datum of 1988 (NAVD 88)
- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1275,000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 6000000 FT — 5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 901), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 0190F

FIRM

FLOOD INSURANCE RATE MAP

SEMINOLE COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 190 OF 330

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

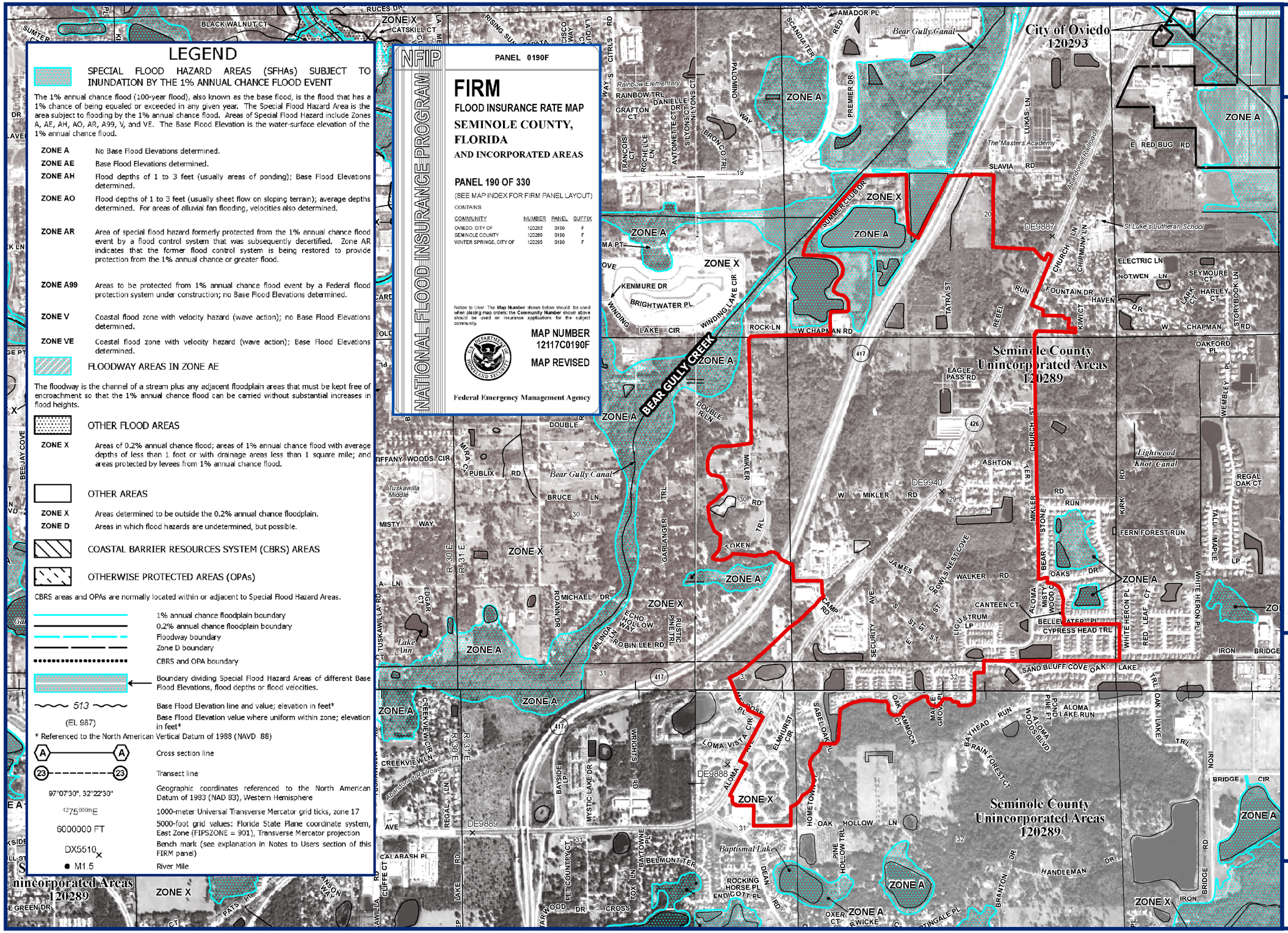
COMMUNITY	NUMBER	PANEL	SUFFIX
OVIEDO, CITY OF	120293	0190	F
SEMINOLE COUNTY	120289	0190	F
WINTER SPRINGS, CITY OF	120295	0190	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12117C0190F

MAP REVISED

Federal Emergency Management Agency



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

0 750 1,500 Feet

LEGEND

PROJECT AREA

DATA SOURCES:
FLOODPLAINS: FEMA (SEE TITLE BLOCK ON MAP)

NOTE THAT ELEVATIONS REFERENCED IN NAVD 1988 DATUM.
CONVERSION FOR PROJECT AREA IS NGVD - 1.06' = NAVD 1988.

FIGURE 2-5

FEMA FLOODPLAINS MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

0 750 1,500
Feet

LEGEND

PROJECT AREA

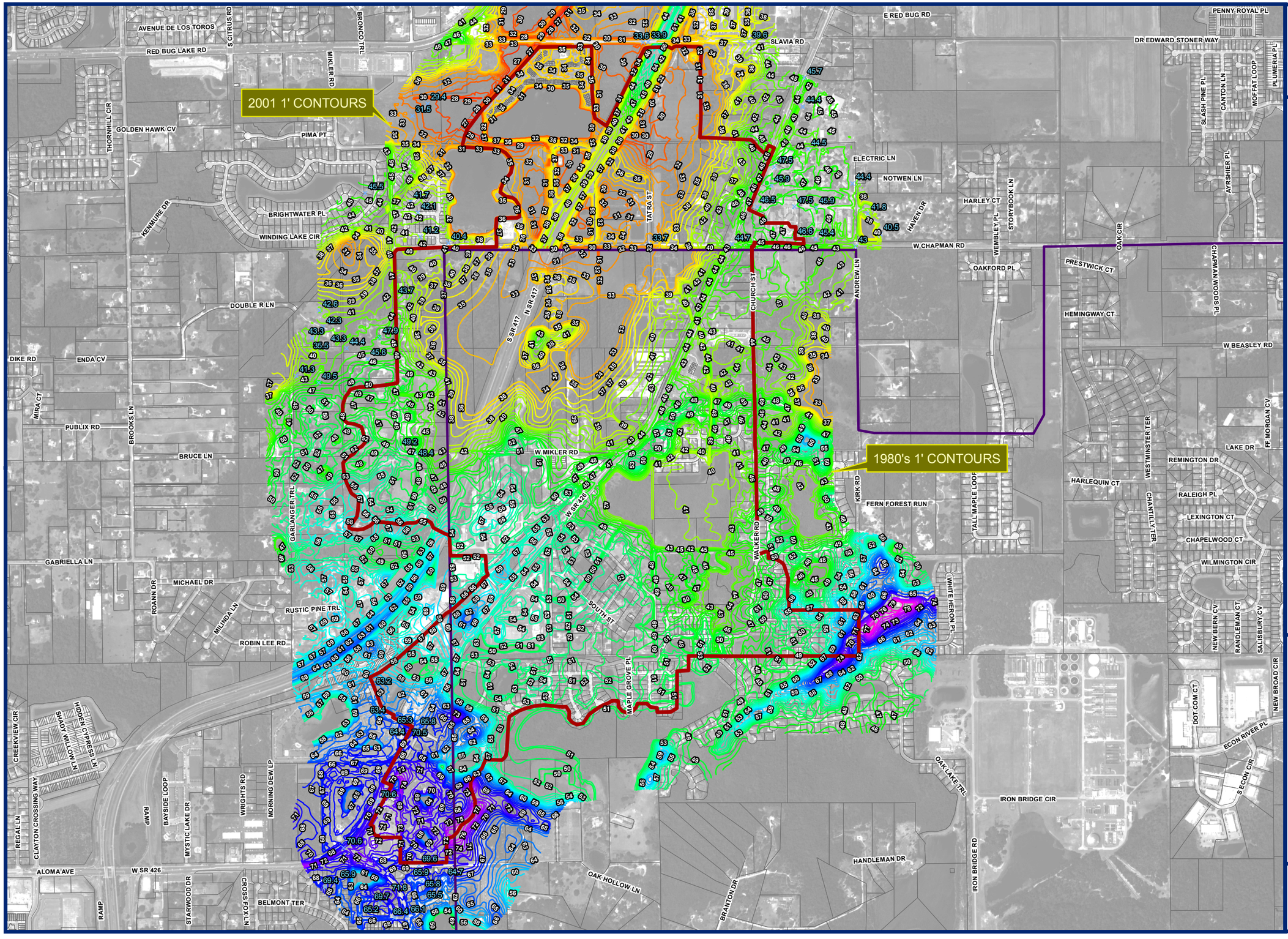
DATA SOURCES:
USGS: TOPOGRAPHIC 7.5 MINUTE QUADRANGLE MAP,CASSELBERRY,
OVIEDO, OVIEDO SW AND ORLANDO EAST,
1980 (PHOTO REVISED 1997)

FIGURE 2-6

USGS TOPOGRAPHIC MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

0 600 1,200
Feet

LEGEND

- PROJECT AREA
- PARCELS
- CONTOURS BOUNDARY
- SPOT ELEVATIONS

1' CONTOURS

- 30
- 35
- 40
- 45
- 50
- 55
- 60
- 65
- 70
- 75
- 80

NOTE: CONTOURS AND SPOT ELEVATIONS REFERENCED TO THE NGVD29 VERTICAL DATUM.

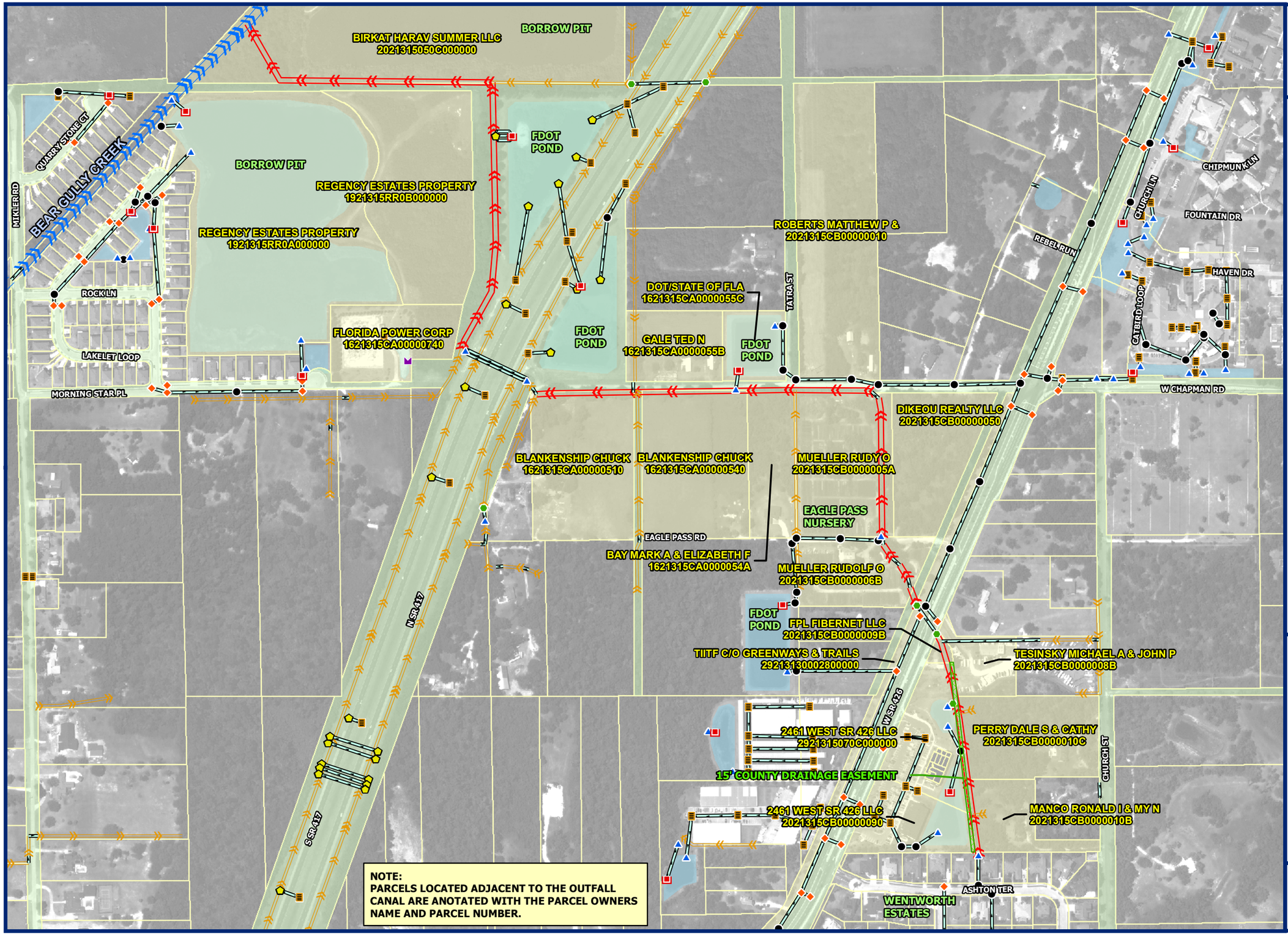
DATA SOURCES:
CONTOURS AND SPOT ELEVATIONS:SJRWMD, DATE VARIES SEE DETAILS ON MAP
STREETS:SEMINOLE COUNTY,2008
AERIALS:SEMINOLE COUNTY,2008

FIGURE 2-7

1' DIGITAL TOPOGRAPHIC CONTOUR MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers



NOTE:
PARCELS LOCATED ADJACENT TO THE OUTFALL CANAL ARE ANOTATED WITH THE PARCEL OWNERS NAME AND PARCEL NUMBER.

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

0 200 400 Feet

LEGEND

- PARCELS
- RIGHT OF WAY
- EXISTING EASEMENT
- PONDS
- CONTROL STRUCTURE
- CURB INLET
- DITCH BOTTOM INLET
- ENDWALL
- HEADWALL
- MANHOLE
- MITERED END SECTION
- WEIR STRUCTURE
- PIPES
- CHANNEL
- OUTFALL CANAL
- CREEK

DATA SOURCES:
AERIAL IMAGERY: SEMINOLE COUNTY, 2008
PARCELS: SEMINOLE COUNTY, 2009
STREETS: SEMINOLE COUNTY, 2004

FIGURE 2-8

OUTFALL CANAL OWNERSHIP INFORMATION MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

3.0 PRELIMINARY ECOLOGICAL ASSESSMENT

3.1 INTRODUCTION

Biologists from Inwood conducted an ecological assessment of the project area in order to determine the overall health of natural communities, their ability to provide habitat for wildlife in the area, the approximate jurisdictional extents of wetlands, evidence of habitat utilization by state and federally listed species, and any potential State and Federal permitting requirements associated with potential improvements measures. A Field review was conducted on June 3, 2009.

Wetlands within the project limits were reviewed by biologists from Inwood Consulting Engineers and the extents depicted in the report are based solely upon experience of Inwood staff and criteria set in the US Army Corps of Engineers Wetland Delineation Manual (1987) with the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (2008) and in accordance with Chapter 62-340.300 of the Florida Administrative Code. At the time of this report, none of the wetlands within the project area had been reviewed by St. Johns River Water Management District (SJRWMD) or US Army Corps of Engineers (ACOE) regulatory staff for jurisdictional extent and quality of habitat.

3.2 EXISTING ENVIRONMENTAL CHARACTERISTICS

3.2.1 Soils

According to the US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soils Conservation Service (SCS) SCS digital soils data, the proposed project location is comprised of ten soil types: Adamsville-Sparr Fine Sands; Astatula-Apopka Fine Sands, 5-8% slopes; Basinger, Samsula, and Hontoon Soils – Depressional; Euagallie and Immokalee Fine Sands; Brighton-Samsula and Sanibel Mucks; Myakka and Eugallie Fine Sands; Paola – St. Lucie Sands, 0-5% slopes; St. Johns and Eaugallie Fine Sands; Tavares-Millhopper Fine Sands, 0-5% slopes; and Urban Land, 0-12% slope. Please refer to Figure 2.3 (Soils Map) for the location and type of soils in the project area.

3.2.2 Existing Vegetative Communities and Land Use

Land use within the project area consists of both natural and developed areas. Land use categories were defined by the Florida Department of Transportation (FDOT) Florida Land Use Cover and Forms Classification System (FLUCFCS). Land uses within the project area include a mixture of residential, agricultural, commercial, and natural communities. Please refer to Figure 2-6 (Land Use Map) for the distribution of each FLUCFCS type within the area surrounding the proposed project site. The following is a general description of land use within the project area.

Residential (1100-1300)

Residential land uses range from high-density apartment housing developments to low-density rural areas characterized by a relatively small number of homes per acre. These land use type will typically offer little to no value for wildlife utilization and the probability of occurrence would be limited to individuals of a given species foraging for limited times. Wetlands located within these areas would have a low to medium value dependent on density and connection to larger systems.

Commercial (1400)

Commercial areas are associated with the distribution of products and/or services. These categories are composed of a large number of individual types of uses which often occur in complex mixtures. These land use type will typically offer little to no value for wildlife utilization and the probability of occurrence would be limited to individuals of a given species foraging for limited times. Wetlands located within these areas would have a low to medium value dependent on density and connection to larger systems.

Recreational (1890)

These land uses allow for active user-oriented recreation and can include parks, golf courses, fairgrounds and zoos. Some lands within this category have been designated as wildlife refuges or habitat restoration areas that do and will support large populations of a variety of protected species. The probability of wildlife utilization will vary based on specific parcel usage, in general, the more improvements on a parcel the lower the probability of wildlife occurrence. Wetlands within these areas would have medium to high value dependent on size and connection to larger systems.

Agriculture (2110-2430)

Agricultural lands are defined as those lands which are cultivated to produce food crops and livestock. Sub-categories of agricultural lands include cropland, pastureland, groves, nurseries, and confined feeding areas. Typically, agricultural lands have been altered physically; ditched, drained, and/or cleared of vegetation. These land use types will typically offer little value for wildlife utilization and the probability of occurrence would be limited to foraging. Wetlands located within these areas would have a low to medium value dependent on improvements to the property and connection to larger systems.

Rangeland (3100-3300)

This natural habitat consists of a vegetative community that is predominantly composed of grasses, forbs, herbs, and shrubs. Rangeland will include dry prairies (excludes wet prairies), shrub lands, palmetto prairies, and coastal scrub. Coastal scrub will contain woody species such as sand live oak and myrtle oak. These lands can be utilized for the grazing of livestock but do not require cultivation, irrigation or fertilization. The probability of wildlife utilization of these natural areas can be high if livestock are not present or present in low numbers. Wetlands located within these areas would have a low to medium value dependent on utilization by livestock and proximity to un-altered systems.

Water (5300)

Water areas are defined as those areas predominantly and persistently covered by water and includes features such as lakes, streams, rivers, sloughs, canals, ditches, and borrow pits. The probability of wildlife occurrence in and around water bodies is high.

Wetlands (6170-6460)

Wetlands are those areas where the water table is at, near, or above the land surface for a significant portion of most years. Wetlands are typically associated with topographic low lying areas. Wetlands found within the project area include mixed wetland hardwoods (6170), freshwater marsh (6410), wet prairie (6430), emergent

aquatic vegetation (6440), and treeless hydric savanna (6460). The probability of wildlife occurrence in and around wetlands is high.

Transportation and Utilities (8140-8320)

These facilities are used for the movement of people, goods, and distribution of utilities such as electricity and water. The transportation networks provide little or no habitat for protected species. Utility corridors have a high probability of utilization by wildlife as movement corridors due to regular maintenance within the easements.

3.3 WETLAND DESCRIPTION

3.3.1 Methodology

Prior to field reconnaissance, several site-specific mapping resources were reviewed. These included aerial photographs of the project area (2004 & 2008), USDA NRCS SCS; Soil Survey of Seminole County, Florida (1990), US Geologic Survey (USGS) 7.5 minute quadrangle maps; Oviedo (3810), and the US Fish and Wildlife Service (USFS) National Wetlands Inventory (NWI) maps.

Subsequent to the review of all available materials, a field review was conducted on June 3, 2009 in order to identify the presence of wetland vegetation, evidence of wetland hydrology, and hydric soil indicators within the project limits. The approximate jurisdictional limits of wetlands were delineated using the criteria set in the US Army Corps of Engineers Wetland Delineation Manual (1987) with the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (2008) and in accordance with Chapter 62-340.300 of the Florida Administrative Code.

3.3.2 SJRWMD Jurisdictional Determination and UMAM Assessment

The Florida Department of Environmental Protection (FDEP) and the four water management districts involved in the Environmental Resource Permitting (ERP) Program (SJRWMD, SFWMD, SWFWMD, and SRWMD) developed the Uniform Wetland Mitigation Assessment Method (Chapter 62-345 FAC). It has since been adopted by the ACOE. The intent of UMAM was to develop an objective and consistent process with which to determine the amount of mitigation needed to offset adverse impacts to wetlands and other surface waters, and to award and deduct mitigation bank credits. UMAM provides a standardized procedure for assessing the functions provided by wetlands and other surface waters, the amount that those functions are reduced by a proposed impact, and the amount of mitigation necessary to offset that loss.

The SJRWMD Basis of Review lists the potential functions of wetlands to include the following; fish and wildlife habitat, flood storage, nutrient cycling, detritus production, recreation, and water quality and quantity, with the recognition that not all types of wetlands and surface waters express all of these functions equally.

Location and Land Support – was evaluated based on the quality and quantity of natural habitats, both upland and wetland, within the geographic area including the proposed project. The location of the impact area was considered to the extent that fish and wildlife utilizing the wetland have the opportunity to access other habitats to perform needed life functions, and that the wetlands have off-site (downstream) water quality and water quantity benefits.

Water Environment – was evaluated based on water quantity and water quality, including: depth, flow, inundation or saturation, and duration. If hydroperiod has been altered via man made improvements, scores would be lowered. The type of surrounding land uses as well as any on-site treatment of surface water prior to discharge is considered.

Community Structure – consisting of the vegetation present (canopy and groundcover) is a measure of the health and appropriateness of the types of vegetation found within each wetland. The assessment was based on the cover, nesting potential, and appropriateness based on the vegetation types typically found within each habitat type. Appropriateness includes the presence and percentage of exotic and/or nuisance vegetation.

3.3.3 ACOE Jurisdictional Determination

Following recent decisions in two cases before the Supreme Court, *Rapanos v. U.S.* and *Carabell v. U.S.*, the ACOE has new guidance to determine if a wetland is considered "waters of the U.S." and thus, subject to federal jurisdiction under Section 404 of the Clean Water Act. These decisions provide two new analytical standards for determining whether water bodies that are not traditionally navigable waters (TNWs), including wetlands adjacent to those non-TNWs, are subject to CWA jurisdiction: 1) if the water body is relatively permanent, or if the water body is a wetland that directly abuts a relatively permanent water body (RPW), or 2) if a water body, in combination with all wetlands adjacent to that water body, has a significant nexus with TNWs. To assist in determining the federal jurisdiction of wetlands in light of the new guidance, the ACOE has developed new Jurisdictional Determination (JD) forms. Wetland within the project corridor are classified as either Relatively Permanent Waters (RPW), wetland directly abutting an RPW, or wetlands adjacent but not abutting an RPW; all of which ultimately flow into a TNW; the Atlantic Ocean. Therefore, all wetlands within the project limits will be considered federally jurisdictional under Section 404 of the CWA based upon the above-referenced guidelines as well as those published in the US Army Corps of Engineers Wetland Delineation Manual (1987) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (2008).

3.3.4 Wetland Vegetative Descriptions

Please refer Figure 3-1, the Wetland Location Map for the location and approximate extent of wetlands and high water marks within the project area. It should be noted that neither the SJRWMD nor the ACOE has reviewed or approved the jurisdictional extents of wetlands within the project limits. The following is a description of wetlands identified during the field review of the project area.

NOTE:
WETLAND LIMITS SHOWN BASED ON AERIAL INTERPRETATION WITH FIELD GROUND VERIFICATION. DOES NOT REPRESENT A JURISDICTIONAL SURVEY.

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

0 600 1,200
Feet

LEGEND

- PROJECT AREA
- HIGH WATER MARKS

WETLAND LIMITS

Wetland ID, UMAM Score

- Wetland 1, Low
- Wetland 2, Low
- Wetland 3, Low
- Wetland 4, Middle
- Wetland 5, Low
- Wetland 6, Middle
- Wetland 7, Low
- Wetland 8, Middle
- Wetland 9, Middle

DATA SOURCES:
WETLAND DELINEATIONS AND HIGH WATER MARKS: INWOOD CONSULTING ENGINEERS, 2009
STREETS:SEMINOLE COUNTY,2008
AERIALS:SEMINOLE COUNTY,2008

FIGURE 3-1

WETLAND LOCATION MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

Wetland 1

This forested system is located between Aloma Woods Boulevard and South Street. Observed canopy vegetation consisted of laurel oak (*Quercus laurifolia*), mimosa (*Albizia julibrissin*), chinaberry (*Melia azedarach*), and slash pine. Shrub and groundcover species included black cherry (*Prunus serotina*), cabbage palm (*Sabal palmetto*), air potato (*Dioscorea bulbifera*), lantana (*Lantana camara*), blackberry (*Rubus sp.*), wild grape (*Vitus sp.*), dog fennel (*Eupatorium capillifoilium*), bahiagrass (*Paspalum notatum*), brackenfern (*Pteridium aquilinum*), and broomsedge bluestem (*Andropogon virginicus*).

Exotic and nuisance vegetation are prevalent within this small system. Proximity to development and lack of upland buffers has reduced the overall health of this system as well as its wildlife habitat value. The proximity to a large swale to the south and the persistence of wetland vegetation are the only indicators of consistent hydrology observed in the field. This system would likely have an overall low UMAM score due to its size, lack of adequate upland buffers, and prevalence of exotic species.

Wetland 2

This forested system is located approximately fifty feet north of Wetland 1 on the north side of South Street. Observed canopy vegetation was similar to that observed in Wetland 1 and included laurel oak, chinaberry, mimosa, and camphor (*Cinnamomum camphora*). Shrub and groundcover species included cabbage palm, black cherry, Brazilian pepper (*Schinus terebinthifolia*), air potato, bahiagrass, dog fennel, wild grape, maidencane (*Panicum sp.*), and cogongrass (*Imperata cylindrical*).

As observed in Wetland 1, exotic and nuisance vegetation is prevalent within this small system. Proximity to development and lack of upland buffers has reduced the overall health of this system as well as its wildlife habitat value. The proximity to a large swale to the east and the persistence of wetland vegetation are the only indicators of consistent hydrology observed in the field. This system would likely have an overall low UMAM score due to its size, lack of adequate upland buffers, and prevalence of exotic species.

Wetland 3

This forested system, located between South Street and James Drive, is bisected by a ditch flowing south to north. Observed canopy vegetation consisted of laurel oak, chinaberry, camphor, mimosa, and red maple (*Acer rubrum*). Shrub and groundcover species included cabbage palm, black cherry, air potato, blackberry, cogongrass, dog fennel, brackenfern, and wild grape.

As observed in Wetlands 1 and 2, exotic and nuisance vegetation are prevalent within this small system. Proximity to development and lack of upland buffers has reduced the overall health of this system as well as its wildlife habitat value. The large swale bisecting this system and the persistence of wetland vegetation are the only indicators of consistent hydrology observed in the field. This system would likely have an overall low UMAM score due to its size and lack of adequate upland buffers.

Wetland 4

This is a large forested system that is bounded by Aloma Oaks Drive to the south, SR 426 to the west, residential development to the north, and Mikler Road/Aloma Oaks Drive to the east. It is bisected by an unpaved portion of Walker Road running east-west through the lower third of the system. Observations in the field indicate that water regularly overtops the road in this area.

Observed canopy vegetation included American elm (*Ulmus americana*), camphor, slash pine, chinaberry, red maple, and red bay (*Persea borbonia*). Shrub and groundcover species included cabbage palm, elderberry (*Sambucus nigra*), wax myrtle (*Myrica cerifera*), Carolina willow (*Salix caroliniana*), Virginia chain fern (*Woodwardia virginica*), blackberry, air potato, wild taro (*Colocasia esculenta*), broomsedge, Carolina redroot (*lachnanthes caroliana*), royal fern (*Osmunda regalis*), cinnamon fern (*Osmunda cinnamomea*), and greenbriar (*Smilax sp.*).

While exotic and nuisance vegetation was observed along the edges of the system, the overall health appeared to be good. Vegetation within the interior was made up of primarily native species with well-defined canopy, mid-story, and herbaceous layers. There are several ditches flowing into the system from the south, but it also appeared that a large amount of the hydrology is maintained via overland flow.

High water mark 1 located approximately 150 feet south of the north edge of Wetland 4.

Three high water marks were set in the field using biological indicators and staining on the trunks of camphor trees on the north side of the system. This system would likely have a middle-range score due to its large size and sufficient hydrology. However, invasion by exotic species and lack of upland buffers will reduce its overall value.

Wetland 5

This forested system is located on the south side of a powerline easement west of Church Street. Observed canopy vegetation included bald cypress (*Taxodium distichum*), sweetgum (*Liquidambar styraciflua*), red maple, and red bay. Shrub and groundcover species included cabbage palm, wax myrtle, Virginia chain fern, spike rush (*Eleocharis sp.*), Carolina redroot, gallberry (*Ilex glabra*), dog fennel, maidencane, elderberry, brackenfern, and cattail (*Typha sp.*).

High water mark 2 located approximately 15 feet south of the northern edge of Wetland 5.

Three high water marks were set in the field at approximately six inches above the ground surface. This system appears to be adequately hydrated with the majority of exotic and nuisance vegetation occurring

along the edges and the area maintained within the powerline easement. This system would likely have an overall low UMAM score due to its size, lack of adequate upland buffers, and proximity to developed areas.

Wetland 6

This large forested system is located on the west side of SR 426 and is bounded to the south by Mikler Road, to the west by SR 417, and to the north by Eagle Pass Road. This system has a shallow ditch on the north side flowing into a culvert underneath Eagle Pass Road and on to Wetland 7. Staining and other evidence of pooled water indicate that surface flow also occurs within the system from south to north.

High water mark 9 located approximately 15 feet south of the northern edge of Wetland 6.

Observed canopy vegetation included bald cypress, laurel oak, sweetgum, red maple, red bay, and camphor. Shrub and groundcover species include cabbage palm, wax myrtle, Carolina willow, Virginia chain fern, greenbriar, blackberry, broomsedge bluestem, and wild grape.

Three high water marks were set in the field on the north side of the system approximately fifteen feet south of Eagle Pass Road on the west side of the small ditch. These marks appeared to be at approximately 5 inches above the existing ground surface. Three additional high water marks were set on the south side of the system on the north side of Mikler Road. These marks were set approximately 3-4 inches from the ground surface on both sides of the shallow ditch that flows south to north through the system. Vegetation diversity and abundance, as well as direct observation of existing hydrology, indicate that this system is adequately hydrated. This system would likely have a middle-range score due to its large size and sufficient hydrology. However, invasion by exotic species and lack of upland buffers will reduce its overall value.

Wetland 7

This herbaceous system is comprised primarily of improved pasture between Eagle Pass Road and Chapman Road to the south and north and between SR 426 and SR 417 to the east and west. Observed vegetation consisted primarily of brackenfern, dog fennel, broomsedge bluestem, and other water-tolerant grasses and sedges.

This wetland has been cleared and is now used as a pasture. The most prominent feature is the ditch flowing south to north taking flow via the culvert underneath Eagle Pass Road. Ditches carry water from south to north and outfall into a larger swale on the south side of Chapman Road. Adequate hydrology is lacking due to the installation of the ditches used to drain the wetland and allow for the land to be used as pasture. It is likely that this area was historically a forested system similar to those located to the north and south.

Three high water marks were set in the northwest corner of the system on the north side of the large swale on the south side of Chapman Road. Three additional high water marks were set on the south side of the swale along Chapman Road directly south of the intersection of Chapman Road and Tatra Street. This system would likely have a low overall UMAM score due to the clearing that has occurred and in the invasion by exotic species.

High water mark 3 located in the northwest corner of Wetland 7.

High water mark 4 located in the northeast corner of Wetland 7.

Wetland 8

This system is comprised of both forested and cleared wetland areas bounded by Slavia Road to the north, SR 426 to the east, Chapman Road to the south, and SR 417 to the west. Observed canopy vegetation included sweetgum, bald cypress, red maple, laurel oak, red bay, and camphor. Shrub and groundcover species included wax myrtle, cabbage palm, Virginia chain fern, wild grape, Carolina redroot, broomsedge bluestem, greenbriar, god fennel, and blackberry.

Portions of the northern part of this system have been cleared and are actively used for grazing livestock. Observations made in the field indicate that this system is adequately hydrated, though continued utilization by livestock in the non-forested areas and the proximity to development has increased invasion by exotic and nuisance species along the edges. This

system would likely have a middle-range UMAM score due to its large size and sufficient hydrology. However, invasion by exotic species and lack of upland buffers will reduce its overall value.

Wetland 9

This system is comprised of several small wetlands connected via a large ditch system and eventually flowing into Bear Gulley Creek This system is bounded by Slavia Road to the north, SR 417 to the east, Morning Star Place to the south, and Mikler Road to the west. Observed canopy vegetation included chinaberry, mimosa, camphor, red maple, and laurel oak. Shrub and groundcover species included gallberry, elderberry, cabbage palm, wax myrtle, Carolina willow, black cherry, cattail, cogongrass, bahiagrass, wild grape, dog fennel, maidencane, wild taro, St. John wort (*Hypericum sp.*), yellow-eyed grass (*Xyris sp.*), and elephant ear (*Xanthosoma sagittifolium*).

High water mark 6 located on the western side of Wetland 9.

The proximity to development, and the maintenance of the ditch system flowing into Bear Gulley Creek, has affected the overall health of this system to the point that the majority of the vegetative species are either exotic or nuisance species. High water marks were set on the south side of the ditch just upstream of the confluence with Bear Gulley Creek and on the west side of the ditch just west of the SR 417 stormwater pond. This system would likely have a low to middle range UMAM score. The creek and ditch system allow for adequate hydration, but proximity to development, fragmentation, and invasion by exotic species will reduce its overall value.

3.4 WILDLIFE

The vegetative communities and current land use within and adjacent to the proposed project limits were evaluated in order to determine the potential use by listed species. Inwood biologists reviewed reference literature, aerial photography, and conducted field reconnaissance in order to determine if suitable protected species habitat exists within the project area.

3.4.1 Methodology

Prior to conducting field visits, a literature search was performed in order to determine if the presence of any protected species, or their habitats, had been documented within the project area. Project biologists consulted standard Florida references to gain insight into the characteristics of existing wildlife habitat. Literature referenced included the NWI maps, site-specific aerial photographs, the USFWS's "Endangered and Threatened Species of the Southeast United States" (The Red Book, 1992), the Florida Fish and Wildlife Conservation Commission's (FWC) "Closing the Gaps in Florida's Wildlife Habitat Conservation System" (1994), Florida's Endangered Species, Threatened Species, and Species of Special Concern lists (2008), and a recent query of the Florida Natural Areas Inventory (FNAI) database of listed species for the surrounding area. Table 1 includes a list of protected species with potential to occur within the project area.

A general wildlife survey was conducted on June 3, 2009 by an experienced Florida biologist in order to determine the potential for listed species indentified in Table 3-1 or their habitat within the proposed project limits. Prior to the field survey, a base map of the study area was developed from aerial photographs.

Review of existing wildlife literature did not indicate the presence of any protected species or habitat within the project area.

3.4.2 Results

4.4.2.1 Listed Floral Species

During the field review, no listed floral species were observed within the project limits.

4.4.2.2 Listed Faunal Species

During field reviews, four listed species was observed within the project limits. Wood storks (*Mycteria americana*), white ibis (*Eudocimus albus*), little blue herons (*Egretta caerulea*), and snowy egrets (*Egretta thula*) were observed foraging within the project area. Wood storks are listed as Endangered by the USFWS and FWC. White ibis, little blue heron, and snowy egret are all listed as Species of Special Concern by the FWC.

The following is a discussion of listed species that addresses those species that were not observed, but have at least a minimal potential of occurrence within the project limits.

A review of the FFWCC eagle nest locator website was conducted on June 9, 2009 for habitat surrounding and including the project area (Section 19, 20, 29, 30, 31, and 32 Township 21S, Range 31E). The results indicated that there are currently a total of fourteen bald eagle (*Haliaeetus leucoephaslus*) nests within five miles of the project, with the nearest (SE022) being 0.7 miles from the project area. The closest recently active nest (active in 2006) is SE004 is approximately 2.5 miles from the project area. Bald eagles could utilize pond and marsh habitat within the project area location for foraging and forested wetland areas for nesting. However, it is anticipated that this project is not likely to have any adverse effect on the breeding success of an established nest.

Although the bald eagle has recently been de-listed by the USFWS, it is still protected under a specific State management plan regulated by the FWC. The bald eagle also remains protected under the Bald Eagle and Golden Eagle Protection Act and the Migratory Bird Protection Act.

Listed wading birds that could potentially use portions of the project area for foraging habitat include limpkin (*Aramus guarauna*), tricolored heron (*Egreatta tricolor*), and sandhill crane (*Grus Canadensis*). A review of the FFWCCC Waterbird colony Locator online database was conducted on June 9, 2009. No wading bird colonies have been recorded within the project limits.

The American alligator (*Alligator mississippiensis*) is federally-listed as Threatened due to similarity in appearance to more endangered crocodilians and state-listed as a species of special concern. Foraging habitat for this species does occur within the proposed project limits.

Non-listed wildlife species, or evidence of utilization, observed within the project limits include red-shouldered hawk (*Buteo lineatus*), osprey (*Pandion haliaetus*), redwing blackbird (*Agelaius phoeniceus*), northern cardinal (*Cardinalis cardinalis*), commom moorhen (*Gallinula chloropus*), turkey vulture (*Cathartes aura*), black vulture (*Coragyps atratus*), wild turkey (*Meleagris gallopavo*), great blue heron (*Ardea herodias*), cattle egret (*Bubulcus ibis*), pileated woodpecker (*Dryocopus pileatus*), and blue jay (*Cyanocitta cristata*).

Table 3-1 – Federal and State Listed Species with the Potential to Occur in Seminole County

GROUP	SCIENTIFIC NAME	COMMON NAME	USFWS	FFWCC	FDACS
Amphibian					
	Rana capito	Gopher frog		SSC	
Birds					
	Ajaia ajaja	Roseate Spoonbill		SSC	
	Aphelocoma coerulescens	Florida scrub jay	T	T	
	Aramus guarauna	Limpkin		SSC	
	Caracara cheriway	Crested caracara	T	T	
	Egretta caerulea	Little blue heron		SSC	
	Egretta thula	Snowy egret		SSC	
	Egretta tricolor	Tricolored heron		SSC	
	Eudocimus albus	White ibis		SSC	
	Falco pergrinus tundrius	Peregrine falcon		E	
	Falco sparverius paulus	Southeastern American kestrel		T	
	Grus canadensis	Sandhill crane		T	
	Haliaeetus leucocephalus	Southern bald eagle	T	T	
	Mycteria americana	Wood stork	E	E	
Fish					
	Pteronotropis welakea	Bluenose shiner	SSC		

Table 3-1 - Continued

GROUP	SCIENTIFIC NAME	COMMON NAME	USFWS	FFWCC	FDACS
Mammal					
	Podomys floridanus	Florida mouse		SSC	
	Sciurus niger shermani	Sherman's fox squirrel		SSC	
	Trichechus manatus latirostris	West Indian manatee	E	E	
	Ursus americanus floridanus	Florida black bear		T	
Plants					
	Carex chapmanii	Chapman's Sedge			E
	Centrosema arenicola	Sand butterfly pea			E
	Cucurbita okeechobeensis	Okeechobee gourd	E		E
	Dennstaedtia bipinnata	Cuplet fern			E
	Illicium parviflorum	Yellow anise tree			T
	Lechea cernua	Nodding Pinweed			T
	Lechea divaricata	Pine pinweed			E
	Nemastylis floridana	Celestial Lily			E
	Ophioglossum palmatum	Hand Fern			E
	Pecluma ptilodon	Swamp plume polypody			E
	Pteroglossaspis ecristata	Giant Orchid			T
	Salix floridana	Florida Willow			E
Reptile					
	Alligator mississippiensis	American alligator	T (S/A)	SSC	
	Drymarchon corais couperi	Eastern indigo snake	T	T	

Table 3-1 - Continued

GROUP	SCIENTIFIC NAME	COMMON NAME	USFWS	FFWCC	FDACS
Reptile (cont'd.)					
	Gopherus polyphemus	Gopher tortoise		T	
	Pituophis melanoleucus mugitus	Florida pine snake		SSC	
	Stilosoma extenuatum	Short-tailed snake		T	

USFWS = United States Fish and Wildlife Service
FFWCC = Florida Fish and Wildlife Conservation Commission
FDACS = Florida Department of Agriculture and Consumer Services

E = Endangered **SSC = Species of Special Concern**
T = Threatened **T(S/A) =Threatened due to Similarity of Appearance**

3.5 REGULATORY AGENCIES AND REQUIRED PERMITTING

As any work within the creek will impact wetlands regulated by the state and federal government, it will be necessary to submit an Environmental Resource Permit (ERP) application for Section 404 dredge and fill permit to the ACOE and the SJRWMD. These permits address the proposed project's impact on wetlands including filling of jurisdictional wetlands, the effect of wetland habitat loss on listed species, and to help determine the mitigation necessary to offset the loss of wetlands resulting from this project.

ACOE and SJRWMD regulate wetlands impacts within this project area. The FDEP, USFWS, and the FWC review and comment on wetland permit applications. It is currently anticipated that the following permits will be required for any work within the creek itself or within adjacent wetlands:

Permit Type	**Issuing Agency**
Standard General Environmental Resource Permit (assuming permanent wetland impacts less than 1.0 acres)	SJRWMD
OR*	
Individual Environmental Resource Permit (assuming permanent wetland impacts greater than 1.0 acres)	SJRWMD
Section 404 General Dredge and Fill Permit (assuming wetland fill impacts less than 0.5 acres)	USACOE
OR*	
Section 404 Individual Dredge and Fill Permit (assuming wetland fill impacts greater than 0.5 acres)	USACOE

**The type of permit required for the project will depend on the amount of impacts to wetlands resulting from the proposed work.*

The FWC and the USFWS will consult with and provide comments to the SJRWMD and ACOE on the potential effect of any proposed wetland impacts on state and federal listed species. Their comments and/or objections will be noted in the sufficiency response from the ACOE.

SJRWMD

The complexity of the permitting process depends greatly on the degree of the impact to jurisdictional areas. The SJRWMD requires an ERP when construction of any project results in the creation of a water management system, impacts to waters of the State, or impacts to isolated wetlands. A Standard General permit will be required with mitigation for projects with proposed wetland impacts less than one acre with an Individual permit being required with proposed wetland impacts greater than one acre. Typically, SJRWMD can review and approve a Standard General ERP in 3-6 months and an Individual ERP in 3-9 months.

ACOE

For the ACOE, a General dredge and fill permit will be required if a project's wetland impacts are less than 0.5 acres, with an Individual permit being required with proposed

wetland impacts greater than 0.5 acres. Both permits require compliance with Section 404(b)(1) guidelines, including verification that all impacts have first been avoided to the greatest extent possible, that unavoidable impacts have been minimized to the greatest extent practicable, and that unavoidable impacts have been mitigated in the form of wetlands creation, restoration, and/or enhancement. Review and issuance of a General ACOE permit typically takes 1-3 months and an Individual permit typically takes 3-6 months from the time the permit application is submitted.

3.6 ECOLOGICAL ASSESSMENT SUMMARY

The jurisdictional extent of wetlands within the project area has been reviewed by Inwood staff and approximated on the Wetland Location Map (Figure 3-1). Any construction activities occurring within these systems will be required to have an approved permit from both the SJRWMD and ACOE with approved mitigation provided for any permanent impacts to wetlands. It should be noted that neither the SJRWMD nor the ACOE have made any determinations regarding the extent and quality of wetlands within the project area at the time of this report.

Suitable habitat exists within the project area for protected species, specifically protected wading birds though, due to surrounding development, the overall quality of the habitat has been reduced. Several protected wading birds were observed foraging within the project area during the field review by Inwood staff. Any proposed projects within wetlands should consider the effects on listed species and provide adequate avoidance and minimization of impacts to listed species and their habitat.

Based on observations in the field, the wetlands appear to be adequately hydrated, though native wetland vegetation is lacking in many areas due to adjacent development. The urbanization of the uplands surrounding these systems has contributed to a decline in the overall abundance and diversity of native wetland vegetation and an increase in amount of nuisance/exotic species. Lack of suitable upland buffers leave little area for native vegetation to remain established and create the canopy normally associated with this type of system.

Any work taking place within wetlands that will involve altering existing vegetation should consider the control/removal of exotic species. Species such a Brazilian pepper, air-potato, and cogongrass spread very quickly in stressed systems and typically out-compete natives for resources. The lack of any buffer between these systems and surrounding vegetation will likely reduce the chance of success for most exotic control attempts. Removing large sections of exotic vegetation and establishing native species in large enough areas to allow a native "core" to be established that can compete for resource may help restore much needed wetland habitat for wildlife using the entire creek and lake system for foraging and cover.

4.0 EXISTING CONDITIONS

4.1 FLOODING PROBLEM AREAS

Several drainage problem areas were identified by Inwood during field visits to the study area, by PEC in the *Aloma Woods Drainage Basin Study*, 2004, and by CDM in the *Howell Creek Basin Watershed Management Plan*, 2008. The identified drainage problem areas based on Inwood observations and the previous studies are shown on Figure 4-1.

4.2 EXISTING CONDITIONS MODEL EVALUATION

The *Aloma Woods Drainage Basin Study* by PEC, July 2004 developed a hydrologic and hydraulic model representation of the project area using ICPR version 3.0. The model extent included all of the upstream contributing areas to the Aloma Woods outfall canal from Elmhurst Village, SR 426, Jamestown, Aloma Woods, and Wentworth Estates. The stormwater collection and conveyance system in the project area was modeled in moderate detail. In some instances, some drainage structures were not included within the model because their overall function was apparently not considered critical. The model included the Aloma Woods outfall canal from Wentworth Estates north to SR 426 and from SR 426 to the culvert under Eagle Pass Road. A copy of the PEC report is on the DVD included with this report.

In addition to the contributing areas included in the PEC model, the current project model included the contributing areas to the Aloma Woods outfall canal from Eagle Pass Road west under SR 417 to the confluence with Bear Gully Creek. Also, the stormwater collection and conveyance system in the project area was modeled in more detail compared to the PEC model in an effort to gain a more comprehensive understanding of stages and discharge rates in the system during the modeled storm events. Several culverts and junction nodes were added to the model upstream of Wentworth Estates. Some model details were also added to reflect development that has occurred in the study area since the PEC study. Surface storage outside of stormsewer inlets, within ponds and overbank areas was accounted for in the model. The model subbasins and node-link network is shown on Exhibit 3.

The existing conditions hydrologic / hydraulic model was developed by Inwood using the ICPR (Version 3.1, Service Pack 6) computer program to assess the level of service performance of drainage infrastructure during design storm events. Much of the data in the Inwood model was referenced as is from the PEC model mentioned above without further verification. Details on the development methodology and parameterization of the model are included in Appendix A – Hydrologic / Hydraulic Model Development and Parameterization Summary which includes a description of the development of model hydrologic and hydraulic parameters such as node initial stage methodology, etc. Appendix A also includes the Landuse Based Curve Number Reference Table, Curve Number Calculation Summary Table, Time of Concentration Summary Table, Subbasin Curve Number Map, and Subbasin Time of Concentration Map.

Camp Dresser & McKee, Inc. (CDM) was tasked as a subconsultant with incorporating this study model into their master hydrologic and hydraulic ICPR model developed for the *Howell Creek Basin Watershed Management Plan* in 2008 to establish appropriate boundary conditions for the model at Bear Gully Creek. CDM ran model simulations for the mean annual, 10-year, 25-year and 100-year / 24-hour design storm events. CDM also ran the model to simulate the Tropical Storm Fay storm that occurred in August of 2008 for a duration of 240 hours (10 days) for model verification purposes. The results of CDM's efforts are included in a technical memorandum in Appendix B.

PONDING AND YARD FLOODING ALONG CHAPMAN ROAD NEAR SR 426 POND DURING TROPICAL STORM FAY DUE TO POOR DRAINAGE.

CHANNEL OVERTOPPING AND FLOODING OF WEST CHAPMAN ROAD

WASHOUT OF CULVERT UNDER EAGLE PASS ROAD DURING TROPICAL STORM FAY IN 2008. THE ROAD HAS SINCE BEEN REPAIRED.

FLOODING OF EAGLE PASS ROAD DUE TO UNDERSIZED CULVERTS.

HIGH STAGES UPSTREAM OF CULVERT UNDER SR 426 DURING TROPICAL STORM FAY ATTRIBUTED TO INSUFFICIENT CAPACITY IN CANAL DOWNSTREAM OF ROAD

FLOODING OF RESIDENTIAL PROPERTIES ALONG CHURCH STREET DUE TO INSUFFICIENT CAPACITY IN OUTFALL CANAL

STREET FLOODING FROM TROPICAL STORM GABRIEL IN 2001 ALONG ASHTON TERRACE ATTRIBUTED TO MAINTENANCE RELATED BLOCKAGE AND INSUFFICIENT CAPACITY IN DOWNSTREAM CANAL. THE CANAL BLOCKAGES HAVE BEEN ADDRESSED THE COUNTY.

FLOODING OF ROADS WITHIN WENTWORTH ESTATES DUE TO INADEQUATE STORAGE IN THE WENTWORTH ESTATES PONDS.

POND OVERTOPPING CAUSED BY SURCHARGING OF OUTFALL SYSTEM ALONG ALOMA WOODS BLVD AND WALKER ROAD.

POND OVERTOPPING

FLOODING OF WALKER ROAD DUE TO INSUFFICIENT CULVERT CAPACITY.

FLOODING OF SABLE OAK PLACE DUE TO HIGH STAGES IN WETLAND TO THE WEST AND ALOMA WOODS PONDSTO THE EAST.

ROAD FLOODING IN ALOMA WOODS PHASE 4 CAUSED BY SURCHARGING OF OUTFALL SYSTEM ALONG ALOMA WOODS BLVD AND WALKER ROAD.

POND OVERTOPPING

MINOR ROAD FLOODING WITHIN ALOMA WOODS PHASE 1 DUE TO HIGH STAGES IN THE STORMWATER PONDS.

FLOODING OF PARKING AREAS AND DRIVEWAYS IN ELMHURST VILLAGE DUE TO INSUFFICIENT CAPACITY IN THE STORMWATER PONDS.

NOTE:
PROBLEM AREAS SOURCE COLOR CODING.
OBSERVED BY INWOOD = GREEN TEXT
OBSERVED BY PEC = BLUE TEXT
MODELED BY PEC FOR THE ALOMA WOODS DRAINAGE BASIN STUDY, 2004 = RED TEXT
MODELED BY CDM FOR THE HOWELL CREEK BASIN WATERSHED MANAGEMENT PLAN = YELLOW TEXT

Seminole County
Florida's Natural Choice

N

0 500 1,000 Feet

LEGEND

PARCELS

DATA SOURCES:
PICTURES:PEC, 2004 & INWOOD CONSULTING ENGINEERS, 2008
AERIAL IMAGERY: SEMINOLE COUNTY, 2008
STREETS: SEMINOLE COUNTY, 2008

FIGURE 4-1

PROBLEM AREAS SUMMARY MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

4.3 LEVEL OF SERVICE CRITERIA

An important component of this study is to establish peak flood stages under existing conditions for several design storms; this allows a comparison of the performance of the particular stormwater management facility to regulatory criteria for the protection of residents, properties, and infrastructure.

A flooding level of service (LOS) is criteria by which infrastructure related flooding problems can be assessed for potential deficiencies. Alternatives for flood control improvements can then be evaluated and developed to improve stormwater management. The LOS criteria also can aid in prioritization of facility improvements under operation and maintenance activities. The criteria are typically tied to a specific design storm event, which would result in a runoff volume that must be accommodated by the stormwater facility.

Based on a review of the Seminole County Stormwater Management criteria, the LOS standards considered applicable for the stormwater facilities assessed in this project are summarized on Table 4-1.

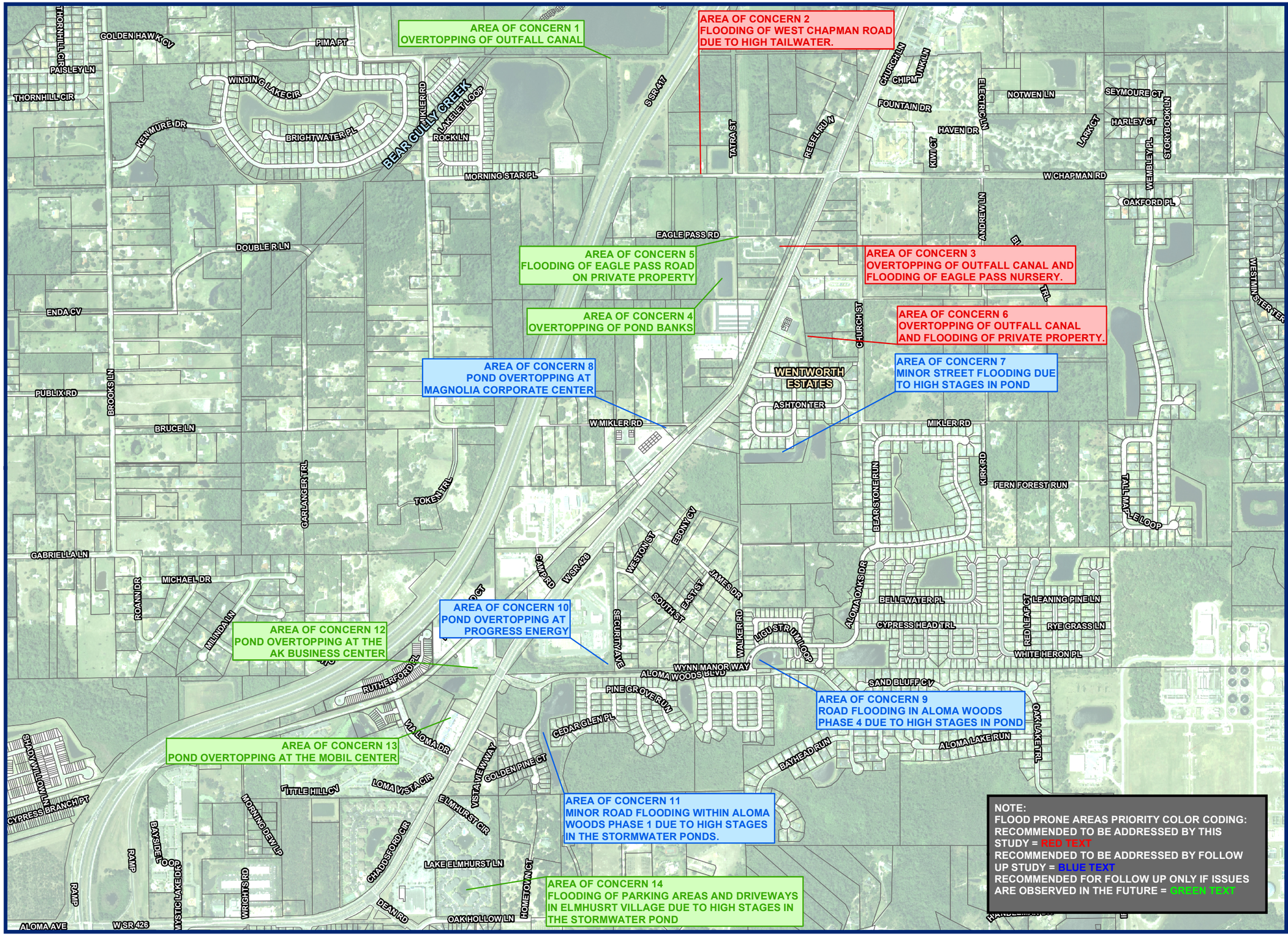
Table 4-1 - Criteria for Study LOS Assessment Modeling

FLOODING LEVEL OF SERVICE (LOS) STANDARDS / DESIGN CRITERIA			
Facility	**Storm Frequency and Duration**	**Physical Elevation Reference**	**Example in Project Area**
Local Road	10 year / 24 hour	Road Edge of Pavement or Manhole Top Elevation	Edge of pavement of Eagle Pass Road
Arterial or Collector Road	25 year / 24 hour	Road Edge of Pavement or Manhole Top Elevation	Edge of pavement of SR 417 or SR 426.
Stormwater Pond	25 year / 24 hour	Pond Top Of Bank Or Overtopping Elevation	Wentworth Estates Detention Pond top of bank
Canals	25 year / 24 hour	Canal Top of Bank	Canal from Wentworth Estates to SR 426
Structure	100 year / 24 hour	Structure Finished Floor Elevation	Residential Structure within Aloma Woods Subdivision

4.4 EXISTING MODEL RESULTS SUMMARY

The model peak stages at critical links in the model were compared to the lowest adjacent critical elevation (warning stage) by CDM to determine the LOS of the infrastructure in the study area. Refer to the technical memorandum in Appendix B for the model link peak stage tables with LOS results. The ICPR Model Node-Link network with nodes color coded to indicate whether the node passed or failed LOS is shown on Exhibit 3. In addition, peak stages for the modeled storm events were adapted from the model results and are summarized graphically on the profile on Exhibit 2. The surveyed seasonal high water marks appear to generally correspond with the mean annual / 24 hour storm peak stages along the canal. The ICPR model files and complete input / output report files are on the DVD included with this report.

The areas with model nodes that failed LOS were designated as flood prone areas. Refer to Figure 4-2 for the location of the flood prone areas. The flood prone areas are discussed in further detail in Section 4.5 of this report.



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

NOTE:
REFER TO SECTION 4.5 FOR ADDITIONAL DETAILS ABOUT THE AREAS OF CONCERN. REFER TO EXHIBIT 3 FOR THE MODEL NODE-LINK AND LOS RESULTS MAP.

DATA SOURCES:
AERIAL IMAGERY: SEMINOLE COUNTY, 2008
STREETS: SEMINOLE COUNTY, 2008

FIGURE 4-2

MODELED FLOOD PRONE AREAS MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

4.5 EXISTING CONDITIONS SUMMARY

4.5.2 Flood Prone Areas

Areas of concern in the study area that failed LOS in the model or where flooding problems have been observed in the field or predicted by the models of previous studies are summarized below:

1. **Aloma Woods Outfall Canal West of SR 417** – The existing conditions model indicates that stages in the canal in this area (model nodes AW-900, AW-895, and AW-915) will overtop the canal banks during the 25-year / 24-hour storm. The depth of flooding was roughly 1.0' and the flooding duration was roughly 20 hours. The peak stage of the outfall canal in this area is only 0.02' above the peak stage of the tailwater condition at Bear Gully Creek. The model results appear to be in general agreement with flooding indicated by the 2008 CDM study model.
2. **Outfall Canal along West Chapman Road west of State Road 426 –** The model results indicated a flooding problem in this area (model nodes AW-555, AW-560, AW-565, AW-570, and AW-575). The depth of flooding in this area was roughly 0.5' above the roadway edge for the 25-year / 24-hour storm event. The flooding duration in this area was roughly 15 hours. The peak stages of the canal in this area range from only 0.12' to 0.19' above the peak stage of the tailwater condition at Bear Gully Creek. Therefore, attempts to simply increase the conveyance capacity of the canal in this area may not be expected to significantly reduce flooding in the area. The model results confirm the existence of a flooding problem in this area that was indicated by the 2008 CDM study model and was mentioned anecdotally by the 2004 PEC study.
3. **Outfall Canal in the Eagle Pass Nursery from State Road 426 to Eagle Pass Road –** The model results indicated a flooding problem in this area (model nodes AW-480 and AW-490). Two of the culverts in the nursery failed to meet the 25-year LOS. The depth of flooding in this area was roughly 0.2' for the 25-year / 24-hour event. The model results indicate that during the 25-year / 24-hour storm event the canal would overtop its banks and discharge flood waters onto the nursery property. The flooding duration in this area was roughly 16 hours. The channel and culvert conveyance system in this area appears to be undersized to effectively convey runoff from the large contributing area southeast of SR 426. In addition, the inverts of the upstream culvert in the nursery are higher than the inverts of the SR 426 culvert and the culvert under Eagle Pass Road is severely reverse graded. The model results confirm the existence of a flooding problem in this area that was indicated previously by a culvert washout observed by Inwood and flooding in the nursery and of Eagle Pass Road indicated by the 2004 PEC study model.
4. **SR 426 Stormwater Pond** – The existing conditions model indicates stages that exceed the pond top of bank (model node AW-505) for the 25-year / 24-hour storm. The depth of flooding was roughly 0.3' and the flooding duration was roughly 2.5 hours. Also, the model indicates that peak stages at two manholes (model nodes AW-510 and AW-515) in the outfall pipe of the pond would exceed the manhole top elevation for the 10-year / 24-hour storm.
5. **Private Culvert Under Eagle Pass Road** – The existing conditions model indicates flooding of Eagle Pass Road at a 10" PVC culvert (model node AW-545) for the 10-year / 24- hour storm. The depth of flooding was roughly 0.2' and the flooding duration was

roughly 16 hours. This culvert is apparently undersized to effectively convey runoff from the contributing area. The culvert was apparently put in place by a private resident to drain runoff from private property under a private road. Therefore, any flooding problems due to this undersized culvert are not considered of concern to the County.

6. **Outfall Canal North of Wentworth Estates and Southeast of SR 426** – The model results indicated that high stages in the canal (model node AW-425) during the 25-year / 24-hour storm would cause flooding to a residential property on the east side of the canal. The depth of flooding was roughly 0.6' and the flooding duration was roughly 22 hours. The model results appear to be in general agreement with high stages in the canal observed during Tropical Storm "Fay" and flooding of residential properties along Church Street indicated by the 2004 PEC study model. The inlet pipe from Wentworth Estates discharges north into the outfall canal. The survey indicates that the outfall canal immediately downstream of the inlet pipe from Wentworth Estates is roughly 2 feet above the invert of the pipe. Portions of the canal are also reverse graded. The grading problems may contribute to the flooding problem in this area.
7. **Wentworth Estates Subdivision** – The existing conditions model indicated that high stages in the subdivision stormwater pond (model node AW-385) during the 25-year / 24-hour storm would cause street flooding in the subdivision. The depth of flooding was roughly 0.2' and the flooding duration was roughly 11 hours. The flooding indicated by the model results appears to be minor compared with severe street flooding observed in the subdivision in 2001 during Tropical Storm "Gabrielle" and road flooding indicated by the 2004 PEC study model. According to the 2004 PEC study several maintenance issues including rubble and debris in the outfall canal, a partially crushed culvert, and a culvert partially blocked by vegetative debris existed during the 2001 flooding. It appears that although the model indicated some issues with the drainage system, the severe flooding observed in 2001 was predominantly due to maintenance problems.
8. **Magnolia Corporate Center** - The existing conditions model indicated that the roadside ditch (model node AW-615) would flood Mikler Road during the 10-year / 24-hour storm. The depth of flooding was roughly 0.2' and the flooding duration was roughly 0.5 hours.
9. **South Walker Road and Aloma Woods Phase IV** - The existing conditions model indicated that high stages in the subdivision stormwater pond (model node AW-175) during the 25-year / 24-hour storm would cause street flooding in the subdivision. The depth of flooding was roughly 1.1' and the flooding duration was roughly 6 hours. The flooding appears to be partially due to high stages in the outfall pipe downstream of the pond. The model results appear to be in general agreement with road flooding in Aloma Woods Phase IV indicated by the 2004 PEC study model.
10. **Progress Energy** - The existing conditions model indicated that the stormwater pond (model node AW-125) would overtop its banks during the 25-year / 24-hour storm. The flooding appears to be partially due to high stages in the outfall pipe (model node AW-130) downstream of the pond. The depth of flooding was roughly 0.6' and the flooding duration was roughly 5 hours. The model results appear to be in general agreement with pond overtopping indicated by the 2004 PEC study model.
11. **Aloma Woods Phase I Stormwater Ponds** – The existing conditions model indicated that the western pond (model node AW-060) would cause minor street flooding in the subdivision during the 25-year / 24-hour storm. The depth of flooding was roughly 0.1'

and the flooding duration was roughly 6 hours. No LOS deficiencies were observed in the model for the east pond (model node AW-145). The model results appear to be in general agreement with minor street flooding indicated by the 2004 PEC study model.

12. **AK Business Center Pond** – The existing conditions model indicates overtopping of the detention pond (model node AW-095) during the 25-year / 24-hour storm. The depth of flooding was roughly 1.2' and the flooding duration was roughly 0.5 hours.
13. **Mobil Center Pond** – The existing conditions model indicates overtopping of the detention pond (model node AW-070) during the 25-year / 24-hour storm. The depth of flooding was roughly 0.1' and the flooding duration was roughly 2 hours.
14. **Elmhurst Village Stormwater Ponds** - The existing conditions model indicates parking area flooding within the Elmhurst Village Apartments due to high stages in the stormwater ponds (model node AW-005) during the 25-year / 24-hour storm. The depth of flooding was roughly 0.3' and the flooding duration was roughly 3 hours. The model results appear to be in general agreement with parking area flooding indicated by the 2004 PEC study model.

Refer to Figure 4-2 for the locations of the modeled flooding areas of concern.

Areas that did not fail LOS in the study model but where flooding was predicted by the 2004 PEC study model are summarized below:

- **North Walker Road** - The 2004 PEC study model indicated overtopping of Walker Road for the 10-year / 24-hour storm. The existing conditions model for this study however, did not indicate road overtopping of Walker Road (model node AW-345) during the 10-year / 24-hour storm. The model did indicate road overtopping for the 25-year / 24-hour storm.
- **Sabel Oak Place** – The 2004 PEC study model indicated flooding of Sabel Oak Place from the wetland on the west side of the road (model node AW-055). The existing conditions model for this study however, did not indicate flooding of Sabel Oak Place for 10 year / 24 hour LOS storm event.

The difference in peak stages between the 2004 PEC study model and the model of this study are likely due to the greater level of detail of the current study model.

Subconsultant CDM performed a simulation of the Tropical Storm Fay event for verification of model accuracy. The modeled stages were compared to corresponding photos of the outfall canal and ponds in the study area taken during Tropical Storm Fay. The model results were found to be generally consistent with observed conditions, although the photos indicated that the model may slightly over-predict flooding in some locations. Refer to Appendix B for the Tropical Storm Fay simulation summary and comparison to observed flooding conditions by CDM.

Refer to Exhibit 3 for the node-link network and LOS results of the nodes in the above referenced areas.

4.5.1 Improvement Areas

As stated in the project goals section of this report, this study is focused on improving drainage conditions along the Aloma Woods Outfall Canal. Therefore, not every area mentioned above that exhibited flooding in the existing conditions model was evaluated in detail for improvement. Recommendations for further evaluation of the areas of concern listed above are summarized below:

- **Areas of Concern 2, 3, 6, and 7** – Improvements for these areas were the focus of the improvements alternatives evaluation under this scope of work and were evaluated further in section 6 of this report.
- **Areas of Concern 9, 10, and 11** – Improvements for these areas were considered outside of the direct focus of this study. These areas should be evaluated further with a follow up study.
- **Areas of Concern 1, 4, 5, 8, 12, 13, and 14 –** Problems in these areas were based on modeling results and have not been confirmed through observation. These should be evaluated further only if flooding issues are observed in the future.

Refer to Figure 4-2 for the locations of the areas of concern. Note the location callouts are color coded based on the recommendations listed above.

5.0 WATER QUALITY EVALUATION

5.1 WATER QUALITY REGULATIONS

Most of the contributing areas to the outfall canal along SR 426 south of Eagle Pass Road have been primarily developed since the advent of stormwater management rules required by the SJRWMD and Seminole County development regulations. These rules require the implementation of water quantity (attenuation) as well as water quality (pollutant reduction) engineering controls be incorporated into site design. Most of the northern section of the study area however appears to have been developed before these rules went into effect.

For water quantity, the requirements generally dictate that post-development discharge should be less than or equal to pre-development discharge and no net reduction in floodplain storage should take place. For water quality purposes, certain acceptable Best Management Practices (BMPs) should be implemented (i.e., wet detention, retention, exfiltration, swales, etc.) to reduce pollutants based on presumptive pollutant load reduction performance. Although not required to be monitored, the goal is that the implementation of BMPs will reduce pollutant discharges into receiving waters which in this case is Bear Gully Creek and later Howell Creek which ultimately discharges into Lake Jesup.

Lake Jesup is an impaired water body subject to Total Maximum Daily Load (TMDL) requirements. Based on impairment data from the Florida Department of Environmental Protection (FDEP), parameters of concern include nutrients (total nitrogen and phosphorus), fecal coliforms and dissolved oxygen (BOD). As a primary tributary to Lake Jesup, the water quality of Howell Creek is by association of specific concern to the County. A Basin Management Action Plan (BMAP) has recently concluded for Lake Jesup. Final load allocations to Seminole County and the other stakeholders are being finalized as of the date of this report.

Note that septic tank usage was identified in the project area in the older and more rural areas of the project area, so leaching of contaminants from non-functioning or failed septic tanks through the groundwater into the creek may be a concern in the these areas.

5.2 BMP EVALUATION

A cursory evaluation of BMPs in the contributing area to the project was conducted in an attempt to identify any specific areas that currently do not have stormwater BMPs in place. These areas could then be targeted in the future for some type of BMP if reduction of pollutant loading in this project area becomes important in the future.

Based on review of plans, permits, and field observations, the developments that were permitted through the SJRMWD in the contributing area were designated as having a currently operating BMP. In the project area the BMPs were distinguished between wet ponds (detention), dry ponds (retention). Figure 5-1 shows the results of this evaluation.

Based on Figure 5-1, the majority of the contributing area (~55%) has no water quality BMP. The areas identified as having no BMPs are predominantly the low density residential, agricultural, and some undeveloped land uses (wetlands, upland forests, or open land).

Since the effectiveness of the existing BMPs is based primarily on presumptive removal efficiencies, there would be opportunity to enhance existing treatment levels through the incorporation of additional BMPs through a "treatment train" of BMPs in series. This would generally require land acquisition, particularly for additional treatment pond sites. Due to the

somewhat rural nature of the northern section of the project area there may be some opportunities for acquisition of land for construction of treatment pond sites if additional treatment of runoff is desired.

The County has previously expressed interest in the possibility of utilizing the large borrow pits at the downstream end of the project area near Bear Gully Creek as regional water quality treatment. This option has been preliminarily evaluated by the County as part of their Lake Jesup BMAP efforts. The utilization of the borrow pits as regional detention facilities could provide some off line attenuation of runoff prior to discharge into Bear Gully Creek. The utilization of the borrow pits would also provide additional offline water quality treatment by increasing the residence time of runoff prior discharging to Bear Gully Creek. A detailed analysis of this potential project was not included in the scope of this study, however this potential project warrants further consideration in the future.

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 600 1,200
Feet

LEGEND

PROJECT AREA

WATER QUALITY BMP

WET POND (DETENTION)

RETENTION POND

NO BMP

DATA SOURCES:
STREETS:SEMINOLE COUNTY,2008
AERIALS:SEMINOLE COUNTY,2008

FIGURE 5-1

BMP EVALUATION MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

BMPs BY AREA		
BMP TYPE	**AREA (acres)**	**% OF AREA**
WET POND	371.8	42.8%
DRY POND	21.9	2.5%
NONE	475.3	54.7%
TOTAL	869.0	100.0%

NOTE:
BMP AREA DELINEATONS LIMITED TO THE SUB-BASIN BOUNDARIES (EXHIBIT 2).
BMP DESIGNATIONS ARE CURSORY BASED ON AVAILABLE PLANS, PERMITS AND FIELD REVIEW.

6.0 PROPOSED IMPROVEMENTS

6.1 PROPOSED IMPROVEMENT CONCEPTS

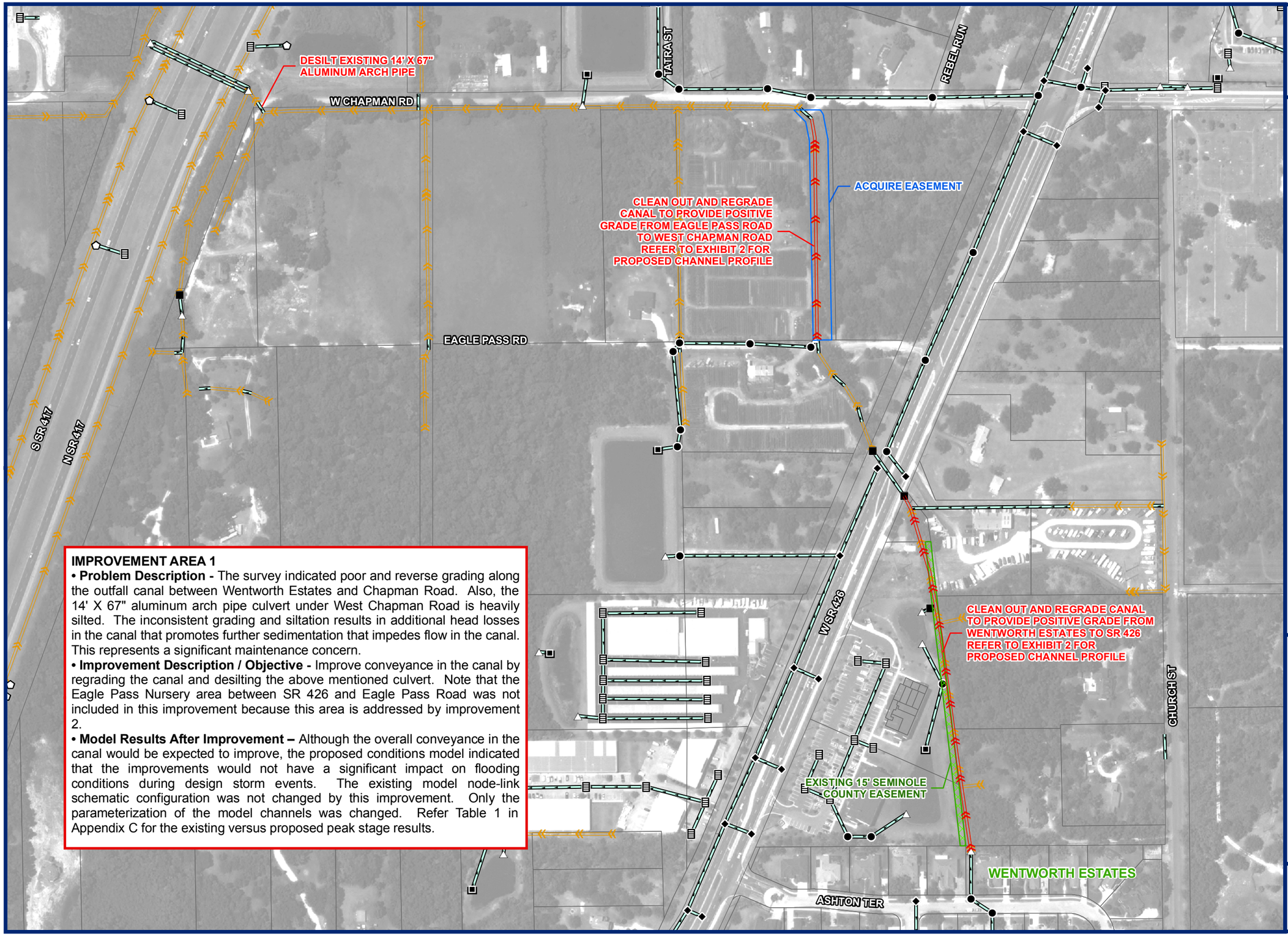
As stated in Section 1, the goal of the proposed improvements is to provide cost-effective alternatives to relieve flooding and address erosion and sedimentation issues along the Outfall Canal. Conceptual improvements were developed in the following areas:

Improvement Area 1 – Outfall Canal between Wentworth Estates and SR 417– The improvement background, description, model results, and project issues are summarized below:

- **Problem Description -** The survey indicated poor and reverse grading along the outfall canal between Wentworth Estates and Chapman Road. Also, the 14' X 67" aluminum arch pipe culvert under West Chapman Road is heavily silted. The inconsistent grading and siltation results in additional head losses in the canal that promotes further sedimentation that impedes flow in the canal. This represents a significant maintenance concern.
- **Improvement Description / Objective -** Improve conveyance in the canal by regrading the canal and desilting the above mentioned culvert. Note that the Eagle Pass Nursery area between SR 426 and Eagle Pass Road was not included in this improvement because this area is addressed by improvement 2. Refer to Figure 6-1 for a depiction of the improvements in this area.
- **Model Results After Improvement –** Although the overall conveyance in the canal would be expected to improve, the proposed conditions model indicated that the improvements would not have a significant impact on flooding conditions during design storm events. The existing model node-link schematic configuration was not changed by this improvement. Only the parameterization of the model channels was changed. Refer to Appendix C for a summary of the model results of this improvement including tabulated existing versus proposed peak stage results.
- **Project Issues:**
  - *Easement Acquisition* - An easement would be required for the outfall canal between Eagle Pass Road and Chapman Road. There is an existing 15’ wide easement along the west side of the outfall canal between Wentworth Estates and SR 426. The County may need to acquire rights of entry from the properties on the east side of the canal prior to performing maintenance or other activities in the canal. The culvert under Chapman Road is within the road right of way.
  - *Permitting Considerations* – A meeting with SJRWMD staff indicated that regrading the canal would not qualify as a maintenance action because there are no established design conditions for the canal. A Standard General environmental resource permit from the SJRWMD would be required for the canal regrading portion of this project. The SJRWMD staff indicated that desilting the 14' X 67" aluminum arch pipe culvert by itself would likely be considered maintenance and therefore exempt from permitting. Refer to Appendix D for the minutes from the meeting with SJRWMD staff.

Portions of the outfall canal may be considered wetland cut. If the canal regrading impacts more than 1 acres of wetlands an Individual Permit would be required.

- *Constructability* – The properties adjacent to the maintenance activities may experience some minor disturbances. No other issues are anticipated.
- *Utility Conflicts* – This project would be within existing drainage system. No utility conflicts are anticipated.
- *Ecological Impacts* – The maintenance activities would not be expected to permanently impact adjacent wetland areas.
- *Cost Estimate* - The estimated cost for this improvement is **$97,448**. Refer to Table 6-1 for a detailed cost estimate.



IMPROVEMENT AREA 1

- **Problem Description -** The survey indicated poor and reverse grading along the outfall canal between Wentworth Estates and Chapman Road. Also, the 14' X 67" aluminum arch pipe culvert under West Chapman Road is heavily silted. The inconsistent grading and siltation results in additional head losses in the canal that promotes further sedimentation that impedes flow in the canal. This represents a significant maintenance concern.
- **Improvement Description / Objective -** Improve conveyance in the canal by regrading the canal and desilting the above mentioned culvert. Note that the Eagle Pass Nursery area between SR 426 and Eagle Pass Road was not included in this improvement because this area is addressed by improvement 2.
- **Model Results After Improvement –** Although the overall conveyance in the canal would be expected to improve, the proposed conditions model indicated that the improvements would not have a significant impact on flooding conditions during design storm events. The existing model node-link schematic configuration was not changed by this improvement. Only the parameterization of the model channels was changed. Refer Table 1 in Appendix C for the existing versus proposed peak stage results.

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

0 75 150
Feet

LEGEND

- PARCELS
- PROPOSED CHANNELS

EXISTING STRUCTURES

- CONTROL STRUCTURE
- HEADWALL
- DITCH BOTTOM INLET
- MITERED END SECTION
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE 6-1

PROPOSED IMPROVEMENT AREA 1

Aloma Woods Outfall Assessment

Inwood consulting engineers

TABLE 6-1
PROPOSED IMPROVEMENT 1
PROPOSED ESTIMATED PROJECT CONSTRUCTION COST[1]

Item	Description	Units	Unit Cost	Quantity	Total
1	MOBILIZATION/ DEMOBILIZATION (10% of Total)	LS	Varies	1	$4,130.00
2	MAINTENANCE OF TRAFFIC (5% of Total)	LS	Varies	1	$2,065.00
3	EROSION CONTROL (5% of Total)	LS	Varies	1	$2,065.00
4	CLEARING & GRUBBING (5% of Total)	LS	Varies	1	$2,065.00
5	LATERAL DITCH EXCAVATION	CY	$10.00	1820	$18,200.00
6	DESILTING PIPE (14' x 67" ALUMINUM ARCH PIPE)	LF	$40.00	30	$1,200.00
7	SODDING (MATCH EXISTING) (ALL DISTURBED AREAS)	SY	$2.50	8760	$21,900.00
				CONSTRUCTION COST:	**$51,625.00**
				CONTINGENCY (15% OF TOTAL)	$7,743.75
				PROPERTY ACQUSITION (MARKET VALUE[2] * (90% + 20% ADMIN COSTS))	$38,079.36
				ESTIMATED TOTAL COST:	**$97,448**

NOTE:

1) The above cost estimate does not include any utility protection or relocations.
2) Referenced from Seminole County Property Appraiser

EASEMENT ACQUISITION			
PARCEL ID	JUST MARKET VALUE	% OF PROPERTY	JMV * PROPERTY %
20-21-31-5CB-0000-005A	$288,480	12.00%	$34,618

Improvement Area 2 – Eagle Pass Nursery – The improvement background, description, model results, and project issues are summarized below:

- **Problem Description -** The existing conditions model indicates overtopping in the outfall canal that would cause flooding to the Eagle Pass Nursery during the 25 year /24 hour storm due to undersized and reverse graded pipes. In addition, high stages in the canal have caused wash outs at Eagle Pass Road. Also, the undersized culverts in the nursery contribute to high stages observed in the outfall canal upstream of SR 426.
- **Improvement Description / Objective –** Four improvement alternatives were developed to improve the conveyance along the outfall canal downstream of SR 426. Each of these improvement alternatives has the same objective of improving LOS by reducing stages on the canal system. The alternatives differ in relative cost, long term maintenance, and easement requirements. The improvements are described briefly below:
  - *Improvement 2A* - Replace the existing 36" CMP culverts within the Eagle Pass Nursery and the 30" CMP culvert under Eagle Pass Road with larger and positively graded 48" RCP culverts that are in line with the SR 426 culvert. Also, replace the 36" CMP culvert under the driveway south of Chapman Road with a 54" RCP culvert to accommodate the increased flow rate from the Eagle Pass Road area. Refer to Figure 6-2 for a depiction of this improvement.
  - *Improvement 2B* – Replace the existing culverts and canal within the Eagle Pass Nursery with 48" stormsewer pipe and inlets from SR 426 to the north side of Eagle Pass Road. Also, replace the 36" CMP culvert under the driveway south of Chapman Road with a 54" RCP culvert to accommodate the increased flow rate from the Eagle Pass Road area. Refer to Figures 6-3 and 6-4 for a depiction of this improvement.
  - *Improvement 2C* – Reroute the discharge from the SR 426 culvert through a stormsewer pipe around the Eagle Pass Nursery to the outfall canal on the north side of Eagle Pass Road. The existing culverts and canal at the nursery property would remain. Also, replace the 36" CMP culvert under the driveway south of Chapman Road with a 54" RCP culvert to accommodate the increased flow rate from the Eagle Pass Road area. Refer to Figures 6-5 and 6-6for a depiction of this improvement.
  - *Improvement 2D* - Reroute the discharge from the SR 426 culvert through a stormsewer pipe northeast along SR 426 to Chapman Road, then west along Chapman Road to the existing canal. The existing culverts and canal at the Eagle Pass Nursery would remain. Refer to Figures 6-7 and 6-8 for a depiction of this improvement.
- **Model Results After Improvement –** All of the improvements provide a passing LOS for the outfall canal in the Eagle Pass Nursery (nodes AW-480 and AW-490) south of Eagle Pass Road. Additionally, the improvements provide a passing LOS for the Wentworth Estates pond (node AW-385) and the outfall canal north of the subdivision (node AW-425). The other upstream problem areas would not be affected by this improvement. The peak stages in the canal downstream of Eagle Pass Road increased roughly 0.5' during the 25-year / 24-hour storm for Alternative 2B, which caused flooding at the culvert just south of Chapman Road. The peak

discharges to the outfall canal downstream of the improvements along Chapman Road, under SR 417, and upstream of Bear Gully Creek would increase by roughly 30 cfs during the 25-year / 24-hour storm event. However, the peak stages in the outfall canal along Chapman Road downstream of the improvements would only increase roughly 0.1' due to the improved conveyance. Refer to Figures 6-4, 6-6, and 6-8 for the proposed conditions node-link maps of improvements 2B, 2C, and 2D respectively. The existing model node-link configuration was not changed by improvement 2A as only the parameterization of the model was changed. Refer to Appendix C for a summary of the model results of each alternative including tabulated existing versus proposed peak stage results.

- **Project Issues:**
  - *Easement Acquisition* – The easement acquisition requirements of the alternatives are summarized below:
    - 2A – An easement would be required along outfall the canal from SR 426 to Chapman Road.
    - 2B – An easement would be required along the outfall canal from SR 426 to Chapman Road.
    - 2C – An easement would be required along the north side of Eagle Pass Road and along the outfall canal from Eagle Pass Road to Chapman Road.
    - 2D – No easements required.
  - *Maintenance Burden* – The acquisition of additional easements would result in an additional maintenance burden on the County due to additional area that would require maintenance. Although none of the proposed improvement alternatives are expected to be a significant additional burden on the County, the relative maintenance needs of the alternatives are summarized below:
    - 2A – The open channel of this alternative would likely require the most frequent maintenance and would be more difficult to access than 2C or 2D because it is located through private property.
    - 2B – The stormsewer of this alternative would require less frequent maintenance than 2A, but would be more difficult to access than 2C or 2D because it is located through private property.
    - 2C – The stormsewer of this alternative would require less frequent maintenance than 2A, and would be less difficult to access than 2A or 2B because it is not located through private property. Furthermore, the maintenance of the canal in the Eagle Pass Nursery south of Eagle Pass Road would remain with the existing owner.
    - 2D – The stormsewer of this alternative would require less frequent maintenance than 2A, 2B, or 2C because it would not require any maintenance of the canal from SR 426 to Chapman Road. Also, the alternative would be less difficult to access than 2A, 2B, or 2C because it is not located through private property. Furthermore the maintenance of the canal from SR 426 to Chapman Road would remain with the existing owner.

- *Permitting Considerations* – A meeting with SJRWMD staff indicated that a Standard General environmental resource permit would likely be required by the SJRWMD for this improvement. Because no attenuation is currently proposed for this improvement, the district would require an analysis of downstream peak stages and flow rates to ensure that the peak flow rate increases caused by the proposed improvements would not cause flooding or erosion problems to downstream areas. The district may also require assurances that the proposed improvements would not increase pollutant loadings to downstream areas.

  The SJRWMD would also be concerned with the potential impacts to wetlands and surface waters of filling in or routing flow around parts of the outfall canal. Some sections of the outfall canal may be considered to be wetland cut. Impacts to wetland cut ditches may require mitigation. Impacts to upland cut ditches would only need to be quantified. If the improvements impact more than 1 acre of wetlands an Individual Permit would be required. Refer to Appendix D for the minutes from the meeting with SJRWMD staff.

- *Constructability* – The improvements appear to be straightforward to construct, the properties near the construction may experience some minor disturbances during construction including lane closure. Diversion of the flow in the canal would be required to construct proposed infrastructure in the canal.

- *Utility Conflicts* – Conflicts with existing utilities along Eagle Pass Road, SR 426, and Chapman Road are possible. Coordination with the affected utility companies will be needed during final design to determine utility location and relocations if necessary.

- *Ecological Impacts* – The proposed improvements would not be expected to permanently impact adjacent wetland areas.

- *Cost Estimate* – The estimated cost of the improvements for 2A, 2B, 2C, and 2D are **$230,943**, **$231,878**, **$227,378**, and **$368,354** respectively. Refer to Tables 6-2 to 6-5 for detailed cost estimates of the improvements.

W CHAPMAN RD

MES
INV. = 30.4'

REPLACE 36" CMP W/
40' OF 54" RCP

MES
INV. = 30.6'

ACQUIRE EASEMENT

ADD RUBBLE RIP-RAP
DOWNSTREAM OF HEADWALL

GRADE CHANNEL TO
PROPOSED HEADWALL

ADD HEADWALL
INV. = 33.8'

EAGLE PASS RD

REPLACE 30" CMP W/
34' OF 48" RCP

ADD HEADWALL
INV. = 33.9'

ADD HEADWALL
INV. = 34.3'

REPLACE 36" CMP W/
42' OF 48" RCP

ADD HEADWALL
INV. = 34.5'

EAGLE PASS NURSERY

ADD HEADWALL
INV. = 34.6'

REPLACE 36" CMP
40' OF 48" RCP

GRADE CHANNEL TO
PROPOSED HEADWALL

ADD HEADWALL
INV. = 34.8'

W SR 426

IMPROVEMENT 2A

- **Problem Description -** The existing conditions model indicates overtopping in the outfall canal that would cause flooding to the Eagle Pass Nursery during the 25 year /24 hour storm due to undersized and reverse graded pipes. In addition, high stages in the canal have caused wash outs at Eagle Pass Road. Also, the undersized culverts in the nursery contribute to high stages observed in the outfall canal upstream of SR 426.
- **Improvement Description / Objective –** Replace the existing 36" CMP culverts within the Eagle Pass Nursery and the 30" CMP culvert under Eagle Pass Road with larger and positively graded 48" RCP culverts that are in line with the SR 426 culvert. Also, replace the 36" CMP culvert under the driveway south of Chapman Road with a 54" RCP culvert to accommodate the increased flow rate from the Eagle Pass Road area.
- **Model Results After Improvement -** The improvements provide a passing LOS for the outfall canal in the Eagle Pass Nursery (nodes AW-480 and AW-490). Additionally, the improvements provide a passing LOS for the Wentworth Estates pond (node AW-385) and the outfall canal north of the subdivision (node AW-425). The other upstream problem areas would not be affected by this improvement. The peak discharges to the outfall canal downstream of the improvements along Chapman Road and under SR 417 would increase by roughly 30 cfs. However, the peak stages in the outfall canal downstream of the improvements would only increase roughly 0.1' due to the improved conveyance. Refer to Table 2 in Appendix C for the existing versus proposed peak stage results.

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

PARCELS

PROPOSED STRUCTURES

MITERED END SECTION
HEADWALL
PIPES
CHANNELS

EXISTING STRUCTURES

CONTROL STRUCTURE
HEADWALL
CURB INLET
ENDWALL
MANHOLE
PIPES
CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE 6-2

PROPOSED IMPROVEMENT AREA 2A

Aloma Woods Outfall Assessment

Inwood consulting engineers

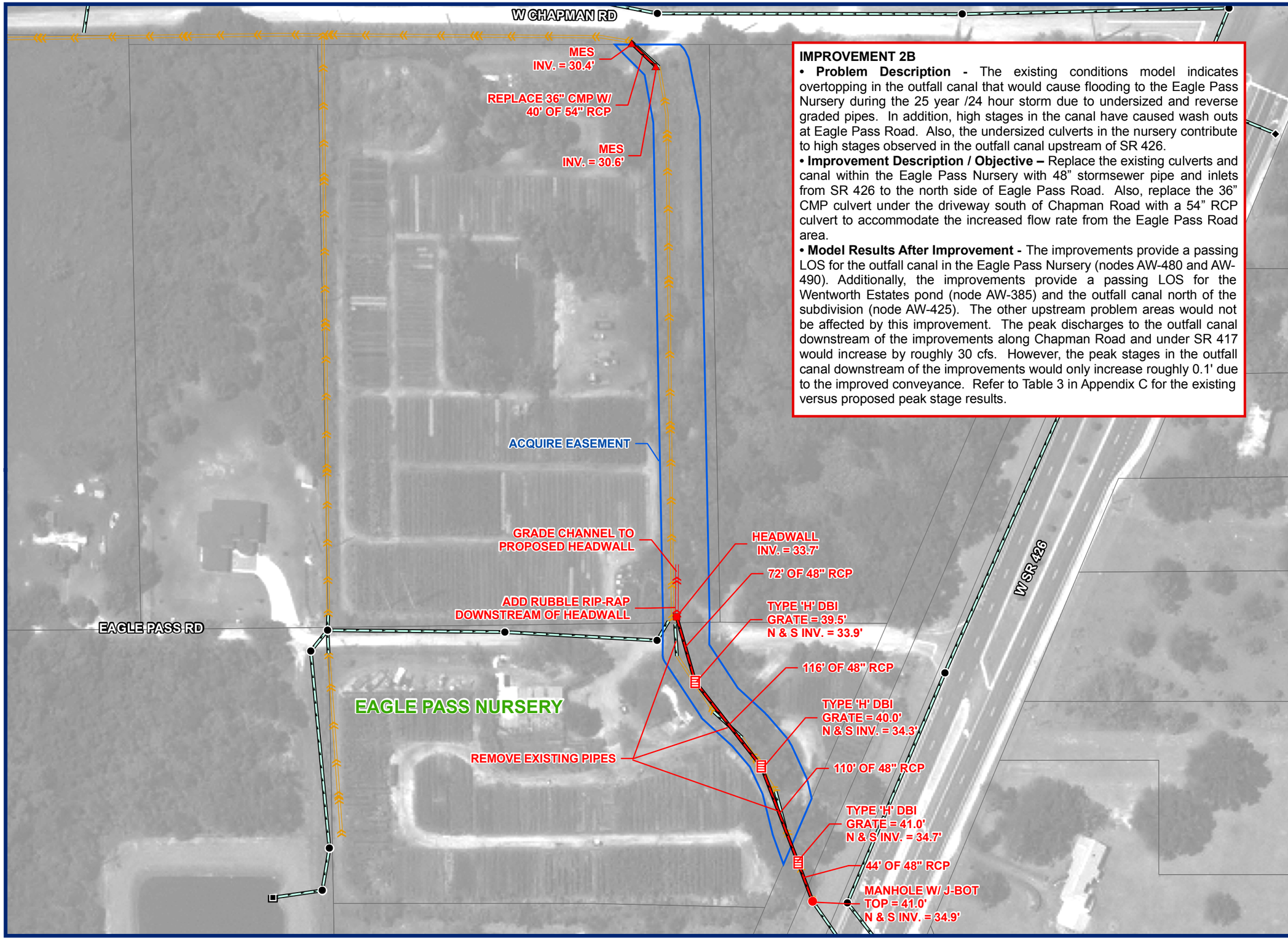
TABLE 6-2
PROPOSED IMPROVEMENT 2A
PROPOSED ESTIMATED PROJECT CONSTRUCTION COST[1]

Item	Description	Units	Unit Cost	Quantity	Total
1	MOBILIZATION/ DEMOBILIZATION (10% of Total)	LS	Varies	1	$7,204.50
2	MAINTENANCE OF TRAFFIC (5% of Total)	LS	Varies	1	$3,602.25
3	EROSION CONTROL (5% of Total)	LS	Varies	1	$3,602.25
4	CLEARING & GRUBBING (10% of Total)	LS	Varies	1	$7,204.50
5	EXCAVATION, EMBANKMENT, AND GRADING (10% of total)	LS	Varies	1	$7,204.50
6	CONCRETE CLASS I (HEADWALLS)	CY	$750.00	49	$36,675.00
7	REINFORCED CONCRETE PIPE (48")	LF	$120.00	116	$13,920.00
8	REINFORCED CONCRETE PIPE (54")	LF	$150.00	40	$6,000.00
9	MITERED END SECTION (4:1) (54")	EA	$5,000.00	2	$10,000.00
10	RIPRAP, RUBBLE, DITCH LINING	TN	$70.00	35	$2,450.00
11	SODDING (MATCH EXISTING) (ALL DISTURBED AREAS)	SY	$2.50	1200	$3,000.00
				CONSTRUCTION COST:	**$100,863.00**
				CONTINGENCY (15% OF TOTAL)	$15,129.45
				PROPERTY ACQUSITION (MARKET VALUE[2] * (90% + 20% ADMIN COSTS))	$114,950.44
				ESTIMATED TOTAL COST:	**$230,943**

NOTE:

1) The above cost estimate does not include any utility protection or relocations.
2) Referenced from Seminole County Property Appraiser

EASEMENT ACQUISITION			
PARCEL ID	JUST MARKET VALUE	% OF PROPERTY	JMV * % AREA
20-21-31-5CB-0000-006B	$873,535	8.00%	$69,882.80
20-21-31-5CB-0000-005A	$288,480	12.00%	$34,617.60
		TOTAL:	$104,500.40



IMPROVEMENT 2B

- **Problem Description -** The existing conditions model indicates overtopping in the outfall canal that would cause flooding to the Eagle Pass Nursery during the 25 year /24 hour storm due to undersized and reverse graded pipes. In addition, high stages in the canal have caused wash outs at Eagle Pass Road. Also, the undersized culverts in the nursery contribute to high stages observed in the outfall canal upstream of SR 426.
- **Improvement Description / Objective –** Replace the existing culverts and canal within the Eagle Pass Nursery with 48" stormsewer pipe and inlets from SR 426 to the north side of Eagle Pass Road. Also, replace the 36" CMP culvert under the driveway south of Chapman Road with a 54" RCP culvert to accommodate the increased flow rate from the Eagle Pass Road area.
- **Model Results After Improvement -** The improvements provide a passing LOS for the outfall canal in the Eagle Pass Nursery (nodes AW-480 and AW-490). Additionally, the improvements provide a passing LOS for the Wentworth Estates pond (node AW-385) and the outfall canal north of the subdivision (node AW-425). The other upstream problem areas would not be affected by this improvement. The peak discharges to the outfall canal downstream of the improvements along Chapman Road and under SR 417 would increase by roughly 30 cfs. However, the peak stages in the outfall canal downstream of the improvements would only increase roughly 0.1' due to the improved conveyance. Refer to Table 3 in Appendix C for the existing versus proposed peak stage results.

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

PARCELS

PROPOSED STRUCTURES

DITCH BOTTOM INLET
HEADWALL
MANHOLE
MITERED END SECTION
CHANNELS
PIPES

EXISTING STRUCTURES

CONTROL STRUCTURE
HEADWALL
CURB INLET
ENDWALL
MANHOLE
PIPES
CHANNELS

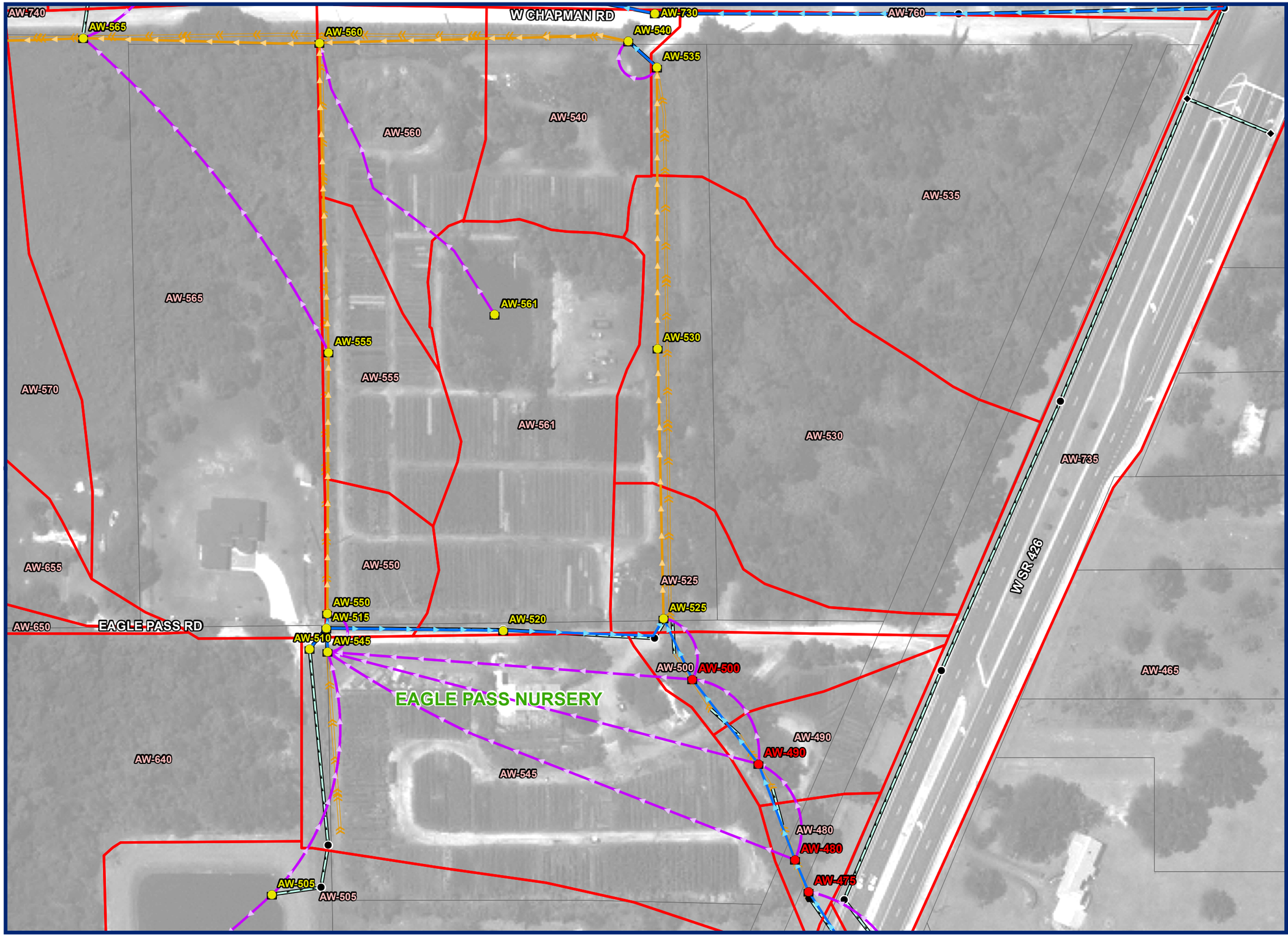
DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE 6-3

PROPOSED IMPROVEMENT AREA 2B

Aloma Woods Outfall Assessment

Inwood consulting engineers



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

- PARCELS
- PROPOSED NODES
- EXISTING NODES
- CHANNELS
- DROP STRUCTURES
- WEIRS
- PIPES
- SUBBASINS

EXISTING STRUCTURES

- CONTROL STRUCTURE
- HEADWALL
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE 6-4

PROPOSED IMPROVEMENT AREA 2B NODE-LINK MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

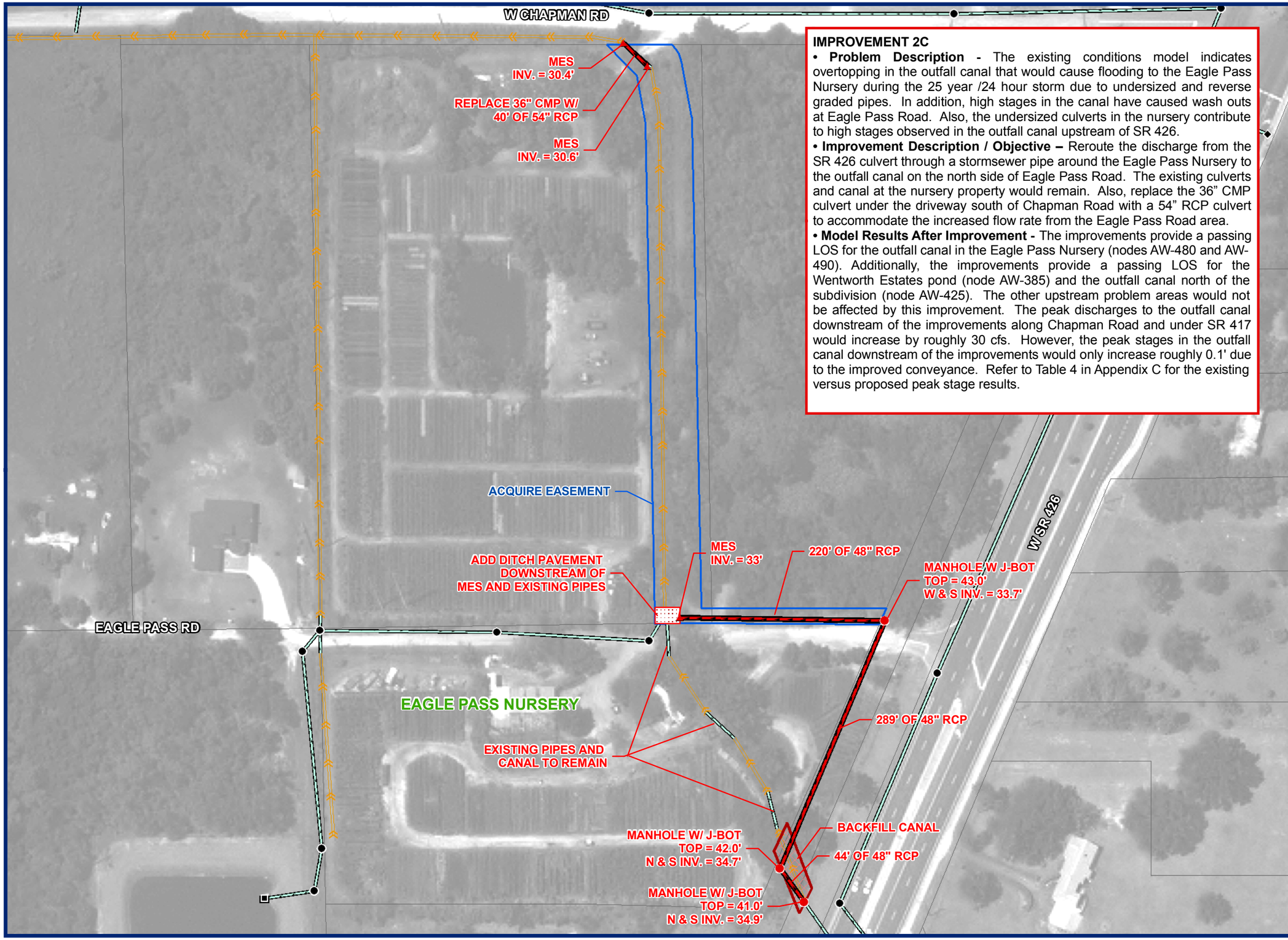
TABLE 6-3
PROPOSED IMPROVEMENT 2B
PROPOSED ESTIMATED PROJECT CONSTRUCTION COST[1]

Item	Description	Units	Unit Cost	Quantity	Total
1	MOBILIZATION/ DEMOBILIZATION (10% of Total)	LS	Varies	1	$7,531.50
2	MAINTENANCE OF TRAFFIC (5% of Total)	LS	Varies	1	$3,765.75
3	EROSION CONTROL (5% of Total)	LS	Varies	1	$3,765.75
4	CLEARING & GRUBBING (10% of Total)	LS	Varies	1	$7,531.50
5	EXCAVATION, EMBANKMENT, AND GRADING (5% of total)	LS	Varies	1	$3,765.75
6	TYPE 'H' DITCH BOTTOM INLET (<10')	EA	$4,400.00	3	$13,200.00
7	REINFORCED CONCRETE PIPE (48")	LF	$120.00	342	$41,040.00
8	REINFORCED CONCRETE PIPE (54")	LF	$150.00	40	$6,000.00
9	MITERED END SECTION (4:1) (54")	EA	$5,000.00	2	$10,000.00
10	RIPRAP, RUBBLE, DITCH LINING	TN	$70.00	35	$2,450.00
11	SODDING (MATCH EXISTING) (ALL DISTURBED AREAS)	SY	$2.50	1050	$2,625.00
				CONSTRUCTION COST:	**$101,676.00**
				CONTINGENCY (15% OF TOTAL)	$15,251.40
				PROPERTY ACQUSITION (MARKET VALUE[2] * (90% + 20% ADMIN COSTS))	$114,950.44
				ESTIMATED TOTAL COST:	**$231,878**

NOTE:

1) The above cost estimate does not include any utility protection or relocations.
2) Referenced from Seminole County Property Appraiser

EASEMENT ACQUISITION			
PARCEL ID	JUST MARKET VALUE	% OF PROPERTY	JMV * % AREA
20-21-31-5CB-0000-006B	$873,535	8.00%	$69,882.80
20-21-31-5CB-0000-005A	$288,480	12.00%	$34,617.60
		TOTAL:	$104,500.40



IMPROVEMENT 2C

• **Problem Description -** The existing conditions model indicates overtopping in the outfall canal that would cause flooding to the Eagle Pass Nursery during the 25 year /24 hour storm due to undersized and reverse graded pipes. In addition, high stages in the canal have caused wash outs at Eagle Pass Road. Also, the undersized culverts in the nursery contribute to high stages observed in the outfall canal upstream of SR 426.

• **Improvement Description / Objective –** Reroute the discharge from the SR 426 culvert through a stormsewer pipe around the Eagle Pass Nursery to the outfall canal on the north side of Eagle Pass Road. The existing culverts and canal at the nursery property would remain. Also, replace the 36" CMP culvert under the driveway south of Chapman Road with a 54" RCP culvert to accommodate the increased flow rate from the Eagle Pass Road area.

• **Model Results After Improvement -** The improvements provide a passing LOS for the outfall canal in the Eagle Pass Nursery (nodes AW-480 and AW-490). Additionally, the improvements provide a passing LOS for the Wentworth Estates pond (node AW-385) and the outfall canal north of the subdivision (node AW-425). The other upstream problem areas would not be affected by this improvement. The peak discharges to the outfall canal downstream of the improvements along Chapman Road and under SR 417 would increase by roughly 30 cfs. However, the peak stages in the outfall canal downstream of the improvements would only increase roughly 0.1' due to the improved conveyance. Refer to Table 4 in Appendix C for the existing versus proposed peak stage results.

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N 0 50 100 Feet

LEGEND

PARCELS

PROPOSED STRUCTURES

DITCH BOTTOM INLET
MANHOLE
MITERED END SECTION
PIPES

EXISTING STRUCTURES

CONTROL STRUCTURE
CURB INLET
ENDWALL
MANHOLE
PIPES
CHANNELS

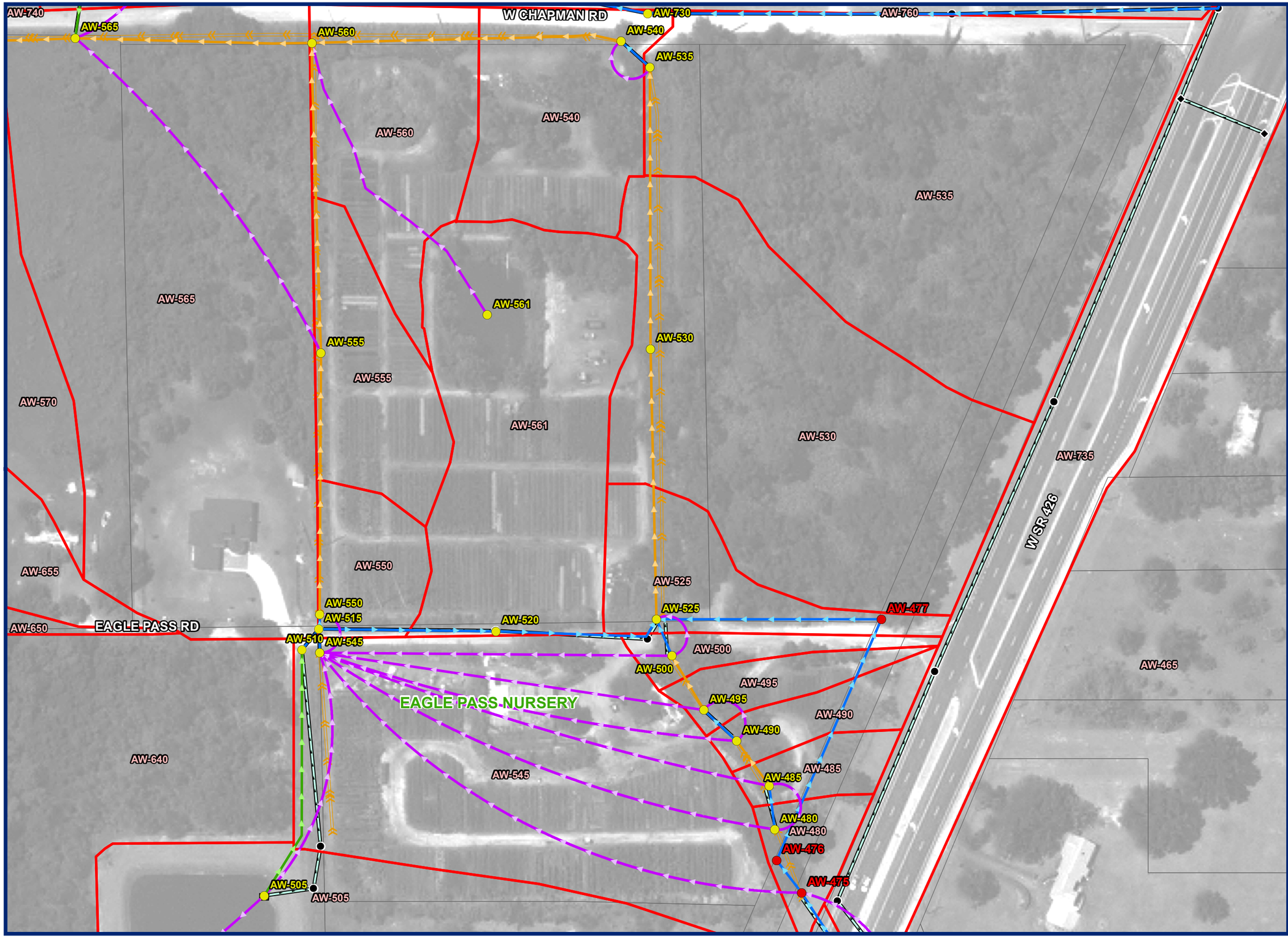
DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008
PARCELS: SEMINOLE COUNTY, 2009

FIGURE 6-5

PROPOSED IMPROVEMENT AREA 2C

Aloma Woods Outfall Assessment

Inwood consulting engineers



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

- PARCELS
- PROPOSED NODES
- EXISTING NODES
- PIPES
- WEIRS
- DROP STRUCTURES
- CHANNELS
- SUBBASINS

EXISTING STRUCTURES

- CONTROL STRUCTURE
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008
PARCELS: SEMINOLE COUNTY, 2009

FIGURE 6-6

PROPOSED IMPROVEMENT AREA 2C NODE-LINK MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

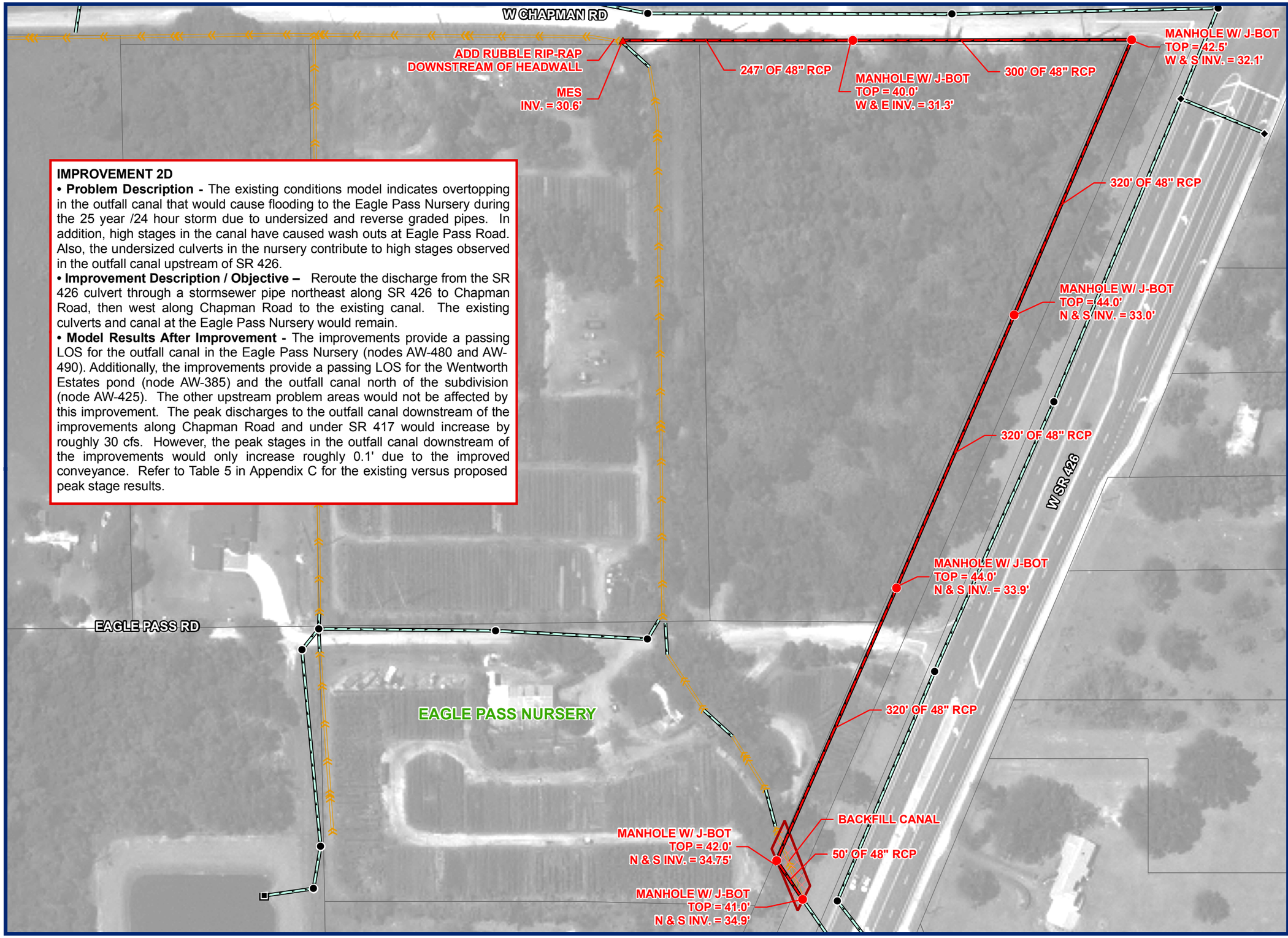
TABLE 6-4
PROPOSED IMPROVEMENT 2C
PROPOSED ESTIMATED PROJECT CONSTRUCTION COST[1]

Item	Description	Units	Unit Cost	Quantity	Total
1	MOBILIZATION/ DEMOBILIZATION (10% of Total)	LS	Varies	1	$10,003.00
2	MAINTENANCE OF TRAFFIC (10% of Total)	LS	Varies	1	$10,003.00
3	EROSION CONTROL (10% of Total)	LS	Varies	1	$10,003.00
4	CLEARING & GRUBBING (10% of Total)	LS	Varies	1	$10,003.00
5	EXCAVATION, EMBANKMENT, AND GRADING (7.5% of total)	LS	Varies	1	$7,502.25
6	MANHOLE W/ J-BOTTOM (<10')	EA	$4,000.00	3	$12,000.00
7	REINFORCED CONCRETE PIPE (48")	LF	$120.00	553	$66,360.00
8	REINFORCED CONCRETE PIPE (54")	LF	$150.00	40	$6,000.00
9	MITERED END SECTION (4:1) (54")	EA	$5,000.00	2	$10,000.00
10	CONCRETE DITCH PAVEMENT, REINFORCED	SY	$42.00	60	$2,520.00
11	SODDING (MATCH EXISTING) (ALL DISTURBED AREAS)	SY	$2.50	1260	$3,150.00
				CONSTRUCTION COST:	**$147,545.00**
				CONTINGENCY (15% OF TOTAL)	$22,131.75
				PROPERTY ACQUSITION (MARKET VALUE[2] * (90% + 20% ADMIN COSTS))	$57,700.96
				ESTIMATED TOTAL COST:	**$227,378**

NOTE:

1) The above cost estimate does not include any utility protection or relocations.
2) Referenced from Seminole County Property Appraiser

EASEMENT ACQUISITION			
PARCEL ID	JUST MARKET VALUE*	% OF PROPERTY	JMV * % AREA
20-21-31-5CB-0000-0050	$1,189,188	1.50%	$17,837.82
20-21-31-5CB-0000-005A	$288,480	12.00%	$34,617.60
		TOTAL:	$52,455.42



IMPROVEMENT 2D

- **Problem Description -** The existing conditions model indicates overtopping in the outfall canal that would cause flooding to the Eagle Pass Nursery during the 25 year /24 hour storm due to undersized and reverse graded pipes. In addition, high stages in the canal have caused wash outs at Eagle Pass Road. Also, the undersized culverts in the nursery contribute to high stages observed in the outfall canal upstream of SR 426.
- **Improvement Description / Objective –** Reroute the discharge from the SR 426 culvert through a stormsewer pipe northeast along SR 426 to Chapman Road, then west along Chapman Road to the existing canal. The existing culverts and canal at the Eagle Pass Nursery would remain.
- **Model Results After Improvement -** The improvements provide a passing LOS for the outfall canal in the Eagle Pass Nursery (nodes AW-480 and AW-490). Additionally, the improvements provide a passing LOS for the Wentworth Estates pond (node AW-385) and the outfall canal north of the subdivision (node AW-425). The other upstream problem areas would not be affected by this improvement. The peak discharges to the outfall canal downstream of the improvements along Chapman Road and under SR 417 would increase by roughly 30 cfs. However, the peak stages in the outfall canal downstream of the improvements would only increase roughly 0.1' due to the improved conveyance. Refer to Table 5 in Appendix C for the existing versus proposed peak stage results.

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

PROPOSED STRUCTURES
- MANHOLE
- MITERED END SECTION
- PIPES

EXISTING STRUCTURES
- CONTROL STRUCTURE
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS
- PARCELS

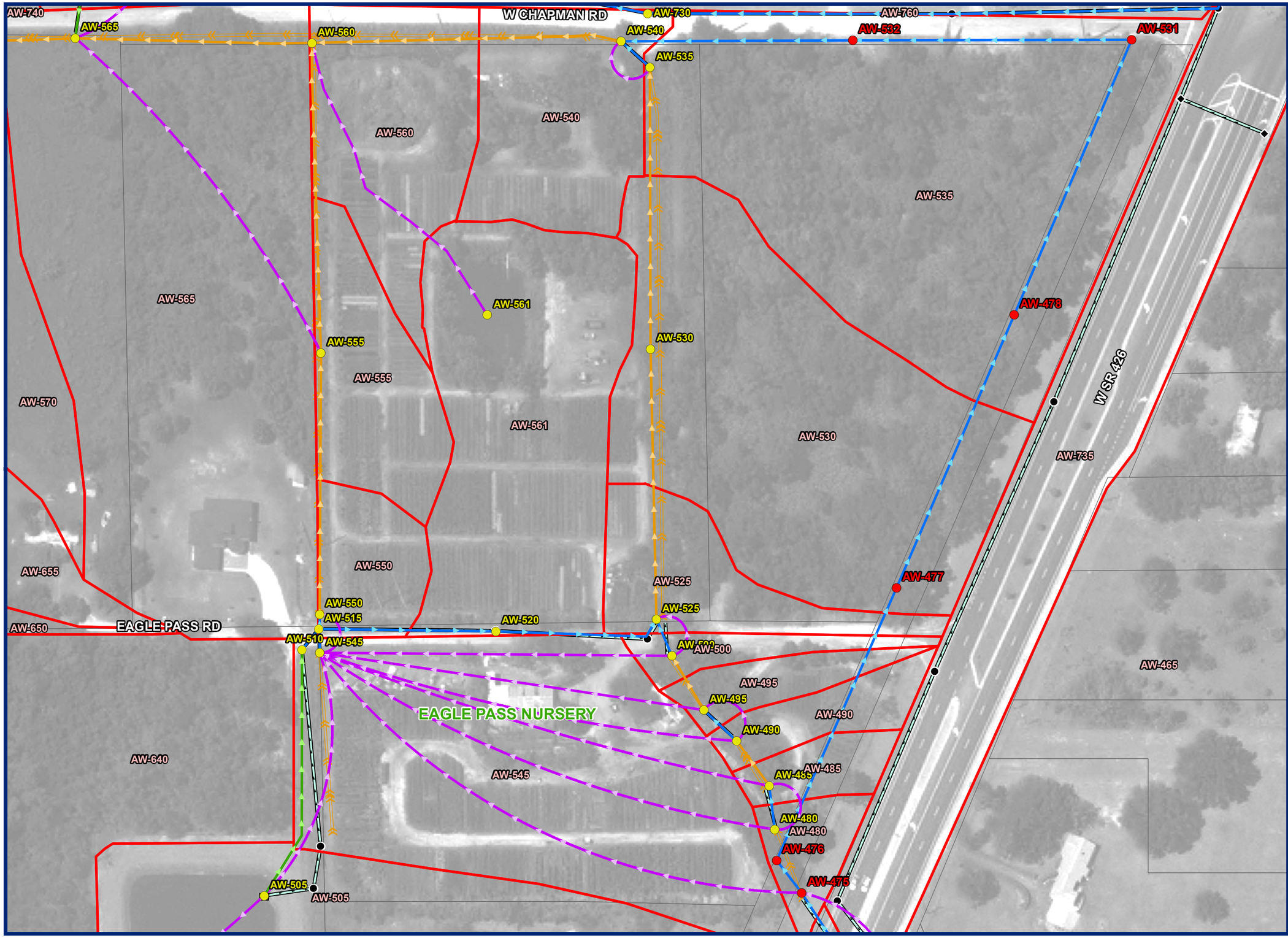
DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008
PARCELS: SEMINOLE COUNTY, 2009

FIGURE 6-7

PROPOSED IMPROVEMENT AREA 2D

Aloma Woods Outfall Assessment

Inwood consulting engineers



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

- PARCELS
- PROPOSED NODES
- EXISTING NODES
- CHANNELS
- DROP STRUCTURES
- WEIRS
- PIPES
- SUBBASINS

EXISTING STRUCTURES

- CONTROL STRUCTURE
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008
PARCELS: SEMINOLE COUNTY, 2009

FIGURE 6-8

PROPOSED IMPROVEMENT AREA 2D NODE-LINK MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

TABLE 6-5
PROPOSED IMPROVEMENT 2D
PROPOSED ESTIMATED PROJECT CONSTRUCTION COST[1]

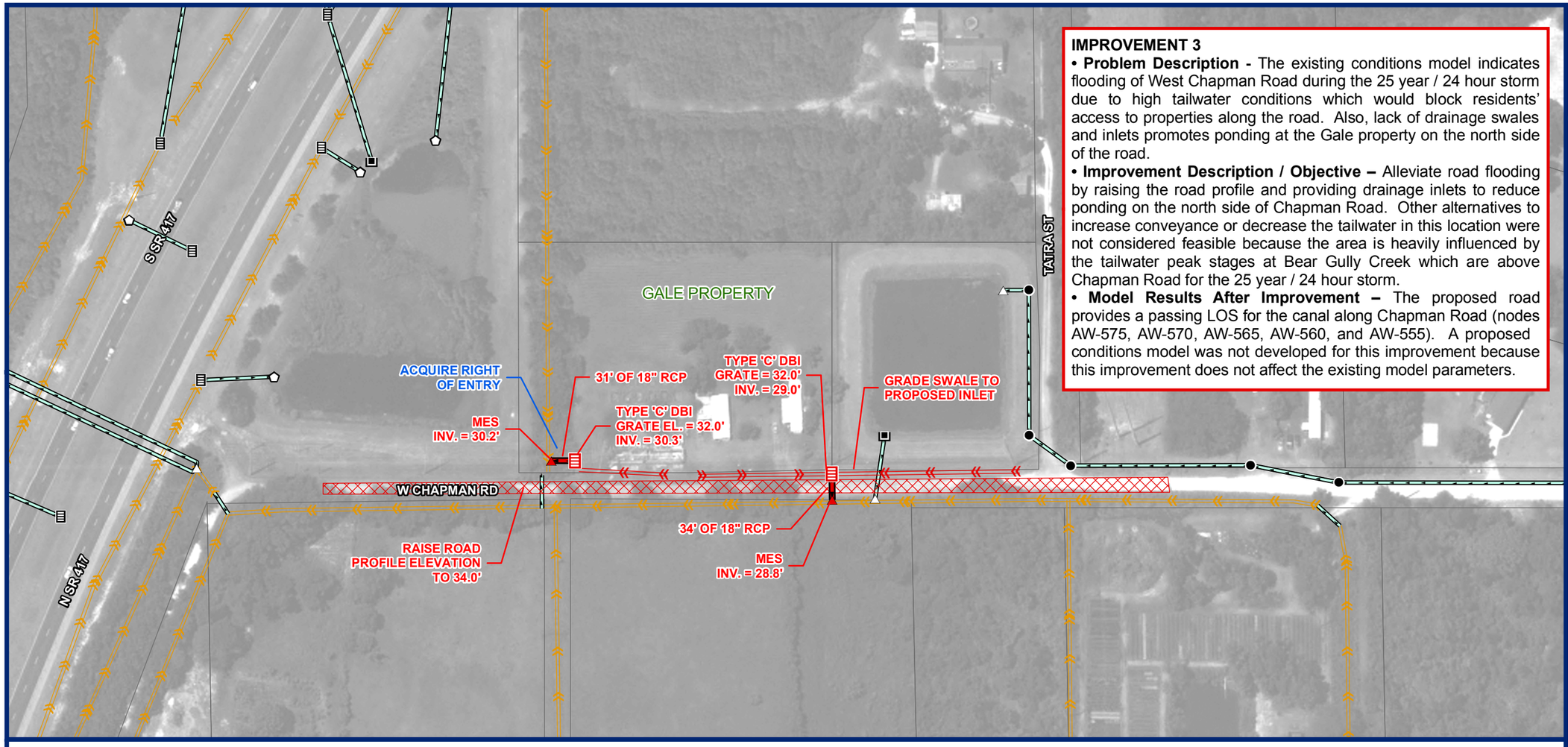
Item	Description	Units	Unit Cost	Quantity	Total
1	MOBILIZATION/ DEMOBILIZATION (10% of Total)	LS	Varies	1	$23,726.50
2	MAINTENANCE OF TRAFFIC (5% of Total)	LS	Varies	1	$11,863.25
3	EROSION CONTROL (5% of Total)	LS	Varies	1	$11,863.25
4	CLEARING & GRUBBING (10% of Total)	LS	Varies	1	$23,726.50
5	EXCAVATION, EMBANKMENT, AND GRADING (5% of total)	LS	Varies	1	$11,863.25
6	MANHOLE W/ J-BOTTOM (<10')	EA	$4,000.00	3	$12,000.00
7	MANHOLE W/ J-BOTTOM (>10')	EA	$6,000.00	3	$18,000.00
8	REINFORCED CONCRETE PIPE (48")	LF	$120.00	1557	$186,840.00
10	MITERED END SECTION (4:1) (54")	EA	$5,000.00	1	$5,000.00
11	RIPRAP, RUBBLE, DITCH LINING	TN	$70.00	35	$2,450.00
12	SODDING (MATCH EXISTING) (ALL DISTURBED AREAS)	SY	$2.50	5190	$12,975.00
				CONSTRUCTION COST:	**$320,308.00**
				CONTINGENCY (15% OF TOTAL)	$48,046.20
				ESTIMATED TOTAL COST:	**$368,354**

NOTE:

1) The above cost estimate does not include any utility protection or relocations.

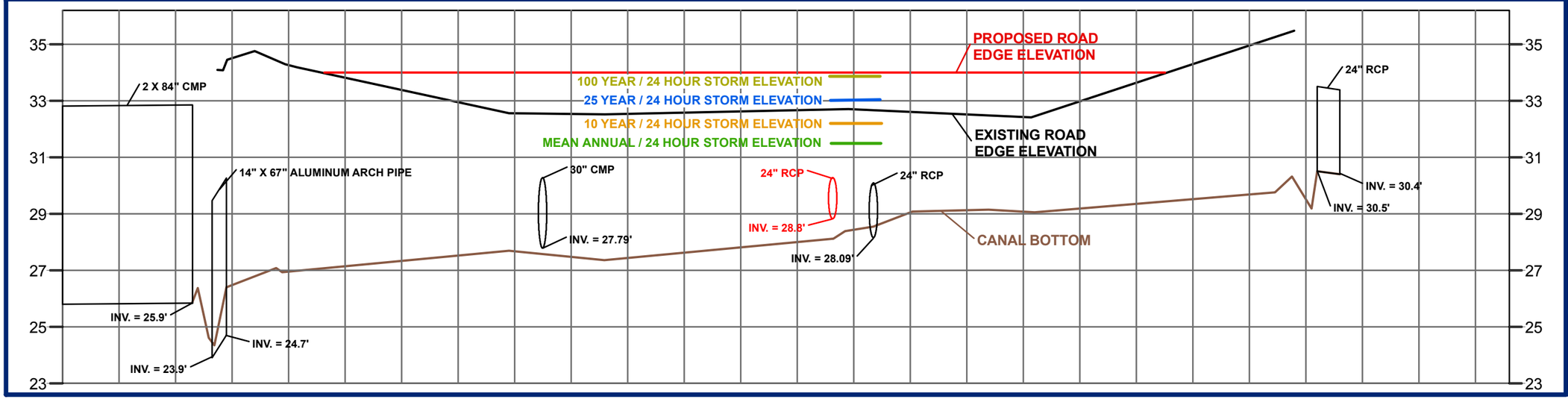
Improvement Area 3 – West Chapman Road – The improvement background, description, model results, and project issues are summarized below:

- **Problem Description -** The existing conditions model indicates flooding of West Chapman Road during the 25 year / 24 hour storm due to high tailwater conditions which would block residents' access to properties along the road. Also, lack of drainage swales and inlets promotes ponding at the Gale property on the north side of the road.
- **Improvement Description / Objective –** Alleviate road flooding by raising the road profile and providing drainage inlets to reduce ponding on the north side of Chapman Road. Other alternatives to increase conveyance or decrease the tailwater in this location were not considered feasible because the area is heavily influenced by the tailwater peak stages at Bear Gully Creek which are above Chapman Road for the 25 year / 24 hour storm. Refer to Figure 6-6 for a depiction of this improvement.
- **Model Results After Improvement –** The proposed road provides a passing LOS for the canal along Chapman Road (nodes AW-575, AW-570, AW-565, AW-560, and AW-555). A proposed conditions model was not developed for this improvement because this improvement does not affect the existing model parameters.
- **Project Issues:**
  - *Easement Acquisition* – An easement or right of entry would be required for the inlet and pipe on the Gale Property. All other construction is expected to occur within the road right of way.
  - *Maintenance Burden* – Other than routine maintenance of drainage infrastructure, no additional maintenance burden is anticipated.
  - *Permitting Considerations* – A meeting with SJRWMD staff indicated that this improvement should be exempt from permitting as long as the road remains the same width, and does not significantly impact drainage. The SJRWMD would however, be interested in ensuring that the proposed inlets on the north side of the road would not cause adverse impacts to the outfall canal or wetlands. Refer to Appendix D for the minutes from the meeting with SJRWMD staff.
  - *Constructability* – The properties adjacent to the construction may experience some minor disturbances including lane closure during construction. Some diversion of the flow in the canal may be necessary during road construction and construction of the proposed culvert that outfalls into the canal.
  - *Utility Conflicts* – Conflicts with existing utilities along Chapman Road are possible. Coordination with the affected utility companies will be needed during final design to determine utility location and relocations if necessary.
  - *Ecological Impacts* – The proposed improvements would not be expected to permanently impact adjacent wetland areas.
  - *Cost Estimate* – The estimated cost for this improvement is **$60,651**. Refer to Table 6-6 for a detailed cost estimate of the improvement.



IMPROVEMENT 3

- **Problem Description -** The existing conditions model indicates flooding of West Chapman Road during the 25 year / 24 hour storm due to high tailwater conditions which would block residents' access to properties along the road. Also, lack of drainage swales and inlets promotes ponding at the Gale property on the north side of the road.
- **Improvement Description / Objective –** Alleviate road flooding by raising the road profile and providing drainage inlets to reduce ponding on the north side of Chapman Road. Other alternatives to increase conveyance or decrease the tailwater in this location were not considered feasible because the area is heavily influenced by the tailwater peak stages at Bear Gully Creek which are above Chapman Road for the 25 year / 24 hour storm.
- **Model Results After Improvement –** The proposed road provides a passing LOS for the canal along Chapman Road (nodes AW-575, AW-570, AW-565, AW-560, and AW-555). A proposed conditions model was not developed for this improvement because this improvement does not affect the existing model parameters.



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

0 75 150 Feet

LEGEND

- PARCELS

PROPOSED STRUCTURES

- DITCH BOTTOM INLET
- MITERED END SECTION
- CHANNELS
- EASEMENT
- PIPES
- ROAD

EXISTING STRUCTURES

- CONTROL STRUCTURE
- DITCH BOTTOM INLET
- MITERED END SECTION
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE 6-9

PROPOSED IMPROVEMENT AREA 3

Aloma Woods Outfall Assessment

Inwood consulting engineers

TABLE 6-6
PROPOSED IMPROVEMENT 3
PROPOSED ESTIMATED PROJECT CONSTRUCTION COST[1]

Item	Description	Units	Unit Cost	Quantity	Total
1	MOBILIZATION/ DEMOBILIZATION (10% of Total)	LS	Varies	1	$987.50
2	MAINTENANCE OF TRAFFIC (10% of Total)	LS	Varies	1	$987.50
3	EROSION CONTROL (10% of Total)	LS	Varies	1	$987.50
4	CLEARING & GRUBBING (10% of Total)	LS	Varies	1	$987.50
5	EMBANKMENT (CHAPMAN ROAD)	CY	$7.50	1350	$10,125.00
6	STABILIZED SUBBASE	SY	$10.00	2159	$21,590.00
7	GRAVEL FILL	CY	$40.00	180	$7,200.00
8	TYPE 'C' DITCH BOTTOM INLET (<10')	EA	$2,000.00	2	$4,000.00
9	REINFORCED CONCRETE PIPE (18")	LF	$35.00	65	$2,275.00
10	MITERED END SECTION (4:1) (18")	EA	$800.00	2	$1,600.00
11	SODDING (MATCH EXISTING) (ALL DISTURBED AREAS)	SY	$2.50	800	$2,000.00
				CONSTRUCTION COST:	**$52,740.00**
				CONTINGENCY (15% OF TOTAL)	$7,911.00
				ESTIMATED TOTAL COST:	**$60,651**

NOTE:

1) The above cost estimate does not include any utility protection or relocations.

7.0 SUMMARY AND RECOMMENDATIONS

The purpose of this study was to address flooding problems along the Aloma Woods outfall canal and contributing areas. The study focused on developing improvement recommendations to relieve flooding problems along the outfall canal from Wentworth Estates to SR 417.

7.1 EXISTING CONDITIONS PROBLEM ASSESSMENT

Based on the review of the historical data, site characteristics data, previous studies, and the existing conditions modeling, the Aloma Woods Outfall Canal has deficiencies that may contribute to yard and road flooding. The following flooding problems have been observed along the outfall canal in the past and/or during the course of this study:

- Ponding along the north side of West Chapman Road near the Gale property.
- High stages in the canal in the Eagle Pass Nursery that threatened streets and yards and caused a washout of near the culvert under Eagle Pass Road.
- High stages in the canal that threatened streets and yards upstream of SR 426.
- Severe street flooding in the Wentworth Estates due to high stages in the subdivision ponds.

Additionally, the existing conditions model indicated failed level of service (LOS) in the following locations along the outfall canal:

- Road flooding of Chapman Road from high stages in the outfall canal due to high tailwater conditions at Bear Gully Creek.
- Yard flooding in the Eagle Pass Nursery south of Eagle Pass Road due to undersized culverts in the nursery.
- Yard flooding of properties north of Wentworth Estates along the east side of the canal due to undersized culverts in the Eagle Pass Nursery.
- Minor street flooding in the Wentworth Estates subdivision due to high stages in the subdivision pond.

The existing conditions model indicated other LOS failures at several locations within the contributing areas of the canal that were outside of the direct focus of this study. Several of the LOS failures were also noted previously by a 2004 PEC study model. These areas are recommended for further evaluation as a subsequent project phase:

- Road flooding in Aloma Woods Phase IV due to high stages in the subdivision stormwater pond and in the outfall pipe along Walker Road.
- Pond overtopping at the Progress Energy property due to high stages in the downstream outfall pipe along Aloma Woods Boulevard.
- Minor street flooding in Aloma Woods Phase I due to high stages in the subdivision stormwater pond.

The remaining LOS failures were not verified by previous modeling or field observations and are therefore recommended to be monitored for flooding problems in the future.

The study area was evaluated for existing water quality BMPs. The majority of the commercial and medium to high density residential land uses in the study area have water quality BMPs in place. Over half of the study area has no specific water quality BMP in place. These areas are predominantly low-density residential, rural or undeveloped type land uses. The County has considered the possibility of using the two large borrow pits adjacent to Bear Gully Creek for a regional water quality enhancement. Further evaluation of these borrow pits for pollutant load reduction is recommended as a subsequent project phase

An ecological assessment was conducted by Inwood staff. Several protected wading birds were observed in the wetlands. Also, the wetlands were found to be lacking in diversity of wetland vegetation and several nuisance / exotic species were observed. Overall the wetlands appeared to be adequately hydrated; however, the quality of the wetland vegetation and wildlife has been degraded due to nearby development.

7.2 IMPROVEMENT CONCEPTS

Several concepts were evaluated to improve the flooding problems along the outfall canal. The improvements were modeled where necessary to evaluate the effect the improvements would have on reducing flooding problems in the canal. The conceptual improvements are summarized below:

- **Improvement Area 1 –** Regrade the Outfall Canal between Wentworth Estates and SR 426 and between Eagle Pass Road and Chapman Road. Desilt the 14' X 67" aluminum arch pipe at the west end of Chapman Road. **This improvement is recommended to ensure proper maintenance of the canal and reduce sedimentation that impedes flow in the canal.**
- **Improvement Area 2 –** Four alternatives were developed to improve conveyance in the canal from SR 426 to Eagle Pass Road. The alternatives are described below:
    - **Improvement 2A –** Replace the undersized and poorly graded existing culverts in the Eagle Pass Nursery, under Eagle Pass Road, and a driveway culvert south of Chapman Road with larger positively graded culverts to relieve flooding along the canal.
    - **Improvement 2B –** Replace the undersized and poorly graded existing culverts in the Eagle Pass Nursery and under Eagle Pass Road with a larger positively graded stormsewer with inlets to relieve flooding along the canal. Also, replace the driveway culvert south of Chapman Road with a larger culvert.
    - **Improvement 2C –** Route the flow from the SR 426 culvert around the Eagle Pass Nursery through proposed stormsewer to the existing Outfall Canal on the north side of Eagle Pass Road. Also, replace the driveway culvert south of Chapman Road with a larger culvert.

- **Improvement 2D –** Route the flow from the SR 426 culvert northeast through proposed stormsewer along SR 426 then west along Chapman Road to the existing outfall canal. **Although improvement 2D is the most expensive improvement 2 alternative, it is recommended for implementation over the other alternatives for the following reasons**:
  - This is the only alternative that would not require easement acquisition, which would likely be the most acceptable alternative to the public.
  - This alternative would eliminate the need for the County to maintain the canal from SR 426 to Chapman Road.
  - This alternative would not require access through private property for construction or maintenance.
  - This alternative would provide the most significant flood relief in the outfall canal from SR 426 to Chapman Road.

- **Improvement Area 3 –** Raise the elevation of Chapman Road above the Bear Gully Creek tailwater and construct inlets and swale on the north side of the road. **This improvement is recommended because it is a reasonably low cost improvement that would relieve road flooding and nuisance ponding along the north side of Chapman Road.**

7.3 RECOMMENDATIONS

The following recommendations are provided based on this study:

- Implement outfall canal improvements 1, 2D, and 3. The total estimated cost of the recommended improvements is summarized in Table 7-1 below.

Table 7-1 – Recommended Improvements Cost Summary

Recommended Improvement	Estimated Cost
Improvement 1	$97,448
Improvement 2D	$368,354
Improvement 3	$60,651
Total Cost =	**$526,453**

- Conduct follow up study to identify improvement alternatives for LOS deficiencies in Aloma Woods area.
- Conduct follow up study for potential regional water quality solution associated with borrow pits near Bear Gully Creek.

Refer to Figure 7-1 for the locations of the study recommendations.

FOLLOW UP STUDY FOR POTENTIAL REGIONAL WATER QUALITY SOLUTION ASSOCIATED WITH BORROW PITS NEAR BEAR GULLY CREEK.

OUTFALL CANAL IMPROVEMENT 3 - RAISE CHAPMAN ROAD AND CONSTRUCT INLETS AND PIPE ON NORTH SIDE OF ROAD.

OUTFALL CANAL

OUTFALL CANAL

OUTFALL CANAL

OUTFALL CANAL IMPROVEMENT 2D - CONSTRUCT STORMSEWER TO ROUTE FLOW FROM SR 426 TO OUTFALL CANAL ALONG CHAPMAN ROAD.

OUTFALL CANAL IMPROVEMENT 1 - REGRADE CANAL AND DESILT CULVERT.

FOLLOW UP STUDY TO IDENTIFY IMPROVEMENT ALTERNATIVES FOR LOS DEFICIENCIES IN ALOMA WOODS AREA.

NOTE:
RECOMMENDATIONS COLOR CODING:
IMPROVEMENT RECOMMENDATIONS = RED TEXT
FOLLOW UP STUDY RECOMMENDATIONS= BLUE TEXT

PIMA PT
WINDING LAKE CIR
QUARRYSTONE CT
LAKELET LOOP
BRIGHTWATER PL
BEAR GULLY CREEK
ROCK LN
MORNING STAR PL
S SR 417
TATRA ST
REBEL RUN
CHURCHILL
CHIPMUNK LN
OUTER CIRCLE DR
FOUNTAIN DR
CATBIRD LOOP
HAVEN DR
KIWI CT
ELECTRIC LN
WOODPECKER LN
NOTWEN LN
SEYMOUR CT
HARLEY CT
LARK CT
STORYBOOK LN
W CHAPMAN RD
N MERAN LN
OAKFORD PL
EAGLE PASS RD
DOUBLE R LN
N SR 417
MIKLER RD
WENTWORTH ESTATES
ASHTON TER
W MIKLER RD
MIKLER RD
BRUCE LN
GARLANGER TRL
TOKEN TRL
W SR 426
CAMP RD
WESTON ST
EBONY CV
OWLS NEST CV
JAMES DR
EAST ST
SOUTH ST
SECURITY AVE
WALKER RD
LIGUSTRUM LOOP
BEARSTONE RUN
KIRK RD
FERN FOREST RUN
WEMBLEY PL
TALLMAPLE LOOP
ALOMA OAKS DR
MISTYWOOD CT
BELLEWATER PL
CYPRESS HEAD TRL
BARNSWALLOW LN
RED LEAF CT
LEANING PINE LN
RYE GRASS LN
WHITE HERON PL
IRON BRIDGE CIR
WESTMINSTER TER
BLACKBERRY TRL
MICHAEL DR
ROBIN LEE RD
RUSTIC PINE TRL
RUTHERFORD PL
ALOMA DR
LITTLE HILL CV
WYNN MANOR WAY
ALOMA WOODS BLVD
PINE GROVE RUN
CEDAR GLEN PL
MAGNOLIA BLOOM TER
SAND BLUFF CV
OAKLAKE TRL
OAK BLUFF WAY
ALOMA LAKE RUN

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N
0 400 800
Feet

LEGEND

PARCELS

DATA SOURCES:
AERIAL IMAGERY: SEMINOLE COUNTY, 2008
STREETS & PARCELS: SEMINOLE COUNTY, 2008

FIGURE 7-1

STUDY RECOMMENDATIONS MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

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2. Aloma Bend Marketplace, Design Service Group, SJRWMD ERP# 42-117-1223an-Erp, 1997
3. Aloma Self Storage Warehouse, Talbot Environmental Inc, SJRWMD ERP# 40-117-63584-2, 1999

4. Aloma Woods Ph 6&8 (Split Transfer), CFQ Real Estate Group, Inc, SJRWMD ERP# 4-117-0247m3h-Erp, 1997
5. Aloma Woods Ph 7 (Letter Mod), Madden Engineering Inc, SJRWMD ERP# 4-117-22121-15, 1999
6. Aloma Woods Ph 7 (Split Transfer), CFG Real Estate Group, Inc, SJRWMD ERP# 4-117-0247m3h2-Erp, 2005
7. Aloma Woods Phase Iv, Harling, Locklin & Associates, Inc, SJRWMD ERP# 40-117-0362-Erp, 1997
8. Aloma Woods Phases 6,7&8, Madden Engineering Inc, SJRWMD ERP# 4-Ll7-0247m3-Erp, 1999
9. Alternate Surfacing-Church St, PBS&J, SJRWMD ERP# 400-117-111576-1, 2007
10. Camden, Harling, Locklin & Associates, Inc, SJRWMD ERP# 4-117-0235a, 1989
11. Camden Phase Iii, Harling, Locklin & Associates, Inc, SJRWMD ERP# 40-117-0321-Erp, 1995
12. Center For Alternative Medicine, Civil/Site Engineering Inc, SJRWMD ERP# 40-117-22121-14, 2005
13. Chapman Road, PEC, Inc, SJRWMD ERP# 4-117-0350g, 1992
14. Devon Forest, Harling, Locklin & Associates, Inc, SJRWMD ERP# 4-117-0247, 1990
15. Elmhurst Village, Madden Engineering Inc, SJRWMD ERP# 42-117-56514-1, 1999
16. Estates Of Aloma Woods (FKA Devon Forest), Harling, Locklin & Associates, Inc, SJRWMD ERP# 4-117-0247m-Erp, 1997
17. Florida Power Corporation Jamestown Operations Center, GMA Design Corp, SJRWMD ERP# 42-117-48836-1, 2006
18. Jamestown Hydrogen Refueling Station, Techexpress Corp, SJRWMD ERP# 400-117-48836-3, 2006
19. Juan Adriatico Property, Harling, Locklin & Associates, Inc, SJRWMD ERP# 40-117-0408-Erp, 1997
20. Loma Vista Apartments, Harling, Locklin & Associates, Inc, SJRWMD ERP#42-117-1369n-Erp, 1999
21. Loma Vista Commercial Phase 2, Harling, Locklin & Associates, Inc, SJRWMD ERP# 4-117-22480-4, 2005
22. Lukas Nursery Gravel Parking, Professional Design Associates, SJRWMD ERP# 44-117-71262-1, 2001
23. Lutheran Haven Nursing Home And ALF, Harris Civil Engineers, SJRWMD ERP# 42-117-91445-1, 2004
24. Magnolia Corporate Center, American Civil Engineering Co, SJRWMD ERP# 40-117-107367-1, 2006
25. Mikler Lake Subdivision, Mellich Blenden Engineering Inc, SJRWMD ERP# 4-117-90178-1, 2004

26. Mikler Road Commerce Center, American Civil Engineering Co, SJRWMD ERP# 40-117-109387-1, 2007
27. Mobil Center At Loma Vista P.U.D, Florida Engineering Group, Inc, SJRWMD ERP# 42-117-65877-1, 2000
28. Oviedo Commerce Center, Universal Engineering Sciences, Inc, SJRWMD ERP# 40-117-68674-1, 2000
29. Provenance, Madden Engineering, Inc, SJRWMD ERP# 40-117-22480-5, 2006
30. R.D.C. Slavia Road, Realty Development Corp, SJRWMD ERP# 4-117-0474-Erp, 1997
31. R.D.C. Slavia Road (Transfer), Cecil Stone , SJRWMD ERP# 4-117-0474k-Erp, 1997
32. Regency Estates Phase II, Harling Lockin & Associates, Inc, SJRWMD ERP# 42-117-99983-1, 2005
33. Security Avenue, DRMP, Inc, SJRWMD ERP# 42-117-0886ang, 1993
34. Sikh Society Of Central Florida Church, International Engineering Consultants, Inc, , SJRWMD ERP# 42-117-61169-1, 2000
35. SR 426 Office Complex, Engineering & Design Group, Inc, SJRWMD ERP# 40-117-945578-1, 2005
36. SR 426 Roadway Widening, Consul-Tech Engineering, Inc, SJRWMD ERP# 4-117-22480-2, 2000
37. SR 426 @ Aloma Woods Blvd, Pond 3 Outfall Modification (Letter modification), Florida Department Of Transportation , SJRWMD ERP# 4-117-22480-6, 2009
38. St. Luke Lutheran Church, Jewett Engineers, Inc, SJRWMD ERP# 42-117-0456an, 1989
39. St. Luke's Lutheran School Expansion, Ivey, Harris & Walls, Inc, SJRWMD ERP# 40-117-48914-4, 2001
40. Wentworth Subdivision, Genesis Engineering Group Of Central Florida, SJRWMD ERP# 4-117-0437k-Erp, 1997

CONSTRUCTION PLANS

1. State Road No. 426, Financial Project Id 240174-1-52-01, State Project No. 77060-3518, Consul-Tech Engineering, Inc, 1998
2. State Road No. 417, Final Plans, Project No. 97770-3300, Dyer, Riddle, Mills & Precourt, Inc, 1994
3. State Road No. 417, Project No. 97770-3301, Hensley-Schmidt, Inc, 1993

APPENDIX A

Hydrologic / Hydraulic Model Development and Parameterization Summary

APPENDIX A
HYDROLOGIC / HYDRAULIC MODEL DEVELOPMENT AND PARAMETERIZATION SUMMARY

Name of Modeling Software:	Interconnected Channel and Pond Routing (ICPR, Version 3.1, Service Pack 6)

Modeling Software Description:

ICPR uses a subbasin-node-link representation of real world conditions. Using the site characteristics and the SCS runoff method (or others), ICPR calculates rainfall rates, soil infiltration rates, and available storage capacity, for discrete storm events. This in turn models a runoff hydrograph that can be applied to an area of hydraulic interest within the study area. The calculated runoff can then be hydrodynamically routed through any number of surface and/or subsurface conveyance structures to evaluate their effectiveness in conveying stormwater.
ICPR can model natural (irregular) channels, prismatic channels, in-line ponds and other storage entities, including the accommodation of overbank flooding. Various control structures can also be simulated including pipes, culverts, drop structures, weirs, orifices, etc. The program can also accommodate the simulation of time dependent tailwater conditions and the effects of submerged and reverse flows. Model output includes detailed stage, storage, and flow data representations versus time for all nodes and links.

Hydrologic Parameters Development:

The model uses subbasins to provide the hydrologic parameters used to generate the runoff volume routed in the hydraulic portion of the model. Using SCS Runoff Hydrograph Method, each subbasin is assigned an appropriately determined area, curve number, time of concentration, and unit hydrograph peaking factor to simulate the runoff from the represented area. Each basin translates a hydrograph to one specific assigned model node.

Subbasins:

Subbasin Delineation Description:

Subbasin delineation was conducted using the using 1' contours and spot elevations obtained from SJRWMD and site specific topo data obtained from development plans to determine boundaries between subbasins.

Runoff Method:	SCS Unit Hydrograph

Curve Number

Description:

Area weighted curve numbers (CN) were calculated for each subbasin by intersecting the soil type (hydrological factor) and land use data within each subbasin using ArcGIS. Literature derived curve number values based from the NRCS's Technical Release 55 (TR-55) were assigned to each of the soil type/land use combinations. A weighted CN was then calculated for each subbasin based on the relative percentages of the various land use and soil types within it. The weighted CN of each subbasin is shown on Figure A-1.

Table References

Table A-1 - Landuse Based Curve Number Reference Table
Table A-2 - Curve Number Calculation Table

Time of Concentration

Description:

The time of concentration (Tc) represents the amount of time it takes for a particle of water to travel from the hydraulically most distant point in the drainage basin to its outlet. The Tc is computed by summing all the travel times for consecutive flow components (sheet flow, shallow concentrated flow, channel flow) of the subbasin conveyance system in accordance with TR-55.
Sheet flow is flow over plane surfaces of less than 300'. After 300' sheet flow is assumed to become shallow concentrated flow. Shallow concentrated flow is also used for flow in very small channels like water flowing along a street curb. Open channel flow is used for flow in ditches or pipes.
The Tc of each subbasin is shown on Figure A-2.

Table References

Table A-3 - Time of Concentration Calculation Table

Peaking Factor Description:

The SCS Unit Hydrograph Method requires a unit hydrograph peak attenuation factor be specified. The selection of a unit hydrograph peaking factor depends on the geographical area and local conditions. The peak rate factor (K) was consistently applied over the project study area to account for average slope, storage, drainage conditions, and predominant land uses present.
A value of 323 was used which is for watersheds with moderate surface storage in some location due to depression area, mild slopes and/or lack of existing drainage features.

Modeled Storm Events:

Rainfall Distribution	Frequency (years)	Duration (hours)	Depth (in)	Model Simulation Time (hours)
SCS II - FL Modified	Mean Annual	24	5.3	60
SCS II - FL Modified	10	24	6.8	60
SCS II - FL Modified	25	24	8.4	60
SCS II - FL Modified	100	24	11.4	60
Tropical Storm Fay	N/A	240	15.2	240

HYDROLOGIC / HYDRAULIC MODEL DEVELOPMENT AND PARAMETERIZATION SUMMARY

Hydraulic Parameters Development:

Nodes

Node Types Description:

Nodes in the model are typically either defined as Stage/Area or Time/Stage. Stage/Area nodes are used to model storage areas like waterbodies/depressions and can also be used as junctions in channels and manholes in pipe networks. Nodes designated as "Manhole Nodes" are essentially Stage/Area nodes that invoke a manhole loss algorithm in the model. Time/Stage nodes typically represent the discharge point(s) or boundary condition(s) in the model.

Initial Stage Methodology:

All initial stages were set such that all model simulation would begin at static equilibrium.

Node Type	Initial Stage Description
Pond Nodes:	Pond design control elevation, season high information if available, or the lowest elevation for dry ponds from the topographic data.
Wetland Nodes	Seasonal high water elevation or the overtopping elevation
Manhole, Inlet, or Other Junction Nodes:	Downstream pipe or channel invert.
Nodes Influenced by Tailwater:	Tailwater elevation

Warning Stage Methodology:

The warning stage is the elevation at which flooding of concern is expected to occur.

Node Type	Warning Stage Description
Pond Nodes:	Pond top of bank
Inlet or Other Junction Nodes Near Road:	Lowest adjacent edge of pavement
Channel Nodes:	Channel top of bank
Manhole Nodes:	Manhole lid

Time/Stage (Boundary) Nodes Description:

BGC-0110 - Represents the model tailwater condition at model confluence with Bear Gully Creek. The node stages were varied for each storm event in the model based on time stage data for the creek from the Howell Creek Basin ICPR model (CDM, 2008).

AW-015 - Represents the model tailwater condition at the wetland south of the Aloma Woods subdivision. The node stages were varied for each storm event in the model based on time stage data for the wetland from the Little Econlockhatchee River Basin model (SAI, 2001).

Links:

The model analyzed flow in links allowing the evaluation of conveyance effectiveness between nodes. Entrance/exit/bend/ head losses were incorporated where appropriate.

Pipes:

Description:

These links are used to represent the various pipe and culvert sections included in the model.

Manning's Roughness Coefficient:

Reinforced Concrete Pipe	Corrugated Metal Pipe
0.012	0.024

Entrance Losses:	Varies from 0.5 to 0.7 depending on pipe inlet edge.
Exit Losses:	Set to 1 for discharge into a static water body (pond, lake, etc.) or 0 if the flow velocity is expected to be carried through to the next downstream link. In some cases values between 0 and 1 were used where slight changes in downstream velocity were expected.
Bend Losses:	Varies from 0 when downstream pipe is aligned with the upstream pipe to 0.7 when the downstream pipe is at a 90 degree angle relative to the upstream pipe.
FHWA Inlet Edge Descriptions:	For submerged inlet face conditions, end treatment designations were also assigned for pipes based on standard FHWA values. Where exact end treatment geometry was uncertain, typical values were used by default (i.e., square-edges headwall for pipes, elliptical inlet face for mitered end sections, etc.).

HYDROLOGIC / HYDRAULIC MODEL DEVELOPMENT AND PARAMETERIZATION SUMMARY

Channels:

Description:

These links were used to represent open drainage ways like ditches, swales, creeks etc., in the model.

Manning's Roughness Coefficient:		Varies from 0.03 for straight channels with well maintained grass to 0.08 or higher for channels with poorly maintained vegetation, trees, obstructions, meander, or other obstructions within the channel.
Entrance Losses:	0.00	For all channels in the model.
Exit Losses:	1.00	for discharge into a static water body
Contraction Coefficient:	0.10	These values are used in channels with gradual transitions.
Expansion Coefficient:	0.30	

Weirs:

Description:

These links are used to represent outflow weirs at ponds, inlet characteristics to some outfall structures, and to represent overtopping of roadways, or overland flow. The specific geometry of the weir was input into the model. In general, horizontal weirs were used to model flat inlet structures and ditch bottom inlets. Vertical weirs were used to model control structure slots and bleeders along with true weir structures (sharp or broad crested) and overtopping situations. Where complex multi-level weirs are present, two or more separate model weirs were used to account for outflow. In the case of overtopping, rectangular wide flat vertical weirs were used to account for cross-node flow of runoff around other links and between roadway depressional areas.

Weirs Coefficient:

Overland / Saddle Flow	Overtopping Roadway	Sharp Crested Weir (typically pond outfall)
2.60	2.80	3.20

Orifice Coefficient: 0.60

Drop Structures:

Typically, the application for drop structures were to represent the control structure at one of the ponds in the study area. The weir and pipe data associated with these links is identical to the weir and pipe data discussed above. These links were also used to simulate inlet-to-pipe in series combinations.

Cross - Sections

Description:

Location specific irregular cross - sections were extracted from the project survey or 1' contours for use in the model. Cross - sections were assigned to specific weir or channel links in the model to provide the irregular geometric properties for these links. For the case of cross-sections used in channel links, the cross sections can be used to store Manning's N values as well as geometric data.

Notes:

Model Statistics	
Feature	**Number of Features**
Subbasins	136
Nodes	166
Pipes	71
Channels	54
Weirs	136
Drop Structures	28
Boundary Conditions	2

TABLE A-1

LANDUSE BASED CURVE NUMBER REFERENCE TABLE

FLUCFCS LAND USE CODE	FLUCFCS LAND USE DESCRIPTION[1]	% OF THE PROJECT AREA	DESIGN CURVE NUMBERS[2]					
			A	B	C	D	B/D	WATER
1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	6.81%	51	68	79	84	84	100
1190	LOW DENSITY UNDER CONSTRUCTION	7.84%	51	68	79	84	84	100
1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	8.93%	57	72	81	86	86	100
1300	RESIDENTIAL HIGH DENSITY	14.87%	77	85	90	92	92	100
1400	COMMERCIAL AND SERVICES	8.45%	89	92	94	95	95	100
1700	INSTITUTIONAL	0.23%	81	88	91	93	93	100
1900	OPEN LAND	1.77%	44	65	77	82	82	100
1920	INACTIVE DEVELOPMENT	3.70%	44	65	77	82	82	100
2110	IMPROVED PASTURES	1.71%	44	65	77	82	82	100
2120	UNIMPROVED PASTURES	1.82%	44	65	77	82	82	100
2130	WOODLAND PASTURE	0.04%	44	65	77	82	82	100
2430	ORNAMENTAL NURSERY	0.69%	59	74	82	86	86	100
3100	HERBACEOUS RANGELAND	0.37%	39	61	74	80	80	100
3200	SHRUB AND BRUSH RANGELAND	0.53%	43	65	76	82	82	100
3300	MIXED RANGELAND	0.87%	49	69	79	84	84	100
4000	UPLAND FOREST	1.07%	36	60	73	79	79	100
4110	PINE FLATWOODS	0.16%	36	60	73	79	79	100
4340	HARDWOOD CONIFER MIXED	4.17%	36	60	73	79	79	100
5100	STREAMS AND WATERWAYS	0.24%	100	100	100	100	100	100
5300	RESERVOIRS	5.86%	100	100	100	100	100	100
6170	MIXED WETLAND HARDWOODS	10.17%	68	79	86	89	89	100
6250	HYDRIC PINE FLATWOODS	0.09%	68	79	86	89	89	100
6300	WETLAND FORESTED MIXED	2.50%	68	79	86	89	89	100
6410	FRESHWATER MARSHES	0.47%	100	100	100	100	100	100
6430	WET PRAIRIES	0.83%	98	98	98	98	98	100
6440	EMERGENT AQUATIC VEGETATION	0.06%	98	98	98	98	98	100
6460	TREELESS HYDRIC SAVANNA	6.26%	98	98	98	98	98	100
8140	ROADS AND HIGHWAYS	8.35%	83	89	92	93	93	100
8310	ELECTRIC POWER FACILITIES	0.35%	68	79	86	89	89	100
8320	ELECTRICAL POWER TRANSMISSION LINE	0.82%	68	79	86	89	89	100

[1]FLUCFCS codes and descriptions referenced from FDOT Handbook Surveying and Mapping Office Thematic Mapping Section, 1999.
[2]Curve Number values referenced from Technical Release No. 55 (2nd Edition), USDA, 1986 (TR-55).

TABLE A-2
CURVE NUMBER CALCULATION SUMMARY

GIS EXPORT						REFERENCE VALUE CALCULATIONS			
SUBBASIN NAME	SUBBASIN AREA (ACRES)	LAND USE CODE	LAND USE	SUBBASIN TO LANDUSE TO SOIL INTERSECTED AREA (AC)	SOIL HYDRO GROUP	LANDUSE BASED CN REFERENCE VALUE	CN LANDUSE AREA RATIO	CN RATIO	WEIGHTED CN
AW-005	6.89	1300	RESIDENTIAL HIGH DENSITY	6.161	A	77.0	0.895	68.884	**78.7**
		1400	COMMERCIAL AND SERVICES	0.167	A	89.0	0.024	2.156	
		4340	HARDWOOD CONIFER MIXED	0.019	A	36.0	0.003	0.099	
		5300	RESERVOIRS	0.407	A	100.0	0.059	5.912	
		8140	ROADS AND HIGHWAYS	0.133	A	83.0	0.019	1.602	
AW-010	8.08	1300	RESIDENTIAL HIGH DENSITY	6.704	A	77.0	0.830	63.898	**74.3**
		1400	COMMERCIAL AND SERVICES	0.010	A	89.0	0.001	0.111	
		1900	OPEN LAND	0.927	A	44.0	0.115	5.049	
		4340	HARDWOOD CONIFER MIXED	0.019	A	36.0	0.002	0.084	
		5300	RESERVOIRS	0.419	A	100.0	0.052	5.182	
AW-025	4.46	1300	RESIDENTIAL HIGH DENSITY	0.000	A	77.0	0.000	0.000	**89.7**
		1400	COMMERCIAL AND SERVICES	3.736	A	89.0	0.838	74.560	
		1900	OPEN LAND	0.088	A	44.0	0.020	0.867	
		5300	RESERVOIRS	0.636	A	100.0	0.143	14.254	
AW-030	3.02	1300	RESIDENTIAL HIGH DENSITY	2.448	A	77.0	0.812	62.489	**79.2**
		1900	OPEN LAND	0.066	A	44.0	0.022	0.956	
		4340	HARDWOOD CONIFER MIXED	0.041	A	36.0	0.014	0.494	
		5300	RESERVOIRS	0.462	A	100.0	0.153	15.301	
AW-040	8.82	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	2.909	A	51.0	0.330	16.811	**66.1**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.513	D	84.0	0.058	4.879	
		1300	RESIDENTIAL HIGH DENSITY	0.403	A	77.0	0.046	3.514	
		1300	RESIDENTIAL HIGH DENSITY	0.059	D	92.0	0.007	0.618	
		4340	HARDWOOD CONIFER MIXED	1.968	A	36.0	0.223	8.028	
		4340	HARDWOOD CONIFER MIXED	0.116	D	79.0	0.013	1.037	
		5300	RESERVOIRS	0.010	A	100.0	0.001	0.109	
		6250	HYDRIC PINE FLATWOODS	0.510	D	89.0	0.058	5.141	
		6460	TREELESS HYDRIC SAVANNA	0.821	A	98.0	0.093	9.115	
		6460	TREELESS HYDRIC SAVANNA	1.517	D	98.0	0.172	16.852	
AW-045	5.10	1300	RESIDENTIAL HIGH DENSITY	0.125	A	77.0	0.025	1.889	**56.9**
		1920	INACTIVE DEVELOPMENT	3.875	A	44.0	0.759	33.414	
		4340	HARDWOOD CONIFER MIXED	0.001	A	36.0	0.000	0.008	
		5300	RESERVOIRS	1.101	A	100.0	0.216	21.584	
		6460	TREELESS HYDRIC SAVANNA	0.000	A	98.0	0.000	0.000	
AW-050	2.55	1300	RESIDENTIAL HIGH DENSITY	0.000	A	77.0	0.000	0.014	**53.6**
		1920	INACTIVE DEVELOPMENT	2.092	A	44.0	0.820	36.090	
		1920	INACTIVE DEVELOPMENT	0.010	B/D	82.0	0.004	0.335	
		1920	INACTIVE DEVELOPMENT	0.035	D	82.0	0.014	1.111	
		5300	RESERVOIRS	0.212	B/D	100.0	0.083	8.318	
		5300	RESERVOIRS	0.175	D	100.0	0.069	6.854	
		6300	WETLAND FORESTED MIXED	0.004	A	68.0	0.002	0.105	
		6300	WETLAND FORESTED MIXED	0.022	D	89.0	0.009	0.773	
AW-055	4.56	1300	RESIDENTIAL HIGH DENSITY	0.183	A	77.0	0.040	3.095	**88.7**
		1300	RESIDENTIAL HIGH DENSITY	0.881	D	92.0	0.193	17.772	
		1920	INACTIVE DEVELOPMENT	0.000	A	44.0	0.000	0.001	
		5300	RESERVOIRS	0.006	B/D	100.0	0.001	0.132	
		5300	RESERVOIRS	0.008	D	100.0	0.002	0.165	
		6300	WETLAND FORESTED MIXED	0.103	A	68.0	0.023	1.538	
		6300	WETLAND FORESTED MIXED	3.381	D	89.0	0.741	65.950	
AW-060	27.17	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.000	B/D	86.0	0.000	0.000	**91.4**
		1300	RESIDENTIAL HIGH DENSITY	3.489	A	77.0	0.128	9.886	
		1300	RESIDENTIAL HIGH DENSITY	8.576	B/D	92.0	0.316	29.038	
		1300	RESIDENTIAL HIGH DENSITY	9.692	D	92.0	0.357	32.816	
		1300	RESIDENTIAL HIGH DENSITY	0.021	W	100.0	0.001	0.076	
		1400	COMMERCIAL AND SERVICES	0.547	D	95.0	0.020	1.913	
		1400	COMMERCIAL AND SERVICES	0.103	W	100.0	0.004	0.380	
		5300	RESERVOIRS	4.407	D	100.0	0.162	16.220	
		6250	HYDRIC PINE FLATWOODS	0.324	D	89.0	0.012	1.060	
		6300	WETLAND FORESTED MIXED	0.010	D	89.0	0.000	0.033	
		6460	TREELESS HYDRIC SAVANNA	0.003	A	98.0	0.000	0.010	
		6460	TREELESS HYDRIC SAVANNA	0.000	D	98.0	0.000	0.001	
AW-065	9.45	1300	RESIDENTIAL HIGH DENSITY	0.582	A	77.0	0.062	4.741	**78.6**
		1300	RESIDENTIAL HIGH DENSITY	0.055	D	92.0	0.006	0.534	
		1400	COMMERCIAL AND SERVICES	0.148	A	89.0	0.016	1.397	
		1400	COMMERCIAL AND SERVICES	0.002	D	95.0	0.000	0.024	
		1900	OPEN LAND	1.017	A	44.0	0.108	4.734	
		1900	OPEN LAND	0.276	B/D	82.0	0.029	2.392	
		1900	OPEN LAND	0.092	W	100.0	0.010	0.969	
		1920	INACTIVE DEVELOPMENT	0.227	A	44.0	0.024	1.058	
		1920	INACTIVE DEVELOPMENT	0.002	B/D	82.0	0.000	0.015	
		4000	UPLAND FOREST	0.482	A	36.0	0.051	1.834	
		5300	RESERVOIRS	0.918	A	100.0	0.097	9.712	
		5300	RESERVOIRS	0.201	B/D	100.0	0.021	2.126	
		5300	RESERVOIRS	0.004	D	100.0	0.000	0.042	
		5300	RESERVOIRS	0.002	W	100.0	0.000	0.021	
		6300	WETLAND FORESTED MIXED	0.001	D	89.0	0.000	0.007	
		8140	ROADS AND HIGHWAYS	4.313	A	83.0	0.456	37.870	
		8140	ROADS AND HIGHWAYS	0.848	B/D	93.0	0.090	8.338	
		8140	ROADS AND HIGHWAYS	0.284	D	93.0	0.030	2.794	
AW-070	2.30	1400	COMMERCIAL AND SERVICES	2.255	A	89.0	0.981	87.314	**88.3**
		1400	COMMERCIAL AND SERVICES	0.003	B/D	95.0	0.001	0.132	
		1900	OPEN LAND	0.038	A	44.0	0.017	0.728	
		1900	OPEN LAND	0.000	B/D	82.0	0.000	0.003	
		8140	ROADS AND HIGHWAYS	0.002	A	83.0	0.001	0.079	
AW-075	2.58	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.028	B/D	84.0	0.011	0.903	**82.4**
		1300	RESIDENTIAL HIGH DENSITY	0.087	A	77.0	0.034	2.590	
		1300	RESIDENTIAL HIGH DENSITY	0.007	B/D	92.0	0.003	0.243	
		1900	OPEN LAND	0.547	A	44.0	0.212	9.331	
		1900	OPEN LAND	0.686	B/D	82.0	0.266	21.825	
		1900	OPEN LAND	0.040	W	100.0	0.016	1.552	

TABLE A-2
CURVE NUMBER CALCULATION SUMMARY

GIS EXPORT						REFERENCE VALUE CALCULATIONS			
SUBBASIN NAME	**SUBBASIN AREA (ACRES)**	**LAND USE CODE**	**LAND USE**	**SUBBASIN TO LANDUSE TO SOIL INTERSECTED AREA (AC)**	**SOIL HYDRO GROUP**	**LANDUSE BASED CN REFERENCE VALUE**	**CN LANDUSE AREA RATIO**	**CN RATIO**	**WEIGHTED CN**
		5300	RESERVOIRS	0.718	A	100.0	0.279	27.867	
		5300	RESERVOIRS	0.465	B/D	100.0	0.181	18.056	
AW-080	5.60	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.075	B/D	84.0	0.013	1.131	**85.1**
		1400	COMMERCIAL AND SERVICES	0.099	A	89.0	0.018	1.567	
		1400	COMMERCIAL AND SERVICES	0.189	B/D	95.0	0.034	3.211	
		1900	OPEN LAND	0.222	A	44.0	0.040	1.745	
		1900	OPEN LAND	2.708	B/D	82.0	0.484	39.651	
		1900	OPEN LAND	0.187	W	100.0	0.033	3.338	
		4110	PINE FLATWOODS	0.850	B/D	79.0	0.152	11.992	
		5300	RESERVOIRS	0.315	B/D	100.0	0.056	5.621	
		5300	RESERVOIRS	0.464	W	100.0	0.083	8.291	
		6440	EMERGENT AQUATIC VEGETATION	0.392	B/D	98.0	0.070	6.854	
		6440	EMERGENT AQUATIC VEGETATION	0.091	W	100.0	0.016	1.631	
		8140	ROADS AND HIGHWAYS	0.006	A	83.0	0.001	0.086	
		8140	ROADS AND HIGHWAYS	0.002	B/D	93.0	0.000	0.031	
AW-090	1.25	1400	COMMERCIAL AND SERVICES	0.573	A	89.0	0.457	40.666	**88.7**
		1400	COMMERCIAL AND SERVICES	0.402	B/D	95.0	0.321	30.465	
		4110	PINE FLATWOODS	0.279	B/D	79.0	0.222	17.569	
AW-095	3.01	1400	COMMERCIAL AND SERVICES	1.663	A	89.0	0.553	49.206	**89.1**
		1400	COMMERCIAL AND SERVICES	0.961	B/D	95.0	0.319	30.338	
		1900	OPEN LAND	0.013	A	44.0	0.004	0.184	
		1900	OPEN LAND	0.065	B/D	82.0	0.022	1.784	
		4110	PINE FLATWOODS	0.031	A	36.0	0.010	0.369	
		4110	PINE FLATWOODS	0.252	B/D	79.0	0.084	6.618	
		8140	ROADS AND HIGHWAYS	0.024	A	83.0	0.008	0.651	
AW-105	2.13	1300	RESIDENTIAL HIGH DENSITY	0.150	D	92.0	0.070	6.481	**96.8**
		1300	RESIDENTIAL HIGH DENSITY	0.011	W	100.0	0.005	0.532	
		1400	COMMERCIAL AND SERVICES	0.161	A	89.0	0.075	6.708	
		1400	COMMERCIAL AND SERVICES	0.715	D	95.0	0.336	31.889	
		1400	COMMERCIAL AND SERVICES	0.976	W	100.0	0.458	45.820	
		5300	RESERVOIRS	0.018	B/D	100.0	0.008	0.849	
		5300	RESERVOIRS	0.008	D	100.0	0.004	0.375	
		5300	RESERVOIRS	0.063	W	100.0	0.030	2.958	
		6300	WETLAND FORESTED MIXED	0.010	D	89.0	0.005	0.422	
		8140	ROADS AND HIGHWAYS	0.014	A	83.0	0.007	0.559	
		8140	ROADS AND HIGHWAYS	0.004	D	93.0	0.002	0.159	
AW-110	0.28	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.124	B/D	86.0	0.437	37.546	**91.1**
		1400	COMMERCIAL AND SERVICES	0.160	B/D	95.0	0.563	53.524	
AW-115	0.65	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.646	B/D	86.0	1.000	86.000	**86.0**
AW-120	0.38	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.172	B/D	86.0	0.454	39.083	**90.9**
		1400	COMMERCIAL AND SERVICES	0.206	B/D	95.0	0.546	51.827	
AW-125	13.86	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.008	B/D	86.0	0.001	0.051	**95.2**
		1400	COMMERCIAL AND SERVICES	0.914	A	89.0	0.066	5.872	
		1400	COMMERCIAL AND SERVICES	11.047	B/D	95.0	0.797	75.723	
		1400	COMMERCIAL AND SERVICES	0.085	W	100.0	0.006	0.613	
		5300	RESERVOIRS	0.097	A	100.0	0.007	0.702	
		5300	RESERVOIRS	1.346	B/D	100.0	0.097	9.709	
		5300	RESERVOIRS	0.238	W	100.0	0.017	1.719	
		8140	ROADS AND HIGHWAYS	0.072	A	83.0	0.005	0.432	
		8140	ROADS AND HIGHWAYS	0.051	B/D	93.0	0.004	0.345	
AW-130	0.95	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.158	B/D	86.0	0.166	14.253	**95.7**
		1300	RESIDENTIAL HIGH DENSITY	0.018	B/D	92.0	0.019	1.717	
		1300	RESIDENTIAL HIGH DENSITY	0.002	D	92.0	0.002	0.188	
		1300	RESIDENTIAL HIGH DENSITY	0.036	W	100.0	0.038	3.777	
		1400	COMMERCIAL AND SERVICES	0.339	B/D	95.0	0.357	33.890	
		1400	COMMERCIAL AND SERVICES	0.372	W	100.0	0.391	39.089	
		5300	RESERVOIRS	0.000	B/D	100.0	0.000	0.035	
		5300	RESERVOIRS	0.026	W	100.0	0.028	2.783	
AW-145	22.39	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.601	B/D	86.0	0.027	2.310	**92.0**
		1300	RESIDENTIAL HIGH DENSITY	19.966	B/D	92.0	0.892	82.053	
		1300	RESIDENTIAL HIGH DENSITY	0.600	D	92.0	0.027	2.466	
		1920	INACTIVE DEVELOPMENT	0.327	B/D	82.0	0.015	1.200	
		5300	RESERVOIRS	0.887	B/D	100.0	0.040	3.960	
		6250	HYDRIC PINE FLATWOODS	0.005	B/D	89.0	0.000	0.020	
AW-175	12.91	1300	RESIDENTIAL HIGH DENSITY	11.078	B/D	92.0	0.858	78.923	**92.4**
		1300	RESIDENTIAL HIGH DENSITY	0.694	D	92.0	0.054	4.944	
		1920	INACTIVE DEVELOPMENT	0.245	B/D	82.0	0.019	1.558	
		5300	RESERVOIRS	0.865	B/D	100.0	0.067	6.696	
		6460	TREELESS HYDRIC SAVANNA	0.032	B/D	98.0	0.002	0.240	
AW-185	0.28	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.272	B/D	86.0	0.977	83.985	**86.1**
		1300	RESIDENTIAL HIGH DENSITY	0.007	B/D	92.0	0.023	2.156	
AW-200	5.07	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.058	A	57.0	0.011	0.652	**92.5**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.543	B/D	86.0	0.107	9.200	
		1400	COMMERCIAL AND SERVICES	0.618	A	89.0	0.122	10.849	
		1400	COMMERCIAL AND SERVICES	3.676	B/D	95.0	0.725	68.843	
		8140	ROADS AND HIGHWAYS	0.178	A	83.0	0.035	2.906	
		8140	ROADS AND HIGHWAYS	0.000	B/D	93.0	0.000	0.001	
AW-205	0.37	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.371	B/D	86.0	1.000	86.000	**86.0**
AW-210	2.71	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.550	A	57.0	0.203	11.577	**80.1**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	2.114	B/D	86.0	0.781	67.164	
		8140	ROADS AND HIGHWAYS	0.043	A	83.0	0.016	1.322	
AW-215	1.05	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	1.055	B/D	86.0	1.000	86.000	**86.0**
AW-220	8.24	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	8.242	B/D	86.0	1.000	85.988	**86.0**
		1300	RESIDENTIAL HIGH DENSITY	0.001	B/D	92.0	0.000	0.012	
AW-225	1.53	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	1.532	B/D	86.0	1.000	86.000	**86.0**
AW-230	2.09	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.971	B/D	86.0	0.464	39.936	**82.3**
		4340	HARDWOOD CONIFER MIXED	1.120	B/D	79.0	0.536	42.315	
AW-235	1.24	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.236	A	57.0	0.190	10.847	**75.6**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.592	B/D	86.0	0.476	40.954	

TABLE A-2
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GIS EXPORT						REFERENCE VALUE CALCULATIONS			
SUBBASIN NAME	**SUBBASIN AREA (ACRES)**	**LAND USE CODE**	**LAND USE**	**SUBBASIN TO LANDUSE TO SOIL INTERSECTED AREA (AC)**	**SOIL HYDRO GROUP**	**LANDUSE BASED CN REFERENCE VALUE**	**CN LANDUSE AREA RATIO**	**CN RATIO**	**WEIGHTED CN**
		4340	HARDWOOD CONIFER MIXED	0.073	A	36.0	0.059	2.106	
		4340	HARDWOOD CONIFER MIXED	0.342	B/D	79.0	0.275	21.723	
AW-240	0.66	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.070	A	57.0	0.106	6.064	**82.9**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.589	B/D	86.0	0.894	76.851	
AW-250	1.10	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.431	A	57.0	0.390	22.254	**74.7**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.673	B/D	86.0	0.610	52.424	
AW-260	2.92	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.735	A	57.0	0.251	14.332	**74.1**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.930	B/D	86.0	0.318	27.343	
		4340	HARDWOOD CONIFER MIXED	0.111	A	36.0	0.038	1.363	
		4340	HARDWOOD CONIFER MIXED	1.148	B/D	79.0	0.393	31.029	
AW-265	2.00	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.733	A	57.0	0.366	20.883	**75.4**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	1.263	B/D	86.0	0.631	54.308	
		8140	ROADS AND HIGHWAYS	0.004	A	83.0	0.002	0.178	
AW-270	0.64	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.632	A	57.0	0.988	56.289	**57.3**
		8140	ROADS AND HIGHWAYS	0.008	A	83.0	0.012	1.036	
AW-275	0.98	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.060	A	57.0	0.061	3.488	**82.7**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.705	B/D	86.0	0.718	61.744	
		4340	HARDWOOD CONIFER MIXED	0.217	B/D	79.0	0.221	17.448	
AW-280	0.27	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.274	A	57.0	1.000	57.000	**57.0**
AW-285	0.22	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.220	A	57.0	1.000	57.000	**57.0**
AW-290	1.68	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.817	A	57.0	0.485	27.645	**71.9**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.867	B/D	86.0	0.515	44.291	
AW-300	0.18	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.180	A	57.0	1.000	57.000	**57.0**
AW-310	0.43	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.018	A	57.0	0.042	2.368	**84.8**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.410	B/D	86.0	0.958	82.427	
AW-315	15.29	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.001	A	57.0	0.000	0.002	**86.1**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	15.151	B/D	86.0	0.991	85.217	
		1300	RESIDENTIAL HIGH DENSITY	0.139	B/D	92.0	0.009	0.835	
AW-325	0.09	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.095	B/D	86.0	1.000	86.000	**86.0**
AW-330	0.31	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.220	B/D	86.0	0.717	61.623	**84.9**
		3200	SHRUB AND BRUSH RANGELAND	0.087	B/D	82.0	0.283	23.243	
AW-335	0.35	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.144	B/D	86.0	0.413	35.509	**83.7**
		3200	SHRUB AND BRUSH RANGELAND	0.205	B/D	82.0	0.587	48.143	
AW-340	0.30	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.035	B/D	86.0	0.114	9.837	**80.8**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.041	D	86.0	0.137	11.772	
		4340	HARDWOOD CONIFER MIXED	0.080	B/D	79.0	0.264	20.883	
		4340	HARDWOOD CONIFER MIXED	0.147	D	79.0	0.484	38.267	
AW-345	6.79	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	1.211	B/D	86.0	0.178	15.341	**82.9**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.285	D	86.0	0.042	3.614	
		1300	RESIDENTIAL HIGH DENSITY	0.017	B/D	92.0	0.003	0.234	
		1300	RESIDENTIAL HIGH DENSITY	0.023	D	92.0	0.003	0.315	
		2110	IMPROVED PASTURES	0.577	B/D	82.0	0.085	6.970	
		2110	IMPROVED PASTURES	1.104	D	82.0	0.163	13.344	
		3200	SHRUB AND BRUSH RANGELAND	1.815	B/D	82.0	0.267	21.931	
		3200	SHRUB AND BRUSH RANGELAND	1.754	D	82.0	0.258	21.192	
AW-350	0.55	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.110	D	86.0	0.201	17.258	**80.4**
		4340	HARDWOOD CONIFER MIXED	0.437	D	79.0	0.799	63.147	
AW-355	21.04	1300	RESIDENTIAL HIGH DENSITY	0.114	B/D	92.0	0.005	0.500	**74.6**
		1920	INACTIVE DEVELOPMENT	4.961	A	44.0	0.236	10.374	
		1920	INACTIVE DEVELOPMENT	9.613	B/D	82.0	0.457	37.468	
		1920	INACTIVE DEVELOPMENT	3.616	C	77.0	0.172	13.234	
		5300	RESERVOIRS	2.626	B/D	100.0	0.125	12.482	
		6460	TREELESS HYDRIC SAVANNA	0.109	B/D	98.0	0.005	0.509	
AW-360	8.37	1920	INACTIVE DEVELOPMENT	0.485	A	44.0	0.058	2.551	**80.8**
		1920	INACTIVE DEVELOPMENT	6.571	B/D	82.0	0.785	64.357	
		3100	HERBACEOUS RANGELAND	0.593	B/D	80.0	0.071	5.670	
		3100	HERBACEOUS RANGELAND	0.114	D	80.0	0.014	1.090	
		4340	HARDWOOD CONIFER MIXED	0.035	B/D	79.0	0.004	0.328	
		5300	RESERVOIRS	0.398	B/D	100.0	0.048	4.756	
		5300	RESERVOIRS	0.104	D	100.0	0.012	1.237	
		6170	MIXED WETLAND HARDWOODS	0.000	D	89.0	0.000	0.004	
		6410	FRESHWATER MARSHES	0.004	B/D	100.0	0.001	0.051	
		6410	FRESHWATER MARSHES	0.036	D	100.0	0.004	0.425	
		6460	TREELESS HYDRIC SAVANNA	0.022	B/D	98.0	0.003	0.262	
		6460	TREELESS HYDRIC SAVANNA	0.010	D	98.0	0.001	0.111	
AW-365	14.43	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.019	B/D	86.0	0.001	0.114	**88.9**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.179	D	86.0	0.012	1.066	
		1300	RESIDENTIAL HIGH DENSITY	0.083	B/D	92.0	0.006	0.526	
		1300	RESIDENTIAL HIGH DENSITY	0.088	D	92.0	0.006	0.561	
		1920	INACTIVE DEVELOPMENT	0.044	B/D	82.0	0.003	0.248	
		2110	IMPROVED PASTURES	1.775	D	82.0	0.123	10.089	
		3100	HERBACEOUS RANGELAND	0.109	B/D	80.0	0.008	0.607	
		3100	HERBACEOUS RANGELAND	0.014	D	80.0	0.001	0.076	
		3200	SHRUB AND BRUSH RANGELAND	0.715	D	82.0	0.050	4.061	
		4340	HARDWOOD CONIFER MIXED	0.686	B/D	79.0	0.048	3.756	
		4340	HARDWOOD CONIFER MIXED	2.432	D	79.0	0.169	13.316	
		6170	MIXED WETLAND HARDWOODS	0.063	B/D	89.0	0.004	0.387	
		6170	MIXED WETLAND HARDWOODS	3.007	D	89.0	0.208	18.548	
		6410	FRESHWATER MARSHES	0.128	B/D	100.0	0.009	0.889	
		6410	FRESHWATER MARSHES	0.891	D	100.0	0.062	6.178	
		6460	TREELESS HYDRIC SAVANNA	1.073	B/D	98.0	0.074	7.288	
		6460	TREELESS HYDRIC SAVANNA	3.123	D	98.0	0.216	21.214	
AW-370	0.43	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.001	B/D	86.0	0.001	0.114	**80.4**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.088	D	86.0	0.204	17.576	
		1920	INACTIVE DEVELOPMENT	0.000	B/D	82.0	0.000	0.000	
		4340	HARDWOOD CONIFER MIXED	0.021	B/D	79.0	0.049	3.835	
		4340	HARDWOOD CONIFER MIXED	0.322	D	79.0	0.746	58.915	
AW-375	51.45	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.190	B/D	84.0	0.004	0.310	**83.4**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	4.551	D	84.0	0.088	7.430	

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CURVE NUMBER CALCULATION SUMMARY

GIS EXPORT						REFERENCE VALUE CALCULATIONS			
SUBBASIN NAME	**SUBBASIN AREA (ACRES)**	**LAND USE CODE**	**LAND USE**	**SUBBASIN TO LANDUSE TO SOIL INTERSECTED AREA (AC)**	**SOIL HYDRO GROUP**	**LANDUSE BASED CN REFERENCE VALUE**	**CN LANDUSE AREA RATIO**	**CN RATIO**	**WEIGHTED CN**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	3.790	A	57.0	0.074	4.199	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	4.821	B/D	86.0	0.094	8.058	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.020	D	86.0	0.000	0.034	
		1400	COMMERCIAL AND SERVICES	0.005	A	89.0	0.000	0.008	
		1400	COMMERCIAL AND SERVICES	0.409	B/D	95.0	0.008	0.755	
		1400	COMMERCIAL AND SERVICES	0.173	D	95.0	0.003	0.319	
		1900	OPEN LAND	1.493	A	44.0	0.029	1.277	
		1900	OPEN LAND	2.658	B/D	82.0	0.052	4.237	
		1900	OPEN LAND	2.134	D	82.0	0.041	3.402	
		1920	INACTIVE DEVELOPMENT	0.031	B/D	82.0	0.001	0.050	
		1920	INACTIVE DEVELOPMENT	0.068	D	82.0	0.001	0.108	
		4340	HARDWOOD CONIFER MIXED	4.111	B/D	79.0	0.080	6.313	
		4340	HARDWOOD CONIFER MIXED	8.175	D	79.0	0.159	12.553	
		5300	RESERVOIRS	0.005	B/D	100.0	0.000	0.010	
		6300	WETLAND FORESTED MIXED	0.617	B/D	89.0	0.012	1.067	
		6300	WETLAND FORESTED MIXED	7.795	D	89.0	0.152	13.484	
		6460	TREELESS HYDRIC SAVANNA	8.800	B/D	98.0	0.171	16.762	
		6460	TREELESS HYDRIC SAVANNA	1.496	D	98.0	0.029	2.850	
		8140	ROADS AND HIGHWAYS	0.045	A	83.0	0.001	0.073	
		8140	ROADS AND HIGHWAYS	0.056	B/D	93.0	0.001	0.102	
		8140	ROADS AND HIGHWAYS	0.005	D	93.0	0.000	0.009	
AW-380	1.45	1400	COMMERCIAL AND SERVICES	0.077	A	89.0	0.053	4.717	**94.8**
		1400	COMMERCIAL AND SERVICES	1.241	B/D	95.0	0.858	81.507	
		1400	COMMERCIAL AND SERVICES	0.023	D	95.0	0.016	1.511	
		1900	OPEN LAND	0.020	B/D	82.0	0.014	1.135	
		1900	OPEN LAND	0.000	D	82.0	0.000	0.004	
		5300	RESERVOIRS	0.086	B/D	100.0	0.059	5.925	
AW-385	24.36	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.035	A	51.0	0.001	0.074	**82.1**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	4.504	A	57.0	0.185	10.537	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	14.229	B/D	86.0	0.584	50.223	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	2.795	D	86.0	0.115	9.865	
		1400	COMMERCIAL AND SERVICES	0.000	B/D	95.0	0.000	0.000	
		1900	OPEN LAND	0.001	A	44.0	0.000	0.002	
		5300	RESERVOIRS	2.561	B/D	100.0	0.105	10.509	
		6460	TREELESS HYDRIC SAVANNA	0.185	B/D	98.0	0.008	0.742	
		8140	ROADS AND HIGHWAYS	0.053	A	83.0	0.002	0.182	
		8140	ROADS AND HIGHWAYS	0.002	B/D	93.0	0.000	0.008	
AW-390	2.20	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.873	B/D	84.0	0.397	33.323	**84.0**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	1.288	D	84.0	0.585	49.163	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.000	B/D	86.0	0.000	0.012	
		1920	INACTIVE DEVELOPMENT	0.039	B/D	82.0	0.018	1.455	
		1920	INACTIVE DEVELOPMENT	0.000	D	82.0	0.000	0.011	
AW-395	4.07	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.085	B/D	84.0	0.021	1.757	**93.9**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.001	D	84.0	0.000	0.024	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.574	B/D	86.0	0.141	12.143	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.909	D	86.0	0.223	19.214	
		1920	INACTIVE DEVELOPMENT	0.002	B/D	82.0	0.001	0.049	
		4340	HARDWOOD CONIFER MIXED	0.085	B/D	79.0	0.021	1.652	
		5300	RESERVOIRS	2.044	B/D	100.0	0.502	50.250	
		5300	RESERVOIRS	0.161	D	100.0	0.040	3.958	
		6460	TREELESS HYDRIC SAVANNA	0.096	B/D	98.0	0.024	2.316	
		8140	ROADS AND HIGHWAYS	0.110	B/D	93.0	0.027	2.509	
AW-415	0.11	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.082	B/D	84.0	0.771	64.767	**86.5**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.001	D	84.0	0.014	1.168	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.007	B/D	86.0	0.068	5.818	
		5300	RESERVOIRS	0.016	B/D	100.0	0.147	14.741	
AW-420	5.14	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.564	A	51.0	0.110	5.598	**80.2**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	1.448	B/D	84.0	0.282	23.690	
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	2.094	D	84.0	0.408	34.249	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.160	A	57.0	0.031	1.780	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.218	B/D	86.0	0.043	3.659	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.142	D	86.0	0.028	2.382	
		6170	MIXED WETLAND HARDWOODS	0.264	D	89.0	0.051	4.574	
		8140	ROADS AND HIGHWAYS	0.065	A	83.0	0.013	1.058	
		8140	ROADS AND HIGHWAYS	0.179	B/D	93.0	0.035	3.243	
AW-425	0.42	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.000	B/D	84.0	0.001	0.084	**89.9**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.086	D	84.0	0.206	17.320	
		5300	RESERVOIRS	0.011	B/D	100.0	0.026	2.603	
		5300	RESERVOIRS	0.061	D	100.0	0.146	14.597	
		6170	MIXED WETLAND HARDWOODS	0.024	B/D	89.0	0.058	5.167	
		6170	MIXED WETLAND HARDWOODS	0.235	D	89.0	0.563	50.084	
AW-430	5.22	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.099	A	57.0	0.019	1.083	**94.3**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.032	B/D	86.0	0.006	0.533	
		1400	COMMERCIAL AND SERVICES	0.936	A	89.0	0.179	15.940	
		1400	COMMERCIAL AND SERVICES	2.624	B/D	95.0	0.502	47.720	
		1400	COMMERCIAL AND SERVICES	0.192	D	95.0	0.037	3.489	
		5300	RESERVOIRS	0.428	A	100.0	0.082	8.203	
		5300	RESERVOIRS	0.203	B/D	100.0	0.039	3.879	
		5300	RESERVOIRS	0.631	D	100.0	0.121	12.074	
		8140	ROADS AND HIGHWAYS	0.079	B/D	93.0	0.015	1.403	
AW-435	1.38	1400	COMMERCIAL AND SERVICES	0.589	B/D	95.0	0.426	40.469	**94.7**
		5300	RESERVOIRS	0.373	B/D	100.0	0.270	26.967	
		8140	ROADS AND HIGHWAYS	0.074	B/D	93.0	0.053	4.957	
		8320	ELECTRICAL POWER TRANSMISSION LINE	0.347	B/D	89.0	0.251	22.342	
AW-440	7.03	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.425	B/D	84.0	0.060	5.076	**90.2**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.320	D	84.0	0.045	3.817	
		1400	COMMERCIAL AND SERVICES	1.312	B/D	95.0	0.187	17.722	
		1400	COMMERCIAL AND SERVICES	0.550	D	95.0	0.078	7.433	
		6170	MIXED WETLAND HARDWOODS	0.568	B/D	89.0	0.081	7.184	

TABLE A-2
CURVE NUMBER CALCULATION SUMMARY

GIS EXPORT						REFERENCE VALUE CALCULATIONS			
SUBBASIN NAME	SUBBASIN AREA (ACRES)	LAND USE CODE	LAND USE	SUBBASIN TO LANDUSE TO SOIL INTERSECTED AREA (AC)	SOIL HYDRO GROUP	LANDUSE BASED CN REFERENCE VALUE	CN LANDUSE AREA RATIO	CN RATIO	WEIGHTED CN
		6170	MIXED WETLAND HARDWOODS	2.457	D	89.0	0.349	31.097	
		8140	ROADS AND HIGHWAYS	0.184	B/D	93.0	0.026	2.434	
		8320	ELECTRICAL POWER TRANSMISSION LINE	0.451	B/D	89.0	0.064	5.704	
		8320	ELECTRICAL POWER TRANSMISSION LINE	0.766	D	89.0	0.109	9.698	
AW-450	0.57	1400	COMMERCIAL AND SERVICES	0.007	B/D	95.0	0.012	1.160	**90.9**
		5300	RESERVOIRS	0.092	B/D	100.0	0.162	16.244	
		6170	MIXED WETLAND HARDWOODS	0.292	B/D	89.0	0.512	45.584	
		6170	MIXED WETLAND HARDWOODS	0.000	D	89.0	0.001	0.069	
		8320	ELECTRICAL POWER TRANSMISSION LINE	0.178	B/D	89.0	0.312	27.803	
AW-455	0.58	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.110	A	51.0	0.189	9.625	**79.4**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.307	B/D	84.0	0.527	44.280	
		8140	ROADS AND HIGHWAYS	0.052	A	83.0	0.089	7.427	
		8140	ROADS AND HIGHWAYS	0.113	B/D	93.0	0.195	18.101	
AW-460	2.36	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	1.497	A	51.0	0.634	32.324	**63.3**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.811	B/D	84.0	0.343	28.823	
		1400	COMMERCIAL AND SERVICES	0.054	B/D	95.0	0.023	2.183	
		8140	ROADS AND HIGHWAYS	0.000	B/D	93.0	0.000	0.008	
AW-465	8.93	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	6.742	A	51.0	0.755	38.499	**59.5**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	1.684	B/D	84.0	0.189	15.843	
		1400	COMMERCIAL AND SERVICES	0.333	B/D	95.0	0.037	3.537	
		8140	ROADS AND HIGHWAYS	0.149	A	83.0	0.017	1.389	
		8140	ROADS AND HIGHWAYS	0.023	B/D	93.0	0.003	0.238	
AW-470	0.39	1400	COMMERCIAL AND SERVICES	0.366	B/D	95.0	0.942	89.456	**94.8**
		8140	ROADS AND HIGHWAYS	0.019	B/D	93.0	0.050	4.639	
		8320	ELECTRICAL POWER TRANSMISSION LINE	0.003	B/D	89.0	0.008	0.755	
AW-475	0.10	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.008	B/D	84.0	0.078	6.559	**89.3**
		2430	ORNAMENTAL NURSERY	0.043	B/D	86.0	0.426	36.654	
		8140	ROADS AND HIGHWAYS	0.050	B/D	93.0	0.496	46.101	
AW-480	0.15	2430	ORNAMENTAL NURSERY	0.125	B/D	86.0	0.828	71.208	**87.2**
		8140	ROADS AND HIGHWAYS	0.026	B/D	93.0	0.172	15.996	
AW-485	0.22	2430	ORNAMENTAL NURSERY	0.013	A	59.0	0.059	3.470	**84.4**
		2430	ORNAMENTAL NURSERY	0.172	B/D	86.0	0.791	68.045	
		8140	ROADS AND HIGHWAYS	0.023	A	83.0	0.106	8.780	
		8140	ROADS AND HIGHWAYS	0.010	B/D	93.0	0.044	4.109	
AW-490	0.29	2430	ORNAMENTAL NURSERY	0.077	A	59.0	0.262	15.456	**78.5**
		2430	ORNAMENTAL NURSERY	0.178	B/D	86.0	0.604	51.913	
		8140	ROADS AND HIGHWAYS	0.040	A	83.0	0.134	11.155	
AW-495	0.25	2430	ORNAMENTAL NURSERY	0.021	A	59.0	0.084	4.971	**83.5**
		2430	ORNAMENTAL NURSERY	0.209	B/D	86.0	0.836	71.870	
		8140	ROADS AND HIGHWAYS	0.019	A	83.0	0.074	6.183	
		8140	ROADS AND HIGHWAYS	0.001	B/D	93.0	0.006	0.516	
AW-500	0.21	2430	ORNAMENTAL NURSERY	0.108	B/D	86.0	0.516	44.418	**87.8**
		8140	ROADS AND HIGHWAYS	0.034	A	83.0	0.161	13.403	
		8140	ROADS AND HIGHWAYS	0.067	B/D	93.0	0.322	29.949	
AW-505	28.94	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	2.921	B/D	84.0	0.101	8.476	**76.2**
		1400	COMMERCIAL AND SERVICES	2.991	A	89.0	0.103	9.196	
		1400	COMMERCIAL AND SERVICES	0.615	B/D	95.0	0.021	2.017	
		1900	OPEN LAND	0.000	A	44.0	0.000	0.000	
		1900	OPEN LAND	0.000	B/D	82.0	0.000	0.000	
		2430	ORNAMENTAL NURSERY	0.322	B/D	86.0	0.011	0.956	
		4000	UPLAND FOREST	6.689	A	36.0	0.231	8.319	
		4000	UPLAND FOREST	0.422	B/D	79.0	0.015	1.153	
		5300	RESERVOIRS	2.265	B/D	100.0	0.078	7.825	
		6170	MIXED WETLAND HARDWOODS	0.004	B/D	89.0	0.000	0.011	
		8140	ROADS AND HIGHWAYS	7.114	A	83.0	0.246	20.401	
		8140	ROADS AND HIGHWAYS	4.817	B/D	93.0	0.166	15.477	
		8140	ROADS AND HIGHWAYS	0.015	D	93.0	0.001	0.048	
		8320	ELECTRICAL POWER TRANSMISSION LINE	0.771	B/D	89.0	0.027	2.370	
AW-525	0.63	2430	ORNAMENTAL NURSERY	0.130	B/D	86.0	0.205	17.645	**80.6**
		4340	HARDWOOD CONIFER MIXED	0.026	A	36.0	0.040	1.454	
		4340	HARDWOOD CONIFER MIXED	0.360	B/D	79.0	0.568	44.859	
		8140	ROADS AND HIGHWAYS	0.043	A	83.0	0.068	5.662	
		8140	ROADS AND HIGHWAYS	0.075	B/D	93.0	0.118	11.010	
AW-530	2.91	2430	ORNAMENTAL NURSERY	0.079	B/D	86.0	0.027	2.342	**65.9**
		3300	MIXED RANGELAND	0.064	B/D	84.0	0.022	1.861	
		4340	HARDWOOD CONIFER MIXED	0.914	A	36.0	0.314	11.301	
		4340	HARDWOOD CONIFER MIXED	1.779	B/D	79.0	0.611	48.285	
		8140	ROADS AND HIGHWAYS	0.074	A	83.0	0.026	2.117	
AW-535	3.89	4340	HARDWOOD CONIFER MIXED	1.384	A	36.0	0.355	12.795	**64.2**
		4340	HARDWOOD CONIFER MIXED	1.427	B/D	79.0	0.366	28.936	
		4340	HARDWOOD CONIFER MIXED	0.577	C	73.0	0.148	10.813	
		8140	ROADS AND HIGHWAYS	0.163	A	83.0	0.042	3.483	
		8140	ROADS AND HIGHWAYS	0.207	B/D	93.0	0.053	4.954	
		8140	ROADS AND HIGHWAYS	0.136	C	92.0	0.035	3.214	
AW-540	0.99	3300	MIXED RANGELAND	0.375	B/D	84.0	0.380	31.942	**85.5**
		3300	MIXED RANGELAND	0.409	D	84.0	0.415	34.853	
		4340	HARDWOOD CONIFER MIXED	0.023	B/D	79.0	0.023	1.848	
		8140	ROADS AND HIGHWAYS	0.179	B/D	93.0	0.181	16.873	
AW-545	2.87	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.117	B/D	84.0	0.041	3.418	**86.2**
		2430	ORNAMENTAL NURSERY	2.630	B/D	86.0	0.916	78.769	
		5300	RESERVOIRS	0.010	B/D	100.0	0.004	0.363	
		6170	MIXED WETLAND HARDWOODS	0.066	B/D	89.0	0.023	2.058	
		8140	ROADS AND HIGHWAYS	0.048	B/D	93.0	0.017	1.548	
AW-550	0.40	2430	ORNAMENTAL NURSERY	0.360	B/D	86.0	0.900	77.390	**86.5**
		2430	ORNAMENTAL NURSERY	0.011	D	86.0	0.028	2.377	
		8140	ROADS AND HIGHWAYS	0.029	B/D	93.0	0.072	6.740	
AW-555	0.75	2430	ORNAMENTAL NURSERY	0.104	B/D	86.0	0.139	11.940	**85.0**
		2430	ORNAMENTAL NURSERY	0.267	D	86.0	0.358	30.779	
		3300	MIXED RANGELAND	0.153	B/D	84.0	0.205	17.242	

TABLE A-2
CURVE NUMBER CALCULATION SUMMARY

GIS EXPORT						REFERENCE VALUE CALCULATIONS			
SUBBASIN NAME	**SUBBASIN AREA (ACRES)**	**LAND USE CODE**	**LAND USE**	**SUBBASIN TO LANDUSE TO SOIL INTERSECTED AREA (AC)**	**SOIL HYDRO GROUP**	**LANDUSE BASED CN REFERENCE VALUE**	**CN LANDUSE AREA RATIO**	**CN RATIO**	**WEIGHTED CN**
		3300	MIXED RANGELAND	0.220	D	84.0	0.294	24.735	
		5300	RESERVOIRS	0.003	D	100.0	0.004	0.353	
AW-560	1.07	3300	MIXED RANGELAND	0.665	B/D	84.0	0.625	52.474	**85.5**
		3300	MIXED RANGELAND	0.225	D	84.0	0.211	17.763	
		5300	RESERVOIRS	0.000	D	100.0	0.000	0.041	
		8140	ROADS AND HIGHWAYS	0.174	B/D	93.0	0.163	15.200	
AW-561	2.00	2430	ORNAMENTAL NURSERY	1.029	B/D	86.0	0.515	44.258	**88.7**
		2430	ORNAMENTAL NURSERY	0.033	D	86.0	0.016	1.403	
		3300	MIXED RANGELAND	0.337	B/D	84.0	0.168	14.154	
		3300	MIXED RANGELAND	0.124	D	84.0	0.062	5.209	
		5300	RESERVOIRS	0.038	B/D	100.0	0.019	1.912	
		5300	RESERVOIRS	0.378	D	100.0	0.189	18.885	
		8140	ROADS AND HIGHWAYS	0.061	B/D	93.0	0.031	2.844	
AW-565	4.44	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.629	B/D	84.0	0.142	11.893	**84.3**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.291	D	84.0	0.066	5.509	
		2120	UNIMPROVED PASTURES	0.749	B/D	82.0	0.169	13.824	
		2120	UNIMPROVED PASTURES	0.279	D	82.0	0.063	5.153	
		2430	ORNAMENTAL NURSERY	0.056	B/D	86.0	0.013	1.080	
		2430	ORNAMENTAL NURSERY	0.049	D	86.0	0.011	0.950	
		3300	MIXED RANGELAND	1.570	B/D	84.0	0.353	29.665	
		3300	MIXED RANGELAND	0.488	D	84.0	0.110	9.225	
		8140	ROADS AND HIGHWAYS	0.333	B/D	93.0	0.075	6.958	
AW-570	2.34	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.021	B/D	84.0	0.009	0.740	**82.7**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.043	D	84.0	0.019	1.557	
		2120	UNIMPROVED PASTURES	1.209	B/D	82.0	0.517	42.428	
		2120	UNIMPROVED PASTURES	0.918	D	82.0	0.393	32.232	
		8140	ROADS AND HIGHWAYS	0.007	B/D	93.0	0.003	0.294	
		8140	ROADS AND HIGHWAYS	0.138	D	93.0	0.059	5.488	
AW-575	0.85	2120	UNIMPROVED PASTURES	0.183	B/D	82.0	0.216	17.723	**82.9**
		2120	UNIMPROVED PASTURES	0.591	D	82.0	0.699	57.357	
		8140	ROADS AND HIGHWAYS	0.071	D	93.0	0.084	7.848	
AW-580	4.35	1300	RESIDENTIAL HIGH DENSITY	0.322	B/D	92.0	0.074	6.819	**83.8**
		1300	RESIDENTIAL HIGH DENSITY	0.233	D	92.0	0.054	4.934	
		2120	UNIMPROVED PASTURES	0.151	B/D	82.0	0.035	2.844	
		2120	UNIMPROVED PASTURES	3.420	D	82.0	0.787	64.529	
		8140	ROADS AND HIGHWAYS	0.220	D	93.0	0.051	4.709	
AW-585	1.99	1300	RESIDENTIAL HIGH DENSITY	0.014	B/D	92.0	0.007	0.651	**84.2**
		1300	RESIDENTIAL HIGH DENSITY	0.283	D	92.0	0.142	13.059	
		2120	UNIMPROVED PASTURES	1.560	D	82.0	0.782	64.121	
		8140	ROADS AND HIGHWAYS	0.138	D	93.0	0.069	6.418	
AW-590	0.49	2120	UNIMPROVED PASTURES	0.147	D	82.0	0.303	24.844	**92.9**
		6460	TREELESS HYDRIC SAVANNA	0.317	D	98.0	0.654	64.081	
		8140	ROADS AND HIGHWAYS	0.021	D	93.0	0.043	4.011	
AW-600	4.22	1300	RESIDENTIAL HIGH DENSITY	0.000	B/D	92.0	0.000	0.000	**91.5**
		1400	COMMERCIAL AND SERVICES	2.434	A	89.0	0.576	51.275	
		1400	COMMERCIAL AND SERVICES	1.429	B/D	95.0	0.338	32.133	
		4000	UPLAND FOREST	0.003	A	36.0	0.001	0.029	
		4000	UPLAND FOREST	0.082	B/D	79.0	0.019	1.525	
		5300	RESERVOIRS	0.277	B/D	100.0	0.066	6.552	
AW-605	0.79	1400	COMMERCIAL AND SERVICES	0.084	A	89.0	0.107	9.486	**95.4**
		1400	COMMERCIAL AND SERVICES	0.535	B/D	95.0	0.678	64.372	
		5300	RESERVOIRS	0.003	A	100.0	0.003	0.319	
		5300	RESERVOIRS	0.168	B/D	100.0	0.213	21.262	
AW-615	10.85	1300	RESIDENTIAL HIGH DENSITY	6.275	A	77.0	0.578	44.540	**81.7**
		1300	RESIDENTIAL HIGH DENSITY	2.293	B/D	92.0	0.211	19.448	
		1400	COMMERCIAL AND SERVICES	0.531	A	89.0	0.049	4.357	
		1400	COMMERCIAL AND SERVICES	0.500	B/D	95.0	0.046	4.383	
		4000	UPLAND FOREST	0.022	A	36.0	0.002	0.073	
		4000	UPLAND FOREST	1.210	B/D	79.0	0.112	8.809	
		5300	RESERVOIRS	0.001	A	100.0	0.000	0.006	
		5300	RESERVOIRS	0.000	B/D	100.0	0.000	0.004	
		8140	ROADS AND HIGHWAYS	0.016	A	83.0	0.001	0.119	
AW-620	7.02	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.164	A	51.0	0.023	1.194	**88.5**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.289	B/D	84.0	0.041	3.460	
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.042	D	84.0	0.006	0.505	
		1300	RESIDENTIAL HIGH DENSITY	0.023	A	77.0	0.003	0.250	
		1300	RESIDENTIAL HIGH DENSITY	0.869	B/D	92.0	0.124	11.393	
		1300	RESIDENTIAL HIGH DENSITY	0.757	D	92.0	0.108	9.930	
		5300	RESERVOIRS	0.000	B/D	100.0	0.000	0.003	
		6170	MIXED WETLAND HARDWOODS	0.035	A	68.0	0.005	0.336	
		6170	MIXED WETLAND HARDWOODS	2.349	B/D	89.0	0.335	29.797	
		6170	MIXED WETLAND HARDWOODS	2.104	D	89.0	0.300	26.696	
		8140	ROADS AND HIGHWAYS	0.137	A	83.0	0.020	1.627	
		8140	ROADS AND HIGHWAYS	0.246	B/D	93.0	0.035	3.259	
AW-625	2.95	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	1.621	B/D	84.0	0.550	46.218	**86.5**
		1400	COMMERCIAL AND SERVICES	0.075	B/D	95.0	0.026	2.428	
		5300	RESERVOIRS	0.001	B/D	100.0	0.000	0.032	
		6170	MIXED WETLAND HARDWOODS	1.100	B/D	89.0	0.373	33.233	
		8140	ROADS AND HIGHWAYS	0.038	A	83.0	0.013	1.075	
		8140	ROADS AND HIGHWAYS	0.111	B/D	93.0	0.038	3.493	
AW-630	4.52	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.001	B/D	84.0	0.000	0.028	**95.5**
		1400	COMMERCIAL AND SERVICES	3.741	B/D	95.0	0.828	78.640	
		5300	RESERVOIRS	0.559	B/D	100.0	0.124	12.370	
		6170	MIXED WETLAND HARDWOODS	0.052	B/D	89.0	0.011	1.018	
		8140	ROADS AND HIGHWAYS	0.166	B/D	93.0	0.037	3.418	
AW-635	5.65	1400	COMMERCIAL AND SERVICES	4.602	B/D	95.0	0.814	77.343	**95.7**
		5300	RESERVOIRS	0.846	B/D	100.0	0.150	14.971	
		8140	ROADS AND HIGHWAYS	0.204	B/D	93.0	0.036	3.363	
AW-640	30.92	1300	RESIDENTIAL HIGH DENSITY	0.257	A	77.0	0.008	0.639	**90.0**

TABLE A-2
CURVE NUMBER CALCULATION SUMMARY

GIS EXPORT						REFERENCE VALUE CALCULATIONS			
SUBBASIN NAME	**SUBBASIN AREA (ACRES)**	**LAND USE CODE**	**LAND USE**	**SUBBASIN TO LANDUSE TO SOIL INTERSECTED AREA (AC)**	**SOIL HYDRO GROUP**	**LANDUSE BASED CN REFERENCE VALUE**	**CN LANDUSE AREA RATIO**	**CN RATIO**	**WEIGHTED CN**
		1300	RESIDENTIAL HIGH DENSITY	5.331	B/D	92.0	0.172	15.861	
		1300	RESIDENTIAL HIGH DENSITY	3.250	D	92.0	0.105	9.669	
		1400	COMMERCIAL AND SERVICES	0.474	B/D	95.0	0.015	1.457	
		5300	RESERVOIRS	0.528	B/D	100.0	0.017	1.709	
		6170	MIXED WETLAND HARDWOODS	20.927	B/D	89.0	0.677	60.232	
		6170	MIXED WETLAND HARDWOODS	0.098	D	89.0	0.003	0.281	
		8140	ROADS AND HIGHWAYS	0.058	B/D	93.0	0.002	0.173	
AW-650	2.33	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.037	B/D	84.0	0.016	1.335	**85.4**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.005	D	84.0	0.002	0.163	
		1300	RESIDENTIAL HIGH DENSITY	0.577	B/D	92.0	0.247	22.767	
		1300	RESIDENTIAL HIGH DENSITY	0.000	D	92.0	0.000	0.000	
		2120	UNIMPROVED PASTURES	0.621	B/D	82.0	0.266	21.835	
		2120	UNIMPROVED PASTURES	0.896	D	82.0	0.384	31.494	
		6170	MIXED WETLAND HARDWOODS	0.033	B/D	89.0	0.014	1.270	
		6170	MIXED WETLAND HARDWOODS	0.001	D	89.0	0.001	0.049	
		8140	ROADS AND HIGHWAYS	0.144	B/D	93.0	0.062	5.760	
		8140	ROADS AND HIGHWAYS	0.018	D	93.0	0.008	0.705	
AW-655	2.32	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.161	B/D	84.0	0.069	5.822	**82.3**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.180	D	84.0	0.078	6.523	
		2120	UNIMPROVED PASTURES	1.978	D	82.0	0.853	69.921	
		8140	ROADS AND HIGHWAYS	0.001	B/D	93.0	0.000	0.032	
AW-660	8.07	1300	RESIDENTIAL HIGH DENSITY	0.727	A	77.0	0.090	6.943	**91.1**
		1300	RESIDENTIAL HIGH DENSITY	2.945	B/D	92.0	0.365	33.582	
		1300	RESIDENTIAL HIGH DENSITY	0.330	D	92.0	0.041	3.761	
		6170	MIXED WETLAND HARDWOODS	0.000	A	68.0	0.000	0.002	
		6170	MIXED WETLAND HARDWOODS	2.240	B/D	89.0	0.278	24.705	
		6170	MIXED WETLAND HARDWOODS	0.004	D	89.0	0.001	0.047	
		6460	TREELESS HYDRIC SAVANNA	0.199	A	98.0	0.025	2.412	
		6460	TREELESS HYDRIC SAVANNA	0.024	B/D	98.0	0.003	0.295	
		6460	TREELESS HYDRIC SAVANNA	1.477	D	98.0	0.183	17.938	
		8140	ROADS AND HIGHWAYS	0.122	D	93.0	0.015	1.408	
AW-665	1.16	1300	RESIDENTIAL HIGH DENSITY	0.895	B/D	92.0	0.770	70.818	**92.7**
		1300	RESIDENTIAL HIGH DENSITY	0.114	D	92.0	0.098	8.995	
		6170	MIXED WETLAND HARDWOODS	0.008	B/D	89.0	0.007	0.583	
		6460	TREELESS HYDRIC SAVANNA	0.135	D	98.0	0.116	11.377	
		8140	ROADS AND HIGHWAYS	0.011	D	93.0	0.010	0.914	
AW-670	0.08	1300	RESIDENTIAL HIGH DENSITY	0.002	B/D	92.0	0.024	2.175	**92.0**
		1300	RESIDENTIAL HIGH DENSITY	0.083	D	92.0	0.976	89.825	
AW-675	0.38	1300	RESIDENTIAL HIGH DENSITY	0.086	D	92.0	0.224	20.627	**96.3**
		6460	TREELESS HYDRIC SAVANNA	0.270	D	98.0	0.706	69.145	
		8140	ROADS AND HIGHWAYS	0.027	D	93.0	0.070	6.531	
AW-680	0.80	1300	RESIDENTIAL HIGH DENSITY	0.053	D	92.0	0.067	6.151	**95.1**
		2120	UNIMPROVED PASTURES	0.099	D	82.0	0.124	10.199	
		6460	TREELESS HYDRIC SAVANNA	0.565	D	98.0	0.706	69.209	
		8140	ROADS AND HIGHWAYS	0.082	D	93.0	0.103	9.537	
AW-700	2.66	1300	RESIDENTIAL HIGH DENSITY	0.078	D	92.0	0.029	2.688	**94.2**
		1700	INSTITUTIONAL	1.865	D	93.0	0.702	65.309	
		1900	OPEN LAND	0.024	D	82.0	0.009	0.728	
		5300	RESERVOIRS	0.516	D	100.0	0.194	19.434	
		8140	ROADS AND HIGHWAYS	0.173	D	93.0	0.065	6.075	
AW-710	2.47	1700	INSTITUTIONAL	0.113	D	93.0	0.046	4.259	**73.7**
		1900	OPEN LAND	0.592	A	44.0	0.240	10.561	
		1900	OPEN LAND	1.527	D	82.0	0.619	50.773	
		5300	RESERVOIRS	0.003	D	100.0	0.001	0.111	
		8140	ROADS AND HIGHWAYS	0.186	A	83.0	0.075	6.246	
		8140	ROADS AND HIGHWAYS	0.046	D	93.0	0.019	1.733	
AW-735	7.43	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.677	B/D	84.0	0.091	7.652	**86.3**
		5300	RESERVOIRS	1.054	B/D	100.0	0.142	14.184	
		8140	ROADS AND HIGHWAYS	5.114	A	83.0	0.688	57.138	
		8140	ROADS AND HIGHWAYS	0.349	B/D	93.0	0.047	4.373	
		8140	ROADS AND HIGHWAYS	0.235	D	93.0	0.032	2.942	
AW-740	11.43	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	3.281	B/D	84.0	0.287	24.122	**92.5**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	0.946	D	84.0	0.083	6.952	
		2120	UNIMPROVED PASTURES	0.092	B/D	82.0	0.008	0.660	
		2120	UNIMPROVED PASTURES	0.084	D	82.0	0.007	0.606	
		6460	TREELESS HYDRIC SAVANNA	4.341	B/D	98.0	0.380	37.231	
		6460	TREELESS HYDRIC SAVANNA	2.578	D	98.0	0.226	22.109	
		8140	ROADS AND HIGHWAYS	0.015	B/D	93.0	0.001	0.123	
		8140	ROADS AND HIGHWAYS	0.089	D	93.0	0.008	0.726	
AW-745	0.12	2120	UNIMPROVED PASTURES	0.036	B/D	82.0	0.303	24.848	**82.4**
		2120	UNIMPROVED PASTURES	0.079	D	82.0	0.658	53.958	
		8140	ROADS AND HIGHWAYS	0.005	D	93.0	0.039	3.623	
AW-750	0.32	2120	UNIMPROVED PASTURES	0.148	B/D	82.0	0.462	37.914	**90.6**
		6460	TREELESS HYDRIC SAVANNA	0.172	B/D	98.0	0.538	52.688	
AW-755	0.81	2120	UNIMPROVED PASTURES	0.049	B/D	82.0	0.060	4.917	**97.0**
		6460	TREELESS HYDRIC SAVANNA	0.482	B/D	98.0	0.592	58.060	
		6460	TREELESS HYDRIC SAVANNA	0.282	D	98.0	0.347	33.962	
		8140	ROADS AND HIGHWAYS	0.001	D	93.0	0.001	0.096	
AW-760	63.12	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	3.258	A	51.0	0.052	2.633	**86.3**
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	12.117	B/D	84.0	0.192	16.127	
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	2.944	C	79.0	0.047	3.684	
		1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	2.791	D	84.0	0.044	3.714	
		2110	IMPROVED PASTURES	9.567	B/D	82.0	0.152	12.430	
		2110	IMPROVED PASTURES	1.853	D	82.0	0.029	2.408	
		2130	WOODLAND PASTURE	0.158	B/D	82.0	0.003	0.206	
		2130	WOODLAND PASTURE	0.157	D	82.0	0.002	0.204	
		6300	WETLAND FORESTED MIXED	8.174	B/D	89.0	0.130	11.526	
		6300	WETLAND FORESTED MIXED	0.511	C	86.0	0.008	0.696	
		6300	WETLAND FORESTED MIXED	0.066	D	89.0	0.001	0.093	

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CURVE NUMBER CALCULATION SUMMARY

GIS EXPORT						REFERENCE VALUE CALCULATIONS			
SUBBASIN NAME	**SUBBASIN AREA (ACRES)**	**LAND USE CODE**	**LAND USE**	**SUBBASIN TO LANDUSE TO SOIL INTERSECTED AREA (AC)**	**SOIL HYDRO GROUP**	**LANDUSE BASED CN REFERENCE VALUE**	**CN LANDUSE AREA RATIO**	**CN RATIO**	**WEIGHTED CN**
		6460	TREELESS HYDRIC SAVANNA	13.778	B/D	98.0	0.218	21.393	
		6460	TREELESS HYDRIC SAVANNA	2.027	D	98.0	0.032	3.148	
		8140	ROADS AND HIGHWAYS	0.340	A	83.0	0.005	0.447	
		8140	ROADS AND HIGHWAYS	0.530	B/D	93.0	0.008	0.781	
		8140	ROADS AND HIGHWAYS	0.083	C	92.0	0.001	0.121	
		8140	ROADS AND HIGHWAYS	0.164	D	93.0	0.003	0.241	
		8320	ELECTRICAL POWER TRANSMISSION LINE	4.254	B/D	89.0	0.067	5.999	
		8320	ELECTRICAL POWER TRANSMISSION LINE	0.342	D	89.0	0.005	0.483	
AW-765	1.05	3100	HERBACEOUS RANGELAND	0.159	B/D	80.0	0.152	12.161	**91.7**
		3300	MIXED RANGELAND	0.217	B/D	84.0	0.207	17.404	
		6430	WET PRAIRIES	0.526	B/D	98.0	0.503	49.313	
		8140	ROADS AND HIGHWAYS	0.144	B/D	93.0	0.138	12.797	
AW-770	0.69	3100	HERBACEOUS RANGELAND	0.179	B/D	80.0	0.258	20.658	**82.2**
		3100	HERBACEOUS RANGELAND	0.135	D	80.0	0.195	15.616	
		3300	MIXED RANGELAND	0.198	B/D	84.0	0.286	24.056	
		3300	MIXED RANGELAND	0.180	D	84.0	0.260	21.857	
AW-800	9.30	1300	RESIDENTIAL HIGH DENSITY	0.020	A	77.0	0.002	0.166	**88.4**
		1300	RESIDENTIAL HIGH DENSITY	0.011	B/D	92.0	0.001	0.105	
		1400	COMMERCIAL AND SERVICES	7.618	A	89.0	0.819	72.885	
		4000	UPLAND FOREST	0.354	A	36.0	0.038	1.372	
		4000	UPLAND FOREST	0.059	B/D	79.0	0.006	0.505	
		5300	RESERVOIRS	0.536	A	100.0	0.058	5.765	
		5300	RESERVOIRS	0.703	B/D	100.0	0.076	7.561	
AW-805	7.54	1300	RESIDENTIAL HIGH DENSITY	0.008	A	77.0	0.001	0.085	**90.7**
		1300	RESIDENTIAL HIGH DENSITY	0.004	B/D	92.0	0.001	0.046	
		1400	COMMERCIAL AND SERVICES	5.693	A	89.0	0.755	67.181	
		1400	COMMERCIAL AND SERVICES	1.445	B/D	95.0	0.192	18.204	
		5300	RESERVOIRS	0.059	A	100.0	0.008	0.785	
		5300	RESERVOIRS	0.332	B/D	100.0	0.044	4.406	
AW-810	0.44	1400	COMMERCIAL AND SERVICES	0.282	A	89.0	0.635	56.515	**88.5**
		1400	COMMERCIAL AND SERVICES	0.033	B/D	95.0	0.075	7.146	
		8140	ROADS AND HIGHWAYS	0.096	A	83.0	0.216	17.925	
		8140	ROADS AND HIGHWAYS	0.033	B/D	93.0	0.074	6.865	
AW-820	21.17	1190	LOW DENSITY UNDER CONSTRUCTION	5.467	A	51.0	0.258	13.172	**74.6**
		1190	LOW DENSITY UNDER CONSTRUCTION	9.022	B/D	84.0	0.426	35.800	
		4340	HARDWOOD CONIFER MIXED	0.058	A	36.0	0.003	0.098	
		4340	HARDWOOD CONIFER MIXED	3.530	B/D	79.0	0.167	13.172	
		4340	HARDWOOD CONIFER MIXED	1.587	D	79.0	0.075	5.921	
		6300	WETLAND FORESTED MIXED	1.051	B/D	89.0	0.050	4.417	
		8140	ROADS AND HIGHWAYS	0.021	A	83.0	0.001	0.082	
		8140	ROADS AND HIGHWAYS	0.328	B/D	93.0	0.016	1.442	
		8140	ROADS AND HIGHWAYS	0.106	D	93.0	0.005	0.467	
AW-830	10.59	1190	LOW DENSITY UNDER CONSTRUCTION	4.773	A	51.0	0.451	22.981	**69.1**
		1190	LOW DENSITY UNDER CONSTRUCTION	5.819	B/D	84.0	0.549	46.150	
AW-835	5.19	1190	LOW DENSITY UNDER CONSTRUCTION	0.251	A	51.0	0.048	2.464	**83.1**
		1190	LOW DENSITY UNDER CONSTRUCTION	4.303	B/D	84.0	0.829	69.595	
		4340	HARDWOOD CONIFER MIXED	0.319	B/D	79.0	0.061	4.846	
		5300	RESERVOIRS	0.321	B/D	100.0	0.062	6.183	
AW-850	1.31	1190	LOW DENSITY UNDER CONSTRUCTION	0.257	A	51.0	0.197	10.025	**77.5**
		1190	LOW DENSITY UNDER CONSTRUCTION	1.049	B/D	84.0	0.803	67.486	
		4340	HARDWOOD CONIFER MIXED	0.000	B/D	79.0	0.000	0.001	
AW-860	32.33	1300	RESIDENTIAL HIGH DENSITY	9.489	A	77.0	0.294	22.602	**83.6**
		1300	RESIDENTIAL HIGH DENSITY	5.453	B/D	92.0	0.169	15.517	
		1300	RESIDENTIAL HIGH DENSITY	0.760	D	92.0	0.023	2.162	
		1400	COMMERCIAL AND SERVICES	1.328	B/D	95.0	0.041	3.903	
		4340	HARDWOOD CONIFER MIXED	0.430	A	36.0	0.013	0.479	
		4340	HARDWOOD CONIFER MIXED	2.113	B/D	79.0	0.065	5.163	
		6170	MIXED WETLAND HARDWOODS	2.086	A	68.0	0.065	4.389	
		6170	MIXED WETLAND HARDWOODS	8.685	B/D	89.0	0.269	23.909	
		6170	MIXED WETLAND HARDWOODS	1.692	D	89.0	0.052	4.659	
		8140	ROADS AND HIGHWAYS	0.015	A	83.0	0.000	0.040	
		8140	ROADS AND HIGHWAYS	0.215	B/D	93.0	0.007	0.618	
		8140	ROADS AND HIGHWAYS	0.061	D	93.0	0.002	0.176	
AW-865	81.62	1190	LOW DENSITY UNDER CONSTRUCTION	10.454	A	51.0	0.128	6.532	**83.0**
		1190	LOW DENSITY UNDER CONSTRUCTION	25.788	B/D	84.0	0.316	26.539	
		1190	LOW DENSITY UNDER CONSTRUCTION	0.659	D	84.0	0.008	0.678	
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.029	B/D	86.0	0.000	0.030	
		4340	HARDWOOD CONIFER MIXED	0.043	B/D	79.0	0.001	0.042	
		4340	HARDWOOD CONIFER MIXED	0.029	D	79.0	0.000	0.028	
		6170	MIXED WETLAND HARDWOODS	37.592	B/D	89.0	0.461	40.990	
		6170	MIXED WETLAND HARDWOODS	1.606	D	89.0	0.020	1.751	
		6460	TREELESS HYDRIC SAVANNA	0.077	A	98.0	0.001	0.093	
		6460	TREELESS HYDRIC SAVANNA	4.315	B/D	98.0	0.053	5.181	
		8140	ROADS AND HIGHWAYS	0.907	B/D	93.0	0.011	1.034	
		8140	ROADS AND HIGHWAYS	0.123	D	93.0	0.002	0.140	
AW-870	2.83	1190	LOW DENSITY UNDER CONSTRUCTION	0.033	B/D	84.0	0.012	0.992	**88.9**
		1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	0.000	B/D	86.0	0.000	0.012	
		5300	RESERVOIRS	0.000	B/D	100.0	0.000	0.010	
		6430	WET PRAIRIES	0.000	B/D	98.0	0.000	0.003	
		8310	ELECTRIC POWER FACILITIES	2.560	B/D	89.0	0.905	80.504	
		8310	ELECTRIC POWER FACILITIES	0.236	D	89.0	0.083	7.420	
AW-875	2.05	1190	LOW DENSITY UNDER CONSTRUCTION	0.108	B/D	84.0	0.053	4.427	**94.1**
		1190	LOW DENSITY UNDER CONSTRUCTION	0.257	D	84.0	0.125	10.527	
		6430	WET PRAIRIES	0.000	B/D	98.0	0.000	0.009	
		6460	TREELESS HYDRIC SAVANNA	0.542	B/D	98.0	0.265	25.933	
		6460	TREELESS HYDRIC SAVANNA	0.762	D	98.0	0.372	36.451	
		8140	ROADS AND HIGHWAYS	0.140	B/D	93.0	0.068	6.367	
		8310	ELECTRIC POWER FACILITIES	0.008	B/D	89.0	0.004	0.342	
		8310	ELECTRIC POWER FACILITIES	0.231	D	89.0	0.113	10.057	

TABLE A-2
CURVE NUMBER CALCULATION SUMMARY

GIS EXPORT						REFERENCE VALUE CALCULATIONS			
SUBBASIN NAME	**SUBBASIN AREA (ACRES)**	**LAND USE CODE**	**LAND USE**	**SUBBASIN TO LANDUSE TO SOIL INTERSECTED AREA (AC)**	**SOIL HYDRO GROUP**	**LANDUSE BASED CN REFERENCE VALUE**	**CN LANDUSE AREA RATIO**	**CN RATIO**	**WEIGHTED CN**
AW-880	5.12	3100	HERBACEOUS RANGELAND	0.137	B/D	80.0	0.027	2.143	**97.5**
		6430	WET PRAIRIES	0.214	B/D	98.0	0.042	4.093	
		6430	WET PRAIRIES	2.067	D	98.0	0.404	39.552	
		6460	TREELESS HYDRIC SAVANNA	2.242	B/D	98.0	0.438	42.893	
		6460	TREELESS HYDRIC SAVANNA	0.423	D	98.0	0.083	8.095	
		8140	ROADS AND HIGHWAYS	0.032	B/D	93.0	0.006	0.578	
		8310	ELECTRIC POWER FACILITIES	0.000	B/D	89.0	0.000	0.003	
		8310	ELECTRIC POWER FACILITIES	0.007	D	89.0	0.001	0.118	
AW-885	15.87	2120	UNIMPROVED PASTURES	1.924	B/D	82.0	0.121	9.939	**91.8**
		2120	UNIMPROVED PASTURES	0.618	D	82.0	0.039	3.195	
		5300	RESERVOIRS	0.595	B/D	100.0	0.037	3.750	
		5300	RESERVOIRS	0.492	D	100.0	0.031	3.097	
		6410	FRESHWATER MARSHES	1.161	B/D	100.0	0.073	7.316	
		6410	FRESHWATER MARSHES	0.071	D	100.0	0.004	0.449	
		6460	TREELESS HYDRIC SAVANNA	0.020	B/D	98.0	0.001	0.121	
		6460	TREELESS HYDRIC SAVANNA	0.004	D	98.0	0.000	0.027	
		8140	ROADS AND HIGHWAYS	0.698	A	83.0	0.044	3.651	
		8140	ROADS AND HIGHWAYS	6.535	B/D	93.0	0.412	38.291	
		8140	ROADS AND HIGHWAYS	3.753	D	93.0	0.236	21.992	
AW-890	32.38	3100	HERBACEOUS RANGELAND	0.867	B/D	80.0	0.027	2.142	**93.1**
		3100	HERBACEOUS RANGELAND	0.481	D	80.0	0.015	1.187	
		5300	RESERVOIRS	1.430	B/D	100.0	0.044	4.417	
		6410	FRESHWATER MARSHES	1.241	B/D	100.0	0.038	3.834	
		6410	FRESHWATER MARSHES	0.594	D	100.0	0.018	1.833	
		8140	ROADS AND HIGHWAYS	0.248	A	83.0	0.008	0.636	
		8140	ROADS AND HIGHWAYS	23.312	B/D	93.0	0.720	66.952	
		8140	ROADS AND HIGHWAYS	4.208	D	93.0	0.130	12.086	
AW-895	4.24	3100	HERBACEOUS RANGELAND	0.098	B/D	80.0	0.023	1.845	**97.1**
		3100	HERBACEOUS RANGELAND	0.111	D	80.0	0.026	2.100	
		6430	WET PRAIRIES	0.012	B/D	98.0	0.003	0.284	
		6430	WET PRAIRIES	1.981	D	98.0	0.467	45.759	
		6460	TREELESS HYDRIC SAVANNA	0.833	B/D	98.0	0.196	19.252	
		6460	TREELESS HYDRIC SAVANNA	1.207	D	98.0	0.284	27.872	
AW-900	1.21	3100	HERBACEOUS RANGELAND	0.004	B/D	80.0	0.003	0.261	**93.4**
		3100	HERBACEOUS RANGELAND	0.190	D	80.0	0.157	12.562	
		3300	MIXED RANGELAND	0.070	B/D	84.0	0.058	4.848	
		3300	MIXED RANGELAND	0.114	D	84.0	0.094	7.895	
		5100	STREAMS AND WATERWAYS	0.137	B/D	100.0	0.113	11.277	
		5100	STREAMS AND WATERWAYS	0.099	D	100.0	0.082	8.173	
		6430	WET PRAIRIES	0.001	B/D	98.0	0.001	0.071	
		6430	WET PRAIRIES	0.423	D	98.0	0.349	34.235	
		6460	TREELESS HYDRIC SAVANNA	0.174	D	98.0	0.143	14.059	
AW-905	32.66	1300	RESIDENTIAL HIGH DENSITY	11.676	B/D	92.0	0.357	32.890	**95.4**
		1300	RESIDENTIAL HIGH DENSITY	3.595	D	92.0	0.110	10.127	
		3300	MIXED RANGELAND	1.396	B/D	84.0	0.043	3.591	
		3300	MIXED RANGELAND	0.308	D	84.0	0.009	0.791	
		5100	STREAMS AND WATERWAYS	0.019	B/D	100.0	0.001	0.058	
		5300	RESERVOIRS	9.819	B/D	100.0	0.301	30.065	
		5300	RESERVOIRS	5.743	D	100.0	0.176	17.585	
		6430	WET PRAIRIES	0.104	B/D	98.0	0.003	0.312	
AW-910	2.65	3300	MIXED RANGELAND	0.043	B/D	84.0	0.016	1.358	**98.3**
		3300	MIXED RANGELAND	0.026	D	84.0	0.010	0.835	
		5100	STREAMS AND WATERWAYS	0.668	B/D	100.0	0.252	25.167	
		5100	STREAMS AND WATERWAYS	0.274	D	100.0	0.103	10.307	
		6430	WET PRAIRIES	0.900	B/D	98.0	0.339	33.220	
		6430	WET PRAIRIES	0.744	D	98.0	0.280	27.457	
AW-915	2.54	1300	RESIDENTIAL HIGH DENSITY	0.098	B/D	92.0	0.039	3.546	**93.1**
		3300	MIXED RANGELAND	0.369	B/D	84.0	0.145	12.191	
		5100	STREAMS AND WATERWAYS	0.895	B/D	100.0	0.352	35.186	
		6170	MIXED WETLAND HARDWOODS	0.938	B/D	89.0	0.369	32.812	
		6430	WET PRAIRIES	0.244	B/D	98.0	0.096	9.388	

TABLE A-3
TIME OF CONCENTRATION CALCULATION SUMMARY

	SHEET FLOW							**SHALLOW CONCENTRATED FLOW**						**CHANNEL / PIPE FLOW**							**SUMMARY**				
	Manning's kinematic wave equation (TR55) (overland flow less than or equal to 300 feet) $T_{t1} = \frac{(0.007*(n*L_1)^{0.8})*60}{(P^{0.5})*(S_1^{0.4})}$							$T_{t2} = \frac{L_2}{60*V} = \frac{L_2}{60*\text{antilog}(X+(0.5*\log S_2))}$ V is per TR-55 Figure 3-1 where equation of average velocity line shown is alog(X+(0.5*log S2))						Open Channel Flow (Manning's equation) $T_{t3} = \frac{L_3}{60*((1.49/n)*R^{2/3}*S_3^{1/2})}$							Time Of Concentration: $T_c = T_{t1} + T_{t2} + T_{t3}$ (10 min. minimum) Lag Time: $T_L = 0.6 * T_c / 60$				
SUBBASIN	L_1 = OVERLAND FLOW LENGTH (ft)	n = MANNING'S n (FROM TR-55)	P = 2-yr, 24-hr RAINFALL (in)	UPSTREAM ELEVATION (ft)	DOWNSTREAM ELEVATION (ft)	S_1 = LAND SLOPE (ft/ft)	**T_{t1} = TRAVEL TIME (min)**	L_2 = FLOW LENGTH (ft)	UPSTREAM ELEVATION (ft)	DOWNSTREAM ELEVATION (ft)	S_2 = WATERCOURSE SLOPE (ft/ft)	PAVED: X = 1.3, UNPAVED: X = 1.2	**T_{t2} = TRAVEL TIME (min)**	L_3 = CHANNEL LENGTH (ft)	n = MANNING'S n	UPSTREAM ELEVATION (ft)	DOWNSTREAM ELEVATION (ft)	S_3 = CHANNEL SLOPE (ft/ft)	R = HYDRAULIC RADIUS (ft)	**T_{t3} = TRAVEL TIME (min)**	TOTAL FLOW LENGTH (ft)	OVERALL SLOPE (ft/ft)	T_c = TIME OF CONC. (min)	T_L = LAG TIME (hrs)	**DESIGN T_c (min)**
AW-005	66.5	0.240	4.75	69.5	69.0	0.0075	12.50	127.6	69.0	68.0	0.0078	1.300	1.20	217.4	0.012	63.7	61.5	0.0099	0.50	0.47	411.5	0.0089	14.17	0.142	14.2
AW-010	196.7	0.240	4.75	76.0	71.0	0.0254	18.28	62.8	71.0	70.0	0.0159	1.300	0.42	439.9	0.012	64.8	61.0	0.0088	0.31	1.37	699.4	0.0141	20.07	0.201	20.1
AW-025	223.9	0.011	4.75	72.0	71.0	0.0045	3.45	12.6	71.0	70.9	0.0079	1.300	0.12	257.8	0.012	66.9	66.0	0.0033	0.50	0.95	494.4	0.0040	4.52	0.045	10.0
AW-030	121.4	0.011	4.75	71.0	70.0	0.0082	1.66	28.6	70.0	69.9	0.0035	1.300	0.40	428.3	0.012	64.8	56.5	0.0193	0.38	0.80	578.3	0.0162	2.86	0.029	10.0
AW-040	299.6	0.400	4.75	77.0	70.0	0.0234	39.84	587.7	70.0	55.0	0.0255	1.200	3.87	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	887.3	0.0248	43.71	0.437	43.7
AW-045	296.7	0.150	4.75	68.0	67.0	0.0034	39.14	107.2	67.0	65.0	0.0187	1.200	0.83	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	404.0	0.0074	39.97	0.400	40.0
AW-050	299.8	0.150	4.75	67.0	65.0	0.0067	30.03	225.6	65.0	55.0	0.0443	1.200	1.13	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	525.4	0.0228	31.16	0.312	31.2
AW-055	218.2	0.240	4.75	73.0	53.0	0.0917	11.89	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	218.2	0.0917	11.89	0.119	11.9
AW-060	114.9	0.240	4.75	53.9	52.9	0.0087	18.26	754.3	52.9	51.0	0.0025	1.300	12.55	159.9	0.012	47.3	46.5	0.0050	0.38	0.58	1029.2	0.0036	31.40	0.314	31.4
AW-065	29.4	0.011	4.75	71.9	71.5	0.0136	0.44	332.1	71.5	69.9	0.0048	1.300	4.00	1616.1	0.012	65.1	47.7	0.0108	0.38	4.02	1977.7	0.0098	8.46	0.085	10.0
AW-070	73.4	0.240	4.75	65.0	64.5	0.0068	14.07	0.0	0.0	0.0	0.0000	0.000	0.00	296.0	0.040	61.1	60.5	0.0020	0.31	6.50	369.4	0.0029	20.57	0.206	20.6
AW-075	148.0	0.240	4.75	63.0	55.0	0.0540	10.77	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	148.0	0.0540	10.77	0.108	10.8
AW-080	299.3	0.240	4.75	62.0	54.0	0.0267	25.07	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	299.3	0.0267	25.07	0.251	25.1
AW-090	272.8	0.150	4.75	60.0	58.0	0.0073	26.81	171.8	58.0	57.0	0.0058	1.200	2.37	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	444.6	0.0067	29.18	0.292	29.2
AW-095	186.1	0.150	4.75	60.0	59.0	0.0054	22.36	375.2	59.0	56.0	0.0080	1.300	3.50	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	561.2	0.0071	25.86	0.259	25.9
AW-105	133.6	0.400	4.75	57.0	52.0	0.0374	17.30	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	133.6	0.0374	17.30	0.173	17.3
AW-110	48.6	0.240	4.75	53.9	52.9	0.0206	6.50	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	48.6	0.0206	6.50	0.065	10.0
AW-115	266.7	0.240	4.75	54.0	53.0	0.0037	50.16	40.7	53.0	52.6	0.0098	1.200	0.43	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	307.4	0.0046	50.59	0.506	50.6
AW-120	46.5	0.400	4.75	53.0	52.0	0.0215	9.28	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	46.5	0.0215	9.28	0.093	10.0
AW-125	300.0	0.150	4.75	55.0	53.5	0.0050	33.72	131.3	53.5	52.9	0.0046	1.200	2.04	86.1	0.012	49.2	49.0	0.0027	0.38	0.43	517.3	0.0045	36.19	0.362	36.2
AW-130	40.0	0.400	4.75	52.0	51.5	0.0125	10.23	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	40.0	0.0125	10.23	0.102	10.2
AW-145	73.2	0.240	4.75	53.5	53.0	0.0068	14.03	596.4	53.0	51.0	0.0034	1.300	8.60	502.7	0.012	47.3	43.7	0.0072	0.31	1.73	1172.3	0.0052	24.36	0.244	24.4
AW-175	234.3	0.240	4.75	51.0	50.0	0.0043	42.93	524.8	50.0	48.5	0.0029	1.300	8.20	552.3	0.012	44.2	42.6	0.0030	0.38	2.60	1311.3	0.0032	53.72	0.537	53.7
AW-185	98.0	0.240	4.75	50.0	49.0	0.0102	15.09	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	98.0	0.0102	15.09	0.151	15.1
AW-200	298.9	0.240	4.75	54.5	53.5	0.0033	57.51	423.7	53.5	52.9	0.0014	1.200	11.84	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	722.6	0.0022	69.35	0.694	69.4
AW-205	160.3	0.240	4.75	54.0	53.0	0.0062	27.23	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	160.3	0.0062	27.23	0.272	27.2
AW-205	160.3	0.240	4.75	54.0	53.0	0.0062	27.23	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	160.3	0.0062	27.23	0.272	27.2
AW-210	110.5	0.240	4.75	53.0	52.5	0.0045	22.98	682.5	52.5	52.1	0.0006	1.200	29.65	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	793.0	0.0011	52.63	0.526	52.6
AW-215	208.3	0.240	4.75	53.0	52.0	0.0048	37.29	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	208.3	0.0048	37.29	0.373	37.3
AW-220	299.9	0.240	4.75	53.0	52.0	0.0033	57.73	656.4	52.0	51.0	0.0015	1.200	17.68	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	956.3	0.0021	75.42	0.754	75.4
AW-225	67.9	0.240	4.75	52.5	52.2	0.0044	15.72	317.3	52.2	51.0	0.0038	1.200	5.43	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	385.2	0.0039	21.15	0.211	21.1
AW-230	238.1	0.240	4.75	54.0	51.0	0.0126	28.20	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	238.1	0.0126	28.20	0.282	28.2
AW-235	167.1	0.240	4.75	51.4	50.0	0.0084	25.02	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	167.1	0.0084	25.02	0.250	25.0
AW-240	35.8	0.240	4.75	52.4	52.0	0.0112	6.50	525.2	52.4	50.4	0.0038	1.200	8.95	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	561.0	0.0043	15.45	0.154	15.4
AW-250	72.4	0.240	4.75	52.2	51.2	0.0138	10.49	440.8	51.2	50.2	0.0023	1.200	9.73	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	513.2	0.0039	20.22	0.202	20.2
AW-260	299.8	0.240	4.75	52.6	52.3	0.0010	93.42	245.9	52.3	50.2	0.0085	1.200	2.80	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	545.7	0.0044	96.22	0.962	96.2
AW-265	120.6	0.240	4.75	52.6	51.1	0.0124	16.46	254.7	51.1	50.5	0.0024	1.200	5.52	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	375.4	0.0056	21.98	0.220	22.0
AW-270	66.8	0.240	4.75	51.0	50.5	0.0075	12.56	303.7	50.5	50.0	0.0016	1.200	7.87	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	370.5	0.0027	20.43	0.204	20.4
AW-275	150.3	0.240	4.75	51.3	50.5	0.0053	27.55	115.5	50.5	50.3	0.0017	1.200	2.92	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	265.8	0.0038	30.47	0.305	30.5
AW-280	12.9	0.240	4.75	51.0	50.2	0.0620	1.45	247.4	50.2	49.8	0.0016	1.200	6.47	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	260.3	0.0046	7.92	0.079	10.0
AW-285	18.8	0.240	4.75	51.2	51.0	0.0106	3.96	271.4	51.0	50.0	0.0037	1.200	4.70	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	290.2	0.0041	8.66	0.087	10.0
AW-290	268.6	0.240	4.75	51.5	48.4	0.0115	32.17	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	268.6	0.0115	32.17	0.322	32.2
AW-300	13.4	0.240	4.75	51.3	51.0	0.0224	2.24	174.1	51.0	50.5	0.0029	1.200	3.42	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	187.5	0.0043	5.66	0.057	10.0
AW-310	27.3	0.011	4.75	51.8	50.6	0.0440	0.26	290.9	50.6	47.6	0.0103	1.200	3.01	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	318.2	0.0132	3.27	0.033	10.0
AW-315	299.9	0.240	4.75	51.5	50.2	0.0043	51.99	1382.8	50.2	49.0	0.0009	1.200	49.36	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	1682.8	0.0015	101.35	1.014	101.4
AW-325	30.7	0.240	4.75	50.0	47.0	0.0977	2.42	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	30.7	0.0977	2.42	0.024	10.0
AW-330	37.1	0.240	4.75	50.0	48.0	0.0539	3.57	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	37.1	0.0539	3.57	0.036	10.0
AW-335	36.9	0.240	4.75	49.0	48.0	0.0271	4.68	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	36.9	0.0271	4.68	0.047	10.0
AW-340	37.7	0.011	4.75	49.0	48.0	0.0265	0.41	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	37.7	0.0265	0.41	0.004	10.0
AW-345	299.7	0.240	4.75	50.0	48.0	0.0067	43.71	603.5	48.0	45.0	0.0050	1.200	9.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	903.2	0.0055	52.71	0.527	52.7
AW-350	21.3	0.240	4.75	45.0	44.0	0.0470	2.41	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	21.3	0.0470	2.41	0.024	10.0
AW-355	118.5	0.240	4.75	64.0	63.3	0.0059	21.86	507.0	63.4	58.0	0.0107	1.300	4.10	1088.1	0.012	53.5	43.5	0.0092	0.38	2.93	1713.6	0.0094	28.89	0.289	28.9
AW-360	142.8	0.240	4.75	52.5	50.5	0.0140	17.96	242.5	50.5	49.0	0.0062	1.300	2.58	525.3	0.012	45.6	40.0	0.0106	0.38	1.32	910.6	0.0100	21.85	0.218	21.8
AW-365	125.2	0.400	4.75	51.0	43.0	0.0639	13.25	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	125.2	0.0639	13.25	0.133	13.3
AW-370	187.5	0.400	4.75	47.0	45.0	0.0107	37.47	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	187.5	0.0107	37.47	0.375	37.5
AW-375	299.3	0.400	4.75	52.0	48.0	0.0134	49.79	339.9	48.0	41.0	0.0206	1.200	2.49	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	639.3	0.0172	52.28	0.523	52.3
AW-380	254.7	0.011	4.75	54.0	48.0	0.0236	1.97	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	254.7	0.0236	1.97	0.020	10.0
AW-385	219.8	0.240	4.75	48.0	46.0	0.0091	30.14	836.6	46.0	43.0	0.0036	1.300	11.67	317.0	0.012	36.8	34.6	0.0070	0.75	0.62	1373.4	0.0052	42.42	0.424	42.4
AW-390	299.4	0.240	4.75	47.0	44.0	0.0100	37.13	118.6	44.0	41.0	0.0253	1.200	0.78	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	418.0	0.0144	37.92	0.379	37.9
AW-395	19.6	0.240	4.75	47.0	46.0	0.0509	2.19	399.6	46.0	44.9	0.0028	1.200	8.01	385.2	0.012	37.5	37.4	0.0002	0.38	7.97	804.5	0.0027	18.17	0.182	18.2
AW-415	36.4	0.400	4.75	45.0	39.0	0.1646	3.38	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	36.4	0.1646	3.38	0.034	10.0
AW-420	16.0	0.240	4.75	47.0	46.0	0.0626	1.71	779.0	46.0	40.0	0.0077	1.200	9.33	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	794.9	0.0088	11.04	0.110	11.0

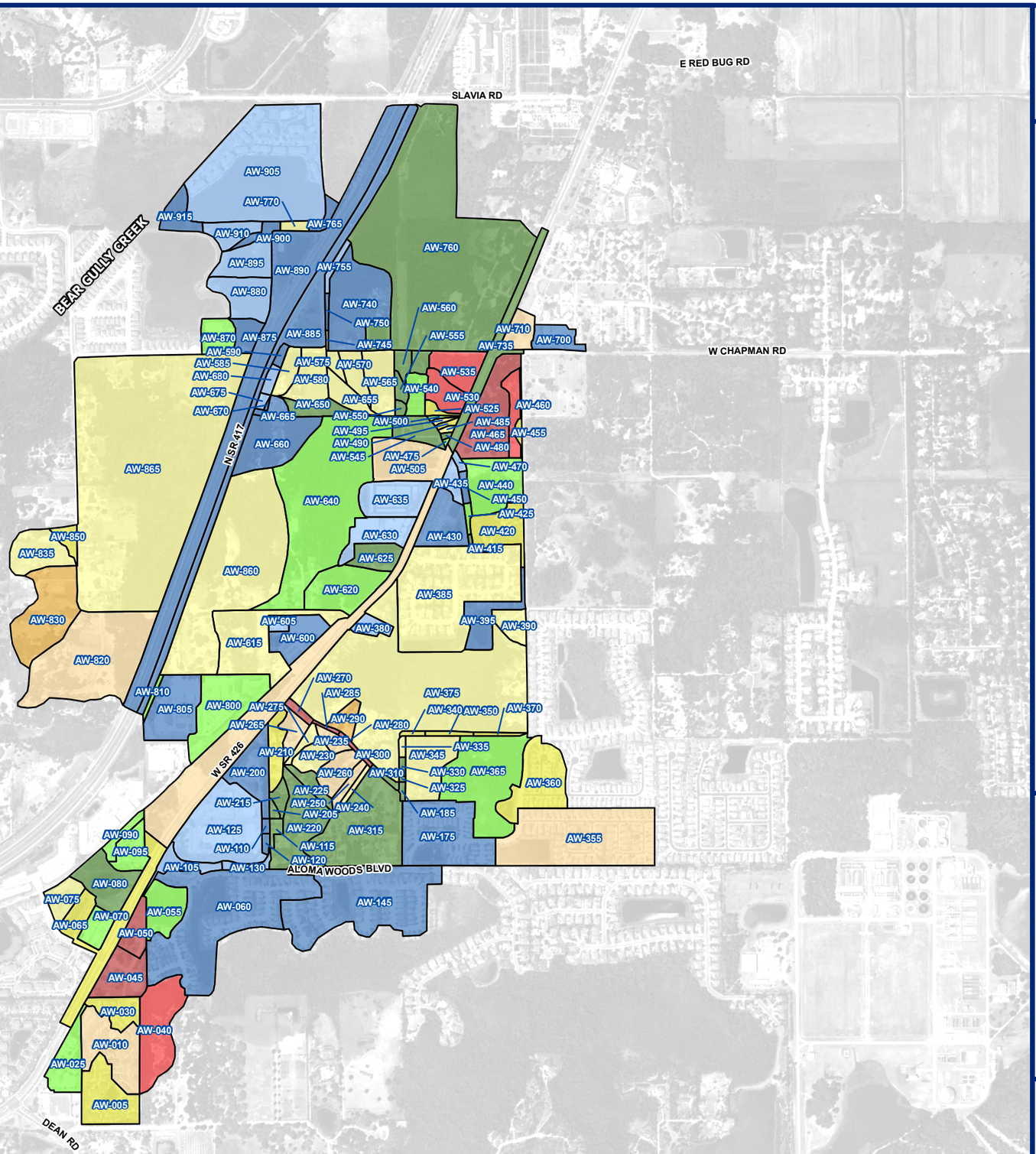
TABLE A-3
TIME OF CONCENTRATION CALCULATION SUMMARY

	SHEET FLOW							SHALLOW CONCENTRATED FLOW						CHANNEL / PIPE FLOW							SUMMARY				
	Manning's kinematic wave equation (TR55) $T_{t1} = \frac{(0.007*(n*L_1)^{0.8})*60}{(P^{0.5})*(S_1^{0.4})}$ (overland flow less than or equal to 300 feet)							$T_{t2} = \frac{L_2}{60*V} = \frac{L_2}{60*\text{antilog}(X+(0.5*\log S_2))}$ V is per TR-55 Figure 3-1 where equation of average velocity line shown is alog(X+(0.5*log S2))						Open Channel Flow (Manning's equation) $T_{t3} = \frac{L_3}{60*((1.49/n)*R^{2/3}*S_3^{1/2})}$							Time Of Concentration: $T_c = T_{t1} + T_{t2} + T_{t3}$ (10 min. minimum) Lag Time: $T_L = 0.6 * T_c / 60$				
SUBBASIN	L_1 = OVERLAND FLOW LENGTH (ft)	n = MANNING'S n (FROM TR-55)	P = 2-yr, 24-hr RAINFALL (in)	UPSTREAM ELEVATION (ft)	DOWNSTREAM ELEVATION (ft)	S_1 = LAND SLOPE (ft/ft)	**T_{t1} = TRAVEL TIME (min)**	L_2 = FLOW LENGTH (ft)	UPSTREAM ELEVATION (ft)	DOWNSTREAM ELEVATION (ft)	S_2 = WATERCOURSE SLOPE (ft/ft)	PAVED: X = 1.3, UNPAVED: X = 1.2	**T_{t2} = TRAVEL TIME (min)**	L_3 = CHANNEL LENGTH (ft)	n = MANNING'S n	UPSTREAM ELEVATION (ft)	DOWNSTREAM ELEVATION (ft)	S_3 = CHANNEL SLOPE (ft/ft)	R = HYDRAULIC RADIUS (ft)	**T_{t3} = TRAVEL TIME (min)**	TOTAL FLOW LENGTH (ft)	OVERALL SLOPE (ft/ft)	T_c = TIME OF CONC. (min)	T_L = LAG TIME (hrs)	**DESIGN T_c (min)**
AW-425	47.3	0.400	4.75	42.0	40.0	0.0422	7.19	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	47.3	0.0422	7.19	0.072	10.0
AW-430	68.0	0.240	4.75	45.0	44.5	0.0074	12.84	153.0	44.5	44.0	0.0033	1.300	2.24	761.3	0.012	40.5	35.0	0.0072	0.38	2.31	982.3	0.0066	17.39	0.174	17.4
AW-435	249.3	0.240	4.75	43.0	41.0	0.0080	35.06	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	249.3	0.0080	35.06	0.351	35.1
AW-440	212.3	0.400	4.75	45.0	41.0	0.0188	32.96	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	212.3	0.0188	32.96	0.330	33.0
AW-450	49.1	0.400	4.75	42.0	40.0	0.0407	7.50	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	49.1	0.0407	7.50	0.075	10.0
AW-455	7.6	0.240	4.75	47.0	46.9	0.0132	1.75	918.7	46.9	44.0	0.0032	1.200	17.19	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	926.2	0.0032	18.94	0.189	18.9
AW-460	299.2	0.240	4.75	47.0	45.9	0.0037	55.41	619.7	45.9	44.0	0.0031	1.200	11.77	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	918.8	0.0033	67.18	0.672	67.2
AW-465	299.7	0.240	4.75	47.0	45.9	0.0037	55.52	759.0	45.9	43.5	0.0032	1.200	14.19	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	1058.7	0.0033	69.72	0.697	69.7
AW-470	65.7	0.240	4.75	43.0	41.0	0.0305	7.07	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	65.7	0.0305	7.07	0.071	10.0
AW-475	78.7	0.240	4.75	42.0	40.0	0.0254	8.79	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	78.7	0.0254	8.79	0.088	10.0
AW-480	105.6	0.240	4.75	43.0	40.0	0.0284	10.64	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	105.6	0.0284	10.64	0.106	10.6
AW-485	152.3	0.240	4.75	43.0	40.0	0.0197	16.50	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	152.3	0.0197	16.50	0.165	16.5
AW-490	216.5	0.240	4.75	43.0	40.0	0.0139	25.17	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	216.5	0.0139	25.17	0.252	25.2
AW-495	230.6	0.240	4.75	44.0	40.0	0.0173	24.20	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	230.6	0.0173	24.20	0.242	24.2
AW-500	284.3	0.240	4.75	44.0	40.0	0.0141	31.10	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	284.3	0.0141	31.10	0.311	31.1
AW-505	205.3	0.240	4.75	65.0	58.0	0.0341	16.82	568.9	58.0	57.0	0.0018	1.200	14.27	4625.6	0.012	51.2	31.2	0.0043	0.38	18.15	5399.9	0.0052	49.24	0.492	49.2
AW-525	281.4	0.400	4.75	44.0	40.0	0.0142	46.22	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	281.4	0.0142	46.22	0.462	46.2
AW-530	299.7	0.400	4.75	45.0	40.0	0.0167	45.60	102.7	40.0	35.0	0.0487	1.200	0.49	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	402.4	0.0249	46.09	0.461	46.1
AW-535	299.9	0.400	4.75	43.5	40.0	0.0117	52.65	286.6	40.0	36.0	0.0140	1.200	2.55	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	586.5	0.0128	55.20	0.552	55.2
AW-540	207.1	0.240	4.75	38.0	35.0	0.0145	23.86	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	207.1	0.0145	23.86	0.239	23.9
AW-545	299.8	0.240	4.75	43.0	40.0	0.0100	37.18	328.9	40.0	37.0	0.0091	1.200	3.62	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	628.6	0.0095	40.81	0.408	40.8
AW-550	99.3	0.240	4.75	38.0	37.0	0.0101	15.32	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	99.3	0.0101	15.32	0.153	15.3
AW-555	216.0	0.240	4.75	37.0	35.0	0.0093	29.51	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	216.0	0.0093	29.51	0.295	29.5
AW-560	299.8	0.240	4.75	36.0	34.0	0.0067	43.74	63.0	34.0	32.0	0.0317	1.200	0.37	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	362.8	0.0110	44.11	0.441	44.1
AW-561	279.0	0.240	4.75	38.0	35.0	0.0108	34.12	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	279.0	0.0108	34.12	0.341	34.1
AW-565	299.2	0.240	4.75	37.0	33.0	0.0134	33.07	375.2	33.0	32.0	0.0027	1.200	7.64	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	674.5	0.0074	40.72	0.407	40.7
AW-570	299.9	0.240	4.75	34.0	32.5	0.0050	49.10	317.5	33.0	31.0	0.0063	1.200	4.21	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	617.4	0.0057	53.30	0.533	53.3
AW-575	299.8	0.240	4.75	32.0	31.0	0.0033	57.70	52.8	31.0	30.0	0.0189	1.200	0.40	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	352.6	0.0057	58.11	0.581	58.1
AW-580	300.0	0.240	4.75	36.0	32.0	0.0133	33.17	240.7	32.0	31.0	0.0042	1.200	3.93	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	540.7	0.0092	37.10	0.371	37.1
AW-585	299.7	0.150	4.75	36.0	31.0	0.0167	20.81	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	299.7	0.0167	20.81	0.208	20.8
AW-590	43.6	0.400	4.75	34.0	31.0	0.0688	5.54	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	43.6	0.0688	5.54	0.055	10.0
AW-600	167.3	0.011	4.75	49.0	45.0	0.0239	1.40	20.9	45.0	44.9	0.0048	1.200	0.32	480.8	0.012	44.1	41.4	0.0056	0.38	1.66	669.0	0.0102	3.37	0.034	10.0
AW-605	75.2	0.240	4.75	50.0	49.5	0.0067	14.48	35.3	49.5	49.0	0.0142	1.300	0.25	140.5	0.012	47.0	46.5	0.0036	0.38	0.61	251.0	0.0060	15.33	0.153	15.3
AW-615	299.5	0.240	4.75	55.0	50.0	0.0167	30.28	964.5	50.0	43.0	0.0073	1.200	11.90	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	1264.0	0.0095	42.19	0.422	42.2
AW-620	300.0	0.400	4.75	46.0	42.0	0.0133	49.92	110.1	42.0	39.0	0.0272	1.200	0.70	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	410.1	0.0171	50.62	0.506	50.6
AW-625	280.9	0.400	4.75	45.0	43.0	0.0071	60.87	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	280.9	0.0071	60.87	0.609	60.9
AW-630	123.8	0.240	4.75	44.3	43.9	0.0032	28.81	40.0	43.9	43.8	0.0025	1.300	0.67	789.5	0.012	38.9	34.0	0.0063	0.31	2.91	953.4	0.0057	32.39	0.324	32.4
AW-635	163.7	0.240	4.75	43.0	42.0	0.0061	27.93	177.1	42.0	40.5	0.0085	1.300	1.61	617.7	0.012	37.8	35.0	0.0045	0.31	2.70	958.5	0.0055	32.24	0.322	32.2
AW-640	299.3	0.240	4.75	50.0	45.0	0.0167	30.26	938.8	45.0	33.0	0.0128	1.200	8.73	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	1238.1	0.0137	38.99	0.390	39.0
AW-650	300.0	0.240	4.75	36.0	34.5	0.0050	49.11	266.1	34.5	33.0	0.0056	1.200	3.73	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	566.1	0.0053	52.84	0.528	52.8
AW-655	299.7	0.240	4.75	35.5	33.5	0.0067	43.73	305.6	33.5	32.5	0.0033	1.200	5.62	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	605.4	0.0050	49.35	0.493	49.3
AW-660	277.2	0.240	4.75	45.0	34.0	0.0397	20.13	248.2	34.0	33.0	0.0040	1.200	4.11	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	525.4	0.0228	24.25	0.242	24.2
AW-665	204.9	0.150	4.75	36.0	34.0	0.0098	19.02	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	204.9	0.0098	19.02	0.190	19.0
AW-670	134.5	0.240	4.75	36.0	33.0	0.0223	14.22	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	134.5	0.0223	14.22	0.142	14.2
AW-675	116.1	0.240	4.75	36.0	33.0	0.0258	11.91	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	116.1	0.0258	11.91	0.119	11.9
AW-680	49.4	0.400	4.75	34.0	31.0	0.0607	6.43	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	49.4	0.0607	6.43	0.064	10.0
AW-700	38.6	0.240	4.75	48.0	47.0	0.0259	4.93	132.5	47.0	46.8	0.0015	1.200	3.58	38.3	0.012	43.0	42.7	0.0086	0.31	0.12	209.3	0.0073	8.64	0.086	10.0
AW-710	299.3	0.240	4.75	47.0	45.0	0.0067	43.65	137.8	45.0	44.5	0.0036	1.200	2.40	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	437.1	0.0057	46.06	0.461	46.1
AW-735	31.5	0.011	4.75	45.6	45.2	0.0127	0.47	540.7	45.2	43.3	0.0035	1.300	7.62	2394.6	0.012	38.9	28.9	0.0042	0.38	9.56	2966.8	0.0041	17.65	0.177	17.7
AW-740	299.1	0.400	4.75	36.0	32.5	0.0117	52.46	193.5	32.5	32.0	0.0026	1.200	4.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	492.6	0.0081	56.47	0.565	56.5
AW-745	13.0	0.400	4.75	34.0	33.9	0.0077	5.03	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	13.0	0.0077	5.03	0.050	10.0
AW-750	24.9	0.400	4.75	36.0	34.0	0.0803	3.32	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	24.9	0.0803	3.32	0.033	10.0
AW-755	27.0	0.400	4.75	36.0	34.0	0.0740	3.67	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	27.0	0.0740	3.67	0.037	10.0
AW-760	299.8	0.400	4.75	45.0	42.0	0.0100	55.96	1498.0	42.0	30.0	0.0080	1.200	17.60	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	1797.8	0.0083	73.56	0.736	73.6
AW-765	51.3	0.400	4.75	37.0	31.0	0.1169	5.10	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	51.3	0.1169	5.10	0.051	10.0
AW-770	32.7	0.400	4.75	37.0	31.0	0.1834	2.97	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	32.7	0.1834	2.97	0.030	10.0
AW-800	299.2	0.011	4.75	56.0	55.0	0.0033	4.89	150.5	55.0	51.0	0.0266	1.200	0.97	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	449.7	0.0111	5.86	0.059	10.0
AW-805	51.3	0.240	4.75	56.0	54.5	0.0292	5.90	406.5	54.5	52.0	0.0062	1.200	5.45	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	457.8	0.0087	11.35	0.113	11.3
AW-810	20.1	0.240	4.75	53.0	52.0	0.0498	2.25	438.3	52.0	50.0	0.0046	1.200	6.82	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	458.4	0.0065	9.07	0.091	10.0
AW-820	299.2	0.400	4.75	59.0	54.0	0.0167	45.50	1136.1	54.0	42.0	0.0106	1.200	11.62	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	1435.2	0.0118	57.13	0.571	57.1
AW-830	299.3	0.400	4.75	57.0	51.0	0.0200	42.33	577.8	51.0	48.0	0.0052	1.200	8.43	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	877.1	0.0103	50.76	0.508	50.8
AW-835	256.5	0.240	4.75	48.0	46.0	0.0078	36.26	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	256.5	0.0078	36.26	0.363	36.3

TABLE A-3
TIME OF CONCENTRATION CALCULATION SUMMARY

	SHEET FLOW							**SHALLOW CONCENTRATED FLOW**						**CHANNEL / PIPE FLOW**							**SUMMARY**				
	Manning's kinematic wave equation (TR55) (overland flow less than or equal to 300 feet) $T_{t1} = \frac{(0.007 * (n * L_1)^{0.8}) * 60}{(P^{0.5}) * (S_1^{0.4})}$							$T_{t2} = \frac{L_2}{60 * V} = \frac{L_2}{60 * \text{antilog}(X + (0.5 * \log S_2))}$ V is per TR-55 Figure 3-1 where equation of average velocity line shown is alog(X+(0.5*log S2))						Open Channel Flow (Manning's equation) $T_{t3} = \frac{L_3}{60 * ((1.49/n) * R^{2/3} * S_3^{1/2})}$							Time Of Concentration: $T_c = T_{t1} + T_{t2} + T_{t3}$ (10 min. minimum) Lag Time: $T_L = 0.6 * T_c / 60$				
SUBBASIN	L_1 = OVERLAND FLOW LENGTH (ft)	n = MANNING'S n (FROM TR-55)	P = 2-yr, 24-hr RAINFALL (in)	UPSTREAM ELEVATION (ft)	DOWNSTREAM ELEVATION (ft)	S_1 = LAND SLOPE (ft/ft)	**T_{t1} = TRAVEL TIME (min)**	L_2 = FLOW LENGTH (ft)	UPSTREAM ELEVATION (ft)	DOWNSTREAM ELEVATION (ft)	S_2 = WATERCOURSE SLOPE (ft/ft)	PAVED: X = 1.3, UNPAVED: X = 1.2	**T_{t2} = TRAVEL TIME (min)**	L_3 = CHANNEL LENGTH (ft)	n = MANNING'S n	UPSTREAM ELEVATION (ft)	DOWNSTREAM ELEVATION (ft)	S_3 = CHANNEL SLOPE (ft/ft)	R = HYDRAULIC RADIUS (ft)	**T_{t3} = TRAVEL TIME (min)**	TOTAL FLOW LENGTH (ft)	OVERALL SLOPE (ft/ft)	T_c = TIME OF CONC. (min)	T_L = LAG TIME (hrs)	**DESIGN T_c (min)**
AW-850	288.0	0.240	4.75	50.0	46.0	0.0139	31.58	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	288.0	0.0139	31.58	0.316	31.6
AW-860	300.0	0.240	4.75	55.0	51.0	0.0133	33.17	1719.7	51.0	35.0	0.0093	1.200	18.75	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	2019.7	0.0099	51.92	0.519	51.9
AW-865	299.0	0.240	4.75	48.0	45.0	0.0100	37.07	1253.1	45.0	34.0	0.0088	1.200	14.06	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	1552.1	0.0090	51.14	0.511	51.1
AW-870	299.8	0.150	4.75	37.0	34.0	0.0100	25.53	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	299.8	0.0100	25.53	0.255	25.5
AW-875	299.2	0.400	4.75	35.5	32.0	0.0117	52.50	51.2	31.0	29.0	0.0391	1.200	0.27	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	350.5	0.0157	52.77	0.528	52.8
AW-880	300.0	0.400	4.75	35.0	34.0	0.0033	86.91	333.9	34.0	30.0	0.0120	1.200	3.21	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	633.9	0.0079	90.11	0.901	90.1
AW-885	33.9	0.240	4.75	57.0	56.0	0.0295	4.22	4135.1	56.0	36.0	0.0048	1.200	62.53	96.0	0.012	27.0	22.0	0.0521	0.75	0.07	4265.0	0.0061	66.82	0.668	66.8
AW-890	53.6	0.240	4.75	56.0	53.0	0.0560	4.71	4387.3	53.0	36.0	0.0039	1.200	74.12	324.8	0.012	28.3	20.4	0.0243	0.75	0.34	4765.7	0.0059	79.17	0.792	79.2
AW-895	299.6	0.400	4.75	34.0	32.5	0.0050	73.77	421.6	32.5	29.0	0.0083	1.200	4.87	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	721.2	0.0069	78.64	0.786	78.6
AW-900	299.4	0.400	4.75	33.5	32.5	0.0033	86.70	159.7	32.5	30.0	0.0157	1.200	1.34	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	459.1	0.0076	88.04	0.880	88.0
AW-905	154.2	0.240	4.75	35.0	34.0	0.0065	25.99	20.3	34.0	33.9	0.0049	1.200	0.30	576.3	0.012	28.3	24.5	0.0066	0.50	1.51	750.7	0.0065	27.80	0.278	27.8
AW-910	265.7	0.400	4.75	34.0	28.0	0.0226	36.69	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	265.7	0.0226	36.69	0.367	36.7
AW-915	53.1	0.240	4.75	35.0	28.0	0.1319	3.32	0.0	0.0	0.0	0.0000	0.000	0.00	0.0	0.000	0.0	0.0	0.0000	0.00	0.00	53.1	0.1319	3.32	0.033	10.0

SUBBASIN DATA SUMMARY					
SUBBASIN	AREA (ACRES)	CURVE NUMBER	SUBBASIN	AREA (ACRES)	CURVE NUMBER
AW-005	6.89	79	AW-465	8.93	60
AW-010	8.08	74	AW-470	0.39	95
AW-025	4.46	90	AW-475	0.10	89
AW-030	3.02	79	AW-480	0.15	87
AW-040	8.82	66	AW-485	0.22	84
AW-045	5.10	57	AW-490	0.29	79
AW-050	2.55	54	AW-495	0.25	84
AW-055	4.56	89	AW-500	0.21	88
AW-060	27.17	91	AW-505	28.94	76
AW-065	9.45	79	AW-525	0.63	81
AW-070	2.30	88	AW-530	2.91	66
AW-075	2.58	82	AW-535	3.89	64
AW-080	5.60	85	AW-540	0.99	86
AW-090	1.25	89	AW-545	2.87	86
AW-095	3.01	89	AW-550	0.40	87
AW-105	2.13	97	AW-555	0.75	85
AW-110	0.28	91	AW-560	1.07	86
AW-115	0.65	86	AW-561	2.00	89
AW-120	0.38	91	AW-565	4.44	84
AW-125	13.86	95	AW-570	2.34	83
AW-130	0.95	96	AW-575	0.85	83
AW-145	22.39	92	AW-580	4.35	84
AW-175	12.91	92	AW-585	1.99	84
AW-185	0.28	86	AW-590	0.49	93
AW-200	5.07	92	AW-600	4.22	92
AW-205	0.37	86	AW-605	0.79	95
AW-210	2.71	80	AW-615	10.85	82
AW-215	1.05	86	AW-620	7.02	88
AW-220	8.24	86	AW-625	2.95	86
AW-225	1.53	86	AW-630	4.52	95
AW-230	2.09	82	AW-635	5.65	96
AW-235	1.24	76	AW-640	30.92	90
AW-240	0.66	83	AW-650	2.33	85
AW-250	1.10	75	AW-655	2.32	82
AW-260	2.92	74	AW-660	8.07	91
AW-265	2.00	75	AW-665	1.16	93
AW-270	0.64	57	AW-670	0.08	92
AW-275	0.98	83	AW-675	0.38	96
AW-280	0.27	57	AW-680	0.80	95
AW-285	0.22	57	AW-700	2.66	94
AW-290	1.68	72	AW-710	2.47	74
AW-300	0.18	57	AW-735	7.43	86
AW-310	0.43	85	AW-740	11.43	93
AW-315	15.29	86	AW-745	0.12	82
AW-325	0.09	86	AW-750	0.32	91
AW-330	0.31	85	AW-755	0.81	97
AW-335	0.35	84	AW-760	63.12	86
AW-340	0.30	81	AW-765	1.05	92
AW-345	6.79	83	AW-770	0.69	82
AW-350	0.55	80	AW-800	9.30	88
AW-355	21.04	75	AW-805	7.54	91
AW-360	8.37	81	AW-810	0.44	88
AW-365	14.43	89	AW-820	21.17	75
AW-370	0.43	80	AW-830	10.59	69
AW-375	51.45	83	AW-835	5.19	83
AW-380	1.45	95	AW-850	1.31	78
AW-385	24.36	82	AW-860	32.33	84
AW-390	2.20	84	AW-865	81.62	83
AW-395	4.07	94	AW-870	2.83	89
AW-415	0.11	86	AW-875	2.05	94
AW-420	5.14	80	AW-880	5.12	97
AW-425	0.42	90	AW-885	15.87	92
AW-430	5.22	94	AW-890	32.38	93
AW-435	1.38	95	AW-895	4.24	97
AW-440	7.03	90	AW-900	1.21	93
AW-450	0.57	91	AW-905	32.66	95
AW-455	0.58	79	AW-910	2.65	98
AW-460	2.36	63	AW-915	2.54	93



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 600 1,200
Feet

LEGEND

SUBBASINS

- 54 - 60
- 60 - 66
- 66 - 72
- 72 - 76
- 76 - 81
- 81 - 84
- 84 - 87
- 87 - 90
- 90 - 94
- 94 - 98

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

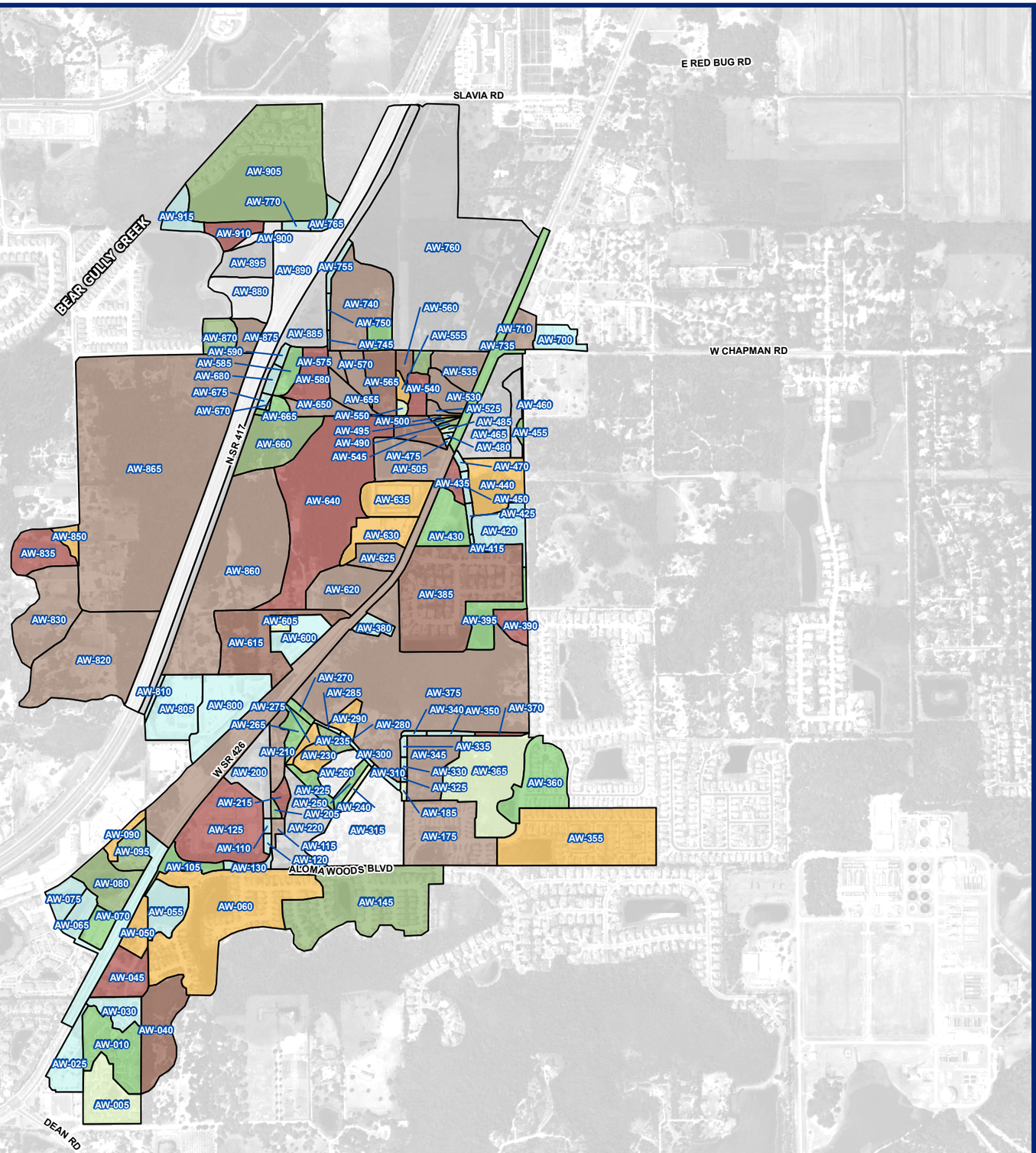
FIGURE A-1

SUBBASIN CURVE NUMBER MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

SUBBASIN DATA SUMMARY			
SUBBASIN	TIME OF CONCENTRATION (MINUTES)	SUBBASIN	TIME OF CONCENTRATION (MINUTES)
AW-005	14.2	AW-465	69.7
AW-010	20.1	AW-470	10.0
AW-025	10.0	AW-475	10.0
AW-030	10.0	AW-480	10.6
AW-040	43.7	AW-485	16.5
AW-045	40.0	AW-490	25.2
AW-050	31.2	AW-495	24.2
AW-055	11.9	AW-500	31.1
AW-060	31.4	AW-505	49.2
AW-065	10.0	AW-525	46.2
AW-070	20.6	AW-530	46.1
AW-075	10.8	AW-535	55.2
AW-080	25.1	AW-540	23.9
AW-090	29.2	AW-545	40.8
AW-095	25.9	AW-550	15.3
AW-105	17.3	AW-555	29.5
AW-110	10.0	AW-560	44.1
AW-115	50.6	AW-561	34.1
AW-120	10.0	AW-565	40.7
AW-125	36.2	AW-570	53.3
AW-130	10.2	AW-575	58.1
AW-145	24.4	AW-580	37.1
AW-175	53.7	AW-585	20.8
AW-185	15.1	AW-590	10.0
AW-200	69.4	AW-600	10.0
AW-205	27.2	AW-605	15.3
AW-210	52.6	AW-615	42.2
AW-215	37.3	AW-620	50.6
AW-220	75.4	AW-625	60.9
AW-225	21.1	AW-630	32.4
AW-230	28.2	AW-635	32.2
AW-235	25.0	AW-640	39.0
AW-240	15.4	AW-650	52.8
AW-250	20.2	AW-655	49.3
AW-260	96.2	AW-660	24.2
AW-265	22.0	AW-665	19.0
AW-270	20.4	AW-670	14.2
AW-275	30.5	AW-675	11.9
AW-280	10.0	AW-680	10.0
AW-285	10.0	AW-700	10.0
AW-290	32.2	AW-710	46.1
AW-300	10.0	AW-735	17.7
AW-310	10.0	AW-740	56.5
AW-315	101.4	AW-745	10.0
AW-325	10.0	AW-750	10.0
AW-330	10.0	AW-755	10.0
AW-335	10.0	AW-760	73.6
AW-340	10.0	AW-765	10.0
AW-345	52.7	AW-770	10.0
AW-350	10.0	AW-800	10.0
AW-355	28.9	AW-805	11.3
AW-360	21.8	AW-810	10.0
AW-365	13.3	AW-820	57.1
AW-370	37.5	AW-830	50.8
AW-375	52.3	AW-835	36.3
AW-380	10.0	AW-850	31.6
AW-385	42.4	AW-860	51.9
AW-390	37.9	AW-865	51.1
AW-395	18.2	AW-870	25.5
AW-415	10.0	AW-875	52.8
AW-420	11.0	AW-880	90.1
AW-425	10.0	AW-885	66.8
AW-430	17.4	AW-890	79.2
AW-435	35.1	AW-895	78.6
AW-440	33.0	AW-900	88.0
AW-450	10.0	AW-905	27.8
AW-455	18.9	AW-910	36.7
AW-460	67.2	AW-915	10.0



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

0 600 1,200
Feet

LEGEND

SUBBASINS

- 10.0 - 12.0
- 12.0 - 17.0
- 17.0 - 22.0
- 22.0 - 28.0
- 28.0 - 34.0
- 34.0 - 40.0
- 40.0 - 46.0
- 46.0 - 61.0
- 61.0 - 79.0
- 79.0 - 101.4

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE A-2

SUBBASIN TIME OF CONCENTRATION MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

APPENDIX B

Stormwater Modeling Support Technical Memorandum, CDM

CDM

Memorandum

To: *Tom Amstadt, P.E., CFM*

From: *Danielle M. Honour, P.E., D.WRE*

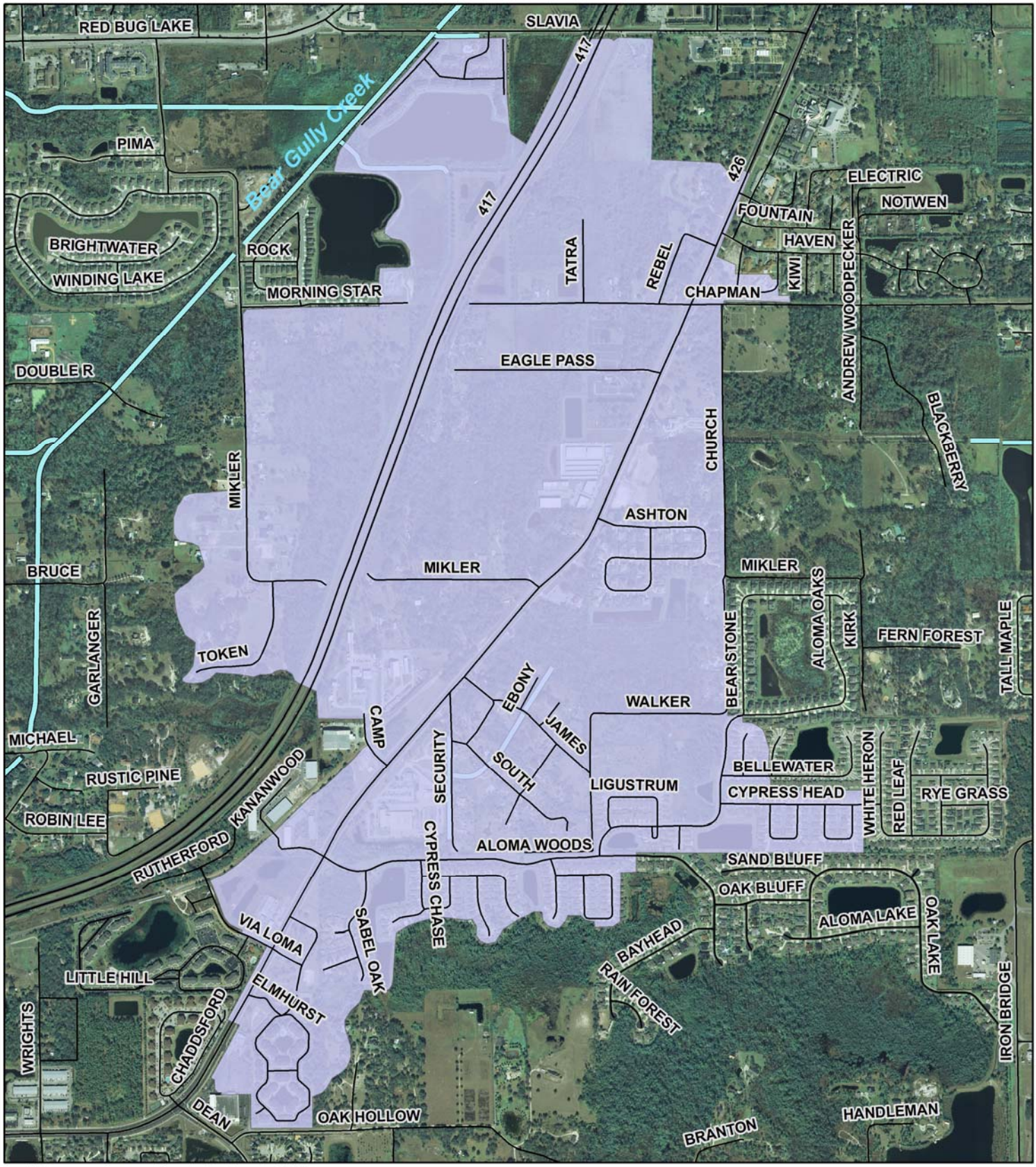
Date: *June 24, 2010*

Subject: *SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support*

For this effort, CDM was responsible for providing stormwater modeling support to Inwood Consulting Engineers (Inwood) for the above referenced project. This memorandum documents the results of design storm event simulations (mean-annual, 10-, 25- and 100-year/ 24-hour design storm events) as well as a model simulation of the Tropical Storm Fay event that occurred in August 2008. CDM also used the results of the design storm event simulations to refine the identification of level of service deficiencies (LOS) within the study area (**Figure 1**). The study area consists of the southeastern portion of the Howell Creek Basin in Seminole County that emanates near the Aloma Wood Subdivision and discharges into Bear Gully Creek at its most downstream point.

Design Storm Event Simulations

Inwood provided an updated Interconnected Channel and Pond Routing (ICPR) model (Version 3.1) of the Aloma Woods study area that included both hydrologic and hydraulic input parameters. CDM used the updated results of the Howell Creek Basin ICPR model as a basis for establishing the boundary condition at Bear Gully Creek (node BGC-0110). The update was based on the *Howell Creek Basin Watershed Management Plan* (CDM, 2008). CDM then simulated the mean-annual, 10-, 25- and 100-year 24-hour design storm events and tabulated the results. CDM also checked for flow instabilities in the model conduits and addressed those as necessary. Due to the number of additional model conduits included in the study area model, CDM assigned the appropriate level of service (LOS) based on the County's current design criteria requirements as shown in **Table 1**. For new development, design criteria for stormwater facilities have been adopted by Seminole County as described in its 2004 Vision 2020 Comprehensive Plan.



Aerial Imagery Source: Seminole County, 2006

N
W E
S

0 650 1,300 2,600

Feet

LEGEND

- Streets
- Study Area
- Existing Canals

Seminole County
Howell Creek Basin CIP

CDM

Figure 1

Table 1
Seminole County Design Storm Criteria

Facility Type	Design Storm
Retention/Detention Basins (with positive outfall) ■ sites ■ subdivisions	25-year/24-hour 25-year/24-hour
Retention/Detention Basins (land locked)	100-year/24-hour Total Retention
Retention/Detention Basins (adjacent to public right-of-way with no positive outfall)	25-year/24-hour Total Retention
Closed Drainage System (internal to development)	10-year/3-hour
Roadside Swales	10-year/3-hour
Arterial and Collector Streets	10-year, hydraulic grade line 1.0 ft. below gutter line
Local Streets	10-year, hydraulic grade line 0.5 ft. below gutter line
Canals	25-year
Bridges	100-year

Based on the criteria above, the LOS was assigned to each model conduit as shown in **Table 2**. These were further reviewed and refined by Inwood as necessary. Exceedance of the LOS was determined by comparing the flood stage for the assigned LOS to the critical elevation for that conduit. Critical elevations were extracted from the study area model developed by Inwood. Table 2 also includes the tabulated results (stage and flow) for each of the design storm events. The depth of flooding was determined if the assigned LOS was exceeded for a particular model conduit and are highlighted in the table. The most significant flooding (i.e., 1-foot or greater) is predicted to occur at the following locations:

- South of Kananwood Ct. – The stormwater pond (AW-095-LD-1) associated with the AK Business Center is predicted to exceed the assigned LOS for the 25-year/24-hour design storm event by 1.2 feet.

- Aloma Woods Phase 4 – The stormwater pond (AW-175-LD-1) associated with the Aloma Woods Phase 4 subdivision is predicted to exceed the assigned LOS for the 25-year/24-hour design storm event by 1.1 feet.

- West side of SR 417– 1.2 feet of flooding is predicted during the 25-year/24-hour design storm event for open channel AW-895-LC-1 based on the defined critical elevation, however, the resulting stages do not appear to impact the adjacent roadway or surrounding development based on existing available 1-foot topography.

Table 2
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Location	Mean Annual			10-Year/24-Hour Storm			25-Year/24-Hour Storm			100-Year/24-Hour Storm			Depth of Flooding (ft) during Assigned LOS
							Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	SOUTH OF LAKE ELMHURST LN	66.8	1	0	67.3	5	4	68.3	5	4	70.0	5	4	0.3
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	NORTH OF LAKE ELMHURST LN	66.6	1	0	67.1	3	3	67.9	4	3	69.5	4	4	no flooding
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	NORTHEASTERN PORTION OF ELMHURST VILLAGE, ELMHURST CIR	61.7	2	3	65.2	6	5	66.9	7	6	68.3	7	6	no flooding
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	WEST OF ELMHURST CIR	70.3	0	0	71.1	0	0	71.7	1	0	72.1	6	5	no flooding
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	NORTHEAST OF ELMHURST CIR	61.6	0	0	62.0	1	2	62.5	4	3	63.1	5	4	no flooding
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	NORTH EAST OF ELMHURST VILLAGE, EAST OF ELMURST CIR	58.7	2	3	61.1	8	6	62.3	9	8	62.9	10	8	no flooding
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	SOUTH OF GOLDEN PINE CT	53.8	1	0	54.2	4	5	55.8	4	6	56.4	5	6	no flooding
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	EAST OF VISTA VIEW WY	61.0	0	0	61.6	0	0	62.3	0	0	63.1	1	0	no flooding
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	WEST OF SABEL OAK PL	51.8	4	0	51.9	6	0	52.0	9	0	52.1	14	4	no flooding
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	ALONG THE SOUTH SIDE OF PINEGROVE RUN	49.6	6	1	50.7	9	1	51.1	21	2	51.6	27	2	0.1
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	NORTH OF VIA LOMA DR	63.9	3	0	64.0	6	0	64.0	7	9	64.1	8	11	0.0
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	WEST OF SR-426, 337 FT SW OF ALOMA WOODS BLVD	52.8	0	0	53.5	0	1	53.9	1	2	54.3	3	2	no flooding
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	NORTH OF KANANWOOD CT	54.0	2	3	54.3	2	4	54.6	3	4	55.3	4	5	no flooding
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	SOUTH OF KANANWOOD CT	54.5	4	4	54.9	6	4	55.3	8	5	55.6	9	6	1.2
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	CROSSES SR 426 AND ALOMA WOODS BLVD	54.0	2	3	54.2	3	4	54.3	4	4	54.4	4	5	no flooding
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	SECURITY AVE	52.8	0	1	52.9	0	1	52.9	1	1	53.0	1	1	no flooding
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	CROSSES SECURITY AVE, 269 FT N OF ALOMA WOODS BLVD	53.1	1	2	53.1	1	3	53.2	2	3	53.3	2	3	no flooding
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	FROM SECURITY AVE INTO PROGRESS ENERGY POND	52.2	2	1	52.5	3	1	52.7	3	1	52.9	5	1	no flooding
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	NORTH OF ALOMA WOODS BLVD	52.2	7	0	52.5	14	4	52.7	16	5	52.9	15	5	0.2
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	NORTH OF ALOMA WOODS BLVD, SOUTH OF SECURITY AVE	49.9	8	4	51.5	10	4	51.6	10	4	51.7	11	4	0.4
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	NORTH OF ALOMA WOODS BLVD, SE OF SECURITY AVE	49.7	8	4	51.1	10	4	51.4	15	4	51.6	15	4	no flooding
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	ALONG THE NORTH SIDE OF ALOMA WOODS BLVD, NW OF MAPLE GROVE PL	49.2	8	3	50.5	10	3	51.0	10	3	51.3	9	3	no flooding
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	SOUTH OF ALOMA WOODS BLVD	49.6	9	2	50.6	12	3	50.9	11	3	51.2	14	3	no flooding
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	NORTH OF ALOMA WOODS BLVD, NORTH OF MAPLE GROVE PL	48.5	14	3	49.6	16	3	50.6	17	3	51.0	21	4	no flooding
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	ALONG THE NORTH SIDE OF ALOMA WOODS BLVD, NE OF MAPLE GROVE PL	48.0	14	3	49.1	16	3	50.0	17	3	50.6	21	4	no flooding
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	NORTH OF ALOMA WOODS BLVD, WEST OF ALOMA OAKS DR	47.6	15	3	48.6	16	3	49.6	17	3	50.3	21	4	no flooding
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	EAST OF WALKER ROAD, WEST OF ALOMA OAKS DR	47.3	21	4	48.3	22	4	49.2	23	5	50.2	24	5	no flooding
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	WEST OF ALOMA OAKS DR	47.3	9	6	48.3	9	6	49.3	9	5	50.4	13	5	1.1
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	EAST OF JAMES DR, WEST OF LIGUSTRUM LOOP	46.4	21	4	47.2	22	4	48.0	23	5	48.9	24	5	no flooding
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	EAST OF WALKER ROAD, NORTH OF JAMES DR	45.2	24	5	45.9	24	5	46.5	24	5	47.1	24	5	no flooding
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	CROSSES WALKER ROAD AT NORTHWEST BEND	44.1	22	4	44.6	22	5	45.0	23	5	45.4	24	5	no flooding
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	CROSSES SECURITY AVE, NORTH OF ALOMA WOODS BLVD	52.4	8	5	52.7	9	5	53.0	9	5	53.3	9	5	no flooding
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	CROSSES SECURITY AVE, NORTH OF ALOMA WOODS BLVD	52.6	1	2	52.7	1	2	53.0	1	2	53.3	2	2	no flooding
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	CROSSES SECURITY AVE, NORTH OF ALOMA WOODS BLVD	52.6	1	3	52.6	1	3	52.7	2	3	52.8	2	3	no flooding
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	E OF SECURITY AVE, NORTH OF ALOMA WOODS BLVD	51.5	10	0	51.8	14	0	52.2	18	0	52.7	23	0	no flooding
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	CROSSES SOUTH STREET BETWEEN WESTON ST AND EAST ST	51.5	14	8	51.8	19	10	52.2	19	11	52.7	19	11	no flooding
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	NE OF SOUTH STREET BETWEEN WESTON ST AND EAST ST	48.6	15	0	49.0	19	0	49.3	19	0	50.0	20	2	no flooding
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	EAST OF WESTON ST	48.5	25	0	48.9	25	0	49.3	25	0	50.0	26	0	no flooding
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	CROSSES JAMES DR BETWEEN EBONY CV AND CANAL ST	48.5	21	7	48.9	26	8	49.3	30	8	50.0	37	9	no flooding
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	SOUTH OF EAST ST AND JAMES DR	48.5	1	3	49.0	2	2	49.4	2	1	50.2	3	1	no flooding
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	CROSSES EAST ST, SOUTH OF JAMES DR	48.5	2	1	49.0	2	1	49.4	2	1	50.3	8	2	no flooding
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	NORTH OF EAST ST, SOUTH OF JAMES DR	48.5	1	1	49.0	2	1	49.4	2	1	50.2	3	2	no flooding
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	SOUTH OF JAMES DR, NORTH OF EAST STREET	48.5	2	1	49.0	3	1	49.4	4	1	50.1	7	2	no flooding
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	SOUTH OF JAMES DRIVE BETWEEN CHURCH ST AND EAST ST	48.5	6	1	49.0	8	2	49.4	8	2	50.2	10	2	no flooding
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	CROSSES JAMES DR NORTH OF CHURCH STREET	49.9	2	2	50.7	3	3	51.6	4	4	52.6	5	4	no flooding
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	CROSSES WESTON ST, NORTH OF JAMES DR	49.7	3	3	50.1	4	4	50.6	5	5	52.0	8	7	no flooding
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	CROSSES JAMES DR, SOUTH OF WESTON ST NORTH OF EBONY CV	48.7	4	4	48.9	6	4	49.1	8	4	49.5	12	5	no flooding
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	NORTH OF JAMES DR SOUTH OF EBONY CV	47.0	0	1	47.3	0	1	47.5	1	1	47.7	1	1	no flooding
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	NORTH OF JAMES DR SOUTH OF EBONY CV	45.8	25	0	46.1	32	0	46.2	38	0	46.3	49	0	no flooding
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	EAST OF EBONY CV	40.9	26	0	41.7	36	0	42.3	46	0	43.2	57	0	no flooding
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	N SIDE OF JAMES ROAD WEST OF EAST STREET	47.0	0	1	47.3	0	1	47.5	0	1	47.7	0	1	no flooding
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	NORTH OF JAMES DR SOUTH OF EAST ST	50.2	0	1	50.2	0	1	50.3	0	2	50.4	0	2	no flooding
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	N SIDE OF JAMES ROAD B/T EAST ST. AND WALKER ROAD	47.0	0	1	47.5	0	1	48.2	0	1	49.2	0	1	no flooding

Table 2
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Location	Mean Annual			10-Year/24-Hour Storm			25-Year/24-Hour Storm			100-Year/24-Hour Storm			Depth of Flooding (ft) during Assigned LOS
							Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	CROSSES JAMES DR , WEST OF WALKER RD	47.0	1	2	47.5	2	2	48.2	2	2	49.2	3	3	no flooding
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	CROSSES WALKER ROAD, SOUTH OF JAMES DR	47.0	12	4	47.5	16	5	48.2	19	6	49.2	24	8	no flooding
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	E OF WALKER ROAD, SOUTH OF JAMES DR	46.5	12	2	46.7	16	2	46.9	19	2	47.3	29	2	no flooding
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	EAST OF WALKER ROAD, NORTH OF JAMES DR	46.5	12	4	46.7	17	5	46.9	19	5	47.3	29	6	no flooding
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	EAST OF WALKER ROAD, NORTH OF JAMES DR	45.4	18	3	46.0	20	3	46.0	20	3	46.2	29	3	no flooding
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	CROSSES WALKER ROAD, 526 FT N OF JAMES DR	45.4	12	5	46.0	17	6	46.0	24	7	46.2	23	7	no flooding
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	N OF WALKER ROAD, N OF JAMES DR	43.2	31	2	43.5	37	2	43.8	42	2	44.0	53	2	no flooding
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	CROSSES WALKER ROAD, 823 FT N OF LIGUSTRUM LOOP	43.2	6	2	43.6	9	3	44.1	12	4	44.3	13	4	no flooding
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	N OF WALKER ROAD, N OF LIGUSTRUM LOOP	40.9	42	0	41.7	53	0	42.3	64	0	43.2	76	0	no flooding
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	SOUTH OF ALOMA OAKS DR	47.1	3	3	47.4	6	4	47.9	11	5	48.7	18	6	no flooding
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	WEST OF ALOMA OAKS DR	47.2	3	4	47.6	7	6	48.1	12	10	48.7	14	12	no flooding
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	CROSSES WALKER ROAD, 353 FT WEST OF BEARSTONE RUN	43.4	6	5	43.9	10	5	44.2	17	6	44.8	25	8	no flooding
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	N OF WALKER ROAD, WEST OF BEARSTONE RUN	43.2	10	0	43.5	11	0	43.8	17	0	44.0	26	0	no flooding
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	EAST OF W SR 426	47.8	4	0	48.0	5	0	48.3	6	0	48.8	7	0	no flooding
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	SOUTH OF ASHTON TER	40.9	3	1	41.7	3	1	42.3	3	1	43.2	3	1	0.2
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	CROSSES S ASHTON TERR, EAST OF KNIGHTSBRIDGE WAY	40.9	38	3	41.7	41	4	42.3	48	4	43.2	65	4	no flooding
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	CROSSES ASHTON TERRACE, EAST OF KNIGHTSBRIDGE WAY	37.4	0	0	37.4	0	0	37.4	0	0	37.4	0	0	no flooding
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	CROSSES N ASHTON TERR, EAST OF KNIGHTSBRIDGE WAY	36.9	0	0	36.9	0	0	36.9	0	0	36.9	0	0	no flooding
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	NORTH OF N ASHTON TERR, EAST OF KNIGHTSBRIDGE WAY	36.8	0	0	36.8	0	0	36.8	0	0	36.8	0	0	no flooding
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	NORTH OF N ASHTON TERR, EAST OF KNIGHTSBRIDGE WAY	40.6	96	1	41.3	290	1	41.7	295	1	42.1	284	1	no flooding
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	NORTH OF ASHTON TER, EAST OF KNIGHTSBRIDGE WAY	40.5	37	2	41.3	41	2	41.7	49	2	42.0	67	2	0.5
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	NORTH OF ASHTON TER	41.9	0	0	42.7	0	0	43.0	0	0	43.1	0	0	no flooding
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	NE OF POND BETWEEN SR 426 AND CHURCH ST	40.5	2	3	41.3	2	3	41.7	2	3	42.0	1	2	no flooding
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	NE OF POND BETWEEN SR 426 AND CHURCH ST	40.5	39	0	41.2	41	0	41.6	50	0	42.0	69	0	no flooding
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	CHURCH STREET	41.2	1	1	41.3	2	2	41.7	3	2	42.0	5	2	no flooding
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	EAST OF SR 426 WEST OF CHURCH ST	43.4	0	1	43.5	0	1	43.6	0	1	43.7	0	1	no flooding
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	NORHT SIDE OF TESTINSKIES AUTOMOTIVE	43.0	1	4	43.1	1	3	43.1	1	4	43.1	2	3	no flooding
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	BETWEEN SR 426 AND CHURCH ST	43.0	0	2	43.1	0	2	43.1	0	2	43.1	0	2	no flooding
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	CROSSES SR 426, 1039 FT N OF WENTWORTH ESTATES	40.5	41	2	41.2	42	2	41.6	51	3	42.0	70	4	no flooding
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	W OF SR 426, N OF WENTWORTH ESTATES	40.3	73	1	41.1	127	1	41.4	149	1	41.6	149	1	no flooding
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	WEST OF SR 426, 178 FT SOUTH OF EAGLE PASS ROAD	40.3	40	6	41.1	42	6	41.4	42	6	41.6	42	6	0.2
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	WEST OF SR 426, 178 FT SOUTH OF EAGLE PASS ROAD	39.2	40	1	39.7	42	1	40.2	110	1	40.3	110	1	0.1
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	WEST OF SR 426, 104 FT SOUTH OF EAGLE PASS ROAD	39.2	40	6	39.7	42	6	40.2	44	6	40.3	44	6	0.1
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	WEST OF SR 426, 104 FT SOUTH OF EAGLE PASS ROAD	38.1	40	2	38.3	42	2	38.5	44	2	38.8	47	2	no flooding
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	CROSSES EAGLE PASS ROAD, 312 FEET WEST OF SR 426	38.1	40	9	38.3	42	9	38.5	44	9	38.8	47	10	no flooding
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	SOUTH OF EAGLE PASS RD	39.8	12	4	40.3	20	6	41.3	23	7	43.1	28	9	no flooding
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	CROSSES EAGLE PASS ROAD, 678 FEET WEST OF SR 426	36.8	7	2	37.1	7	2	37.2	7	2	37.3	7	2	0.6
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	N OF EAGLE PASS ROAD, 581 FEET WEST OF SR 426	36.6	7	2	36.7	7	2	36.7	7	2	36.8	7	2	no flooding
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	N OF EAGLE PASS ROAD, 473 FEET WEST OF SR 426	35.9	7	2	35.9	7	2	36.0	7	2	36.2	7	2	no flooding
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	N OF EAGLE PASS ROAD, WEST OF SR 426	34.3	46	0	34.5	48	0	34.6	51	0	35.4	53	0	no flooding
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	NORTH OF EAGLE PASS RD	34.2	46	2	34.4	49	0	34.6	51	2	35.4	56	2	no flooding
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	SOUTH OF W CHAPMAN RD, WEST OF SR 426	34.2	47	7	34.4	50	8	34.6	53	8	35.4	60	9	no flooding
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	SOUTH OF W CHAPMAN RD, WEST OF SR 426	31.7	47	1	32.3	50	1	33.0	54	1	33.9	61	1	no flooding
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	CROSSES EAGLE PASS ROAD, 720 FEET WEST OF SR 426	36.3	2	4	36.5	3	6	36.6	3	6	36.8	3	6	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	N OF EAGLE PASS ROAD, WEST OF SR 426	31.9	8	0	32.4	16	0	33.0	28	0	33.9	47	0	no flooding
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	SOUTH OF W CHAPMAN RD	31.7	7	0	32.3	16	0	33.0	22	0	33.9	30	0	0.5
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	SOUTH OF W CHAPMAN RD	31.5	52	1	32.2	66	1	33.0	75	1	33.9	90	1	0.5
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	NORTH OF W CHAPMAN RD	31.5	55	1	32.2	74	1	33.0	90	1	33.9	109	1	0.3
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	SOUTH OF W CHAPMAN RD	31.4	56	2	32.2	76	2	33.0	93	2	33.9	111	2	0.5
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	S OF W CHAPMAN RD, EAST OF SR 417	31.4	69	0	32.1	90	0	33.0	117	0	33.9	121	0	0.5
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	CROSSES W CHAPMAN RD, 700 FT EAST OF SR 417	31.4	7	2	32.2	13	3	33.0	16	3	33.9	21	4	0.5
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	SOUTH OF W CHAPMAN RD	31.4	70	1	32.1	93	1	33.0	119	1	33.9	130	1	no flooding
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	CROSSES W CHAPMAN RD, 179 FT EAST OF SR 417	31.4	70	1	32.1	94	1	33.0	114	2	33.9	120	2	no flooding

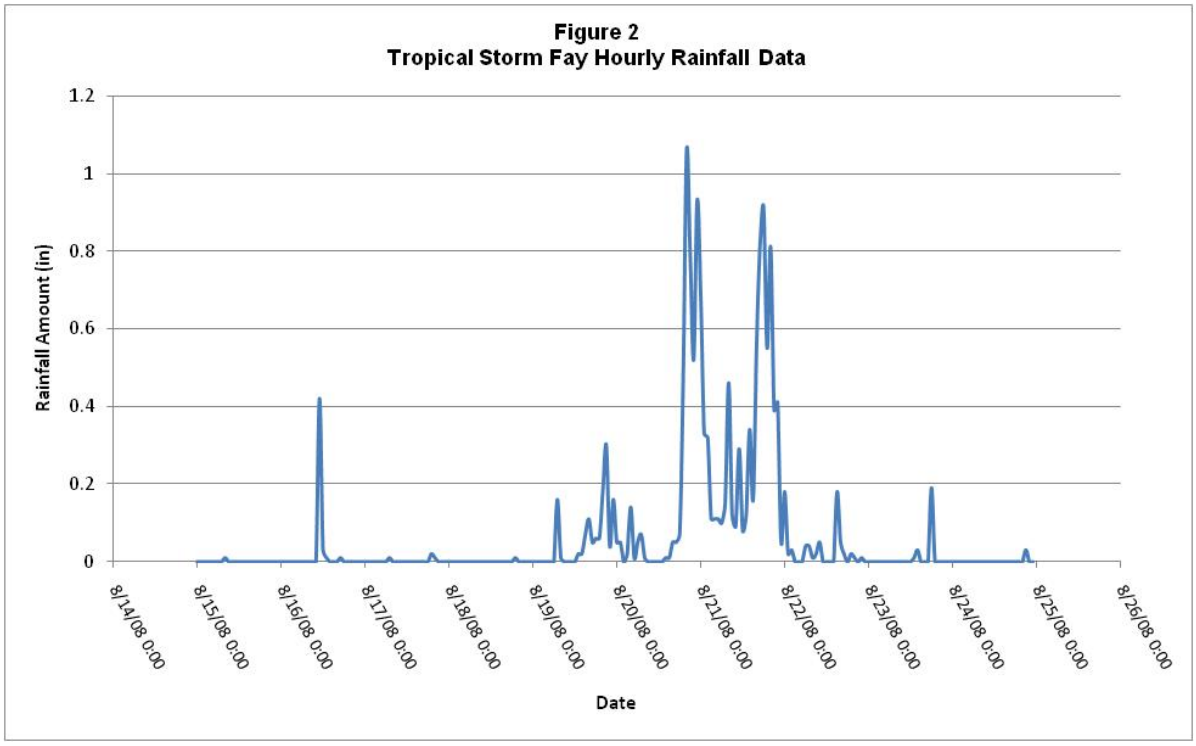
Table 2
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Location	Mean Annual			10-Year/24-Hour Storm			25-Year/24-Hour Storm			100-Year/24-Hour Storm			Depth of Flooding (ft) during Assigned LOS
							Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	CROSSES SR 417, 765 FEET NORTH OF EAGLE PASS ROAD	31.4	92	2	32.1	122	2	32.9	143	2	33.8	177	2	no flooding
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	SOUTH OF W MIKLER RD	47.3	0	2	48.2	0	2	48.5	2	3	49.1	10	6	no flooding
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	SOUTH OF W MIKLER RD	49.5	2	0	49.5	2	0	49.6	3	0	49.6	3	0	no flooding
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	SOUTH OF W MILKER ROAD, WEST OF SR 426	43.6	0	2	43.9	1	2	44.1	2	4	46.4	10	6	no flooding
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	CROSSES W MICKLER ROAD, WEST OF SR 426	42.4	16	8	43.9	25	10	44.1	26	11	44.3	27	11	0.2
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	NORTH OF W MIKLER RD	40.6	6	4	40.8	9	6	41.0	12	7	41.5	14	8	no flooding
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	WEST OF W SR 426	39.9	4	5	40.3	7	6	40.6	10	7	41.1	16	9	no flooding
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	CROSSES EAGLE PASS ROAD, BETWEEN SR 417 AND SR 426	33.5	10	6	33.8	11	6	34.1	11	6	34.5	11	6	no flooding
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	N OF EAGLE PASS ROAD, BETWEEN SR 417 AND SR 426	31.4	23	1	32.2	34	1	33.0	61	1	33.9	117	1	no flooding
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	NORTH OF EAGLE PASS RD	31.4	17	1	32.2	34	1	33.0	51	1	33.9	44	1	no flooding
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	WEST OF EAGLE PASS ROAD, EAST OF SR 417	33.4	20	6	33.8	15	5	34.1	15	5	34.3	17	5	no flooding
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	WEST OF EAGLE PASS ROAD, EAST OF SR 417	32.9	32	0	33.7	111	0	34.1	146	0	34.3	129	0	no flooding
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	WEST OF EAGLE PASS ROAD, EAST OF SR 417	32.9	36	10	33.7	38	12	34.1	40	12	34.3	34	11	no flooding
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	WEST OF EAGLE PASS ROAD, EAST OF SR 417	31.4	31	0	32.1	37	0	33.0	45	0	33.9	66	0	no flooding
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	EAST OF N SR 417	31.4	29	1	32.1	36	1	32.9	43	1	33.8	60	1	no flooding
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	NORTH OF W CHAPMAN RD	45.4	0	0	45.8	1	0	46.0	3	0	46.2	10	6	no flooding
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	NORTH OF W CHAPMAN ROAD, EAST OF SR 426	38.1	3	2	38.4	4	3	39.3	8	5	42.8	17	9	no flooding
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	N OF W CHAPMAN ROAD, SE OF SR 426	39.8	2	5	40.1	4	6	40.3	5	7	43.3	9	7	no flooding
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	CROSSES SR 426 , NORTH OF W CHAPMAN ROAD	37.5	3	2	37.7	4	3	38.3	8	3	39.8	19	5	no flooding
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	ALONG NORTH OF W CHAPMAN ROAD, WEST OF SR 426	37.4	3	3	37.5	4	3	38.0	8	4	38.7	31	7	no flooding
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	NORTH OF W CHAPMAN RD CROSSES TATRA ST	33.7	3	3	33.9	4	3	34.3	8	4	35.6	18	5	no flooding
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	NORTH OF W CHAPMAN RD	33.1	2	1	33.5	5	2	34.1	10	3	35.3	18	6	no flooding
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	N OF W CHAPMAN RD, EAST OF SR 417	31.4	4	0	32.1	26	0	32.9	24	0	33.9	24	0	no flooding
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	EAST OF N SR 417	31.3	24	13	32.1	29	3	32.9	32	3	33.8	56	3	0.8
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	NORTH OF CHAPMAN RD	31.4	5	0	32.1	5	0	32.9	5	0	33.8	4	0	0.8
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	CROSSES SR 417, 1315 SOUTH OF SLAVIA ROAD	31.3	47	2	32.1	36	2	32.9	48	2	33.8	73	2	no flooding
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	W OF SR 417, SOUTH OF SLAVIA ROAD	31.3	46	0	32.1	37	0	32.9	46	0	33.7	74	0	no flooding
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	SOUTH OF SUMMER CLUB DR	31.3	45	0	32.1	37	0	32.9	46	0	33.7	74	0	no flooding
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	FDOT MAINTENANCE YARD	51.1	0	0	51.4	0	0	51.6	0	0	51.9	9	0	0.4
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	W. MILKER ROAD	34.7	0	0	34.9	0	0	35.1	0	0	35.5	14	2	no flooding
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	CROSSES SR 417, SOUTH OF MIKLER ROAD	47.1	1	2	47.2	1	2	47.9	7	4	50.5	23	8	no flooding
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	CROSSES MIKLER ROAD, 273 FT WEST OF SR 417	38.9	15	4	39.3	23	5	40.0	34	7	42.0	48	10	no flooding
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	W. MILKER ROAD	34.6	15	2	34.8	23	2	35.1	34	2	35.5	48	3	no flooding
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	WEST OF MIKLER RD	46.3	4	0	46.5	8	7	46.9	9	7	47.1	9	7	no flooding
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	CROSSES MIKLER ROAD, 1266 FT WEST OF SR 417	45.2	4	4	45.7	8	5	45.8	9	6	46.7	15	8	no flooding
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	W. MILKER ROAD	34.6	4	2	34.8	8	2	35.1	9	2	35.5	15	2	no flooding
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	W. MILKER ROAD	33.4	16	1	33.8	22	2	34.1	30	2	34.3	52	2	no flooding
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	CROSSES SR 417, 1632 SW OF W CHAPMAN ROAD	34.7	15	3	34.9	21	3	35.1	26	3	35.5	35	3	no flooding
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	W OF SR 417, NORTH OF EAGLE PASS ROAD	31.3	32	0	32.1	53	0	32.9	72	0	33.7	103	0	no flooding
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	W OF SR 417, NORTH OF EAGLE PASS ROAD	31.3	106	1	32.1	154	1	32.9	208	1	33.7	256	1	no flooding
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	WEST OF S SR 417	31.3	103	1	32.1	149	1	32.9	194	1	33.7	227	1	no flooding
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	EAST OF N SR 417	32.2	3	1	32.8	4	1	33.5	4	1	34.9	6	2	no flooding
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	WEST OF S SR 417	32.1	13	4	32.6	16	5	33.4	17	5	34.8	17	5	no flooding
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	WEST OF S SR 417	31.3	106	0	32.1	162	0	32.9	203	0	33.7	226	0	1.2
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	SOUTH OF SUMMER CLUB DR	31.3	143	1	32.1	161	1	32.9	165	1	33.7	258	1	0.9
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	SOUTH OF SUMMER CLUB DR	31.3	142	1	32.1	155	1	32.9	157	1	33.6	260	1	no flooding
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	SOUTH OF SUMMER CLUB DR	31.3	126	0	32.1	137	0	32.9	143	0	33.6	263	0	0.1

Indicates LOS deficiency

Tropical Storm Fay Simulation

As part of the stormwater model support for this effort, CDM performed a simulation for the Tropical Storm Fay storm event that occurred in August 2008 using the existing conditions ICPR model. CDM obtained hourly rainfall data from the United States Geologic Survey (USGS) gage 284254081021000 (St. Johns River above Lake Harney, Near Geneva, Florida). This gage was selected due to its close proximity to the study area as well as for the availability of hourly rainfall data during the Tropical Storm Fay event. The Tropical Storm Fay simulation was initiated on August 15, 2008 and was run for 240 hours (10 days) in order to capture peak of the storm. The hourly rainfall data used in the simulation is shown in **Figure 2**. Overall, the gage recorded a total of 15.2 inches during the 10-day event.



In addition to hourly rainfall data, CDM also established a boundary condition for the Tropical Storm Fay event at Bear Gully Creek (node BGC-0110). In order to accomplish this, CDM ran the Howell Creek Basin-wide model using the same hourly rainfall data while also adjusting the ultimate boundary condition for that model (i.e., Lake Jesup) to match measured stages recorded during the storm event. CDM then used the resulting stages simulated at node BGC-0110 as the boundary condition in the Aloma Woods model simulation of the Tropical Storm Fay event. The resulting stages of the Tropical Storm Fay simulation for the Aloma Woods study area model are shown in **Table 3**. For comparison purposes, CDM also

Table 3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Location	100-Year/24-Hour Storm		T.S. Fay Simulation			Depth of Flooding (ft) during Tropical Storm Fay
							Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Stage (ft-NGVD29) at Hour 180 (August 22, 2008)	
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	SOUTH OF LAKE ELMHURST LN	70.0	5	68.6	4	66.4	0.6
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	NORTH OF LAKE ELMHURST LN	69.5	4	68.2	4	66.3	0.2
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	NORTHEASTERN PORTION OF ELMHURST VILLAGE, ELMHURST CIR	68.3	7	67.2	7	61.4	no flooding
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	WEST OF ELMHURST CIR	72.1	6	72.0	4	71.1	no flooding
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	NORTHEAST OF ELMHURST CIR	63.1	5	63.0	4	61.7	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	NORTH EAST OF ELMHURST VILLAGE, EAST OF ELMURST CIR	62.9	10	62.8	10	58.4	no flooding
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	SOUTH OF GOLDEN PINE CT	56.4	5	56.5	5	54.9	0.5
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	EAST OF VISTA VIEW WY	63.1	1	63.4	3	62.9	no flooding
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	WEST OF SABEL OAK PL	52.1	14	51.9	7	51.6	no flooding
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	ALONG THE SOUTH SIDE OF PINEGROVE RUN	51.6	27	51.3	24	50.2	0.3
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	NORTH OF VIA LOMA DR	64.1	8	63.8	2	63.0	no flooding
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	WEST OF SR-426, 337 FT SW OF ALOMA WOODS BLVD	54.3	3	54.7	6	54.0	no flooding
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	NORTH OF KANANWOOD CT	55.3	4	54.8	1	54.0	no flooding
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	SOUTH OF KANANWOOD CT	55.6	9	54.7	3	54.0	0.6
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	CROSSES SR 426 AND ALOMA WOODS BLVD	54.4	4	54.7	7	54.0	no flooding
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	SECURITY AVE	53.0	1	53.7	0	53.5	no flooding
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	CROSSES SECURITY AVE, 269 FT N OF ALOMA WOODS BLVD	53.3	2	53.0	1	52.7	no flooding
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	FROM SECURITY AVE INTO PROGRESS ENERGY POND	52.9	5	52.4	1	52.5	no flooding
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	NORTH OF ALOMA WOODS BLVD	52.9	15	52.4	11	51.9	no flooding
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	NORTH OF ALOMA WOODS BLVD, SOUTH OF SECURITY AVE	51.7	11	51.5	10	49.1	0.5
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	NORTH OF ALOMA WOODS BLVD, SE OF SECURITY AVE	51.6	15	51.4	12	47.8	no flooding
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	ALONG THE NORTH SIDE OF ALOMA WOODS BLVD, NW OF MAPLE GROVE PL	51.3	9	51.1	10	46.3	no flooding
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	SOUTH OF ALOMA WOODS BLVD	51.2	14	51.0	13	50.2	no flooding
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	NORTH OF ALOMA WOODS BLVD, NORTH OF MAPLE GROVE PL	51.0	21	50.6	21	46.2	0.6
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	ALONG THE NORTH SIDE OF ALOMA WOODS BLVD, NE OF MAPLE GROVE PL	50.6	21	50.0	21	45.8	0.0
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	NORTH OF ALOMA WOODS BLVD, WEST OF ALOMA OAKS DR	50.3	21	49.5	27	45.4	no flooding
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	EAST OF WALKER ROAD, WEST OF ALOMA OAKS DR	50.2	24	49.1	22	45.3	no flooding
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	WEST OF ALOMA OAKS DR	50.4	13	49.2	8	46.2	1.0
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	EAST OF JAMES DR, WEST OF LIGUSTRUM LOOP	48.9	24	48.0	22	44.9	no flooding
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	EAST OF WALKER ROAD, NORTH OF JAMES DR	47.1	24	46.5	25	44.3	no flooding
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	CROSSES WALKER ROAD AT NORTHWEST BEND	45.4	24	45.0	22	43.4	no flooding
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	CROSSES SECURITY AVE, NORTH OF ALOMA WOODS BLVD	53.3	9	51.6	6	49.3	no flooding
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	CROSSES SECURITY AVE, NORTH OF ALOMA WOODS BLVD	53.3	2	52.5	0	52.3	no flooding
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	CROSSES SECURITY AVE, NORTH OF ALOMA WOODS BLVD	52.8	2	52.6	1	52.2	no flooding
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	E OF SECURITY AVE, NORTH OF ALOMA WOODS BLVD	52.7	23	51.1	7	49.1	no flooding
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	CROSSES SOUTH STREET BETWEEN WESTON ST AND EAST ST	52.7	19	51.1	13	48.4	no flooding
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	NE OF SOUTH STREET BETWEEN WESTON ST AND EAST ST	50.0	20	48.6	14	47.9	no flooding
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	EAST OF WESTON ST	50.0	26	48.4	25	47.6	no flooding

Table 3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Location	100-Year/24-Hour Storm		T.S. Fay Simulation			Depth of Flooding (ft) during Tropical Storm Fay
							Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Stage (ft-NGVD29) at Hour 180 (August 22, 2008)	
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	CROSSES JAMES DR BETWEEN EBONY CV AND CANAL ST	50.0	37	48.4	19	46.4	no flooding
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	SOUTH OF EAST ST AND JAMES DR	50.2	3	48.4	4	47.0	no flooding
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	CROSSES EAST ST, SOUTH OF JAMES DR	50.3	8	48.4	1	46.9	no flooding
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	NORTH OF EAST ST, SOUTH OF JAMES DR	50.2	3	48.4	1	46.9	no flooding
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	SOUTH OF JAMES DR, NORTH OF EAST STREET	50.1	7	48.4	4	46.9	no flooding
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	SOUTH OF JAMES DRIVE BETWEEN CHURCH ST AND EAST ST	50.2	10	48.4	7	46.9	no flooding
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	CROSSES JAMES DR NORTH OF CHURCH STREET	52.6	5	49.6	2	48.7	no flooding
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	CROSSES WESTON ST, NORTH OF JAMES DR	52.0	8	49.5	2	48.5	no flooding
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	CROSSES JAMES DR, SOUTH OF WESTON ST NORTH OF EBONY CV	49.5	12	48.5	3	47.9	no flooding
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	NORTH OF JAMES DR SOUTH OF EBONY CV	47.7	1	46.9	0	46.4	no flooding
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	NORTH OF JAMES DR SOUTH OF EBONY CV	46.3	49	45.6	23	45.9	no flooding
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	EAST OF EBONY CV	43.2	57	43.6	24	44.5	no flooding
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	N SIDE OF JAMES ROAD WEST OF EAST STREET	47.7	0	46.9	0	50.0	no flooding
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	NORTH OF JAMES DR SOUTH OF EAST ST	50.4	0	50.2	0	50.0	no flooding
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	N SIDE OF JAMES ROAD B/T EAST ST. AND WALKER ROAD	49.2	0	46.9	0	49.6	no flooding
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	CROSSES JAMES DR , WEST OF WALKER RD	49.2	3	46.9	0	45.8	no flooding
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	CROSSES WALKER ROAD, SOUTH OF JAMES DR	49.2	24	46.9	11	45.7	no flooding
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	E OF WALKER ROAD, SOUTH OF JAMES DR	47.3	29	46.4	11	45.6	no flooding
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	EAST OF WALKER ROAD, NORTH OF JAMES DR	47.3	29	46.4	11	45.3	no flooding
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	EAST OF WALKER ROAD, NORTH OF JAMES DR	46.2	29	45.3	17	45.2	no flooding
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	CROSSES WALKER ROAD, 526 FT N OF JAMES DR	46.2	23	45.3	19	43.6	no flooding
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	N OF WALKER ROAD, N OF JAMES DR	44.0	53	43.9	38	43.1	no flooding
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	CROSSES WALKER ROAD, 823 FT N OF LIGUSTRUM LOOP	44.3	13	44.0	5	43.0	no flooding
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	N OF WALKER ROAD, N OF LIGUSTRUM LOOP	43.2	76	43.6	58	43.0	no flooding
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	SOUTH OF ALOMA OAKS DR	48.7	18	48.0	12	46.9	no flooding
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	WEST OF ALOMA OAKS DR	48.7	14	47.6	7	46.9	no flooding
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	CROSSES WALKER ROAD, 353 FT WEST OF BEARSTONE RUN	44.8	25	44.5	22	43.3	no flooding
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	N OF WALKER ROAD, WEST OF BEARSTONE RUN	44.0	26	43.9	21	43.0	no flooding
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	EAST OF W SR 426	48.8	7	47.5	2	47.2	no flooding
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	SOUTH OF ASHTON TER	43.2	3	43.6	5	42.8	1.5
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	CROSSES S ASHTON TERR, EAST OF KNIGHTSBRIDGE WAY	43.2	65	43.6	69	42.8	1.1
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	NORTH OF N ASHTON TERR, EAST OF KNIGHTSBRIDGE WAY	42.1	284	42.4	305	42.1	no flooding
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	NORTH OF ASHTON TER, EAST OF KNIGHTSBRIDGE WAY	42.0	67	42.3	70	42.0	1.2
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	NORTH OF ASHTON TER	43.1	0	43.0	0	43.0	no flooding
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	NE OF POND BETWEEN SR 426 AND CHURCH ST	42.0	1	42.3	2	42.0	no flooding
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	NE OF POND BETWEEN SR 426 AND CHURCH ST	42.0	69	42.3	74	42.0	0.3
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	CHURCH STREET	42.0	5	42.3	1	43.0	no flooding
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	EAST OF SR 426 WEST OF CHURCH ST	43.7	0	43.3	0	43.0	no flooding

Table 3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Location	100-Year/24-Hour Storm		T.S. Fay Simulation			Depth of Flooding (ft) during Tropical Storm Fay
							Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Stage (ft-NGVD29) at Hour 180 (August 22, 2008)	
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	NORHT SIDE OF TESTINSKIES AUTOMOTIVE	43.1	2	43.1	1	43.1	no flooding
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	BETWEEN SR 426 AND CHURCH ST	43.1	0	43.1	0	43.0	no flooding
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	CROSSES SR 426, 1039 FT N OF WENTWORTH ESTATES	42.0	70	42.3	83	42.0	0.3
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	W OF SR 426, N OF WENTWORTH ESTATES	41.6	149	41.8	39	41.6	no flooding
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	WEST OF SR 426, 178 FT SOUTH OF EAGLE PASS ROAD	41.6	42	41.8	48	41.6	0.6
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	WEST OF SR 426, 178 FT SOUTH OF EAGLE PASS ROAD	40.3	110	40.5	29	39.9	0.4
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	WEST OF SR 426, 104 FT SOUTH OF EAGLE PASS ROAD	40.3	44	40.5	46	40.3	0.4
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	WEST OF SR 426, 104 FT SOUTH OF EAGLE PASS ROAD	38.8	47	39.0	42	38.8	no flooding
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	CROSSES EAGLE PASS ROAD, 312 FEET WEST OF SR 426	38.8	47	39.0	48	38.7	no flooding
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	SOUTH OF EAGLE PASS RD	43.1	28	40.3	19	39.2	no flooding
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	CROSSES EAGLE PASS ROAD, 678 FEET WEST OF SR 426	37.3	7	37.2	7	35.4	0.6
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	N OF EAGLE PASS ROAD, 581 FEET WEST OF SR 426	36.8	7	36.8	7	35.3	no flooding
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	N OF EAGLE PASS ROAD, 473 FEET WEST OF SR 426	36.2	7	36.2	7	35.3	no flooding
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	N OF EAGLE PASS ROAD, WEST OF SR 426	35.4	53	35.4	55	35.3	no flooding
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	NORTH OF EAGLE PASS RD	35.4	56	35.4	56	34.6	no flooding
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	SOUTH OF W CHAPMAN RD, WEST OF SR 426	35.4	60	35.4	57	34.6	0.2
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	SOUTH OF W CHAPMAN RD, WEST OF SR 426	33.9	61	33.9	59	33.5	no flooding
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	CROSSES EAGLE PASS ROAD, 720 FEET WEST OF SR 426	36.8	3	36.8	3	36.4	0.6
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	N OF EAGLE PASS ROAD, WEST OF SR 426	33.9	47	33.9	50	35.3	no flooding
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	SOUTH OF W CHAPMAN RD	33.9	30	33.9	23	33.4	1.4
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	SOUTH OF W CHAPMAN RD	33.9	90	33.9	79	33.4	1.4
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	NORTH OF W CHAPMAN RD	33.9	109	33.9	104	33.4	1.2
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	SOUTH OF W CHAPMAN RD	33.9	111	33.9	100	33.3	1.4
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	S OF W CHAPMAN RD, EAST OF SR 417	33.9	121	33.9	95	33.3	1.4
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	CROSSES W CHAPMAN RD, 700 FT EAST OF SR 417	33.9	21	33.9	14	33.3	1.4
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	SOUTH OF W CHAPMAN RD	33.9	130	33.9	96	33.3	0.4
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	CROSSES W CHAPMAN RD, 179 FT EAST OF SR 417	33.9	120	33.9	93	33.3	0.8
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	CROSSES SR 417, 765 FEET NORTH OF EAGLE PASS ROAD	33.8	177	33.8	117	33.3	no flooding
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	SOUTH OF W MIKLER RD	49.1	10	48.7	4	47.8	no flooding
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	SOUTH OF W MIKLER RD	49.6	3	49.3	1	49.1	no flooding
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	SOUTH OF W MILKER ROAD, WEST OF SR 426	46.4	10	44.4	4	43.6	no flooding
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	CROSSES W MICKLER ROAD, WEST OF SR 426	44.3	27	44.0	26	40.4	0.3
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	NORTH OF W MIKLER RD	41.5	14	40.4	4	40.0	no flooding
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	WEST OF W SR 426	41.1	16	39.9	4	39.0	no flooding
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	CROSSES EAGLE PASS ROAD, BETWEEN SR 417 AND SR 426	34.5	11	34.1	11	33.5	0.1
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	N OF EAGLE PASS ROAD, BETWEEN SR 417 AND SR 426	33.9	117	33.9	58	33.3	0.4
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	NORTH OF EAGLE PASS RD	33.9	44	33.9	39	33.3	1.4
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	WEST OF EAGLE PASS ROAD, EAST OF SR 417	34.3	17	34.3	18	33.5	no flooding

Table 3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Location	100-Year/24-Hour Storm		T.S. Fay Simulation			Depth of Flooding (ft) during Tropical Storm Fay
							Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Stage (ft-NGVD29) at Hour 180 (August 22, 2008)	
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	WEST OF EAGLE PASS ROAD, EAST OF SR 417	34.3	129	34.3	19	33.0	no flooding
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	WEST OF EAGLE PASS ROAD, EAST OF SR 417	34.3	34	34.3	26	33.7	no flooding
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	WEST OF EAGLE PASS ROAD, EAST OF SR 417	33.9	66	33.9	27	33.3	no flooding
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	EAST OF N SR 417	33.8	60	33.8	32	33.3	no flooding
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	NORTH OF W CHAPMAN RD	46.2	10	45.9	2	45.3	no flooding
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	NORTH OF W CHAPMAN ROAD, EAST OF SR 426	42.8	17	38.3	4	37.2	no flooding
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	N OF W CHAPMAN ROAD, SE OF SR 426	43.3	9	39.8	2	39.1	no flooding
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	CROSSES SR 426 , NORTH OF W CHAPMAN ROAD	39.8	19	37.8	4	37.0	no flooding
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	ALONG NORTH OF W CHAPMAN ROAD, WEST OF SR 426	38.7	31	37.6	4	36.8	no flooding
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	NORTH OF W CHAPMAN RD CROSSES TATRA ST	35.6	18	34.4	4	33.4	no flooding
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	NORTH OF W CHAPMAN RD	35.3	18	34.3	7	33.4	no flooding
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	N OF W CHAPMAN RD, EAST OF SR 417	33.9	24	33.8	74	33.3	1.3
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	EAST OF N SR 417	33.8	56	33.8	55	33.3	2.5
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	NORTH OF CHAPMAN RD	33.8	4	33.8	3	33.3	2.5
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	CROSSES SR 417, 1315 SOUTH OF SLAVIA ROAD	33.8	73	33.8	60	33.3	no flooding
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	W OF SR 417, SOUTH OF SLAVIA ROAD	33.7	74	33.7	58	33.2	no flooding
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	SOUTH OF SUMMER CLUB DR	33.7	74	33.7	238	33.3	no flooding
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	FDOT MAINTENANCE YARD	51.9	9	51.5	0	51.0	0.5
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	W. MILKER ROAD	35.5	14	35.1	0	46.9	no flooding
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	CROSSES SR 417, SOUTH OF MIKLER ROAD	50.5	23	47.0	0	46.9	no flooding
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	CROSSES MIKLER ROAD, 273 FT WEST OF SR 417	42.0	48	38.8	16	37.3	no flooding
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	W. MILKER ROAD	35.5	48	35.1	16	37.0	no flooding
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	WEST OF MIKLER RD	47.1	9	47.1	8	46.1	0.1
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	CROSSES MIKLER ROAD, 1266 FT WEST OF SR 417	46.7	15	46.2	12	44.4	no flooding
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	W. MILKER ROAD	35.5	15	35.1	12	44.3	no flooding
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	W. MILKER ROAD	34.3	52	34.3	28	34.3	no flooding
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	CROSSES SR 417, 1632 SW OF W CHAPMAN ROAD	35.5	35	35.1	11	34.3	no flooding
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	W OF SR 417, NORTH OF EAGLE PASS ROAD	33.7	103	33.7	55	34.3	no flooding
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	W OF SR 417, NORTH OF EAGLE PASS ROAD	33.7	256	33.7	164	33.3	no flooding
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	WEST OF S SR 417	33.7	227	33.7	155	33.2	no flooding
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	EAST OF N SR 417	34.9	6	34.4	5	33.4	no flooding
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	WEST OF S SR 417	34.8	17	34.4	17	33.4	no flooding
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	WEST OF S SR 417	33.7	226	33.7	328	33.2	2.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	SOUTH OF SUMMER CLUB DR	33.7	258	33.7	175	33.2	1.7
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	SOUTH OF SUMMER CLUB DR	33.6	260	33.7	217	33.2	0.7
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	SOUTH OF SUMMER CLUB DR	33.6	263	33.7	213	33.2	0.9

Denotes 0.5 feet of flooding or greater

included the results of the 100-year/24-hour design storm event. The conduits where the depth of flooding was predicted to be 6 inches or greater are highlighted on Table 3.

Figure 3 – Aloma Woods Pond

CDM compared the model results to photographs taken by Inwood during the storm event to verify the model's accuracy in predicting flooding locations. It is important to note that the photographs were taken on August 22, 2008, after the peak of the storm occurred (see Figure 2) and coincide to hour 180 (approximately) of the simulation. Therefore the predicted stage at hour 180 was used for comparison purposes. Where a model node or conduit could be correlated to photographic information provided by Inwood, a comparison was made. The following comparisons included:

1. Pond in Aloma Woods – The stormwater pond in the Aloma Woods (model node AW-060) was shown to be extremely full, but not overtopping its banks during Tropical Storm Fay as shown in **Figure 3**. The model indicated that the pond is 0.8 feet below the assigned critical elevation feet.

2. Intersection of Aloma Woods and SR426 – The model did not predict any flooding at the culvert (AW-100-LP1) that crosses under SR426 near Aloma Woods. Some minor street flooding was observed during the storm, however it is not clear if this was due to the storm sewer system serving SR 426 possibly backing up during the storm event.

Figure 4 – Outfall Ditch at SR 426

3. Outfall ditch just upstream of SR 426 – Photographs taken at this location show the channel (model conduit AW-450-LC-1) to be completely full and the pipe under SR426 to be submerged, as shown in **Figure 4**. The model also predicted this open channel segment to be flowing full at the assigned critical elevation of 42.0 ft-NGVD.

4. Eagle Pass ditch at Eagle Pass Road – The picture at this crossing (model conduit AW-500-LP-1) shows the ditch flowing full during Tropical Storm Fay, but not overtopping the road. The model also does not predict flooding at this location but does indicate

that stages in the channel on the upstream side of the road are within 0.5 feet of the critical elevation. The photographs taken show the channel flowing full but the depth of flow is not discernible from the picture.

5. Eagle Pass Ditch near Chapman Road – The photograph taken at this location (model conduit AW-540-LC-1) shows the culvert flowing almost full (**Figure 5**). The top of bank elevation for the upstream portion of the channel is 35.05 ft-NGVD based on cross-sectional data in the model. The model predicted the stage to be 33.5 ft-NGVD at this location at the approximate time the picture was taken. Therefore, the model results seem to corroborate with actual conditions.

6. Chapman ditch near SR417 – The photograph at the upstream and downstream end of SR417 show the culvert (model conduit AW-585-LP-1) flowing almost full. The model at this location predicts the peak stage to be 0.2 feet above the assigned critical elevation (top of bank). Although the channel is full, it does not appear to overtop its banks, therefore the model may slightly be over-predicting the stage at this location.

Based on this discussion, the model results appear to be generally consistent with the photographic information. Thus the model can be used to predict where flooding occurs or where systems are flowing at full capacity. It appears that the model may over-predict flooding depths at some locations.

Figure 5 – Eagle Pass Ditch at Chapman Road

APPENDIX C

Alternative Development Stormwater Modeling Support Technical Memorandum, CDM

CDM

Memorandum

To: *Tom Amstadt*

From: *Danielle M. Honour, P.E., D.WRE*

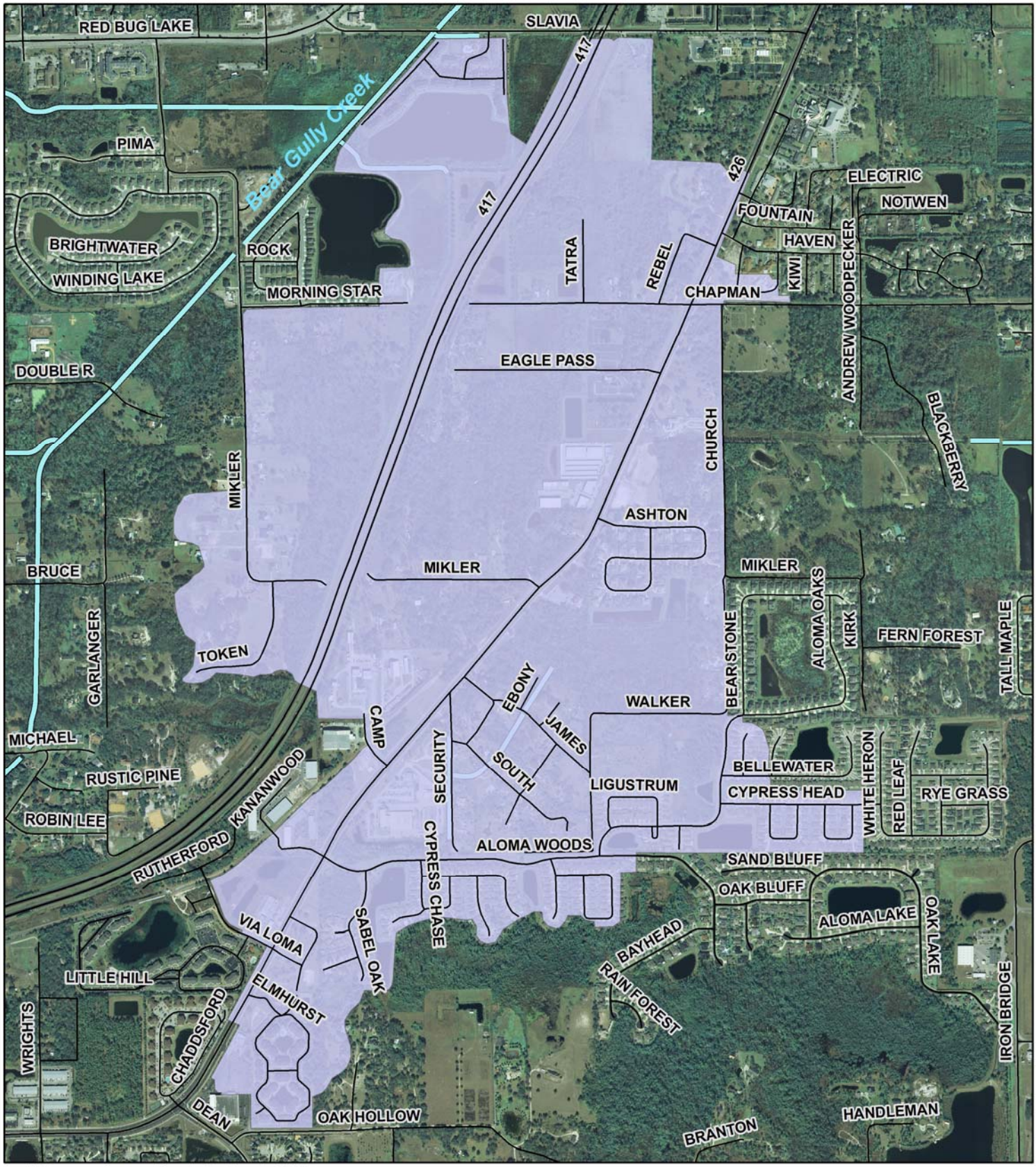
Date: *June 21, 2010*

Subject: *SR 426 at Aloma Woods Stormwater Improvement Project – Alternative Development Stormwater Modeling Support*

CDM was contracted by Inwood Consulting Engineers (Inwood) to provide stormwater modeling support for the above referenced project. The stormwater modeling completed by CDM for the Howell Creek Basin supported Inwood's development of alternative improvements to address the level of service (LOS) deficiencies associated with the Aloma Woods study area outfall to the Bear Gully Creek system. These deficiencies as well as existing conditions modeling results for the entire study area were previously documented in the technical memorandum prepared by CDM dated March 15, 2010 (SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support). This memorandum documents the results of design storm event simulations (mean-annual, 10-, 25- and 100-year/ 24-hour design storm events) as well as a model simulation of the Tropical Storm Fay event for alternative improvements developed by Inwood. The study area consists of the southeastern portion of the Howell Creek Basin in Seminole County that emanates near the Aloma Wood Subdivision and discharges into Bear Gully Creek at its most downstream point (**Figure 1**).

Improvements and Design Storm Event Simulation Results

Inwood provided updated Interconnected Channel and Pond Routing (ICPR) models (Version 3.1) of the Aloma Woods study area for each of the five (5) proposed alternatives. The details of the design storm event modeling for existing conditions were previously documented in the technical memorandum prepared by CDM dated March 15, 2010 (SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support). CDM ran the ICPR models developed by Inwood for each of the five alternatives as well as for the Tropical Storm Fay simulation and summarized the results. The following paragraphs provide a description of the alternative improvements and a comparison of the alternatives stages and flows to existing conditions and the defined County's level of service.



Aerial Imagery Source: Seminole County, 2006

N
W E
S

0 650 1,300 2,600

Feet

LEGEND

- Streets
- Study Area
- Existing Canals

Seminole County
Howell Creek Basin CIP

CDM

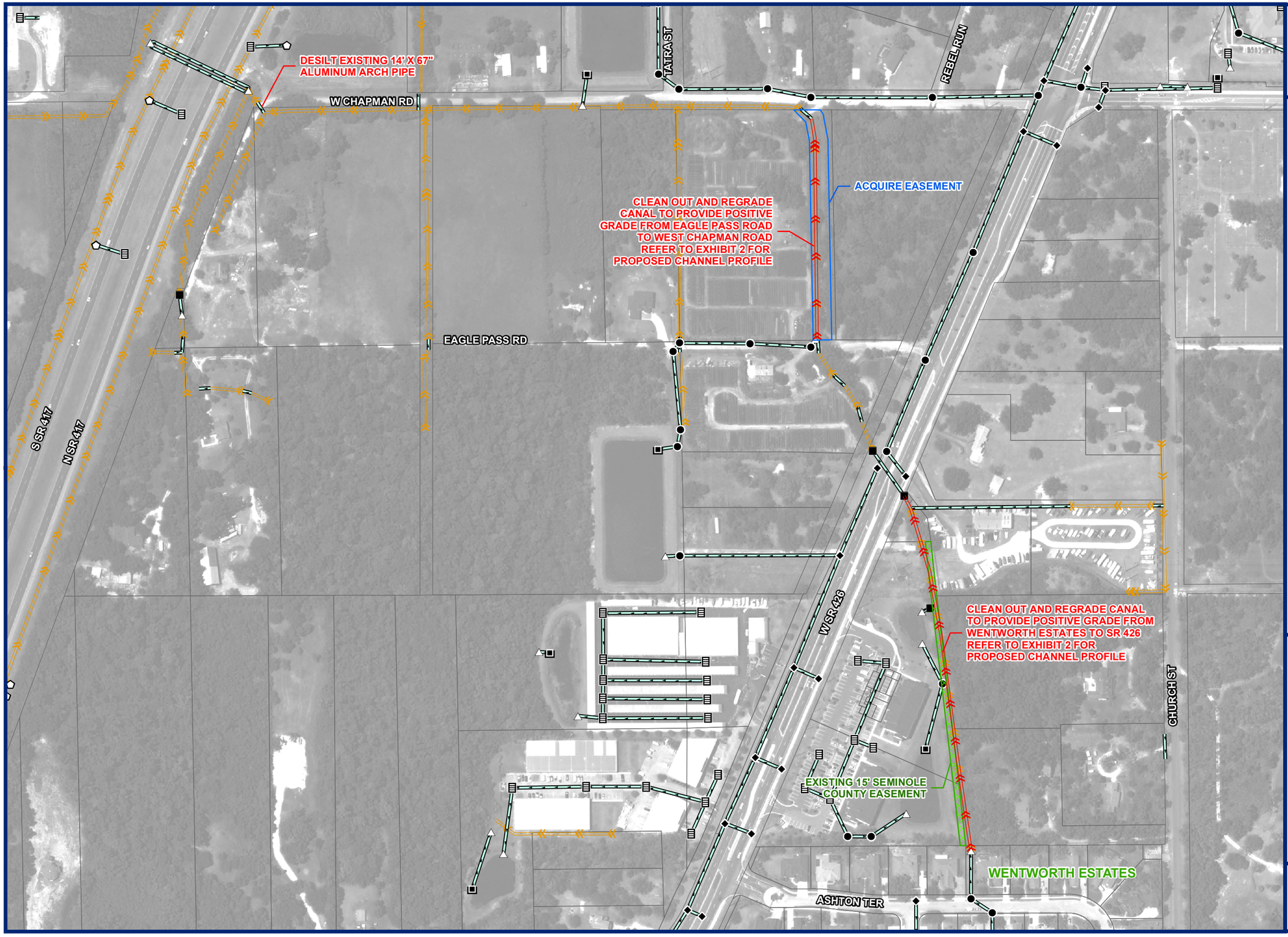
Figure 1

Alternative 1

Alternative 1 focused on improving conveyance within the channel from the downstream end of the Wentworth Estates subdivision to SR 417. The improvements are primarily maintenance oriented and include cleaning out and regrading portions of the channel, acquiring easements and desilting the 14-inch x 67-inch aluminum arch culvert just upstream of the SR 417 crossing. These improvements are called out on **Figure 2**. A comparison of the existing condition to the proposed alternative condition design storm event results are summarized below in **Table 1**. A comprehensive tabular summary of a comparison of all the design storm events for Alternative 1 is provided in **Attachment A**. As shown in the table, Alternative 1 has a minimal effect on the reduction of flood stages through the area of interest (i.e., node AW-415 to node AW-585). The most notable difference is a 0.1 to 0.3 foot reduction in flood stages during the 10-year/24-hour design storm event at the pipe crossings (AW-510-LP-1, AW-515-LP-1 and AW-520-LP-1) under Eagle Pass Road just west of the nursery, as shown in the model schematic in **Figure 3**.

Table 1
Alternative 1 - Design Storm Events Stage Comparison

Conduit	U/S Node	D/S Node	Critical Elev. (ft-NGVD)	LOS Design Storm	10-Year Existing Stage	10-Year Alternative Stage	Δ Stage (ft)	25-Year Existing Stage	25-Year Alternative Stage	Δ Stage (ft)
AW-415-LC-1	AW-415	AW-425	44.5	25	41.3	41.3	0.0	41.7	41.7	0.0
AW-425-LC-1	AW-425	AW-450	41.1	25	41.3	41.3	0.0	41.7	41.7	0.0
AW-430-LD-1	AW-430	AW-435	44.5	25	42.7	42.7	0.0	43.0	43.0	0.0
AW-435-LP-1	AW-435	AW-450	43.0	25	41.3	41.3	0.0	41.7	41.7	0.0
AW-450-LC-1	AW-450	AW-470	42.0	25	41.2	41.3	0.1	41.6	41.7	0.0
AW-455-LC-1	AW-455	AW-440	44.0	10	41.3	41.3	0.0	41.7	41.7	0.0
AW-455-LP-1	AW-455	AW-460	44.0	10	43.5	43.5	0.0	43.6	43.6	0.0
AW-460-LC-1	AW-460	AW-465	43.5	10	43.1	43.1	0.0	43.1	43.1	0.0
AW-465-LP-1	AW-465	AW-470	43.5	10	43.1	43.1	0.0	43.1	43.1	0.0
AW-470-LP-1	AW-470	AW-475	42.0	25	41.2	41.3	0.1	41.6	41.7	0.0
AW-475-LC-1	AW-475	AW-480	42.4	25	41.1	41.2	0.1	41.4	41.4	0.0
AW-480-LP-1	AW-480	AW-485	41.2	25	41.1	41.2	0.1	41.4	41.4	0.0
AW-485-LC-1	AW-485	AW-490	40.1	25	39.7	39.8	0.0	40.2	40.2	0.0
AW-490-LP-1	AW-490	AW-495	40.1	25	39.7	39.8	0.0	40.2	40.2	0.0
AW-495-LC-1	AW-495	AW-500	39.5	25	38.3	38.3	0.0	38.5	38.6	0.0
AW-500-LP-1	AW-500	AW-525	39.2	25	38.3	38.3	0.0	38.5	38.6	0.0
AW-505-LD-1	AW-505	AW-510	42.0	25	40.3	40.3	0.0	41.3	41.3	0.0
AW-510-LP-1	AW-510	AW-515	36.5	10	37.1	37.1	0.0	37.2	37.2	0.0
AW-515-LP-1	AW-515	AW-520	37.1	10	36.7	36.6	-0.1	36.7	36.6	-0.1



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 75 150
Feet

LEGEND

- PARCELS
- PROPOSED CHANNELS

EXISTING STRUCTURES

- CONTROL STRUCTURE
- HEADWALL
- DITCH BOTTOM INLET
- MITERED END SECTION
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE 6-1

PROPOSED IMPROVEMENT AREA 1

Aloma Woods Outfall Assessment

Inwood consulting engineers

FIGURE 2

Aerial Imagery Source: Seminole County, 2006

LEGEND

- Nodes
- Pipe
- Weir
- Drop Structure
- Open Channel
- Subbasin
- Streets

N
W E
S

0 185 370 740

Feet

Seminole County
Howell Creek Basin CIP

CDM

Figure 3
Model Schematic

Table 1
Alternative 1 - Design Storm Events Stage Comparison

Conduit	U/S Node	D/S Node	Critical Elev. (ft-NGVD)	LOS Design Storm	10-Year Existing Stage	10-Year Alternative Stage	Δ Stage (ft)	25-Year Existing Stage	25-Year Alternative Stage	Δ Stage (ft)
AW-520-LP-1	AW-520	AW-525	38.6	10	35.9	35.7	-0.3	36.0	35.8	-0.2
AW-525-LC-1	AW-525	AW-530	38.5	25	34.5	34.5	0.0	34.6	34.6	0.0
AW-530-LC-1	AW-530	AW-535	36.5	25	34.4	34.4	0.1	34.6	34.6	0.0
AW-535-LP-1	AW-535	AW-540	35.2	25	34.4	34.4	0.1	34.6	34.6	0.0
AW-540-LC-1	AW-540	AW-560	34.5	25	32.3	32.3	0.0	33.0	33.0	0.0
AW-545-LP-1	AW-545	AW-550	36.2	10	36.5	36.5	0.0	36.6	36.5	0.0
AW-550-LC-1	AW-550	AW-555	36.0	25	32.4	32.3	0.0	33.0	33.0	0.0
AW-555-LC-1	AW-555	AW-560	32.5	25	32.3	32.3	0.0	33.0	33.0	0.0
AW-560-LC-1	AW-560	AW-565	32.5	25	32.2	32.2	0.0	33.0	33.0	0.0
AW-565-LC-1	AW-565	AW-570	32.7	25	32.2	32.2	0.0	33.0	33.0	0.0
AW-570-LC-1	AW-570	AW-575	32.5	25	32.2	32.2	0.0	33.0	33.0	0.0
AW-575-LC-1	AW-575	AW-580	32.5	25	32.1	32.1	0.0	33.0	33.0	0.0
AW-575-LP-1	AW-575	AW-745	32.5	25	32.2	32.2	0.0	33.0	33.0	0.0
AW-580-LC-1	AW-580	AW-585	33.5	25	32.1	32.1	0.0	33.0	33.0	0.0
AW-585-LP-1	AW-585	AW-590	33.1	25	32.1	32.1	0.0	33.0	33.0	0.0

Indicates LOS deficiency

Alternative 2A

Alternative 2A focuses on improvements to the portion of open channel from SR 426 to W. Chapman Road. This is the area that essentially flows through Eagle Pass Nursery. This alternative primarily consists of improving conveyance by replacing the existing pipes on the nursery property with larger as well as regrading the channel sections in between. The alternative also calls for acquiring an easement along this section of open channel. These improvements are called out on **Figure 4**. A comparison of the existing condition to the proposed alternative condition design storm event results are summarized below in **Table 2**. A comprehensive tabular summary of a comparison of all the design storm events for Alternative 2A is provided in Attachment A. As shown in the table, Alternative 2A has the most effect on reducing flood stages through the open channel section from SR 426 (node AW-475) to Eagle Pass Road (node AW-500) as shown in Figure 3. Flood stages through this portion of the channel are reduced almost up to 2 feet during the 25-year/24-hour design storm event.

W CHAPMAN RD

MES
INV. = 30.4'

REPLACE 36" CMP W/
40' OF 54" RCP

MES
INV. = 30.6'

ACQUIRE EASEMENT

ADD RUBBLE RIP-RAP
DOWNSTREAM OF HEADWALL

GRADE CHANNEL TO
PROPOSED HEADWALL

ADD HEADWALL
INV. = 33.8'

EAGLE PASS RD

REPLACE 30" CMP W/
34' OF 48" RCP

ADD HEADWALL
INV. = 33.9'

ADD HEADWALL
INV. = 34.3'

REPLACE 36" CMP W/
42' OF 48" RCP

ADD HEADWALL
INV. = 34.5'

EAGLE PASS NURSERY

ADD HEADWALL
INV. = 34.6'

REPLACE 36" CMP
40' OF 48" RCP

GRADE CHANNEL TO
PROPOSED HEADWALL

ADD HEADWALL
INV. = 34.8'

W SR 426

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

PARCELS

PROPOSED STRUCTURES

MITERED END SECTION

HEADWALL

PIPES

CHANNELS

EXISTING STRUCTURES

CONTROL STRUCTURE

HEADWALL

CURB INLET

ENDWALL

MANHOLE

PIPES

CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE 6-2

PROPOSED IMPROVEMENT AREA 2A

Aloma Woods Outfall Assessment

Inwood consulting engineers

FIGURE 4

Table 2
Alternative 2A - Design Storm Events Stage Comparison

Conduit	U/S Node	D/S Node	Critical Elevation (ft-NGVD)	LOS Design Storm	10-Year Existing Stage	10-Year Alternative Stage	Δ Stage (ft)	25-Year Existing Stage	25-Year Alternative Stage	Δ Stage (ft)
AW-475-LC-1	AW-475	AW-480	42.4	25	41.1	39.0	-2.1	41.4	39.7	-1.8
AW-480-LP-1	AW-480	AW-485	41.2	25	41.1	39.0	-2.1	41.4	39.7	-1.8
AW-485-LC-1	AW-485	AW-490	40.1	25	39.7	38.4	-1.3	40.2	38.8	-1.4
AW-490-LP-1	AW-490	AW-495	40.1	25	39.7	38.4	-1.3	40.2	38.8	-1.4
AW-495-LC-1	AW-495	AW-500	39.5	25	38.3	37.2	-1.1	38.5	37.5	-1.1
AW-500-LP-1	AW-500	AW-525	39.2	25	38.3	37.2	-1.1	38.5	37.5	-1.1
AW-505-LD-1	AW-505	AW-510	42.0	25	40.3	40.3	0.0	41.3	41.3	0.0
AW-510-LP-1	AW-510	AW-515	36.5	10	37.1	37.1	0.0	37.2	37.2	0.0
AW-515-LP-1	AW-515	AW-520	37.1	10	36.7	36.8	0.1	36.7	36.8	0.1
AW-520-LP-1	AW-520	AW-525	38.6	10	35.9	36.3	0.3	36.0	36.4	0.4
AW-525-LC-1	AW-525	AW-530	38.5	25	34.5	34.5	0.0	34.6	34.7	0.0
AW-530-LC-1	AW-530	AW-535	36.5	25	34.4	34.1	-0.3	34.6	34.4	-0.2
AW-535-LP-1	AW-535	AW-540	35.2	25	34.4	34.1	-0.3	34.6	34.4	-0.2
AW-540-LC-1	AW-540	AW-560	34.5	25	32.3	32.4	0.2	33.0	33.1	0.1
AW-545-LP-1	AW-545	AW-550	36.2	10	36.5	36.5	0.0	36.6	36.6	0.0
AW-550-LC-1	AW-550	AW-555	36.0	25	32.4	32.6	0.2	33.0	33.1	0.1
AW-555-LC-1	AW-555	AW-560	32.5	25	32.3	32.4	0.2	33.0	33.1	0.1

Indicates Existing Conditions LOS deficiency

Alternative 2B

Alternative 2B also focuses on improvements to the portion of open channel from SR 426 (node AW-475) to W. Chapman Road (node AW-535), the area that flows through Eagle Pass Nursery (Figure 3). This alternative consists of the following:

- Replacing the entire open channel segment and existing pipes between SR 426 and Eagle Pass Road with 48-inch reinforced concrete pipes (RCPs);
- Replacing the culvert just upstream of W. Chapman Road (AW-535-LP-1) with a 54-inch RCP;
- Regrading of a portion of the open channel (AW-525-LC-1) downstream of Eagle Pass Road; and
- Acquiring an easement over the section of open channel from SR 426 to W. Chapman Road.

These improvements are called out on **Figure 5**. A comparison of the existing condition to the proposed alternative condition design storm event results are summarized below in **Table 3**. A comprehensive tabular summary of a comparison of all the design storm events for Alternative 2B is provided in Attachment A. An updated model schematic prepared by Inwood showing the proposed alternative is provided in **Attachment B**. As shown in the table, Alternative 2B reduces the flood stages through the Eagle Pass Nursery property up to 2.7 feet, but slightly increases the stages downstream of Eagle Pass Road (AW-500) by approximately 0.5 feet during the 25-year/24-hour design storm event.

Table 3
Alternative 2B - Design Storm Events Stage Comparison

Conduit	U/S Node	D/S Node	Critical Elevation (ft-NGVD)	LOS Design Storm	10-Year Existing Stage	10-Year Alternative Stage	Δ Stage (ft)	25-Year Existing Stage	25-Year Alternative Stage	Δ Stage (ft)
AW-475-LC-1	AW-475	AW-480	42.4	25	41.1	N/A	N/A	41.4	N/A	N/A
AW-475-LP-1	AW-475	AW-480	42.4	25	N/A	38.3	-2.8	N/A	38.7	-2.7
AW-480-LP-1	AW-480	AW-490	41.2	25	41.1	38.3	-2.8	41.4	38.7	-2.7
AW-485-LC-1	AW-485	AW-490	40.1	25	39.7	N/A	N/A	40.2	N/A	N/A
AW-490-LP-1	AW-490	AW-500	40.1	25	39.7	37.9	-1.8	40.2	38.4	-1.8
AW-495-LC-1	AW-495	AW-500	39.5	25	38.3	N/A	N/A	38.5	N/A	N/A
AW-500-LP-1	AW-500	AW-525	39.2	25	38.3	37.6	-0.7	38.5	38.0	-0.6
AW-505-LD-1	AW-505	AW-510	42.0	25	40.3	40.3	0.0	41.3	41.3	0.0
AW-510-LP-1	AW-510	AW-515	36.5	10	37.1	37.1	0.0	37.2	37.2	0.0
AW-515-LP-1	AW-515	AW-520	37.1	10	36.7	36.8	0.1	36.7	36.8	0.1
AW-520-LP-1	AW-520	AW-525	38.6	10	35.9	36.3	0.3	36.0	36.4	0.4
AW-525-LC-1	AW-525	AW-530	38.5	25	34.5	34.9	0.4	34.6	35.2	0.6
AW-530-LC-1	AW-530	AW-535	36.5	25	34.4	34.7	0.3	34.6	35.1	0.5
AW-535-LP-1	AW-535	AW-540	35.2	25	34.4	34.7	0.3	34.6	35.1	0.5
AW-540-LC-1	AW-540	AW-560	34.5	25	32.3	32.4	0.2	33.0	33.2	0.1
AW-545-LP-1	AW-545	AW-550	36.2	10	36.5	36.5	0.0	36.6	36.6	0.0
AW-550-LC-1	AW-550	AW-555	36.0	25	32.4	32.6	0.2	33.0	33.1	0.1
AW-555-LC-1	AW-555	AW-560	32.5	25	32.3	32.4	0.2	33.0	33.2	0.1

Indicates conduit removed as part of proposed alternative

Indicates conduit added as part of proposed alternative

Indicates Existing Conditions LOS deficiency

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

PARCELS

PROPOSED STRUCTURES

- DITCH BOTTOM INLET
- HEADWALL
- MANHOLE
- MITERED END SECTION
- CHANNELS
- PIPES

EXISTING STRUCTURES

- CONTROL STRUCTURE
- HEADWALL
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE 6-3

PROPOSED IMPROVEMENT AREA 2B

Aloma Woods Outfall Assessment

Inwood consulting engineers

FIGURE 5

Alternative 2C

Alternative 2C consists of re-routing the flow around the Eagle Pass Nursery from SR 426 (node AW-475) to Eagle Pass Road (AW-500) as shown in **Figure 6**. This alternative consists of the following:

- Maintaining the existing pipes and open channel segments through the Eagle Pass Nursery;
- Re-routing the flow from SR 426 to Eagle Pass Road using 553 feet of 48-inch RCP;
- Replacing the culvert just upstream of W. Chapman Road with a 54-inch RCP; and
- Acquiring an easement over the section of open channel from SR 426 to W. Chapman Road.

A comparison of the existing condition to the proposed alternative condition design storm event results are summarized below in **Table 4**. A comprehensive tabular summary of a comparison of all the design storm events for Alternative 2C is provided in Attachment A. An updated model schematic prepared by Inwood is provided in Attachment B. As can be seen in the table, Alternative 2C significantly reduces the flood stages through the Eagle Pass Nursery property by up to 5 feet during the 25-year/24-hour design storm event. The level of service is also met for the proposed pipes (AW-475-LP-1, AW-476-LP-1 and AW-477-LP-1) that re-route the flow around the nursery. Slight increases in stage (0.1 to 0.3 feet) were predicted elsewhere in adjoining or downstream parts of the system.

Table 4
Alternative 2C - Design Storm Events Stage Comparison

Conduit	U/S Node	D/S Node	Critical Elevation (ft-NGVD)	LOS Design Storm	10-Year Existing Stage	10-Year Alternative Stage	Δ Stage (ft)	25-Year Existing Stage	25-Year Alternative Stage	Δ Stage (ft)
AW-475-LC-1	AW-475	AW-480	42.4	25	41.1	N/A	N/A	41.4	N/A	N/A
AW-475-LP-1	AW-475	AW-476	42.4	25	N/A	39.8	-1.4	N/A	40.4	-1.0
AW-476-LP-1	AW-476	AW-477	41.0	25	N/A	39.1	-2.0	N/A	39.7	-1.7
AW-477-LP-1	AW-477	AW-525	42.0	25	N/A	38.0	N/A	N/A	38.2	N/A
AW-480-LP-1	AW-480	AW-485	41.2	25	41.1	36.4	-4.7	41.4	36.5	-5.0
AW-485-LC-1	AW-485	AW-490	40.1	25	39.8	36.4	-3.4	40.2	35.9	-4.3
AW-490-LP-1	AW-490	AW-495	40.1	25	39.7	35.8	-3.9	40.2	35.9	-4.3
AW-495-LC-1	AW-495	AW-500	39.5	25	38.4	35.7	-2.7	38.5	35.8	-2.8
AW-500-LP-1	AW-500	AW-525	39.2	25	38.3	35.7	-2.6	38.5	35.8	-2.8
AW-505-LD-1	AW-505	AW-510	42.0	10	40.3	40.3	0.0	41.3	41.3	0.0
AW-510-LP-1	AW-510	AW-515	36.5	10	37.1	37.1	0.0	37.2	37.2	0.0
AW-515-LP-1	AW-515	AW-520	37.1	10	36.7	36.7	0.1	36.7	36.8	0.1

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

- PARCELS

PROPOSED STRUCTURES

- DITCH BOTTOM INLET
- MANHOLE
- MITERED END SECTION
- CHANNELS
- PIPES

EXISTING STRUCTURES

- CONTROL STRUCTURE
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008
PARCELS: SEMINOLE COUNTY, 2009

FIGURE 6-4

PROPOSED IMPROVEMENT 2C

Aloma Woods Outfall Assessment

Inwood consulting engineers

FIGURE 6

Table 4
Alternative 2C - Design Storm Events Stage Comparison

Conduit	U/S Node	D/S Node	Critical Elevation (ft-NGVD)	LOS Design Storm	10-Year Existing Stage	10-Year Alternative Stage	Δ Stage (ft)	25-Year Existing Stage	25-Year Alternative Stage	Δ Stage (ft)
AW-520-LP-1	AW-520	AW-525	38.6	25	35.9	36.2	0.3	36.0	36.2	0.3
AW-525-LC-1	AW-525	AW-530	38.5	25	34.5	34.6	0.1	34.6	34.8	0.1
AW-530-LC-1	AW-530	AW-535	36.5	25	34.4	34.4	0.1	34.6	34.6	0.1
AW-535-LP-1	AW-535	AW-540	35.2	25	34.4	34.4	0.1	34.6	34.6	0.1
AW-540-LC-1	AW-540	AW-560	34.5	10	32.3	32.4	0.1	33.0	33.1	0.1
AW-545-LP-1	AW-545	AW-550	36.2	25	36.5	36.5	0.0	36.6	36.6	0.0
AW-550-LC-1	AW-550	AW-555	36.0	25	32.4	32.5	0.2	33.0	33.1	0.0
AW-555-LC-1	AW-555	AW-560	32.5	25	32.3	32.4	0.1	33.0	33.1	0.1

Indicates conduit removed as part of proposed alternative

Indicates conduit added as part of proposed alternative

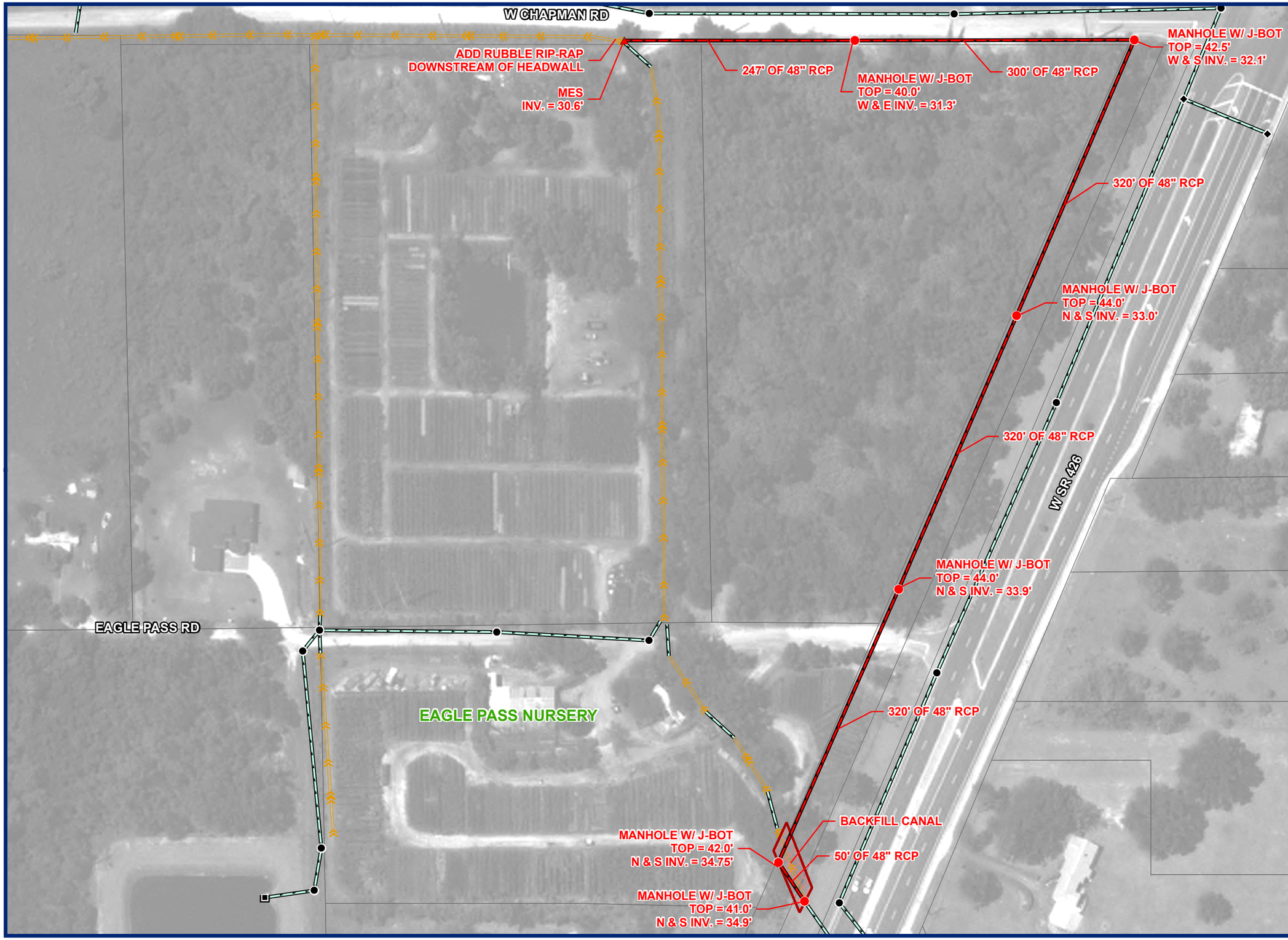
Indicates LOS deficiency

Alternative 2D

Alternative 2D consists of re-routing the flow entirely around the Eagle Pass Nursery from SR 426 (node AW-475) to W. Chapman Road and then along W. Chapman to the outfall pipe (AW-535-LP-1) from the Eagle Pass Nursery as shown in **Figure 7**. This alternative consists of the following:

- Maintaining the existing pipe and open channel through the Eagle Pass Nursery; and
- Re-routing the flow from SR 426 to W. Chapman Road using 1,557 feet of 48-inch RCP.

A comparison of the existing condition to the proposed alternative condition design storm event results are summarized below in **Table 5**. A comprehensive tabular summary of a comparison of all the design storm events for Alternative 2D is provided in Attachment A. An updated model schematic prepared by Inwood is provided in Attachment B. As can be seen in the table, the results are similar to Alternative 2C in that Alternative 2D significantly reduces the flood stages through the Eagle Pass Nursery property by up to 5 feet during the 25-year/24-hour design storm event. The level of service is also met for the proposed pipes (AW-475-LP-1, AW-476-LP-1, AW-477-LP-1, AW-531-LP-1 and AW-532-LP-1) that re-route the flow around the nursery. By-re-routing the flow entirely around the nursery property, this alternative also has some additional benefit to reducing stages at the west end of Eagle Pass Road (AW-510-LP-1, AW-515-LP-1, AW-520-LP-1 and AW-525-LC-1). There is some slight increase in stage (0.1 foot) predicted within open channels AW-540-LC-1, AW-550-LC-1 and AW-555-LC-1 during the 25-year/24-hour design storm event.



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

PARCELS

PROPOSED STRUCTURES

- MANHOLE
- MITERED END SECTION
- PIPES

EXISTING STRUCTURES

- CONTROL STRUCTURE
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008
PARCELS: SEMINOLE COUNTY, 2009

FIGURE 6-5

PROPOSED IMPROVEMENT 2D

Aloma Woods Outfall Assessment

Inwood consulting engineers

FIGURE 7

Table 5
Alternative 2D - Design Storm Events Stage Comparison

Conduit	U/S Node	D/S Node	Critical Elevation (ft-NGVD)	LOS Design Storm	10-Year Existing Stage	10-Year Alternative Stage	Δ Stage (ft)	25-Year Existing Stage	25-Year Alternative Stage	Δ Stage (ft)
AW-475-LC-1	AW-475	AW-480	42.4	25	41.1	N/A	N/A	41.4	N/A	N/A
AW-475-LP-1	AW-475	AW-476	42.4	25	N/A	39.0	-2.1	N/A	40.1	-1.4
AW-476-LP-1	AW-476	AW-477	42.0	25	N/A	38.7	-2.4	N/A	39.2	-2.2
AW-477-LP-1	AW-477	AW-478	44.0	25	N/A	37.8	N/A	N/A	38.1	N/A
AW-478-LP-1	AW-478	AW-531	44.0	25	N/A	36.9	N/A	N/A	37.1	N/A
AW-480-LP-1	AW-480	AW-485	41.2	25	41.1	36.4	-4.7	41.4	36.5	-5.0
AW-485-LC-1	AW-485	AW-490	40.1	25	39.8	35.8	-3.9	40.2	35.9	-4.3
AW-490-LP-1	AW-490	AW-495	40.1	25	39.7	35.8	-3.9	40.2	35.9	-4.3
AW-495-LC-1	AW-495	AW-500	39.5	25	38.4	34.8	-3.6	38.5	34.9	-3.6
AW-500-LP-1	AW-500	AW-525	39.2	25	38.3	34.8	-3.5	38.5	34.9	-3.6
AW-505-LD-1	AW-505	AW-510	42.0	25	40.3	40.3	0.0	41.3	41.3	0.0
AW-510-LP-1	AW-510	AW-515	36.5	10	37.1	37.0	0.0	37.2	37.1	-0.1
AW-515-LP-1	AW-515	AW-520	37.1	10	36.7	36.5	-0.2	36.7	36.5	-0.2
AW-520-LP-1	AW-520	AW-525	38.6	10	35.9	35.3	-0.6	36.0	35.3	-0.7
AW-525-LC-1	AW-525	AW-530	38.5	25	34.5	33.4	-1.1	34.6	33.7	-1.0
AW-530-LC-1	AW-530	AW-535	36.5	25	34.4	33.4	-1.0	34.6	33.6	-0.9
AW-531-LP-1	AW-531	AW-532	42.5	25	N/A	36.0	N/A	N/A	36.1	N/A
AW-532-LP-1	AW-532	AW-540	40.0	25	N/A	35.2	N/A	N/A	35.3	N/A
AW-535-LP-1	AW-535	AW-540	35.2	25	34.4	33.4	-1.0	34.6	33.6	-0.9
AW-540-LC-1	AW-540	AW-560	34.5	25	32.3	32.4	0.2	33.0	33.1	0.1
AW-545-LP-1	AW-545	AW-550	36.2	10	36.5	36.5	0.0	36.6	36.5	0.0
AW-550-LC-1	AW-550	AW-555	36.0	25	32.4	32.5	0.1	33.0	33.1	0.1
AW-555-LC-1	AW-555	AW-560	32.5	25	32.3	32.4	0.2	33.0	33.1	0.1

Indicates conduit removed as part of proposed alternative

Indicates conduit added as part of proposed alternative

Indicates LOS deficiency

Summary

CDM ran the simulations of the five alternatives provided by Inwood using the ICPR stormwater model. Comparisons between the existing and proposed alternative stages indicate the Alternative 2D provides the greatest benefit in terms of reduction in flood stage throughout the nursery area as well as adjoining conduits. It also results in the least amount of impact (i.e., increase in stage downstream) compared to other alternatives. Alternative C also provides a significant flood reduction benefit, but has more impacts downstream.

Additional storage and/or water quality treatment may be required by the St. Johns River Water Management District during the permitting process to offset any downstream impacts or increases in flow. Design and permitting will be the responsibility of Inwood. Project costs will need to be considered in tandem with flood reduction benefit in order to determine the preferred alternative in the end.

ATTACHMENT A

Table A-1
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	66.8	1	0	66.8	1	0	0.0	yes	N/A	67.3	5	4	67.3	5	4	0.0	yes	N/A
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	66.6	1	0	66.6	1	0	0.0	yes	N/A	67.1	3	3	67.1	3	3	0.0	yes	N/A
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	61.7	2	3	61.7	2	3	0.0	yes	N/A	65.2	6	5	65.2	6	5	0.0	yes	N/A
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	70.3	0	0	70.3	0	0	0.0	yes	N/A	71.1	0	0	71.1	0	0	0.0	yes	N/A
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	61.6	0	0	61.6	0	0	0.0	yes	N/A	62.0	1	2	62.0	1	2	0.0	yes	N/A
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	58.7	2	3	58.7	2	3	0.0	yes	N/A	61.1	8	6	61.1	8	6	0.0	yes	N/A
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	53.8	1	0	53.8	1	0	0.0	yes	N/A	54.2	4	5	54.2	4	5	0.0	yes	N/A
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	61.0	0	0	61.0	0	0	0.0	yes	N/A	61.6	0	0	61.6	0	0	0.0	yes	N/A
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.8	4	0	51.8	4	0	0.0	yes	N/A	51.9	6	0	51.9	6	0	0.0	yes	N/A
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	49.6	6	1	49.6	6	1	0.0	yes	N/A	50.7	9	1	50.7	9	1	0.0	yes	N/A
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.9	3	0	63.9	3	0	0.0	yes	N/A	64.0	6	0	64.0	6	0	0.0	yes	N/A
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	52.8	0	0	52.8	0	0	0.0	yes	N/A	53.5	0	1	53.5	0	1	0.0	yes	N/A
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.3	2	4	54.3	2	4	0.0	yes	N/A
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.5	4	4	54.5	4	4	0.0	no	0.4	54.9	6	4	54.9	6	4	0.0	no	0.8
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.2	3	4	54.2	3	4	0.0	yes	N/A
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.8	0	1	52.8	0	1	0.0	yes	N/A	52.9	0	1	52.9	0	1	0.0	yes	N/A
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.1	1	2	53.1	1	2	0.0	yes	N/A	53.1	1	3	53.1	1	3	0.0	yes	N/A
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.2	2	1	52.2	2	1	0.0	yes	N/A	52.5	3	1	52.5	3	1	0.0	yes	N/A
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.2	7	0	52.2	7	0	0.0	yes	N/A	52.5	14	4	52.5	14	4	0.0	yes	N/A
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	49.9	8	4	49.9	8	4	0.0	yes	N/A	51.5	10	4	51.5	10	4	0.0	no	0.4
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	49.7	8	4	49.7	8	4	0.0	yes	N/A	51.1	10	4	51.1	10	4	0.0	yes	N/A
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	49.2	8	3	49.2	8	3	0.0	yes	N/A	50.5	10	3	50.5	10	3	0.0	yes	N/A
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	49.6	9	2	49.6	9	2	0.0	yes	N/A	50.6	12	3	50.6	12	3	0.0	yes	N/A
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	48.5	14	3	48.5	14	3	0.0	yes	N/A	49.6	16	3	49.6	16	3	0.0	yes	N/A
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	48.0	14	3	48.0	14	3	0.0	yes	N/A	49.1	16	3	49.1	16	3	0.0	yes	N/A
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	47.6	15	3	47.6	15	3	0.0	yes	N/A	48.6	16	3	48.6	16	3	0.0	yes	N/A
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	47.3	21	4	47.3	21	4	0.0	yes	N/A	48.3	22	4	48.3	22	4	0.0	yes	N/A
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	47.3	9	6	47.3	9	6	0.0	yes	N/A	48.3	9	6	48.3	9	6	0.0	no	0.1
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	46.4	21	4	46.4	21	4	0.0	yes	N/A	47.2	22	4	47.2	22	4	0.0	yes	N/A
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	45.2	24	5	45.3	24	6	0.0	yes	N/A	45.9	24	5	45.9	24	5	0.0	yes	N/A
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	44.1	22	4	44.1	22	4	0.0	yes	N/A	44.6	22	5	44.6	22	5	0.0	yes	N/A
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	52.4	8	5	52.4	8	5	0.0	yes	N/A	52.7	9	5	52.7	9	5	0.0	yes	N/A
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.6	1	2	52.6	1	2	0.0	yes	N/A	52.7	1	2	52.7	1	2	0.0	yes	N/A
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	3	52.6	1	3	0.0	yes	N/A	52.6	1	3	52.6	1	3	0.0	yes	N/A
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.5	10	0	51.5	10	0	0.0	yes	N/A	51.8	14	0	51.8	14	0	0.0	yes	N/A
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.5	14	8	51.5	14	8	0.0	yes	N/A	51.8	19	10	51.8	19	10	0.0	yes	N/A
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	15	0	48.6	15	0	0.0	yes	N/A	49.0	19	0	49.0	19	0	0.0	yes	N/A
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.5	25	0	48.5	25	0	0.0	yes	N/A	48.9	25	0	48.9	25	0	0.0	yes	N/A
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.5	21	7	48.5	21	7	0.0	yes	N/A	48.9	26	8	48.9	26	8	0.0	yes	N/A
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.5	1	3	48.5	1	3	0.0	yes	N/A	49.0	2	2	49.0	2	2	0.0	yes	N/A
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.5	2	1	48.5	2	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.5	1	1	48.5	1	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.5	2	2	48.5	2	2	0.0	yes	N/A	49.0	3	1	49.0	3	1	0.0	yes	N/A
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.5	6	2	48.5	6	2	0.0	yes	N/A	49.0	8	2	49.0	8	2	0.0	yes	N/A
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.9	2	2	49.9	2	2	0.0	yes	N/A	50.7	3	3	50.7	3	3	0.0	yes	N/A
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.7	3	3	49.7	3	3	0.0	yes	N/A	50.1	4	4	50.1	4	4	0.0	yes	N/A
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.7	4	4	48.7	4	4	0.0	yes	N/A	48.9	6	4	48.9	6	4	0.0	yes	N/A
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.8	25	0	45.8	25	0	0.0	yes	N/A	46.1	32	0	46.1	32	0	0.0	yes	N/A
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	40.9	26	0	40.8	26	0	0.0	yes	N/A	41.7	36	0	41.6	36	0	0.0	yes	N/A
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	1	50.2	0	1	0.0	yes	N/A	50.2	0	1	50.2	0	1	0.0	yes	N/A

Table A-1
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.5	0	1	47.5	0	1	0.0	yes	N/A
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	47.0	1	2	47.0	1	2	0.0	yes	N/A	47.5	2	2	47.5	2	2	0.0	yes	N/A
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	47.0	12	4	47.0	12	4	0.0	yes	N/A	47.5	16	5	47.5	16	5	0.0	yes	N/A
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.5	12	2	46.5	12	2	0.0	yes	N/A	46.7	16	2	46.7	16	2	0.0	yes	N/A
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.5	12	4	46.5	12	4	0.0	yes	N/A	46.7	17	5	46.7	17	5	0.0	yes	N/A
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.4	18	3	45.4	18	3	0.0	yes	N/A	46.0	20	3	46.0	20	3	0.0	yes	N/A
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.4	12	5	45.4	12	5	0.0	yes	N/A	46.0	17	6	46.0	17	6	0.0	yes	N/A
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.2	31	2	43.2	31	2	0.0	yes	N/A	43.5	37	2	43.5	37	2	0.0	yes	N/A
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	43.2	6	2	43.2	6	2	0.0	yes	N/A	43.6	9	3	43.6	9	3	0.0	yes	N/A
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	40.9	42	0	40.8	42	0	0.0	yes	N/A	41.7	53	0	41.6	53	0	0.0	yes	N/A
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.1	3	3	47.1	3	3	0.0	yes	N/A	47.4	6	4	47.4	6	4	0.0	yes	N/A
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.2	3	4	47.2	3	4	0.0	yes	N/A	47.6	7	6	47.6	7	6	0.0	yes	N/A
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	43.4	6	5	43.4	6	5	0.0	yes	N/A	43.9	10	5	43.9	10	5	0.0	yes	N/A
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.2	10	0	43.2	10	0	0.0	yes	N/A	43.5	11	0	43.5	11	0	0.0	yes	N/A
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.8	4	0	47.8	4	0	0.0	yes	N/A	48.0	5	0	48.0	5	0	0.0	yes	N/A
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	40.9	3	1	40.8	3	3	0.0	yes	N/A	41.7	3	1	41.6	3	1	0.0	yes	N/A
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	40.9	38	3	40.8	38	4	-0.1	yes	N/A	41.7	41	4	41.6	40	4	0.0	yes	N/A
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0	yes	N/A
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0	yes	N/A
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0	yes	N/A
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	40.6	96	1	40.6	38	1	-0.1	yes	N/A	41.3	290	1	41.3	40	1	0.0	yes	N/A
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	40.5	37	2	40.5	37	1	0.0	yes	N/A	41.3	41	2	41.3	41	1	0.0	no	0.2
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	41.9	0	0	41.9	0	0	0.0	yes	N/A	42.7	0	0	42.7	0	0	0.0	yes	N/A
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	40.5	2	3	40.5	2	2	0.0	yes	N/A	41.3	2	3	41.3	2	2	0.0	yes	N/A
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	40.5	39	0	40.5	39	1	0.0	yes	N/A	41.2	41	0	41.3	41	1	0.1	yes	N/A
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.2	1	1	41.2	1	1	0.0	yes	N/A	41.3	2	2	41.3	2	2	0.0	yes	N/A
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.4	0	1	43.4	0	1	0.0	yes	N/A	43.5	0	1	43.5	0	1	0.0	yes	N/A
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.0	1	4	43.0	1	4	0.0	yes	N/A	43.1	1	3	43.1	1	3	0.0	yes	N/A
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.0	0	2	43.0	0	8	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0	yes	N/A
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	40.5	41	2	40.5	41	2	0.0	yes	N/A	41.2	42	2	41.3	43	2	0.1	yes	N/A
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	40.3	73	1	40.4	73	1	0.0	yes	N/A	41.1	127	1	41.2	74	1	0.1	yes	N/A
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	40.3	40	6	40.4	40	6	0.0	yes	N/A	41.1	42	6	41.2	42	6	0.1	yes	N/A
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	39.2	40	1	39.2	40	1	0.0	yes	N/A	39.7	42	1	39.8	41	1	0.0	yes	N/A
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	39.2	40	6	39.2	40	6	0.0	yes	N/A	39.7	42	6	39.8	42	6	0.0	yes	N/A
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.1	40	2	38.1	40	2	0.0	yes	N/A	38.3	42	2	38.3	42	2	0.0	yes	N/A
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.1	40	9	38.1	40	9	0.0	yes	N/A	38.3	42	9	38.3	42	9	0.0	yes	N/A
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	39.8	12	4	39.8	12	4	0.0	yes	N/A	40.3	20	6	40.3	20	6	0.0	yes	N/A
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	36.8	7	2	36.8	8	2	0.0	no	0.3	37.1	7	2	37.1	8	3	0.0	no	0.5
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.6	7	2	36.5	8	2	-0.1	yes	N/A	36.7	7	2	36.6	8	3	-0.1	yes	N/A
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	35.9	7	2	35.6	8	2	-0.3	yes	N/A	35.9	7	2	35.7	8	3	-0.3	yes	N/A
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.3	46	0	34.3	47	0	0.0	yes	N/A	34.5	48	0	34.5	49	0	0.0	yes	N/A
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.2	46	2	34.3	47	1	0.1	yes	N/A	34.4	49	0	34.4	50	1	0.1	yes	N/A
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.2	47	7	34.3	48	8	0.1	yes	N/A	34.4	50	8	34.4	51	8	0.1	yes	N/A
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	31.7	47	1	31.7	48	1	0.0	yes	N/A	32.3	50	1	32.3	51	1	0.0	yes	N/A
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.3	2	4	36.3	2	4	0.0	no	0.1	36.5	3	6	36.5	2	5	0.0	no	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	31.9	8	0	31.9	8	0	0.0	yes	N/A	32.4	16	0	32.3	15	0	0.0	yes	N/A
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	31.7	7	0	31.7	6	0	0.0	yes	N/A	32.3	16	0	32.3	16	0	0.0	yes	N/A
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	31.5	52	1	31.5	53	1	0.0	yes	N/A	32.2	66	1	32.2	66	1	0.0	yes	N/A
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	31.5	55	1	31.5	56	1	0.0	yes	N/A	32.2	74	1	32.2	75	1	0.0	yes	N/A
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	31.4	56	2	31.4	57	2	0.0	yes	N/A	32.2	76	2	32.2	77	2	0.0	yes	N/A
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	31.4	69	0	31.4	69	0	0.0	yes	N/A	32.1	90	0	32.1	90	0	0.0	yes	N/A
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	31.4	7	2	31.4	7	1	0.0	yes	N/A	32.2	13	3	32.2	13	3	0.0	yes	N/A

Table A-1
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	31.4	70	1	31.4	70	1	0.0	yes	N/A	32.1	93	1	32.1	92	1	0.0	yes	N/A
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	31.4	70	1	31.4	70	1	0.0	yes	N/A	32.1	94	1	32.1	94	1	0.0	yes	N/A
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	31.4	92	2	31.4	91	2	0.0	yes	N/A	32.1	122	2	32.1	122	2	0.0	yes	N/A
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	47.3	0	2	47.3	0	2	0.0	yes	N/A	48.2	0	2	48.2	0	2	0.0	yes	N/A
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.5	2	0	49.5	2	0	0.0	yes	N/A	49.5	2	0	49.5	2	0	0.0	yes	N/A
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	43.6	0	2	43.6	0	2	0.0	yes	N/A	43.9	1	2	43.9	1	2	0.0	yes	N/A
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	42.4	16	8	42.4	16	8	0.0	yes	N/A	43.9	25	10	43.9	25	10	0.0	no	0.2
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.6	6	4	40.6	6	4	0.0	yes	N/A	40.8	9	6	40.8	9	6	0.0	yes	N/A
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	5	39.9	4	5	0.0	yes	N/A	40.3	7	6	40.3	7	6	0.0	yes	N/A
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	33.5	10	6	33.5	10	6	0.0	yes	N/A	33.8	11	6	33.8	11	6	0.0	yes	N/A
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	31.4	23	1	31.4	23	1	0.0	yes	N/A	32.2	34	1	32.2	34	1	0.0	yes	N/A
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	31.4	17	1	31.4	17	1	0.0	yes	N/A	32.2	34	1	32.2	34	1	0.0	yes	N/A
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	33.4	20	6	33.4	20	6	0.0	yes	N/A	33.8	15	5	33.8	15	5	0.0	yes	N/A
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	32.9	32	0	32.9	30	0	0.0	yes	N/A	33.7	111	0	33.7	111	0	0.0	yes	N/A
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	32.9	36	10	32.9	36	10	0.0	yes	N/A	33.7	38	12	33.7	38	12	0.0	yes	N/A
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	31.4	31	0	31.4	32	0	0.0	yes	N/A	32.1	37	0	32.1	37	0	0.0	yes	N/A
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	31.4	29	1	31.4	29	1	0.0	yes	N/A	32.1	36	1	32.1	36	1	0.0	yes	N/A
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.4	0	0	45.4	0	0	0.0	yes	N/A	45.8	1	0	45.8	1	0	0.0	yes	N/A
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.1	3	2	38.1	3	2	0.0	yes	N/A	38.4	4	3	38.4	4	3	0.0	yes	N/A
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	5	39.8	2	5	0.0	yes	N/A	40.1	4	6	40.1	4	6	0.0	yes	N/A
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.5	3	2	37.5	3	2	0.0	yes	N/A	37.7	4	3	37.7	4	3	0.0	yes	N/A
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.4	3	3	37.4	3	3	0.0	yes	N/A	37.5	4	3	37.5	4	3	0.0	yes	N/A
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	33.7	3	3	33.7	3	3	0.0	yes	N/A	33.9	4	3	33.9	4	3	0.0	yes	N/A
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	33.1	2	1	33.1	2	1	0.0	yes	N/A	33.5	5	2	33.5	5	2	0.0	yes	N/A
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	31.4	4	0	31.4	4	0	0.0	yes	N/A	32.1	26	0	32.1	27	0	0.0	yes	N/A
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	31.3	24	13	31.3	24	13	0.0	yes	N/A	32.1	29	3	32.1	29	3	0.0	no	0.8
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	31.4	5	0	31.4	5	0	0.0	no	0.1	32.1	5	0	32.1	5	0	0.0	no	0.8
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	31.3	47	2	31.3	47	2	0.0	yes	N/A	32.1	36	2	32.1	36	2	0.0	yes	N/A
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	31.3	46	0	31.3	46	0	0.0	yes	N/A	32.1	37	0	32.1	37	0	0.0	yes	N/A
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	31.3	45	0	31.3	44	0	0.0	yes	N/A	32.1	37	0	32.1	37	0	0.0	yes	N/A
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.1	0	0	51.1	0	0	0.0	no	0.1	51.4	0	0	51.4	0	0	0.0	no	0.4
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	34.7	0	0	34.7	0	0	0.0	yes	N/A	34.9	0	0	34.9	0	0	0.0	yes	N/A
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.1	1	2	47.1	1	2	0.0	yes	N/A	47.2	1	2	47.2	1	2	0.0	yes	N/A
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.9	15	4	38.9	15	4	0.0	yes	N/A	39.3	23	5	39.3	23	5	0.0	yes	N/A
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	34.6	15	2	34.6	15	2	0.0	yes	N/A	34.8	23	2	34.8	23	2	0.0	yes	N/A
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.3	4	0	46.3	4	0	0.0	yes	N/A	46.5	8	7	46.5	8	7	0.0	yes	N/A
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.2	4	4	45.2	4	4	0.0	yes	N/A	45.7	8	5	45.7	8	5	0.0	yes	N/A
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	34.6	4	2	34.6	4	2	0.0	yes	N/A	34.8	8	2	34.8	8	2	0.0	yes	N/A
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	33.4	16	1	33.4	16	1	0.0	yes	N/A	33.8	22	2	33.8	22	2	0.0	yes	N/A
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	34.7	15	3	34.7	15	3	0.0	yes	N/A	34.9	21	3	34.9	21	3	0.0	yes	N/A
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	31.3	32	0	31.3	32	0	0.0	yes	N/A	32.1	53	0	32.1	53	0	0.0	yes	N/A
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	31.3	106	1	31.3	106	1	0.0	yes	N/A	32.1	154	1	32.1	154	1	0.0	yes	N/A
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	31.3	103	1	31.3	104	1	0.0	yes	N/A	32.1	149	1	32.1	149	1	0.0	yes	N/A
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	32.2	3	1	32.2	3	1	0.0	yes	N/A	32.8	4	1	32.8	4	1	0.0	yes	N/A
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	32.1	13	4	32.1	13	4	0.0	yes	N/A	32.6	16	5	32.6	16	5	0.0	yes	N/A
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	31.3	106	0	31.3	106	0	0.0	yes	N/A	32.1	162	0	32.1	162	0	0.0	no	0.4
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	31.3	143	1	31.3	142	1	0.0	yes	N/A	32.1	161	1	32.1	161	1	0.0	no	0.1
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	31.3	142	1	31.3	141	1	0.0	yes	N/A	32.1	155	1	32.1	154	1	0.0	yes	N/A
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	31.3	126	0	31.3	125	0	0.0	yes	N/A	32.1	137	0	32.1	137	0	0.0	yes	N/A

Indicates LOS deficiency

Table A-1
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.3	5	4	68.3	5	4	0.0	no	0.3	70.0	5	4	70.0	5	4	0.0
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	67.9	4	3	67.9	4	3	0.0	yes	N/A	69.5	4	4	69.5	4	4	0.0
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	66.9	7	6	66.9	7	6	0.0	yes	N/A	68.3	7	6	68.3	7	6	0.0
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	71.7	1	0	71.7	1	0	0.0	yes	N/A	72.1	6	5	72.1	6	5	0.0
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	62.5	4	3	62.5	4	3	0.0	yes	N/A	63.1	5	4	63.1	5	4	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.3	9	8	62.3	9	8	0.0	yes	N/A	62.9	10	8	62.9	10	8	0.0
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	55.8	4	6	55.8	4	6	0.0	yes	N/A	56.4	5	6	56.4	5	6	0.0
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	62.3	0	0	62.3	0	0	0.0	yes	N/A	63.1	1	0	63.1	1	0	0.0
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	52.0	9	0	52.0	9	0	0.0	yes	N/A	52.1	14	4	52.1	14	4	0.0
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.1	21	2	51.1	21	2	0.0	no	0.1	51.6	27	2	51.6	27	2	0.0
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	64.0	7	9	64.0	7	9	0.0	no	0.0	64.1	8	11	64.1	8	11	0.0
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	53.9	1	2	53.9	1	2	0.0	yes	N/A	54.3	3	2	54.3	3	2	0.0
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.6	3	4	54.6	3	4	0.0	yes	N/A	55.3	4	5	55.3	4	5	0.0
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	55.3	8	5	55.3	8	5	0.0	no	1.2	55.6	9	6	55.6	9	6	0.0
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.3	4	4	54.3	4	4	0.0	yes	N/A	54.4	4	5	54.4	4	5	0.0
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.9	1	1	52.9	1	1	0.0	yes	N/A	53.0	1	1	53.0	1	1	0.0
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.2	2	3	53.2	2	3	0.0	yes	N/A	53.3	2	3	53.3	2	3	0.0
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.7	3	1	52.7	3	1	0.0	yes	N/A	52.9	5	1	52.9	5	1	0.0
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.7	16	5	52.7	16	5	0.0	no	0.2	52.9	15	5	52.9	15	5	0.0
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.6	10	4	51.6	10	4	0.0	no	0.5	51.7	11	4	51.7	11	4	0.0
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	15	4	51.4	15	4	0.0	yes	N/A	51.6	15	4	51.6	15	4	0.0
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.0	10	3	51.0	10	3	0.0	yes	N/A	51.3	9	3	51.3	9	3	0.0
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	50.9	11	3	50.9	11	3	0.0	yes	N/A	51.2	14	3	51.2	14	3	0.0
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	17	3	50.6	17	3	0.0	no	0.6	51.0	21	4	51.0	21	4	0.0
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	17	3	50.0	17	3	0.0	no	0.0	50.6	21	4	50.6	21	4	0.0
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.6	17	3	49.6	17	3	0.0	yes	N/A	50.3	21	4	50.3	21	4	0.0
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.2	23	5	49.2	23	5	0.0	yes	N/A	50.2	24	5	50.2	24	5	0.0
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.3	9	5	49.3	9	5	0.0	no	1.1	50.4	13	5	50.4	13	5	0.0
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	23	5	48.0	23	5	0.0	yes	N/A	48.9	24	5	48.9	24	5	0.0
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	24	5	46.5	24	5	0.0	yes	N/A	47.1	24	5	47.1	24	5	0.0
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	23	5	45.0	23	5	0.0	yes	N/A	45.4	24	5	45.4	24	5	0.0
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	53.0	9	5	53.0	9	5	0.0	no	0.0	53.3	9	5	53.3	9	5	0.0
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	53.0	1	2	53.0	1	2	0.0	no	0.0	53.3	2	2	53.3	2	2	0.0
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.7	2	3	52.7	2	3	0.0	yes	N/A	52.8	2	3	52.8	2	3	0.0
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	52.2	18	0	52.2	18	0	0.0	no	0.2	52.7	23	0	52.7	23	0	0.0
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	52.2	19	11	52.2	19	11	0.0	yes	N/A	52.7	19	11	52.7	19	11	0.0
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	49.3	19	0	49.3	19	0	0.0	yes	N/A	50.0	20	2	50.0	20	2	0.0
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	49.3	25	0	49.3	25	0	0.0	yes	N/A	50.0	26	0	50.0	26	0	0.0
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	49.3	30	8	49.3	30	8	0.0	yes	N/A	50.0	37	9	50.0	37	9	0.0
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	1	50.2	3	2	0.0
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	49.4	2	1	49.4	3	1	0.0	yes	N/A	50.3	8	2	50.2	3	1	0.1
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	2	50.2	3	2	0.0
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	49.4	4	1	49.4	4	1	0.0	yes	N/A	50.1	7	2	50.2	7	2	-0.1
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	49.4	8	2	49.4	8	2	0.0	yes	N/A	50.2	10	2	50.2	10	2	0.0
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	51.6	4	4	51.6	4	4	0.0	yes	N/A	52.6	5	4	52.6	5	4	0.0
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	50.6	5	5	50.6	5	5	0.0	yes	N/A	52.0	8	7	52.0	8	7	0.0
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	49.1	8	4	49.1	8	4	0.0	yes	N/A	49.5	12	5	49.5	12	5	0.0
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.5	1	1	47.5	1	1	0.0	yes	N/A	47.7	1	1	47.7	1	1	0.0
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	46.2	38	0	46.2	38	0	0.0	yes	N/A	46.3	49	0	46.4	49	0	0.0
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	42.3	46	0	42.3	46	0	-0.1	yes	N/A	43.2	57	0	43.2	58	0	0.0
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.5	0	1	47.5	0	1	0.0	yes	N/A	47.7	0	1	47.7	0	1	0.0
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.3	0	2	50.3	0	2	0.0	yes	N/A	50.4	0	2	50.4	0	2	0.0

Table A-1
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	48.2	0	1	48.2	0	1	0.0	yes	N/A	49.2	0	1	49.2	0	1	0.0
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	48.2	2	2	48.2	2	2	0.0	yes	N/A	49.2	3	3	49.2	3	3	0.0
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	48.2	19	6	48.2	19	6	0.0	yes	N/A	49.2	24	8	49.2	24	8	0.0
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.9	19	2	46.9	19	2	0.0	yes	N/A	47.3	29	2	47.3	29	2	0.0
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.9	19	5	46.9	19	5	0.0	yes	N/A	47.3	29	6	47.3	29	6	0.0
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	46.0	20	3	45.9	20	3	0.0	yes	N/A	46.2	29	3	46.2	29	3	0.0
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	46.0	24	7	45.9	23	8	0.0	yes	N/A	46.2	23	7	46.2	23	7	0.0
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.8	42	2	43.8	42	2	0.0	yes	N/A	44.0	53	2	44.0	53	2	0.0
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.1	12	4	44.1	12	4	0.0	no	0.0	44.3	13	4	44.3	12	4	0.0
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	42.3	64	0	42.3	64	0	-0.1	yes	N/A	43.2	76	0	43.2	76	0	0.0
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.9	11	5	47.9	11	5	0.0	yes	N/A	48.7	18	6	48.7	18	6	0.0
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	48.1	12	10	48.1	12	10	0.0	yes	N/A	48.7	14	12	48.7	14	12	0.0
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.2	17	6	44.2	17	6	0.0	yes	N/A	44.8	25	8	44.8	26	8	0.0
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.8	17	0	43.8	17	0	0.0	yes	N/A	44.0	26	0	44.0	26	0	0.0
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	48.3	6	0	48.3	6	0	0.0	yes	N/A	48.8	7	0	48.8	7	0	0.0
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	42.3	3	1	42.3	3	1	-0.1	no	0.2	43.2	3	1	43.2	3	1	0.0
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	42.3	48	4	42.3	49	5	-0.1	yes	N/A	43.2	65	4	43.2	66	5	0.0
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	41.7	295	1	41.7	116	1	0.0	yes	N/A	42.1	284	1	42.1	709	3	0.0
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	41.7	49	2	41.7	50	1	0.0	no	0.6	42.0	67	2	42.1	69	1	0.0
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	0	43.0	0	0	0.0	yes	N/A	43.1	0	0	43.1	0	0	0.0
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	41.7	2	3	41.7	2	2	0.0	yes	N/A	42.0	1	2	42.1	1	2	0.0
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	41.6	50	0	41.7	52	1	0.0	yes	N/A	42.0	69	0	42.0	71	1	0.0
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.7	3	2	41.7	3	2	0.0	yes	N/A	42.0	5	2	42.1	5	2	0.0
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.6	0	1	43.6	0	1	0.0	yes	N/A	43.7	0	1	43.7	0	1	0.0
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	4	43.1	1	4	0.0	yes	N/A	43.1	2	3	43.1	2	3	0.0
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	2	43.1	0	2	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	41.6	51	3	41.7	52	3	0.0	yes	N/A	42.0	70	4	42.0	71	4	0.0
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	41.4	149	1	41.4	149	1	0.0	yes	N/A	41.6	149	1	41.6	149	1	0.0
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	41.4	42	6	41.4	42	6	0.0	no	0.2	41.6	42	6	41.6	42	6	0.0
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.2	110	1	40.2	110	1	0.0	no	0.1	40.3	110	1	40.3	110	1	0.0
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.2	44	6	40.2	44	6	0.0	no	0.1	40.3	44	6	40.3	44	6	0.0
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.5	44	2	38.6	44	2	0.0	yes	N/A	38.8	47	2	38.8	47	2	0.0
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.5	44	9	38.6	45	9	0.0	yes	N/A	38.8	47	10	38.8	47	10	0.0
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	41.3	23	7	41.3	23	7	0.0	yes	N/A	43.1	28	9	43.1	28	9	0.0
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	2	37.2	8	3	0.0	no	0.6	37.3	7	2	37.3	8	3	0.0
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.7	7	2	36.6	8	3	-0.1	yes	N/A	36.8	7	2	36.8	8	3	0.0
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.0	7	2	35.8	8	3	-0.2	yes	N/A	36.2	7	2	36.1	8	2	0.1
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.6	51	0	34.6	52	0	0.0	yes	N/A	35.4	53	0	35.4	53	0	0.0
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.6	51	2	34.6	52	0	0.0	yes	N/A	35.4	56	2	35.4	56	1	0.0
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.6	53	8	34.6	54	8	0.0	yes	N/A	35.4	60	9	35.4	60	9	0.0
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.0	54	1	33.0	54	1	0.0	yes	N/A	33.9	61	1	33.9	61	1	0.0
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.6	3	6	36.5	3	6	0.0	no	0.3	36.8	3	6	36.8	3	6	0.0
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.0	28	0	33.0	20	0	0.0	yes	N/A	33.9	47	0	33.9	48	0	0.0
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.0	22	0	33.0	21	0	0.0	no	0.5	33.9	30	0	33.9	29	0	0.0
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.0	75	1	33.0	74	1	0.0	no	0.5	33.9	90	1	33.9	90	1	0.0
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.0	90	1	33.0	90	1	0.0	no	0.3	33.9	109	1	33.9	109	1	0.0
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.0	93	2	33.0	92	2	0.0	no	0.5	33.9	111	2	33.9	110	2	0.0
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.0	117	0	33.0	117	0	0.0	no	0.5	33.9	121	0	33.9	121	0	0.0
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.0	16	3	33.0	16	3	0.0	no	0.5	33.9	21	4	33.9	21	4	0.0

Table A-1
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.0	119	1	33.0	119	1	0.0	yes	N/A	33.9	130	1	33.9	130	1	0.0
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.0	114	2	33.0	114	2	0.0	yes	N/A	33.9	120	2	33.9	120	2	0.0
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	32.9	143	2	32.9	143	2	0.0	yes	N/A	33.8	177	2	33.8	177	2	0.0
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.5	2	3	48.5	2	3	0.0	yes	N/A	49.1	10	6	49.1	10	6	0.0
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.6	3	0	49.6	3	0	0.0	no	0.0	49.6	3	0	49.6	3	0	0.0
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.1	2	4	44.1	2	4	0.0	yes	N/A	46.4	10	6	46.4	10	6	0.0
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.1	26	11	44.1	26	11	0.0	no	0.4	44.3	27	11	44.3	27	11	0.0
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	41.0	12	7	41.0	12	7	0.0	yes	N/A	41.5	14	8	41.5	14	8	0.0
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	40.6	10	7	40.6	10	7	0.0	yes	N/A	41.1	16	9	41.1	16	9	0.0
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	6	34.1	11	6	0.0	no	0.1	34.5	11	6	34.5	11	6	0.0
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.0	61	1	33.0	61	1	0.0	yes	N/A	33.9	117	1	33.9	117	1	0.0
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.0	51	1	33.0	51	1	0.0	no	0.5	33.9	44	1	33.9	45	1	0.0
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.1	15	5	34.1	15	5	0.0	yes	N/A	34.3	17	5	34.3	17	5	0.0
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.1	146	0	34.1	133	0	0.0	yes	N/A	34.3	129	0	34.3	129	0	0.0
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.1	40	12	34.1	40	12	0.0	yes	N/A	34.3	34	11	34.3	34	11	0.0
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.0	45	0	33.0	45	0	0.0	yes	N/A	33.9	66	0	33.9	66	0	0.0
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	32.9	43	1	32.9	43	1	0.0	yes	N/A	33.8	60	1	33.8	60	1	0.0
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	46.0	3	0	46.0	3	0	0.0	yes	N/A	46.2	10	6	46.2	10	6	0.0
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	39.3	8	5	39.3	8	5	0.0	yes	N/A	42.8	17	9	42.8	17	9	0.0
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	40.3	5	7	40.3	5	7	0.0	yes	N/A	43.3	9	7	43.3	9	7	0.0
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	38.3	8	3	38.3	8	3	0.0	yes	N/A	39.8	19	5	39.8	19	5	0.0
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	38.0	8	4	38.0	8	4	0.0	yes	N/A	38.7	31	7	38.7	31	7	0.0
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.3	8	4	34.3	8	4	0.0	yes	N/A	35.6	18	5	35.6	18	5	0.0
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.1	10	3	34.1	10	3	0.0	yes	N/A	35.3	18	6	35.3	18	6	0.0
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	32.9	24	0	32.9	19	0	0.0	no	0.4	33.9	24	0	33.9	17	0	0.0
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	32.9	32	3	32.9	32	3	0.0	no	1.6	33.8	56	3	33.8	56	3	0.0
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	32.9	5	0	32.9	5	0	0.0	no	1.6	33.8	4	0	33.9	4	0	0.0
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	32.9	48	2	32.9	48	2	0.0	yes	N/A	33.8	73	2	33.8	74	2	0.0
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	32.9	46	0	32.9	46	0	0.0	yes	N/A	33.7	74	0	33.7	74	67	0.0
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	32.9	46	0	32.9	46	0	0.0	yes	N/A	33.7	74	0	33.7	74	0	0.0
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.6	0	0	51.6	0	0	0.0	no	0.6	51.9	9	0	51.9	9	0	0.0
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	0	35.1	0	0	0.0	yes	N/A	35.5	14	2	35.5	14	2	0.0
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.9	7	4	47.9	7	4	0.0	yes	N/A	50.5	23	8	50.5	23	8	0.0
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	40.0	34	7	40.0	34	7	0.0	yes	N/A	42.0	48	10	42.0	48	10	0.0
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	34	2	35.1	34	2	0.0	yes	N/A	35.5	48	3	35.5	48	3	0.0
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.9	9	7	46.9	9	7	0.0	yes	N/A	47.1	9	7	47.1	9	7	0.0
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.8	9	6	45.8	9	6	0.0	yes	N/A	46.7	15	8	46.7	15	8	0.0
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	9	2	35.1	9	2	0.0	yes	N/A	35.5	15	2	35.5	15	2	0.0
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.1	30	2	34.1	30	2	0.0	yes	N/A	34.3	52	2	34.3	52	2	0.0
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	26	3	35.1	26	3	0.0	yes	N/A	35.5	35	3	35.5	35	3	0.0
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	32.9	72	0	32.9	72	0	0.0	yes	N/A	33.7	103	0	33.7	103	0	0.0
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	32.9	208	1	32.9	207	1	0.0	yes	N/A	33.7	256	1	33.7	255	1	0.0
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	32.9	194	1	32.9	194	1	0.0	yes	N/A	33.7	227	1	33.7	227	1	0.0
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	33.5	4	1	33.5	4	1	0.0	yes	N/A	34.9	6	2	34.9	6	2	0.0
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	33.4	17	5	33.4	17	5	0.0	yes	N/A	34.8	17	5	34.8	17	5	0.0
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	32.9	203	0	32.9	203	0	0.0	no	1.2	33.7	226	0	33.7	226	0	0.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	32.9	165	1	32.9	165	1	0.0	no	0.9	33.7	258	1	33.7	260	1	0.0
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	32.9	157	1	32.9	157	1	0.0	yes	N/A	33.6	260	1	33.6	262	1	0.0
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	32.9	143	0	32.9	143	0	0.0	no	0.1	33.6	263	0	33.6	264	0	0.0

Indicates LOS deficiency

Table A-2
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.6	4	68.6	4	0.0	0.6
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	68.2	4	68.2	4	0.0	0.2
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	67.2	7	67.2	7	0.0	no flooding
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	72.0	4	72.0	4	0.0	no flooding
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	63.0	4	63.0	4	0.0	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.8	10	62.8	10	0.0	no flooding
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	56.5	5	56.5	5	0.0	0.5
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	63.4	3	63.4	3	0.0	no flooding
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.9	7	51.9	7	0.0	no flooding
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.3	24	51.3	24	0.0	0.3
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.8	2	63.8	2	0.0	no flooding
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	54.7	6	54.7	6	0.0	no flooding
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.8	1	54.8	1	0.0	no flooding
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.7	3	54.7	3	0.0	0.6
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.7	7	54.7	7	0.0	no flooding
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.7	0	52.7	0	0.0	no flooding
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.0	1	53.0	1	0.0	no flooding
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.4	1	52.4	1	0.0	no flooding
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.4	11	52.4	11	0.0	no flooding
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.5	10	51.5	10	0.0	0.5
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	12	51.4	12	0.0	no flooding
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.1	10	51.1	10	0.0	no flooding
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	51.0	13	51.0	13	0.0	no flooding
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	21	50.6	21	0.0	0.6
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	21	50.0	21	0.0	0.0
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.5	27	49.5	28	0.0	no flooding
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.1	22	49.1	22	0.0	no flooding
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.2	8	49.2	8	0.0	1.0
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	22	48.0	22	0.0	no flooding
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	25	46.5	25	0.0	no flooding
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	22	45.0	22	0.0	no flooding
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	51.6	6	51.6	6	0.0	no flooding
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.5	0	52.5	0	0.0	no flooding
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	52.6	1	0.0	no flooding
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.1	7	51.1	7	0.0	no flooding
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.1	13	51.1	13	0.0	no flooding
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	14	48.6	14	0.0	no flooding
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.4	25	48.4	25	0.0	no flooding
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.4	19	48.4	19	0.0	no flooding
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.4	4	48.4	4	0.0	no flooding
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.4	1	48.4	1	0.0	no flooding
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.4	1	48.4	1	0.0	no flooding
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.4	4	48.4	4	0.0	no flooding
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.4	7	48.4	7	0.0	no flooding
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.6	2	49.6	2	0.0	no flooding
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.5	2	49.5	2	0.0	no flooding
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.5	3	48.5	3	0.0	no flooding

Table A-2
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	46.9	0	46.9	0	0.0	no flooding
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.6	23	45.6	23	0.0	no flooding
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	43.6	24	43.5	24	-0.1	no flooding
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	46.9	0	46.9	0	0.0	no flooding
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	50.2	0	0.0	no flooding
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	46.9	0	46.9	0	0.0	no flooding
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	46.9	0	46.9	0	0.0	no flooding
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	46.9	11	46.9	11	0.0	no flooding
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.4	11	46.4	11	0.0	no flooding
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.4	11	46.4	11	0.0	no flooding
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.3	17	45.3	17	0.0	no flooding
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.3	19	45.3	19	0.0	no flooding
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.9	38	43.9	38	0.0	no flooding
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.0	5	43.9	5	0.0	no flooding
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	43.6	58	43.5	59	-0.1	no flooding
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	48.0	12	48.0	12	0.0	no flooding
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.6	7	47.6	7	0.0	no flooding
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.5	22	44.5	22	0.0	no flooding
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.9	21	43.9	21	0.0	no flooding
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.5	2	47.5	2	0.0	no flooding
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	43.6	5	43.5	5	-0.1	1.4
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	43.6	69	43.5	70	-0.1	1.0
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	37.4	0	0.0	no flooding
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	36.9	0	0.0	no flooding
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	36.8	0	0.0	no flooding
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	42.4	305	42.3	675	0.0	no flooding
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	42.3	70	42.3	79	0.0	1.2
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	43.0	0	0.0	no flooding
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	42.3	2	42.3	2	0.0	no flooding
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	42.3	74	42.3	74	0.0	0.3
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	42.3	1	42.3	1	0.0	no flooding
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.3	0	43.3	0	0.0	no flooding
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	43.1	1	0.0	no flooding
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	43.1	0	0.0	no flooding
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	42.3	83	42.3	83	0.0	0.3
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	41.8	39	41.8	39	0.0	no flooding
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	41.8	48	41.8	48	0.0	0.6
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.5	29	40.5	29	0.0	0.4
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.5	46	40.5	46	0.0	0.4
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	39.0	42	39.0	42	0.0	no flooding
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	39.0	48	39.0	49	0.0	no flooding
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	40.3	19	40.3	19	0.0	no flooding
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	37.1	8	0.0	0.6
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.8	7	36.8	8	0.0	no flooding
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.2	7	36.1	8	-0.1	no flooding
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	35.4	55	35.4	55	0.0	no flooding
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	35.4	56	35.4	57	0.0	no flooding

Table A-2
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	35.4	57	35.4	57	0.0	0.2
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.9	59	33.9	59	0.0	no flooding
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.8	3	36.8	3	0.0	0.6
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.9	50	33.9	51	0.0	no flooding
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.9	23	33.9	23	0.0	1.4
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.9	79	33.9	79	0.0	1.4
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.9	104	33.9	105	0.0	1.2
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.9	100	33.9	101	0.0	1.4
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.9	95	33.9	95	0.0	1.4
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.9	14	33.9	14	0.0	1.4
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.9	96	33.9	96	0.0	0.4
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.9	93	33.9	98	0.0	0.8
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	33.8	117	33.8	117	0.0	no flooding
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.7	4	48.7	4	0.0	no flooding
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.3	1	49.3	1	0.0	no flooding
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.4	4	44.4	4	0.0	no flooding
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.0	26	44.0	26	0.0	0.3
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.4	4	40.4	4	0.0	no flooding
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	39.9	4	0.0	no flooding
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	34.1	11	0.0	0.1
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.9	58	33.9	58	0.0	0.4
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.9	39	33.9	39	0.0	1.4
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.3	18	34.3	18	0.0	no flooding
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.3	19	34.4	20	0.0	no flooding
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.3	26	34.4	26	0.0	no flooding
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.9	27	33.9	27	0.0	no flooding
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	33.8	32	33.8	32	0.0	no flooding
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.9	2	45.9	2	0.0	no flooding
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.3	4	38.3	4	0.0	no flooding
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	39.8	2	0.0	no flooding
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.8	4	37.8	4	0.0	no flooding
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.6	4	37.6	4	0.0	no flooding
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.4	4	34.4	4	0.0	no flooding
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.3	7	34.3	7	0.0	no flooding
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	33.8	74	33.8	74	0.0	1.3
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	33.8	55	33.8	55	0.0	2.5
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	33.8	3	33.8	3	0.0	2.5
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	33.8	60	33.8	60	0.0	no flooding
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	33.7	58	33.7	58	0.0	no flooding
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	33.7	238	33.7	238	0.0	no flooding
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.5	0	51.5	0	0.0	0.5
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	35.1	0	0.0	no flooding
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.0	0	47.0	0	0.0	no flooding
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.8	16	38.8	16	0.0	no flooding
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	16	35.1	16	0.0	no flooding
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	47.1	8	47.1	8	0.0	0.1
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	46.2	12	46.2	12	0.0	no flooding

Table A-2

SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support

Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 1

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	12	35.1	12	0.0	no flooding
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.3	28	34.3	28	0.0	no flooding
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	11	35.1	11	0.0	no flooding
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	33.7	55	33.7	55	0.0	no flooding
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	33.7	164	33.7	164	0.0	no flooding
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	33.7	155	33.7	155	0.0	no flooding
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	34.4	5	34.4	5	0.0	no flooding
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	34.4	17	34.4	17	0.0	no flooding
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	33.7	328	33.7	328	0.0	2.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	33.7	175	33.7	176	0.0	1.7
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	33.7	217	33.7	218	0.0	0.7
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	33.7	213	33.7	214	0.0	0.9

Denotes 0.5 feet of flooding or greater

Table A-3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	66.8	1	0	66.8	1	0	0.0	yes	N/A	67.3	5	4	67.3	5	4	0.0	yes	N/A
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	66.6	1	0	66.6	1	0	0.0	yes	N/A	67.1	3	3	67.1	3	3	0.0	yes	N/A
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	61.7	2	3	61.7	2	3	0.0	yes	N/A	65.2	6	5	65.2	6	5	0.0	yes	N/A
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	70.3	0	0	70.3	0	0	0.0	yes	N/A	71.1	0	0	71.1	0	0	0.0	yes	N/A
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	61.6	0	0	61.6	0	0	0.0	yes	N/A	62.0	1	2	62.0	1	2	0.0	yes	N/A
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	58.7	2	3	58.7	2	3	0.0	yes	N/A	61.1	8	6	61.1	8	6	0.0	yes	N/A
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	53.8	1	0	53.8	1	0	0.0	yes	N/A	54.2	4	5	54.2	4	5	0.0	yes	N/A
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	61.0	0	0	61.0	0	0	0.0	yes	N/A	61.6	0	0	61.6	0	0	0.0	yes	N/A
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.8	4	0	51.8	4	0	0.0	yes	N/A	51.9	6	0	51.9	6	0	0.0	yes	N/A
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	49.6	6	1	49.6	6	1	0.0	yes	N/A	50.7	9	1	50.7	9	1	0.0	yes	N/A
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.9	3	0	63.9	3	0	0.0	yes	N/A	64.0	6	0	64.0	6	0	0.0	yes	N/A
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	52.8	0	0	52.8	0	0	0.0	yes	N/A	53.5	0	1	53.5	0	1	0.0	yes	N/A
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.3	2	4	54.3	2	4	0.0	yes	N/A
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.5	4	4	54.5	4	4	0.0	no	0.4	54.9	6	4	54.9	6	4	0.0	no	0.8
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.2	3	4	54.2	3	4	0.0	yes	N/A
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.8	0	1	52.8	0	1	0.0	yes	N/A	52.9	0	1	52.9	0	1	0.0	yes	N/A
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.1	1	2	53.1	1	2	0.0	yes	N/A	53.1	1	3	53.1	1	3	0.0	yes	N/A
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.2	2	1	52.2	2	1	0.0	yes	N/A	52.5	3	1	52.5	3	1	0.0	yes	N/A
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.2	7	0	52.2	7	0	0.0	yes	N/A	52.5	14	4	52.5	14	4	0.0	yes	N/A
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	49.9	8	4	49.9	8	4	0.0	yes	N/A	51.5	10	4	51.5	10	4	0.0	no	0.4
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	49.7	8	4	49.7	8	4	0.0	yes	N/A	51.1	10	4	51.1	10	4	0.0	yes	N/A
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	49.2	8	3	49.2	8	3	0.0	yes	N/A	50.5	10	3	50.5	10	3	0.0	yes	N/A
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	49.6	9	2	49.6	9	2	0.0	yes	N/A	50.6	12	3	50.6	12	3	0.0	yes	N/A
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	48.5	14	3	48.5	14	3	0.0	yes	N/A	49.6	16	3	49.6	16	3	0.0	yes	N/A
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	48.0	14	3	48.0	14	3	0.0	yes	N/A	49.1	16	3	49.1	16	3	0.0	yes	N/A
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	47.6	15	3	47.6	15	3	0.0	yes	N/A	48.6	16	3	48.6	16	3	0.0	yes	N/A
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	47.3	21	4	47.3	21	4	0.0	yes	N/A	48.3	22	4	48.3	22	4	0.0	yes	N/A
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	47.3	9	6	47.3	9	6	0.0	yes	N/A	48.3	9	6	48.3	9	6	0.0	no	0.1
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	46.4	21	4	46.4	21	4	0.0	yes	N/A	47.2	22	4	47.2	22	4	0.0	yes	N/A
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	45.2	24	5	45.3	24	5	0.0	yes	N/A	45.9	24	5	45.9	24	5	0.0	yes	N/A
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	44.1	22	4	44.1	22	4	0.0	yes	N/A	44.6	22	5	44.6	22	4	0.0	yes	N/A
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	52.4	8	5	52.4	8	5	0.0	yes	N/A	52.7	9	5	52.7	9	5	0.0	yes	N/A
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.6	1	2	52.6	1	2	0.0	yes	N/A	52.7	1	2	52.7	1	2	0.0	yes	N/A
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	3	52.6	1	3	0.0	yes	N/A	52.6	1	3	52.6	1	3	0.0	yes	N/A
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.5	10	0	51.5	10	0	0.0	yes	N/A	51.8	14	0	51.8	14	0	0.0	yes	N/A
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.5	14	8	51.5	14	8	0.0	yes	N/A	51.8	19	10	51.8	19	10	0.0	yes	N/A
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	15	0	48.6	15	0	0.0	yes	N/A	49.0	19	0	49.0	19	0	0.0	yes	N/A
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.5	25	0	48.5	25	0	0.0	yes	N/A	48.9	25	0	48.9	25	0	0.0	yes	N/A
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.5	21	7	48.5	21	7	0.0	yes	N/A	48.9	26	8	48.9	26	8	0.0	yes	N/A
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.5	1	3	48.5	1	3	0.0	yes	N/A	49.0	2	2	49.0	2	2	0.0	yes	N/A
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.5	2	1	48.5	2	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.5	1	1	48.5	1	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.5	2	2	48.5	2	2	0.0	yes	N/A	49.0	3	1	49.0	3	1	0.0	yes	N/A
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.5	6	2	48.5	6	2	0.0	yes	N/A	49.0	8	2	49.0	8	2	0.0	yes	N/A
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.9	2	2	49.9	2	2	0.0	yes	N/A	50.7	3	3	50.7	3	3	0.0	yes	N/A
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.7	3	3	49.7	3	3	0.0	yes	N/A	50.1	4	4	50.1	4	4	0.0	yes	N/A
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.7	4	4	48.7	4	4	0.0	yes	N/A	48.9	6	4	48.9	6	4	0.0	yes	N/A
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.8	25	0	45.8	25	0	0.0	yes	N/A	46.1	32	0	46.1	32	0	0.0	yes	N/A
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	40.9	26	0	40.6	26	0	-0.2	yes	N/A	41.7	36	0	41.2	36	0	-0.5	yes	N/A
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	1	50.2	0	1	0.0	yes	N/A	50.2	0	1	50.2	0	1	0.0	yes	N/A
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.5	0	1	47.5	0	1	0.0	yes	N/A

Table A-3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	47.0	1	2	47.0	1	2	0.0	yes	N/A	47.5	2	2	47.5	2	2	0.0	yes	N/A
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	47.0	12	4	47.0	12	4	0.0	yes	N/A	47.5	16	5	47.5	16	5	0.0	yes	N/A
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.5	12	2	46.5	12	2	0.0	yes	N/A	46.7	16	2	46.7	16	2	0.0	yes	N/A
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.5	12	4	46.5	12	4	0.0	yes	N/A	46.7	17	5	46.7	17	5	0.0	yes	N/A
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.4	18	3	45.4	18	3	0.0	yes	N/A	46.0	20	3	46.0	20	3	0.0	yes	N/A
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.4	12	5	45.4	12	5	0.0	yes	N/A	46.0	17	6	46.0	17	6	0.0	yes	N/A
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.2	31	2	43.2	31	2	0.0	yes	N/A	43.5	37	2	43.5	37	2	0.0	yes	N/A
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	43.2	6	2	43.2	6	2	0.0	yes	N/A	43.6	9	3	43.6	9	3	0.0	yes	N/A
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	40.9	42	0	40.6	42	0	-0.2	yes	N/A	41.7	53	0	41.2	53	0	-0.5	yes	N/A
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.1	3	3	47.1	3	3	0.0	yes	N/A	47.4	6	4	47.4	6	4	0.0	yes	N/A
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.2	3	4	47.2	3	4	0.0	yes	N/A	47.6	7	6	47.6	7	6	0.0	yes	N/A
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	43.4	6	5	43.4	6	5	0.0	yes	N/A	43.9	10	5	43.9	10	5	0.0	yes	N/A
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.2	10	0	43.2	10	0	0.0	yes	N/A	43.5	11	0	43.5	11	0	0.0	yes	N/A
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.8	4	0	47.8	4	0	0.0	yes	N/A	48.0	5	0	48.0	5	0	0.0	yes	N/A
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	40.9	3	1	40.6	3	1	-0.2	yes	N/A	41.7	3	1	41.2	3	1	-0.5	yes	N/A
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	40.9	38	3	40.6	51	4	-0.3	yes	N/A	41.7	41	4	41.2	64	4	-0.5	yes	N/A
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0	yes	N/A
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0	yes	N/A
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0	yes	N/A
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	40.6	96	1	40.1	51	1	-0.5	yes	N/A	41.3	290	1	40.3	64	1	-1.0	yes	N/A
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	40.5	37	2	38.9	52	3	-1.6	yes	N/A	41.3	41	2	39.6	65	3	-1.7	yes	N/A
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	41.9	0	0	41.8	0	0	-0.1	yes	N/A	42.7	0	0	42.7	0	0	-0.1	yes	N/A
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	40.5	2	3	38.9	2	2	-1.6	yes	N/A	41.3	2	3	39.6	2	3	-1.7	yes	N/A
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	40.5	39	0	38.5	55	0	-2.0	yes	N/A	41.2	41	0	39.3	69	0	-1.9	yes	N/A
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.2	1	1	41.2	1	1	0.0	yes	N/A	41.3	2	2	41.3	2	2	0.0	yes	N/A
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.4	0	1	43.4	0	1	0.0	yes	N/A	43.5	0	1	43.5	0	1	0.0	yes	N/A
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.0	1	4	43.0	1	4	0.0	yes	N/A	43.1	1	3	43.1	1	3	0.0	yes	N/A
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.0	0	2	43.0	0	2	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0	yes	N/A
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	40.5	41	2	38.5	55	3	-2.0	yes	N/A	41.2	42	2	39.3	72	4	-1.9	yes	N/A
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	40.3	73	1	38.3	55	0	-2.0	yes	N/A	41.1	127	1	39.0	70	0	-2.1	yes	N/A
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	40.3	40	6	38.3	56	5	-2.0	yes	N/A	41.1	42	6	39.0	70	6	-2.1	yes	N/A
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	39.2	40	1	37.8	56	0	-1.3	yes	N/A	39.7	42	1	38.4	70	0	-1.3	yes	N/A
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	39.2	40	6	37.8	56	7	-1.3	yes	N/A	39.7	42	6	38.4	70	7	-1.3	yes	N/A
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.1	40	2	36.8	56	1	-1.3	yes	N/A	38.3	42	2	37.2	70	1	-1.1	yes	N/A
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.1	40	9	36.8	56	7	-1.3	yes	N/A	38.3	42	9	37.2	70	7	-1.1	yes	N/A
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	39.8	12	4	39.8	12	4	0.0	yes	N/A	40.3	20	6	40.3	20	6	0.0	yes	N/A
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	36.8	7	2	36.8	6	2	0.0	no	0.3	37.1	7	2	37.1	6	2	0.0	no	0.6
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.6	7	2	36.6	6	2	0.1	yes	N/A	36.7	7	2	36.8	6	2	0.1	yes	N/A
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	35.9	7	2	36.0	6	2	0.1	yes	N/A	35.9	7	2	36.3	6	2	0.3	yes	N/A
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.3	46	0	34.1	61	0	-0.2	yes	N/A	34.5	48	0	34.5	76	0	0.0	yes	N/A
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.2	46	2	33.7	61	0	-0.5	yes	N/A	34.4	49	0	34.1	76	2	-0.3	yes	N/A
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.2	47	7	33.7	62	6	-0.5	yes	N/A	34.4	50	8	34.1	77	6	-0.3	yes	N/A
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	31.7	47	1	31.8	62	1	0.2	yes	N/A	32.3	50	1	32.4	77	1	0.2	yes	N/A
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.3	2	4	36.4	2	4	0.0	no	0.1	36.5	3	6	36.5	3	6	0.0	no	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	31.9	8	0	32.0	10	0	0.1	yes	N/A	32.4	16	0	32.6	16	0	0.2	yes	N/A
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	31.7	7	0	31.8	7	0	0.2	yes	N/A	32.3	16	0	32.4	17	0	0.2	yes	N/A
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	31.5	52	1	31.6	66	1	0.1	yes	N/A	32.2	66	1	32.3	91	1	0.1	yes	N/A
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	31.5	55	1	31.6	69	1	0.1	yes	N/A	32.2	74	1	32.3	97	1	0.1	yes	N/A
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	31.4	56	2	31.5	69	2	0.1	yes	N/A	32.2	76	2	32.2	97	2	0.1	yes	N/A
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	31.4	69	0	31.4	79	0	0.1	yes	N/A	32.1	90	0	32.2	112	0	0.1	yes	N/A
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	31.4	7	2	31.5	9	2	0.1	yes	N/A	32.2	13	3	32.2	16	3	0.1	yes	N/A
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	31.4	70	1	31.4	80	1	0.0	yes	N/A	32.1	93	1	32.2	110	1	0.1	yes	N/A
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	31.4	70	1	31.4	81	1	0.0	yes	N/A	32.1	94	1	32.2	107	2	0.1	yes	N/A

Table A-3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	31.4	92	2	31.4	100	2	0.0	yes	N/A	32.1	122	2	32.2	133	2	0.0	yes	N/A
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	47.3	0	2	47.3	0	2	0.0	yes	N/A	48.2	0	2	48.2	0	2	0.0	yes	N/A
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.5	2	0	49.5	2	0	0.0	yes	N/A	49.5	2	0	49.5	2	0	0.0	yes	N/A
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	43.6	0	2	43.6	0	2	0.0	yes	N/A	43.9	1	2	43.9	1	2	0.0	yes	N/A
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	42.4	16	8	42.4	16	8	0.0	yes	N/A	43.9	25	10	43.9	25	10	0.0	no	0.2
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.6	6	4	40.6	6	4	0.0	yes	N/A	40.8	9	6	40.8	9	6	0.0	yes	N/A
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	5	39.9	4	5	0.0	yes	N/A	40.3	7	6	40.3	7	6	0.0	yes	N/A
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	33.5	10	6	33.5	10	6	0.0	yes	N/A	33.8	11	6	33.8	11	6	0.0	yes	N/A
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	31.4	23	1	31.5	22	1	0.1	yes	N/A	32.2	34	1	32.2	34	1	0.1	yes	N/A
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	31.4	17	1	31.5	17	1	0.1	yes	N/A	32.2	34	1	32.2	34	1	0.1	yes	N/A
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	33.4	20	6	33.4	20	6	0.0	yes	N/A	33.8	15	5	33.9	15	5	0.1	yes	N/A
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	32.9	32	0	32.8	31	0	0.0	yes	N/A	33.7	111	0	33.8	124	0	0.1	yes	N/A
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	32.9	36	10	32.8	35	9	0.0	yes	N/A	33.7	38	12	33.8	37	12	0.1	yes	N/A
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	31.4	31	0	31.4	31	0	0.0	yes	N/A	32.1	37	0	32.2	37	0	0.1	yes	N/A
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	31.4	29	1	31.4	29	1	0.0	yes	N/A	32.1	36	1	32.2	36	1	0.0	yes	N/A
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.4	0	0	45.4	0	0	0.0	yes	N/A	45.8	1	0	45.8	1	0	0.0	yes	N/A
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.1	3	2	38.1	3	2	0.0	yes	N/A	38.4	4	3	38.4	4	3	0.0	yes	N/A
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	5	39.8	2	5	0.0	yes	N/A	40.1	4	6	40.1	4	6	0.0	yes	N/A
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.5	3	2	37.5	3	2	0.0	yes	N/A	37.7	4	3	37.7	4	3	0.0	yes	N/A
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.4	3	3	37.4	3	3	0.0	yes	N/A	37.5	4	3	37.5	4	3	0.0	yes	N/A
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	33.7	3	3	33.7	3	3	0.0	yes	N/A	33.9	4	3	33.9	4	3	0.0	yes	N/A
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	33.1	2	1	33.1	2	1	0.0	yes	N/A	33.5	5	2	33.5	5	2	0.0	yes	N/A
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	31.4	4	0	31.4	4	0	0.0	yes	N/A	32.1	26	0	32.1	22	0	0.0	yes	N/A
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	31.3	24	13	31.3	25	13	0.0	yes	N/A	32.1	29	3	32.1	29	3	0.0	no	0.8
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	31.4	5	0	31.4	5	0	0.0	no	0.1	32.1	5	0	32.1	4	0	0.0	no	0.8
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	31.3	47	2	31.3	46	2	0.0	yes	N/A	32.1	36	2	32.1	37	2	0.0	yes	N/A
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	31.3	46	0	31.3	49	0	0.0	yes	N/A	32.1	37	0	32.1	37	0	0.0	yes	N/A
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	31.3	45	0	31.3	43	0	0.0	yes	N/A	32.1	37	0	32.1	38	0	0.0	yes	N/A
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.1	0	0	51.1	0	0	0.0	no	0.1	51.4	0	0	51.4	0	0	0.0	no	0.4
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	34.7	0	0	34.7	0	0	0.0	yes	N/A	34.9	0	0	34.9	0	0	0.0	yes	N/A
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.1	1	2	47.1	1	2	0.0	yes	N/A	47.2	1	2	47.2	1	2	0.0	yes	N/A
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.9	15	4	38.9	15	4	0.0	yes	N/A	39.3	23	5	39.3	23	5	0.0	yes	N/A
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	34.6	15	2	34.6	15	2	0.0	yes	N/A	34.8	23	2	34.8	23	2	0.0	yes	N/A
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.3	4	0	46.3	4	0	0.0	yes	N/A	46.5	8	7	46.5	8	7	0.0	yes	N/A
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.2	4	4	45.2	4	4	0.0	yes	N/A	45.7	8	5	45.7	8	5	0.0	yes	N/A
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	34.6	4	2	34.6	4	2	0.0	yes	N/A	34.8	8	2	34.8	8	2	0.0	yes	N/A
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	33.4	16	1	33.4	16	1	0.0	yes	N/A	33.8	22	2	33.9	22	2	0.1	yes	N/A
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	34.7	15	3	34.7	15	3	0.0	yes	N/A	34.9	21	3	34.9	21	3	0.0	yes	N/A
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	31.3	32	0	31.3	31	0	0.0	yes	N/A	32.1	53	0	32.1	52	0	0.0	yes	N/A
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	31.3	106	1	31.3	117	1	0.0	yes	N/A	32.1	154	1	32.1	175	1	0.0	yes	N/A
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	31.3	103	1	31.3	115	1	0.0	yes	N/A	32.1	149	1	32.1	171	1	0.0	yes	N/A
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	32.2	3	1	32.2	3	1	0.0	yes	N/A	32.8	4	1	32.8	4	1	0.0	yes	N/A
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	32.1	13	4	32.1	13	4	0.0	yes	N/A	32.6	16	5	32.6	16	5	0.0	yes	N/A
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	31.3	106	0	31.3	118	0	0.0	yes	N/A	32.1	162	0	32.1	183	0	0.0	no	0.4
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	31.3	143	1	31.3	152	1	0.0	yes	N/A	32.1	161	1	32.1	174	1	0.0	no	0.1
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	31.3	142	1	31.3	150	1	0.0	yes	N/A	32.1	155	1	32.1	167	1	0.0	yes	N/A
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	31.3	126	0	31.3	134	0	0.0	yes	N/A	32.1	137	0	32.1	157	0	0.0	yes	N/A

Indicates LOS deficiency

Table A-3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.3	5	4	68.3	5	4	0.0	no	0.3	70.0	5	4	70.0	5	4	0.0
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	67.9	4	3	67.9	4	3	0.0	yes	N/A	69.5	4	4	69.5	4	4	0.0
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	66.9	7	6	66.9	7	6	0.0	yes	N/A	68.3	7	6	68.3	7	6	0.0
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	71.7	1	0	71.7	1	0	0.0	yes	N/A	72.1	6	5	72.1	6	5	0.0
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	62.5	4	3	62.5	4	3	0.0	yes	N/A	63.1	5	4	63.1	5	4	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.3	9	8	62.3	9	8	0.0	yes	N/A	62.9	10	8	62.9	10	8	0.0
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	55.8	4	6	55.8	4	6	0.0	yes	N/A	56.4	5	6	56.4	5	6	0.0
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	62.3	0	0	62.3	0	0	0.0	yes	N/A	63.1	1	0	63.1	1	0	0.0
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	52.0	9	0	52.0	9	0	0.0	yes	N/A	52.1	14	4	52.1	14	4	0.0
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.1	21	2	51.1	21	2	0.0	no	0.1	51.6	27	2	51.6	27	2	0.0
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	64.0	7	9	64.0	7	9	0.0	no	0.0	64.1	8	11	64.1	8	11	0.0
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	53.9	1	2	53.9	1	2	0.0	yes	N/A	54.3	3	2	54.3	3	2	0.0
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.6	3	4	54.6	3	4	0.0	yes	N/A	55.3	4	5	55.3	4	5	0.0
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	55.3	8	5	55.3	8	5	0.0	no	1.2	55.6	9	6	55.6	9	6	0.0
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.3	4	4	54.3	4	4	0.0	yes	N/A	54.4	4	5	54.4	4	5	0.0
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.9	1	1	52.9	1	1	0.0	yes	N/A	53.0	1	1	53.0	1	1	0.0
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.2	2	3	53.2	2	3	0.0	yes	N/A	53.3	2	3	53.3	2	3	0.0
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.7	3	1	52.7	3	1	0.0	yes	N/A	52.9	5	1	52.9	5	1	0.0
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.7	16	5	52.7	16	5	0.0	no	0.2	52.9	15	5	52.9	15	5	0.0
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.6	10	4	51.6	10	4	0.0	no	0.5	51.7	11	4	51.7	11	4	0.0
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	15	4	51.4	15	4	0.0	yes	N/A	51.6	15	4	51.6	15	4	0.0
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.0	10	3	51.0	10	3	0.0	yes	N/A	51.3	9	3	51.3	9	3	0.0
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	50.9	11	3	50.9	11	3	0.0	yes	N/A	51.2	14	3	51.2	14	3	0.0
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	17	3	50.6	17	3	0.0	no	0.6	51.0	21	4	51.0	21	4	0.0
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	17	3	50.0	17	3	0.0	no	0.0	50.6	21	4	50.6	21	4	0.0
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.6	17	3	49.6	17	3	0.0	yes	N/A	50.3	21	4	50.3	21	4	0.0
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.2	23	5	49.2	23	5	0.0	yes	N/A	50.2	24	5	50.2	24	5	0.0
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.3	9	5	49.3	9	5	0.0	no	1.1	50.4	13	5	50.4	13	5	0.0
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	23	5	48.1	23	5	0.0	yes	N/A	48.9	24	5	48.9	24	5	0.0
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	24	5	46.5	24	5	0.0	yes	N/A	47.1	24	5	47.1	24	5	0.0
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	23	5	45.0	23	5	0.0	yes	N/A	45.4	24	5	45.4	24	5	0.0
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	53.0	9	5	53.0	9	5	0.0	no	0.0	53.3	9	5	53.3	9	5	0.0
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	53.0	1	2	53.0	1	2	0.0	no	0.0	53.3	2	2	53.3	2	2	0.0
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.7	2	3	52.7	2	3	0.0	yes	N/A	52.8	2	3	52.8	2	3	0.0
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	52.2	18	0	52.2	18	0	0.0	no	0.2	52.7	23	0	52.7	23	0	0.0
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	52.2	19	11	52.2	19	11	0.0	yes	N/A	52.7	19	11	52.7	19	11	0.0
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	49.3	19	0	49.3	19	0	0.0	yes	N/A	50.0	20	2	50.0	20	2	0.0
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	49.3	25	0	49.3	25	0	0.0	yes	N/A	50.0	26	0	50.0	26	0	0.0
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	49.3	30	8	49.3	30	8	0.0	yes	N/A	50.0	37	9	50.0	37	9	0.0
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	1	50.2	3	2	0.0
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.3	8	2	50.2	3	1	0.1
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	2	50.2	3	2	0.0
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	49.4	4	1	49.4	4	1	0.0	yes	N/A	50.1	7	2	50.2	7	2	-0.1
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	49.4	8	2	49.4	8	2	0.0	yes	N/A	50.2	10	2	50.2	10	2	0.0
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	51.6	4	4	51.6	4	4	0.0	yes	N/A	52.6	5	4	52.6	5	4	0.0
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	50.6	5	5	50.6	5	5	0.0	yes	N/A	52.0	8	7	52.0	8	7	0.0

Table A-3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	49.1	8	4	49.1	8	4	0.0	yes	N/A	49.5	12	5	49.5	12	5	0.0
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.5	1	1	47.5	1	1	0.0	yes	N/A	47.7	1	1	47.7	1	1	0.0
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	46.2	38	0	46.2	38	0	0.0	yes	N/A	46.3	49	0	46.4	49	0	-0.1
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	42.3	46	0	41.7	46	0	-0.6	yes	N/A	43.2	57	0	42.8	58	0	0.5
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.5	0	1	47.5	0	1	0.0	yes	N/A	47.7	0	1	47.7	0	1	0.0
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.3	0	2	50.3	0	2	0.0	yes	N/A	50.4	0	2	50.4	0	2	0.0
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	48.2	0	1	48.2	0	1	0.0	yes	N/A	49.2	0	1	49.2	0	1	0.0
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	48.2	2	2	48.2	2	2	0.0	yes	N/A	49.2	3	3	49.2	3	3	0.0
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	48.2	19	6	48.2	19	6	0.0	yes	N/A	49.2	24	8	49.2	24	8	0.0
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.9	19	2	46.9	19	2	0.0	yes	N/A	47.3	29	2	47.3	29	2	0.0
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.9	19	5	46.9	19	5	0.0	yes	N/A	47.3	29	6	47.3	29	6	0.0
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	46.0	20	3	45.9	20	3	0.0	yes	N/A	46.2	29	3	46.2	29	3	0.0
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	46.0	24	7	45.9	23	8	0.0	yes	N/A	46.2	23	7	46.2	23	7	0.0
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.8	42	2	43.8	42	2	0.0	yes	N/A	44.0	53	2	44.0	53	2	0.0
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.1	12	4	44.1	12	4	0.0	no	0.0	44.3	13	4	44.3	12	4	0.0
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	42.3	64	0	41.7	64	0	-0.6	yes	N/A	43.2	76	0	42.8	76	0	0.5
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.9	11	5	47.9	11	5	0.0	yes	N/A	48.7	18	6	48.7	18	6	0.0
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	48.1	12	10	48.1	12	10	0.0	yes	N/A	48.7	14	12	48.7	14	12	0.0
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.2	17	6	44.2	17	6	0.0	yes	N/A	44.8	25	8	44.8	26	8	0.0
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.8	17	0	43.8	17	0	0.0	yes	N/A	44.0	26	0	44.0	26	0	0.0
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	48.3	6	0	48.3	6	0	0.0	yes	N/A	48.8	7	0	48.8	7	0	0.0
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	42.3	3	1	41.7	3	1	-0.6	yes	N/A	43.2	3	1	42.8	4	1	0.5
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	42.3	48	4	41.7	72	5	-0.6	yes	N/A	43.2	65	4	42.8	84	5	0.5
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	41.7	295	1	40.7	72	1	-1.0	yes	N/A	42.1	284	1	41.0	308	1	1.1
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	41.7	49	2	40.3	74	3	-1.4	yes	N/A	42.0	67	2	40.8	86	3	-1.3
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	0	43.0	0	1	0.0	yes	N/A	43.1	0	0	43.1	0	0	0.0
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	41.7	2	3	40.3	3	2	-1.4	yes	N/A	42.0	1	2	40.8	2	2	-1.2
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	41.6	50	0	40.2	78	0	-1.5	yes	N/A	42.0	69	0	40.7	91	0	-1.4
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.7	3	2	41.4	3	2	-0.3	yes	N/A	42.0	5	2	41.5	5	2	-0.5
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.6	0	1	43.6	0	1	0.0	yes	N/A	43.7	0	1	43.7	0	1	0.0
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	4	43.1	1	4	0.0	yes	N/A	43.1	2	3	43.1	2	3	0.0
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	2	43.1	0	2	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	41.6	51	3	40.2	79	4	-1.5	yes	N/A	42.0	70	4	40.7	96	8	-1.4
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	41.4	149	1	39.7	79	0	-1.8	yes	N/A	41.6	149	1	39.9	96	0	-1.7
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	41.4	42	6	39.7	79	6	-1.8	yes	N/A	41.6	42	6	39.9	96	8	-1.7
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.2	110	1	38.8	79	0	-1.4	yes	N/A	40.3	110	1	38.8	96	0	-1.5
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.2	44	6	38.8	79	8	-1.4	yes	N/A	40.3	44	6	38.8	114	8	-1.5
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.5	44	2	37.5	79	1	-1.1	yes	N/A	38.8	47	2	37.9	98	1	-0.8
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.5	44	9	37.5	79	8	-1.1	yes	N/A	38.8	47	10	37.9	97	9	-0.8
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	41.3	23	7	41.3	23	7	0.0	yes	N/A	43.1	28	9	43.1	28	9	0.0
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	2	37.2	6	2	0.0	no	0.7	37.3	7	2	37.4	6	2	0.0
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.7	7	2	36.8	6	2	0.1	yes	N/A	36.8	7	2	36.9	6	2	0.1
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.0	7	2	36.4	6	2	0.4	yes	N/A	36.2	7	2	36.5	6	2	0.3

Table A-3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.6	51	0	34.7	84	0	0.0	yes	N/A	35.4	53	0	35.2	103	0	-0.2
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.6	51	2	34.4	85	2	-0.2	yes	N/A	35.4	56	2	35.0	106	2	-0.3
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.6	53	8	34.4	86	7	-0.2	yes	N/A	35.4	60	9	35.0	110	8	-0.3
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.0	54	1	33.1	87	1	0.1	yes	N/A	33.9	61	1	34.0	111	1	0.1
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.6	3	6	36.6	3	6	0.0	no	0.4	36.8	3	6	36.7	3	6	-0.1
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.0	28	0	33.1	21	0	0.1	yes	N/A	33.9	47	0	34.0	32	0	0.1
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.0	22	0	33.1	23	0	0.1	no	0.6	33.9	30	0	34.0	31	0	0.1
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.0	75	1	33.1	108	1	0.1	no	0.6	33.9	90	1	34.0	126	1	0.1
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.0	90	1	33.1	116	1	0.1	no	0.4	33.9	109	1	34.0	140	1	0.1
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.0	93	2	33.0	117	3	0.1	no	0.5	33.9	111	2	33.9	135	3	0.1
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.0	117	0	33.0	133	0	0.1	no	0.5	33.9	121	0	33.9	133	0	0.1
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.0	16	3	33.0	18	4	0.1	no	0.5	33.9	21	4	33.9	22	5	0.1
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.0	119	1	33.0	144	1	0.1	yes	N/A	33.9	130	1	33.9	154	1	0.1
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.0	114	2	33.0	138	2	0.1	yes	N/A	33.9	120	2	33.9	143	2	0.1
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	32.9	143	2	33.0	168	3	0.0	yes	N/A	33.8	177	2	33.9	198	3	0.1
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.5	2	3	48.5	2	3	0.0	yes	N/A	49.1	10	6	49.1	10	6	0.0
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.6	3	0	49.6	3	0	0.0	no	0.0	49.6	3	0	49.6	3	0	0.0
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.1	2	4	44.1	2	4	0.0	yes	N/A	46.4	10	6	46.4	10	6	0.0
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.1	26	11	44.1	26	11	0.0	no	0.4	44.3	27	11	44.3	27	11	0.0
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	41.0	12	7	41.0	12	7	0.0	yes	N/A	41.5	14	8	41.5	14	8	0.0
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	40.6	10	7	40.6	10	7	0.0	yes	N/A	41.1	16	9	41.1	16	9	0.0
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	6	34.1	11	6	0.0	no	0.1	34.5	11	6	34.5	11	6	0.0
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.0	61	1	33.0	61	1	0.1	yes	N/A	33.9	117	1	33.9	116	1	0.1
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.0	51	1	33.0	42	1	0.1	no	0.5	33.9	44	1	33.9	35	1	0.1
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.1	15	5	34.1	15	5	0.0	yes	N/A	34.3	17	5	34.3	17	5	0.0
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.1	146	0	34.1	133	0	0.0	yes	N/A	34.3	129	0	34.3	128	0	0.0
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.1	40	12	34.1	39	12	0.0	yes	N/A	34.3	34	11	34.3	34	10	0.0
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.0	45	0	33.0	45	0	0.0	yes	N/A	33.9	66	0	33.9	66	0	0.0
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	32.9	43	1	33.0	42	1	0.0	yes	N/A	33.8	60	1	33.9	60	1	0.1
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	46.0	3	0	46.0	3	0	0.0	yes	N/A	46.2	10	6	46.2	10	6	0.0
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	39.3	8	5	39.3	8	5	0.0	yes	N/A	42.8	17	9	42.8	17	9	0.0
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	40.3	5	7	40.3	5	7	0.0	yes	N/A	43.3	9	7	43.3	9	7	0.0
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	38.3	8	3	38.3	8	3	0.0	yes	N/A	39.8	19	5	39.8	19	5	0.0
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	38.0	8	4	38.0	8	4	0.0	yes	N/A	38.7	31	7	38.7	31	5	0.0
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.3	8	4	34.3	8	4	0.0	yes	N/A	35.6	18	5	35.7	18	5	0.0
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.1	10	3	34.1	10	3	0.0	yes	N/A	35.3	18	6	35.4	17	5	0.0
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	32.9	24	0	33.0	4	0	0.0	no	0.5	33.9	24	0	33.9	23	0	0.1
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	32.9	32	3	32.9	34	3	0.0	no	1.6	33.8	56	3	33.8	68	3	0.0
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	32.9	5	0	33.0	4	0	0.0	no	1.7	33.8	4	0	33.9	3	0	0.1
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	32.9	48	2	32.9	48	1	0.0	yes	N/A	33.8	73	2	33.8	81	2	0.0
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	32.9	46	0	32.9	46	0	0.0	yes	N/A	33.7	74	0	33.7	81	0	0.0
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	32.9	46	0	32.9	46	0	0.0	yes	N/A	33.7	74	0	33.7	81	0	0.0
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.6	0	0	51.6	0	0	0.0	no	0.6	51.9	9	0	51.9	9	0	0.0
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	0	35.1	0	0	0.0	yes	N/A	35.5	14	2	35.5	14	2	0.0
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.9	7	4	47.9	7	4	0.0	yes	N/A	50.5	23	8	50.5	23	8	0.0
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	40.0	34	7	40.0	34	7	0.0	yes	N/A	42.0	48	10	42.0	48	10	0.0

Table A-3
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	34	2	35.1	34	2	0.0	yes	N/A	35.5	48	3	35.5	48	3	0.0
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.9	9	7	46.9	9	7	0.0	yes	N/A	47.1	9	7	47.1	9	7	0.0
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.8	9	6	45.8	9	6	0.0	yes	N/A	46.7	15	8	46.7	15	8	0.0
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	9	2	35.1	9	2	0.0	yes	N/A	35.5	15	2	35.5	15	2	0.0
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.1	30	2	34.1	30	2	0.0	yes	N/A	34.3	52	2	34.3	52	2	0.0
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	26	3	35.1	26	3	0.0	yes	N/A	35.5	35	3	35.5	35	3	0.0
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	32.9	72	0	32.9	72	0	0.0	yes	N/A	33.7	103	0	33.7	103	0	0.0
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	32.9	208	1	32.9	232	1	0.0	yes	N/A	33.7	256	1	33.7	279	1	0.0
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	32.9	194	1	32.9	218	1	0.0	yes	N/A	33.7	227	1	33.7	250	1	0.0
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	33.5	4	1	33.5	4	1	0.0	yes	N/A	34.9	6	2	34.9	6	2	0.0
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	33.4	17	5	33.4	17	5	0.0	yes	N/A	34.8	17	5	34.8	17	5	0.0
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	32.9	203	0	32.9	227	0	0.0	no	1.2	33.7	226	0	33.7	249	0	0.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	32.9	165	1	32.9	185	1	0.0	no	0.9	33.7	258	1	33.7	279	1	0.0
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	32.9	157	1	32.9	177	1	0.0	yes	N/A	33.6	260	1	33.6	281	1	0.0
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	32.9	143	0	32.9	163	0	0.0	no	0.1	33.6	263	0	33.6	283	0	0.0

Indicates LOS deficiency

Table A-4
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.6	4	68.6	4	0.0	0.6
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	68.2	4	68.2	4	0.0	0.2
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	67.2	7	67.2	7	0.0	no flooding
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	72.0	4	72.0	4	0.0	no flooding
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	63.0	4	63.0	4	0.0	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.8	10	62.8	10	0.0	no flooding
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	56.5	5	56.5	5	0.0	0.5
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	63.4	3	63.4	3	0.0	no flooding
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.9	7	51.9	7	0.0	no flooding
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.3	24	51.3	24	0.0	0.3
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.8	2	63.8	2	0.0	no flooding
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	54.7	6	54.7	6	0.0	no flooding
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.8	1	54.8	1	0.0	no flooding
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.7	3	54.7	3	0.0	0.6
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.7	7	54.7	7	0.0	no flooding
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.7	0	52.7	0	0.0	no flooding
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.0	1	53.0	1	0.0	no flooding
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.4	1	52.4	1	0.0	no flooding
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.4	11	52.4	11	0.0	no flooding
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.5	10	51.5	10	0.0	0.5
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	12	51.4	12	0.0	no flooding
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.1	10	51.1	10	0.0	no flooding
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	51.0	13	51.0	13	0.0	no flooding
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	21	50.6	21	0.0	0.6
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	21	50.0	21	-0.1	no flooding
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.5	27	49.4	21	-0.1	no flooding
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.1	22	49.1	23	-0.1	no flooding
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.2	8	49.1	8	-0.1	0.9
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	22	47.9	23	-0.1	no flooding
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	25	46.3	24	-0.2	no flooding
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	22	44.7	23	-0.3	no flooding
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	51.6	6	51.6	6	0.0	no flooding
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.5	0	52.5	0	0.0	no flooding
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	52.6	1	0.0	no flooding
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.1	7	51.1	7	0.0	no flooding
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.1	13	51.1	13	0.0	no flooding
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	14	48.6	14	0.0	no flooding
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.4	25	48.4	25	0.0	no flooding
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.4	19	48.4	19	0.0	no flooding
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.4	4	48.4	1	0.0	no flooding
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.4	1	48.4	2	0.0	no flooding
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.4	1	48.4	1	0.0	no flooding
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.4	4	48.4	2	0.0	no flooding
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.4	7	48.4	7	0.0	no flooding
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.6	2	49.6	2	0.0	no flooding
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.5	2	49.5	2	0.0	no flooding
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.5	3	48.5	3	0.0	no flooding

Table A-4
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	46.9	0	46.9	0	0.0	no flooding
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.6	23	45.4	23	-0.1	no flooding
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	43.6	24	42.3	24	-1.3	no flooding
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	46.9	0	46.9	0	0.0	no flooding
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	50.2	0	0.0	no flooding
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	46.9	0	46.9	0	0.0	no flooding
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	46.9	0	46.9	0	0.0	no flooding
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	46.9	11	46.9	11	0.0	no flooding
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.4	11	46.4	11	0.0	no flooding
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.4	11	46.4	11	0.0	no flooding
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.3	17	45.3	17	0.0	no flooding
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.3	19	45.3	11	0.0	no flooding
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.9	38	43.5	34	-0.5	no flooding
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.0	5	43.6	5	-0.4	no flooding
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	43.6	58	42.3	55	-1.3	no flooding
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	48.0	12	48.0	12	0.0	no flooding
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.6	7	47.6	7	0.0	no flooding
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.5	22	44.6	16	0.1	no flooding
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.9	21	43.5	17	-0.5	no flooding
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.5	2	47.5	2	0.0	no flooding
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	43.6	5	42.3	5	-1.3	0.2
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	43.6	69	42.3	78	-1.3	no flooding
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	37.4	0	0.0	no flooding
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	36.9	0	0.0	no flooding
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	36.8	0	0.0	no flooding
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	42.4	305	40.8	308	-1.6	no flooding
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	42.3	70	40.5	79	-1.8	no flooding
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	43.0	0	0.0	no flooding
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	42.3	2	40.5	3	-1.8	no flooding
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	42.3	74	40.4	88	-1.9	no flooding
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	42.3	1	41.3	1	-1.0	no flooding
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.3	0	43.3	0	0.0	no flooding
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	43.1	1	0.0	no flooding
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	43.1	0	0.0	no flooding
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	42.3	83	40.4	91	-1.9	no flooding
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	41.8	39	39.9	92	-1.9	no flooding
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	41.8	48	39.9	94	-1.9	no flooding
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.5	29	38.9	98	-1.6	no flooding
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.5	46	38.9	115	-1.6	no flooding
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	39.0	42	37.9	99	-1.1	no flooding
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	39.0	48	37.9	94	-1.1	no flooding
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	40.3	19	40.3	20	0.0	no flooding
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	37.1	7	0.0	0.6
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.8	7	36.8	7	0.0	no flooding
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.2	7	36.5	7	0.2	no flooding
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	35.4	55	35.1	99	-0.3	no flooding
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	35.4	56	34.9	99	-0.5	no flooding

Table A-4
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	35.4	57	34.9	100	-0.5	no flooding
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.9	59	34.0	99	0.0	no flooding
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.8	3	36.5	3	-0.3	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.9	50	34.0	22	0.0	no flooding
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.9	23	34.0	15	0.0	1.5
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.9	79	34.0	98	0.0	1.5
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.9	104	33.9	117	0.0	1.2
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.9	100	33.9	113	0.0	1.4
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.9	95	33.9	113	0.0	1.4
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.9	14	33.9	16	0.0	1.4
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.9	96	33.9	123	0.0	0.4
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.9	93	33.9	120	0.0	0.8
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	33.8	117	33.8	141	0.0	no flooding
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.7	4	48.7	4	0.0	no flooding
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.3	1	49.3	1	0.0	no flooding
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.4	4	44.4	4	0.0	no flooding
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.0	26	44.0	26	0.0	0.3
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.4	4	40.4	4	0.0	no flooding
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	39.9	4	0.0	no flooding
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	34.1	11	0.0	0.1
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.9	58	33.9	58	0.0	0.4
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.9	39	33.9	33	0.0	1.4
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.3	18	34.2	18	-0.2	no flooding
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.3	19	34.1	21	-0.2	no flooding
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.3	26	34.1	24	-0.2	no flooding
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.9	27	33.9	35	0.0	no flooding
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	33.8	32	33.8	34	0.0	no flooding
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.9	2	45.9	2	0.0	no flooding
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.3	4	38.3	4	0.0	no flooding
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	39.8	2	0.0	no flooding
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.8	4	37.8	4	0.0	no flooding
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.6	4	37.6	4	0.0	no flooding
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.4	4	34.4	4	0.0	no flooding
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.3	7	34.3	7	0.0	no flooding
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	33.8	74	33.9	2	0.0	1.4
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	33.8	55	33.8	61	0.0	2.5
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	33.8	3	33.9	3	0.0	2.6
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	33.8	60	33.8	66	0.0	no flooding
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	33.7	58	33.7	67	0.0	no flooding
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	33.7	238	33.7	67	0.0	no flooding
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.5	0	51.5	0	0.0	0.5
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	35.1	0	0.0	no flooding
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.0	0	47.0	0	0.0	no flooding
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.8	16	38.8	16	0.0	no flooding
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	16	35.1	16	0.0	no flooding
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	47.1	8	47.1	8	0.0	0.1
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	46.2	12	46.2	12	0.0	no flooding

Table A-4

SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support

Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2A

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	12	35.1	12	0.0	no flooding
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.3	28	34.2	29	-0.2	no flooding
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	11	35.1	11	0.0	no flooding
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	33.7	55	33.7	54	0.0	no flooding
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	33.7	164	33.7	188	0.0	no flooding
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	33.7	155	33.7	179	0.0	no flooding
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	34.4	5	34.4	5	0.0	no flooding
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	34.4	17	34.4	17	0.0	no flooding
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	33.7	328	33.7	189	0.0	2.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	33.7	175	33.7	224	0.0	1.7
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	33.7	217	33.7	224	0.0	0.7
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	33.7	213	33.7	224	0.0	0.9

Denotes 0.5 feet of flooding or greater

Table A-5
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	66.8	1	0	66.8	1	0	0.0	yes	N/A	67.3	5	4	67.3	5	4	0.0	yes	N/A
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	66.6	1	0	66.6	1	0	0.0	yes	N/A	67.1	3	3	67.1	3	3	0.0	yes	N/A
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	61.7	2	3	61.7	2	3	0.0	yes	N/A	65.2	6	5	65.2	6	5	0.0	yes	N/A
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	70.3	0	0	70.3	0	0	0.0	yes	N/A	71.1	0	0	71.1	0	0	0.0	yes	N/A
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	61.6	0	0	61.6	0	0	0.0	yes	N/A	62.0	1	2	62.0	1	2	0.0	yes	N/A
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	58.7	2	3	58.7	2	3	0.0	yes	N/A	61.1	8	6	61.1	8	6	0.0	yes	N/A
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	53.8	1	0	53.8	1	0	0.0	yes	N/A	54.2	4	5	54.2	4	5	0.0	yes	N/A
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	61.0	0	0	61.0	0	0	0.0	yes	N/A	61.6	0	0	61.6	0	0	0.0	yes	N/A
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.8	4	0	51.8	4	0	0.0	yes	N/A	51.9	6	0	51.9	6	0	0.0	yes	N/A
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	49.6	6	1	49.6	6	1	0.0	yes	N/A	50.7	9	1	50.7	9	1	0.0	yes	N/A
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.9	3	0	63.9	3	0	0.0	yes	N/A	64.0	6	0	64.0	6	0	0.0	yes	N/A
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	52.8	0	0	52.8	0	0	0.0	yes	N/A	53.5	0	1	53.5	0	1	0.0	yes	N/A
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.3	2	4	54.3	2	4	0.0	yes	N/A
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.5	4	4	54.5	4	4	0.0	no	0.4	54.9	6	4	54.9	6	4	0.0	no	0.8
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.2	3	4	54.2	3	4	0.0	yes	N/A
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.8	0	1	52.8	0	1	0.0	yes	N/A	52.9	0	1	52.9	0	1	0.0	yes	N/A
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.1	1	2	53.1	1	2	0.0	yes	N/A	53.1	1	3	53.1	1	3	0.0	yes	N/A
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.2	2	1	52.2	2	1	0.0	yes	N/A	52.5	3	1	52.5	3	1	0.0	yes	N/A
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.2	7	0	52.2	7	0	0.0	yes	N/A	52.5	14	4	52.5	14	4	0.0	yes	N/A
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	49.9	8	4	49.9	8	4	0.0	yes	N/A	51.5	10	4	51.5	10	4	0.0	no	0.4
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	49.7	8	4	49.7	8	4	0.0	yes	N/A	51.1	10	4	51.1	10	4	0.0	yes	N/A
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	49.2	8	3	49.2	8	3	0.0	yes	N/A	50.5	10	3	50.5	10	3	0.0	yes	N/A
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	49.6	9	2	49.6	9	2	0.0	yes	N/A	50.6	12	3	50.6	12	3	0.0	yes	N/A
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	48.5	14	3	48.5	14	3	0.0	yes	N/A	49.6	16	3	49.6	16	3	0.0	yes	N/A
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	48.0	14	3	48.0	14	3	0.0	yes	N/A	49.1	16	3	49.1	16	3	0.0	yes	N/A
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	47.6	15	3	47.6	15	3	0.0	yes	N/A	48.6	16	3	48.6	16	3	0.0	yes	N/A
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	47.3	21	4	47.3	21	4	0.0	yes	N/A	48.3	22	4	48.3	22	4	0.0	yes	N/A
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	47.3	9	6	47.3	9	6	0.0	yes	N/A	48.3	9	6	48.3	9	6	0.0	no	0.1
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	46.4	21	4	46.4	21	4	0.0	yes	N/A	47.2	22	4	47.2	22	4	0.0	yes	N/A
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	45.2	24	5	45.3	24	5	0.0	yes	N/A	45.9	24	5	45.9	24	5	0.0	yes	N/A
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	44.1	22	4	44.1	22	4	0.0	yes	N/A	44.6	22	5	44.6	22	4	0.0	yes	N/A
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	52.4	8	5	52.4	8	5	0.0	yes	N/A	52.7	9	5	52.7	9	5	0.0	yes	N/A
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.6	1	2	52.6	1	2	0.0	yes	N/A	52.7	1	2	52.7	1	2	0.0	yes	N/A
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	3	52.6	1	3	0.0	yes	N/A	52.6	1	3	52.6	1	3	0.0	yes	N/A
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.5	10	0	51.5	10	0	0.0	yes	N/A	51.8	14	0	51.8	14	0	0.0	yes	N/A
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.5	14	8	51.5	14	8	0.0	yes	N/A	51.8	19	10	51.8	19	10	0.0	yes	N/A
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	15	0	48.6	15	0	0.0	yes	N/A	49.0	19	0	49.0	19	0	0.0	yes	N/A
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.5	25	0	48.5	25	0	0.0	yes	N/A	48.9	25	0	48.9	25	0	0.0	yes	N/A
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.5	21	7	48.5	21	7	0.0	yes	N/A	48.9	26	8	48.9	26	8	0.0	yes	N/A
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.5	1	3	48.5	1	3	0.0	yes	N/A	49.0	2	2	49.0	2	2	0.0	yes	N/A
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.5	2	1	48.5	2	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.5	1	1	48.5	1	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.5	2	2	48.5	2	2	0.0	yes	N/A	49.0	3	1	49.0	3	1	0.0	yes	N/A
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.5	6	2	48.5	6	2	0.0	yes	N/A	49.0	8	2	49.0	8	2	0.0	yes	N/A
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.9	2	2	49.9	2	2	0.0	yes	N/A	50.7	3	3	50.7	3	3	0.0	yes	N/A
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.7	3	3	49.7	3	3	0.0	yes	N/A	50.1	4	4	50.1	4	4	0.0	yes	N/A
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.7	4	4	48.7	4	4	0.0	yes	N/A	48.9	6	4	48.9	6	4	0.0	yes	N/A
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.8	25	0	45.8	25	0	0.0	yes	N/A	46.1	32	0	46.1	32	0	0.0	yes	N/A
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	40.9	26	0	40.6	26	0	-0.2	yes	N/A	41.7	36	0	41.2	36	0	-0.5	yes	N/A
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	1	50.2	0	1	0.0	yes	N/A	50.2	0	1	50.2	0	1	0.0	yes	N/A
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.5	0	1	47.5	0	1	0.0	yes	N/A

Table A-5
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	47.0	1	2	47.0	1	2	0.0	yes	N/A	47.5	2	2	47.5	2	2	0.0	yes	N/A
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	47.0	12	4	47.0	12	4	0.0	yes	N/A	47.5	16	5	47.5	16	5	0.0	yes	N/A
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.5	12	2	46.5	12	2	0.0	yes	N/A	46.7	16	2	46.7	16	2	0.0	yes	N/A
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.5	12	4	46.5	12	4	0.0	yes	N/A	46.7	17	5	46.7	17	5	0.0	yes	N/A
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.4	18	3	45.4	18	3	0.0	yes	N/A	46.0	20	3	46.0	20	3	0.0	yes	N/A
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.4	12	5	45.4	12	5	0.0	yes	N/A	46.0	17	6	46.0	17	6	0.0	yes	N/A
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.2	31	2	43.2	31	2	0.0	yes	N/A	43.5	37	2	43.5	37	2	0.0	yes	N/A
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	43.2	6	2	43.2	6	2	0.0	yes	N/A	43.6	9	3	43.6	9	3	0.0	yes	N/A
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	40.9	42	0	40.6	42	0	-0.2	yes	N/A	41.7	53	0	41.2	53	0	-0.5	yes	N/A
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.1	3	3	47.1	3	3	0.0	yes	N/A	47.4	6	4	47.4	6	4	0.0	yes	N/A
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.2	3	4	47.2	3	4	0.0	yes	N/A	47.6	7	6	47.6	7	6	0.0	yes	N/A
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	43.4	6	5	43.4	6	5	0.0	yes	N/A	43.9	10	5	43.9	10	5	0.0	yes	N/A
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.2	10	0	43.2	10	0	0.0	yes	N/A	43.5	11	0	43.5	11	0	0.0	yes	N/A
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.8	4	0	47.8	4	0	0.0	yes	N/A	48.0	5	0	48.0	5	0	0.0	yes	N/A
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	40.9	3	1	40.6	3	1	-0.2	yes	N/A	41.7	3	1	41.2	3	1	-0.5	yes	N/A
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	40.9	38	3	40.6	51	4	-0.3	yes	N/A	41.7	41	4	41.1	66	4	-0.5	yes	N/A
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0	yes	N/A
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0	yes	N/A
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0	yes	N/A
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	40.6	96	1	40.1	51	1	-0.5	yes	N/A	41.3	290	1	40.3	66	1	-1.0	yes	N/A
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	40.5	37	2	38.8	52	3	-1.7	yes	N/A	41.3	41	2	39.3	66	3	-2.0	yes	N/A
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	41.9	0	0	41.8	0	0	-0.1	yes	N/A	42.7	0	0	42.6	0	0	-0.1	yes	N/A
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	40.5	2	3	38.8	2	2	-1.7	yes	N/A	41.3	2	3	39.3	2	3	-2.0	yes	N/A
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	40.5	39	0	38.2	55	0	-2.3	yes	N/A	41.2	41	0	38.8	71	0	-2.5	yes	N/A
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.2	1	1	41.2	1	1	0.0	yes	N/A	41.3	2	2	41.3	2	2	0.0	yes	N/A
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.4	0	1	43.4	0	1	0.0	yes	N/A	43.5	0	1	43.5	0	1	0.0	yes	N/A
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.0	1	4	43.0	1	4	0.0	yes	N/A	43.1	1	3	43.1	1	3	0.0	yes	N/A
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.0	0	2	43.0	0	2	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0	yes	N/A
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	40.5	41	2	38.2	56	4	-2.3	yes	N/A	41.2	42	2	38.8	72	4	-2.5	yes	N/A
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	40.3	73	1	N/A	N/A	N/A	N/A	N/A	N/A	41.1	127	1	N/A	N/A	N/A	N/A	N/A	N/A
AW-475-LP-1	Pipe	42.4	25	AW-475	AW-480	N/A	N/A	N/A	37.8	56	4	-2.5	yes	N/A	N/A	N/A	N/A	38.3	72	5	-2.8	yes	N/A
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-490	40.3	40	6	37.8	56	6	-2.5	yes	N/A	41.1	42	6	38.3	76	6	-2.8	yes	N/A
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	39.2	40	1	N/A	N/A	N/A	N/A	N/A	N/A	39.7	42	1	N/A	N/A	N/A	N/A	N/A	N/A
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-500	39.2	40	6	37.4	56	6	-1.8	yes	N/A	39.7	42	6	37.9	72	6	-1.8	yes	N/A
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.1	40	2	N/A	N/A	N/A	N/A	N/A	N/A	38.3	42	2	N/A	N/A	N/A	N/A	N/A	N/A
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.1	40	9	37.0	56	6	-1.1	yes	N/A	38.3	42	9	37.6	72	6	-0.7	yes	N/A
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	39.8	12	4	39.8	12	4	0.0	yes	N/A	40.3	20	6	40.3	20	6	0.0	yes	N/A
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	36.8	7	2	36.8	6	2	0.0	no	0.3	37.1	7	2	37.1	6	2	0.0	no	0.6
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.6	7	2	36.6	6	2	0.1	yes	N/A	36.7	7	2	36.8	6	2	0.1	yes	N/A
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	35.9	7	2	36.0	6	2	0.2	yes	N/A	35.9	7	2	36.3	6	2	0.3	yes	N/A
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.3	46	0	34.4	61	0	0.0	yes	N/A	34.5	48	0	34.9	78	0	0.4	yes	N/A
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.2	46	2	34.1	62	0	-0.1	yes	N/A	34.4	49	0	34.7	78	0	0.3	yes	N/A
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.2	47	7	34.1	62	7	-0.1	yes	N/A	34.4	50	8	34.7	79	7	0.3	yes	N/A
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	31.7	47	1	31.9	62	1	0.2	yes	N/A	32.3	50	1	32.4	79	1	0.2	yes	N/A
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.3	2	4	36.4	2	4	0.0	no	0.1	36.5	3	6	36.5	3	6	0.0	no	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	31.9	8	0	32.0	10	0	0.1	yes	N/A	32.4	16	0	32.6	17	0	0.2	yes	N/A
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	31.7	7	0	31.9	7	0	0.2	yes	N/A	32.3	16	0	32.4	17	0	0.2	yes	N/A
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	31.5	52	1	31.6	66	1	0.1	yes	N/A	32.2	66	1	32.3	92	1	0.1	yes	N/A
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	31.5	55	1	31.6	69	1	0.1	yes	N/A	32.2	74	1	32.3	96	1	0.1	yes	N/A
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	31.4	56	2	31.5	69	2	0.1	yes	N/A	32.2	76	2	32.2	97	2	0.1	yes	N/A
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	31.4	69	0	31.4	79	0	0.1	yes	N/A	32.1	90	0	32.2	112	0	0.1	yes	N/A
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	31.4	7	2	31.5	9	2	0.1	yes	N/A	32.2	13	3	32.2	16	3	0.1	yes	N/A
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	31.4	70	1	31.4	80	1	0.0	yes	N/A	32.1	93	1	32.2	110	1	0.1	yes	N/A

Table A-5
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	31.4	70	1	31.4	80	1	0.0	yes	N/A	32.1	94	1	32.2	108	2	0.1	yes	N/A
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	31.4	92	2	31.4	101	2	0.0	yes	N/A	32.1	122	2	32.2	132	2	0.0	yes	N/A
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	47.3	0	2	47.3	0	2	0.0	yes	N/A	48.2	0	2	48.2	0	2	0.0	yes	N/A
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.5	2	0	49.5	2	0	0.0	yes	N/A	49.5	2	0	49.5	2	0	0.0	yes	N/A
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	43.6	0	2	43.6	0	2	0.0	yes	N/A	43.9	1	2	43.9	1	2	0.0	yes	N/A
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	42.4	16	8	42.4	16	8	0.0	yes	N/A	43.9	25	10	43.9	25	10	0.0	no	0.2
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.6	6	4	40.6	6	4	0.0	yes	N/A	40.8	9	6	40.8	9	6	0.0	yes	N/A
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	5	39.9	4	5	0.0	yes	N/A	40.3	7	6	40.3	7	6	0.0	yes	N/A
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	33.5	10	6	33.5	10	6	0.0	yes	N/A	33.8	11	6	33.8	11	6	0.0	yes	N/A
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	31.4	23	1	31.5	22	1	0.1	yes	N/A	32.2	34	1	32.2	34	1	0.1	yes	N/A
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	31.4	17	1	31.5	17	1	0.1	yes	N/A	32.2	34	1	32.2	34	1	0.1	yes	N/A
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	33.4	20	6	33.4	20	6	0.0	yes	N/A	33.8	15	5	33.9	15	5	0.1	yes	N/A
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	32.9	32	0	32.8	30	0	0.0	yes	N/A	33.7	111	0	33.8	124	0	0.1	yes	N/A
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	32.9	36	10	32.8	35	9	0.0	yes	N/A	33.7	38	12	33.8	37	12	0.1	yes	N/A
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	31.4	31	0	31.4	31	0	0.0	yes	N/A	32.1	37	0	32.2	37	0	0.1	yes	N/A
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	31.4	29	1	31.4	29	1	0.0	yes	N/A	32.1	36	1	32.2	36	1	0.0	yes	N/A
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.4	0	0	45.4	0	0	0.0	yes	N/A	45.8	1	0	45.8	1	0	0.0	yes	N/A
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.1	3	2	38.1	3	2	0.0	yes	N/A	38.4	4	3	38.4	4	3	0.0	yes	N/A
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	5	39.8	2	5	0.0	yes	N/A	40.1	4	6	40.1	4	6	0.0	yes	N/A
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.5	3	2	37.5	3	2	0.0	yes	N/A	37.7	4	3	37.7	4	3	0.0	yes	N/A
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.4	3	3	37.4	3	3	0.0	yes	N/A	37.5	4	3	37.5	4	3	0.0	yes	N/A
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	33.7	3	3	33.7	3	3	0.0	yes	N/A	33.9	4	3	33.9	4	3	0.0	yes	N/A
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	33.1	2	1	33.1	2	1	0.0	yes	N/A	33.5	5	2	33.5	5	2	0.0	yes	N/A
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	31.4	4	0	31.4	4	0	0.0	yes	N/A	32.1	26	0	32.1	25	0	0.0	yes	N/A
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	31.3	24	13	31.3	25	13	0.0	yes	N/A	32.1	29	3	32.1	29	3	0.0	no	0.8
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	31.4	5	0	31.4	5	0	0.0	no	0.1	32.1	5	0	32.1	4	0	0.0	no	0.8
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	31.3	47	2	31.3	46	2	0.0	yes	N/A	32.1	36	2	32.1	37	2	0.0	yes	N/A
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	31.3	46	0	31.3	52	0	0.0	yes	N/A	32.1	37	0	32.1	37	0	0.0	yes	N/A
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	31.3	45	0	31.3	43	0	0.0	yes	N/A	32.1	37	0	32.1	38	0	0.0	yes	N/A
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.1	0	0	51.1	0	0	0.0	no	0.1	51.4	0	0	51.4	0	0	0.0	no	0.4
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	34.7	0	0	34.7	0	0	0.0	yes	N/A	34.9	0	0	34.9	0	0	0.0	yes	N/A
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.1	1	2	47.1	1	2	0.0	yes	N/A	47.2	1	2	47.2	1	2	0.0	yes	N/A
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.9	15	4	38.9	15	4	0.0	yes	N/A	39.3	23	5	39.3	23	5	0.0	yes	N/A
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	34.6	15	2	34.6	15	2	0.0	yes	N/A	34.8	23	2	34.8	23	2	0.0	yes	N/A
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.3	4	0	46.3	4	0	0.0	yes	N/A	46.5	8	7	46.5	8	7	0.0	yes	N/A
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.2	4	4	45.2	4	4	0.0	yes	N/A	45.7	8	5	45.7	8	5	0.0	yes	N/A
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	34.6	4	2	34.6	4	2	0.0	yes	N/A	34.8	8	2	34.8	8	2	0.0	yes	N/A
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	33.4	16	1	33.4	16	1	0.0	yes	N/A	33.8	22	2	33.9	22	2	0.1	yes	N/A
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	34.7	15	3	34.7	15	3	0.0	yes	N/A	34.9	21	3	34.9	21	3	0.0	yes	N/A
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	31.3	32	0	31.3	31	0	0.0	yes	N/A	32.1	53	0	32.1	52	0	0.0	yes	N/A
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	31.3	106	1	31.3	117	1	0.0	yes	N/A	32.1	154	1	32.1	176	1	0.0	yes	N/A
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	31.3	103	1	31.3	114	1	0.0	yes	N/A	32.1	149	1	32.1	171	1	0.0	yes	N/A
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	32.2	3	1	32.2	3	1	0.0	yes	N/A	32.8	4	1	32.8	4	1	0.0	yes	N/A
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	32.1	13	4	32.1	13	4	0.0	yes	N/A	32.6	16	5	32.6	16	5	0.0	yes	N/A
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	31.3	106	0	31.3	118	0	0.0	yes	N/A	32.1	162	0	32.1	183	0	0.0	no	0.4
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	31.3	143	1	31.3	152	1	0.0	yes	N/A	32.1	161	1	32.1	173	1	0.0	no	0.1
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	31.3	142	1	31.3	151	1	0.0	yes	N/A	32.1	155	1	32.1	166	1	0.0	yes	N/A
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	31.3	126	0	31.3	134	0	0.0	yes	N/A	32.1	137	0	32.1	157	0	0.0	yes	N/A

Indicates LOS deficiency
New conduits added as part of the alternative
Conduits removed as part of alternative

Table A-5
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.3	5	4	68.3	5	4	0.0	no	0.3	70.0	5	4	70.0	5	4	0.0
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	67.9	4	3	67.9	4	3	0.0	yes	N/A	69.5	4	4	69.5	4	4	0.0
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	66.9	7	6	66.9	7	6	0.0	yes	N/A	68.3	7	6	68.3	7	6	0.0
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	71.7	1	0	71.7	1	0	0.0	yes	N/A	72.1	6	5	72.1	6	5	0.0
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	62.5	4	3	62.5	4	3	0.0	yes	N/A	63.1	5	4	63.1	5	4	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.3	9	8	62.3	9	8	0.0	yes	N/A	62.9	10	8	62.9	10	8	0.0
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	55.8	4	6	55.8	4	6	0.0	yes	N/A	56.4	5	6	56.4	5	6	0.0
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	62.3	0	0	62.3	0	0	0.0	yes	N/A	63.1	1	0	63.1	1	0	0.0
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	52.0	9	0	52.0	9	0	0.0	yes	N/A	52.1	14	4	52.1	14	4	0.0
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.1	21	2	51.1	21	2	0.0	no	0.1	51.6	27	2	51.6	27	2	0.0
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	64.0	7	9	64.0	7	9	0.0	no	0.0	64.1	8	11	64.1	8	11	0.0
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	53.9	1	2	53.9	1	2	0.0	yes	N/A	54.3	3	2	54.3	3	2	0.0
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.6	3	4	54.6	3	4	0.0	yes	N/A	55.3	4	5	55.3	4	5	0.0
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	55.3	8	5	55.3	8	5	0.0	no	1.2	55.6	9	6	55.6	9	6	0.0
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.3	4	4	54.3	4	4	0.0	yes	N/A	54.4	4	5	54.4	4	5	0.0
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.9	1	1	52.9	1	1	0.0	yes	N/A	53.0	1	1	53.0	1	1	0.0
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.2	2	3	53.2	2	3	0.0	yes	N/A	53.3	2	3	53.3	2	3	0.0
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.7	3	1	52.7	3	1	0.0	yes	N/A	52.9	5	1	52.9	5	1	0.0
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.7	16	5	52.7	16	5	0.0	no	0.2	52.9	15	5	52.9	15	5	0.0
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.6	10	4	51.6	10	4	0.0	no	0.5	51.7	11	4	51.7	11	4	0.0
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	15	4	51.4	15	4	0.0	yes	N/A	51.6	15	4	51.6	15	4	0.0
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.0	10	3	51.0	10	3	0.0	yes	N/A	51.3	9	3	51.3	9	3	0.0
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	50.9	11	3	50.9	11	3	0.0	yes	N/A	51.2	14	3	51.2	14	3	0.0
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	17	3	50.6	17	3	0.0	no	0.6	51.0	21	4	51.0	21	4	0.0
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	17	3	50.0	17	3	0.0	no	0.0	50.6	21	4	50.6	21	4	0.0
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.6	17	3	49.6	17	3	0.0	yes	N/A	50.3	21	4	50.3	21	4	0.0
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.2	23	5	49.2	23	5	0.0	yes	N/A	50.2	24	5	50.2	24	5	0.0
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.3	9	5	49.3	9	5	0.0	no	1.1	50.4	13	5	50.4	13	5	0.0
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	23	5	48.1	23	5	0.0	yes	N/A	48.9	24	5	48.9	24	5	0.0
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	24	5	46.5	24	5	0.0	yes	N/A	47.1	24	5	47.1	24	5	0.0
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	23	5	45.0	23	5	0.0	yes	N/A	45.4	24	5	45.4	24	5	0.0
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	53.0	9	5	53.0	9	5	0.0	no	0.0	53.3	9	5	53.3	9	5	0.0
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	53.0	1	2	53.0	1	2	0.0	no	0.0	53.3	2	2	53.3	2	2	0.0
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.7	2	3	52.7	2	3	0.0	yes	N/A	52.8	2	3	52.8	2	3	0.0
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	52.2	18	0	52.2	18	0	0.0	no	0.2	52.7	23	0	52.7	23	0	0.0
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	52.2	19	11	52.2	19	11	0.0	yes	N/A	52.7	19	11	52.7	19	11	0.0
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	49.3	19	0	49.3	19	0	0.0	yes	N/A	50.0	20	2	50.0	20	2	0.0
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	49.3	25	0	49.3	25	0	0.0	yes	N/A	50.0	26	0	50.0	26	0	0.0
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	49.3	30	8	49.3	30	8	0.0	yes	N/A	50.0	37	9	50.0	37	9	0.0
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	1	50.2	3	1	0.0
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	49.4	2	1	49.4	3	1	0.0	yes	N/A	50.3	8	2	50.2	3	2	-0.1
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	2	50.2	3	2	0.0
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	49.4	4	1	49.4	4	1	0.0	yes	N/A	50.1	7	2	50.2	7	2	0.1
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	49.4	8	2	49.4	8	2	0.0	yes	N/A	50.2	10	2	50.2	10	2	0.0
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	51.6	4	4	51.6	4	4	0.0	yes	N/A	52.6	5	4	52.6	5	4	0.0
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	50.6	5	5	50.6	5	5	0.0	yes	N/A	52.0	8	7	52.0	8	7	0.0
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	49.1	8	4	49.1	8	4	0.0	yes	N/A	49.5	12	5	49.5	12	5	0.0
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.5	1	1	47.5	1	1	0.0	yes	N/A	47.7	1	1	47.7	1	1	0.0

Table A-5
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	46.2	38	0	46.2	38	0	0.0	yes	N/A	46.3	49	0	46.4	49	0	0.1
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	42.3	46	0	41.7	46	0	-0.6	yes	N/A	43.2	57	0	42.7	58	0	-0.5
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.5	0	1	47.5	0	1	0.0	yes	N/A	47.7	0	1	47.7	0	1	0.0
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.3	0	2	50.3	0	2	0.0	yes	N/A	50.4	0	2	50.4	0	2	0.0
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	48.2	0	1	48.2	0	1	0.0	yes	N/A	49.2	0	1	49.2	0	1	0.0
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	48.2	2	2	48.2	2	2	0.0	yes	N/A	49.2	3	3	49.2	3	3	0.0
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	48.2	19	6	48.2	19	6	0.0	yes	N/A	49.2	24	8	49.2	24	8	0.0
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.9	19	2	46.9	19	2	0.0	yes	N/A	47.3	29	2	47.3	29	2	0.0
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.9	19	5	46.9	19	5	0.0	yes	N/A	47.3	29	6	47.3	29	6	0.0
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	46.0	20	3	45.9	20	3	0.0	yes	N/A	46.2	29	3	46.2	29	3	0.0
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	46.0	24	7	45.9	23	8	0.0	yes	N/A	46.2	23	7	46.2	23	7	0.0
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.8	42	2	43.8	42	2	0.0	yes	N/A	44.0	53	2	44.0	53	2	0.0
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.1	12	4	44.1	12	4	0.0	no	0.0	44.3	13	4	44.3	12	4	0.0
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	42.3	64	0	41.7	64	0	-0.6	yes	N/A	43.2	76	0	42.7	76	0	-0.5
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.9	11	5	47.9	11	5	0.0	yes	N/A	48.7	18	6	48.7	18	6	0.0
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	48.1	12	10	48.1	12	10	0.0	yes	N/A	48.7	14	12	48.7	14	12	0.0
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.2	17	6	44.2	17	6	0.0	yes	N/A	44.8	25	8	44.8	26	8	0.0
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.8	17	0	43.8	17	0	0.0	yes	N/A	44.0	26	0	44.0	26	0	0.0
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	48.3	6	0	48.3	6	0	0.0	yes	N/A	48.8	7	0	48.8	7	0	0.0
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	42.3	3	1	41.7	3	1	-0.6	yes	N/A	43.2	3	1	42.7	4	1	-0.5
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	42.3	48	4	41.7	76	5	-0.6	yes	N/A	43.2	65	4	42.7	87	5	-0.5
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	41.7	295	1	40.5	76	1	-1.2	yes	N/A	42.1	284	1	40.9	303	1	-1.3
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	41.7	49	2	39.7	78	3	-1.9	yes	N/A	42.0	67	2	40.6	86	3	-1.5
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	0	43.0	0	1	0.0	yes	N/A	43.1	0	0	43.1	0	0	0.0
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	41.7	2	3	39.7	3	3	-1.9	yes	N/A	42.0	1	2	40.6	3	2	-1.4
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	41.6	50	0	39.4	82	0	-2.2	yes	N/A	42.0	69	0	40.4	97	0	-1.6
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.7	3	2	41.4	3	2	-0.3	yes	N/A	42.0	5	2	41.5	5	2	-0.5
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.6	0	1	43.6	0	1	0.0	yes	N/A	43.7	0	1	43.7	0	1	0.0
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	4	43.1	1	4	0.0	yes	N/A	43.1	2	3	43.1	2	3	0.0
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	2	43.1	0	2	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	41.6	51	3	39.4	85	4	-2.2	yes	N/A	42.0	70	4	40.4	102	8	-1.6
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	41.4	149	1	N/A	N/A	N/A	N/A	N/A	N/A	41.6	149	1	N/A	N/A	N/A	N/A
AW-475-LP-1	Pipe	42.4	25	AW-475	AW-480	N/A	N/A	N/A	38.7	83	5	-2.7	yes	N/A	N/A	N/A	N/A	39.3	102	6	-2.3
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-490	41.4	42	6	38.7	83	6	-2.7	yes	N/A	41.6	42	6	39.3	103	7	-2.3
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.2	110	1	N/A	N/A	N/A	N/A	N/A	N/A	40.3	110	1	N/A	N/A	N/A	N/A
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.2	44	6	38.4	84	6	-1.8	yes	N/A	40.3	44	6	38.8	105	7	-1.5
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.5	44	2	N/A	N/A	N/A	N/A	N/A	N/A	38.8	47	2	N/A	N/A	N/A	N/A
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.5	44	9	38.0	84	7	-0.6	yes	N/A	38.8	47	10	38.3	123	8	-0.5
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	41.3	23	7	41.3	23	7	0.0	yes	N/A	43.1	28	9	43.1	28	9	0.0
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	2	37.2	6	2	0.0	no	0.7	37.3	7	2	37.4	6	2	0.0
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.7	7	2	36.8	6	2	0.1	yes	N/A	36.8	7	2	36.9	6	2	0.1
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.0	7	2	36.4	6	2	0.4	yes	N/A	36.2	7	2	36.6	6	2	0.4
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.6	51	0	35.2	89	0	0.6	yes	N/A	35.4	53	0	35.7	110	0	0.2
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.6	51	2	35.1	90	0	0.5	yes	N/A	35.4	56	2	35.5	119	2	0.1
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.6	53	8	35.1	91	8	0.5	yes	N/A	35.4	60	9	35.5	151	10	0.1

Table A-5
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.0	54	1	33.2	92	1	0.1	yes	N/A	33.9	61	1	34.1	121	1	0.1
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.6	3	6	36.6	3	6	0.0	no	0.4	36.8	3	6	36.7	3	6	-0.1
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.0	28	0	33.1	22	0	0.1	yes	N/A	33.9	47	0	34.0	32	0	0.1
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.0	22	0	33.2	23	0	0.1	no	0.7	33.9	30	0	34.1	31	0	0.1
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.0	75	1	33.1	112	1	0.1	no	0.6	33.9	90	1	34.0	132	1	0.1
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.0	90	1	33.1	118	1	0.1	no	0.4	33.9	109	1	34.0	143	1	0.1
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.0	93	2	33.1	117	2	0.1	no	0.5	33.9	111	2	34.0	140	3	0.1
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.0	117	0	33.0	132	0	0.1	no	0.5	33.9	121	0	33.9	131	0	0.1
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.0	16	3	33.1	18	4	0.1	no	0.5	33.9	21	4	34.0	22	5	0.1
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.0	119	1	33.0	145	1	0.1	yes	N/A	33.9	130	1	33.9	156	1	0.1
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.0	114	2	33.0	139	2	0.1	yes	N/A	33.9	120	2	33.9	144	2	0.1
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	32.9	143	2	33.0	169	2	0.1	yes	N/A	33.8	177	2	33.9	197	3	0.1
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.5	2	3	48.5	2	3	0.0	yes	N/A	49.1	10	6	49.1	10	6	0.0
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.6	3	0	49.6	3	0	0.0	no	0.0	49.6	3	0	49.6	3	0	0.0
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.1	2	4	44.1	2	4	0.0	yes	N/A	46.4	10	6	46.4	10	6	0.0
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.1	26	11	44.1	26	11	0.0	no	0.4	44.3	27	11	44.3	27	11	0.0
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	41.0	12	7	41.0	12	7	0.0	yes	N/A	41.5	14	8	41.5	14	8	0.0
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	40.6	10	7	40.6	10	7	0.0	yes	N/A	41.1	16	9	41.1	16	9	0.0
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	6	34.1	11	6	0.0	no	0.1	34.5	11	6	34.5	11	6	0.0
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.0	61	1	33.1	61	1	0.1	yes	N/A	33.9	117	1	34.0	116	1	0.1
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.0	51	1	33.1	43	1	0.1	no	0.5	33.9	44	1	34.0	36	1	0.1
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.1	15	5	34.1	15	5	0.0	yes	N/A	34.3	17	5	34.3	17	5	0.0
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.1	146	0	34.1	146	0	0.0	yes	N/A	34.3	129	0	34.3	145	0	0.0
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.1	40	12	34.1	39	12	0.0	yes	N/A	34.3	34	11	34.3	34	10	0.0
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.0	45	0	33.0	45	0	0.0	yes	N/A	33.9	66	0	33.9	66	0	0.1
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	32.9	43	1	33.0	42	1	0.1	yes	N/A	33.8	60	1	33.9	60	1	0.1
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	46.0	3	0	46.0	3	0	0.0	yes	N/A	46.2	10	6	46.2	10	6	0.0
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	39.3	8	5	39.3	8	5	0.0	yes	N/A	42.8	17	9	42.8	17	9	0.0
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	40.3	5	7	40.3	5	7	0.0	yes	N/A	43.3	9	7	43.3	9	7	0.0
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	38.3	8	3	38.3	8	3	0.0	yes	N/A	39.8	19	5	39.8	19	5	0.0
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	38.0	8	4	38.0	8	4	0.0	yes	N/A	38.7	31	7	38.7	31	5	0.0
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.3	8	4	34.3	8	4	0.0	yes	N/A	35.6	18	5	35.6	18	5	0.0
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.1	10	3	34.1	10	3	0.0	yes	N/A	35.3	18	6	35.4	17	5	0.0
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	32.9	24	0	33.0	3	0	0.0	no	0.5	33.9	24	0	33.9	23	0	0.1
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	32.9	32	3	32.9	34	3	0.0	no	1.6	33.8	56	3	33.8	70	3	0.0
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	32.9	5	0	33.0	4	0	0.0	no	1.7	33.8	4	0	33.9	3	0	0.1
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	32.9	48	2	32.9	48	1	0.0	yes	N/A	33.8	73	2	33.8	81	2	0.0
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	32.9	46	0	32.9	46	0	0.0	yes	N/A	33.7	74	0	33.7	81	0	0.0
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	32.9	46	0	32.9	46	0	0.0	yes	N/A	33.7	74	0	33.7	82	0	0.0
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.6	0	0	51.6	0	0	0.0	no	0.6	51.9	9	0	51.9	9	0	0.0
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	0	35.1	0	0	0.0	yes	N/A	35.5	14	2	35.5	14	2	0.0
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.9	7	4	47.9	7	4	0.0	yes	N/A	50.5	23	8	50.5	23	8	0.0
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	40.0	34	7	40.0	34	7	0.0	yes	N/A	42.0	48	10	42.0	48	10	0.0
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	34	2	35.1	34	2	0.0	yes	N/A	35.5	48	3	35.5	48	3	0.0
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.9	9	7	46.9	9	7	0.0	yes	N/A	47.1	9	7	47.1	9	7	0.0
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.8	9	6	45.8	9	6	0.0	yes	N/A	46.7	15	8	46.7	15	8	0.0
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	9	2	35.1	9	2	0.0	yes	N/A	35.5	15	2	35.5	15	2	0.0
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.1	30	2	34.1	30	2	0.0	yes	N/A	34.3	52	2	34.3	52	2	0.0

Table A-5
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	26	3	35.1	26	3	0.0	yes	N/A	35.5	35	3	35.5	35	3	0.0
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	32.9	72	0	32.9	72	0	0.0	yes	N/A	33.7	103	0	33.7	103	0	0.0
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	32.9	208	1	32.9	233	1	0.0	yes	N/A	33.7	256	1	33.7	280	1	0.0
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	32.9	194	1	32.9	219	1	0.0	yes	N/A	33.7	227	1	33.7	252	1	0.0
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	33.5	4	1	33.5	4	1	0.0	yes	N/A	34.9	6	2	34.9	6	2	0.0
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	33.4	17	5	33.4	17	5	0.0	yes	N/A	34.8	17	5	34.8	17	5	0.0
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	32.9	203	0	32.9	228	0	0.0	no	1.2	33.7	226	0	33.7	250	0	0.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	32.9	165	1	32.9	184	1	0.0	no	0.9	33.7	258	1	33.7	280	1	0.0
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	32.9	157	1	32.9	176	1	0.0	yes	N/A	33.6	260	1	33.6	282	1	0.0
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	32.9	143	0	32.9	167	0	0.0	no	0.1	33.6	263	0	33.6	284	0	0.0

Indicates LOS deficiency
New conduits added as part of the alternative
Conduits removed as part of alternative

Table A-6

SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support

Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.6	4	68.6	4	0.0	0.6
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	68.2	4	68.2	4	0.0	0.2
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	67.2	7	67.2	7	0.0	no flooding
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	72.0	4	72.0	4	0.0	no flooding
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	63.0	4	63.0	4	0.0	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.8	10	62.8	10	0.0	no flooding
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	56.5	5	56.5	5	0.0	0.5
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	63.4	3	63.4	3	0.0	no flooding
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.9	7	51.9	7	0.0	no flooding
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.3	24	51.3	24	0.0	0.3
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.8	2	63.8	2	0.0	no flooding
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	54.7	6	54.7	6	0.0	no flooding
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.8	1	54.8	1	0.0	no flooding
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.7	3	54.7	3	0.0	0.6
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.7	7	54.7	7	0.0	no flooding
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.7	0	52.7	0	0.0	no flooding
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.0	1	53.0	1	0.0	no flooding
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.4	1	52.4	1	0.0	no flooding
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.4	11	52.4	11	0.0	no flooding
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.5	10	51.5	10	0.0	0.5
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	12	51.4	12	0.0	no flooding
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.1	10	51.1	10	0.0	no flooding
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	51.0	13	51.0	13	0.0	no flooding
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	21	50.6	21	0.0	0.6
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	21	50.0	21	-0.1	no flooding
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.5	27	49.4	21	-0.1	no flooding
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.1	22	49.1	23	-0.1	no flooding
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.2	8	49.1	8	-0.1	0.9
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	22	47.9	23	-0.1	no flooding
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	25	46.3	24	-0.2	no flooding
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	22	44.7	23	-0.3	no flooding
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	51.6	6	51.6	6	0.0	no flooding
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.5	0	52.5	0	0.0	no flooding
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	52.6	1	0.0	no flooding
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.1	7	51.1	7	0.0	no flooding
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.1	13	51.1	13	0.0	no flooding
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	14	48.6	14	0.0	no flooding
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.4	25	48.4	25	0.0	no flooding
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.4	19	48.4	19	0.0	no flooding
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.4	4	48.4	1	0.0	no flooding
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.4	1	48.4	2	0.0	no flooding
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.4	1	48.4	1	0.0	no flooding
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.4	4	48.4	2	0.0	no flooding
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.4	7	48.4	7	0.0	no flooding
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.6	2	49.6	2	0.0	no flooding
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.5	2	49.5	2	0.0	no flooding
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.5	3	48.5	3	0.0	no flooding
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	46.9	0	46.9	0	0.0	no flooding

Table A-6
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.6	23	45.4	23	-0.1	no flooding
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	43.6	24	42.2	24	-1.4	no flooding
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	46.9	0	46.9	0	0.0	no flooding
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	50.2	0	0.0	no flooding
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	46.9	0	46.9	0	0.0	no flooding
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	46.9	0	46.9	0	0.0	no flooding
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	46.9	11	46.9	11	0.0	no flooding
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.4	11	46.4	11	0.0	no flooding
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.4	11	46.4	11	0.0	no flooding
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.3	17	45.3	17	0.0	no flooding
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.3	19	45.3	11	0.0	no flooding
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.9	38	43.5	34	-0.5	no flooding
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.0	5	43.6	5	-0.4	no flooding
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	43.6	58	42.2	55	-1.4	no flooding
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	48.0	12	48.0	12	0.0	no flooding
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.6	7	47.6	7	0.0	no flooding
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.5	22	44.6	16	0.1	no flooding
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.9	21	43.5	17	-0.5	no flooding
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.5	2	47.5	2	0.0	no flooding
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	43.6	5	42.2	5	-1.4	0.1
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	43.6	69	42.2	84	-1.4	no flooding
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	37.4	0	0.0	no flooding
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	36.9	0	0.0	no flooding
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	36.8	0	0.0	no flooding
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	42.4	305	40.8	309	-1.6	no flooding
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	42.3	70	40.3	82	-2.0	no flooding
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	43.0	0	0.0	no flooding
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	42.3	2	40.3	2	-2.0	no flooding
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	42.3	74	40.1	88	-2.2	no flooding
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	42.3	1	41.3	1	-1.0	no flooding
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.3	0	43.3	0	0.0	no flooding
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	43.1	1	0.0	no flooding
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	43.1	0	0.0	no flooding
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	42.3	83	40.1	91	-2.2	no flooding
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	41.8	39	N/A	N/A	N/A	N/A
AW-475-LP-1	Pipe	42.4	25	AW-475	AW-480	N/A	N/A	39.1	91	-2.7	no flooding
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-490	41.8	48	39.1	91	-2.7	no flooding
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.5	29	N/A	N/A	N/A	N/A
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.5	46	38.7	91	-1.8	no flooding
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	39.0	42	38.2	N/A	N/A	N/A
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	39.0	48	38.2	91	-0.7	no flooding
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	40.3	19	40.3	20	0.0	no flooding
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	37.1	6	0.0	0.6
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.8	7	36.8	6	0.0	no flooding
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.2	7	36.5	6	0.3	no flooding
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	35.4	55	35.5	97	0.1	no flooding
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	35.4	56	35.4	111	0.0	no flooding
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	35.4	57	35.4	147	0.0	0.2

Table A-6
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.9	59	34.0	114	0.1	no flooding
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.8	3	36.5	3	-0.3	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.9	50	34.0	22	0.0	no flooding
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.9	23	34.0	15	0.1	1.5
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.9	79	34.0	100	0.0	1.5
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.9	104	33.9	125	0.0	1.2
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.9	100	33.9	123	0.0	1.4
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.9	95	33.9	113	0.0	1.4
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.9	14	33.9	16	0.0	1.4
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.9	96	33.9	124	0.0	0.4
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.9	93	33.9	121	0.0	0.8
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	33.8	117	33.8	142	0.0	no flooding
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.7	4	48.7	4	0.0	no flooding
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.3	1	49.3	1	0.0	no flooding
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.4	4	44.4	4	0.0	no flooding
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.0	26	44.0	26	0.0	0.3
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.4	4	40.4	4	0.0	no flooding
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	39.9	4	0.0	no flooding
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	34.1	11	0.0	0.1
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.9	58	33.9	58	0.0	0.4
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.9	39	33.9	33	0.0	1.4
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.3	18	34.2	18	-0.2	no flooding
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.3	19	34.1	21	-0.2	no flooding
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.3	26	34.1	24	-0.2	no flooding
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.9	27	33.9	35	0.0	no flooding
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	33.8	32	33.8	34	0.0	no flooding
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.9	2	45.9	2	0.0	no flooding
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.3	4	38.3	4	0.0	no flooding
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	39.8	2	0.0	no flooding
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.8	4	37.8	4	0.0	no flooding
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.6	4	37.6	4	0.0	no flooding
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.4	4	34.4	4	0.0	no flooding
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.3	7	34.3	7	0.1	no flooding
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	33.8	74	33.9	2	0.1	1.4
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	33.8	55	33.8	62	0.0	2.5
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	33.8	3	33.9	3	0.0	2.6
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	33.8	60	33.8	67	0.0	no flooding
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	33.7	58	33.7	68	0.0	no flooding
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	33.7	238	33.7	68	0.0	no flooding
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.5	0	51.5	0	0.0	0.5
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	35.1	0	0.0	no flooding
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.0	0	47.0	0	0.0	no flooding
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.8	16	38.8	16	0.0	no flooding
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	16	35.1	16	0.0	no flooding
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	47.1	8	47.1	8	0.0	0.1
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	46.2	12	46.2	12	0.0	no flooding
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	12	35.1	12	0.0	no flooding
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.3	28	34.2	29	-0.2	no flooding

Table A-6

SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support

Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2B

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	11	35.1	11	0.0	no flooding
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	33.7	55	33.7	54	0.0	no flooding
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	33.7	164	33.7	189	0.0	no flooding
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	33.7	155	33.7	180	0.0	no flooding
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	34.4	5	34.4	5	0.0	no flooding
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	34.4	17	34.4	17	0.0	no flooding
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	33.7	328	33.7	192	0.0	2.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	33.7	175	33.7	228	0.0	1.7
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	33.7	217	33.7	228	0.0	0.7
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	33.7	#N/A	33.7	228	0.0	0.9

Denotes 0.5 feet of flooding or greater

New conduits added as part of the alternative

Conduits removed as part of alternative

Table A-7
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	66.8	1	0	66.8	1	0	0.0	yes	N/A	67.3	5	4	67.3	5	4	0.0	yes	N/A
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	66.6	1	0	66.6	1	0	0.0	yes	N/A	67.1	3	3	67.1	3	3	0.0	yes	N/A
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	61.7	2	3	61.7	2	3	0.0	yes	N/A	65.2	6	5	65.2	6	5	0.0	yes	N/A
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	70.3	0	0	70.3	0	0	0.0	yes	N/A	71.1	0	0	71.1	0	0	0.0	yes	N/A
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	61.6	0	0	61.6	0	0	0.0	yes	N/A	62.0	1	2	62.0	1	2	0.0	yes	N/A
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	58.7	2	3	58.7	2	3	0.0	yes	N/A	61.1	8	6	61.1	8	6	0.0	yes	N/A
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	53.8	1	0	53.8	1	0	0.0	yes	N/A	54.2	4	5	54.2	4	5	0.0	yes	N/A
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	61.0	0	0	61.0	0	0	0.0	yes	N/A	61.6	0	0	61.6	0	0	0.0	yes	N/A
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.8	4	0	51.8	4	0	0.0	yes	N/A	51.9	6	0	51.9	6	0	0.0	yes	N/A
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	49.6	6	1	49.6	6	1	0.0	yes	N/A	50.7	9	1	50.7	9	1	0.0	yes	N/A
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.9	3	0	63.9	3	0	0.0	yes	N/A	64.0	6	0	64.0	6	0	0.0	yes	N/A
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	52.8	0	0	52.8	0	0	0.0	yes	N/A	53.5	0	1	53.5	0	1	0.0	yes	N/A
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.3	2	4	54.3	2	4	0.0	yes	N/A
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.5	4	4	54.5	4	4	0.0	no	0.4	54.9	6	4	54.9	6	4	0.0	no	0.8
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.2	3	4	54.2	3	4	0.0	yes	N/A
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.8	0	1	52.8	0	1	0.0	yes	N/A	52.9	0	1	52.9	0	1	0.0	yes	N/A
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.1	1	2	53.1	1	2	0.0	yes	N/A	53.1	1	3	53.1	1	3	0.0	yes	N/A
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.2	2	1	52.2	2	1	0.0	yes	N/A	52.5	3	1	52.5	3	1	0.0	yes	N/A
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.2	7	0	52.2	7	0	0.0	yes	N/A	52.5	14	4	52.5	14	4	0.0	yes	N/A
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	49.9	8	4	49.9	8	4	0.0	yes	N/A	51.5	10	4	51.5	10	4	0.0	no	0.4
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	49.7	8	4	49.7	8	4	0.0	yes	N/A	51.1	10	4	51.1	10	4	0.0	yes	N/A
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	49.2	8	3	49.2	8	3	0.0	yes	N/A	50.5	10	3	50.5	10	3	0.0	yes	N/A
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	49.6	9	2	49.6	9	2	0.0	yes	N/A	50.6	12	3	50.6	12	3	0.0	yes	N/A
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	48.5	14	3	48.5	14	3	0.0	yes	N/A	49.6	16	3	49.6	16	3	0.0	yes	N/A
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	48.0	14	3	48.0	14	3	0.0	yes	N/A	49.1	16	3	49.1	16	3	0.0	yes	N/A
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	47.6	15	3	47.6	15	3	0.0	yes	N/A	48.6	16	3	48.6	16	3	0.0	yes	N/A
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	47.3	21	4	47.3	21	4	0.0	yes	N/A	48.3	22	4	48.3	22	4	0.0	yes	N/A
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	47.3	9	6	47.3	9	6	0.0	yes	N/A	48.3	9	6	48.3	9	6	0.0	no	0.1
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	46.4	21	4	46.4	21	4	0.0	yes	N/A	47.2	22	4	47.2	22	4	0.0	yes	N/A
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	45.2	24	5	45.3	24	6	0.0	yes	N/A	45.9	24	5	45.9	24	5	0.0	yes	N/A
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	44.1	22	4	44.1	22	4	0.0	yes	N/A	44.6	22	5	44.6	22	4	0.0	yes	N/A
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	52.4	8	5	52.4	8	5	0.0	yes	N/A	52.7	9	5	52.7	9	5	0.0	yes	N/A
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.6	1	2	52.6	1	2	0.0	yes	N/A	52.7	1	2	52.7	1	2	0.0	yes	N/A
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	3	52.6	1	3	0.0	yes	N/A	52.6	1	3	52.6	1	3	0.0	yes	N/A
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.5	10	0	51.5	10	0	0.0	yes	N/A	51.8	14	0	51.8	14	0	0.0	yes	N/A
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.5	14	8	51.5	14	8	0.0	yes	N/A	51.8	19	10	51.8	19	10	0.0	yes	N/A
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	15	0	48.6	15	0	0.0	yes	N/A	49.0	19	0	49.0	19	0	0.0	yes	N/A
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.5	25	0	48.5	25	0	0.0	yes	N/A	48.9	25	0	48.9	25	0	0.0	yes	N/A
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.5	21	7	48.5	21	7	0.0	yes	N/A	48.9	26	8	48.9	26	8	0.0	yes	N/A
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.5	1	3	48.5	1	3	0.0	yes	N/A	49.0	2	2	49.0	2	2	0.0	yes	N/A
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.5	2	1	48.5	2	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.5	1	1	48.5	1	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.5	2	2	48.5	2	2	0.0	yes	N/A	49.0	3	1	49.0	3	1	0.0	yes	N/A
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.5	6	2	48.5	6	2	0.0	yes	N/A	49.0	8	2	49.0	8	2	0.0	yes	N/A
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.9	2	2	49.9	2	2	0.0	yes	N/A	50.7	3	3	50.7	3	3	0.0	yes	N/A
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.7	3	3	49.7	3	3	0.0	yes	N/A	50.1	4	4	50.1	4	4	0.0	yes	N/A
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.7	4	4	48.7	4	4	0.0	yes	N/A	48.9	6	4	48.9	6	4	0.0	yes	N/A
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.8	25	0	45.8	25	0	0.0	yes	N/A	46.1	32	0	46.1	32	0	0.0	yes	N/A
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	40.9	26	0	40.6	26	0	-0.2	yes	N/A	41.7	36	0	41.2	36	0	-0.5	yes	N/A
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	1	50.2	0	1	0.0	yes	N/A	50.2	0	1	50.2	0	1	0.0	yes	N/A
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.5	0	1	47.5	0	1	0.0	yes	N/A

Table A-7
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	47.0	1	2	47.0	1	2	0.0	yes	N/A	47.5	2	2	47.5	2	2	0.0	yes	N/A
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	47.0	12	4	47.0	12	4	0.0	yes	N/A	47.5	16	5	47.5	16	5	0.0	yes	N/A
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.5	12	2	46.5	12	2	0.0	yes	N/A	46.7	16	2	46.7	16	2	0.0	yes	N/A
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.5	12	4	46.5	12	4	0.0	yes	N/A	46.7	17	5	46.7	17	5	0.0	yes	N/A
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.4	18	3	45.4	18	3	0.0	yes	N/A	46.0	20	3	46.0	20	3	0.0	yes	N/A
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.4	12	5	45.4	12	5	0.0	yes	N/A	46.0	17	6	46.0	17	6	0.0	yes	N/A
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.2	31	2	43.2	31	2	0.0	yes	N/A	43.5	37	2	43.5	37	2	0.0	yes	N/A
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	43.2	6	2	43.2	6	2	0.0	yes	N/A	43.6	9	3	43.6	9	3	0.0	yes	N/A
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	40.9	42	0	40.6	42	0	-0.2	yes	N/A	41.7	53	0	41.2	53	0	-0.5	yes	N/A
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.1	3	3	47.1	3	3	0.0	yes	N/A	47.4	6	4	47.4	6	4	0.0	yes	N/A
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.2	3	4	47.2	3	4	0.0	yes	N/A	47.6	7	6	47.6	7	6	0.0	yes	N/A
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	43.4	6	5	43.4	6	5	0.0	yes	N/A	43.9	10	5	43.9	10	5	0.0	yes	N/A
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.2	10	0	43.2	10	0	0.0	yes	N/A	43.5	11	0	43.5	11	0	0.0	yes	N/A
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.8	4	0	47.8	4	0	0.0	yes	N/A	48.0	5	0	48.0	5	0	0.0	yes	N/A
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	40.9	3	1	40.6	3	1	-0.2	yes	N/A	41.7	3	1	41.2	3	1	-0.5	yes	N/A
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	40.9	38	3	40.6	51	4	-0.3	yes	N/A	41.7	41	4	41.2	59	4	-0.5	yes	N/A
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0	yes	N/A
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0	yes	N/A
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0	yes	N/A
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	40.6	96	1	40.1	51	1	-0.5	yes	N/A	41.3	290	1	40.5	59	1	-0.8	yes	N/A
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	40.5	37	2	39.0	52	3	-1.5	yes	N/A	41.3	41	2	40.2	59	3	-1.1	yes	N/A
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	41.9	0	0	41.8	0	0	-0.1	yes	N/A	42.7	0	0	42.7	0	0	0.0	yes	N/A
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	40.5	2	3	39.0	1	2	-1.5	yes	N/A	41.3	2	3	40.2	2	2	-1.1	yes	N/A
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	40.5	39	0	38.7	55	0	-1.7	yes	N/A	41.2	41	0	40.1	63	0	-1.2	yes	N/A
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.2	1	1	41.2	1	1	0.0	yes	N/A	41.3	2	2	41.3	2	2	0.0	yes	N/A
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.4	0	1	43.4	0	1	0.0	yes	N/A	43.5	0	1	43.5	0	1	0.0	yes	N/A
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.0	1	4	43.0	1	4	0.0	yes	N/A	43.1	1	3	43.1	1	3	0.0	yes	N/A
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.0	0	2	43.0	0	2	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0	yes	N/A
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	40.5	41	2	38.7	55	3	-1.7	yes	N/A	41.2	42	2	40.1	67	3	-1.2	yes	N/A
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	40.3	73	1	N/A	N/A	N/A	N/A	N/A	N/A	41.1	127	1	N/A	N/A	N/A	N/A	N/A	N/A
AW-475-LP-1	Pipe	42.4	25	AW-475	AW-476	N/A	N/A	N/A	38.6	58	6	-1.7	yes	N/A	N/A	N/A	N/A	39.8	64	6	-1.4	yes	N/A
AW-476-LP-1	Pipe	41.0	25	AW-476	AW-477	N/A	N/A	N/A	38.4	56	6	-1.9	yes	N/A	N/A	N/A	N/A	39.1	64	6	-2.0	yes	N/A
AW-477-LP-1	Pipe	42.0	25	AW-477	AW-525	N/A	N/A	N/A	37.5	55	6	N/A	yes	N/A	N/A	N/A	N/A	38.0	64	6	N/A	yes	N/A
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	40.3	40	6	36.4	0	1	-4.0	yes	N/A	41.1	42	6	36.4	1	1	-4.7	yes	N/A
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	39.2	40	1	35.7	1	1	-3.5	yes	N/A	39.8	42	1	36.4	1	1	-3.4	yes	N/A
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	39.2	40	6	35.7	1	2	-3.5	yes	N/A	39.7	42	6	35.8	2	2	-3.9	yes	N/A
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.1	40	2	35.6	2	2	-2.6	yes	N/A	38.4	42	2	35.7	6	2	-2.7	yes	N/A
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.1	40	9	35.6	2	2	-2.6	yes	N/A	38.3	42	9	35.7	3	2	-2.6	yes	N/A
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	39.8	12	4	39.8	12	4	0.0	yes	N/A	40.3	20	6	40.3	20	6	0.0	yes	N/A
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	36.8	7	2	36.8	6	2	0.0	no	0.3	37.1	7	2	37.1	6	2	0.0	no	0.6
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.6	7	2	36.6	6	2	0.1	yes	N/A	36.7	7	2	36.7	6	2	0.1	yes	N/A
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	35.9	7	2	36.0	6	2	0.1	yes	N/A	35.9	7	2	36.2	6	2	0.3	yes	N/A
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.3	46	0	34.3	61	0	0.0	yes	N/A	34.5	48	0	34.6	69	0	0.1	yes	N/A
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.2	46	2	34.1	61	2	-0.1	yes	N/A	34.4	49	0	34.4	70	2	0.1	yes	N/A
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.2	47	7	34.1	61	7	-0.1	yes	N/A	34.4	50	8	34.4	71	7	0.1	yes	N/A
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	31.7	47	1	31.8	62	1	0.2	yes	N/A	32.3	50	1	32.4	71	1	0.1	yes	N/A
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.3	2	4	36.4	2	4	0.0	no	0.1	36.5	3	6	36.5	3	6	0.0	no	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	31.9	8	0	32.0	10	0	0.1	yes	N/A	32.4	16	0	32.5	16	0	0.2	yes	N/A
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	31.7	7	0	31.8	7	0	0.2	yes	N/A	32.3	16	0	32.4	17	0	0.1	yes	N/A
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	31.5	52	1	31.6	65	1	0.1	yes	N/A	32.2	66	1	32.3	86	1	0.1	yes	N/A
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	31.5	55	1	31.6	68	1	0.1	yes	N/A	32.2	74	1	32.3	92	1	0.1	yes	N/A
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	31.4	56	2	31.5	69	2	0.1	yes	N/A	32.2	76	2	32.2	93	2	0.1	yes	N/A
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	31.4	69	0	31.4	78	0	0.1	yes	N/A	32.1	90	0	32.2	108	0	0.1	yes	N/A

Table A-7
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	31.4	7	2	31.5	9	2	0.1	yes	N/A	32.2	13	3	32.2	15	3	0.1	yes	N/A
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	31.4	70	1	31.4	79	1	0.0	yes	N/A	32.1	93	1	32.2	106	1	0.1	yes	N/A
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	31.4	70	1	31.4	80	1	0.0	yes	N/A	32.1	94	1	32.2	103	2	0.1	yes	N/A
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	31.4	92	2	31.4	100	2	0.0	yes	N/A	32.1	122	2	32.2	132	2	0.0	yes	N/A
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	47.3	0	2	47.3	0	2	0.0	yes	N/A	48.2	0	2	48.2	0	2	0.0	yes	N/A
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.5	2	0	49.5	2	0	0.0	yes	N/A	49.5	2	0	49.5	2	0	0.0	yes	N/A
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	43.6	0	2	43.6	0	2	0.0	yes	N/A	43.9	1	2	43.9	1	2	0.0	yes	N/A
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	42.4	16	8	42.4	16	8	0.0	yes	N/A	43.9	25	10	43.9	25	10	0.0	no	0.2
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.6	6	4	40.6	6	4	0.0	yes	N/A	40.8	9	6	40.8	9	6	0.0	yes	N/A
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	5	39.9	4	5	0.0	yes	N/A	40.3	7	6	40.3	7	6	0.0	yes	N/A
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	33.5	10	6	33.5	10	6	0.0	yes	N/A	33.8	11	6	33.8	11	6	0.0	yes	N/A
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	31.4	23	1	31.5	22	1	0.1	yes	N/A	32.2	34	1	32.2	34	1	0.1	yes	N/A
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	31.4	17	1	31.5	17	1	0.1	yes	N/A	32.2	34	1	32.2	34	1	0.1	yes	N/A
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	33.4	20	6	33.4	20	6	0.0	yes	N/A	33.8	15	5	33.9	15	5	0.1	yes	N/A
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	32.9	32	0	32.8	31	0	0.0	yes	N/A	33.7	111	0	33.8	123	0	0.1	yes	N/A
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	32.9	36	10	32.8	35	9	0.0	yes	N/A	33.7	38	12	33.8	37	12	0.1	yes	N/A
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	31.4	31	0	31.4	31	0	0.0	yes	N/A	32.1	37	0	32.2	37	0	0.0	yes	N/A
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	31.4	29	1	31.4	29	1	0.0	yes	N/A	32.1	36	1	32.2	36	1	0.0	yes	N/A
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.4	0	0	45.4	0	0	0.0	yes	N/A	45.8	1	0	45.8	1	0	0.0	yes	N/A
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.1	3	2	38.1	3	2	0.0	yes	N/A	38.4	4	3	38.4	4	3	0.0	yes	N/A
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	5	39.8	2	5	0.0	yes	N/A	40.1	4	6	40.1	4	6	0.0	yes	N/A
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.5	3	2	37.5	3	2	0.0	yes	N/A	37.7	4	3	37.7	4	3	0.0	yes	N/A
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.4	3	3	37.4	3	3	0.0	yes	N/A	37.5	4	3	37.5	4	3	0.0	yes	N/A
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	33.7	3	3	33.7	3	3	0.0	yes	N/A	33.9	4	3	33.9	4	3	0.0	yes	N/A
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	33.1	2	1	33.1	2	1	0.0	yes	N/A	33.5	5	2	33.5	5	2	0.0	yes	N/A
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	31.4	4	0	31.4	4	0	0.0	yes	N/A	32.1	26	0	32.1	24	0	0.0	yes	N/A
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	31.3	24	13	31.3	25	13	0.0	yes	N/A	32.1	29	3	32.1	29	3	0.0	no	0.8
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	31.4	5	0	31.4	5	0	0.0	no	0.1	32.1	5	0	32.1	5	0	0.0	no	0.8
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	31.3	47	2	31.3	46	2	0.0	yes	N/A	32.1	36	2	32.1	37	2	0.0	yes	N/A
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	31.3	46	0	31.3	48	0	0.0	yes	N/A	32.1	37	0	32.1	37	0	0.0	yes	N/A
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	31.3	45	0	31.3	43	0	0.0	yes	N/A	32.1	37	0	32.1	38	0	0.0	yes	N/A
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.1	0	0	51.1	0	0	0.0	no	0.1	51.4	0	0	51.4	0	0	0.0	no	0.4
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	34.7	0	0	34.7	0	0	0.0	yes	N/A	34.9	0	0	34.9	0	0	0.0	yes	N/A
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.1	1	2	47.1	1	2	0.0	yes	N/A	47.2	1	2	47.2	1	2	0.0	yes	N/A
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.9	15	4	38.9	15	4	0.0	yes	N/A	39.3	23	5	39.3	23	5	0.0	yes	N/A
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	34.6	15	2	34.6	15	2	0.0	yes	N/A	34.8	23	2	34.8	23	2	0.0	yes	N/A
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.3	4	0	46.3	4	0	0.0	yes	N/A	46.5	8	7	46.5	8	7	0.0	yes	N/A
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.2	4	4	45.2	4	4	0.0	yes	N/A	45.7	8	5	45.7	8	5	0.0	yes	N/A
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	34.6	4	2	34.6	4	2	0.0	yes	N/A	34.8	8	2	34.8	8	2	0.0	yes	N/A
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	33.4	16	1	33.4	16	1	0.0	yes	N/A	33.8	22	2	33.9	22	2	0.1	yes	N/A
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	34.7	15	3	34.7	15	3	0.0	yes	N/A	34.9	21	3	34.9	21	3	0.0	yes	N/A
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	31.3	32	0	31.3	31	0	0.0	yes	N/A	32.1	53	0	32.1	52	0	0.0	yes	N/A
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	31.3	106	1	31.3	116	1	0.0	yes	N/A	32.1	154	1	32.1	172	1	0.0	yes	N/A
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	31.3	103	1	31.3	114	1	0.0	yes	N/A	32.1	149	1	32.1	167	1	0.0	yes	N/A
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	32.2	3	1	32.2	3	1	0.0	yes	N/A	32.8	4	1	32.8	4	1	0.0	yes	N/A
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	32.1	13	4	32.1	13	4	0.0	yes	N/A	32.6	16	5	32.6	16	5	0.0	yes	N/A
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	31.3	106	0	31.3	117	0	0.0	yes	N/A	32.1	162	0	32.1	179	0	0.0	no	0.4
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	31.3	143	1	31.3	151	1	0.0	yes	N/A	32.1	161	1	32.1	172	1	0.0	no	0.1
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	31.3	142	1	31.3	150	1	0.0	yes	N/A	32.1	155	1	32.1	165	1	0.0	yes	N/A
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	31.3	126	0	31.3	134	0	0.0	yes	N/A	32.1	137	0	32.1	154	0	0.0	yes	N/A

Indicates LOS deficiency
New conduits added as part of the alternative

Table A-7
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.3	5	4	68.3	5	4	0.0	no	0.3	70.0	5	4	70.0	5	4	0.0
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	67.9	4	3	67.9	4	3	0.0	yes	N/A	69.5	4	4	69.5	4	4	0.0
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	66.9	7	6	66.9	7	6	0.0	yes	N/A	68.3	7	6	68.3	7	6	0.0
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	71.7	1	0	71.7	1	0	0.0	yes	N/A	72.1	6	5	72.1	6	5	0.0
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	62.5	4	3	62.5	4	3	0.0	yes	N/A	63.1	5	4	63.1	5	4	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.3	9	8	62.3	9	8	0.0	yes	N/A	62.9	10	8	62.9	10	8	0.0
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	55.8	4	6	55.8	4	6	0.0	yes	N/A	56.4	5	6	56.4	5	6	0.0
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	62.3	0	0	62.3	0	0	0.0	yes	N/A	63.1	1	0	63.1	1	0	0.0
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	52.0	9	0	52.0	9	0	0.0	yes	N/A	52.1	14	4	52.1	14	4	0.0
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.1	21	2	51.1	21	2	0.0	no	0.1	51.6	27	2	51.6	27	2	0.0
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	64.0	7	9	64.0	7	9	0.0	yes	N/A	64.1	8	11	64.1	8	11	0.0
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	53.9	1	2	53.9	1	2	0.0	yes	N/A	54.3	3	2	54.3	3	2	0.0
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.6	3	4	54.6	3	4	0.0	yes	N/A	55.3	4	5	55.3	4	5	0.0
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	55.3	8	5	55.3	8	5	0.0	no	1.2	55.6	9	6	55.6	9	6	0.0
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.3	4	4	54.3	4	4	0.0	yes	N/A	54.4	4	5	54.4	4	5	0.0
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.9	1	1	52.9	1	1	0.0	yes	N/A	53.0	1	1	53.0	1	1	0.0
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.2	2	3	53.2	2	3	0.0	yes	N/A	53.3	2	3	53.3	2	3	0.0
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.7	3	1	52.7	3	1	0.0	yes	N/A	52.9	5	1	52.9	5	1	0.0
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.7	16	5	52.7	16	5	0.0	no	0.2	52.9	15	5	52.9	15	5	0.0
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.6	10	4	51.6	10	4	0.0	no	0.5	51.7	11	4	51.7	11	4	0.0
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	15	4	51.4	15	4	0.0	yes	N/A	51.6	15	4	51.6	15	4	0.0
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.0	10	3	51.0	10	3	0.0	yes	N/A	51.3	9	3	51.3	9	3	0.0
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	50.9	11	3	50.9	11	3	0.0	yes	N/A	51.2	14	3	51.2	14	3	0.0
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	17	3	50.6	17	3	0.0	no	0.6	51.0	21	4	51.0	21	4	0.0
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	17	3	50.0	17	3	0.0	yes	N/A	50.6	21	4	50.6	21	4	0.0
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.6	17	3	49.6	17	3	0.0	yes	N/A	50.3	21	4	50.3	21	4	0.0
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.2	23	5	49.2	23	5	0.0	yes	N/A	50.2	24	5	50.2	24	5	0.0
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.3	9	5	49.3	9	5	0.0	no	1.1	50.4	13	5	50.4	13	5	0.0
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	23	5	48.1	23	5	0.0	yes	N/A	48.9	24	5	48.9	24	5	0.0
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	24	5	46.5	24	5	0.0	yes	N/A	47.1	24	5	47.1	25	5	0.0
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	23	5	45.0	23	5	0.0	yes	N/A	45.4	24	5	45.4	24	5	0.0
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	53.0	9	5	53.0	9	5	0.0	yes	N/A	53.3	9	5	53.3	9	5	0.0
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	53.0	1	2	53.0	1	2	0.0	yes	N/A	53.3	2	2	53.3	2	2	0.0
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.7	2	3	52.7	2	3	0.0	yes	N/A	52.8	2	3	52.8	2	3	0.0
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	52.2	18	0	52.2	18	0	0.0	no	0.2	52.7	23	0	52.7	23	0	0.0
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	52.2	19	11	52.2	19	11	0.0	yes	N/A	52.7	19	11	52.7	19	11	0.0
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	49.3	19	0	49.3	19	0	0.0	yes	N/A	50.0	20	2	50.0	20	2	0.0
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	49.3	25	0	49.3	25	0	0.0	yes	N/A	50.0	26	0	50.0	26	0	0.0
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	49.3	30	8	49.3	30	8	0.0	yes	N/A	50.0	37	9	50.0	37	9	0.0
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	1	50.2	3	1	0.0
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.3	8	2	50.3	8	2	0.0
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	2	50.2	3	2	0.0
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	49.4	4	1	49.4	4	1	0.0	yes	N/A	50.1	7	2	50.1	7	2	0.0
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	49.4	8	2	49.4	8	2	0.0	yes	N/A	50.2	10	2	50.2	10	2	0.0
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	51.6	4	4	51.6	4	4	0.0	yes	N/A	52.6	5	4	52.6	5	4	0.0
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	50.6	5	5	50.6	5	5	0.0	yes	N/A	52.0	8	7	52.0	8	7	0.0

Table A-7
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	49.1	8	4	49.1	8	4	0.0	yes	N/A	49.5	12	5	49.5	12	5	0.0
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.5	1	1	47.5	1	1	0.0	yes	N/A	47.7	1	1	47.7	1	1	0.0
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	46.2	38	0	46.2	38	0	0.0	yes	N/A	46.3	49	0	46.4	49	0	0.1
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	42.3	46	0	41.9	46	0	-0.4	yes	N/A	43.2	57	0	43.0	58	0	-0.2
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.5	0	1	47.5	0	1	0.0	yes	N/A	47.7	0	1	47.7	0	1	0.0
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.3	0	2	50.3	0	2	0.0	yes	N/A	50.4	0	2	50.4	0	2	0.0
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	48.2	0	1	48.2	0	1	0.0	yes	N/A	49.2	0	1	49.2	0	1	0.0
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	48.2	2	2	48.2	2	2	0.0	yes	N/A	49.2	3	3	49.2	3	3	0.0
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	48.2	19	6	48.2	19	6	0.0	yes	N/A	49.2	24	8	49.2	24	8	0.0
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.9	19	2	46.9	19	2	0.0	yes	N/A	47.3	29	2	47.3	29	2	0.0
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.9	19	5	46.9	19	5	0.0	yes	N/A	47.3	29	6	47.3	29	6	0.0
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	46.0	20	3	45.9	20	3	0.0	yes	N/A	46.2	29	3	46.2	29	3	0.0
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	46.0	24	7	45.9	23	8	0.0	yes	N/A	46.2	23	7	46.2	23	7	0.0
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.8	42	2	43.8	42	2	0.0	yes	N/A	44.0	53	2	44.0	53	2	0.0
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.1	12	4	44.1	12	4	0.0	yes	N/A	44.3	13	4	44.3	12	4	0.0
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	42.3	64	0	41.9	64	0	-0.4	yes	N/A	43.2	76	0	43.0	76	0	-0.2
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.9	11	5	47.9	11	5	0.0	yes	N/A	48.7	18	6	48.7	18	6	0.0
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	48.1	12	10	48.1	12	10	0.0	yes	N/A	48.7	14	12	48.7	14	12	0.0
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.2	17	6	44.2	17	6	0.0	yes	N/A	44.8	25	8	44.8	26	8	0.0
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.8	17	0	43.8	17	0	0.0	yes	N/A	44.0	26	0	44.0	26	0	0.0
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	48.3	6	0	48.3	6	0	0.0	yes	N/A	48.8	7	0	48.8	7	0	0.0
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	42.3	3	1	41.9	3	1	-0.4	yes	N/A	43.2	3	1	43.0	3	1	-0.2
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	42.3	48	4	41.9	65	4	-0.4	yes	N/A	43.2	65	4	43.0	69	4	-0.2
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	41.7	295	1	41.0	306	1	-0.7	yes	N/A	42.1	284	1	41.8	306	1	-0.3
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	41.7	49	2	40.8	65	3	-0.8	yes	N/A	42.0	67	2	41.7	71	3	-0.4
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	0	43.0	0	0	0.0	yes	N/A	43.1	0	0	43.1	0	0	0.0
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	41.7	2	3	40.8	3	2	-0.8	yes	N/A	42.0	1	2	41.7	1	2	-0.4
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	41.6	50	0	40.8	66	0	-0.9	yes	N/A	42.0	69	0	41.7	73	0	-0.4
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.7	3	2	41.4	3	2	-0.3	yes	N/A	42.0	5	2	41.7	5	2	-0.4
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.6	0	1	43.6	0	1	0.0	yes	N/A	43.7	0	1	43.7	0	1	0.0
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	4	43.1	1	4	0.0	yes	N/A	43.1	2	3	43.1	2	3	0.0
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	2	43.1	0	2	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	41.6	51	3	40.8	67	3	-0.9	yes	N/A	42.0	70	4	41.7	73	8	-0.4
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	41.4	149	1	N/A	N/A	N/A	N/A	N/A	N/A	41.6	149	1	N/A	N/A	N/A	N/A
AW-475-LP-1	Pipe	42.4	25	AW-475	AW-476	N/A	N/A	N/A	40.4	67	6	-1.0	yes	N/A	N/A	N/A	N/A	41.2	73	6	-0.4
AW-476-LP-1	Pipe	41.0	25	AW-476	AW-477	N/A	N/A	N/A	39.7	67	6	-1.7	yes	N/A	N/A	N/A	N/A	40.4	73	6	-1.2
AW-477-LP-1	Pipe	42.0	25	AW-477	AW-525	N/A	N/A	N/A	38.2	67	7	N/A	yes	N/A	N/A	N/A	N/A	38.5	73	7	N/A
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	41.4	42	6	36.5	1	1	-5.0	yes	N/A	41.6	42	6	36.5	1	1	-5.1
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.2	110	1	35.9	2	1	-4.3	yes	N/A	40.3	110	1	36.0	2	1	-4.3
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.2	44	6	35.9	2	2	-4.3	yes	N/A	40.3	44	6	36.0	4	2	-4.3
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.5	44	2	35.8	6	2	-2.8	yes	N/A	38.8	47	2	35.9	5	2	-2.9
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.5	44	9	35.8	4	1	-2.8	yes	N/A	38.8	47	10	35.9	5	1	-2.9
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	41.3	23	7	41.3	23	7	0.0	yes	N/A	43.1	28	9	43.1	28	9	0.0

Table A-7
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	2	37.2	6	2	0.0	no	0.7	37.3	7	2	37.3	6	2	0.0
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.7	7	2	36.8	6	2	0.1	yes	N/A	36.8	7	2	36.8	6	2	0.0
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.0	7	2	36.2	6	2	0.3	yes	N/A	36.2	7	2	36.3	6	2	0.1
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.6	51	0	34.8	73	0	0.1	yes	N/A	35.4	53	0	35.1	79	0	-0.3
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.6	51	2	34.6	74	2	0.1	yes	N/A	35.4	56	2	35.0	83	2	-0.4
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.6	53	8	34.6	77	7	0.1	yes	N/A	35.4	60	9	35.0	88	8	-0.4
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.0	54	1	33.1	77	1	0.1	yes	N/A	33.9	61	1	34.0	89	1	0.0
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.6	3	6	36.6	3	6	0.0	no	0.4	36.8	3	6	36.7	3	6	-0.1
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.0	28	0	33.1	21	0	0.0	yes	N/A	33.9	47	0	34.0	30	0	0.0
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.0	22	0	33.1	22	0	0.1	no	0.6	33.9	30	0	34.0	31	0	0.0
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.0	75	1	33.1	98	1	0.1	no	0.6	33.9	90	1	34.0	116	1	0.0
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.0	90	1	33.0	110	1	0.0	no	0.3	33.9	109	1	33.9	131	1	0.0
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.0	93	2	33.0	112	2	0.0	no	0.5	33.9	111	2	33.9	127	3	0.0
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.0	117	0	33.0	130	0	0.0	no	0.5	33.9	121	0	33.9	130	0	0.0
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.0	16	3	33.0	18	4	0.0	no	0.5	33.9	21	4	33.9	22	4	0.0
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.0	119	1	33.0	138	1	0.0	yes	N/A	33.9	130	1	33.9	146	1	0.0
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.0	114	2	33.0	132	2	0.0	yes	N/A	33.9	120	2	33.9	135	2	0.0
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	32.9	143	2	33.0	162	2	0.0	yes	N/A	33.8	177	2	33.8	191	3	0.0
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.5	2	3	48.5	2	3	0.0	yes	N/A	49.1	10	6	49.1	10	6	0.0
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.6	3	0	49.6	3	0	0.0	yes	N/A	49.6	3	0	49.6	3	0	0.0
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.1	2	4	44.1	2	4	0.0	yes	N/A	46.4	10	6	46.4	10	6	0.0
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.1	26	11	44.1	26	11	0.0	no	0.4	44.3	27	11	44.3	27	11	0.0
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	41.0	12	7	41.0	12	7	0.0	yes	N/A	41.5	14	8	41.5	14	8	0.0
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	40.6	10	7	40.6	10	7	0.0	yes	N/A	41.1	16	9	41.1	16	9	0.0
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	6	34.1	11	6	0.0	no	0.1	34.5	11	6	34.5	11	6	0.0
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.0	61	1	33.0	61	1	0.0	yes	N/A	33.9	117	1	33.9	117	1	0.0
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.0	51	1	33.0	44	1	0.0	no	0.5	33.9	44	1	33.9	37	1	0.0
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.1	15	5	34.1	15	5	0.0	yes	N/A	34.3	17	5	34.3	17	5	0.0
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.1	146	0	34.1	146	0	0.0	yes	N/A	34.3	129	0	34.3	67	0	0.0
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.1	40	12	34.1	39	12	0.0	yes	N/A	34.3	34	11	34.3	34	10	0.0
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.0	45	0	33.0	45	0	0.0	yes	N/A	33.9	66	0	33.9	66	0	0.0
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	32.9	43	1	33.0	42	1	0.0	yes	N/A	33.8	60	1	33.8	60	1	0.0
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	46.0	3	0	46.0	3	0	0.0	yes	N/A	46.2	10	6	46.2	10	6	0.0
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	39.3	8	5	39.3	8	5	0.0	yes	N/A	42.8	17	9	42.8	17	9	0.0
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	40.3	5	7	40.3	5	7	0.0	yes	N/A	43.3	9	7	43.3	9	7	0.0
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	38.3	8	3	38.3	8	3	0.0	yes	N/A	39.8	19	5	39.8	19	5	0.0
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	38.0	8	4	38.0	8	4	0.0	yes	N/A	38.7	31	7	38.7	31	5	0.0
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.3	8	4	34.3	8	4	0.0	yes	N/A	35.6	18	5	35.6	18	5	0.0
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.1	10	3	34.1	10	3	0.0	yes	N/A	35.3	18	6	35.4	17	5	0.0
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	32.9	24	0	32.9	3	0	0.0	no	0.4	33.9	24	0	33.9	23	0	0.0
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	32.9	32	3	32.9	34	3	0.0	no	1.6	33.8	56	3	33.8	59	3	0.0
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	32.9	5	0	32.9	4	0	0.0	no	1.6	33.8	4	0	33.9	3	0	0.0
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	32.9	48	2	32.9	49	1	0.0	yes	N/A	33.8	73	2	33.8	75	2	0.0
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	32.9	46	0	32.9	47	0	0.0	yes	N/A	33.7	74	0	33.7	76	0	0.0
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	32.9	46	0	32.9	47	0	0.0	yes	N/A	33.7	74	0	33.7	76	0	0.0
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.6	0	0	51.6	0	0	0.0	no	0.6	51.9	9	0	51.9	9	0	0.0

Table A-7
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	0	35.1	0	0	0.0	yes	N/A	35.5	14	2	35.5	14	2	0.0
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.9	7	4	47.9	7	4	0.0	yes	N/A	50.5	23	8	50.5	23	8	0.0
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	40.0	34	7	40.0	34	7	0.0	yes	N/A	42.0	48	10	42.0	48	10	0.0
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	34	2	35.1	34	2	0.0	yes	N/A	35.5	48	3	35.5	48	3	0.0
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.9	9	7	46.9	9	7	0.0	yes	N/A	47.1	9	7	47.1	9	7	0.0
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.8	9	6	45.8	9	6	0.0	yes	N/A	46.7	15	8	46.7	15	8	0.0
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	9	2	35.1	9	2	0.0	yes	N/A	35.5	15	2	35.5	15	2	0.0
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.1	30	2	34.1	30	2	0.0	yes	N/A	34.3	52	2	34.3	52	2	0.0
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	26	3	35.1	26	3	0.0	yes	N/A	35.5	35	3	35.5	35	3	0.0
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	32.9	72	0	32.9	72	0	0.0	yes	N/A	33.7	103	0	33.7	103	0	0.0
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	32.9	208	1	32.9	226	1	0.0	yes	N/A	33.7	256	1	33.7	271	1	0.0
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	32.9	194	1	32.9	213	1	0.0	yes	N/A	33.7	227	1	33.7	242	1	0.0
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	33.5	4	1	33.5	4	1	0.0	yes	N/A	34.9	6	2	34.9	6	2	0.0
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	33.4	17	5	33.4	17	5	0.0	yes	N/A	34.8	17	5	34.8	17	5	0.0
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	32.9	203	0	32.9	221	0	0.0	no	1.2	33.7	226	0	33.7	240	0	0.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	32.9	165	1	32.9	180	1	0.0	no	0.9	33.7	258	1	33.7	264	1	0.0
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	32.9	157	1	32.9	172	1	0.0	yes	N/A	33.6	260	1	33.6	266	1	0.0
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	32.9	143	0	32.9	158	0	0.0	no	0.1	33.6	263	0	33.6	268	0	0.0

Indicates LOS deficiency
New conduits added as part of the alternative

Table A-8
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.6	4	68.6	4	0.0	0.6
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	68.2	4	68.2	4	0.0	0.2
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	67.2	7	67.2	7	0.0	no flooding
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	72.0	4	72.0	4	0.0	no flooding
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	63.0	4	63.0	4	0.0	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.8	10	62.8	10	0.0	no flooding
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	56.5	5	56.5	5	0.0	0.5
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	63.4	3	63.4	3	0.0	no flooding
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.9	7	51.9	7	0.0	no flooding
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.3	24	51.3	24	0.0	0.3
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.8	2	63.8	2	0.0	no flooding
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	54.7	6	54.7	6	0.0	no flooding
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.8	1	54.8	1	0.0	no flooding
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.7	3	54.7	3	0.0	0.6
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.7	7	54.7	7	0.0	no flooding
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.7	0	52.7	0	0.0	no flooding
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.0	1	53.0	1	0.0	no flooding
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.4	1	52.4	1	0.0	no flooding
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.4	11	52.4	11	0.0	no flooding
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.5	10	51.5	10	0.0	0.5
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	12	51.4	12	0.0	no flooding
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.1	10	51.1	10	0.0	no flooding
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	51.0	13	51.0	13	0.0	no flooding
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	21	50.6	21	0.0	0.6
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	21	50.0	21	-0.1	no flooding
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.5	27	49.4	21	-0.1	no flooding
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.1	22	49.1	23	-0.1	no flooding
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.2	8	49.1	8	-0.1	0.9
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	22	47.9	23	-0.1	no flooding
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	25	46.3	24	-0.2	no flooding
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	22	44.8	23	-0.2	no flooding
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	51.6	6	51.6	6	0.0	no flooding
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.5	0	52.5	0	0.0	no flooding
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	52.6	1	0.0	no flooding
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.1	7	51.1	7	0.0	no flooding
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.1	13	51.1	13	0.0	no flooding
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	14	48.6	14	0.0	no flooding
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.4	25	48.4	25	0.0	no flooding
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.4	19	48.4	19	0.0	no flooding
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.4	4	48.4	1	0.0	no flooding
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.4	1	48.4	2	0.0	no flooding
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.4	1	48.4	1	0.0	no flooding
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.4	4	48.4	2	0.0	no flooding
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.4	7	48.4	7	0.0	no flooding
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.6	2	49.6	2	0.0	no flooding
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.5	2	49.5	2	0.0	no flooding
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.5	3	48.5	3	0.0	no flooding
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	46.9	0	46.9	0	0.0	no flooding

Table A-8
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.6	23	45.5	23	-0.1	no flooding
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	43.6	24	42.7	24	-0.8	no flooding
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	46.9	0	46.9	0	0.0	no flooding
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	50.2	0	0.0	no flooding
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	46.9	0	46.9	0	0.0	no flooding
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	46.9	0	46.9	0	0.0	no flooding
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	46.9	11	46.9	11	0.0	no flooding
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.4	11	46.4	11	0.0	no flooding
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.4	11	46.4	11	0.0	no flooding
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.3	17	45.3	17	0.0	no flooding
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.3	19	45.3	11	0.0	no flooding
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.9	38	43.5	34	-0.4	no flooding
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.0	5	43.6	5	-0.4	no flooding
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	43.6	58	42.7	54	-0.8	no flooding
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	48.0	12	48.0	12	0.0	no flooding
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.6	7	47.6	7	0.0	no flooding
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.5	22	44.6	16	0.1	no flooding
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.9	21	43.5	17	-0.4	no flooding
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.5	2	47.5	2	0.0	no flooding
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	43.6	5	42.7	5	-0.8	0.6
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	43.6	69	42.7	67	-0.8	0.2
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	37.4	0	0.0	no flooding
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	36.9	0	0.0	no flooding
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	36.8	0	0.0	no flooding
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	42.4	305	41.6	306	-0.8	no flooding
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	42.3	70	41.5	67	-0.8	0.4
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	43.0	0	0.0	no flooding
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	42.3	2	41.5	1	-0.8	no flooding
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	42.3	74	41.5	71	-0.8	no flooding
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	42.3	1	41.5	1	-0.8	no flooding
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.3	0	43.3	0	0.0	no flooding
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	43.1	1	0.0	no flooding
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	43.1	0	0.0	no flooding
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	42.3	83	41.5	72	-0.8	no flooding
AW-475-LC-1	Open Channel/Pipe	42.4	25	AW-475	AW-480	41.8	39	N/A	N/A	N/A	N/A
AW-475-LP-1	Pipe	42.4	25	AW-475	AW-476	N/A	N/A	41.1	72	-0.7	no flooding
AW-476-LP-1	Pipe	41.0	25	AW-476	AW-477	N/A	N/A	40.2	72	-1.5	no flooding
AW-477-LP-1	Pipe	42.0	25	AW-477	AW-525	N/A	N/A	38.5	72	N/A	no flooding
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	41.8	48	36.2	0	-5.6	no flooding
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.5	29	35.9	0	-4.6	no flooding
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.5	46	35.9	1	-4.6	no flooding
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	39.0	42	35.8	1	-3.1	no flooding
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	39.0	48	35.8	1	-3.1	no flooding
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	40.3	19	40.3	20	0.0	no flooding
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	37.1	7	0.0	0.6
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.8	7	36.8	7	0.0	no flooding
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.2	7	36.3	7	0.0	no flooding

Table A-8

SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support

Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	35.4	55	35.0	78	-0.5	no flooding
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	35.4	56	34.8	80	-0.6	no flooding
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	35.4	57	34.8	82	-0.6	no flooding
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.9	59	33.9	83	0.0	no flooding
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.8	3	36.5	3	-0.3	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.9	50	33.9	20	0.0	no flooding
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.9	23	33.9	15	0.0	1.4
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.9	79	33.9	91	0.0	1.4
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.9	104	33.9	101	0.0	1.2
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.9	100	33.9	98	0.0	1.4
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.9	95	33.9	110	0.0	1.4
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.9	14	33.9	16	0.0	1.4
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.9	96	33.9	117	0.0	0.4
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.9	93	33.9	114	0.0	0.8
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	33.8	117	33.8	135	0.0	no flooding
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.7	4	48.7	4	0.0	no flooding
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.3	1	49.3	1	0.0	no flooding
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.4	4	44.4	4	0.0	no flooding
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.0	26	44.0	26	0.0	0.3
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.4	4	40.4	4	0.0	no flooding
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	39.9	4	0.0	no flooding
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	34.1	11	0.0	0.1
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.9	58	33.9	58	0.0	0.4
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.9	39	33.9	34	0.0	1.4
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.3	18	34.2	18	-0.2	no flooding
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.3	19	34.1	135	-0.2	no flooding
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.3	26	34.1	23	-0.2	no flooding
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.9	27	33.8	35	0.0	no flooding
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	33.8	32	33.8	34	0.0	no flooding
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.9	2	45.9	2	0.0	no flooding
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.3	4	38.3	4	0.0	no flooding
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	39.8	2	0.0	no flooding
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.8	4	37.8	4	0.0	no flooding
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.6	4	37.6	4	0.0	no flooding
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.4	4	34.4	4	0.0	no flooding
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.3	7	34.3	7	0.0	no flooding
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	33.8	74	33.8	2	0.0	1.3
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	33.8	55	33.8	55	0.0	2.5
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	33.8	3	33.8	3	0.0	2.5
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	33.8	60	33.8	63	0.0	no flooding
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	33.7	58	33.7	63	0.0	no flooding
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	33.7	238	33.7	64	0.0	no flooding
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.5	0	51.5	0	0.0	0.5
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	35.1	0	0.0	no flooding
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.0	0	47.0	0	0.0	no flooding
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.8	16	38.8	16	0.0	no flooding
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	16	35.1	16	0.0	no flooding
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	47.1	8	47.1	8	0.0	0.1

Table A-8

SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support

Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2C

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	46.2	12	46.2	12	0.0	no flooding
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	12	35.1	12	0.0	no flooding
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.3	28	34.2	29	-0.2	no flooding
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	11	35.1	11	0.0	no flooding
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	33.7	55	33.7	54	0.0	no flooding
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	33.7	164	33.7	182	0.0	no flooding
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	33.7	155	33.7	173	0.0	no flooding
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	34.4	5	34.4	5	0.0	no flooding
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	34.4	17	34.4	17	0.0	no flooding
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	33.7	328	33.7	183	0.0	2.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	33.7	175	33.7	211	0.0	1.7
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	33.7	217	33.7	211	0.0	0.7
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	33.7	213	33.7	211	0.0	0.9

Denotes 0.5 feet of flooding or greater

New conduits added as part of the alternative

Table A-9
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	66.8	1	0	66.8	1	0	0.0	yes	N/A	67.3	5	4	67.3	5	4	0.0	yes	N/A
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	66.6	1	0	66.6	1	0	0.0	yes	N/A	67.1	3	3	67.1	3	3	0.0	yes	N/A
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	61.7	2	3	61.7	2	3	0.0	yes	N/A	65.2	6	5	65.2	6	5	0.0	yes	N/A
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	70.3	0	0	70.3	0	0	0.0	yes	N/A	71.1	0	0	71.1	0	0	0.0	yes	N/A
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	61.6	0	0	61.6	0	0	0.0	yes	N/A	62.0	1	2	62.0	1	2	0.0	yes	N/A
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	58.7	2	3	58.7	2	3	0.0	yes	N/A	61.1	8	6	61.1	8	6	0.0	yes	N/A
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	53.8	1	0	53.8	1	0	0.0	yes	N/A	54.2	4	5	54.2	4	5	0.0	yes	N/A
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	61.0	0	0	61.0	0	0	0.0	yes	N/A	61.6	0	0	61.6	0	0	0.0	yes	N/A
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.8	4	0	51.8	4	0	0.0	yes	N/A	51.9	6	0	51.9	6	0	0.0	yes	N/A
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	49.6	6	1	49.6	6	1	0.0	yes	N/A	50.7	9	1	50.7	9	1	0.0	yes	N/A
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.9	3	0	63.9	3	0	0.0	yes	N/A	64.0	6	0	64.0	6	0	0.0	yes	N/A
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	52.8	0	0	52.8	0	0	0.0	yes	N/A	53.5	0	1	53.5	0	1	0.0	yes	N/A
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.3	2	4	54.3	2	4	0.0	yes	N/A
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.5	4	4	54.5	4	4	0.0	no	0.4	54.9	6	4	54.9	6	4	0.0	no	0.8
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.0	2	3	54.0	2	3	0.0	yes	N/A	54.2	3	4	54.2	3	4	0.0	yes	N/A
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.8	0	1	52.8	0	1	0.0	yes	N/A	52.9	0	1	52.9	0	1	0.0	yes	N/A
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.1	1	2	53.1	1	2	0.0	yes	N/A	53.1	1	3	53.1	1	3	0.0	yes	N/A
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.2	2	1	52.2	2	1	0.0	yes	N/A	52.5	3	1	52.5	3	1	0.0	yes	N/A
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.2	7	0	52.2	7	0	0.0	yes	N/A	52.5	14	4	52.5	14	4	0.0	yes	N/A
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	49.9	8	4	49.9	8	4	0.0	yes	N/A	51.5	10	4	51.5	10	4	0.0	no	0.4
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	49.7	8	4	49.7	8	4	0.0	yes	N/A	51.1	10	4	51.1	10	4	0.0	yes	N/A
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	49.2	8	3	49.2	8	3	0.0	yes	N/A	50.5	10	3	50.5	10	3	0.0	yes	N/A
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	49.6	9	2	49.6	9	2	0.0	yes	N/A	50.6	12	3	50.6	12	3	0.0	yes	N/A
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	48.5	14	3	48.5	14	3	0.0	yes	N/A	49.6	16	3	49.6	16	3	0.0	yes	N/A
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	48.0	14	3	48.0	14	3	0.0	yes	N/A	49.1	16	3	49.1	16	3	0.0	yes	N/A
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	47.6	15	3	47.6	15	3	0.0	yes	N/A	48.6	16	3	48.6	16	3	0.0	yes	N/A
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	47.3	21	4	47.3	21	4	0.0	yes	N/A	48.3	22	4	48.3	22	4	0.0	yes	N/A
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	47.3	9	6	47.3	9	6	0.0	yes	N/A	48.3	9	6	48.3	9	6	0.0	no	0.1
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	46.4	21	4	46.4	21	4	0.0	yes	N/A	47.2	22	4	47.2	22	4	0.0	yes	N/A
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	45.2	24	5	45.3	24	5	0.0	yes	N/A	45.9	24	5	45.9	24	6	0.0	yes	N/A
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	44.1	22	4	44.1	22	4	0.0	yes	N/A	44.6	22	5	44.6	22	4	0.0	yes	N/A
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	52.4	8	5	52.4	8	5	0.0	yes	N/A	52.7	9	5	52.7	9	5	0.0	yes	N/A
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.6	1	2	52.6	1	2	0.0	yes	N/A	52.7	1	2	52.7	1	2	0.0	yes	N/A
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	3	52.6	1	3	0.0	yes	N/A	52.6	1	3	52.6	1	3	0.0	yes	N/A
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.5	10	0	51.5	10	0	0.0	yes	N/A	51.8	14	0	51.8	14	0	0.0	yes	N/A
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.5	14	8	51.5	14	8	0.0	yes	N/A	51.8	19	10	51.8	19	10	0.0	yes	N/A
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	15	0	48.6	15	0	0.0	yes	N/A	49.0	19	0	49.0	19	0	0.0	yes	N/A
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.5	25	0	48.5	25	0	0.0	yes	N/A	48.9	25	0	48.9	25	0	0.0	yes	N/A
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.5	21	7	48.5	21	7	0.0	yes	N/A	48.9	26	8	48.9	26	8	0.0	yes	N/A
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.5	1	3	48.5	1	3	0.0	yes	N/A	49.0	2	2	49.0	2	2	0.0	yes	N/A
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.5	2	1	48.5	2	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.5	1	1	48.5	1	1	0.0	yes	N/A	49.0	2	1	49.0	2	1	0.0	yes	N/A
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.5	2	2	48.5	2	2	0.0	yes	N/A	49.0	3	1	49.0	3	1	0.0	yes	N/A
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.5	6	2	48.5	6	2	0.0	yes	N/A	49.0	8	2	49.0	8	2	0.0	yes	N/A
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.9	2	2	49.9	2	2	0.0	yes	N/A	50.7	3	3	50.7	3	3	0.0	yes	N/A
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.7	3	3	49.7	3	3	0.0	yes	N/A	50.1	4	4	50.1	4	4	0.0	yes	N/A
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.7	4	4	48.7	4	4	0.0	yes	N/A	48.9	6	4	48.9	6	4	0.0	yes	N/A
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.8	25	0	45.8	25	0	0.0	yes	N/A	46.1	32	0	46.1	32	0	0.0	yes	N/A
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	40.9	26	0	40.6	26	0	-0.2	yes	N/A	41.7	36	0	41.2	36	0	-0.5	yes	N/A
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.3	0	1	47.3	0	1	0.0	yes	N/A
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	1	50.2	0	1	0.0	yes	N/A	50.2	0	1	50.2	0	1	0.0	yes	N/A
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	47.0	0	1	47.0	0	1	0.0	yes	N/A	47.5	0	1	47.5	0	1	0.0	yes	N/A
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	47.0	1	2	47.0	1	2	0.0	yes	N/A	47.5	2	2	47.5	2	2	0.0	yes	N/A

Table A-9
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	47.0	12	4	47.0	12	4	0.0	yes	N/A	47.5	16	5	47.5	16	5	0.0	yes	N/A
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.5	12	2	46.5	12	2	0.0	yes	N/A	46.7	16	2	46.7	16	2	0.0	yes	N/A
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.5	12	4	46.5	12	4	0.0	yes	N/A	46.7	17	5	46.7	17	5	0.0	yes	N/A
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.4	18	3	45.4	18	3	0.0	yes	N/A	46.0	20	3	46.0	20	3	0.0	yes	N/A
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.4	12	5	45.4	12	5	0.0	yes	N/A	46.0	17	6	46.0	17	6	0.0	yes	N/A
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.2	31	2	43.2	31	2	0.0	yes	N/A	43.5	37	2	43.5	37	2	0.0	yes	N/A
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	43.2	6	2	43.2	6	2	0.0	yes	N/A	43.6	9	3	43.6	9	3	0.0	yes	N/A
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	40.9	42	0	40.6	42	0	-0.2	yes	N/A	41.7	53	0	41.2	53	0	-0.5	yes	N/A
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.1	3	3	47.1	3	3	0.0	yes	N/A	47.4	6	4	47.4	6	4	0.0	yes	N/A
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.2	3	4	47.2	3	4	0.0	yes	N/A	47.6	7	6	47.6	7	6	0.0	yes	N/A
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	43.4	6	5	43.4	6	5	0.0	yes	N/A	43.9	10	5	43.9	10	5	0.0	yes	N/A
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.2	10	0	43.2	10	0	0.0	yes	N/A	43.5	11	0	43.5	11	0	0.0	yes	N/A
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.8	4	0	47.8	4	0	0.0	yes	N/A	48.0	5	0	48.0	5	0	0.0	yes	N/A
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	40.9	3	1	40.6	3	1	-0.2	yes	N/A	41.7	3	1	41.2	3	1	-0.5	yes	N/A
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	40.9	38	3	40.6	51	4	-0.3	yes	N/A	41.7	41	4	41.2	64	4	-0.5	yes	N/A
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0	yes	N/A
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0	yes	N/A
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0	yes	N/A
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	40.6	96	1	40.1	51	1	-0.5	yes	N/A	41.3	290	1	40.3	64	1	-1.0	yes	N/A
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	40.5	37	2	38.9	52	3	-1.6	yes	N/A	41.3	41	2	39.5	65	3	-1.7	yes	N/A
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	41.9	0	0	41.8	0	0	-0.1	yes	N/A	42.7	0	0	42.7	0	0	-0.1	yes	N/A
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	40.5	2	3	38.9	2	3	-1.6	yes	N/A	41.3	2	3	39.5	2	3	-1.7	yes	N/A
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	40.5	39	0	38.5	55	0	-2.0	yes	N/A	41.2	41	0	39.3	69	0	-2.0	yes	N/A
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.2	1	1	41.2	1	1	0.0	yes	N/A	41.3	2	2	41.3	2	2	0.0	yes	N/A
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.4	0	1	43.4	0	1	0.0	yes	N/A	43.5	0	1	43.5	0	1	0.0	yes	N/A
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.0	1	4	43.0	1	4	0.0	yes	N/A	43.1	1	3	43.6	1	3	0.5	no	0.0
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.0	0	2	43.0	0	2	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0	yes	N/A
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	40.5	41	2	38.5	55	3	-2.0	yes	N/A	41.2	42	2	39.3	73	4	-2.0	yes	N/A
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	40.3	73	1	N/A	N/A	N/A	N/A	N/A	N/A	41.1	127	1	N/A	N/A	N/A	N/A	N/A	N/A
AW-475-LP-1	Pipe	42.4	25	AW-475	AW-476	N/A	N/A	N/A	38.4	56	5	-1.98	yes	N/A	N/A	N/A	N/A	39.0	70	6	-2.1	yes	N/A
AW-476-LP-1	Pipe	42.0	25	AW-476	AW-477	N/A	N/A	N/A	38.1	56	6	-2.24	yes	N/A	N/A	N/A	N/A	38.7	70	6	-2.4	yes	N/A
AW-477-LP-1	Pipe	44.0	25	AW-477	AW-478	N/A	N/A	N/A	37.2	56	6	N/A	yes	N/A	N/A	N/A	N/A	37.8	70	6	N/A	yes	N/A
AW-478-LP-1	Pipe	44.0	25	AW-478	AW-531	N/A	N/A	N/A	36.3	56	6	N/A	yes	N/A	N/A	N/A	N/A	36.9	70	6	N/A	yes	N/A
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	40.3	40	6	36.4	0	1	-4.0	yes	N/A	41.1	42	6	36.4	1	1	-4.7	yes	N/A
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	39.2	40	1	35.7	1	1	-3.5	yes	N/A	39.8	42	1	35.8	1	1	-3.9	yes	N/A
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	39.2	40	6	35.7	1	2	-3.5	yes	N/A	39.7	42	6	35.8	2	2	-3.9	yes	N/A
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.1	40	2	34.7	2	2	-3.4	yes	N/A	38.4	42	2	34.8	3	2	-3.6	yes	N/A
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.1	40	9	34.7	2	2	-3.4	yes	N/A	38.3	42	9	34.8	3	2	-3.5	yes	N/A
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	39.8	12	4	39.8	12	4	0.0	yes	N/A	40.3	20	6	40.3	20	6	0.0	yes	N/A
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	36.8	7	2	36.7	9	3	-0.1	no	0.2	37.1	7	2	37.0	9	3	0.0	no	0.5
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.6	7	2	36.4	9	3	-0.2	yes	N/A	36.7	7	2	36.5	9	3	-0.2	yes	N/A
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	35.9	7	2	35.3	9	4	-0.6	yes	N/A	35.9	7	2	35.3	9	4	-0.6	yes	N/A
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.3	46	0	33.1	9	0	-1.2	yes	N/A	34.5	48	0	33.4	11	0	-1.1	yes	N/A
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.2	46	2	33.1	10	0	-1.1	yes	N/A	34.4	49	0	33.4	14	1	-1.0	yes	N/A
AW-531-LP-1	Pipe	42.5	25	AW-531	AW-532	N/A	N/A	N/A	35.4	56	6	N/A	yes	N/A	N/A	N/A	N/A	36.0	70	6	N/A	yes	N/A
AW-532-LP-1	Pipe	40.0	25	AW-532	AW-540	N/A	N/A	N/A	34.6	56	6	N/A	yes	N/A	N/A	N/A	N/A	35.2	70	7	N/A	yes	N/A
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.2	47	7	33.1	12	2	-1.1	yes	N/A	34.4	50	8	33.4	17	3	-1.0	yes	N/A
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	31.7	47	1	31.8	64	1	0.2	yes	N/A	32.3	50	1	32.4	81	1	0.2	yes	N/A
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.3	2	4	36.3	2	4	0.0	no	0.1	36.5	3	6	36.5	2	5	0.0	no	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	31.9	8	0	31.9	8	0	0.0	yes	N/A	32.4	16	0	32.5	14	0	0.1	yes	N/A
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	31.7	7	0	31.8	7	0	0.2	yes	N/A	32.3	16	0	32.4	15	0	0.2	yes	N/A
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	31.5	52	1	31.6	66	1	0.1	yes	N/A	32.2	66	1	32.3	93	1	0.1	yes	N/A
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	31.5	55	1	31.6	69	1	0.1	yes	N/A	32.2	74	1	32.3	99	1	0.1	yes	N/A
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	31.4	56	2	31.5	70	2	0.1	yes	N/A	32.2	76	2	32.2	99	2	0.1	yes	N/A

Table A-9
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	Mean Annual/24-Hour Storm			Mean Annual/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	10-Year/24-Hour Storm			10-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)			
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	31.4	69	0	31.4	79	0	0.1	yes	N/A	32.1	90	0	32.2	113	0	0.1	yes	N/A
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	31.4	7	2	31.5	9	2	0.1	yes	N/A	32.2	13	3	32.2	16	3	0.1	yes	N/A
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	31.4	70	1	31.4	80	1	0.0	yes	N/A	32.1	93	1	32.2	111	1	0.1	yes	N/A
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	31.4	70	1	31.4	80	1	0.0	yes	N/A	32.1	94	1	32.2	109	2	0.1	yes	N/A
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	31.4	92	2	31.4	101	2	0.0	yes	N/A	32.1	122	2	32.2	133	2	0.0	yes	N/A
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	47.3	0	2	47.3	0	2	0.0	yes	N/A	48.2	0	2	48.2	0	2	0.0	yes	N/A
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.5	2	0	49.5	2	0	0.0	yes	N/A	49.5	2	0	49.5	2	0	0.0	yes	N/A
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	43.6	0	2	43.6	0	2	0.0	yes	N/A	43.9	1	2	43.9	1	2	0.0	yes	N/A
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	42.4	16	8	42.4	16	8	0.0	yes	N/A	43.9	25	10	43.9	25	10	0.0	no	0.2
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.6	6	4	40.6	6	4	0.0	yes	N/A	40.8	9	6	40.8	9	6	0.0	yes	N/A
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	5	39.9	4	5	0.0	yes	N/A	40.3	7	6	40.3	7	6	0.0	yes	N/A
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	33.5	10	6	33.5	10	6	0.0	yes	N/A	33.8	11	6	33.8	11	6	0.0	yes	N/A
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	31.4	23	1	31.5	22	1	0.1	yes	N/A	32.2	34	1	32.2	34	1	0.1	yes	N/A
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	31.4	17	1	31.5	17	1	0.1	yes	N/A	32.2	34	1	32.2	34	1	0.1	yes	N/A
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	33.4	20	6	33.4	20	6	0.0	yes	N/A	33.8	15	5	33.9	15	5	0.1	yes	N/A
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	32.9	32	0	32.8	31	0	0.0	yes	N/A	33.7	111	0	33.8	125	0	0.1	yes	N/A
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	32.9	36	10	32.8	35	9	0.0	yes	N/A	33.7	38	12	33.8	37	12	0.1	yes	N/A
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	31.4	31	0	31.4	31	0	0.0	yes	N/A	32.1	37	0	32.2	37	0	0.1	yes	N/A
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	31.4	29	1	31.4	29	1	0.0	yes	N/A	32.1	36	1	32.2	36	1	0.0	yes	N/A
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.4	0	0	45.4	0	0	0.0	yes	N/A	45.8	1	0	45.8	1	0	0.0	yes	N/A
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.1	3	2	38.1	3	2	0.0	yes	N/A	38.4	4	3	38.4	4	3	0.0	yes	N/A
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	5	39.8	2	5	0.0	yes	N/A	40.1	4	6	40.1	4	6	0.0	yes	N/A
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.5	3	2	37.5	3	2	0.0	yes	N/A	37.7	4	3	37.7	4	3	0.0	yes	N/A
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.4	3	3	37.4	3	3	0.0	yes	N/A	37.5	4	3	37.5	4	3	0.0	yes	N/A
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	33.7	3	3	33.7	3	3	0.0	yes	N/A	33.9	4	3	33.9	4	3	0.0	yes	N/A
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	33.1	2	1	33.1	2	1	0.0	yes	N/A	33.5	5	2	33.5	5	2	0.0	yes	N/A
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	31.4	4	0	31.4	4	0	0.0	yes	N/A	32.1	26	0	32.1	25	0	0.0	yes	N/A
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	31.3	24	13	31.3	25	13	0.0	yes	N/A	32.1	29	3	32.1	29	3	0.0	no	0.8
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	31.4	5	0	31.4	4	0	0.0	no	0.1	32.1	5	0	32.1	4	0	0.0	no	0.8
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	31.3	47	2	31.3	46	2	0.0	yes	N/A	32.1	36	2	32.1	37	2	0.0	yes	N/A
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	31.3	46	0	31.3	53	0	0.0	yes	N/A	32.1	37	0	32.1	37	0	0.0	yes	N/A
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	31.3	45	0	31.3	43	0	0.0	yes	N/A	32.1	37	0	32.1	38	0	0.0	yes	N/A
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.1	0	0	51.1	0	0	0.0	no	0.1	51.4	0	0	51.4	0	0	0.0	no	0.4
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	34.7	0	0	34.7	0	0	0.0	yes	N/A	34.9	0	0	34.9	0	0	0.0	yes	N/A
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.1	1	2	47.1	1	2	0.0	yes	N/A	47.2	1	2	47.2	1	2	0.0	yes	N/A
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.9	15	4	38.9	15	4	0.0	yes	N/A	39.3	23	5	39.3	23	5	0.0	yes	N/A
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	34.6	15	2	34.6	15	2	0.0	yes	N/A	34.8	23	2	34.8	23	2	0.0	yes	N/A
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.3	4	0	46.3	4	0	0.0	yes	N/A	46.5	8	7	46.5	8	7	0.0	yes	N/A
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.2	4	4	45.2	4	4	0.0	yes	N/A	45.7	8	5	45.7	8	5	0.0	yes	N/A
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	34.6	4	2	34.6	4	2	0.0	yes	N/A	34.8	8	2	34.8	8	2	0.0	yes	N/A
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	33.4	16	1	33.4	16	1	0.0	yes	N/A	33.8	22	2	33.9	22	2	0.1	yes	N/A
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	34.7	15	3	34.7	15	3	0.0	yes	N/A	34.9	21	3	34.9	21	3	0.0	yes	N/A
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	31.3	32	0	31.3	31	0	0.0	yes	N/A	32.1	53	0	32.1	52	0	0.0	yes	N/A
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	31.3	106	1	31.3	117	1	0.0	yes	N/A	32.1	154	1	32.1	177	1	0.0	yes	N/A
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	31.3	103	1	31.3	114	1	0.0	yes	N/A	32.1	149	1	32.1	172	1	0.0	yes	N/A
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	32.2	3	1	32.2	3	1	0.0	yes	N/A	32.8	4	1	32.8	4	1	0.0	yes	N/A
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	32.1	13	4	32.1	13	4	0.0	yes	N/A	32.6	16	5	32.6	16	5	0.0	yes	N/A
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	31.3	106	0	31.3	119	0	0.0	yes	N/A	32.1	162	0	32.1	184	0	0.0	no	0.4
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	31.3	143	1	31.3	152	1	0.0	yes	N/A	32.1	161	1	32.1	175	1	0.0	no	0.1
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	31.3	142	1	31.3	151	1	0.0	yes	N/A	32.1	155	1	32.1	168	1	0.0	yes	N/A
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	31.3	126	0	31.3	134	0	0.0	yes	N/A	32.1	137	0	32.1	159	0	0.0	yes	N/A

Indicates LOS deficiency

New conduits added as part of the alternative

Table A-9
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.3	5	4	68.3	5	4	0.0	no	0.3	70.0	5	4	70.0	5	4	0.0
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	67.9	4	3	67.9	4	3	0.0	yes	N/A	69.5	4	4	69.5	4	4	0.0
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	66.9	7	6	66.9	7	6	0.0	yes	N/A	68.3	7	6	68.3	7	6	0.0
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	71.7	1	0	71.7	1	0	0.0	yes	N/A	72.1	6	5	72.1	6	5	0.0
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	62.5	4	3	62.5	4	3	0.0	yes	N/A	63.1	5	4	63.1	5	4	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.3	9	8	62.3	9	8	0.0	yes	N/A	62.9	10	8	62.9	10	8	0.0
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	55.8	4	6	55.8	4	6	0.0	yes	N/A	56.4	5	6	56.4	5	6	0.0
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	62.3	0	0	62.3	0	0	0.0	yes	N/A	63.1	1	0	63.1	1	0	0.0
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	52.0	9	0	52.0	9	0	0.0	yes	N/A	52.1	14	4	52.1	14	4	0.0
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.1	21	2	51.1	21	2	0.0	no	0.1	51.6	27	2	51.6	27	2	0.0
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	64.0	7	9	64.0	7	9	0.0	no	0.0	64.1	8	11	64.1	8	11	0.0
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	53.9	1	2	53.9	1	2	0.0	yes	N/A	54.3	3	2	54.3	3	2	0.0
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.6	3	4	54.6	3	4	0.0	yes	N/A	55.3	4	5	55.3	4	5	0.0
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	55.3	8	5	55.3	8	5	0.0	no	1.2	55.6	9	6	55.6	9	6	0.0
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.3	4	4	54.3	4	4	0.0	yes	N/A	54.4	4	5	54.4	4	5	0.0
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.9	1	1	52.9	1	1	0.0	yes	N/A	53.0	1	1	53.0	1	1	0.0
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.2	2	3	53.2	2	3	0.0	yes	N/A	53.3	2	3	53.3	2	3	0.0
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.7	3	1	52.7	3	1	0.0	yes	N/A	52.9	5	1	52.9	5	1	0.0
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.7	16	5	52.7	16	5	0.0	no	0.2	52.9	15	5	52.9	15	5	0.0
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.6	10	4	51.6	10	4	0.0	no	0.5	51.7	11	4	51.7	11	4	0.0
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	15	4	51.4	15	4	0.0	yes	N/A	51.6	15	4	51.6	15	4	0.0
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.0	10	3	51.0	10	3	0.0	yes	N/A	51.3	9	3	51.3	9	3	0.0
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	50.9	11	3	50.9	11	3	0.0	yes	N/A	51.2	14	3	51.2	14	3	0.0
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	17	3	50.6	17	3	0.0	no	0.6	51.0	21	4	51.0	21	4	0.0
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	17	3	50.0	17	3	0.0	no	0.0	50.6	21	4	50.6	21	4	0.0
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.6	17	3	49.6	17	3	0.0	yes	N/A	50.3	21	4	50.3	21	4	0.0
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.2	23	5	49.2	23	5	0.0	yes	N/A	50.2	24	5	50.2	24	5	0.0
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.3	9	5	49.3	9	5	0.0	no	1.1	50.4	13	5	50.4	13	5	0.0
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	23	5	48.1	23	5	0.0	yes	N/A	48.9	24	5	48.9	24	5	0.0
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	24	5	46.5	24	5	0.0	yes	N/A	47.1	24	5	47.1	25	5	0.0
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	23	5	45.0	23	5	0.0	yes	N/A	45.4	24	5	45.4	24	5	0.0
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	53.0	9	5	53.0	9	5	0.0	yes	N/A	53.3	9	5	53.3	9	5	0.0
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	53.0	1	2	53.0	1	2	0.0	yes	N/A	53.3	2	2	53.3	2	2	0.0
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.7	2	3	52.7	2	3	0.0	yes	N/A	52.8	2	3	52.8	2	3	0.0
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	52.2	18	0	52.2	18	0	0.0	no	0.2	52.7	23	0	52.7	23	0	0.0
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	52.2	19	11	52.2	19	11	0.0	yes	N/A	52.7	19	11	52.7	19	11	0.0
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	49.3	19	0	49.3	19	0	0.0	yes	N/A	50.0	20	2	50.0	20	2	0.0
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	49.3	25	0	49.3	25	0	0.0	yes	N/A	50.0	26	0	50.0	26	0	0.0
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	49.3	30	8	49.3	30	8	0.0	yes	N/A	50.0	37	9	50.0	37	9	0.0
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	1	50.2	3	2	0.0
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	49.4	2	1	49.4	3	1	0.0	yes	N/A	50.3	8	2	50.2	3	1	-0.1
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	49.4	2	1	49.4	2	1	0.0	yes	N/A	50.2	3	2	50.2	3	2	0.0
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	49.4	4	1	49.4	4	1	0.0	yes	N/A	50.1	7	2	50.2	7	2	0.1
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	49.4	8	2	49.4	8	2	0.0	yes	N/A	50.2	10	2	50.2	10	2	0.0
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	51.6	4	4	51.6	4	4	0.0	yes	N/A	52.6	5	4	52.6	5	4	0.0
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	50.6	5	5	50.6	5	5	0.0	yes	N/A	52.0	8	7	52.0	8	7	0.0
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	49.1	8	4	49.1	8	4	0.0	yes	N/A	49.5	12	5	49.5	12	5	0.0
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	47.5	1	1	47.5	1	1	0.0	yes	N/A	47.7	1	1	47.7	1	1	0.0
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	46.2	38	0	46.2	38	0	0.0	yes	N/A	46.3	49	0	46.4	49	0	0.1
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	42.3	46	0	41.8	46	0	-0.5	yes	N/A	43.2	57	0	43.0	58	0	-0.2
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	47.5	0	1	47.5	0	1	0.0	yes	N/A	47.7	0	1	47.7	0	1	0.0
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.3	0	2	50.3	0	2	0.0	yes	N/A	50.4	0	2	50.4	0	2	0.0
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	48.2	0	1	48.2	0	1	0.0	yes	N/A	49.2	0	1	49.2	0	1	0.0
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	48.2	2	2	48.2	2	2	0.0	yes	N/A	49.2	3	3	49.2	3	3	0.0

Table A-9
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	48.2	19	6	48.2	19	6	0.0	yes	N/A	49.2	24	8	49.2	24	8	0.0
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.9	19	2	46.9	19	2	0.0	yes	N/A	47.3	29	2	47.3	29	2	0.0
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.9	19	5	46.9	19	5	0.0	yes	N/A	47.3	29	6	47.3	29	6	0.0
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	46.0	20	3	45.9	20	3	0.0	yes	N/A	46.2	29	3	46.2	29	3	0.0
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	46.0	24	7	45.9	23	8	0.0	yes	N/A	46.2	23	7	46.2	23	7	0.0
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.8	42	2	43.8	42	2	0.0	yes	N/A	44.0	53	2	44.0	53	2	0.0
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.1	12	4	44.1	12	4	0.0	yes	N/A	44.3	13	4	44.3	12	4	0.0
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	42.3	64	0	41.8	64	0	-0.5	yes	N/A	43.2	76	0	43.0	76	0	-0.2
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	47.9	11	5	47.9	11	5	0.0	yes	N/A	48.7	18	6	48.7	18	6	0.0
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	48.1	12	10	48.1	12	10	0.0	yes	N/A	48.7	14	12	48.7	14	12	0.0
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.2	17	6	44.2	17	6	0.0	yes	N/A	44.8	25	8	44.8	26	8	0.0
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.8	17	0	43.8	17	0	0.0	yes	N/A	44.0	26	0	44.0	26	0	0.0
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	48.3	6	0	48.3	6	0	0.0	yes	N/A	48.8	7	0	48.8	7	0	0.0
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	42.3	3	1	41.8	3	1	-0.5	yes	N/A	43.2	3	1	43.0	3	1	-0.2
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	42.3	48	4	41.8	71	5	-0.5	yes	N/A	43.2	65	4	43.0	72	5	-0.2
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	0	37.4	0	0	0.0	yes	N/A	37.4	0	0	37.4	0	0	0.0
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	0	36.9	0	0	0.0	yes	N/A	36.9	0	0	36.9	0	0	0.0
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	0	36.8	0	0	0.0	yes	N/A	36.8	0	0	36.8	0	0	0.0
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	41.7	295	1	40.8	298	1	-0.9	yes	N/A	42.1	284	1	41.8	298	1	-0.3
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	41.7	49	2	40.6	71	3	-1.1	yes	N/A	42.0	67	2	41.7	71	3	-0.4
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	0	43.0	0	0	0.0	yes	N/A	43.1	0	0	43.1	0	0	0.0
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	41.7	2	3	40.6	3	3	-1.1	yes	N/A	42.0	1	2	41.7	1	2	-0.4
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	41.6	50	0	40.5	71	0	-1.2	yes	N/A	42.0	69	0	41.7	72	0	-0.4
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	41.7	3	2	41.4	3	2	-0.3	yes	N/A	42.0	5	2	41.7	5	2	-0.4
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.6	0	1	43.6	0	1	0.0	yes	N/A	43.7	0	1	43.7	0	1	0.0
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	4	43.1	1	4	0.0	yes	N/A	43.1	2	3	43.1	2	3	0.0
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	2	43.1	0	2	0.0	yes	N/A	43.1	0	2	43.1	0	2	0.0
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	41.6	51	3	40.5	73	4	-1.2	yes	N/A	42.0	70	4	41.7	73	8	-0.4
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	41.4	149	1	N/A	N/A	N/A	N/A	N/A	N/A	41.6	149	1	N/A	N/A	N/A	N/A
AW-475-LP-1	Pipe	42.4	25	AW-475	AW-476	N/A	N/A	N/A	40.1	71	6	-1.4	yes	N/A	N/A	N/A	N/A	41.2	73	6	-0.4
AW-476-LP-1	Pipe	42.0	25	AW-476	AW-477	N/A	N/A	N/A	39.2	71	6	-2.2	yes	N/A	N/A	N/A	N/A	40.4	73	6	-1.3
AW-477-LP-1	Pipe	44.0	25	AW-477	AW-478	N/A	N/A	N/A	38.1	71	7	N/A	yes	N/A	N/A	N/A	N/A	38.9	73	6	N/A
AW-478-LP-1	Pipe	44.0	25	AW-478	AW-531	N/A	N/A	N/A	37.1	71	7	N/A	yes	N/A	N/A	N/A	N/A	37.4	73	6	N/A
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	41.4	42	6	36.5	1	1	-5.0	yes	N/A	41.6	42	6	36.5	1	1	-5.1
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.2	110	1	35.9	2	1	-4.3	yes	N/A	40.3	110	1	36.0	2	1	-4.3
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.2	44	6	35.9	2	2	-4.3	yes	N/A	40.3	44	6	36.0	4	3	-4.3
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	38.5	44	2	34.9	3	2	-3.6	yes	N/A	38.8	47	2	35.1	16	2	-3.7
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	38.5	44	9	34.9	4	2	-3.6	yes	N/A	38.8	47	10	35.1	6	3	-3.7
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	41.3	23	7	41.3	23	7	0.0	yes	N/A	43.1	28	9	43.1	28	9	0.0
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	2	37.1	10	3	-0.1	no	0.6	37.3	7	2	37.3	10	3	-0.1
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.7	7	2	36.5	9	3	-0.2	yes	N/A	36.8	7	2	36.5	9	3	-0.3
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.0	7	2	35.3	9	4	-0.7	yes	N/A	36.2	7	2	35.3	9	3	-0.9
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	34.6	51	0	33.7	13	0	-1.0	yes	N/A	35.4	53	0	34.3	18	0	-1.2
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	34.6	51	2	33.6	17	1	-0.9	yes	N/A	35.4	56	2	34.3	21	1	-1.1
AW-531-LP-1	Pipe	42.5	25	AW-531	AW-532	N/A	N/A	N/A	36.1	71	6	N/A	yes	N/A	N/A	N/A	N/A	36.3	73	6	N/A
AW-532-LP-1	Pipe	40.0	25	AW-532	AW-540	N/A	N/A	N/A	35.3	71	7	N/A	yes	N/A	N/A	N/A	N/A	35.3	73	7	N/A
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	34.6	53	8	33.6	22	3	-0.9	yes	N/A	35.4	60	9	34.3	27	4	-1.1
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.0	54	1	33.1	90	1	0.1	yes	N/A	33.9	61	1	34.0	101	1	0.0
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.6	3	6	36.5	3	6	0.0	no	0.3	36.8	3	6	36.6	3	6	-0.2
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.0	28	0	33.1	19	0	0.1	yes	N/A	33.9	47	0	34.0	26	0	0.0
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.0	22	0	33.1	20	0	0.1	no	0.6	33.9	30	0	34.0	28	0	0.0
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.0	75	1	33.1	110	1	0.1	no	0.6	33.9	90	1	34.0	131	1	0.0
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.0	90	1	33.1	119	1	0.1	no	0.3	33.9	109	1	33.9	144	1	0.0
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.0	93	2	33.0	121	3	0.1	no	0.5	33.9	111	2	33.9	140	3	0.0

Table A-9
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	25-Year/24-Hour Storm			25-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives	LOS Met?	Depth of Flooding (ft)	100-Year/24-Hour Storm			100-Year/24-Hour Storm Alternative			Reduction of Flooding (ft) w/ Alternatives
						Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)				Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	Stage (ft-NGVD29)	Flow (cfs)	Peak Velocity (fps)	
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.0	117	0	33.0	136	0	0.0	no	0.5	33.9	121	0	33.9	137	0	0.0
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.0	16	3	33.0	18	4	0.1	no	0.5	33.9	21	4	33.9	22	5	0.0
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.0	119	1	33.0	145	1	0.0	yes	N/A	33.9	130	1	33.9	152	1	0.0
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.0	114	2	33.0	139	2	0.0	yes	N/A	33.9	120	2	33.9	142	2	0.0
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	32.9	143	2	33.0	169	3	0.0	yes	N/A	33.8	177	2	33.8	197	3	0.0
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.5	2	3	48.5	2	3	0.0	yes	N/A	49.1	10	6	49.1	10	6	0.0
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.6	3	0	49.6	3	0	0.0	yes	N/A	49.6	3	0	49.6	3	0	0.0
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.1	2	4	44.1	2	4	0.0	yes	N/A	46.4	10	6	46.4	10	6	0.0
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.1	26	11	44.1	26	11	0.0	no	0.4	44.3	27	11	44.3	27	11	0.0
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	41.0	12	7	41.0	12	7	0.0	yes	N/A	41.5	14	8	41.5	14	8	0.0
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	40.6	10	7	40.6	10	7	0.0	yes	N/A	41.1	16	9	41.1	16	9	0.0
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	6	34.1	11	6	0.0	no	0.1	34.5	11	6	34.5	11	6	0.0
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.0	61	1	33.0	61	1	0.1	yes	N/A	33.9	117	1	33.9	117	1	0.0
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.0	51	1	33.0	40	1	0.1	no	0.5	33.9	44	1	33.9	32	1	0.0
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.1	15	5	34.1	15	5	0.0	yes	N/A	34.3	17	5	34.3	17	5	0.0
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.1	146	0	34.1	146	0	0.0	yes	N/A	34.3	129	0	34.3	67	0	0.0
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.1	40	12	34.1	39	12	0.0	yes	N/A	34.3	34	11	34.3	34	10	0.0
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.0	45	0	33.0	45	0	0.0	yes	N/A	33.9	66	0	33.9	66	0	0.0
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	32.9	43	1	33.0	42	1	0.0	yes	N/A	33.8	60	1	33.8	60	1	0.0
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	46.0	3	0	46.0	3	0	0.0	yes	N/A	46.2	10	6	46.2	10	6	0.0
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	39.3	8	5	39.3	8	5	0.0	yes	N/A	42.8	17	9	42.8	17	9	0.0
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	40.3	5	7	40.3	5	7	0.0	yes	N/A	43.3	9	7	43.3	9	7	0.0
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	38.3	8	3	38.3	8	3	0.0	yes	N/A	39.8	19	5	39.8	19	5	0.0
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	38.0	8	4	38.0	8	4	0.0	yes	N/A	38.7	31	7	38.7	31	5	0.0
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.3	8	4	34.3	8	4	0.0	yes	N/A	35.6	18	5	35.7	18	5	0.0
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.1	10	3	34.1	10	3	0.0	yes	N/A	35.3	18	6	35.4	17	5	0.0
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	32.9	24	0	33.0	3	0	0.0	no	0.5	33.9	24	0	33.9	3	0	0.0
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	32.9	32	3	32.9	34	3	0.0	no	1.6	33.8	56	3	33.8	59	3	0.0
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	32.9	5	0	33.0	4	0	0.0	no	1.7	33.8	4	0	33.9	3	0	0.0
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	32.9	48	2	32.9	48	1	0.0	yes	N/A	33.8	73	2	33.8	75	2	0.0
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	32.9	46	0	32.9	46	0	0.0	yes	N/A	33.7	74	0	33.7	75	0	0.0
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	32.9	46	0	32.9	46	0	0.0	yes	N/A	33.7	74	0	33.7	76	0	0.0
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.6	0	0	51.6	0	0	0.0	no	0.6	51.9	9	0	51.9	9	0	0.0
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	0	35.1	0	0	0.0	yes	N/A	35.5	14	2	35.5	14	2	0.0
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.9	7	4	47.9	7	4	0.0	yes	N/A	50.5	23	8	50.5	23	8	0.0
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	40.0	34	7	40.0	34	7	0.0	yes	N/A	42.0	48	10	42.0	48	10	0.0
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	34	2	35.1	34	2	0.0	yes	N/A	35.5	48	3	35.5	48	3	0.0
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	46.9	9	7	46.9	9	7	0.0	yes	N/A	47.1	9	7	47.1	9	7	0.0
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	45.8	9	6	45.8	9	6	0.0	yes	N/A	46.7	15	8	46.7	15	8	0.0
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	9	2	35.1	9	2	0.0	yes	N/A	35.5	15	2	35.5	15	2	0.0
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.1	30	2	34.1	30	2	0.0	yes	N/A	34.3	52	2	34.3	52	2	0.0
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	26	3	35.1	26	3	0.0	yes	N/A	35.5	35	3	35.5	35	3	0.0
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	32.9	72	0	32.9	72	0	0.0	yes	N/A	33.7	103	0	33.7	103	0	0.0
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	32.9	208	1	32.9	232	1	0.0	yes	N/A	33.7	256	1	33.7	277	1	0.0
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	32.9	194	1	32.9	220	1	0.0	yes	N/A	33.7	227	1	33.7	247	1	0.0
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	33.5	4	1	33.5	4	1	0.0	yes	N/A	34.9	6	2	34.9	6	2	0.0
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	33.4	17	5	33.4	17	5	0.0	yes	N/A	34.8	17	5	34.8	17	5	0.0
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	32.9	203	0	32.9	228	0	0.0	no	1.2	33.7	226	0	33.7	245	0	0.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	32.9	165	1	32.9	188	1	0.0	no	0.9	33.7	258	1	33.7	264	1	0.0
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	32.9	157	1	32.9	180	1	0.0	yes	N/A	33.6	260	1	33.6	265	1	0.0
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	32.9	143	0	32.9	166	0	0.0	no	0.1	33.6	263	0	33.6	268	0	0.0

Indicates LOS deficiency

New conduits added as part of the alternative

Table A-10
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-005-LD-1	Drop Structure	68.0	25	AW-005	AW-020	68.6	4	68.6	4	0.0	0.6
AW-010-LD-1	Drop Structure	68.0	25	AW-010	AW-020	68.2	4	68.2	4	0.0	0.2
AW-020-LP-1	Pipe	69.5	10	AW-020	AW-035	67.2	7	67.2	7	0.0	no flooding
AW-025-LD-1	Drop Structure	72.5	25	AW-025	AW-030	72.0	4	72.0	4	0.0	no flooding
AW-030-LD-1	Drop Structure	63.0	25	AW-030	AW-035	63.0	4	63.0	4	0.0	0.0
AW-035-LP-1	Pipe	63.0	10	AW-035	AW-040	62.8	10	62.8	10	0.0	no flooding
AW-040-LD-1	Drop Structure	56.0	25	AW-040	AW-060	56.5	5	56.5	5	0.0	0.5
AW-045-LD-1	Drop Structure	64.0	25	AW-045	AW-050	63.4	3	63.4	3	0.0	no flooding
AW-055-LD-1	Drop Structure	52.0	10	AW-055	AW-060	51.9	7	51.9	7	0.0	no flooding
AW-060-LP-1	Pipe	51.0	25	AW-060	AW-145	51.3	24	51.3	24	0.0	0.3
AW-070-LD-1	Drop Structure	64.0	25	AW-070	AW-080	63.8	2	63.8	2	0.0	no flooding
AW-080-LP-1	Pipe	56.0	10	AW-080	AW-100	54.7	6	54.7	6	0.0	no flooding
AW-090-LD-1	Drop Structure	55.5	25	AW-090	AW-080	54.8	1	54.8	1	0.0	no flooding
AW-095-LD-1	Drop Structure	54.1	25	AW-095	AW-100	54.7	3	54.7	3	0.0	0.6
AW-100-LP-1	Pipe	56.0	25	AW-100	AW-105	54.7	7	54.7	7	0.0	no flooding
AW-110-LC-1	Open Channel	54.7	10	AW-110	AW-120	52.7	0	52.7	0	0.0	no flooding
AW-115-LP-1	Pipe	54.0	10	AW-115	AW-120	53.0	1	53.0	1	0.0	no flooding
AW-120-LC-1	Open Channel	54.0	10	AW-120	AW-125	52.4	1	52.4	1	0.0	no flooding
AW-125-LD-1	Drop Structure	52.5	25	AW-125	AW-130	52.4	11	52.4	11	0.0	no flooding
AW-130-LP-1	Pipe	51.1	10	AW-130	AW-135	51.5	10	51.5	10	0.0	0.5
AW-135-LP-1	Pipe	53.5	10	AW-135	AW-140	51.4	12	51.4	12	0.0	no flooding
AW-140-LP-1	Pipe	51.9	10	AW-140	AW-150	51.1	10	51.1	10	0.0	no flooding
AW-145-LD-1	Drop Structure	51.0	25	AW-145	AW-150	51.0	13	51.0	13	0.0	no flooding
AW-150-LP-1	Pipe	50.0	10	AW-150	AW-160	50.6	21	50.6	21	0.0	0.6
AW-160-LP-1	Pipe	50.0	10	AW-160	AW-165	50.0	21	50.0	21	0.1	no flooding
AW-165-LP-1	Pipe	50.0	10	AW-165	AW-170	49.5	27	49.4	21	0.1	no flooding
AW-170-LP-1	Pipe	52.3	10	AW-170	AW-180	49.1	22	49.1	23	0.1	no flooding
AW-175-LD-1	Drop Structure	48.2	25	AW-175	AW-170	49.2	8	49.1	8	0.1	0.9
AW-180-LP-1	Pipe	49.9	10	AW-180	AW-185	48.0	22	47.9	23	0.1	no flooding
AW-185-LP-1	Pipe	49.9	10	AW-185	AW-190	46.5	25	46.3	24	0.2	no flooding
AW-190-LP-1	Pipe	48.9	10	AW-190	AW-340	45.0	22	44.7	23	0.3	no flooding
AW-200-LP-1	Pipe	53.0	10	AW-200	AW-215	51.6	6	51.6	6	0.0	no flooding
AW-205-LP-1	Pipe	53.0	10	AW-205	AW-200	52.5	0	52.5	0	0.0	no flooding
AW-210-LP-1	Pipe	53.0	10	AW-210	AW-200	52.6	1	52.6	1	0.0	no flooding
AW-215-LC-1	Open Channel	52.0	10	AW-215	AW-220	51.1	7	51.1	7	0.0	no flooding
AW-220-LP-1	Pipe	53.5	10	AW-220	AW-225	51.1	13	51.1	13	0.0	no flooding
AW-225-LC-1	Open Channel	53.5	10	AW-225	AW-230	48.6	14	48.6	14	0.0	no flooding
AW-230-LC-1	Open Channel	53.5	10	AW-230	AW-235	48.4	25	48.4	25	0.0	no flooding
AW-235-LP-1	Pipe	52.0	10	AW-235	AW-285	48.4	19	48.4	19	0.0	no flooding
AW-240-LP-1	Pipe	51.5	10	AW-240	AW-245	48.4	4	48.4	1	0.0	no flooding
AW-245-LP-1	Pipe	51.4	10	AW-245	AW-255	48.4	1	48.4	2	0.0	no flooding
AW-250-LP-1	Pipe	52.0	10	AW-250	AW-255	48.4	1	48.4	1	0.0	no flooding
AW-255-LP-1	Pipe	52.0	10	AW-255	AW-260	48.4	4	48.4	2	0.0	no flooding
AW-260-LP-1	Pipe	49.9	10	AW-260	AW-235	48.4	7	48.4	7	0.0	no flooding
AW-265-LP-1	Pipe	52.3	10	AW-265	AW-270	49.6	2	49.6	2	0.0	no flooding
AW-270-LP-1	Pipe	52.4	10	AW-270	AW-275	49.5	2	49.5	2	0.0	no flooding
AW-275-LP-1	Pipe	52.0	10	AW-275	AW-285	48.5	3	48.5	3	0.0	no flooding
AW-280-LP-1	Pipe	49.4	10	AW-280	AW-285	46.9	0	46.9	0	0.0	no flooding

Table A-10
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-285-LC-1	Open Channel	52.5	10	AW-285	AW-290	45.6	23	45.4	23	0.1	no flooding
AW-290-LC-1	Open Channel	52.5	10	AW-290	AW-375	43.6	24	42.5	24	1.1	no flooding
AW-300-LC-1	Open Channel	51.5	10	AW-300	AW-280	46.9	0	46.9	0	0.0	no flooding
AW-300-LP-1	Pipe	51.5	10	AW-300	AW-305	50.2	0	50.2	0	0.0	no flooding
AW-305-LC-1	Open Channel	51.5	10	AW-305	AW-310	46.9	0	46.9	0	0.0	no flooding
AW-310-LP-1	Pipe	48.5	10	AW-310	AW-315	46.9	0	46.9	0	0.0	no flooding
AW-315-LP-1	Pipe	48.5	10	AW-315	AW-320	46.9	11	46.9	11	0.0	no flooding
AW-320-LC-1	Open Channel	49.0	10	AW-320	AW-325	46.4	11	46.4	11	0.0	no flooding
AW-325-LP-1	Pipe	49.5	10	AW-325	AW-330	46.4	11	46.4	11	0.0	no flooding
AW-330-LC-1	Open Channel	49.5	10	AW-330	AW-335	45.3	17	45.3	17	0.0	no flooding
AW-335-LP-1	Pipe	46.0	10	AW-335	AW-340	45.3	19	45.3	11	0.0	no flooding
AW-340-LC-1	Open Channel	48.5	10	AW-340	AW-350	43.9	38	43.5	34	0.5	no flooding
AW-345-LP-1	Pipe	44.1	10	AW-345	AW-350	44.0	5	43.6	5	0.4	no flooding
AW-350-LC-1	Open Channel	44.7	10	AW-350	AW-375	43.6	58	42.5	54	1.1	no flooding
AW-355-LD-1	Drop Structure	49.5	25	AW-355	AW-365	48.0	12	48.0	12	0.0	no flooding
AW-360-LD-1	Drop Structure	48.5	25	AW-360	AW-365	47.6	7	47.6	7	0.0	no flooding
AW-365-LP-1	Pipe	45.0	10	AW-365	AW-370	44.5	22	44.6	16	-0.1	no flooding
AW-370-LC-1	Open Channel	45.0	10	AW-370	AW-350	43.9	21	43.5	17	0.5	no flooding
AW-380-LD-1	Drop Structure	50.0	25	AW-380	AW-375	47.5	2	47.5	2	0.0	no flooding
AW-385-LD-1	Drop Structure	42.1	25	AW-385	AW-395	43.6	5	42.5	5	1.1	0.4
AW-395-LP-1	Pipe	42.5	25	AW-395	AW-415	43.6	69	42.5	72	1.1	no flooding
AW-400-LP-1	Pipe	44.0	25	AW-400	AW-405	37.4	0	37.4	0	0.0	no flooding
AW-405-LP-1	Pipe	45.4	25	AW-405	AW-410	36.9	0	36.9	0	0.0	no flooding
AW-410-LP-1	Pipe	45.3	25	AW-410	AW-415	36.8	0	36.8	0	0.0	no flooding
AW-415-LC-1	Open Channel	44.5	25	AW-415	AW-425	42.4	305	41.4	307	1.0	no flooding
AW-425-LC-1	Open Channel	41.1	25	AW-425	AW-450	42.3	70	41.3	72	1.0	0.2
AW-430-LD-1	Drop Structure	44.5	25	AW-430	AW-435	43.0	0	43.0	0	0.0	no flooding
AW-435-LP-1	Pipe	43.0	25	AW-435	AW-450	42.3	2	41.3	1	1.0	no flooding
AW-450-LC-1	Open Channel	42.0	25	AW-450	AW-470	42.3	74	41.2	71	1.1	no flooding
AW-455-LC-1	Open Channel	44.0	10	AW-455	AW-440	42.3	1	41.3	1	1.0	no flooding
AW-455-LP-1	Pipe	44.0	10	AW-455	AW-460	43.3	0	43.3	0	0.0	no flooding
AW-460-LC-1	Open Channel	43.5	10	AW-460	AW-465	43.1	1	43.1	1	0.0	no flooding
AW-465-LP-1	Pipe	43.5	10	AW-465	AW-470	43.1	0	43.1	0	0.0	no flooding
AW-470-LP-1	Pipe	42.0	25	AW-470	AW-475	42.3	83	41.2	73	1.1	no flooding
AW-475-LC-1	Open Channel	42.4	25	AW-475	AW-480	41.8	39	N/A	N/A	N/A	N/A
AW-475-LP-1	Pipe	42.4	25	AW-475	AW-476	N/A	N/A	40.8	72	1.0	no flooding
AW-476-LP-1	Pipe	42.0	25	AW-476	AW-477	N/A	N/A	39.9	72	1.9	no flooding
AW-477-LP-1	Pipe	44.0	25	AW-477	AW-478	N/A	N/A	38.5	72	N/A	no flooding
AW-478-LP-1	Pipe	44.0	25	AW-478	AW-531	N/A	N/A	37.2	72	N/A	no flooding
AW-480-LP-1	Pipe	41.2	25	AW-480	AW-485	41.8	48	36.2	0	5.6	no flooding
AW-485-LC-1	Open Channel	40.1	25	AW-485	AW-490	40.5	29	35.5	0	4.9	no flooding
AW-490-LP-1	Pipe	40.1	25	AW-490	AW-495	40.5	46	35.5	1	4.9	no flooding
AW-495-LC-1	Open Channel	39.5	25	AW-495	AW-500	39.0	42	34.4	1	4.5	no flooding
AW-500-LP-1	Pipe	39.2	25	AW-500	AW-525	39.0	48	34.4	1	4.5	no flooding
AW-505-LD-1	Drop Structure	42.0	25	AW-505	AW-510	40.3	19	40.3	20	0.0	no flooding
AW-510-LP-1	Pipe	36.5	10	AW-510	AW-515	37.2	7	37.0	9	0.1	0.5
AW-515-LP-1	Pipe	37.1	10	AW-515	AW-520	36.8	7	36.5	9	0.3	no flooding
AW-520-LP-1	Pipe	38.6	10	AW-520	AW-525	36.2	7	35.3	9	0.9	no flooding

Table A-10
SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-525-LC-1	Open Channel	38.5	25	AW-525	AW-530	35.4	55	34.2	11	1.2	no flooding
AW-530-LC-1	Open Channel	36.5	25	AW-530	AW-535	35.4	56	34.2	12	1.2	no flooding
AW-531-LP-1	Pipe	42.5	25	AW-531	AW-532	N/A	N/A	36.2	72	N/A	no flooding
AW-532-LP-1	Pipe	40.0	25	AW-532	AW-540	N/A	N/A	35.3	72	N/A	no flooding
AW-535-LP-1	Pipe	35.2	25	AW-535	AW-540	35.4	57	34.2	15	1.2	no flooding
AW-540-LC-1	Open Channel	34.5	25	AW-540	AW-560	33.9	59	33.9	87	0.0	no flooding
AW-545-LP-1	Pipe	36.2	10	AW-545	AW-550	36.8	3	36.5	2	0.4	0.3
AW-550-LC-1	Open Channel	36.0	25	AW-550	AW-555	33.9	50	33.9	13	0.0	no flooding
AW-555-LC-1	Open Channel	32.5	25	AW-555	AW-560	33.9	23	33.9	12	0.0	1.4
AW-560-LC-1	Open Channel	32.5	25	AW-560	AW-565	33.9	79	33.9	98	0.0	1.4
AW-565-LC-1	Open Channel	32.7	25	AW-565	AW-570	33.9	104	33.9	105	0.0	1.2
AW-570-LC-1	Open Channel	32.5	25	AW-570	AW-575	33.9	100	33.9	104	0.0	1.4
AW-575-LC-1	Open Channel	32.5	25	AW-575	AW-580	33.9	95	33.9	114	0.0	1.4
AW-575-LP-1	Pipe	32.5	25	AW-575	AW-745	33.9	14	33.9	16	0.0	1.4
AW-580-LC-1	Open Channel	33.5	25	AW-580	AW-585	33.9	96	33.8	123	0.0	0.3
AW-585-LP-1	Pipe	33.1	25	AW-585	AW-590	33.9	93	33.8	120	0.0	0.7
AW-590-LP-1	Pipe	34.0	25	AW-590	AW-875	33.8	117	33.8	141	0.0	no flooding
AW-600-LD-1	Drop Structure	49.0	25	AW-600	AW-610	48.7	4	48.7	4	0.0	no flooding
AW-605-LD-1	Drop Structure	49.6	10	AW-605	AW-615	49.3	1	49.3	1	0.0	no flooding
AW-610-LP-1	Pipe	50.0	10	AW-610	AW-615	44.4	4	44.4	4	0.0	no flooding
AW-615-LP-1	Pipe	43.7	10	AW-615	AW-620	44.0	26	44.0	26	0.0	0.3
AW-630-LD-1	Drop Structure	41.6	25	AW-630	AW-640	40.4	4	40.4	4	0.0	no flooding
AW-635-LD-1	Drop Structure	41.8	25	AW-635	AW-640	39.9	4	39.9	4	0.0	no flooding
AW-640-LP-1	Pipe	34.0	10	AW-640	AW-650	34.1	11	34.1	11	0.0	0.1
AW-650-LC-1	Open Channel	33.5	10	AW-650	AW-655	33.9	58	33.9	58	0.0	0.4
AW-655-LC-1	Open Channel	32.5	10	AW-655	AW-575	33.9	39	33.9	32	0.0	1.4
AW-660-LP-1	Pipe	34.6	10	AW-660	AW-665	34.3	18	34.2	18	0.2	no flooding
AW-665-LC-1	Open Channel	34.6	10	AW-665	AW-670	34.3	19	34.1	21	0.2	no flooding
AW-670-LP-1	Pipe	34.6	10	AW-670	AW-675	34.3	26	34.1	24	0.2	no flooding
AW-675-LC-1	Open Channel	34.6	10	AW-675	AW-680	33.9	27	33.8	35	0.0	no flooding
AW-680-LC-1	Open Channel	34.6	25	AW-680	AW-590	33.8	32	33.8	34	0.0	no flooding
AW-700-LD-1	Drop Structure	46.0	25	AW-700	AW-705	45.9	2	45.9	2	0.0	no flooding
AW-705-LP-1	Pipe	44.6	10	AW-705	AW-715	38.3	4	38.3	4	0.0	no flooding
AW-710-LP-1	Pipe	45.0	10	AW-710	AW-705	39.8	2	39.8	2	0.0	no flooding
AW-715-LP-1	Pipe	44.6	25	AW-715	AW-720	37.8	4	37.8	4	0.0	no flooding
AW-720-LP-1	Pipe	44.6	10	AW-720	AW-730	37.6	4	37.6	4	0.0	no flooding
AW-730-LP-1	Pipe	36.8	10	AW-730	AW-735	34.4	4	34.4	4	0.0	no flooding
AW-735-LD-1	Drop Structure	36.0	25	AW-735	AW-565	34.3	7	34.3	7	0.0	no flooding
AW-750-LC-1	Open Channel	32.5	25	AW-750	AW-745	33.8	74	33.8	2	0.0	1.3
AW-755-LC-1	Open Channel	31.3	25	AW-755	AW-760	33.8	55	33.8	54	0.0	2.5
AW-755-LC-2	Open Channel	31.3	25	AW-755	AW-750	33.8	3	33.8	3	0.0	2.5
AW-760-LP-1	Pipe	36.0	25	AW-760	AW-765	33.8	60	33.8	63	0.0	no flooding
AW-765-LC-1	Open Channel	34.8	25	AW-765	AW-770	33.7	58	33.7	63	0.0	no flooding
AW-770-LC-1	Open Channel	34.8	25	AW-770	AW-900	33.7	238	33.7	64	0.0	no flooding
AW-800-LC-1	Open Channel	51.0	25	AW-800	AW-805	51.5	0	51.5	0	0.0	0.5
AW-810-LC-1	Open Channel	52.0	10	AW-810	AW-860	35.1	0	35.1	0	0.0	no flooding
AW-810-LP-1	Pipe	52.0	25	AW-810	AW-820	47.0	0	47.0	0	0.0	no flooding
AW-820-LP-1	Pipe	43.5	10	AW-820	AW-825	38.8	16	38.8	16	0.0	no flooding

Table A-10

SR 426 at Aloma Woods Stormwater Improvement Project – Stormwater Modeling Support

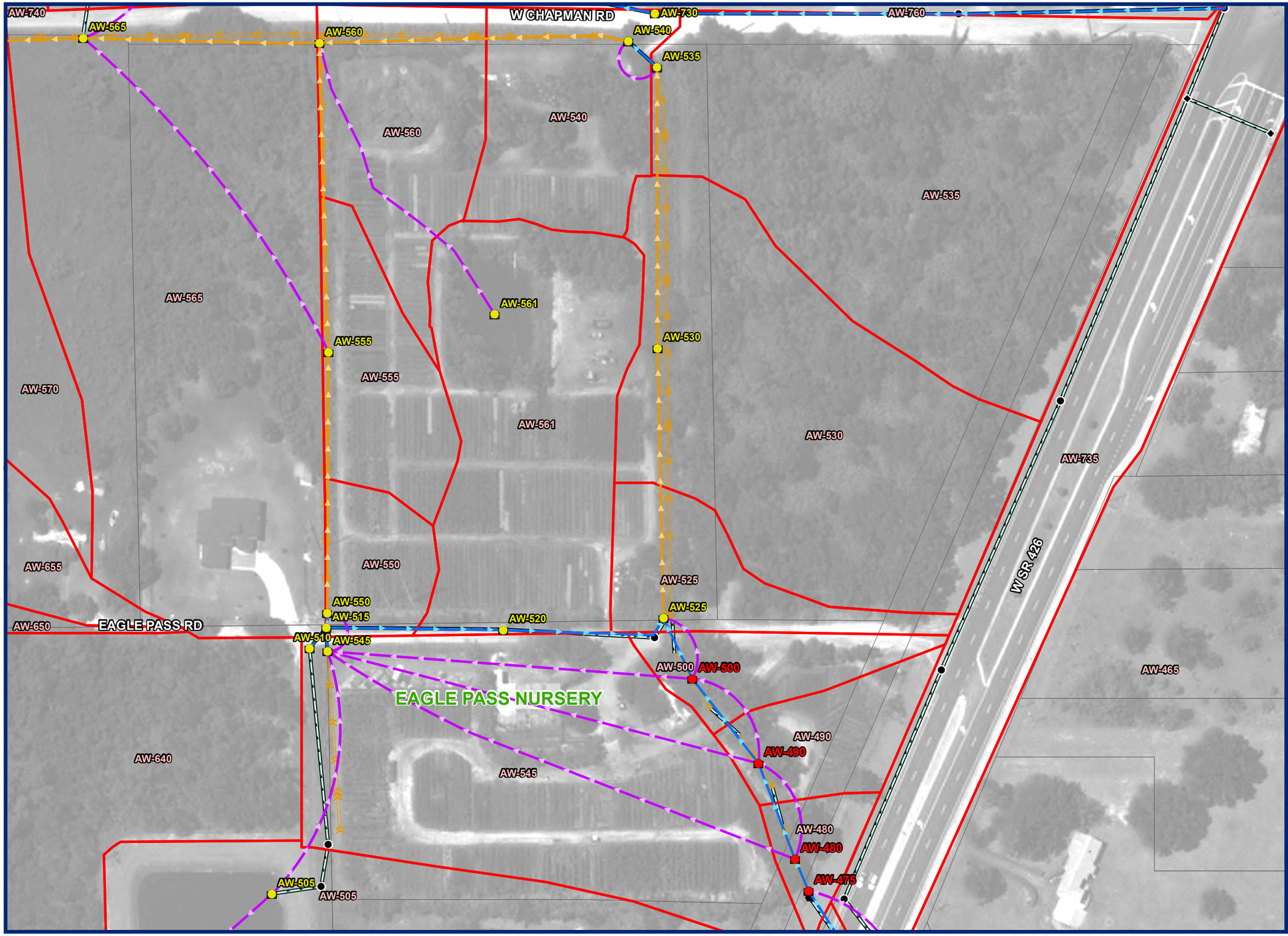
Level of Service Existing Conditions Results - Tropical Storm Fay Simulation - Improvement 2D

Model ID	Description	Critical Elevation (ft-NGVD)	Design Storm LOS	U/S Node	D/S Node	T.S. Fay Simulation		T.S. Fay Simulation w/Alternatives		Reduction of Flooding (ft) w/ Alternatives	Depth of Flooding (ft)
						Peak Stage (ft-NGVD29)	Peak Flow (cfs)	Peak Stage (ft-NGVD29)	Peak Flow (cfs)		
AW-825-LC-1	Open Channel	43.5	10	AW-825	AW-865	35.1	16	35.1	16	0.0	no flooding
AW-835-LD-1	Drop Structure	47.0	10	AW-835	AW-850	47.1	8	47.1	8	0.0	0.1
AW-850-LP-1	Pipe	47.0	10	AW-850	AW-855	46.2	12	46.2	12	0.0	no flooding
AW-855-LC-1	Open Channel	47.0	10	AW-855	AW-865	35.1	12	35.1	12	0.0	no flooding
AW-860-LC-1	Open Channel	41.0	10	AW-860	AW-660	34.3	28	34.2	29	0.2	no flooding
AW-860-LP-1	Pipe	41.0	25	AW-860	AW-865	35.1	11	35.1	11	0.0	no flooding
AW-865-LC-1	Open Channel	40.0	25	AW-865	AW-875	33.7	55	33.7	54	0.0	no flooding
AW-875-LC-1	Open Channel	34.5	25	AW-875	AW-880	33.7	164	33.7	188	0.0	no flooding
AW-880-LC-1	Open Channel	37.0	25	AW-880	AW-895	33.7	155	33.7	180	0.0	no flooding
AW-885-LD-1	Drop Structure	37.0	25	AW-885	AW-890	34.4	5	34.4	5	0.0	no flooding
AW-890-LD-1	Drop Structure	37.0	25	AW-890	AW-895	34.4	17	34.4	16	0.0	no flooding
AW-895-LC-1	Open Channel	31.7	25	AW-895	AW-900	33.7	328	33.7	190	0.0	2.0
AW-900-LC-1	Open Channel	32.0	25	AW-900	AW-910	33.7	175	33.7	210	0.0	1.7
AW-910-LC-1	Open Channel	33.0	25	AW-910	AW-915	33.7	217	33.7	210	0.0	0.7
AW-915-LC-1	Open Channel	32.8	25	AW-915	BGC-0110	33.7	213	33.7	211	0.0	0.9

Denotes 0.5 feet of flooding or greater

New conduits added as part of the alternative

ATTACHMENT B



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N 0 50 100 Feet

LEGEND

- PARCELS
- PROPOSED NODES
- EXISTING NODES
- CHANNELS
- DROP STRUCTURES
- WEIRS
- PIPES
- SUBBASINS

EXISTING STRUCTURES

- CONTROL STRUCTURE
- HEADWALL
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

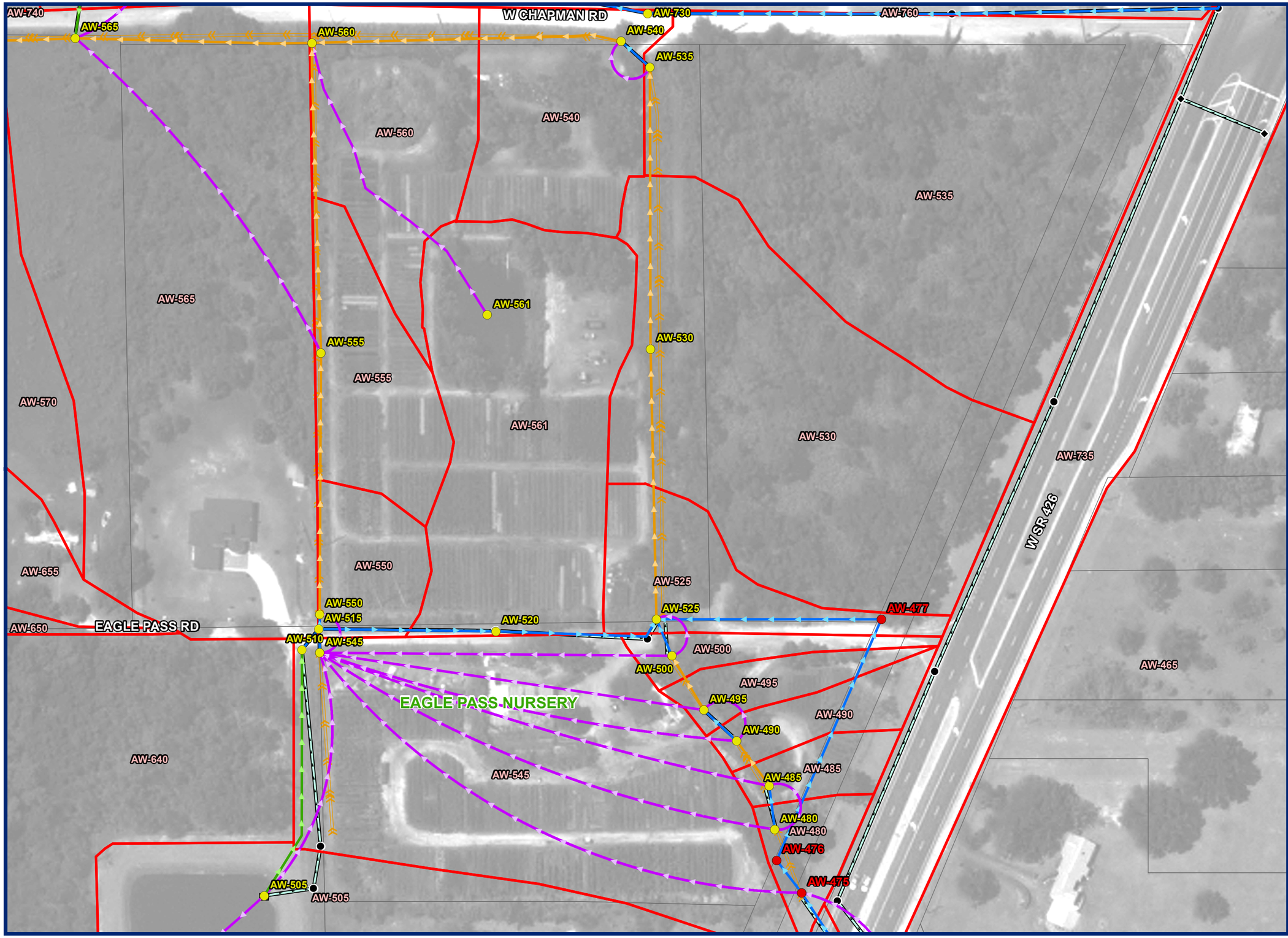
DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008

FIGURE 6-6

PROPOSED IMPROVEMENT AREA 2B NODE-LINK MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

- PARCELS
- PROPOSED NODES
- EXISTING NODES
- PIPES
- WEIRS
- DROP STRUCTURES
- CHANNELS
- SUBBASINS

EXISTING STRUCTURES

- CONTROL STRUCTURE
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

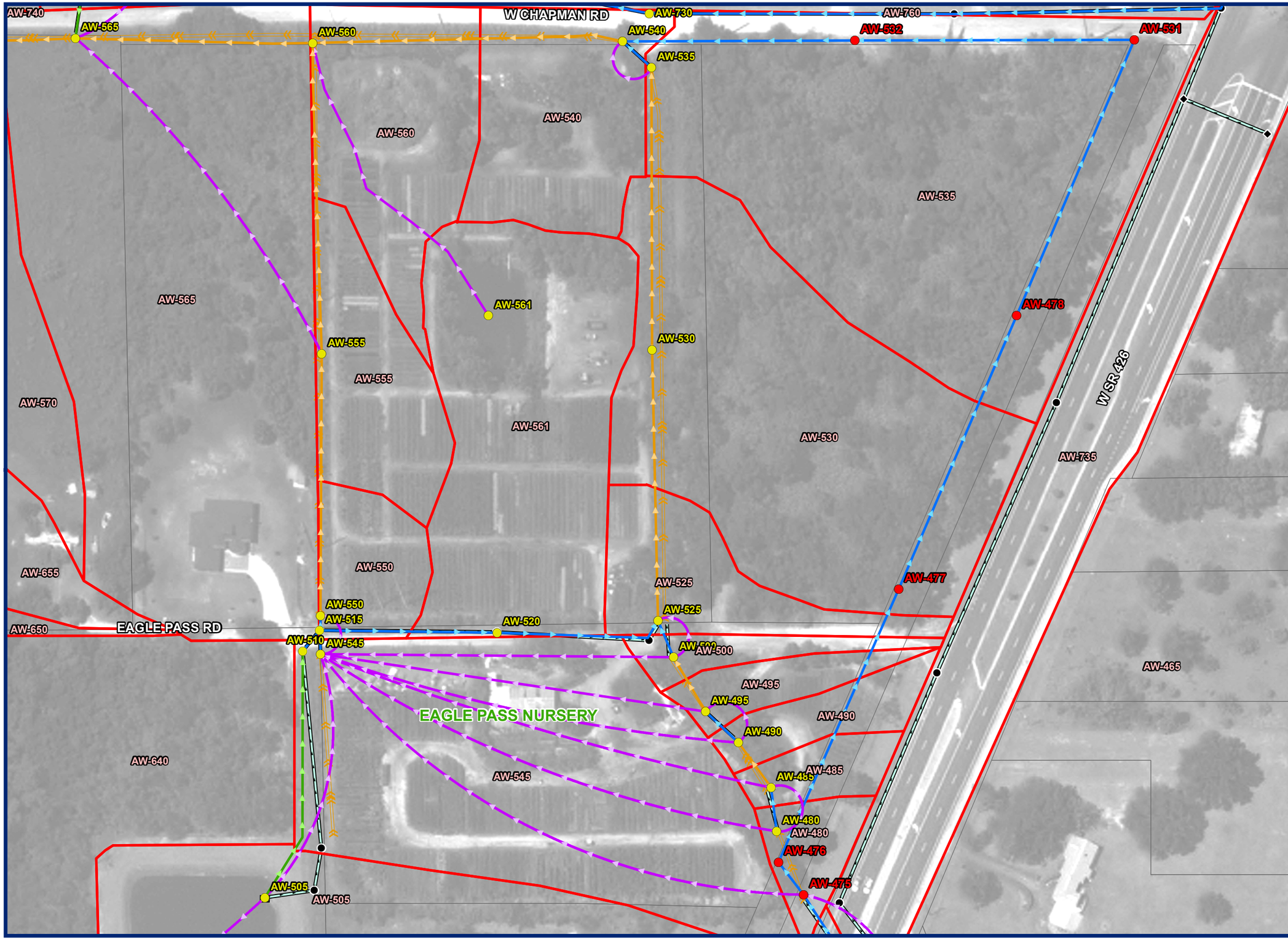
DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008
PARCELS: SEMINOLE COUNTY, 2009

FIGURE 6-7

PROPOSED IMPROVEMENT AREA 2C NODE-LINK MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

N

0 50 100
Feet

LEGEND

- PARCELS
- PROPOSED NODES
- EXISTING NODES
- CHANNELS
- DROP STRUCTURES
- WEIRS
- PIPES
- SUBBASINS

EXISTING STRUCTURES

- CONTROL STRUCTURE
- CURB INLET
- ENDWALL
- MANHOLE
- PIPES
- CHANNELS

DATA SOURCES:
AERIALS:SEMINOLE COUNTY,2008
PARCELS: SEMINOLE COUNTY, 2009

FIGURE 6-8

PROPOSED IMPROVEMENT AREA 2D NODE-LINK MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

APPENDIX D

Meeting Minutes from Permit Determination Meeting with SJRWMD Staff

M E E T I N G
M I N U T E S

DATE: June 15, 2010 (Meeting Date June 15, 2010)

RE: **ALOMA WOODS OUTFALL ASSESSMENT**

PERMIT DETERMINATION MEETING

ATTENDEES: Roland Raymundo – Seminole County Public Works Engineering Division

Cammie Dewey, Tonya Guadalupe, Monica Sovacool, Rick Ottesen, Richard Lee – SJRWMD

Mark Ellard, Tom Amstadt, Steve Sommerfeldt – Inwood Consulting Engineers (Inwood)

MEETING GOAL:

The goal of the meeting is to discuss the Aloma Woods Outfall Assessment project background, existing problems, and proposed improvements with SJRWMD staff in order to determine the permit requirements for the proposed improvements.

DISCUSSION ITEMS:

- **Project Background and Existing Problems**
  - Flooding of the streets in the Wentworth Estates subdivision north of the canal occurred during Tropical Storm Gabrielle due to capacity and conveyance problems in the outfall canal.
  - Tropical Storm Fay caused a washout of Eagle Pass Road at the outfall canal.
  - There are several nuisance flooding problems along West Chapman Road on the north side of the outfall canal.
  - Several areas along the outfall canal suffer from poor and inconsistent grading.
  - The culverts in the outfall canal within the Eagle Pass Nursery are undersized to meet an acceptable flooding level of service for the canal.
  - Large portions of the outfall canal are completely within private property. Other portions of the canal are partially within a County easement or right of way and partially within private property.
- **Improvement Area 1 Discussion**
  - This improvement includes regrading of portions of the canal and desilting of a culvert under West Chapman Road. The County would like to know if this improvement would be considered a maintenance action by the District and would therefore be exempt from permitting.
  - District Comments regarding permitting of this improvement
    - If the work can be clearly classified as maintenance then the project would be exempt from permitting. However, determining what qualifies as a maintenance action can be difficult to define.

- If there are no plans or other data that establish what the outfall canal's cross section and grading is supposed to be (design conditions) then it is difficult to qualify any action in the outfall canal as maintenance versus an improvement. Much of ditching was likely done by private property owners for agricultural purposes so no "plans" would exist. Therefore, a permit may be required for this improvement.

- The canals may have been dredged through historical wetlands rather than uplands, so impacts may need to be quantified.

- If the canal appears to have not been maintained for several years it may not qualify for a permit exemption because the canal has become well established in a non-maintained condition.

- Cleaning out silted pipes by itself would qualify as a maintenance action in most cases.

- Obtaining a permit for this improvement may be beneficial for the County because any future maintenance actions in the canal would have permitted conditions that could be referenced as a baseline for maintenance actions. This improvement could be permitted in conjunction with other outfall improvements to lessen the permitting efforts.

❖ **Improvement Area 2 Discussion**

- This improvement consists of several alternatives to improve the outfall canal conveyance downstream of SR 426 through the Eagle Pass Nursery to West Chapman Road. Each improvement would replace the undersized CMP culverts in the Eagle Pass Nursery with various conveyance improvement options. Each improvement alternative is listed below:

  - Improvement 2A – Maintain the existing canal and replace the existing CMP culverts with larger RCP culverts.

  - Improvement 2B – Replace the existing culvert in Eagle Pass Nursery with a stormsewer pipe and inlets along the existing canal.

  - Improvement 2C – Re-route the flow from SR 426 around the Eagle Pass nursery in a stormsewer pipe to the outfall canal on the north side of Eagle Pass Road. Maintain the existing canal from Eagle Pass Road to West Chapman Road.

  - Improvement 2D – Re-route the flow from SR 426 around the Eagle Pass nursery in a stormsewer pipe along SR 426 then west along West Chapman Road to the canal at West Chapman Road.

- All of the alternatives would have similar peak stage and discharge impacts to the canal. The model results for the 25-year / 24-hour storm indicated that the peak stages downstream of the improvements would increase ~0.1' and the peak discharges would increase ~30 cfs. The impacts to downstream areas decrease as the canal gets closer to Bear Gully Creek.

- No changes or improvements are proposed at the outfall canals confluence with Bear Gully Creek.

- The contributing area to the canal would remain the same as existing for this improvement.

- The boundary conditions at Bear Gully Creek were referenced from the Howell Creek model. The mean annual, 10, 25, and 100 year / 24 hour storms were modeled for this project.

- There are some parcels along the canal that may be possible pond sites for attenuation along the canal.

- District Comments regarding permitting of this improvement

    - The permitting process would be much easier if the flow rates to downstream areas do not increase. If the project increases the flow rates to downstream areas in the canal and to Bear Gully Creek then it would need to be clearly demonstrated that the project would not cause flooding impacts from increased peak stages or erosion problems from increased velocities.

    - Large portions of the outfall canal are likely in hydric soils. The canal may be considered wetland cut in some areas which would mean any changes to the canal could be considered wetland impacts. Also, filling in and piping section of the outfall that are considered wetlands would be considered a loss of wetland habitat and would require mitigation. The alternative of routing the pipe around the outfall canal leaving the ditch intact may avoid wetland impacts. Any wetland impacts of more than 1 acre would require an Individual Permit.

    - It will be important to determine which sections of the outfall canal are upland cut versus wetland cut prior to permitting the project. Impacts to wetland cut ditches may require mitigation but impacts to upland cut ditch would only need to be quantified.

    - The SJRWMD would also require that changing or re-routing flow in the outfall canal would not negatively impact the hydrology (i.e. drawdown the water table or alter established seasonal high levels) in any adjacent wetlands.

    - Because there are no existing maintenance berms along the canal, in areas where the outfall canal is wetland cut, establishing access for driving equipment along the side of the outfall canal to perform maintenance on or regrade the canal would be considered wetland impacts.

❖ **Improvement Area 3 Discussion**

- The tailwater from Bear Gully Creek stages up and floods West Chapman Road. This improvement would raise the road to avoid flooding and provide inlets along the north side of the road to convey runoff from the road to the outfall canal.

- District Comments regarding permitting of this improvement

    - This improvement should be exempt from permitting as long as the road remains the same width, and does not significantly impact drainage.

    - SJRWMD would be interested in what is happening with the inlets on the north side of the road to ensure that the inlets would not cause any adverse impacts to the outfall canal or wetlands.

❖ **General Permit Discussion**

- Permitting for the improvements can be done all at once even though the construction of the project might be phased.

- Since some of the proposed improvement areas are on private property, the County would need to have documentation that they have an easement over the project area or they would need to have the current owner co-sign the permit.

- Flow from areas upstream project is considered offsite flow and would normally not be considered part of the project area. The actual footprint of a construction project is normally considered the project area for permitting thresholds.

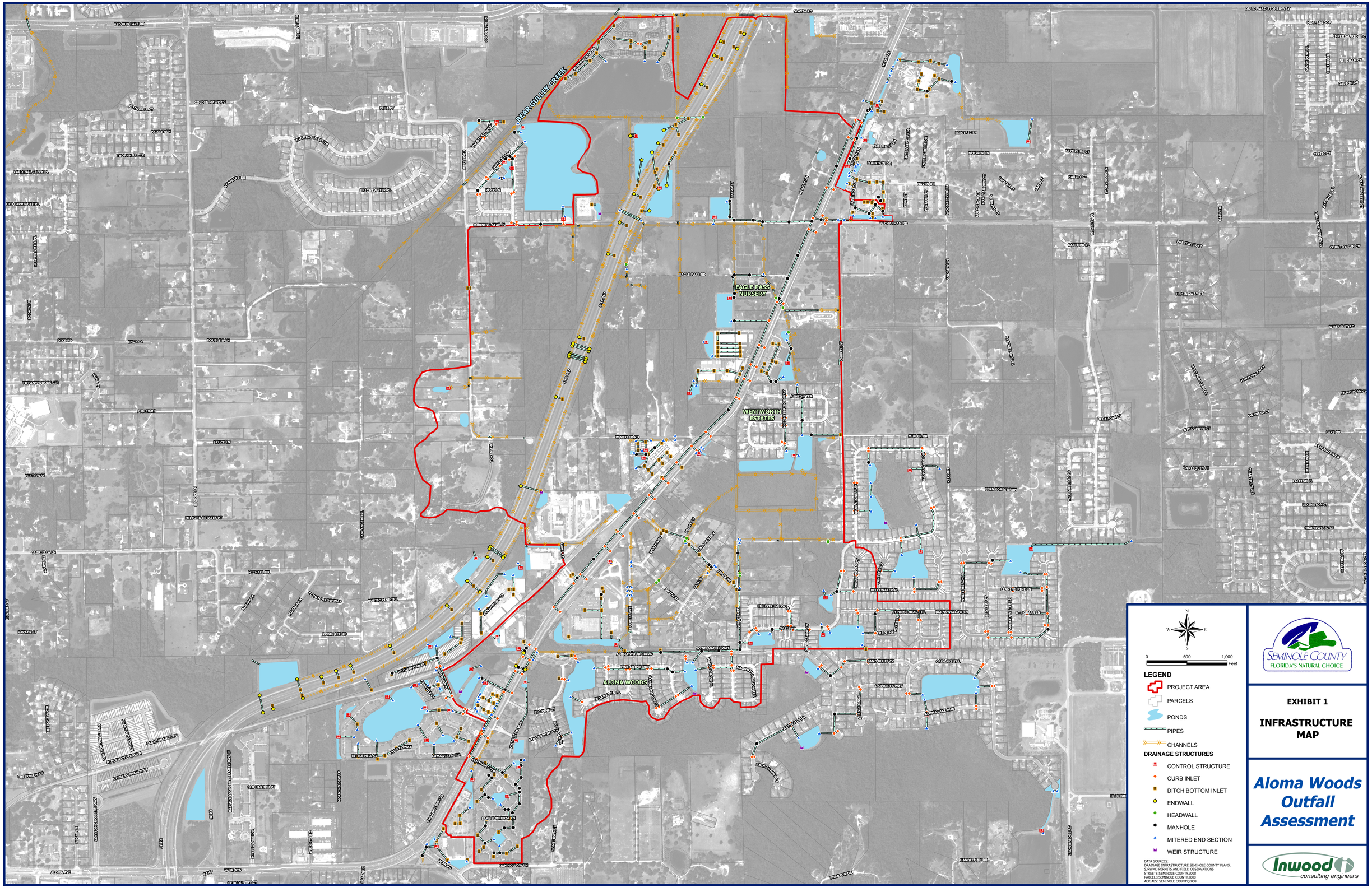
The above summary is Inwood's understanding of the main points of the meeting. If any one of the participants has any clarifications or additional information that may be useful, please reply to Tom Amstadt of Inwood Consulting Engineers, Inc. at 407-971-8850 or tamstadt@inwoodinc.com.

EXHIBITS

Exhibit 1 – Infrastructure Map

Exhibit 2 – Outfall Canal Plan / Profile / Cross Section Map

Exhibit 3 – ICPR Model Node-Link With LOS Results Map



0 500 1,000 Feet

LEGEND

- PROJECT AREA
- PARCELS
- PONDS
- PIPES
- CHANNELS

DRAINAGE STRUCTURES

- CONTROL STRUCTURE
- CURB INLET
- DITCH BOTTOM INLET
- ENDWALL
- HEADWALL
- MANHOLE
- MITERED END SECTION
- WEIR STRUCTURE

DATA SOURCES:
DRAINAGE INFRASTRUCTURE:SEMINOLE COUNTY PLANS, SJRWMD PERMITS AND FIELD OBSERVATIONS
STREETS:SEMINOLE COUNTY,2008
PARCELS:SEMINOLE COUNTY,2008
AERIALS: SEMINOLE COUNTY,2008

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

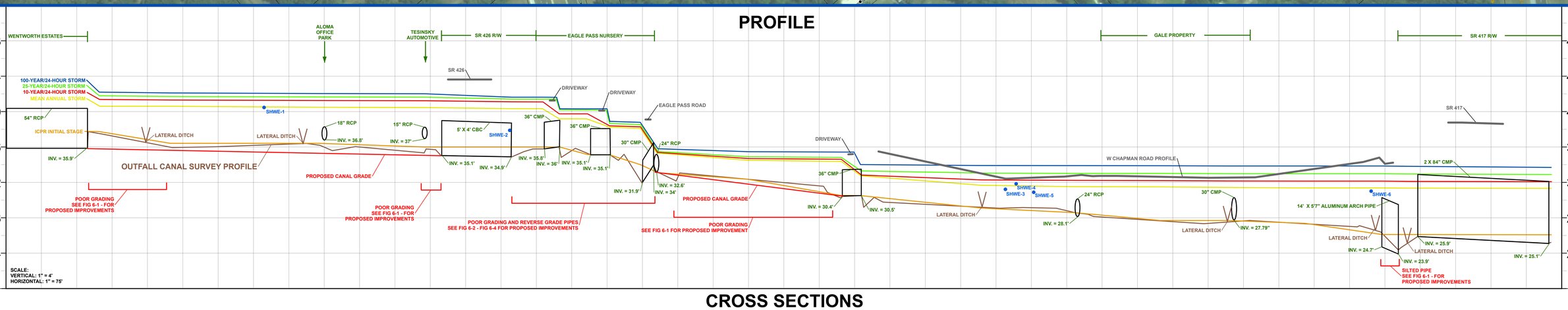
EXHIBIT 1

INFRASTRUCTURE MAP

Aloma Woods Outfall Assessment

Inwood consulting engineers

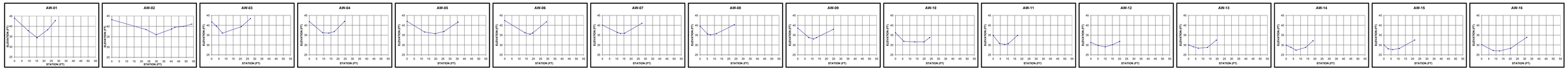
PROFILE



SCALE:
VERTICAL: 1" = 4'
HORIZONTAL: 1" = 75'

CROSS SECTIONS

NOT TO SCALE



DATA SOURCES:
SURVEY:SSMC,2009
DRAINAGE INFRASTRUCTURE:
SEMINOLE COUNTY PLANS, SJRWMD PERMITS
AND FIELD OBSERVATIONS
PARCELS: SEMINOLE COUNTY,2009
AERIALS:SEMINOLE COUNTY,2008

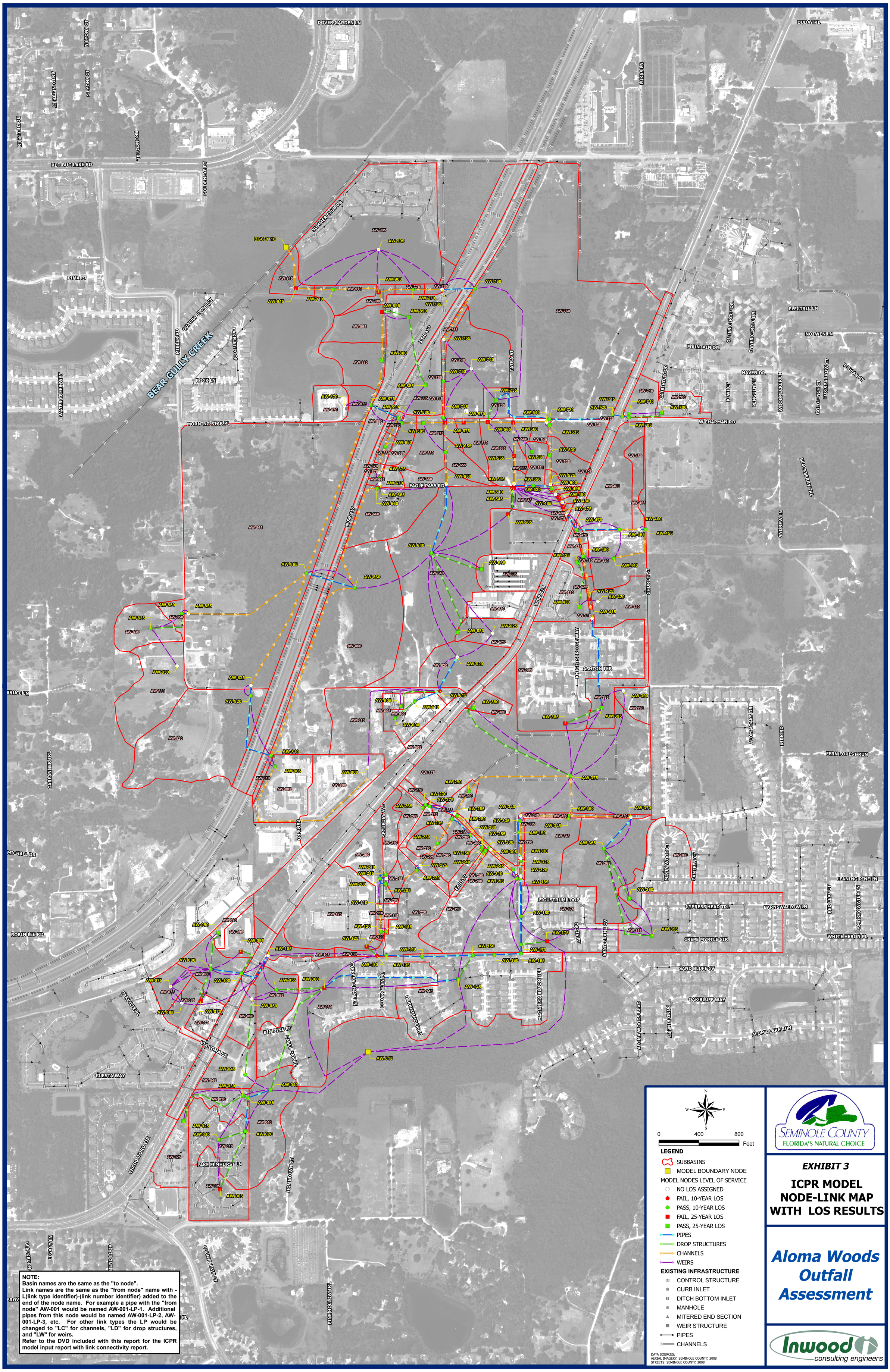
SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Aloma Woods Outfall Assessment
Wentworth Estates to SR 417

0 75 150 Feet

Inwood consulting engineers

EXHIBIT 2
ALOMA WOODS OUTFALL CANAL PLAN / PROFILE / CROSS SECTION MAP



NOTE:
Basin names are the same as the "to node".
Link names are the same as the "from node" name with -L(link type identifier)-(link number identifier) added to the end of the node name. For example a pipe with the "from node" AW-001 would be named AW-001-LP-1. Additional pipes from this node would be named AW-001-LP-2, AW-001-LP-3, etc. For other link types the LP would be changed to "LC" for channels, "LD" for drop structures, and "LW" for weirs.
Refer to the DVD included with this report for the ICPR model input report with link connectivity report.

N
W E
S

0 400 800
Feet

LEGEND

- SUBBASINS
- MODEL BOUNDARY NODE

MODEL NODES LEVEL OF SERVICE

- NO LOS ASSIGNED
- FAIL, 10-YEAR LOS
- PASS, 10-YEAR LOS
- FAIL, 25-YEAR LOS
- PASS, 25-YEAR LOS
- PIPES
- DROP STRUCTURES
- CHANNELS
- WEIRS

EXISTING INFRASTRUCTURE

- CONTROL STRUCTURE
- CURB INLET
- DITCH BOTTOM INLET
- MANHOLE
- MITERED END SECTION
- WEIR STRUCTURE
- PIPES
- CHANNELS

DATA SOURCES:
AERIAL IMAGERY: SEMINOLE COUNTY, 2008
STREETS: SEMINOLE COUNTY, 2008

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

EXHIBIT 3

ICPR MODEL NODE-LINK MAP WITH LOS RESULTS

Aloma Woods Outfall Assessment

Inwood consulting engineers

DVD

- GIS DATA
- ICPR MODELS
- REFERENCE DATA
- PDF OF REPORT

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