Appendix A:

Design / Right of Way

Mayor
Charles W. "Sonny" Penhale

City Clerk / Treasurer
Peggy C. Dunaway

CITY OF HELENA

816 Highway 52 East
P.O. Box 613
Helena, AL 35080-0613
Phone (205) 663-2161
Fax (205) 663-9276

Council Members
Colleen Kelley Lenz
Barbara F. Hyche
Thomas P. Lefebvre
Jerry Deon Pate
Katherine E. Ennis

September 12, 2008

Mr. Brian Davis
Division Engineer
Third Division
Alabama Department of Transportation
PO Box 2745
Birmingham, Alabama 35202-2745

Dear Mr. Davis:

In response to ALDOT's letter dated August 18, 2004, the City of Helena has formally designated a Transportation Corridor for the proposed Helena Bypass which would provide an alternate route for SR 261 and bypass Old Towne Helena (Project ST-059-261-004). The proposed bypass is expected to cross over the City's proposed Buck Creek Greenway/Multi-Use Trail (Project CMAQ-9802(126)), which is a recreational facility currently in the corridor study and design phase.

The City of Helena is aware of the potential for the proposed bypass to cross the Buck Creek Greenway/Multi-Use Trail and has provided for this future development as shown on the attached figures. Designation of this Transportation Corridor should assist in preventing the proposed Helena Bypass from resulting in Section 4(f) impacts on the Buck Creek Greenway/Multi-Use Trail in the future. It should be noted that both the proposed Helena Bypass project and the Buck Creek Greenway/Multi-Use Trail are included in the City of Helena's Comprehensive Plan, dated 10/23/2003. The correspondence regarding this formal designation of a Transportation Corridor and the attached graphics will be included as an appendix to the Comprehensive Plan.

Sincerely,

Charles W. Penhale
Mayor

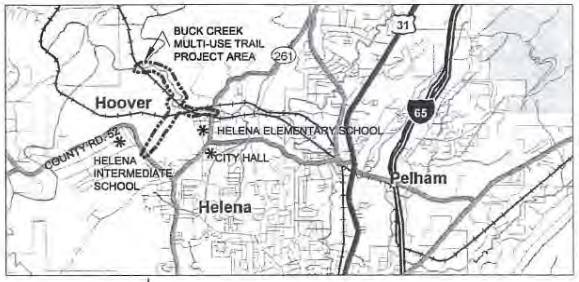
:ke

c: Sandra
Cindy
c: 9-17-08

HELENA BUCK CREEK MULTI- USE TRAIL

HELENA, ALABAMA

Project No. CMAQ-9802(126)



SITE LOCATION MAP

N

MAIN STREET

TRAIL HEAD
W/ PARKING

HWY. 261

MAIN STREET

HWY. 52

HELENA
CITY
HALL

HELENA
POST
OFFICE

SECOND STREET

RUFFIN ROAD

TRAIL HEAD
W/ PARKING

AMPHITHEATER

DOWNTOWN
HELENA

1ST AVENUE

PROPOSED TRAIL SEATING AREA
SCENIC VIEWING AREA

THIRD STREET

2ND AVENUE

HELENA ELEMENTARY
SCHOOL

HELENA
SPORTS COMPLEX

PROPOSED TRAIL CROSSING BENEATH EXISTING
RAILROAD BRIDGE

BUCK CREEK

PROPOSED BOARDWALK OVER
BUCK CREEK

PROPOSED TRAIL CROSSING BENEATH EXISTING
RAILROAD BRIDGE
TRAIL SEATING AREA\ SCENIC VIEWING AREA

PROPOSED BRIDGE OVER
TRIBUTARY

PROPOSED BRIDGE OVER
RAILROAD

PRIOR DESIGNATED 400' WIDE
TRANSPORTATION CORRIDOR
PROJECT NO. ST-059-261-004,
PROPOSED HELENA BYPASS

BUCK CREEK

GSX RAILROAD

TRAIL SEATING AREA
SCENIC VIEWING AREA

TRAIL CROSSING BENEATH
EXISTING RAILROAD BRIDGE

TRAIL SEATING AREA
SCENIC VIEWING AREA

PART - E

POWER EASEMENT

EXISTING RAIL
BED

APPLEFORD CONNECTOR ROAD

TRAIL NARROWS TO 8 FT. WIDTH
AS IT PASSES THROUGH A NARROW
ROCK CUT FOR APPROXIMATLY 300 FT.

EXISTING RAIL
BED

TRAIL WIDTH = 12' (TYP.)
TRAIL ROW = 80' (TYP.)

PROPOSED TRAIL WIDTH = 12' (TYP.)
PROPOSED TRAIL ROW = 80' (TYP.)

PROPOSED BRIDGE STRUCTURE
TO BE PLACED ON EXISTING
STONE PIERS

SITE OF HISTORIC
BILLY GOULD COKE
OVENS

TRAIL SEATING AREA
SCENIC VIEWING AREA

CAHABA RIVER

GSX RAILROAD

POWER EASEMENT

PRIOR DESIGNATED 400' WIDE
TRANSPORTATION CORRIDOR
PROJECT NO. ST-059-261-004,
PROPOSED HELENA BYPASS

GSX RAILROAD

SITE OF HISTORIC
COKE OVENS

PROPOSED FUTURE LOCAL ROAD BY
OTHERS

BUCK CREEK

COUNTY RD. 52

PROPERTY OWNERS

1. CITY OF HELENA
2. USX STEEL
3. ACTON WILLIAM
4. WOOLSTEEN TOMMY
5. GAMBLE HARRY
6. SMITH THELMA
7. BETHEL AMER. METHODIST CHURCH
8. SMITH L Z
9. DEVINER JOHNIE
10. ORSE SADIE
11. HANEY DON
12. SMITH HENRY
13. POWELL JOSEPH
14. MOORE ROBERT
15. PATTON JAMES
16. HILL BEVERLY
17. EDWARDS ORA LEE
18. HABSHEY FAMILY
19. SEARS PAULINE
20. SHARP JOHN
21. HAWTHORNE DONNA
22. DEVINER ADDIE
23. MOLLINS L L
24. MORTON RONNIE
25. SIDES MARION
26. HENDERSON JOEY
27. WOOD WANDA WEBSTER
28. MURPHY DONALD
29. DUTRENSE CARLETON
30. HARRELL FLOYD WESLEY
31. THOMPSON NORMA
32. COURINGTON JAMES
33. PULLIAM SHAWN
34. GRANT ROBERT
35. CUTCHER RUBEN
36. ARAUJO TONY
37. RIVERWOODS LLC
38. LOUISVILLE AND NASHVILLE RR

LEGEND

- CITY OF HELENA PARK PROPERTY
- RAIL TRAIL
- EXISTING TRAIL IN PLACE
- PROPOSED TRAIL
- BRIDGES
- BUCK CREEK
- CAHABA RIVER

N

0 100 200 300 400

SCALE: 1" = 100'-0"

HELENA BUCK CREEK MULTI -USE TRAIL

HELENA, AL

DEPARTMENT OF TRANSPORTATION

KPS GROUP

VOLKERT

Figure 4.05-3

5-LANE TYPICAL SECTION

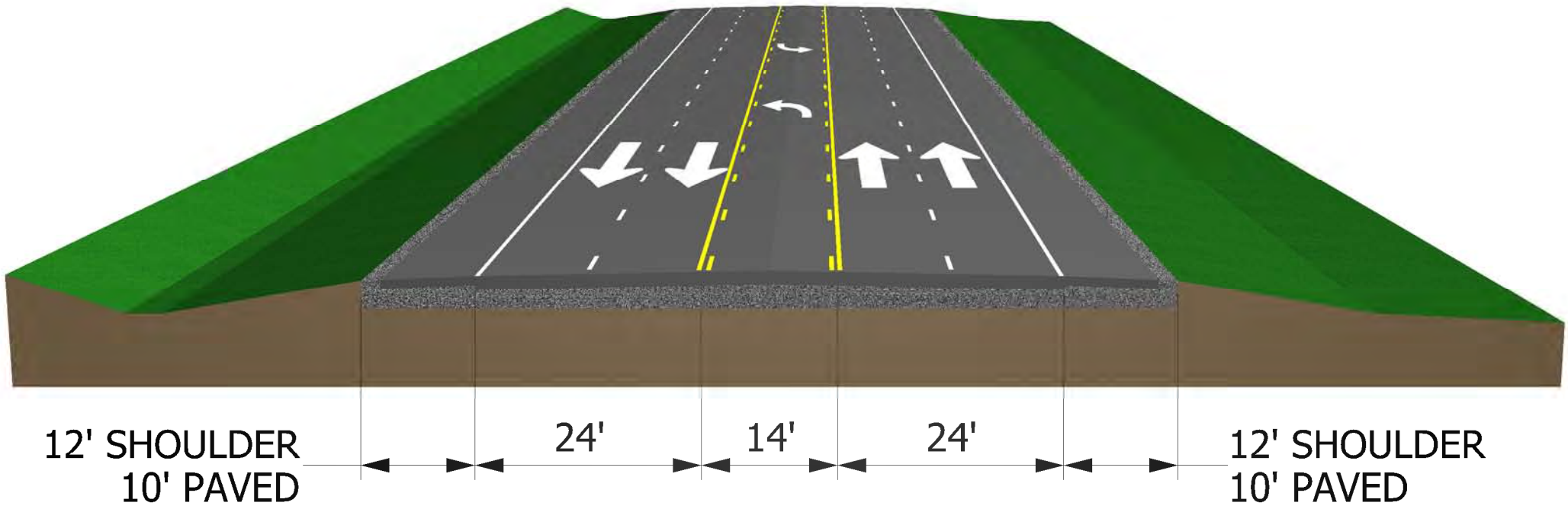
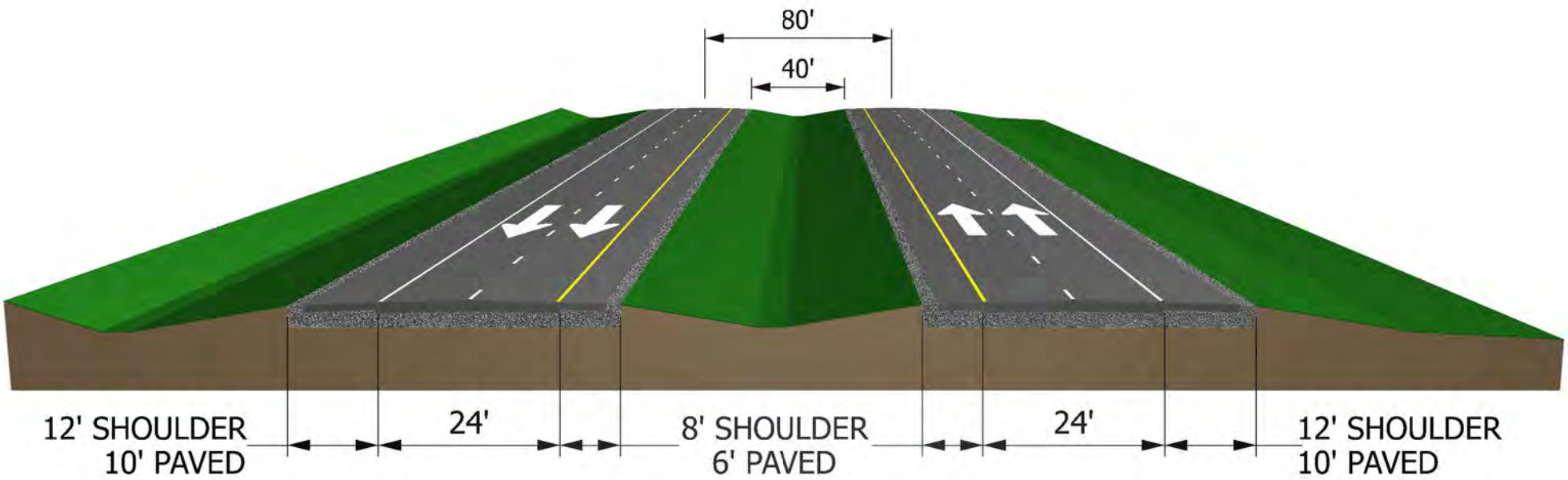


Figure 4.05-4

4-LANE DIVIDED TYPICAL SECTION



ALABAMA DEPARTMENT OF TRANSPORTATION
1409 Coliseum Boulevard, Montgomery, Alabama 36110

Bob Riley
Governor

Joe McInnes
Transportation Director

October 5, 2007

Mr. Greg Lowe
Solid Civil Design
One Chase Corporate Drive
Suite 400
Birmingham, AL 35244-1000

Subject: Project ST-059-261-004
Helena Bypass Corridor Study
Shelby County

Dear Mr. Lowe:

Enclosed is a revised Form ROW-RA-1 Project Relocation Analysis for your use in preparing the environmental documentation for the referenced project. If you have any questions regarding this matter, please contact Corey Clifton at (334)242-6147.

Sincerely,

William F. Adams, P.E.
Design Bureau Chief

By: _____
Alfedo Acoff, Coordinator
Environmental Technical Section

CWC

Enclosure
c: Mr. Brian Davis
File (2)

REC'D OCT 0 8 2007

INTERDEPARTMENT MEMORANDUM

ALABAMA DEPARTMENT OF TRANSPORTATION
1409 COLISEUM BOULEVARD MONTGOMERY, ALABAMA 36130-3050

September 27, 2007

TO: Mr. William Adams
Chief Design Engineer

FROM: Paul Bowlin
Right of Way Engineer

RE: Project No. ST-059-261-004
Helena Bypass
Shelby County

Attached is a revised Form ROW-RA-1, Preliminary Project Relocation Analysis for the referenced project.

MT
Attachment

cc: Ms. Alfedo Acoff
File (2)

OCT 2007
RECEIVED
DESIGN BUREAU
ENVIRONMENTAL SEC.
ALDOT

OCT 2007
RECEIVED
Design Bur/Admin.

MEMORANDUM

TO: **Mr. Lance Taylor, Pre-Construction Engineer**

ATTN: **Mrs. Sandra F.P. Bonner, Environmental/Planning Engineer**

FROM: **James P. Holmes, Right of Way Manager** J.P.H.

DATE: **October 19, 2009**

RE: **Shelby County**
Project No. ST-059-261-004
Helena Bypass

Pursuant to a request from Greg Lowe with Solid Civil Design, we are submitting a revised updated ROW-RA-1 form for Alternate 2 on the Helena Bypass.

A recent site visit revealed that two of the residences along the proposed route are currently vacant. These would be the homes listed on tract 8 and tract 10 of the attached map. Also a tract that was previously listed as vacant is now occupied. There is a mobile home located on tract 11. In addition, the business that is located on tract 4 is currently vacant and is signed "Available for Rent".

Through the use of circulars, local newspapers, Birmingham Area MLS and other internet searches, it is shown that market availability is adequate for the satisfactory relocation of all displacees.

There appear to be no hazardous material sites.

If any additional information is needed, please advise.

JPH/skd
Cc: Steven E. Walker, P.E. w/att
Greg Lowe w/att
Project General w/att
Estimate File w/att

FORM ROW-RA-1
Revised 3/01

ALABAMA DEPARTMENT OF TRANSPORTATION
PRELIMINARY PROJECT RELOCATION ANALYSIS
(To be prepared prior to Corridor Public Hearing)

Project No. ST-059-261-004 County: Shelby
Description Helena Bypass Alternate No. 2

DISPLACEMENT AND REPLACEMENT HOUSING INVENTORY ESTIMATE

ESTIMATED NUMBER DISPLACEES						INCOME LEVEL			
Type of Displacee	Owners	Tenants	Total	Minority		*0-15	15-30	30-50	Over 50
				Own.	Ten.				
Individuals and Families	6	2	8	0	2	1	1	4	2
Businesses	3	0	3	0	0				
Farms	NA								
Non-Profit Organizations	NA								
Signs	NA								

OWNERS **VALUE OF DWELLING**

DISPLACED DWELLINGS	** 0 - 40	40 - 60	60 - 80	80 - 100	Over 100
1 - 3 BEDROOMS	3	3	1		
4 - OVER BEDROOMS					1

AVAILABLE DWELLINGS

1 - 3 BEDROOMS	7	9	10	4	18
4 - OVER BEDROOMS					9

TENANTS **MONTHLY RENTAL RATE**

DISPLACED UNITS	$ 0 - 150	$ 151 - 300	$ 301 - 400	$ 401 - 500	$ 501 +
1 - 3 BEDROOMS	0	2	0	0	0
4 - OVER BEDROOMS					

AVAILABLE UNITS

1 - 3 BEDROOMS	0	4	3	2	6
4 - OVER BEDROOMS					

Items numbered 1 through 7 on the back of this form must be answered and explained. Number the corresponding responses and attach additional pages as needed.

I certify that the above is a realistic estimate.

Date: October 15, 2009 Signed: James B. Crandall, PE Title: Division Relocation Officer

(Submit in duplicate to Bureau of Right of Way)
Attached: Narrative Explanations

*Denotes Thousands **DSS dwellings currently available.

The information listed below must be furnished as a narrative analysis to the extent appropriate for the project and in accordance with 49 CFR 24.205 and Paragraph G, Section I, of the State's Relocation Assistance Manual.

1. An estimate of the number of households to be displaced, including the family characteristics (e.g. minority, ethnic, handicapped, elderly, large family, income level and owner/tenant status). However, where there are very few displacees, information on race, ethnicity and income levels should not be included in the EIS to protect the privacy of those affected.

2. A discussion comparing available (decent, safe and sanitary) housing in the area with the housing needs of the displacees. The comparison should include: (1) price ranges, (2) sizes (number of bedrooms), and (3) occupancy status (owner/tenant).

3. A discussion of any affected neighborhoods, public facilities, non-profit organizations and families having special composition (e.g. ethnic, minority, elderly, handicapped or other factors) which may require special relocation considerations and the measures proposed to resolve these relocation concerns.

4. A discussion of the measures to be taken where the existing housing inventory is insufficient, does not meet relocation standards or is not within the financial capability of the displacees. A commitment to last resort housing should be included when sufficient comparable replacement housing may not be available.

5. An estimate of the numbers, descriptions, types of occupancy (owner/tenant) and sizes (number of employees) of businesses and farms to be displaced. Additionally, the discussion should identify: (1) sites available in the area to which the affected businesses may relocate. (2) likelihood of such relocation, and (3) potential impacts on individual businesses and farms caused by displacement or proximity of the proposed highway if not displaced.

6. A discussion of the results of contacts, if any, with local governments, organizations, groups and individuals regarding residential and business relocation impacts, including any measures or coordination needed to reduce general and/or specific impacts. These contacts are encouraged for projects with large numbers of relocatees or complex relocation requirements. Specific financial and incentive programs or opportunities beyond those provided by the Uniforms Relocation Act) to residential and business relocatees to minimize impacts may be identified, if available through other agencies or organizations.

7. A statement that: (1) the acquisition and relocation program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended by the Surface Transportation & Uniform Relocation Assistance Act of 1987, and (2) relocation resources are available to all residential and business relocatees without discrimination.

NARRATIVE ANALYSIS
Shelby County
Project No. ST-059-261-004
Helena Bypass

Generalizations
The proposed project covers acquisition of rights of way for a bypass of the City of Helena. The project is located entirely within Shelby County and the City of Helena.

The attached inventory and the following analyses are realistic compilations based on field observations, city and county records, real estate service listings, classified ads, and discussions with local officials and others. In addition to the foregoing narrative, we offer the following responses to the questions posed on Side 2 of Form ROW-RA-1:

1. An estimate of the number of households to be displaced is included on Side 1 of this form. Side -1 also includes the estimated income levels of the displacees. We have no direct indication of the existence of large numbers of elderly and disabled or large families. A recent site visit revealed the following pertinent information:
    a. The proposed project will require the acquisition of two (2) vacant residences:
        i. A structure belonging to Jennifer K. Friedman with an address of 6486 Helena Road
        ii. A structure belonging to Fred and Martha McGuffie with an address of 6622 Helena Road
    b. A site that was also previously shown as vacant is now occupied. There is a sw/mh located at 6848 Helena Road. Joel Bearden Jr. is the current record owner of this tract.

2. A listing of the number, cost, and size of available housing in the area at the time of the inventory is shown on Side 1 of this form. Through the use of circulars, local newspapers, Birmingham Area MLS and other internet searches, it is shown that market availability is sufficient for the satisfactory relocation of all displacees.

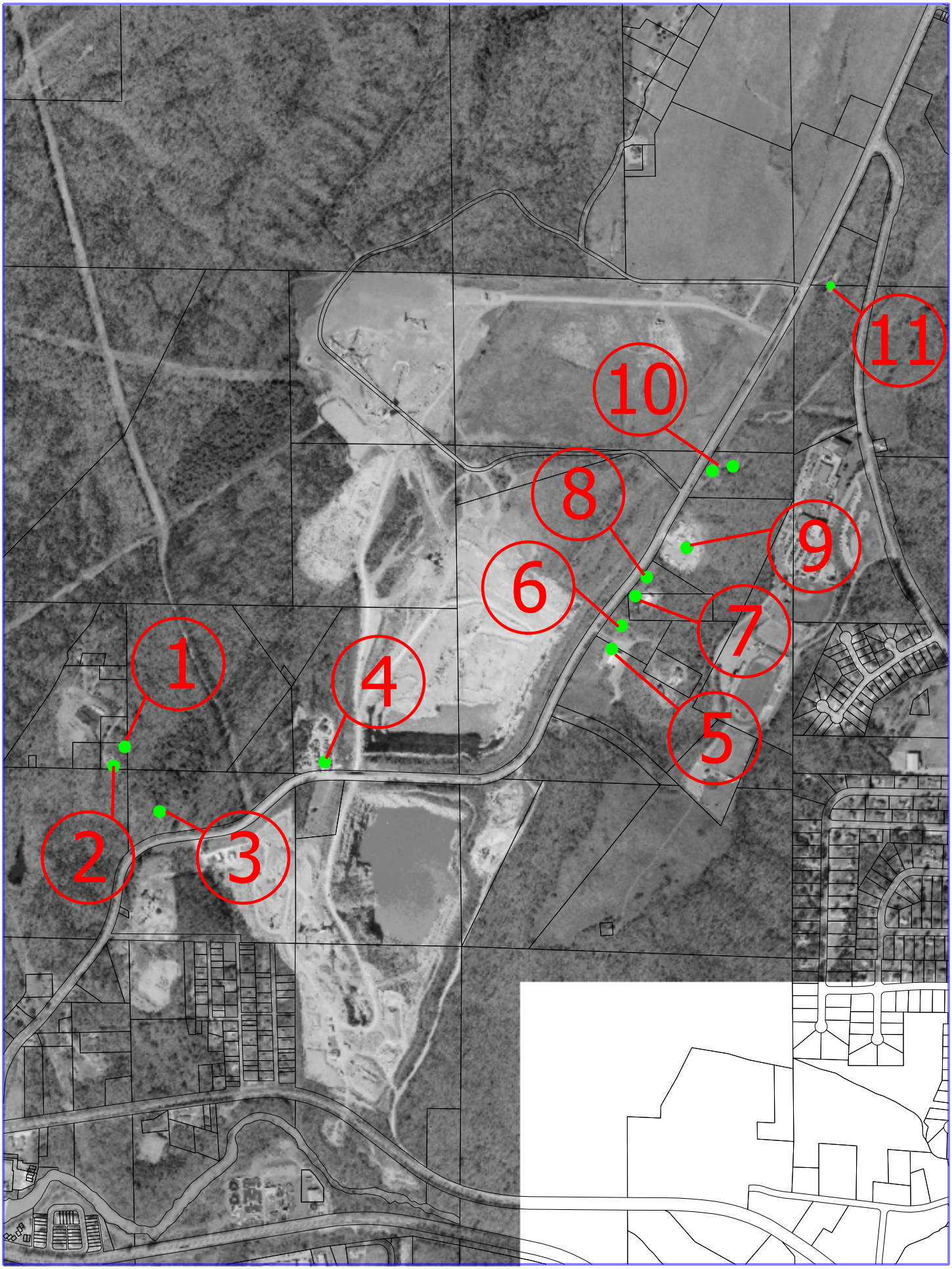
3. No detrimental impact on neighborhoods, houses, or community services is evident. Adequate planning and coordination during the design phase should minimize or prevent any detrimental impact due to location.

4. When necessary, Last Resort Housing plans will be made for any displacee, including the option of new construction. The Alabama Department of Transportation is committed to the equitable, timely, consistent relocation of all persons displaced by highway construction.

5. The proposed project will require the acquisition of three (3) businesses. This includes the storage-yard for the business on tract 4. The recent site visit revealed that the business on tract for is currently vacant and available for rent.

6. The consensus of local officials and community groups is favorable. All have indicated a desire for the project. All have expressed a desire for the improvement. Current and future need, growth impetus, and improved traffic flow are the most often cited reasons for wanting an improved facility.

7. The acquisition and Relocation Assistance Program Services will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended by the Surface Transportation & Uniform Relocation Assistance Act of 1987. Relocation assistance and resources will be made available to **all** displaced persons without regard to race, creed, color, national origin, religion, sex, or sexual orientation.


1
2
3
4
5
6
7
8
9
10
11

Current Land Owners

01 Landers Willie (Life Estate) Heir Lilli or Allen Tammy Faye

02 Allen Tammy Faye

03 Watson Norris Edward

04 Bearden Leasing Co ½ Int & Joel E Bearden Quarry Trust ½ Int *

05 Peoples Janice B

06 Bearden Joel E & Peggy A

07 Cotney William B & Debra R *

08 McGuffie Fred D Jr & Martha A

09 Vulcan Land Inc *

10 Friedman Jennifer K

11 Bearden Joel E Jr.

Notes

01 Single Wide Mobile Home

02 Single Wide Mobile Home

03 Home with Outbuildings – **Intersection Design will Cause Relocation**

04 Brick Yard *

05 Previously Home of Bearden Farms

06 Residence

07 Aerospace Engineering *

08 Residence

09 Concrete Mixing – USA Ready Mix*

10 2 Residential Homes

11 Single Wide Mobile Home

* denotes business

ESTIMATE

Shelby County
Projects No. ST-059-261-004
Helena Bypass

ALT	ROW COST	RELOC COST	50% CONTINGENCY	TOTAL COST
1	$ 2,915,000.00	$ NA	$ 1,457,500.00	$ 4,372,500.00
2	$ 4,432,700.00	$ 222,000.00	$ 2,327,350.00	$ 6,982,050.00

WITH BYPASS

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information

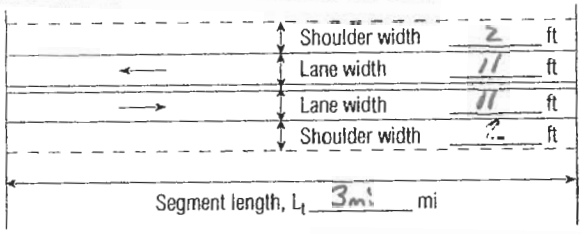
Analyst	Carr
Agency or Company	Solid Civil Design
Date Performed	8/15/08
Analysis Time Period	2030

Site Information

Highway	261
From/To	
Jurisdiction	Helena
Analysis Year	2008

☐ Operational (LOS) ☐ Design (v_p) ☐ Planning (LOS) ☐ Planning (v_p)

Input Data



☑ Class I highway ☐ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume ____ veh/h

Directional split 75 / 25

Peak-hour factor, PHF .90

% Trucks and buses, P_T 6 %

% Recreational vehicles, P_R — %

% No-passing zone 100 %

Access points/mi 10 /mi

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	0.99
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.5
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	—
Heavy-vehicle adjustment factor, f_{HV} $f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$	0.97
Two-way flow rate,[1] v_p (pc/h) $v_p = \frac{V}{PHF * f_G * f_{HV}}$	1861
v_p * highest directional split proportion[2] (pc/h)	1396

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field measured speed, S_{FM}	____ mi/h	Base free-flow speed, BFFS	45 mi/h
Observed volume, V_f	____ veh/h	Adj. for lane width and shoulder width, f_{LS} (Exhibit 20-5)	4.7 mi/h
Free-flow speed, FFS	____ mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.5 mi/h
$FFS = S_{FM} + 0.00776\left(\frac{V_f}{f_{HV}}\right)$		Free-flow speed, FFS	37.8 mi/h
		$FFS = BFFS - f_{LS} - f_A$	

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	1.3
Average travel speed, ATS (mi/h) $ATS = FFS - 0.00776v_p - f_{np}$	22

Percent Time-Spent-Following

Grade adjustment factor, f_G (Exhibit 20-8)	1.0
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} $f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$	1.00
Two-way flow rate,[1] v_p (pc/h) $v_p = \frac{V}{PHF * f_G * f_{HV}}$	1788
v_p * highest directional split proportion[2] (pc/h)	1341
Base percent time-spent-following, BPTSF (%) $BPTSF = 100(1 - e^{-0.000879v_p})$	79.2
Adj. for directional distribution and no-passing zone, $f_{d/np}$ (%) (Exhibit 20-12)	8.3
Percent time-spent-following, PTSF (%) $PTSF = BPTSF + f_{d/np}$	87.5

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	E
Volume to capacity ratio, v/c $v/c = \frac{v_p}{3,200}$	
Peak 15-min vehicle-miles of travel, VMT_{15} (veh-mi) $VMT_{15} = 0.25L_t\left(\frac{V}{PHF}\right)$	
Peak-hour vehicle-miles of travel, VMT_{60} (veh-mi) $VMT_{60} = V * L_t$	
Peak 15-min total travel time, TT_{15} (veh-h) $TT_{15} = \frac{VMT_{15}}{ATS}$	

Notes:

1. If $v_p \geq 3,200$ pc/h, terminate analysis—the LOS is F.
2. If highest directional split $v_p \geq 1,700$ pc/h, terminate analysis—the LOS is F.

CONTECH BRIDGE SOLUTIONS INC.

Job No._____, Sh.____Of____,Pg__

Project_____

By_____ Date_____

Subject _____

Traffic on 261 AFTER By Pass is Constructed

K = 11% Class 1 two lane 45 m/hr
11' lanes 3mi 10 access points per mile

$f_{HV} = .97$

$V_p = DHV = (1313 \times 2) \times .11 = 1609$

$V_p = \frac{1609}{.90 \times .99 \times .97} = 1861 \times .75 = 1396$ pc/hr

5. 1396 < 1700
1609 < 3200

6. FFS = BFFS − f_{LS} − f_A
45 − 4.1 − 2.5 = 37.8

f_{LS} = 4.1
f_A = 2.5

14.44

7. ATS = 37.8 − .00776(1861) + 1.3 = 22.06

10 V_p $\frac{1609}{.90} = 1788$

11. V_p = 1788 × .75 = 1341

13. $100\left(1 - e^{.000879(1788)}\right)$ 79.2%

14. $f_{dlnp} = 8.3$

PTSF = 79.2 + 8.3 = 87.5

ATS = 22 87.5%

Level E

WITHOUT BYPASS

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information

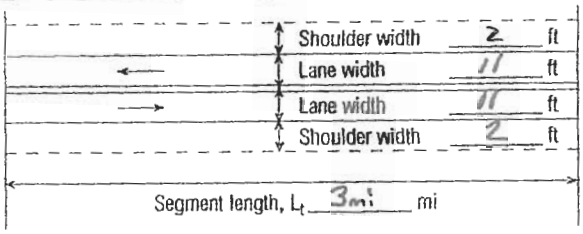
Analyst	Carr
Agency or Company	Solid Civil Design
Date Performed	8/15/08
Analysis Time Period	2013 2030

Site Information

Highway	261
From/To	
Jurisdiction	Helena
Analysis Year	2008

☐ Operational (LOS) ☐ Design (v_p) ☐ Planning (LOS) ☐ Planning (v_p)

Input Data



☑ Class I highway ☐ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume _____ veh/h

Directional split 75 / 25

Peak-hour factor, PHF .95

% Trucks and buses, P_T 6 %

% Recreational vehicles, P_R — %

% No-passing zone 100 %

Access points/mi 10 /mi

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	0.99
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.5
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	—
Heavy-vehicle adjustment factor, f_{HV} $f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$	0.97
Two-way flow rate,[1] v_p (pc/h) $v_p = \frac{V}{PHF * f_G * f_{HV}}$	2383
v_p * highest directional split proportion[2] (pc/h)	1787 LOS F

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field measured speed, S_{FM}	mi/h	Base free-flow speed, BFFS	45 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width, f_{LS} (Exhibit 20-5)	mi/h
Free-flow speed, FFS $FFS = S_{FM} + 0.00776\left(\frac{V_f}{f_{HV}}\right)$	mi/h	Adj. for access points, f_A (Exhibit 20-6)	mi/h
		Free-flow speed, FFS $FFS = BFFS - f_{LS} - f_A$	mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	
Average travel speed, ATS (mi/h) $ATS = FFS - 0.00776v_p - f_{np}$	

Percent Time-Spent-Following

Grade adjustment factor, f_G (Exhibit 20-8)	
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	
Heavy-vehicle adjustment factor, f_{HV} $f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$	
Two-way flow rate,[1] v_p (pc/h) $v_p = \frac{V}{PHF * f_G * f_{HV}}$	
v_p * highest directional split proportion[2] (pc/h)	
Base percent time-spent-following, BPTSF (%) $BPTSF = 100(1 - e^{-0.000879v_p})$	
Adj. for directional distribution and no-passing zone, $f_{d/np}$ (%) (Exhibit 20-12)	
Percent time-spent-following, PTSF (%) $PTSF = BPTSF + f_{d/np}$	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	
Volume to capacity ratio, v/c $v/c = \frac{v_p}{3{,}200}$	
Peak 15-min vehicle-miles of travel, VMT_{15} (veh-mi) $VMT_{15} = 0.25L_t\left(\frac{V}{PHF}\right)$	
Peak-hour vehicle-miles of travel, VMT_{60} (veh-mi) $VMT_{60} = V * L_t$	
Peak 15-min total travel time, TT_{15} (veh-h) $TT_{15} = \frac{VMT_{15}}{ATS}$	

Notes

1. If $v_p \geq 3{,}200$ pc/h, terminate analysis—the LOS is F.
2. If highest directional split $v_p \geq 1{,}700$ pc/h, terminate analysis—the LOS is F.

CONTECH BRIDGE SOLUTIONS INC.

Job No. _____, Sh. ____ Of ____ Pg ____

Project _____

By _____ Date _____

Subject _____

2030

No Build - 2 lane - 11' width

K = 11%

D = 75% ←

T DH = 4%

T ADT = 6%

MT = 36%

HT = 64%

DHV = 1030 × 2 = 2060

Rolling

f_g = .99

E_T = 1.5

$$f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)} = \frac{1}{1 + .06(1.5-1) + 0} = .97$$

$$V_p = \frac{2060}{.90 * .99 * .97} = 2383$$

Highest directional Flow $V_p = 2383 * .75 = 1787$ pc/h

5. 1787 > 1700

LOS F

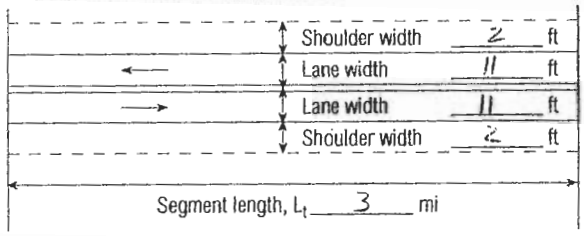
EXISTING

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	CHELETTE	Highway	SR-261
Agency or Company	SOLID CIVIL DESIGN	From/To	
Date Performed	8-14-2008	Jurisdiction	HELENA
Analysis Time Period	2007	Analysis Year	2008

☐ Operational (LOS) ☐ Design (v_p) ☐ Planning (LOS) ☐ Planning (v_p)

Input Data



☑ Class I highway ☐ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume 1259 veh/h

Directional split 75 / 25 (1180 x .11)

Peak-hour factor, PHF 0.90

% Trucks and buses, P_T 6 %

% Recreational vehicles, P_R — %

% No-passing zone 100 %

Access points/mi 10 /mi

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)		0.99
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)		1.5
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)		
Heavy-vehicle adjustment factor, f_{HV} $f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$		0.97
Two-way flow rate,[1] v_p (pc/h) $v_p = \frac{V}{PHF * f_G * f_{HV}}$		1457
v_p * highest directional split proportion[2] (pc/h)		1093
Free-Flow Speed from Field Measurement	Estimated Free-Flow Speed	
Field measured speed, S_{FM} — mi/h	Base free-flow speed, BFFS	45 mi/h
Observed volume, V_f — veh/h	Adj. for lane width and shoulder width, f_{LS} (Exhibit 20-5)	4.2 mi/h
Free-flow speed, FFS — mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.5 mi/h
$FFS = S_{FM} + 0.00776(\frac{V_f}{f_{HV}})$	Free-flow speed, FFS	37.8 mi/h
	$FFS = BFFS - f_{LS} - f_A$	
Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)		1.3
Average travel speed, ATS (mi/h) $ATS = FFS - 0.00776v_p - f_{np}$		25.18

Percent Time-Spent-Following

Grade adjustment factor, f_G (Exhibit 20-8)	0.99
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} $f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$	1.0
Two-way flow rate,[1] v_p (pc/h) $v_p = \frac{V}{PHF * f_G * f_{HV}}$	1413
v_p * highest directional split proportion[2] (pc/h)	1060
Base percent time-spent-following, BPTSF (%) $BPTSF = 100(1 - e^{-0.000879v_p})$	60.62
Adj. for directional distribution and no-passing zone, $f_{d/np}$ (%) (Exhibit 20-12)	8.3
Percent time-spent-following, PTSF (%) $PTSF = BPTSF + f_{d/np}$	68.92

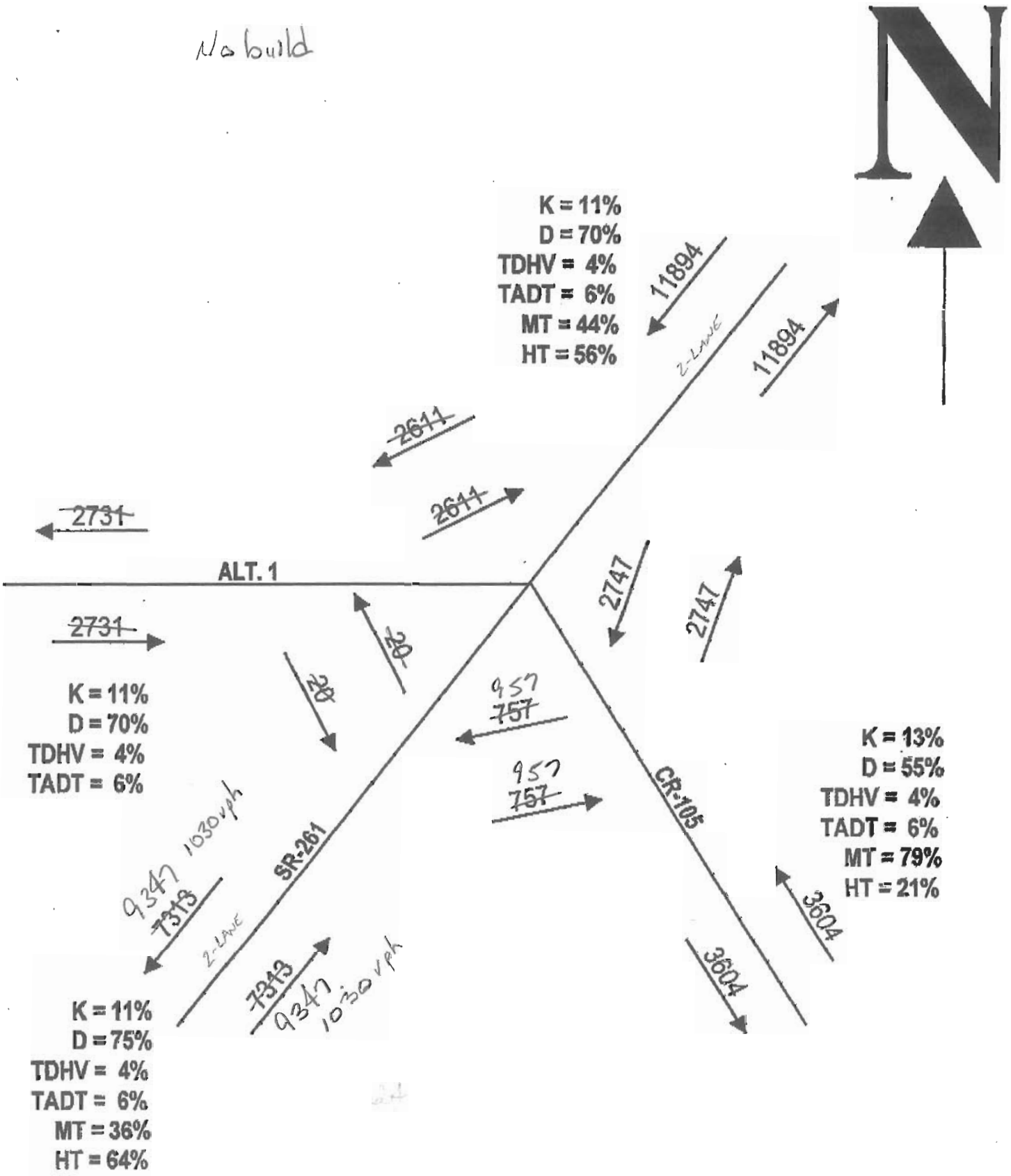
Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	E
Volume to capacity ratio, v/c $v/c = \frac{v_p}{3,200}$	
Peak 15-min vehicle-miles of travel, VMT_{15} (veh-mi) $VMT_{15} = 0.25L_t(\frac{V}{PHF})$	
Peak-hour vehicle-miles of travel, VMT_{60} (veh-mi) $VMT_{60} = V * L_t$	
Peak 15-min total travel time, TT_{15} (veh-h) $TT_{15} = \frac{VMT_{15}}{ATS}$	

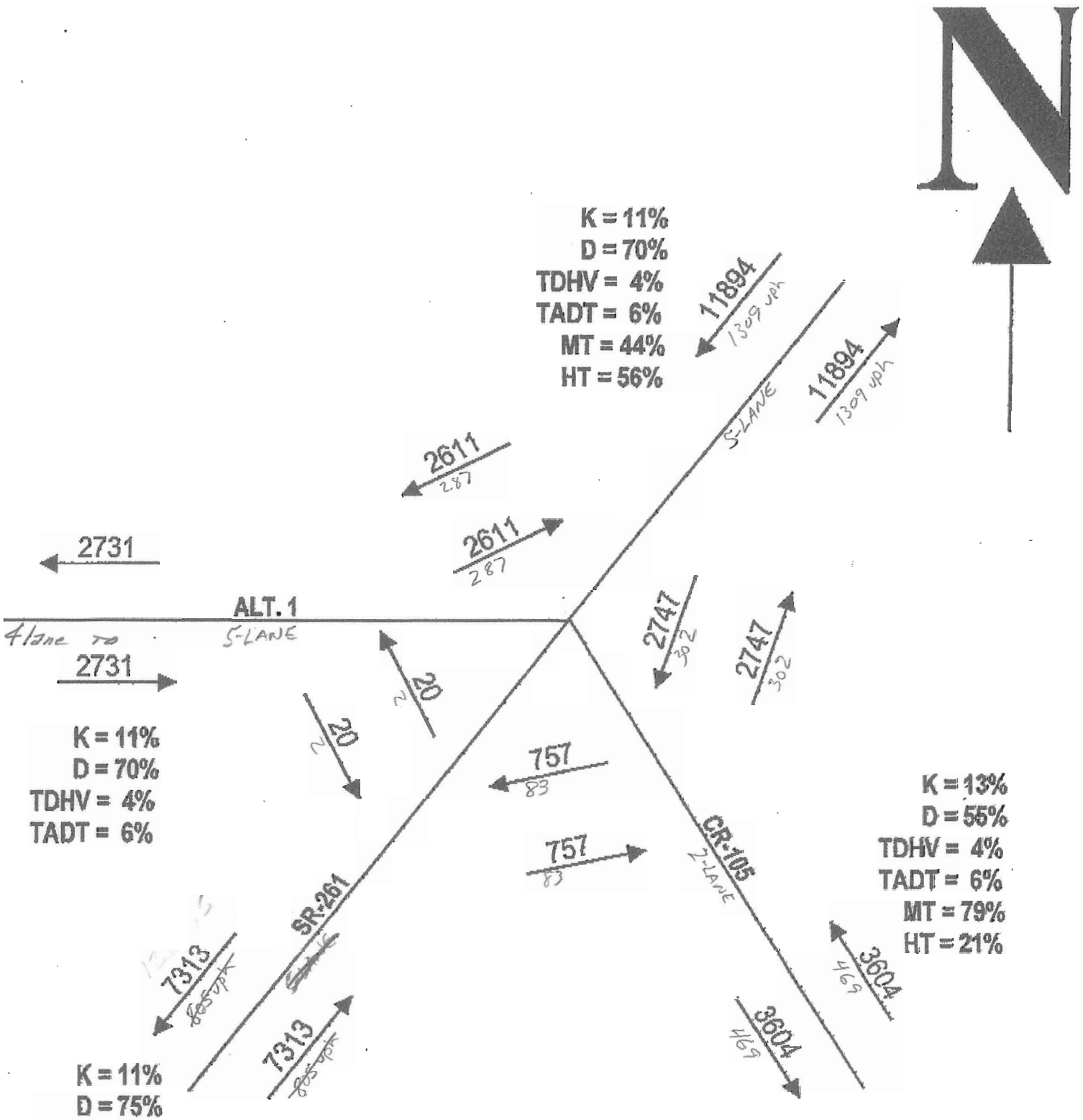
Notes

1. If $v_p \geq 3,200$ pc/h, terminate analysis—the LOS is F.
2. If highest directional split $v_p \geq 1,700$ pc/h, terminate analysis—the LOS is F.

No build



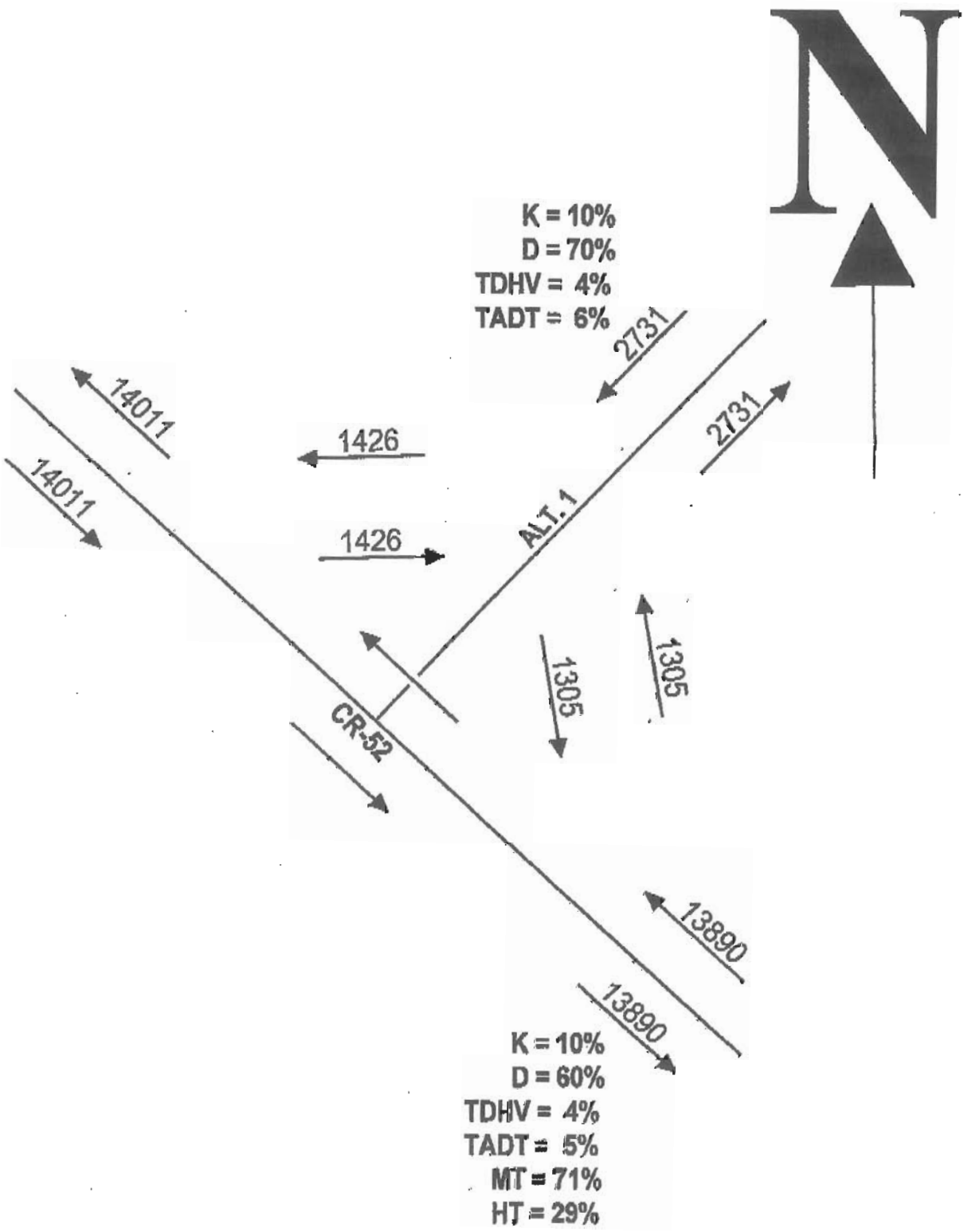
SHELBY COUNTY
ST-059-261-004
100 = 2030 ADT



$$\frac{(7313 \times 2) * .11}{.75 \times .95}$$

$$K = \frac{DHV (vph)}{AADT}$$

SHELBY COUNTY
ST-059-261-004
100 = 2030 ADT



SHELBY COUNTY
ST-059-261-004
100 = 2030 ADT

3

Alabama Traffic Counters 2007

Identify

layers
overview
zoom in
zoom out
zoom full
zoom last
Pan
identify
Locate address

To view Hourly Traffic Counts Click Here

Traffic Flow Legend

- Highlighted Feature
- Traffic Counters 2007
- Alabama Routes
- State Route
- Interstate Route
- US Route
- All Roads
- Counties
- State

Record 1

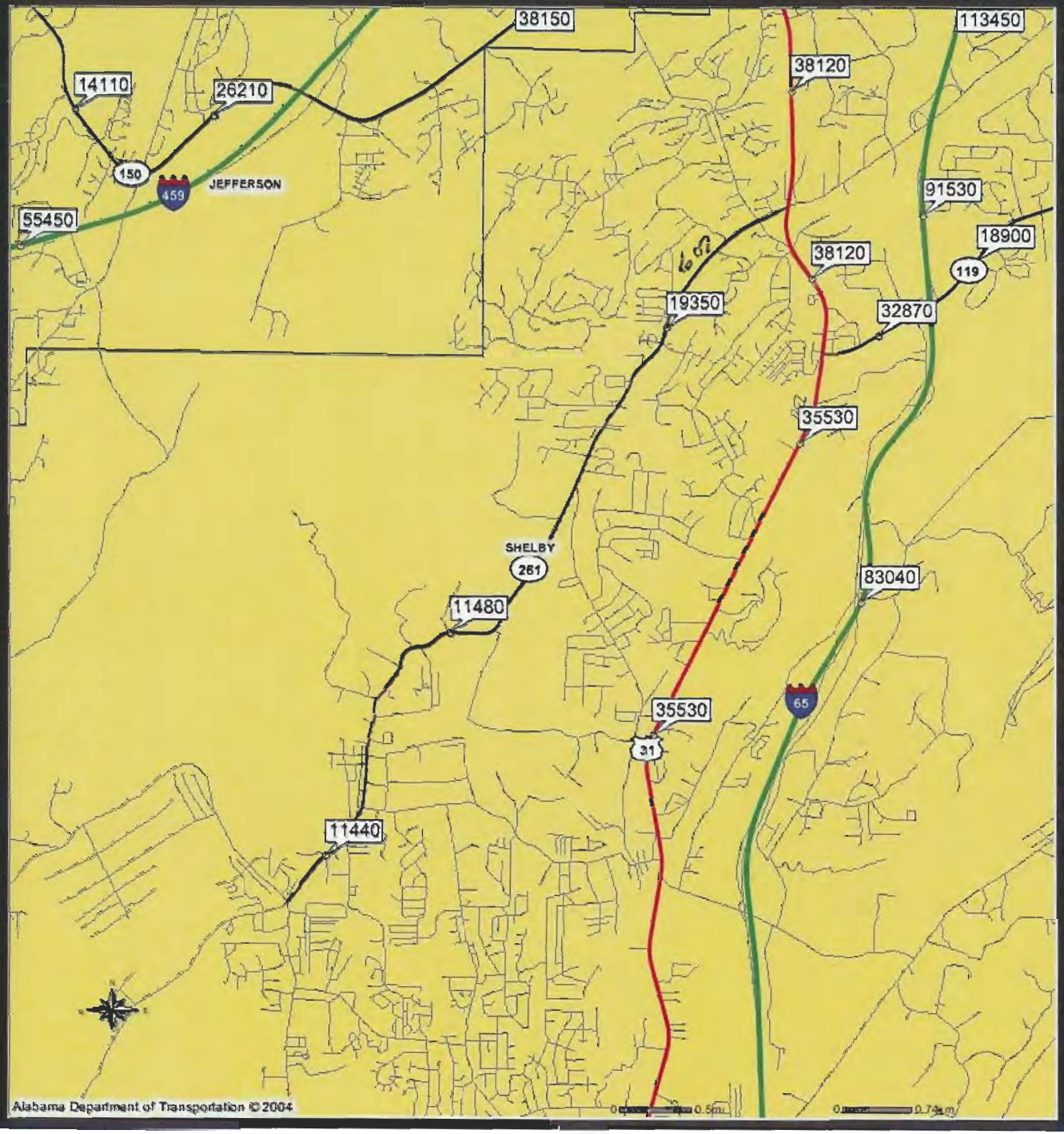
Station	915
County	59
City	35
State Route	261
Mile Post	2.185
AADT 2007	11480
AADT 2006	12670
AADT 2005	12530
AADT 2004	12610
AADT 2003	10640
AADT 2002	11030
AADT 2001	10470
AADT 2000	11460
AADT 1999	10700
AADT 1998	6770
AADT 1997	8960
AADT 1996	7730
K	11
D	60
TDHV	4
TADT	5
Heavy	35
Functional Class	16
Description	

Alabama Traffic Counters 2007

Identify

layers
overview
zoom in
zoom out
zoom full
zoom last
Pan
identify
Locate address

To view Hourly Traffic Counts Click Here



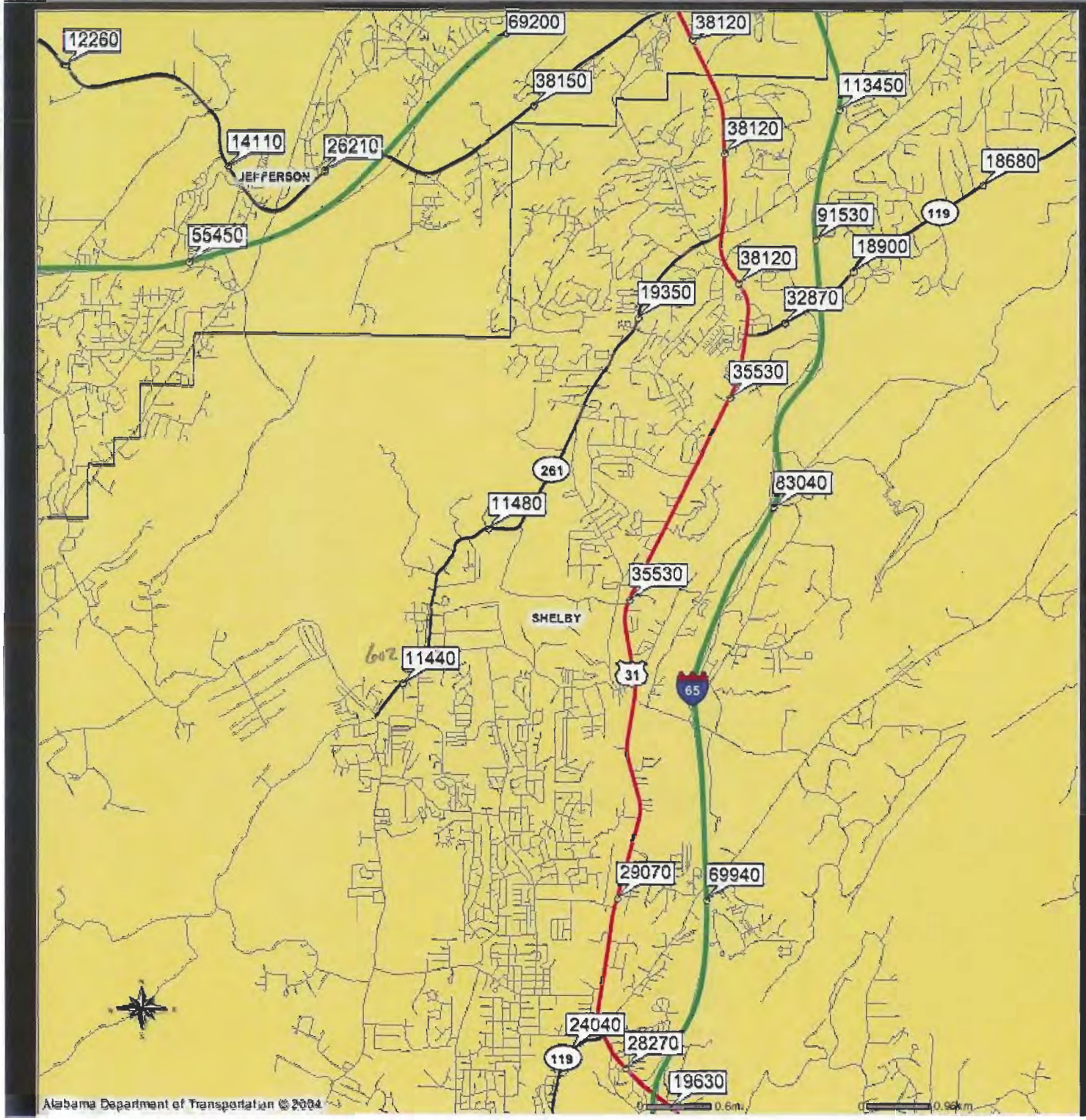
Traffic Flow Legend

- Highlighted Feature
- Traffic Counters 2007
- Alabama Routes
- State Route
- Interstate Route
- US Route
- All Roads
- Counties
- State

Record 1

Station	607
County	59
City	35
State Route	261
Mile Post	4.7385
AADT 2007	19350
AADT 2006	20880
AADT 2005	20700
AADT 2004	20810
AADT 2003	18280
AADT 2002	18410
AADT 2001	17120
AADT 2000	18340
AADT 1999	17760
AADT 1998	13790
AADT 1997	16360
AADT 1996	14620
K	11
D	60
TDHV	2
TADT	3
Heavy	35
Functional Class	16
Description	SOUTH OF CO. RD. 275

Traffic Counters 2007



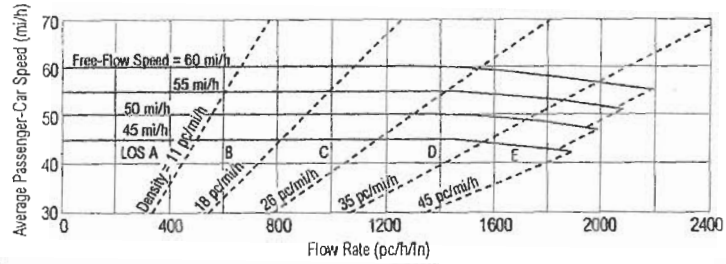
Traffic Flow Legend

- Highlighted Feature
- Traffic Counters 2007
- Alabama Routes
- State Route
- Interstate Route
- US Route
- All Roads
- Counties
- State

Record 1

Station	602
County	59
City	35
State Route	261
Mile Post	0.395
AADT 2007	11440
AADT 2006	12630
AADT 2005	12490
AADT 2004	12640
AADT 2003	10720
AADT 2002	13400
AADT 2001	12780
AADT 2000	12950
AADT 1999	12140
AADT 1998	7890
AADT 1997	9900
AADT 1996	9040
K	11
D	60
TDHV	4
TADT	5
Heavy	35
Functional Class	16
Description	

MULTILANE HIGHWAYS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	J. Carr
Agency or Company	Solid Civil Design
Date Performed	8/15/08
Analysis Time Period	

Site Information

Highway/Direction of Travel	EW
From/To	Head Rd to 52
Jurisdiction	City of Helena
Analysis Year	2030

☐ Operational (LOS) ☐ Design (N) ☐ Design (v_p) ☐ Planning (LOS) ☐ Planning (N) ☑ Planning (v_p)

Flow Inputs

Volume, V	veh/h	Peak-hour factor, PHF	.90
Annual avg. daily traffic, AADT	5462 veh/day	% Trucks and buses, P_T	6%
Peak-hour proportion of AADT, K		% RVs, P_R	
Peak-hour direction proportion, D		General terrain	
DDHV = AADT * K * D	382 veh/h	☐ Level ☑ Rolling ☐ Mountainous	
Driver type		Grade: Length 3½' mi	Up/Down %
☑ Commuter/Weekday ☐ Recreational/Weekend		Number of lanes 4	

Calculate Flow Adjustments

f_p		E_R	
E_T		$f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$	

Speed Inputs

Lane width, LW	12 ft	f_{LW}	0 mi/h
Total lateral clearance, TLC	ft	f_{LC}	0 mi/h
Access points, A	0-10 A/mi	f_A	2 mi/h
Median type, M ☐ Undivided ☐ Divided		f_M	mi/h
FFS (measured)	mi/h	FFS = BFFS − f_{LW} − f_{LC} − f_A − f_M	58 mi/h
Base free-flow speed, BFFS	58 mi/h		

Operational, Planning (LOS); Design, Planning (v_p)

Operational (LOS) or Planning (LOS)

$v_p = \frac{V \text{ or DDHV}}{PHF * N * f_{HV} * f_p}$	219 pc/h/ln
S	58 mi/h
D = v_p/S	3.77 pc/mi/ln
LOS	A

Design (v_p) or Planning (v_p)

LOS	
v_p	pc/h/ln
V = v_p * PHF * N * f_{HV} * f_p	veh/h
S	mi/h
D = v_p/S	pc/mi/ln

Design, Planning (N)

Design (N) or Planning (N) 1st Iteration

N	assumed
$v_p = \frac{V \text{ or DDHV}}{PHF * N * f_{HV} * f_p}$	pc/h/ln
LOS	

Design (N) or Planning (N) 2nd Iteration

N	assumed
$v_p = \frac{V \text{ or DDHV}}{PHF * N * f_{HV} * f_p}$	pc/h/ln
LOS	
S	mi/h
D = v_p/S	pc/mi/ln

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design-hour volume	

Factor Location

E_T - Exhibit 21-8, 21-9, 21-11	f_{LW} - Exhibit 21-4
E_R - Exhibit 21-8, 21-10	f_{LC} - Exhibit 21-5
f_p - Page 21-11	f_M - Exhibit 21-6
LOS, S, FFS, v_p - Exhibit 21-2, 21-3	f_A - Exhibit 21-7

CONTECH BRIDGE SOLUTIONS INC.

Job No. _____, Sh. ____ Of ____ Pg ____

Project Helena Bypass

By Johnny Carr Date 8/15/08

Subject _____

Assume 4 lane

1. DDHV = AADT K = 11% D = 70% T = 6%
   = 5462 x .11 x .70
   = 382 (1 way) 601 (2 way)
2. Find f_{HV} = .97
3. Compute FFS = BFFS - f_{LW} - f_{LC} - f_A - f_m L_W = 12 f_{LC} = 0 f_m = 0 f_A = 2.5
   = 60 - 2.5
   = 58

VP = 382 / .90 * 2 * .97 * 1 = 219 pc/h/ln

D = 3.77

LOS = A

Appendix B:

Air Quality Report

Appendix B Air Quality Analysis

B 1 Purpose

This air quality analysis evaluates whether this project would cause Carbon Monoxide (CO) levels to National Ambient Air Quality Standards (NAAQS) to be exceeded at receptor locations within the project area. These primary standards for CO, ozone, particulate matter (PM2.5) & (PM10) are established by the Environmental Protection Agency to protect against adverse health effects.

The NAAQS for CO are 35 parts per million (ppm) for the one-hour standard and 9 ppm for the eight-hour standard. It is the purpose of this study to estimate the worst possible concentration of CO within the project area to determine if the NAAQS will be exceeded as a result of this project. The results of this analysis do establish that the NAAQS would not be exceeded by this project.

B 2 Project Description

ALDOT project no. ST-059-261-004 - Helena bypass - from county road 52 in Helena to state route 261 near Bearden road in Shelby County, Alabama.

This project is part of a long term plan for the City of Helena which will serve as a bypass route around the City of Helena's Historic District.

B 2.1 Alternates

The "No Build" alternate is the first of the alternatives. This alternative primarily serves as a benchmark of comparison for the other alternatives.

Alternative I is the west most alterative consisting nearly entirely of new road on new location. This alternative traverses on new location through undeveloped land for the vast majority of its length. This is accomplished by traversing the west side of the Quarry in the area. Alternate is approximately 3.7 miles long.

Alternative II is the alternative that utilizes much of the existing state route 261 right of way. This is accomplished by traversing to the east side of the Quarry. Alternate II is approximately 3.9 miles long.

Alternate I-A is nearly the same as Alternate I except that the southwest terminus is moved east along county road 52.

Alternate II-A is nearly the same as Alternate II except that its southwest terminus is moved east along county road 52 in common with Alternate I-A.

B 2.2 Air Quality concerns in the Project area.

This project is located in Shelby County Alabama. According to CFR Title 40 Part 81 Subpart C Section 107 (40CFR81.301), as of October 10, 2007, Shelby County Alabama is a nonattainment area for PM 2.5 only and is listed as a maintenance

area for Ozone. This means that Shelby County has attained all the National Ambient Air Quality Standards (NAAQS) except that of PM2.5.

B 3 Carbon Monoxide Analysis procedures

B 3.1 Regulatory Codes, Documents and Guidance.

Analysis of this projects predicted effects on the air quality of the project area was performed according to the following Publications:

Code of Federal Regulations (CFR) Title 40 Part 93. Specifically Sections 115, 116, 123,151,

Guideline for Modeling Carbon Monoxide from Roadway Intersections (EPA–454/R–92–005; November 1992).

Federal Publication EPA–454/R–92–005

CFR Title 40 Part 51. Specifically Sections 5.2,

Software User Manuals for MOBILE 6.2, CALINE 3, and CAL3-QHC

B 3.2 Software models & analysis factors.

The accuracy of the software models utilized is limited by the accuracy of the input factors and the ability to model non-typical conditions. The input factors must be carefully considered. The input factors must accurately represent the conditions of the alternative and impartially represent the alternatives and remain within the functional limits of the software model. Careful consideration has been given to all input factors for this model. All regulatory guidelines and technical guidelines were observed.

B 3.3 Identification of Analysis Intersections

The “worst case” intersection for this project was identified by traffic volumes. The traffic volumes on County Road 52 are notably higher than any other road intersected by this project. Higher traffic volume for an intersection generally means there will be a large concentration of vehicles at intersection. This will increase the pollutants generate in a concentrated area. Therefore the intersection with the highest traffic load is assumed to be the worst case for air quality concerns.

For the “No build” Alternate, the worst case intersection will clearly be the intersection of County Road 17, County Road 91, County Road 52, and State Route 261. This is an intersection of these four routes.

For build alternates 1 and 2 the worst case intersection condition would be at the junction of the new road and CR52 or the Southern terminus of the project. This intersection’s worst case configuration would be a signalized intersection in a “T” configuration with County Road 52 East being the disadvantaged leg.

For build alternates 1A and 2A the worst case intersection condition would be at the junction of the new road and CR52 or the Southern terminus of the project. This intersection's worst case configuration would be a signalized intersection in a "T" configuration with newly constructed road being the disadvantaged leg.

B 3.4 Identification of Receptors

The intersection identified as the worst case for air quality is the intersection of this project with county road 52. No specifically identifiable receptors exist in the proximity of this intersection. For the purpose of a thorough analysis, all reasonably possible receptor locations were analyzed.

B 4 Input parameters

B 4.1 MOBILE 6.2 Parameters

For the purpose of calculating the idle emissions factor a vehicle speed of 2.5 miles per hour was used. Appropriate worst case input values were used to model the emissions factors for several conditions. The worst applicable results were then utilized as inputs for CAL3-QHC.

The detail description of the actual MOBILE 6.2 input file can be found with the output file for MOBILE 6.2 included on the following pages. This file represents worst case assumptions, not site specific empirical data.

B 4.2 CAL3-QHC Parameters

B 4.2.1 Meteorological Variables

Input for meteorological variables was in accordance with ADLOT and EPA guidance as given in CFR 40 part 51 Section 5.2 and publication EPA–454/R–92–005 and the CAL3-QHC user manual and the CALINE 3 user manual.

The following meteorological variables were used:

Averaging time in minutes (ATIM)	60
Background CO Ambient Concentrations (AMB)	3.0 ppm (1-hour)
Mixing height in meters (MIXH)	1000
Atmosphere Stability Class (CLAS)	4 (D)
Settling Velocity (VS)	0
Deposition Velocity (VD)	0
Wind Speed in meters/second (U)	1
Wind Angle Range	0° - 360°
Wind Angle increment	10°
Surface Roughness Coefficient in centimeters(Zo)	170

B 4.2.2 Emission Factors

The output from MOBILE 6.2 provided the emission factors for the vehicles in the intersection analysis.

The emission factor for vehicles in Queue (Idle emission factors) is **75.615 gph** (grams per hour). This value was calculated by taking the emission factors vehicle analyzed at 2.5 mph in g/mi (grams per mile) and multiplying that value by 2.5 (mph)

The emission factor for vehicles moving trough the intersection is **12.373 g/mi.** This value was taken directly from the MOBILE 6.2 Output.

B 4.2.3 Intersection Configuration

The 'worst case' intersection configuration was determined based on the traffic report provided by ALDOT. The worst case intersection was found to be the intersection of this project with county road 52. This intersection was modeled with a layout as provided in the preliminary design shown in this report.

B 4.2.4 Traffic Volumes

The traffic volumes utilized in this analysis were provided by the Alabama Department of Transportation for use in this analysis as a part of the Environment Impact Statement for this project.

B 4.2.5 Traffic Parameters

The hourly traffic volume per link was as follows

1. Bypass Southbound left turn queue	178.
2. Bypass Northbound thru T queue	177.
3. CR52 Westbound left turn queue	153.
4. Bypass Northbound right turn queue	49.
5. Bypass Southbound thru T queue	178.
6. CR52 Westbound right turn queue	26.
7. CR52 Eastbound departing	1667.
8. CR52 W departing	1681.
9. BYP Northbound departing	328.

Signal timings were estimated based on expected traffic volumes.

B 4.2.6 Receptor Locations

Multiple receptor locations near the worst case intersection were analyzed. The receptor with the highest levels of carbon monoxide was receptor number 14. Receptor 14 was modeled to have a 1 hour CO concentration of 5.50 ppm. Since this concentration was well below the 1 hour and 8 hour standards, a detailed 8 hour analysis was not performed.

B 5 Carbon Monoxide Analysis Results

B 5.1 MOBILE 6.2 Output Data

Output data with input parameters descriptive output.

The Carbon Monoxide composite Emission Factors for July 2010 was 44.800 grams per mile. For July 2030 this value was 30.246 grams per mile. These values were multiplied by 2.5 mile/hour to obtain the idle emission factors.

Other values from the MOBILE 6.2 output were directly used in the CAL3-QHC input file.

The complete MOBILE 6.2 output analysis is included as pages B-7 through B-12 of this report.

B 5.2 CAL3-QHC Output Data

The output of CAL3-QHC shows the occurrence of the 5.50 parts per million was the highest concentration which occurred at any receptor in the 1 hour analysis. This analysis was run on November 8, 2007. The concentration of 5.50 ppm occurred at receptor 14 with a wind angle of 170°.

The highest concentration at any receptor for the 1 hour period was below the NAAQS for the one and eight hour period. A separate eight hour analysis is not required if the one hour analysis results are within the eight hour NAAQS. No eight hour period analysis was performed.

The complete CAL3-QHC output of the one hour analysis is included as pages B-13 through B-16 of this report.

B 6 PM 2.5 Analysis

B 6.1 PM 2.5 Analysis Method

The proposed project is in a PM2.5 nonattainment area.

According to Transportation Conformity, Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas (EPA420-B-06-902) dated March 2006, PM2.5 nonattainment and maintenance areas are required to attain and maintain two standards:

- 24-hour standard – 65 µg/m3 , and
- Annual standard – 15.0 µg/m3

Chapter 4: Developing a Qualitative PM2.5 or PM10 Hot-spot Analysis of (EPA420-B-06-902) provides further guidance on the requirements of a qualitative analysis. A standardized PM 2.5 Hot Spot Checklist was provided by ALDOT according to these requirements. This checklist is the primary analysis for PM 2.5 for this project.

B 6.2 PM 2.5 Hot Spot Checklist.

A PM2.5 Hot Spot Checklist was completed for this analysis. This checklist revealed that this project is "Not a project of Air Quality Concern." No further PM2.5 analysis was performed either qualitative or quantitative.

The PM 2.5 Hot Spot Checklist is included in as pages B-17 through B-21 of this report.

B 7 Conclusions

B 7.1 Impacts

The analysis performed has shown that for the 'worst case' conditions as defined in this report, carbon monoxide concentrations will not exceed the National Ambient Air Quality Standards in Design Year 2030, at any receptors located in or near the project area studied.

To minimize potential air quality impacts from particulate matter (PM2.5 and/or PM10) during project construction, the contractor shall follow the procedures in the ALDOT publication "Standard Specifications for Highway Construction."

B 7.2 Summary

The worst case intersection for build alternatives was analyzed. The NAAQS for CO are 35 parts per million (ppm) for the one-hour standard and 9 ppm for the eight-hour standard. This project was found to be well within the limits of Air Quality Standards. This analysis does not show any comparative benefit of one build alternative over the other.

```
************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                           *
* Input file: HELENA.IN (file 1, run 1).                               *
************************************************************************
*HELENA BYPASS

* # # # # # # # # # # # # # # # # # # # # # # #
* WINTER IDLE 2010
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:  28.0 (F)
              Maximum Temperature:  35.0 (F)
                Minimum Rel. Hum.:  90.0 (%)
                Maximum Rel. Hum.:  90.0 (%)
                 Nominal Fuel RVP:   7.0 psi
                    Weathered RVP:   7.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3540    0.3855    0.1315              0.0357    0.0003    0.0019    0.0856    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      4.202     4.127     7.474     4.978     6.219     0.434     1.081     1.247     8.16      4.437
     Composite CO  :     43.02     45.21     65.98     50.49     53.66     2.813     2.360     8.294    109.67    44.555
     Composite NOX :      1.415     1.853     2.918     2.124     1.892     0.697     1.235    11.648     1.69     2.676
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # #
* SUMMER IDLE 2010
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  70.0 (F)
              Maximum Temperature:  90.0 (F)
                Minimum Rel. Hum.:  40.0 (%)
                Maximum Rel. Hum.:  40.0 (%)
                 Nominal Fuel RVP:  11.0 psi
                    Weathered RVP:  10.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     10.994     8.658    15.998    10.535    14.920     0.426     1.039     1.213     9.46     10.023
     Composite CO  :     45.76     44.21     62.15     48.80     57.47     2.788     2.288     7.764    118.97    44.800
     Composite NOX :      1.290     1.405     2.113     1.586     1.571     0.671     1.169    10.824     1.07     2.273
  ---------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* WINTER IDLE 2030
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
               there are no sales for vehicle class HDGV8b
  M 48 Warning:
               there are no sales for vehicle class LDDT12

                     Calendar Year:  2030
                             Month:  Jan.
                          Altitude:  Low
               Minimum Temperature:  28.0 (F)
               Maximum Temperature:  35.0 (F)
                 Minimum Rel. Hum.:  90.0 (%)
                 Maximum Rel. Hum.:  90.0 (%)
                  Nominal Fuel RVP:   7.0 psi
                     Weathered RVP:   7.0 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  No
                  Evap I/M Program:  No
                       ATP Program:  No
                  Reformulated Gas:  No
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	2.019	2.112	3.200	2.389	2.350	0.116	0.280	0.745	8.16	2.165
Composite CO :	31.48	29.38	36.84	31.28	41.94	1.869	1.139	1.145	109.67	29.415
Composite NOX :	0.536	0.760	1.212	0.875	0.148	0.045	0.209	1.032	1.69	0.770

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* SUMMER IDLE 2030
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
               there are no sales for vehicle class HDGV8b
  M 48 Warning:
               there are no sales for vehicle class LDDT12

                     Calendar Year:  2030
                             Month:  July
                          Altitude:  Low
               Minimum Temperature:  70.0 (F)
               Maximum Temperature:  90.0 (F)
                 Minimum Rel. Hum.:  40.0 (%)
                 Maximum Rel. Hum.:  40.0 (%)
                  Nominal Fuel RVP:  11.0 psi
                     Weathered RVP:  10.5 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  No
                  Evap I/M Program:  No
                       ATP Program:  No
                  Reformulated Gas:  No
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	5.555	4.577	6.254	5.006	6.118	0.117	0.280	0.744	9.46	4.837
Composite CO :	31.07	31.11	36.86	32.58	45.56	1.879	1.140	1.131	118.97	30.246
Composite NOX :	0.548	0.646	0.952	0.724	0.130	0.045	0.208	1.014	1.07	0.679

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* WINTER TURNING 2010
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 10.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  28.0 (F)
                Maximum Temperature:  35.0 (F)
                  Minimum Rel. Hum.:  90.0 (%)
                  Maximum Rel. Hum.:  90.0 (%)
                   Nominal Fuel RVP:   7.0 psi
                      Weathered RVP:   7.0 psi
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  No
                   Evap I/M Program:  No
                        ATP Program:  No
                   Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:                 <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
    VMT Distribution:    0.3540    0.3855    0.1315              0.0357    0.0003    0.0019    0.0856    0.0054    1.0000
   ---------------------------------------------------------------------------------------------------------------------
  Composite Emission Factors (g/mi):
      Composite VOC :      1.040     1.223     2.189     1.469     1.894    0.319     0.794     0.860      3.15     1.287
      Composite CO  :     20.52     22.75     31.46     24.97     28.52    1.737     1.466     4.669     33.78    21.775
      Composite NOX :      1.028     1.351     2.132     1.550     2.039    0.524     0.928     8.766      1.48     1.999
   ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # #
* SUMMER TURNING 2010
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 10.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
                Minimum Temperature:  70.0 (F)
                Maximum Temperature:  90.0 (F)
                  Minimum Rel. Hum.:  40.0 (%)
                  Maximum Rel. Hum.:  40.0 (%)
                   Nominal Fuel RVP:  11.0 psi
                      Weathered RVP:  10.5 psi
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  No
                   Evap I/M Program:  No
                        ATP Program:  No
                   Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:                 <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
    VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
   ---------------------------------------------------------------------------------------------------------------------
  Composite Emission Factors (g/mi):
      Composite VOC :      2.205     1.909     3.309     2.267     3.388    0.313     0.765     0.837      4.40     2.171
      Composite CO  :     17.30     18.61     25.52     20.38     30.55    1.724     1.424     4.370     35.34    18.336
      Composite NOX :      0.869     1.004     1.516     1.135     1.693    0.505     0.879     8.145      0.94     1.663
   ---------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* WINTER TURNING 2030
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 10.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
               there are no sales for vehicle class HDGV8b
  M 48 Warning:
               there are no sales for vehicle class LDDT12

                     Calendar Year:  2030
                             Month:  Jan.
                          Altitude:  Low
               Minimum Temperature:  28.0 (F)
               Maximum Temperature:  35.0 (F)
                 Minimum Rel. Hum.:  90.0 (%)
                 Maximum Rel. Hum.:  90.0 (%)
                  Nominal Fuel RVP:   7.0 psi
                     Weathered RVP:   7.0 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  No
                  Evap I/M Program:  No
                       ATP Program:  No
                  Reformulated Gas:  No
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.499	0.598	0.903	0.675	0.598	0.085	0.204	0.514	3.15	0.621
Composite CO :	15.99	15.02	18.26	15.85	22.30	1.148	0.693	0.645	33.78	14.848
Composite NOX :	0.389	0.553	0.884	0.637	0.160	0.034	0.157	0.769	1.48	0.565

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* SUMMER TURNING 2030
* File 1, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 10.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
               there are no sales for vehicle class HDGV8b
  M 48 Warning:
               there are no sales for vehicle class LDDT12

                     Calendar Year:  2030
                             Month:  July
                          Altitude:  Low
               Minimum Temperature:  70.0 (F)
               Maximum Temperature:  90.0 (F)
                 Minimum Rel. Hum.:  40.0 (%)
                 Maximum Rel. Hum.:  40.0 (%)
                  Nominal Fuel RVP:  11.0 psi
                     Weathered RVP:  10.5 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  No
                  Evap I/M Program:  No
                       ATP Program:  No
                  Reformulated Gas:  No
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.166	1.009	1.365	1.100	1.361	0.085	0.204	0.513	4.40	1.091
Composite CO :	11.98	13.31	15.88	13.97	24.22	1.155	0.694	0.637	35.34	12.697
Composite NOX :	0.359	0.458	0.677	0.514	0.141	0.034	0.156	0.756	0.94	0.479

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* WINTER DRIVING 2010
* File 1, Run 1, Scenario 9.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  28.0 (F)
                Maximum Temperature:  35.0 (F)
                  Minimum Rel. Hum.:  90.0 (%)
                  Maximum Rel. Hum.:  90.0 (%)
                   Nominal Fuel RVP:   7.0 psi
                      Weathered RVP:   7.0 psi
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  No
                   Evap I/M Program:  No
                        ATP Program:  No
                   Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
                GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
    VMT Distribution:    0.3540    0.3855    0.1315              0.0357    0.0003    0.0019    0.0856    0.0054    1.0000
   ---------------------------------------------------------------------------------------------------------------------
  Composite Emission Factors (g/mi):
      Composite VOC :      0.680     0.839     1.496     1.006     0.854    0.204     0.508     0.475      1.86     0.843
      Composite CO  :     16.73     18.84     25.79     20.60     11.68    0.949     0.811     2.011     16.04    17.254
      Composite NOX :      0.781     1.043     1.677     1.204     2.334    0.375     0.665     6.287      1.69     1.531
   ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # #
* SUMMER DRIVING 2010
* File 1, Run 1, Scenario 10.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
                Minimum Temperature:  70.0 (F)
                Maximum Temperature:  90.0 (F)
                  Minimum Rel. Hum.:  40.0 (%)
                  Maximum Rel. Hum.:  40.0 (%)
                   Nominal Fuel RVP:  11.0 psi
                      Weathered RVP:  10.5 psi
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  No
                   Evap I/M Program:  No
                        ATP Program:  No
                   Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
                GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
    VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
   ---------------------------------------------------------------------------------------------------------------------
  Composite Emission Factors (g/mi):
      Composite VOC :      1.182     1.175     2.073     1.405     1.780    0.201     0.491     0.462      3.11     1.267
      Composite CO  :     12.27     13.73     19.08     15.10     12.52    0.944     0.790     1.882     15.80    12.854
      Composite NOX :      0.617     0.756     1.164     0.860     1.938    0.361     0.630     5.841      1.07     1.243
   ---------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* WINTER DRIVING 2030
* File 1, Run 1, Scenario 11.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
               there are no sales for vehicle class HDGV8b
  M 48 Warning:
               there are no sales for vehicle class LDDT12

                     Calendar Year:  2030
                             Month:  Jan.
                          Altitude:  Low
               Minimum Temperature:  28.0 (F)
               Maximum Temperature:  35.0 (F)
                 Minimum Rel. Hum.:  90.0 (%)
                 Maximum Rel. Hum.:  90.0 (%)
                  Nominal Fuel RVP:   7.0 psi
                     Weathered RVP:   7.0 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  No
                  Evap I/M Program:  No
                       ATP Program:  No
                  Reformulated Gas:  No
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.324	0.398	0.597	0.448	0.279	0.053	0.128	0.284	1.86	0.399
Composite CO :	13.25	12.35	14.80	12.97	9.13	0.620	0.367	0.278	16.04	11.790
Composite NOX :	0.294	0.422	0.683	0.488	0.183	0.024	0.112	0.544	1.69	0.433

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* SUMMER DRIVING 2030
* File 1, Run 1, Scenario 12.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
               there are no sales for vehicle class HDGV8b
  M 48 Warning:
               there are no sales for vehicle class LDDT12

                     Calendar Year:  2030
                             Month:  July
                          Altitude:  Low
               Minimum Temperature:  70.0 (F)
               Maximum Temperature:  90.0 (F)
                 Minimum Rel. Hum.:  40.0 (%)
                 Maximum Rel. Hum.:  40.0 (%)
                  Nominal Fuel RVP:  11.0 psi
                     Weathered RVP:  10.5 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  No
                  Evap I/M Program:  No
                       ATP Program:  No
                  Reformulated Gas:  No
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.536	0.565	0.794	0.624	0.626	0.054	0.128	0.283	3.11	0.581
Composite CO :	8.23	9.47	11.43	9.97	9.92	0.625	0.367	0.274	15.80	8.639
Composite NOX :	0.247	0.339	0.508	0.383	0.161	0.024	0.112	0.534	1.07	0.353

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221

JOB: HELENA BYPASS WORST POSSIBLE INTERSECTIO RUN: CR52 TEE INTO BYPASS

DATE : 11/ 8/ 7
TIME : 12:47:18

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 0.5 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 3.0 PPM

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
1. BYP S lt trn queue	41.0	12.0	208.3	12.0	167.	90.	AG	178.	100.0	0.0	12.0	0.98	8.5
2. BYP N THRU T queue	-41.0	-12.0	-189.7	-12.0	149.	270.	AG	177.	100.0	0.0	12.0	0.92	7.6
3. CR52 W lt trn queue	6.0	-41.0	6.0	-193.8	153.	180.	AG	100.	100.0	0.0	20.0	0.64	7.8
4. BYP N RT TRN queue	-41.0	-30.0	-115.3	-30.0	74.	270.	AG	49.	100.0	0.0	20.0	0.55	3.8
5. BYP S THRU T queue	41.0	24.0	338.5	24.0	297.	90.	AG	178.	100.0	0.0	12.0	1.07	15.1
6. CR52 W RT trn queue	24.0	-41.0	24.0	-57.3	16.	180.	AG	26.	100.0	0.0	12.0	0.12	0.8
7. CR52 E DEPARTING	-41.0	-41.0	-18.0	-1500.0	1459.	179.	AG	1667.	14.8	0.0	40.0		
8. CR52 W DEPARTING	-41.0	41.0	-1500.0	18.0	1459.	269.	AG	1681.	14.8	0.0	40.0		
9. BYP N DEPARTING	41.0	-41.0	1500.0	-18.0	1459.	89.	AG	328.	14.8	0.0	40.0		

JOB: HELENA BYPASS WORST POSSIBLE INTERSECTIO RUN: CR52 TEE INTO BYPASS

DATE : 11/ 8/ 7
TIME : 12:47:18

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
1. BYP S lt trn queue	150	132	1.0	157	1600	75.61	1	3
2. BYP N THRU T queue	150	131	1.0	157	1600	75.61	1	3
3. CR52 W lt trn queue	150	37	1.0	1510	1600	75.61	1	3
4. BYP N RT TRN queue	150	18	1.0	1510	1600	75.61	1	3
5. BYP S THRU T queue	150	132	1.0	171	1600	75.61	1	3
6. CR52 W RT trn queue	150	19	1.0	157	1600	75.61	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. REC 1	-80.0	-80.0	6.0
2. REC 2	80.0	-80.0	6.0
3. REC 3	-80.0	-200.0	6.0
4. REC 4	80.0	-200.0	6.0
5. REC 5	-80.0	-500.0	6.0
6. REC 6	80.0	-500.0	6.0
7. REC 7	-80.0	-750.0	6.0
8. REC 8	80.0	-750.0	6.0
9. REC 9	-80.0	-1000.0	6.0
10. REC 10	80.0	-1000.0	6.0
11. REC 11	-750.0	80.0	6.0
12. REC 12	-500.0	80.0	6.0
13. REC 13	-200.0	80.0	6.0
14. REC 14	-80.0	80.0	6.0
15. REC 15	0.0	80.0	6.0
16. REC 16	80.0	80.0	6.0
17. REC 17	200.0	80.0	6.0
18. REC 18	500.0	80.0	6.0
19. REC 19	750.0	80.0	6.0

JOB: HELENA BYPASS WORST POSSIBLE INTERSECTIO RUN: CR52 TEE INTO BYPASS

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19
0.	3.9	3.8	3.7	3.3	3.9	3.3	3.8	3.2	3.9	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
10.	3.8	3.8	3.9	3.5	4.2	3.2	4.1	3.1	4.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20.	3.8	3.8	4.4	3.5	4.5	3.1	4.3	3.0	4.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30.	3.8	3.8	4.4	3.4	4.2	3.0	4.1	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
40.	3.9	3.8	4.7	3.4	4.2	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
50.	4.1	3.7	4.6	3.2	4.0	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
60.	4.5	3.7	4.5	3.1	3.9	3.0	3.9	3.0	3.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
70.	4.6	3.6	4.4	3.1	3.9	3.0	3.9	3.0	3.8	3.0	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0
80.	4.7	3.4	4.2	3.1	3.9	3.0	3.9	3.0	3.8	3.0	3.3	3.3	3.2	3.1	3.1	3.0	3.0	3.0	3.0
90.	4.5	3.2	4.1	3.0	3.9	3.0	3.9	3.0	3.8	3.0	3.8	4.0	3.7	3.4	3.4	3.2	3.1	3.1	3.0
100.	4.3	3.1	4.0	3.0	3.9	3.0	3.9	3.0	3.8	3.0	4.2	4.6	4.1	3.7	3.7	3.5	3.2	3.1	3.1
110.	4.2	3.0	4.0	3.0	3.9	3.0	3.9	3.0	3.8	3.0	4.3	4.4	4.4	3.9	3.9	3.6	3.4	3.1	3.1
120.	4.3	3.0	4.0	3.0	4.0	3.0	3.9	3.0	3.9	3.0	4.3	4.4	4.7	3.9	4.0	3.9	3.5	3.1	3.1
130.	4.3	3.0	4.1	3.0	4.0	3.0	4.0	3.0	3.9	3.0	4.2	4.3	4.8	3.8	3.9	4.0	3.6	3.1	3.1
140.	4.3	3.0	4.2	3.0	4.1	3.0	4.0	3.0	4.0	3.0	4.1	4.2	4.8	3.9	3.7	4.0	3.6	3.1	3.1
150.	4.4	3.0	4.3	3.0	4.2	3.0	4.1	3.0	4.0	3.0	4.0	4.2	4.8	4.3	3.5	3.9	3.5	3.1	3.1
160.	4.5	3.0	4.4	3.0	4.3	3.0	4.2	3.0	4.1	3.0	4.0	4.1	4.9	4.9	3.4	3.9	3.6	3.1	3.1
170.	4.5	3.1	4.4	3.1	4.2	3.1	4.1	3.1	3.9	3.0	3.9	4.0	4.7	5.5	3.6	4.0	3.7	3.1	3.1
180.	4.0	3.4	4.0	3.3	3.8	3.3	3.7	3.2	3.5	3.2	3.9	3.9	4.3	5.3	4.1	4.3	3.9	3.1	3.1
190.	3.4	3.6	3.4	3.6	3.3	3.6	3.2	3.5	3.2	3.4	3.9	3.9	4.0	4.8	4.2	4.5	4.1	3.2	3.1
200.	3.1	3.8	3.1	3.7	3.1	3.7	3.0	3.6	3.0	3.6	3.9	3.9	4.0	4.4	3.9	4.4	4.3	3.2	3.2
210.	3.0	3.7	3.0	3.6	3.0	3.6	3.0	3.6	3.0	3.6	3.9	4.0	4.0	4.4	3.8	4.1	4.4	3.3	3.2
220.	3.0	3.8	3.0	3.6	3.0	3.6	3.0	3.6	3.0	3.6	4.0	4.0	4.1	4.4	3.9	3.9	4.4	3.3	3.3
230.	3.0	3.7	3.0	3.5	3.0	3.6	3.0	3.6	3.0	3.6	4.0	4.1	4.2	4.4	3.9	3.5	4.4	3.3	3.3
240.	3.0	3.7	3.0	3.5	3.0	3.5	3.0	3.5	3.0	3.6	4.1	4.2	4.3	4.4	4.2	3.6	4.2	3.4	3.2
250.	3.0	3.7	3.0	3.5	3.0	3.5	3.0	3.5	3.0	3.5	4.2	4.3	4.4	4.5	4.4	3.9	4.0	3.6	3.4
260.	3.1	3.8	3.0	3.5	3.0	3.5	3.0	3.5	3.0	3.5	4.1	4.2	4.4	4.5	4.6	4.1	4.0	3.9	3.6
270.	3.4	4.1	3.1	3.7	3.0	3.5	3.0	3.5	3.0	3.5	3.7	3.8	4.0	4.0	4.1	3.9	3.8	3.6	3.3
280.	3.6	4.4	3.3	3.9	3.0	3.6	3.0	3.5	3.0	3.5	3.2	3.3	3.4	3.4	3.5	3.4	3.3	3.3	3.1
290.	3.8	4.2	3.4	4.1	3.1	3.6	3.0	3.6	3.0	3.5	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.0	3.0
300.	3.8	4.0	3.4	4.2	3.2	3.7	3.1	3.6	3.0	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
310.	3.9	3.7	3.4	4.2	3.2	3.8	3.1	3.8	3.1	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
320.	4.0	3.3	3.4	3.9	3.2	3.8	3.2	3.8	3.1	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
330.	4.0	3.5	3.4	3.7	3.2	3.8	3.2	3.7	3.1	3.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
340.	4.0	3.6	3.5	3.3	3.2	3.7	3.2	3.7	3.2	3.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
350.	4.0	3.7	3.6	3.2	3.6	3.5	3.4	3.5	3.4	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MAX	4.7	4.4	4.7	4.2	4.5	3.8	4.3	3.8	4.1	3.8	4.3	4.6	4.9	5.5	4.6	4.5	4.4	3.9	3.6
DEGR.	80	280	40	300	20	310	20	310	10	330	110	100	160	170	260	190	210	260	260

THE HIGHEST CONCENTRATION OF 5.50 PPM OCCURRED AT RECEPTOR REC14.

JOB: HELENA BYPASS WORST POSSIBLE INTERSECTIO RUN: CR52 TEE INTO BYPASS

METEOROLOGICAL VARIABLES

U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 3.0 PPM

JOB: HELENA BYPASS WORST POSSIBLE INTERSECTIO RUN: CR52 TEE INTO BYPASS

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19
0.	3.6	3.4	3.4	3.2	3.5	3.1	3.4	3.1	3.4	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
10.	3.5	3.5	3.6	3.2	3.6	3.0	3.6	3.0	3.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20.	3.4	3.5	3.6	3.2	3.7	3.0	3.7	3.0	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30.	3.5	3.5	4.0	3.2	3.7	3.0	3.7	3.0	3.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
40.	3.4	3.5	4.0	3.2	3.6	3.0	3.6	3.0	3.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
50.	3.6	3.4	3.9	3.2	3.6	3.0	3.6	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
60.	3.7	3.4	3.9	3.1	3.6	3.0	3.5	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
70.	4.0	3.3	3.8	3.1	3.6	3.0	3.5	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
80.	4.0	3.2	3.8	3.0	3.6	3.0	3.5	3.0	3.5	3.0	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.0
90.	3.8	3.1	3.6	3.0	3.6	3.0	3.5	3.0	3.5	3.0	3.4	3.4	3.3	3.1	3.1	3.1	3.0	3.0	3.0
100.	3.7	3.0	3.6	3.0	3.6	3.0	3.5	3.0	3.5	3.0	3.6	3.6	3.7	3.4	3.4	3.3	3.2	3.1	3.1
110.	3.7	3.0	3.6	3.0	3.6	3.0	3.5	3.0	3.5	3.0	3.8	3.8	4.0	3.5	3.6	3.4	3.2	3.1	3.1
120.	3.7	3.0	3.6	3.0	3.6	3.0	3.5	3.0	3.5	3.0	3.8	3.8	3.9	3.5	3.6	3.5	3.3	3.1	3.1
130.	3.8	3.0	3.7	3.0	3.6	3.0	3.6	3.0	3.5	3.0	3.7	3.7	4.0	3.4	3.5	3.6	3.3	3.1	3.1
140.	3.8	3.0	3.7	3.0	3.7	3.0	3.6	3.0	3.6	3.0	3.7	3.7	4.0	3.5	3.4	3.5	3.3	3.1	3.1
150.	3.8	3.0	3.8	3.0	3.7	3.0	3.7	3.0	3.6	3.0	3.6	3.7	4.1	3.9	3.2	3.5	3.3	3.1	3.1
160.	3.9	3.0	3.9	3.0	3.8	3.0	3.7	3.0	3.6	3.0	3.5	3.7	4.0	4.2	3.2	3.5	3.3	3.1	3.1
170.	3.9	3.1	3.8	3.1	3.7	3.0	3.6	3.0	3.5	3.0	3.5	3.6	4.0	4.3	3.4	3.6	3.4	3.1	3.1
180.	3.6	3.2	3.6	3.2	3.5	3.2	3.4	3.1	3.3	3.1	3.5	3.6	3.8	4.3	3.6	3.7	3.5	3.1	3.1
190.	3.2	3.3	3.2	3.3	3.2	3.3	3.1	3.3	3.1	3.2	3.5	3.6	3.6	4.0	3.7	3.8	3.7	3.1	3.1
200.	3.1	3.4	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.3	3.5	3.6	3.6	3.9	3.5	3.9	3.7	3.2	3.1
210.	3.0	3.5	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.4	3.6	3.6	3.6	3.8	3.4	3.6	3.7	3.2	3.2
220.	3.0	3.4	3.0	3.3	3.0	3.3	3.0	3.4	3.0	3.4	3.6	3.6	3.7	3.8	3.4	3.4	3.7	3.2	3.2
230.	3.0	3.4	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.6	3.7	3.7	3.8	3.6	3.3	3.6	3.2	3.2
240.	3.0	3.4	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.7	3.7	3.8	3.8	3.7	3.3	3.5	3.3	3.2
250.	3.0	3.4	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.7	3.8	3.9	3.9	3.9	3.5	3.7	3.4	3.2
260.	3.1	3.5	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.6	3.7	3.8	3.9	3.9	3.7	3.5	3.4	3.3
270.	3.2	3.6	3.1	3.4	3.0	3.3	3.0	3.3	3.0	3.3	3.4	3.5	3.6	3.6	3.6	3.5	3.4	3.3	3.2
280.	3.3	3.8	3.2	3.6	3.0	3.3	3.0	3.3	3.0	3.3	3.1	3.2	3.2	3.3	3.3	3.2	3.2	3.1	3.1
290.	3.5	3.7	3.2	3.6	3.1	3.4	3.0	3.3	3.0	3.3	3.0	3.0	3.0	3.1	3.1	3.1	3.0	3.0	3.0
300.	3.5	3.6	3.2	3.6	3.1	3.4	3.1	3.4	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
310.	3.5	3.4	3.2	3.7	3.1	3.4	3.1	3.4	3.1	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
320.	3.5	3.2	3.2	3.6	3.1	3.4	3.1	3.5	3.1	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
330.	3.6	3.2	3.3	3.3	3.1	3.4	3.1	3.5	3.1	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
340.	3.6	3.3	3.3	3.2	3.1	3.4	3.1	3.5	3.1	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
350.	3.6	3.3	3.4	3.1	3.2	3.2	3.3	3.3	3.3	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MAX	4.0	3.8	4.0	3.7	3.8	3.4	3.7	3.5	3.7	3.5	3.8	3.8	4.1	4.3	3.9	3.9	3.7	3.4	3.3
DEGR.	70	280	30	310	160	200	20	320	20	310	110	110	150	170	250	200	190	250	260

THE HIGHEST CONCENTRATION OF 4.30 PPM OCCURRED AT RECEPTOR REC14.

JOB: HELENA BYPASS WORST POSSIBLE INTERSECTIO RUN: CR52 TEE INTO BYPASS

METEOROLOGICAL VARIABLES

U = 1.5 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 3.0 PPM

JOB: HELENA BYPASS WORST POSSIBLE INTERSECTIO RUN: CR52 TEE INTO BYPASS

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16	REC17	REC18	REC19
0.	3.4	3.3	3.3	3.2	3.3	3.0	3.3	3.1	3.3	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
10.	3.4	3.3	3.4	3.2	3.4	3.0	3.5	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20.	3.3	3.3	3.4	3.2	3.5	3.0	3.5	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30.	3.3	3.3	3.6	3.1	3.5	3.0	3.5	3.0	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
40.	3.2	3.3	3.7	3.1	3.5	3.0	3.4	3.0	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
50.	3.5	3.3	3.6	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
60.	3.6	3.2	3.5	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
70.	3.8	3.2	3.5	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
80.	3.7	3.1	3.5	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0
90.	3.6	3.1	3.4	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.3	3.3	3.2	3.1	3.1	3.0	3.0	3.0	3.0
100.	3.5	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.5	3.4	3.4	3.2	3.2	3.1	3.0	3.0	3.0
110.	3.5	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.6	3.6	3.4	3.4	3.4	3.4	3.2	3.1	3.1
120.	3.6	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.6	3.6	3.7	3.4	3.4	3.4	3.2	3.1	3.1
130.	3.6	3.0	3.5	3.0	3.4	3.0	3.4	3.0	3.4	3.0	3.5	3.6	3.7	3.2	3.2	3.3	3.2	3.0	3.1
140.	3.6	3.0	3.5	3.0	3.5	3.0	3.4	3.0	3.4	3.0	3.5	3.5	3.8	3.3	3.2	3.3	3.2	3.0	3.0
150.	3.6	3.0	3.5	3.0	3.5	3.0	3.5	3.0	3.4	3.0	3.5	3.5	3.7	3.6	3.2	3.3	3.2	3.0	3.0
160.	3.6	3.0	3.6	3.0	3.5	3.0	3.5	3.0	3.4	3.0	3.4	3.5	3.7	3.9	3.0	3.3	3.2	3.0	3.0
170.	3.6	3.0	3.6	3.0	3.5	3.0	3.4	3.0	3.4	3.0	3.4	3.4	3.7	3.9	3.3	3.3	3.3	3.0	3.0
180.	3.4	3.1	3.4	3.1	3.3	3.1	3.3	3.1	3.2	3.1	3.4	3.4	3.5	3.9	3.5	3.4	3.3	3.0	3.0
190.	3.2	3.2	3.2	3.2	3.1	3.2	3.1	3.2	3.1	3.2	3.4	3.4	3.4	3.7	3.4	3.4	3.4	3.0	3.0
200.	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.2	3.4	3.4	3.4	3.5	3.3	3.6	3.5	3.1	3.0
210.	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.4	3.4	3.4	3.6	3.3	3.4	3.5	3.1	3.0
220.	3.0	3.3	3.0	3.2	3.0	3.2	3.0	3.3	3.0	3.3	3.4	3.4	3.5	3.6	3.3	3.2	3.4	3.1	3.1
230.	3.0	3.3	3.0	3.2	3.0	3.2	3.0	3.2	3.0	3.2	3.4	3.5	3.5	3.6	3.4	3.2	3.4	3.1	3.2
240.	3.0	3.3	3.0	3.2	3.0	3.2	3.0	3.2	3.0	3.2	3.5	3.5	3.6	3.6	3.5	3.2	3.4	3.1	3.2
250.	3.0	3.3	3.0	3.2	3.0	3.2	3.0	3.2	3.0	3.2	3.5	3.6	3.6	3.6	3.7	3.4	3.3	3.2	3.1
260.	3.0	3.3	3.0	3.2	3.0	3.2	3.0	3.2	3.0	3.2	3.4	3.5	3.6	3.6	3.6	3.4	3.3	3.2	3.1
270.	3.1	3.4	3.0	3.2	3.0	3.2	3.0	3.2	3.0	3.2	3.3	3.3	3.4	3.4	3.4	3.4	3.2	3.2	3.1
280.	3.2	3.5	3.1	3.4	3.0	3.2	3.0	3.2	3.0	3.2	3.1	3.1	3.2	3.2	3.2	3.2	3.1	3.1	3.0
290.	3.3	3.6	3.2	3.5	3.0	3.3	3.0	3.2	3.0	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
300.	3.4	3.3	3.2	3.5	3.1	3.3	3.0	3.2	3.0	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
310.	3.3	3.2	3.1	3.4	3.1	3.3	3.1	3.3	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
320.	3.3	3.2	3.1	3.3	3.1	3.3	3.1	3.4	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
330.	3.3	3.1	3.1	3.3	3.1	3.3	3.1	3.4	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
340.	3.3	3.3	3.2	3.0	3.1	3.3	3.1	3.3	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
350.	3.4	3.3	3.2	3.0	3.2	3.1	3.2	3.2	3.1	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MAX	3.8	3.6	3.7	3.5	3.5	3.3	3.5	3.4	3.5	3.3	3.6	3.6	3.8	3.9	3.7	3.6	3.5	3.2	3.2
DEGR.	70	290	40	290	20	200	10	320	10	210	110	110	140	160	250	200	200	250	230

THE HIGHEST CONCENTRATION OF 3.90 PPM OCCURRED AT RECEPTOR REC14.

PM 2.5 HOT SPOT ANALYSIS CHECKLIST

This checklist is only intended as a tool to assist in meeting the PM2.5 hotspot analysis requirements. This checklist does not replace regulatory requirements in the Transportation Conformity Rule (40 CFR Part 93), nor associated guidance. Any decisions regarding a particular conformity determination or hot-spot analysis will be made based on the statute and regulations, after appropriate public input. A $PM_{2.5}$ project-level conformity determination (with appropriate hot-spot analysis) should be included as an element in NEPA documentation.

A. Item Number and Project Name: ST-059-261-004

B. Project Description: (HELENA BYPASS) Realignment of SR 261 from CR 52 to North of Helena

C. $PM_{2.5}$ non-attainment or maintenance area: SHELBY COUNTY

STEP 1: EXEMPT STATUS

D. Conformity Exempt Status

☑ Not An Exempt Project. Go to STEP 2.

❑ Exempt Project or Traffic Signalization (40 CFR 93.126 or 93.128). Select one from the list below. No hotspot analysis required. Go to STEP 4.

AIR QUALITY

- ❑ Continuation of ride-sharing and van-pooling promotion activities at current levels.
- ❑ Bicycle and pedestrian facilities

SAFETY

- ❑ Adding medians
- ❑ Emergency relief (23 U.S.C. 125)
- ❑ Emergency truck pullovers
- ❑ Fencing
- ❑ Guardrails, median barriers, crash cushions
- ❑ Hazard Elimination Program
- ❑ Increasing Sight Distance
- ❑ Lighting improvements
- ❑ Pavement marking demonstration
- ❑ Pavement resurfacing and/or rehabilitation
- ❑ Railroad/highway crossing
- ❑ Railroad/highway crossing warning devices
- ❑ Reconstructing bridges (no additional travel lanes)
- ❑ Safer non-Federal-aid system roads
- ❑ Safety improvement program
- ❑ Safety roadside rest areas
- ❑ Shoulder improvements
- ❑ Skid treatments
- ❑ Traffic control devices and operating assistance other than signalization projects.
- ❑ Truck Climbing lanes outside the urbanized area
- ❑ Widening narrow pavement (no additional travel lanes)

MASS TRANSIT

- ❑ Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part 771
- ❑ Construction of small passenger shelters and information kiosks
- ❑ Construction or renovation of power, signal, and communications systems.
- ❑ Operating assistance to transit agencies
- ❑ Purchase of new buses and rail cars to replace existing vehicles or for minor expansion of the fleet. In PM10 and PM2.5 nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.
- ❑ Purchase of office, shop, and operating equipment for existing facilities
- ❑ Purchase of operating equipment for vehicles (e.g., radios, fareboxes, lifts, etc.)
- ❑ Purchase of support vehicles
- ❑ Reconstruction or renovation of transit building and structures (e.g., rail or bus building, storage and maintenance facilities, stations, terminals and ancillary structures)
- ❑ Rehabilitation of transit vehicles – In PM10 and PM2.5 nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.
- ❑ Rehabilitation or reconstruction of track structures, track, and trackbed in existing rights-of-way

OTHER

- ❑ Acquisition of scenic easement
- ❑ Directional and information signs
- ❑ Emergency or hardship advance land acquisitions (23 CFR 710.503 (d))
- ❑ Engineering to assess social, economic, and environmental effects of the proposed action or alternative to that action
- ❑ Noise attenuation
- ❑ Planting, landscaping, etc
- ❑ Repair of damage caused by natural disasters, civil unrest, of terrorist acts, except projects involving substantial functional, locational, or capacity changes
- ❑ Sign removal
- ❑ Specific activities which do not involve or lead directly to construction, such as:
    - Federal-aid systems revisions
    - Grants for training and research programs
    - Planning activities conducted pursuant to titles 23 and 49 USC
    - Planning and technical studies
- ❑ Traffic signal synchronization (40 CFR 93.128)
- ❑ Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures, or facilities)

PM 2.5 HOT SPOT ANALYSIS CHECKLIST

STEP 2: AIR QUALITY CONCERN STATUS

E. Project Status **(NEPA type)** _____Environmental Impact Statement_____

F. Project Sponsor **(State, Local, City, Other)**_____ALDOT_____

G. Project Data **(worst case scenario or scenarios)**

1. Percentage of diesel vehicles (trucks and buses) traffic and/or number diesel vehicles
   _____6% total Trucks_____(Design hour # of Trucks ≈ 24)_____
2. AADT __(Year 2010) N / A (Year 2030) 5462_____
3. Intersections at LOS D, E, or F and number of diesel vehicles____(NONE)__

_____

H. Air Quality Concern

☑ Not Project of Air Quality Concern. Hot-spot requirements may be satisfied without a qualitative or quantitative hotspot analysis. Prepare documentation for Interagency consultation (IAC) and make suggestion on level of public involvement. Go to STEP 3, Meeting Notices and Dates.

❑ Project of Air Quality Concern. Hot-spot analysis **IS** required. Convene interagency consultation (IAC) meeting. Go to STEP 3.

- ❑ New or expanded highway projects with a significant number of, or increase in, diesel vehicles (e.g., 125,000 AADT and 10,000 (8%) diesel truck traffic) Note: The example of 125,000 AADT and 10,000 (8%) diesel truck traffic are not exact threshold values and should not be viewed as such.
- ❑ Project affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.
- ❑ New bus and rail terminals and transfer points that have significant number of diesel vehicles congregating at a single location
- ❑ Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.
- ❑ Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{10} and $PM_{2.5}$ applicable implementation plan or implementation plan submissions, as appropriate, as sites of violation or possible violation

PM 2.5 HOT SPOT ANALYSIS CHECKLIST

STEP 3: ANALYSIS AND DOCUMENTATION

The following is a summary of documentation to be included for PM2.5 hotspot analysis and does not replace information that will be provided for a full quantitative analysis if this analysis is required.

Documentation to Be Included for the PM2.5 Hot-spot analysis

- ❑ Description of project (location, design and scope; date project is expected to be open, i.e., what part of 93.123(b) (1) applies)
- ❑ Description of type of emissions considered in the analysis
- ❑ Contributing Factors
  - o Air Quality
  - o Transportation and traffic conditions
  - o Built and natural environment
  - o Meteorology, climate and seasonal data
  - o Adopted emissions control measures
- ❑ Consider full time frame of area's LRTP
- ❑ Description of existing conditions
- ❑ Description of changes resulting from project
- ❑ Description of method chosen
- ❑ Description of analysis years
- ❑ Examine year in which emissions are expected to peak
- ❑ Profession judgment of impact
- ❑ Discussion of any mitigation measures
- ❑ Written commitments for mitigation
- ❑ Conclusion on how project meets 40 CFR 93.116 and 93.123

Meetings, Notices, Dates

J. IAC meeting (Project sponsor is lead) _____
(attach minutes)

K. Public Involvement

a. Public notice (should be consistent with NEPA project) _____
(attach)

b. Public review & comment period (should be consistent with NEPA project) _____
(dates)

c. Public concerns addressed (cc IAC) _____

PM 2.5 HOT SPOT ANALYSIS CHECKLIST

STEP – 2

(HELENA BYPASS) Realignment of SR 261 from CR 52 to North of Helena

Is this Project a new or expanded highway projects with a significant number of, or increase in, diesel vehicles.

No. The expected traffic on this project is considerably lower than the example of 125,000 AADT and 10,000 (8%) diesel truck traffic and this project should not be considered similar to a project of that class.

Is this Project a project affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.

No. The Purpose of this project is to provide a bypass to a congested area. The only intersections with LOS D, E, or F are the intersections to be relieved by this project. This project proposes no intersections with LOS D, E, or F within the limits of this project.

Does this Project propose new bus and rail terminals and transfer points that have significant number of diesel vehicles congregating at a single location.

No. This project does not propose any new bus or rail terminals or transfer points. This project does not propose any locations of significant vehicle congregation.

Does this Project propose expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.

No. This Project proposes to provide traffic relief around a congested area which has at grade rail crossings which contribute to congestion. The Project proposes bridged rail crossings which will tend to eliminate vehicles congregating at a single location.

Is this Project in or affecting any locations, areas, or categories of sites which are identified in the PM10 and PM2.5 applicable implementation plan or implementation plan submissions, as appropriate, as sites of violation or possible violation

No.

Appendix C:

Noise Report

Appendix C Noise Analysis

Table of Contents

C 1 Purpose

The purpose of this report is to provide information concerning traffic noise generation and its impacts, beneficial or detrimental, on the project area and local receptors. The information provided is to be suitable for consideration in the decision making process, concerning which alternate, if any to follow.

This report will present comparative analysis of the expected impact of traffic noise for each of the alternates.

C 2 Project Description

ALDOT project no. ST-059-261-004 - Helena bypass - from county road 52 in Helena to state route 261 near Bearden road in Shelby County, Alabama.

The purpose of this project is to add an addition bypass route around the City of Helena's Historic District.

C 2.1 Alternates

The "No Build" alternate is the first of the alternatives. This alternative primarily serves as a benchmark of comparison for the other alternatives.

Alternative I is the west most alterative consisting nearly entirely of new road on new location. This alternative traverses on new location through undeveloped land for the vast majority of its length. This is accomplished by traversing the the west side of the Quarry in the area. Alternate is approximately 3.7 miles long.

Alternative II is the alternative that utilizes a portion of the existing state route 261 right of way. This is accomplished by traversing to the east side of the Quarry. Alternate II is approximately 3.9 miles long.

Alternate I-A is nearly the same as Alternate I except that the southwest terminus is moved east along county road 52.

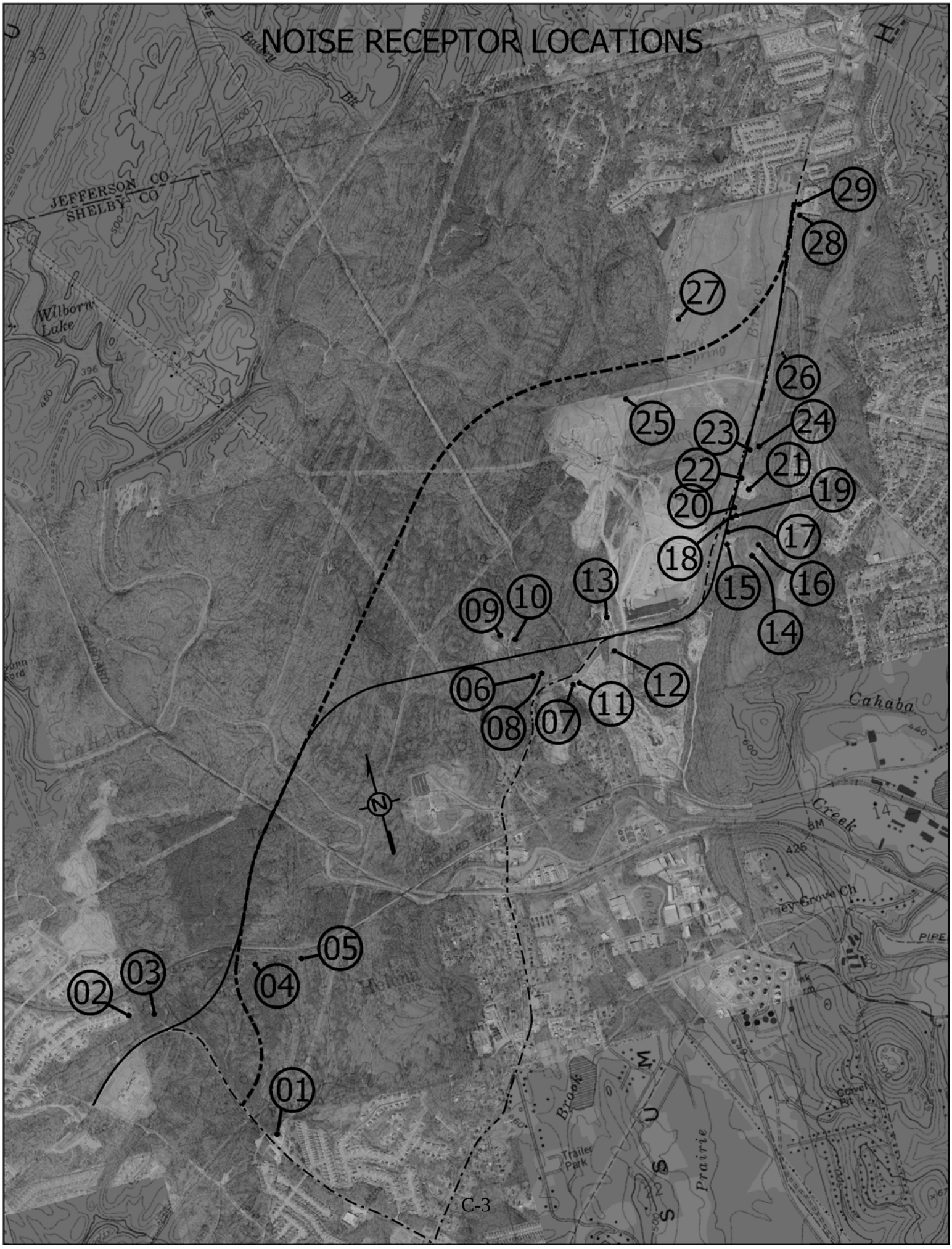
Alternate II-A is nearly the same as Alternate II except the its southwest terminus is moved east along county road 52 in common with Alternate I-A.

C 2.2 Noise sensitive receptors in the Project area.

There were a total of 29 locations close enough to a proposed alternate or an existing roadway affected by an alternate to be considered a potentially impacted receptor. The 29 potentially impacted receptors include residences, cemeteries, churches, industrial facilities, other commercial facilities. Field measurements of existing sound levels were taken for only a few key receptors. In Accordance with the ALDOT Policy, Section II, all potentially impacted receptors were analyzed in this report.

The following page is a local area map with the noise receptors identified.

NOISE RECEPTOR LOCATIONS



C 3 Analysis procedures

C 3.1 Fundamentals of Sound and Noise

The intensity or loudness of sound is measured in units called decibels (dB). However, since the human ear does not hear sound waves of different frequencies at the same subjective loudness, an adjustment or weighting of the high-pitched and low-pitched sounds is made to approximate how an average person hears sounds. When such adjustments to the sound levels are made, they are called “A-weighted levels” and are usually labeled “dBA.”

The decibel scale for measuring the intensity of sound is based on the logarithm of the sound level pressure relative to a reference sound level pressure. Logarithmic scales are based on powers of ten, and are not linear.

It has been found that a 10 dBA increase in the sound level is perceived to be doubling of the sound level as heard by the human ear. This means that a sound level of 60 dBA sounds twice as loud as a sound level of 50 dBA and a sound level of 70 dBA sounds twice as loud as sound level 60 dBA. This also means that a sound level 70 dBA sounds four times as loud as a sound level of 50 dBA.

Because of the logarithmic nature of the decibel scale for sound levels, changes in sound levels are complex to define. For example, if a sound of 60 dBA is added to another sound of 60 dBA, the resulting sound is 63 dBA instead of 120 dBA.

Noise is defined as unwanted sound. Since highway traffic sound is normally unwanted, highway traffic sound is usually called highway traffic noise. The level of highway traffic noise is never constant; therefore, it is necessary to use a statistical descriptor to describe the varying traffic noise levels. The equivalent continuous sound level (Leq) is the statistical descriptor used in this report. The Leq sound level is the steady A-weighted sound level, which would produce the same A-weighted sound energy over a stated period of time.

C 3.2 Regulatory Codes, Documents and Guidance.

The analysis performed in this report is in accordance with the following Publications:

Alabama Department of Transportation’s Noise Policy

Code of Federal Regulations (CFR) Title 23 Part 772. entitled “Procedures for Abatement of Highway Traffic Noise and Construction Noise”

Software User Manuals for Traffic Noise Model 2.5

C 3.3 ALDOT Noise Abatement Criteria

Activity Category	Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in categories A or B above.
D	-	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

C 3.4 Software utilized.

All calculations and noise modeling was done be FHWA TRAFFIC NOISE MODEL, Version 2.5 (TNM 2.5).

"The FHWA TNM is a state-of-the-art computer program used for predicting noise impacts in the vicinity of highways. It uses advances in personal computer hardware and software to improve upon the accuracy and ease of modeling highway noise, including the design of effective, cost-efficient highway noise barriers." (http://mctrans.ce.ufl.edu/featured/trafficNoise/)

C 3.5 Data Collection.

Data collection process for this report included field visits, examination of recent aerial photographs. Existing sound Level were recorded by hand from a Sound Level Meter by EXTECH (Model 407730). Sound level were recorded on dry days during afternoon pear hour traffic. All sound levels in this report are 'A' weighted. All calculated sound levels are one hour average energy levels Leq(h). Field measured values are 15 minute energy averages Leq(15m). Field measurements are only used for the receptors which are too far from an existing road to model existing traffic noise as the primary source of sound energy, and as a selective case of verification of software accuracy.

C 4 Input parameters

C 4.1 Traffic Speeds

The speed of traffic is assumed to 60 miles per hour in areas of the build alternatives 1000 feet or greater from a major intersection. Traffic speed in all other areas is assumed to be 45 miles per hour.

C 4.2 Traffic Volumes

A traffic report was provided for this study by ALDOT. This report supplied the data necessary for the design year of the build alternates. The values from this study were used to find the peak hourly volumes of each vehicle type expected utilized in the noise analysis. For the existing condition the 2006 values from traffic counters station 602 at SR 261 mile post 0.395 and station 915 at SR 261 mile post 2.185 were averaged.

Peak hourly Volumes				
Road	LDV	MDV	HDV	M
Current Conditions				
Existing State Route 261	3202	88	46	6
Existing County Road 52	3118	94	38	6
No-build Alternative				
Existing State Route 261	3510	64	82	8
Existing County Road 52	3220	96	39	8
All Build Alternatives				
Project Roadway	732	16	16	2
Existing State Route 261	3510	64	82	8
Existing County Road 52	3220	96	40	8
Bypassed State Route 261	2778	48	66	6
Bypassed County Road 52	2488	80	24	6

C 5 Calculation Results

C 5.1 Detailed Sound level reports from TNM 2.5

Sound levels were calculated for each of the receivers for each of the alternate. The results from tables generated by TNM 2.5 were copied into the table of receivers. Since all of the relevant data from the TNM result tables was included in the table of receivers, the detailed sound level reports as produced by TNM were not included in this report.

C 5.2 Sound level Contours

Sound level contours are included at the end of this report. They are included for the planning purposes for the local governments. The 66 dBA contour is shown throughout the proposed areas on new location. The 71 dBA contour is not shown throughout because it consistently falls within the necessary R.O.W.

C 5.3 Table of Receivers.

The table of receivers is divided into three sections.

1. Locations

"Receiver" is the number assigned to each receiver throughout this report. "Global Coordinates" are given as the approximate in Latitude/Longitude of the receiver. This coordinate system is useful for GPS use during field visits.

2. Noise Levels

The noise level is considered to be approaching the Noise Abatement Criteria (NAC) levels when they reach 1 dBA less than the given NAC level.

3. Noise Summary

The noise impacts are summarized as no impact (blank) or approaching the NAC levels (NAC) or 15dBA increase (15). If a receptor result shows an impact but is furthermore a relocation impact it is additionally designated with (R).

Detail of receptors which reach NAC levels in one or more alternates.

Receptor Number	NAC Level	Existing Levels	No Build	Alt-1	Alt-1A	Alt-2	Alt-2A	Remarks
17	67	63.3	64.0	63.0	63.0	75.3 *	75.3 *	Residence
18	72	66.1	66.8	65.8	65.8	75.2 *	75.2 *	
20	67	67.6	68.3	67.1	67.1	74.4 *	74.4 *	
22	72	69.1	69.7	68.7	68.7	74.7 *	74.7 *	
23	67	67.5	68.1	67.2	67.2	72.6 *	72.6 *	Residence
28	67	67.7	68.3	64.3	64.3	64.2	64.2	Residence
29	67	70.9	71.6	68.4	68.4	68.5	68.5	Residence
Total Impacts		4	4	3	3	1	1	

* Noted receptor is a relocation impact for the noted alternate, and therefore not a noise impact.

Table of Receivers

(C 5.3.1 - Locations)

Receiver	Global Coordinates		Elev. (ft.)	Dist. to nearest Travel Lane				
	Latitude	Longitude		Existing	ALT-1	ALT-1A	ALT-2	ALT-2A
1	33° 17' 18.2"	86° 51' 33.8"	489	96	96	96	96	96
2	33° 17' 43.9"	86° 51' 56.1"	493	469	469	469	469	469
3	33° 17' 43.0"	86° 51' 51.1"	523	286	286	286	286	286
4	33° 17' 46.5"	86° 51' 29.1"	439	>500	360	282	360	282
5	33° 17' 45.4"	86° 51' 19.9"	428	>500	>500	>500	>500	>500
6	33° 18' 20.7"	86° 50' 20.5"	470	245	245	245	245	245
7	33° 18' 17.6"	86° 50' 13.2"	438	117	117	117	117	117
8	33° 18' 20.8"	86° 50' 18.7"	465	214	214	214	214	214
9	33° 18' 28.7"	86° 50' 24.7"	534	>500	>500	>500	337	337
10	33° 18' 27.4"	86° 50' 22.0"	543	>500	>500	>500	222	222
11	33° 18' 17.6"	86° 50' 11.9"	438	144	144	144	144	144
12	33° 18' 21.2"	86° 50' 03.6"	463	225	225	225	225	225
13	33° 18' 26.9"	86° 50' 03.2"	478	327	327	327	296	296
14	33° 18' 30.4"	86° 49' 32.1"	562	>500	>500	>500	496	496
15	33° 18' 33.3"	86° 49' 36.3"	484	210	>500	>500	R	R
16	33° 18' 31.9"	86° 49' 30.3"	587	>500	>500	>500	498	498
17	33° 18' 35.3"	86° 49' 35.5"	478	135	135	135	R	R
18	33° 18' 37.5"	86° 49' 34.1"	476	99	99	99	R	R
19	33° 18' 37.5"	86° 49' 33.0"	480	162	162	162	R	R
20	33° 18' 38.9"	86° 49' 33.0"	477	82	82	82	R	R
21	33° 18' 41.2"	86° 49' 29.2"	487	223	223	223	130	130
22	33° 18' 43.3"	86° 49' 30.0"	478	62	62	62	R	R
23	33° 18' 47.5"	86° 49' 26.9"	489	82	82	82	R	R
24	33° 18' 47.7"	86° 49' 25.1"	520	212	212	212	147	147
25	33° 19' 01.4"	86° 49' 48.0"	528	>500	465	465	>500	>500
26	33° 19' 01.7"	86° 49' 15.6"	519	166	166	166	145	145
27	33° 19' 11.9"	86° 49' 33.7"	539	>500	492	492	>500	>500
28	33° 19' 23.2"	86° 49' 05.0"	523	74	74	74	74	74
29	33° 19' 25.1"	86° 49' 04.5"	521	58	58	58	58	58

Table of Receivers

(C 5.3.2 - Noise Levels)

Receiver	Sound Levels Leq (dBA)							
	NAC	Measured	Existing	No-Build	ALT-1	ALT-1A	ALT-2	ALT-2A
1	67		62.6	62.8	61.4	61.4	61.4	61.4
2	67		52.2	52.4	52.3	52.1	52.3	52.1
3	67	55.36	56.5	56.6	56.6	56.0	56.6	56.0
4	67		43.6	43.9	51.2	53.4	51.2	53.4
5	67		42.7	43.1	45.0	45.5	45.0	45.5
6	67		58.9	59.6	58.6	58.6	59.3	59.3
7	67		63.7	64.4	63.4	63.4	63.4	63.4
8	67		60.2	60.9	59.9	59.9	60.4	60.4
9	67	42.83	45.4	46.2	45.9	45.9	51.7	51.7
10	67		47.2	48.0	47.5	47.5	54.8	54.8
11	67		62.1	62.8	61.8	61.8	61.9	61.9
12	67		59.8	60.6	59.6	59.6	60.0	60.0
13	72		55.4	56.3	55.4	55.4	57.5	57.5
14	67		50.1	51.0	50.1	50.1	53.2	53.2
15	72		59.8	60.6	59.6	59.6	69.0	69.0
16	67		49.6	50.6	49.7	49.7	52.2	52.2
17	67		63.3	64.0	63.0	63.0	75.3	75.3
18	72		66.1	66.8	65.8	65.8	75.2	75.2
19	72		62.3	63.0	62.0	62.0	66.0	66.0
20	67		67.6	68.3	67.2	67.2	74.4	74.4
21	72		58.8	59.7	58.7	58.7	60.8	60.8
22	72		69.1	69.7	68.7	68.7	74.7	74.7
23	67		67.5	68.1	67.1	67.1	72.6	72.6
24	67		60.0	60.8	59.8	59.8	61.4	61.4
25	67		42.2	42.9	49.0	49.0	43.0	43.0
26	67		61.8	62.6	61.6	61.6	61.3	61.3
27	67		43.4	44.2	48.8	48.8	44.3	44.3
28	67		67.7	68.3	64.3	64.3	64.2	64.2
29	67		70.9	71.6	68.4	68.4	68.5	68.5

Table of Receivers

(C 5.3.3 - Noise Summary)

Receiver	Noise Impact?						Remarks
	Existing	No-Build	ALT-1	ALT-1A	ALT-2	ALT-2A	
1							1 Business
2							1 Residence
3							1 Church (Cahaba Bend)
4							1 Cemetary (unnamed)
5							1 Business
6							1 Residence (Unoccupied)
7							1 Business
8							1 Residence
9							1 Church
10							1 Residence
11							1 Business
12							1 Roy Cemetary
13							1 Business
14							1 Residence
15							Residential Shop
16							1 Residence
17					NAC (R)	NAC (R)	1 Residence
18					NAC (R)	NAC (R)	1 Business
19							1 Business
20	NAC	NAC	NAC	NAC	NAC (R)	NAC (R)	1 Residence
21							1 Business
22					NAC (R)	NAC (R)	1 Business
23	NAC	NAC	NAC	NAC	NAC (R)	NAC (R)	1 Residence
24							1 Residence
25							1 Business
26							1 Residence
27							1 Residence
28	NAC	NAC					1 Residence
29	NAC	NAC	NAC	NAC	NAC	NAC	1 Residence

C 6 Conclusion

This noise analysis was performed in accordance with the Alabama Department of Transportation's 'Highway Traffic Noise Analysis and Abatement, Policy and Guidance.' This Document is herein referred to as the "ALDOT Policy."

According to ALDOT Policy, Section II, 29 potentially impacted receptors were included in this report. No receptors were found to be representative of other receptors. All receptors were modeled individually due to their unique properties. Field measurements of existing sound levels were taken for only a few key receptors.

The software used for the prediction of noise levels was the current FHWA Computer Model (TNM 2.5). Traffic Volumes used in the analysis were provided by ALDOT.

C 6.1 Impacts:

A table of receivers was provided on the previous pages with the detailed analysis results for each receiver location. Receptors which approach or exceed the (NAC) Traffic Noise levels are tabulated as follows:

No-Build	ALT 1	ALT 1A	ALT 2	ALT 2A
4	3	3	6	6

Some of these receptors were determined in the design and right-of-Way requirements to be relocation impacts. Therefore, they are to be removed from the final tally of noise impacts. These receptors are tabulated as follows:

No-Build	ALT 1	ALT 1A	ALT 2	ALT 2A
0	0	0	5	5

Noise impacts are those receptors determined to approach or exceed the Noise abetment criteria levels which are not a relocation impact.

Noise Impacts				
No-Build	**ALT 1**	**ALT 1A**	**ALT 2**	**ALT 2A**
4	**3**	**3**	**1**	**1**

C 6.2 Abatement:

ALDOT's guidelines establish noise abatement criteria (NAC), as well as design and cost requirements for noise mitigation. The guidelines state that ALDOT shall identify noise abatement measures which are reasonable and feasible and which are likely to be incorporated in the project.

There are no feasible and reasonable noise abatement measures that will eliminate or reduce the noise impacts at the occupied facilities that are expected to receive noise impacts. The following is a list of common noise abatement measures and a brief discussion on how these measures are not feasible/reasonable for reducing or eliminating the noise impacts on this project.

Restricting Access to Heavy Trucks at certain times of the day is one way to reduce noise. The proposed SR 261 bypass of Helena will be an extension of a state highway and will likely be funded by state and federal tax dollars with the intent of providing travel for all users, including trucks. Given the industrial operations and commercial land uses that occur within the project area and the lack of alternative routes to those operations, it is not reasonable to prohibit or restrict trucks along the project corridor.

The Acquisition of Property to Form a Buffer Zone is generally a viable alternative for undeveloped lands where noise impact prevention is the goal. For impacted receptors along the existing facilities, either a buffer exists or the site has been developed so that most properties front the edge of the right-of-way line. This eliminates the potential of creating any buffer zones between the roadway and the residences.

The Alteration of the Horizontal and Vertical Alignments is an abatement measure to be considered for reasonableness. ALDOT noise policy section IV-B-3 states "the threshold of noise reduction which determines a 'benefited' residence is 5 dBA. To achieve benefits beyond this threshold, the horizontal alignment would have to be shifted away from the receptor 1.9 times more than the original distance. For instance, if a receptor is 100 feet from the current centerline, the alignment should be moved 190 feet to be 290 feet from the receptor to achieve a 5 dBA reduction. No alteration of the horizontal or vertical alignments would achieve a benefit for a sufficient number of receptors. Therefore this abatement option is considered not reasonable.

Reducing Speed Limits is another option to control vehicle noise. On this project, the assumed vehicle speed varies between 45 and 60 miles per hour (mph). The high traffic volumes on this road and its key position in the functionality of the local road network make it unreasonable to consider lowering the speed limit. Reducing the speed limit would only be considered feasible if the road in consideration were not a key arterial. Therefore, due to the nature of this route and its functional classification, reducing the proposed speed limit is not a feasible measure.

Noise Insulation of Public Use or Non-Profit Institutional Structures or soundproofing of buildings typically involves the installation of double-pane windows that are specially designed to provide a high degree of noise attenuation. ALDOT guidelines state that noise insulation is only applied to publicly used or non-profit organizational buildings experiencing severe impacts. There are no occupied facilities receiving impacts that fall within this category.

Noise Barriers are the most common form of traffic noise abatement that are used to reduce noise. Barriers can be comprised of concrete, wood, metal, earth or vegetation blocking the sound path between roadways and noise-sensitive areas. They are generally used on high-speed, limited-access facilities where noise levels are high and adequate room for barriers is available. There were no cases where more than one impact was found to be in a localized area. Therefore the use of noise barriers is found to be unreasonable according to the ALDOT Noise Policy Section IV (B) 8 paragraph 2, because the number of receptors benefited by possible abatement measures would not substantiate the cost of abatement.

The possible negative impact of abatement measures reasonably out weighs the possible positive impact of abatement. Therefore a detailed analysis of abatement measures was not completed.

The following noise abatement measures will be incorporated in the contract plans and specifications in order to prevent adverse construction noise impacts in the vicinity of the proposed project:

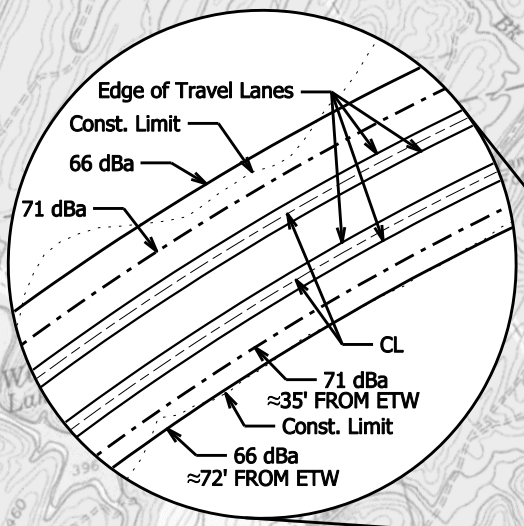
- The contractor shall comply with all state and local sound control and noise level rules, regulations and ordinances that apply to any work performed pursuant to the contract;

- Each internal combustion engine used for any purpose on work related to the project shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without such muffler.

C 6.3 Summary

The purpose of this report is to provide information suitable for consideration in the decision making process. Concerning the aspect of traffic noise, the greatest benefit is the expected reduction of traffic noise for the receptors near the bypassed portion of the bypass section of the existing route. This is a direct secondary benefit to the primary purpose and need of this project. Likewise, the greatest detriment is the increase of noise levels for several receptors. This traffic noise increase was shown to be insufficient for the consideration of any noise abatement. Therefore, this report provides only that all build alternatives have a more positive impact than the “No-build” Alternative.

Alternative 1 / 1A
Estimated Future Sound Energy Level Contours

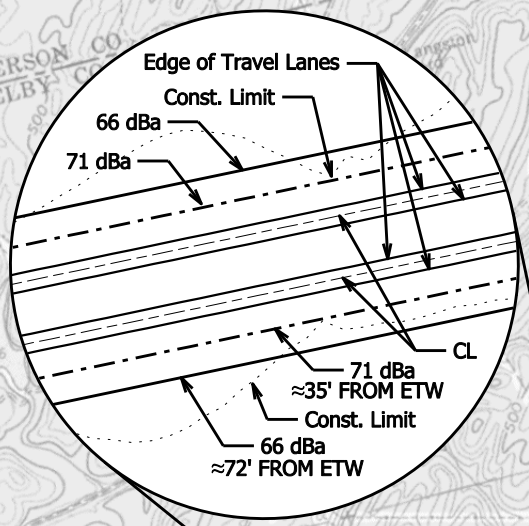


66 dBa

CL

N

Alternative 2 / 2A
Estimated Future Sound Energy Level Contours



66 dBa

CL

N

Alabama
Department of Transportation
(ALDOT)

Highway Traffic Noise
Analysis and Abatement

Policy and Guidance

Revised July 2001

APPROVAL: _____ **DATE:** 8/22/01
Federal Highway Administration

Alabama Department of Transportation
Noise Analysis and Abatement Guidelines

These Noise Abatement Guidelines are intended to supplement Title 23, Article 772, Code of Federal Regulations (23 CFR 772) in addressing traffic generated noise impacts. These guidelines provide the basis for statewide uniformity in consideration of noise abatement while providing flexibility for decision making.

I. DEFINITIONS

The following definitions shall be used in the Noise Abatement Guidelines.

1. **Abatement** shall mean measures used to reduce traffic noise levels. Under normal circumstances, abatement measures will not be implemented where noise reduction will be less than 5 dBA.

2. **Approach** as used in 23 CFR 772.5 (g) shall mean levels (Leq h) which are one decibel (or dBA) below the levels shown in Table 1 (page 8) of these Guidelines.

3. **Barriers** shall a solid wall, earthen berm or a combination of the two. Vegetation is not considered a barrier because it is rarely acoustically effective.

4. **CFR** shall mean the Code of Federal Regulations.

5. **Design Year** shall mean the future year used to estimate the probable traffic volume for which a highway is designed, typically 20 years into the future.

6. **Existing Noise Level** shall mean the noise resulting from the natural and mechanical sources and human activity considered to be usually present in a particular area.

7. **Insertion Loss** shall mean the predicted reduction in noise level resulting from the implementation of a noise abatement measure.

8. **Leq** shall mean the equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period.

9. **Leq (h)** shall mean the hourly value of Leq.

10. **NAC** shall mean the Noise Abatement Criteria as shown in Table 1 of these Guidelines.

11. **Parallel Barriers** shall mean noise abatement walls or earthen berms constructed on both sides of a roadway on a parallel alignment.

12. **Receptor** shall mean locations where highway traffic noise may affect frequent human activities as shown in the NAC.

13. **Substantially exceed the existing noise levels,** as cited in 23 CFR 772.5 (g), shall mean increases of 15 dBA or more above the existing noise level.

14. **Traffic Noise Impacts** shall mean impacts which occur when the predicted traffic noise levels approach or exceed the NAC or when the predicted traffic noise levels substantially exceed the existing noise levels.

15. **Type I Projects** shall mean proposed Federal-aid highway projects for the construction of a highway on new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through traffic lanes.

16. **Type II Projects** shall mean proposed Federal or Federal-aid highway projects for noise abatement on an existing highway, (ALDOT does not have a program for TYPE II projects at this time).

II. ANALYSIS

All federally funded Type I ALDOT projects will have a noise analysis performed when potentially impacted receptors are present within 500 ft. of the nearest travel lane. Analysis, whether by FHWA Highway Noise Prediction Model (Report No. FHWA-RD-77-108), STAMINA 2.0, or current FHWA approved model should be done even if potential abatement may not be feasible or reasonable. Existing noise levels are measured or modeled at the site, such as a residence, where the most frequent human use occurs.

III. ANALYSIS PROCESS

ALDOT shall determine and analyze expected traffic noise impacts and alternative noise abatement measures to mitigate these impacts, giving weight to the benefits and costs of abatement, and to overall social, economic and environmental effects.

The traffic noise analysis shall include the following for each alternative under detailed study:

(A) Traffic noise analysis will be done for developed lands and undeveloped lands where development is planned, designed, and programmed. Development will be deemed to be planned, designed, and programmed if a noise-sensitive land, such as a residence, school, church, hospital, library, etc., has received a building permit from the local agency with jurisdiction at the time of the noise analysis.

(B) The date of public knowledge shall be the date that a project's environmental analysis and documentation is approved, i.e., the date of approval of Categorical Exclusions, Finding of No Significant Impacts, or Record of Decisions. After this date, the ALDOT is still responsible for analyzing changes in traffic noise impacts, when appropriate, but the ALDOT is no longer responsible for providing noise abatement for new development which occurs adjacent to the proposed highway project. Provision of such noise

abatement becomes the responsibility of local communities and private developers.

(C) Determination of existing noise levels by measuring or modeling Leq values at each representative receptor that are selected closest to the project, thereby creating a worst-case analysis. Modeling of existing noise levels will normally be used to determine existing noise levels. Where the existing highway is not the dominant source of noise (e.g. on new location), or where the ALDOT determines they would be beneficial, measurements will be taken.

(D) Prediction of future traffic noise levels by implementation of the Federal Highway Administration highway traffic noise prediction model (Report No. FHWA-RD-77-108), Stamina 2.0 Computer Model or current FHWA approved model employing traffic volumes furnishes by ALDOT Traffic Section using twenty-year projection. Vehicular speed used in the prediction model is derived from posted speed limit signs in the study area.

(E) Determination of traffic noise impacts using the following criteria. Noise impacts will be determined to occur when either or both of the following conditions are met:

(1) When the predicted design year noise levels approach or exceed those values shown for the appropriate activity category of the NAC, (as defined).

(2) When the predicted design year noise levels "substantially exceed existing noise levels" (as defined), by 15 dBA or more. This situation only likely to occur when a new highway alignment is involved.

(F) Examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts, if impacts are identified. These abatement measures include the following:

(1) Traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, time-use restriction for certain vehicle types, modified speed limits, and exclusive land designation).

(2) Alteration of horizontal and vertical alignments.

(3) Acquisition of property rights (either in fee or lesser interest) for construction of noise barriers.

(4) Construction of noise barriers (including landscaping for aesthetic purposes) whether within or outside the highway right-of-way.

(5) Acquisition of real property or interests therein (predominantly improved property) to serve as a buffer zone to preempt

development which would be adversely impacted by traffic noise.

(6) Noise insulation of public use or nonprofit institutional structures.

IV. ABATEMENT: FEASIBILITY AND REASONABLENESS

There are two main elements in the consideration of noise abatement: feasibility and reasonableness. ALDOT's policy concerning feasibility and reasonableness draws heavily upon the Federal Highway Administration (FHWA) guidance issued in Highway Traffic Noise Analysis and Abatement, Policy and Guidance (June 1995).

It is ALDOT's policy to ensure that all reasonable and feasible mitigation measures are incorporated into projects to minimize noise impacts and enhance the surrounding noise environment to the extent practicable. This commitment to minimize noise and impacts and enhance the noise environment will be fulfilled through prudent application of FHWA's noise regulation-23 CFR 772, 23 CFR 772 requires that... "before adoption of a final Environmental Impact Statement or Finding No Significant Impact, ALDOT shall identify noise abatement measures which are reasonable and feasible and which are likely to be incorporated in the project".

(A) Feasibility

Feasibility deals with the engineering consideration which would produce a noise reduction given the specific site conditions. When determining the feasibility of constructing a noise barrier, ALDOT will consider whether or not:

(1) A barrier can be built given the topography of the location.

(2) A substantial noise reduction of 6 dBA or more can be achieved by barrier construction given certain access, drainage, safety, or maintenance requirements.

(3) The insertion loss provided by the barrier will be a minimum of 6 dBA, but preferable 8 dBA or more.

(4) Other noise sources are present in the area such as trains, aircraft, factories etc.

(B) Reasonableness

Reasonableness is a more subjective criterion than feasibility. It implies that common sense and good judgement were applied in arriving at a decision. When determining the reasonableness

of noise abatement measures, ALDOT will consider a wide range of factors, such as but not limited to the following:

1. Amount of noise reduction provided.

Every reasonable effort shall be made to achieve a substantial noise reduction. A substantial noise reduction of at least 6 dBA, but preferably 8 dBA.

2. Cost of abatement

Abatement costing $20,000/residence or less is deemed to be reasonable for cost. For purposes of determining the reasonable cost of highway noise barriers, and estimated cost of & 15.00 per square foot of barrier will be used.

3. Number of people protected.

The method used to count residences will include dwelling units, e.g., owner-occupied, rental units, mobile homes, etc., that are "benefited", regardless of whether or not they were identified as impacted. The threshold of noise reduction which determines a "benefited" residence is 5 dBA.

4. Absolute noise levels.

The ALDOT will give greater consideration to residential area where high absolute traffic noise levels are anticipated to occur, i.e., greater than 70 dBA.

5. Change in noise levels.

The ALDOT will give greater consideration to residential areas where noticeable increases over existing noise levels are anticipated, i.e., greater than a 15 dBA increase.

6. Development along the highway

The ALDOT will give greater consideration to
(1) residential areas along highways on new location,
(2) residential areas that were constructed before and existing highway, and
(3) residential areas that have been in place along an existing highway for an extended period of time, i.e., 20 years. The LDOT will give less consideration to residential areas that have developed along an existing highway without proper consideration of traffic noise impacts by the local community or developer.

7. Environmental impacts of abatement construction.

When considering the construction of noise abatement measures, the ALDOT will consider any potential negative effects on the natural environment, e.g., loss of trees and vegetation, as well as potential positive effects of noise reduction during highway construction.

8. Other factors.

The exposed height of a noise barrier should not exceed a maximum of 6 meters (approximately 20').

Unless special conditions exist, it generally will not be considered reasonable to provide abatement for impacted businesses or isolated receptors. Based on past project experience, businesses generally prefer visibility from the transportation facility. It is usually unreasonable to provide abatement for isolated residence due to the cost of abatement versus the benefits provided.

Unless special conditions exists, it generally will not be considered reasonable to construct noise barriers on the shoulder of a roadway due to safety, maintenance, and drainage concerns. These issues should be addressed during preliminary and final project design.

A noise barrier should be located within the right-of-way, beyond the clean recovery zone, or be incorporated into safety devices.

In areas with impacted receptors where noise abatement measures have been considered and found not to be reasonable, a vegetative barrier may be considered for aesthetic screening and psychological benefits, even though an acoustical barrier is not justified.

9. Viewpoints of the impacted residents.

The viewpoints of the impacted residents (i.e., support for or opposition to) will be a major consideration in determining the reasonableness of noise abatement measures. When the ALDOT has determined the barrier is otherwise reasonable for the project, ALDOT will meet the impacted residents and present a brief program on highway traffic noise to explain and demonstrate the characteristics of highway traffic noise, the effects of noise barriers in attenuating traffic noise, and the types of noise barriers that may be considered. As available, specific details-location, length, height, aesthetic treatment, landscaping, maintenance, drainage, safety, etc.-of noise

barriers being studied will also be provided in addition to a discussion of alternatives to a barrier construction.

The ALDOT will then solicit the views and opinions of the impacted residents and make a preliminary determination on the reasonableness and feasibility of noise abatement. After completion of final design, the ALDOT will meet again with the impacted residents to present final barrier design details and to solicit the residents' final views and opinions on barrier construction. The ALDOT will then make a final determination on the reasonableness and feasibility of noise abatement.

V. COORDINATION WITH LOCAL OFFICALS:

The ALDOT will furnish the results of all highway traffic noise analyses to local government officials and will encourage local communities and developers to practice noise compatible development. Local coordination will specifically be accomplished through the distribution of highway project environmental document and noise study reports.

VI. EXTENUATING CIRCUMSTANCES:

There may be extenuating circumstances where unique or unusual conditions warrant special consideration of highway traffic noise impacts and /or implementation of noise abatement measures. These circumstances could involve areas such as (1) those that are extremely noise-sensitive, (2) those where severe noise impacts are anticipated, or (3) those containing Section 4(f) resources. Extenuating circumstances will be considered on an individual project basis.

TABLE 1

NOISE ABATEMENT CRITERIA		
ACTIVITY CATEGORY	**ABATEMENT CRTIERIA LEVEL (L_{eq})**	**DESCRIPTION OF ACTIVITY CATEGORY**
A	57 (Exterior)	Lands on which serenity and quite are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the are is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active ports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 (Exterior)	Developed lands, properties or activities not included in Category A or B above.
D	----------	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Reference: 23 CFR 772

Appendix D:

2008 §303(d) List

ECOLOGICAL REPORTS

Water Quality Analysis

Wetlands Delineation Report

Floodplain Mapping

2008 Alabama §303(d) List

Assessment Unit ID	Waterbody Name	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	Draft TMDL Date
AL03160112-0303-100	Pegues Creek	R	L	Black Warrior	Tuscaloosa	Fish & Wildlife	Metals (Chromium, Lead) Siltation (habitat alteration)	Surface mining-abandoned	2002	4.23 miles	Black Warrior River / Its source	2014
AL03160112-0304-100	Daniel Creek	R	L	Black Warrior	Tuscaloosa	Fish & Wildlife	Metals (Chromium, Lead)	Surface mining-abandoned	2002	10.42 miles	Black Warrior River / Its source	2014
AL03160112-0404-102	North River	R	H	Black Warrior	Fayette Tuscaloosa	Fish & Wildlife	Nutrients Siltation (habitat alteration)	Surface mining-abandoned	1987	43.48 miles	Lake Tuscaloosa / Ellis Creek	2009
AL03160113-0703-100	Cottonwood Creek	R	L	Black Warrior	Hale Marengo Perry	Fish & Wildlife	Organic Enrichment (CBOD, NBOD) Siltation (habitat alteration) Nutrients	Municipal Pasture grazing	2002	11.42 miles	Big Prarie Creek / Its source	2014
AL03150202-0503-102	Cahaba River	R	H	Cahaba	Bibb	Outstanding Alabama Water Swimming	Siltation (habitat alteration)	Municipal Urban runoff/storm sewers Land development	1990 1992 1993 2002-04	10.58 miles	Alabama Highway 82 / lower Little Cahaba River	2008
AL03150202-0405-100	Cahaba River	R	H	Cahaba	Bibb	Outstanding Alabama Water Fish & Wildlife	Siltation (habitat alteration)	Municipal Urban runoff/storm sewer Land development	1990 1992 1993 2002-04	13.51 miles	lower Little Cahaba River / Shades Creek	2008
AL03150202-0203-101	Cahaba River	R	H	Cahaba	Shelby	Outstanding Alabama Water Fish & Wildlife	Siltation (habitat alteration) Pathogens	Municipal Urban runoff/storm sewers Land development	1993-97 2002-04	23.61 miles	Shades Creek / Shelby County Road 52	2008
AL03150202-0203-102	Cahaba River	R	H	Cahaba	Shelby	Fish & Wildlife	Siltation (habitat alteration) Pathogens	Municipal Urban runoff/storm sewers Land development	1993-97 2002-04	3.62 miles	Shelby County Road 52 / Buck Creek	2008
AL03150202-0201-101	Cahaba River	R	H	Cahaba	Jefferson Shelby	Fish & Wildlife	Siltation (habitat alteration)	Urban runoff/storm sewers Municipal	1993 2002-04	17.46 miles	Buck Creek / Dam near US Highway 280	2008
AL03150202-0201-102	Cahaba River	R	H	Cahaba	Jefferson	Outstanding Alabama Water Public Water Supply	Siltation (habitat alteration)	Urban runoff/storm sewers	1993 2002-04	13.45 miles	Dam near US Highway 280 / Grant's Mill Road	2008
AL03150202-0104-102	Cahaba River	R	H	Cahaba	Jefferson St. Clair	Fish & Wildlife	Siltation (habitat alteration)	Urban runoff/storm sewers	1993 2002-04	21.11 miles	Grant's Mill Road / US Highway 11	2008
AL03150202-0101-102	Cahaba River	R	H	Cahaba	Jefferson	Outstanding Alabama Water Fish & Wildlife	Siltation (habitat alteration)	Urban runoff/storm sewers	1993 2002-04	3.13 miles	US Highway 11 / I-59	2008
AL03150202-0103-300	Lee Branch	R	H	Cahaba	Shelby	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1996-99	2.87 miles	Lake Purdy / Its source	2009
AL03150202-0202-101	Buck Creek	R	L	Cahaba	Shelby	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2003	2.92 miles	Cahaba River / Cahaba Valley Creek	2009
AL03150202-0202-401	Cahaba Valley Creek	R	L	Cahaba	Shelby	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1999-00	4.67 miles	Buck Creek / US Highway 31	2009
AL03150202-0901-100	Childers Creek	R	L	Cahaba	Dallas	Fish & Wildlife	Siltation (habitat alteration)	Pasture grazing	2002	18.79 miles	Cahaba River / Its source	2014
AL03130003-0101-100	Mill Creek	R	L	Chattahoochee	Lee Russell	Fish & Wildlife	Unknown	Unknown source	1999	9.93 miles	Chattahoochee River / Its source	2010
AL03130003-1307-100	Barbour Creek	R	H	Chattahoochee	Barbour	Fish & Wildlife	Siltation (habitat alteration)	Agriculture	1987	27.23 miles	Chattahoochee River / Its source	2009
AL03130004-0601-500	Cedar Creek	R	L	Chattahoochee	Henry Houston	Fish & Wildlife	Metals (Mercury)	Atmospheric Deposition	2006	4.04 miles	Omusee Creek / Its source	2016
AL03130012-0201-400	Cypress Creek	R	M	Chipola	Houston	Fish & Wildlife	Nutrients Organic Enrichment (CBOD, NBOD)	Municipal Urban runoff/storm sewers	1984 1986	8.11 miles	Limestone Creek / Its source	2008
AL03140201-0404-100	Judy Creek	R	L	Choctawhatchee	Barbour Dale	Fish & Wildlife	Nutrients	Unknown source	1998, 1999	23.64 miles	West Fork Choctawhatchee River / Its source	2010
AL03140201-0502-100	Hurricane Creek	R	H	Choctawhatchee	Dale	Fish & Wildlife	Pathogens	Agriculture Municipal Urban runoff/storm sewers	1991	9.39 miles	Choctawhatchee River / Its source	2008
AL03140201-0602-201	Beaver Creek	R	H	Choctawhatchee	Houston	Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers	1977-86	2.09 miles	Newton Creek / Dothan WWTP	2008
AL03140201-0602-201	Beaver Creek	R	H	Choctawhatchee	Houston	Fish & Wildlife	Organic Enrichment (CBOD, NBOD)	Municipal Urban runoff/storm sewers	1977-86	2.09 miles	Newton Creek / Dothan WWTP	2009

Water Quality Assessment
Proposed Helena Bypass
Helena, Shelby County, Alabama
Project No.: 06BHSOL0201E

Prepared for:
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1.0 PURPOSE

The purpose of this assessment was to establish the ambient conditions of the streams located within the proposed Helena Bypass corridor study area. Based on our August 15, 2006 proposal (Proposal No. 06E-0348R), Gallet & Associates, Inc. (Gallet) pursued the following scope of work for this project:

- Performed a review of published information on site area geology and hydrology, using Alabama Geological Survey and U.S. Geological Survey (USGS) publications.

- Consulted with state and/or local agencies responsible for water quality in the study area.

- Assessed ambient conditions of streams with the potential to be impacted by either of the two proposed corridors. This involved the collection of field parameters including pH, temperature, dissolved oxygen, specific conductance (dissolved solids), oxidation-reduction potential, and turbidity (suspended solids). Surface water and sediment samples were collected for laboratory analysis of selected chemical constituents based on a review of relevant literature and conditions observed in the field area. The sampling strategy included two sampling events which characterized ambient water quality under both base flow (low flow) and stormwater runoff conditions in each of these streams.

- Identified locations where roadway runoff or other non-point sources pollution may have an adverse impact on sensitive water resources (e.g., water supply reservoirs, ground water recharge areas, and high quality streams).

- Identified potential impacts to principal or sole-source aquifers and wellhead protection areas where present.

2.0 STUDY AREA LOCATION AND DESCRIPTION

The study area is located north of downtown Helena and to the east-southeast of the Cahaba River. The study area is depicted on the USGS 7.5-minute Topographic Quadrangle *Helena, Alabama*, dated 1959, photoinspected in 1986 and photorevised in 1988. The area is located in portions of Sections 2, 3, 9, 10, 11, 15, 16, and 21, Township 20 South, Range 3 West. A location map depicting the study area boundaries and two proposed alternative bypass routes (Alternates I and II) is included as Figure 1.

The study area comprises approximately 1,680 acres of predominantly undeveloped, wooded land. Vulcan Materials operates an approximately 330-acre quarry, with approximately 235 acres occupying the northeastern part of the study area. An approximately 65-acre City of Helena recreation park, including ball fields, occupies a part of the study area along its southern boundary adjacent to the north bank of Buck Creek. Single-family residential development is present along the eastern study area boundary, primarily along County Road 261. Additionally, several power easements extend through the study area, along with two active railroads and an abandoned railroad.

Topography for the majority of the study area is moderately to steeply sloping, with gently to moderately sloping topography in the northeast part of the study area. Buck Creek, the primary stream of the study area, intersects the south-central part of the study area, flowing in a northwesterly direction towards its confluence with the Cahaba River, located approximately 1,000 feet to the north-northwest of the study area. Several unnamed tributaries of Buck Creek and the Cahaba River also originate in the study area or flow through the study area.

2.1 Surface Waters

For the purpose of this assessment, Gallet assigned a numerical identification (1-10) to streams flowing through the study area (Figure 2). Ephemeral streams (i.e., those flowing only during rainfall events or shortly after) were not included in this assessment.

Stream 1 is a first-order stream that discharges directly into Buck Creek. The stream order is a measure of the degree of stream branching within a watershed. Each length of stream is indicated by its order (for example, first-order, second-order, etc.). A first-order stream is an unbranched tributary, a second-order stream is a tributary formed by two or more first-order streams. A third-order stream is a tributary formed by two or more second-order streams and so on. Stream 1 is depicted as a perennial flow (i.e., flowing year-round under normal conditions) on the *Helena, Alabama* topographic quadrangle. However, based on field observations, Stream 1 most likely functions as an intermittently flowing tributary in the northern portion of the study area and converts to an ephemeral flow closer to Buck Creek. The upper reach of this stream has been impacted through agricultural land use and quarrying. Approximately 2,385 linear feet of the stream within the study area has been re-directed and straightened. Due to apparent dewatering from the adjacent quarry, the majority of the re-directed stream bank is often dry.

Streams 2 through 4 are first-order intermittent streams that originate within the study area and discharge into a second order tributary of the Cahaba River. Stream 5 is a first-order stream that appears to have a perennial flow, discharging directly into Buck Creek. The headwaters of Stream 5 have been impacted by the Vulcan Materials quarry through excavation and fill activity, which has resulted in approximately 2,000 feet of headwaters being apparently relocated and/or piped. Streams 6 through 10 are first-order intermittent streams that originate within the study area and discharge directly into Buck Creek. Buck

Creek appears to be a third-order creek with perennial flow, and discharges into the Cahaba River.

Buck Creek (partially within the study area) and the Cahaba River (located to the west of the study area) are both included on the Alabama Department of Environmental Management (ADEM) Draft 2006 §303(d) List (Appendix B) of State Impaired Waters. The 303(d) list includes state water bodies that are too polluted or otherwise degraded to support their designated and existing uses (e.g., drinking water, swimming, recreation, and fishing). According to the ADEM list, Buck Creek, extending from Cahaba Valley Creek to the Cahaba River, is degraded by the presence of pathogens from urban runoff and storm sewers. Pathogens are classified as microorganisms that can cause disease in humans and animals.

Several segments of the Cahaba River are included on the 303(d) list. However, segments potentially affected by the study area include a segment extending from County Road 52 (1.2 miles to the southwest of the study area) to Buck Creek and a second segment extending from Buck Creek to the dam near U.S. Highway 280 (9.5 miles to the northeast of the study area). The first segment is included on the list due to nutrient loading, siltation, pathogens, and other habitat alterations from municipal discharges, urban runoff, storm sewer discharge, and land development. The second segment is included on the list due to nutrient loading and siltation from municipal discharges, urban runoff, and storm sewer discharge. Nutrient loading is classified as substances assimilated by living things that promote growth. Nitrogen and phosphorus are the two major nutrients of concern. Siltation is classified as excessive amounts of sediment, which degrade the habitat of aquatic organisms and interfere with the stream's aquatic community. Other habitat alterations are classified as aquatic organism habitat alteration as a result of stream channel modification (channelization) or changes in the stream's hydrograph (i.e., greater peak flows or extended low-flow periods).

For all impaired waters included on the 303(d) lists, ADEM has or will assign total maximum daily loads (TMDLs) for the impairment causes (e.g., siltation, nutrients, pathogens, etc.). According to the Draft 2006 §303(d) List, pathogen TMDLs for Buck Creek will not be defined until 2009. Mr. Chris Goodman of the ADEM Water Division confirmed by telephone that only nutrient and pathogen TMDLs for the Cahaba River segments have been defined. TMDLs for siltation are in draft form to the EPA and ADEM is awaiting comments from EPA. Mr. Goodman indicated that non-defined TMDLs for Buck Creek and the Cahaba River segments, including other non-listed stream impairment causes, would currently default to background levels. Mr. Goodman did indicate that the proposed Helena Bypass project should not affect Buck Creek or the adjacent segments of the Cahaba River with regards to pathogens or nutrient loading.

3.0 GEOLOGIC AND HYDROLOGIC SETTING

3.1 Geology

According to the Geologic Survey of Alabama *Geology of the Helena 7.5-minute Quadrangle, Jefferson and Shelby Counties, Alabama*, issued 1996, the study area lies within the Valley and Ridge Physiographic Province (western part) and is underlain primarily by the Pennsylvanian-aged Pottsville Formation, undifferentiated. The eastern part of the study area is underlain by bands of the Cambrian-aged Ketona Dolomite and Brierfield Dolomite, northeast striking.

The Pottsville Formation consists of dark-gray silty shale containing intervals of light- to medium-gray lithic sandstone and interbeds of coal and underclay, with predominantly dark-gray shale between lower quartzose sandstone members. The Ketona Dolomite consists of light- to dark-gray chert-free dolomite. The Brierfield Dolomite consists of medium- to medium-dark-gray dolomite containing chert nodules and stringers, and cavernous chert.

4.0 HYDROGEOLOGY

According to the USGS *Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama, Area 4*, issued 1989, the study area is located in the Cahaba Valley and Cahaba Ridges Physiographic Districts of the Valley and Ridge Physiographic Province. Geologic formations for Area 4 can be grouped into two major aquifers, the Knox-Shady and the Tuscumbia-Fort Payne. The complex geologic structure (primarily thrust faulting from the southeast) for Area 4 has disrupted the regional continuity of the formations so that individual aquifers are associated with major valleys and the same major aquifer type may be present in adjacent valleys but the aquifer not be hydraulically connected.

Aquifers coincide with the physiographic districts they are located in and tapped within their outcrop areas, where they are also recharged. Highest yields from aquifers in Area 4 are associated with solution openings in carbonate rocks. Springs provide substantial amounts of water for municipal supply. The source of recharge for these major aquifers is rainfall. Average annual rainfall is about 53 inches per year, but a large part of this is lost either by direct runoff to streams immediately after a rain or evapotranspiration to the atmosphere. A relatively small part of the total rainfall infiltrates to the water table to recharge the aquifers.

All the recharge areas for Area 4 aquifers are susceptible to contamination from the surface. Two conditions exist which may cause contamination on a local scale: rock material is fractured in places due to faulting, and weathered, cherty soils tend to be

porous. Where sinkholes are present, there may be a direct connection between surface water and underlying aquifers; these areas are considered to be extremely susceptible to contamination from the surface. However, there are no mapped sinkholes in the study area. Likewise, Gallet observed no sinkholes during our study area reconnaissance.

4.1 Sole-Source Aquifer

According to the U.S. Environmental Protection Agency (EPA) website (http://www.epa.gov/), there are no sole-source aquifers documented for EPA Region 4, which covers the southeastern United States. Ms. Enid Probst of the ADEM Groundwater Division confirmed, by telephone conversation, that no sole-source aquifers are located in proximity to the study area.

4.2 Public and Private Water Wells

Based on the Geological Survey of Alabama *Water Availability, Shelby County, Alabama, issued 1980*, there are three documented water wells (M-1 through M-3) in the northeastern part of the study area along County Road 261. The wells are classified as domestic or stock-use wells. There are no public water supply, industrial, or irrigation wells documented for the study area. The City of Helena has a public water supply well (M-7) located approximately 3,000 feet to the southeast of the study area. Additionally, two public water supply wells (M-8 and M-9) for the City of Pelham and two industrial-use wells (M-5 and M-6) are located 1 to 2 miles to the east of the study area along Highway 31. Locations of documented water wells are depicted on Figure 3. According to Ms. Probst, there are no wellhead protection areas within the study area or immediately adjacent of the study area.

5.0 FIELD PARAMETERS

Field parameters were collected from six sampling points within the study area to establish ambient stream water conditions (Figure 4). These locations represented the potential stream crossings according to the proposed Helena Bypass alternates. Each site was visited twice, both before and after a single rainfall runoff event. A USGS stream gage on the Cahaba River approximately 1.2 miles southwest of the study area was used to determine when base flow conditions were present in the overall area. According to the USGS *Low-flow and Flow-duration Characteristics of Alabama Streams*, base flow conditions occur in mid September to early October. This was also evident in the historical and real time data from the gage (Figure 5).

Field parameter tests included pH, temperature, dissolved oxygen (DO), conductivity, oxidation-reduction potential (ORP), and turbidity at each sampling point. For each field parameter measurement (Sites 1 through 6), the appropriate electrode was placed in the

main current of the stream and a reading was recorded once the parameter reading stabilized. Field parameters for each site are summarized in Table 1.

Based on many scientific publications, turbidity has been found to be a suitable substitute for Total Suspended Solids (TSS) sampling in streams. Therefore, Gallet utilized turbidity parameters as a measurement for the presence of suspended solids within sampled study area streams.

6.0 SURFACE WATER AND STREAM SEDIMENT SAMPLING METHODOLOGY

Surface water and sediment samples were collected for laboratory analysis of selected chemical constituents (polynuclear aromatic hydrocarbons [PAHs] and the Priority Pollutant Metals) based on a review of relevant literature and conditions in the field area. These constituents were selected because they are the most common contaminants found in stormwater runoff from roads and can best characterize ambient conditions with respect to potential future sources of stormwater runoff. Besides being a common component of stormwater runoff, several of the priority pollutant metals are also a common component of acid mine drainage from abandoned coal mines, common throughout the region. Both water and sediment samples were collected because of the potential of each to behave as a contaminant source (urban runoff is composed of both dissolved and particulate contaminants). All samples were collected using laboratory provided containers and shipped under chain of custody via overnight courier to Analytical Environmental Services, Inc. (AES) in Atlanta, Georgia for analysis. Both surface water samples and sediment samples were collected from the center of the stream channels, with the exception of the Buck Creek samples which were collected within 5 feet of the stream bank. For the sediment samples, sediment was collected within the top 10 inches of the stream beds and water was decanted from the laboratory provided containers. Copies of the Chain-of-Custody forms are attached (Appendix A). A description of stream conditions at each sampling point is provided below. Photographs of the sampling points are included as Figure 6.

Site 1 was selected as a representative of Stream 1 crossings by both bypass Alternate I and Alternate II. Stream conditions observed at the sample point (adjacent north of County Road 261) consisted of an approximately 3 foot wide channel, with 1-2 foot slightly sloped banks. Stream channel substrate consisted of sand, gravel, and silt. For both sampling events, water levels in the channel ranged from ½-inch to 3 inches in depth. Water clarity was good prior to rainfall and moderate after rainfall. Water velocity was low prior to rainfall and moderate after rainfall. Based on additional site visits, no flow is evident during extended periods of no to little rainfall.

Site 2 stream conditions consisted of an approximately 2 foot wide channel, with 2 foot moderately sloped banks. The stream channel substrate in this area consisted primarily of

rock and clay, with some silt and sand deposits. Water velocity for this stream was high during both sampling events. Water clarity was good prior to rainfall and moderate after rainfall.

Site 3 stream conditions consisted of an approximately 4 foot wide channel, with 3 foot moderately sloped banks. The stream channel substrate in this area consisted primarily of sand and silt, with cobbles. Water velocity for this stream was low during the before rainfall sampling event and moderate for the after rainfall sampling event. Water clarity was good prior to rainfall and moderate after rainfall.

Site 4 was chosen for Buck Creek as a representative of stream conditions within a developed area. Stream conditions at the sampling point consisted of an approximately 40 foot wide channel, with 4-5 foot moderately sloped banks. The stream channel substrate in the sample area consisted primarily of sand and gravel, with cobbles. Water velocity for this stream was high during both sampling events. Water clarity was moderate to low for both sampling events. Stream conditions at the proposed crossing for Alternate I are similar to those observed at the sampling point; however, the channel width is less (approximately 20 feet), the stream banks are taller (3-6 feet) and steeply sloped, and the water clarity is moderate.

Site 5 stream conditions consisted of an approximately 5 foot wide channel, with 2 foot steeply sloped banks. The stream channel substrate in this area consisted primarily of sand and clay, with silt/sand bars and cobbles. Water velocity for this stream was low during the before rainfall sampling event and moderate for the after rainfall sampling event. Water clarity was moderate for both sampling events.

Site 6 stream conditions consisted of an approximately 2 foot wide channel, with 1 foot moderately sloped banks. The stream channel substrate in this area consisted primarily of clay, with silt/sand deposits and cobbles. Water velocity for this stream was low during the before rainfall sampling event and moderate for the after rainfall sampling event. Water clarity was good prior to rainfall and moderate after rainfall.

7.0 SURFACE WATER AND STREAM SEDIMENT DATA RESULTS

7.1 Surface Water Field Parameter Results

Surface water field parameter and analytical results are included in Table 1. The majority of the sampling sites contain slightly alkaline surface water (pH >7.0) which is expected for the area. Sampling sites 3 and 4 contained acidic (3.8) to moderately acid (5.23) water, respectively, prior to the rain event. The acidic water present at Site 3 may be attributable to the presence of former coal mining in the drainage area. The pH of water following the rainfall event at these locations was recorded as slightly alkaline.

Temperature of the surface water ranged from 21.2 degrees Celsius (°C) to 26.3°C prior to the rain event and from 21.5°C to 24.3°C after. All but Site 5 showed a decrease in temperature following the rain event which is to be expected. The increase in temperature at Site 5 (21.2°C to 21.5°C) is considered minimal.

Dissolved oxygen levels in the surface water ranged from 2.60 mg/L to 8.25 mg/L prior to the rainfall event. As expected, the DO levels increased in the surface water at all sampling sites, except Site 6. The DO levels at Site 6, after the rainfall event, appear to be an anomaly.

The specific conductance, which generally indicates the relative concentration of dissolved solids, ranged from 51 microSiemens/centimeter (µs/cm) to 740 µs/cm prior to the rain event. The specific conductance following the rain event ranged from 30 µs/cm to 743 µs/cm. For sites 5 and 6, the specific conductance was an order of magnitude below the other four sites. This is likely due to the fact that these sampling sites are located in wooded areas.

Oxidation-reduction potential measured prior to the rainfall event ranged from -224 millivolts (mV) to 300 mV. Where ORP is negative, surface water is considered reducing, indicating substantial bacterial decomposition. Where ORP is positive, surface water is considered oxidizing, and bacterial degradation is minimal or is not occurring. We note that ORP is a qualitative indicator, and should not be used for precise calculations of bacterial degradation. Reducing or near reducing conditions were observed in the surface water at Site 2 and Site 3. The data collected after the rainfall indicated oxidizing conditions at all sampling sites.

Turbidity is a measure of the amount of total suspended solids present in the surface water. Turbidity measurements prior to the rainfall event ranged from 1.02 to 170 nephelometric turbidity units (NTUs). At sampling Site 2 and Site 6, turbidity was measured at a lower level following the rainfall event which is not the expected trend.

7.2 Surface Water Analytical Results

Surface water analytical results are included in Table 2. For purposes of comparison of analytical results, the EPA drinking water Maximum Contaminant Levels (MCLs) are presented for the thirteen Priority Pollutant Metals. Where an MCL was not established, the EPA Secondary Drinking Water Standard was used.

Based on the analytical report provided by AES (Appendix B), PAHs were below laboratory reporting limits for all surface water samples.

Metals were detected in surface water samples collected from Sites 4, 5, and 6 at concentrations below their respective MCLs. The metals detected at Sites 4, 5, and 6 and included copper (Cu), lead (Pb), and zinc (Zn). Site 5 exhibited a slight increase in Cu concentration with the onset of the runoff event, from <10 µg/L to 11.9 µg/L, with no

other constituents detected. Site 4 exhibited a decrease in Cu concentration from 25.9 µg/L to 14.9 µg/L, with no other constituents detected. Site 6 exhibited decreases in Cu from 18.9 µg/L to 10.5 µg/L, Pb from 14.8 µg/L to <10 µg/L, and Zn µg/L from 39.3 µg/L to <20 µg/L, with no other constituents detected.

7.3 Sediment Analytical Results

Stream sediment analytical results are included in Table 3. Based on the analytical report provided by AES (Appendix C), PAHs were below laboratory reporting limits for all stream sediment samples except at Site 4. Sediment at Site 4 prior to the rainfall event contained low levels of five PAH constituents that were detected slightly above the laboratory detection limit.

Metals were detected in every sediment sample collected during this assessment. The metals and concentrations detected are generally consistent with values that could be expected in this geologic context. Metals detected included arsenic (As), chromium (Cr), Cu, Pb, nickel (Ni), and Zn. Based on our experience with the chemical makeup of soils and sediments in the central Alabama area, these constituent concentrations are within typical ranges. Additionally, the differences between the before and after rainfall sediment samples are minimal and likely due to sample heterogeneity.

8.0 ROADWAY RUNOFF AND NON-POINT SOURCE POLLUTION

As part of this Water Quality Assessment, Gallet assessed the potential for roadway runoff or other non-point sources pollution from both Alternate I and II, which may have an adverse impact on sensitive water resources such as water supply reservoirs, ground water recharge areas, and high quality streams. Based on our assessment and the information provided in this report, the proposed bypass routes should have no impact on water supply reservoirs or groundwater recharge areas. Gallet has identified no high quality streams within or in proximity to the study area. It is the opinion of Gallet potential impacts to streams within the study area should be limited to surface water runoff and stream sediment loading common to any land clearing and development in regions with moderate to steep topographic relief and fine particulate clay-containing soils such as is present in the study area.

Gallet also contacted Mr. Corey Clifton of the Alabama Department of Transportation (ALDOT) Design Bureau, Environmental Technical Section regarding the potential for roadway runoff or other non-point sources pollution from the proposed Helena Bypass project. Based on provided preliminary information from this report, Mr. Clifton indicated no further assessment of potential water quality impacts would be required at this time so long as Best Management Practices (BMPs) recommend in a United States Fish and Wildlife Service (USFWS) letter to Solid Civil Design, dated February 28,

2006, were implemented during and after the completion of the bypass project. The USFWS BMP recommendations are as follows:

- Inspect erosion controls routinely, especially during and immediately following significant rain events, to insure no impacts to nearby surface waters and aquatic habitat.

- Take immediate corrective action if erosion or sedimentation is observed.

- Maintain vegetated buffers (preferably 100 feet or greater) adjacent to any ditches or drainages.

- Immediately re-vegetate disturbed areas with a native species or an annual grass.

- Limit exposed dirt to 5 acres, where practicable, with rapid re-vegetation of rights-of-ways upon completion of each phase.

- Execute any work that results in exposed earth during periods when significant rainfall is not predicted.

- Use pervious shoulder materials to allow infiltration along highway portions and implement a monitoring plan to evaluate any increase in turbidity or sedimentation rates in stream adjacent to construction areas.

9.0 CONCLUSIONS

Based on the research and fieldwork as described in this report, Gallet concludes the following:

- Most of the streams in the study area are small and/or intermittent, with the exception of Buck Creek. Ambient water quality in the study area indicates minimal impairment with respect to the most common contaminants found in urban runoff (PAHs and metals). It is well documented, however, that the main channels of the Cahaba River and Buck Creek have persistent water quality impairments.

- Stream sediment composition is interpreted to largely reflect the geologic setting (natural levels); however, additional loading of metals via stormwater runoff may lead to water quality impairments in excess of regulatory limits since some constituents, especially As and Pb, are naturally elevated to start.

- TMDLs for the 303(d) listed streams segments within and in close proximity to the study area are not likely to be exceeded by the proposed Helena Bypass

project so long as appropriate BMP design is implemented during and after construction of either alternate.

Urbanization in any watershed affects the stream's rainfall-runoff curve in such a way as to increase the peak flow following rainfall events but shorten the duration of peak flow. As rainfall encounters impervious surfaces and is directed to streams as runoff, it bypasses the groundwater system and reaches the streams more quickly. This alteration of watershed function can lead to degraded water quality via rapid transport. For this reason, BMPs for stormwater emphasize interception, retention, and facilitated infiltration of runoff. BMPs that follow this model will be the most effective at preventing particulates from entering waterways and attenuate dissolved contaminants before the water enters the waterway. So long as the USFWS-specified BMPs are implemented and monitored for either bypass alternate, the proposed bypass project should have minimal impact on study area water quality.

10.0 INFORMATION SOURCES

1. USGS, 7.5-minute topographic quadrangle *Helena, Alabama,* dated 1959, photoinspected in 1986 and photorevised in 1988.

2. USGS, *Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama, Area 4,* issued 1989.

3. Alabama Department of Environmental Management (ADEM), Draft 2006 303(d) list of state impaired waters.

4. Geologic Survey of Alabama, *Geology of the Helena 7.5-minute Quadrangle, Jefferson and Shelby Counties, Alabama*, issued 1996.

5. U.S. Environmental Protection Agency (EPA) website (http://www.epa.gov/).

6. Telephone interview with Mr. Chris Goodman of the ADEM Water Division.

7. Telephone interview with Ms. Enid Probst of the ADEM Groundwater Division.

8. Geological Survey of Alabama, *Water Availability, Shelby County, Alabama, issued 1980*.

9. United States Geological Survey, *Low-flow and Flow-duration Characteristics of Alabama Streams*, 1994.

10. *Stormwater Effects Handbook* by Burton and Pitt, Lewis Publishers, 2002.

11. *Introduction to Geochemistry* by Krauskopf and Bird, McGraw-Hill, Inc., 1995.

12. Telephone interview with Mr. Corey Clifton of the ALDOT-Design Bureau, Environmental Technical Section.

Table 1
Field Parameters and Turbidity
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Location	Date	Time	pH (Std Units)	Temp (° Cel)	DO (mg/L)	Cond. (µS/cm)	ORP (mV)	Turbidity (NTUs)
Site 1	9/11/2006	1400	7.80	26.3	2.60	710	258	2.88
Site 1	9/13/2006	1005	7.24	24.3	6.02	617	245	12.6
Site 2	9/11/2006	1440	7.10	23.7	6.10	740	-224	3.88
Site 2	9/13/2006	1024	7.90	22.1	10.72	743	187	1.58
Site 3	9/11/2006	1535	3.80	23.2	6.62	706	7	2.20
Site 3	9/13/2006	1150	7.56	22.5	9.49	228	193	12.0
Site 4	9/11/2006	1610	5.23	26.0	8.25	568	109	1.02
Site 4	9/13/2006	1230	7.60	24.2	11.18	323	216	33.8
Site 5	9/12/2006	1130	7.45	21.2	3.89	82	300	17.2
Site 5	9/13/2006	1545	7.46	21.5	4.71	30	180	54.4
Site 6	9/12/2006	1330	7.01	21.2	5.69	51	230	170
Site 6	9/13/2006	1620	7.23	22.2	2.47	97	157	8.51

Notes:
° Cel - Degrees Celcius
mg/L - Milligrams per liter
µS/cm - MicroSiemens per centimeter
mV - Millivolts
NTUs - Nephelometric turbidity units
9/11/06 and 9/12/06 - Before rain event
9/13/06 - After rain event

Table 2
Surface Water Analytical Data
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Location		Site 1	Site 1	Site 2	Site 2	Site 3	Site 3	Site 4	Site 4	Site 5	Site 5	Site 6	Site 6
Sample ID		SW-1	SW-8	SW-2	SW-9	SW-3	SW-10	SW-4	SW-11	SW-5	SW-12	SW-6	SW-13
Date		9/11/2006	9/13/2006	9/11/2006	9/13/2006	9/11/2006	9/13/2006	9/11/2006	9/13/2006	9/12/2006	9/13/2006	9/12/2006	9/13/2006
Priority Pollutant Metals:	MCL (ug/L):												
Antimony	6	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
Arsenic	10	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Beryllium	4	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Cadmium	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chromium	100	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Copper	1300	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	**25.9**	**14.9**	<10.0	**11.9**	**18.9**	**10.5**
Lead	15	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	**14.8**	<10.0
Nickel	NL	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
Selenium	50	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
Silver	100*	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Thallium	2	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
Zinc	5000*	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	**39.3**	<20.0
Mercury	2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
PAHs:													
Naphthalene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Acenaphthylene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
1-Methylnaphthalene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
2-Methylnaphthalene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Acenaphthene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Fluorene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Phenanthrene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Anthracene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Fluoranthene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Pyrene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Benz(a)anthracene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Chrysene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Benzo(b)fluoranthene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Benzo(k)fluoranthene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Benzo(a)pyrene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Dibenz(a,h)anthracene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Benzo(g,h,i)perylene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene		<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10

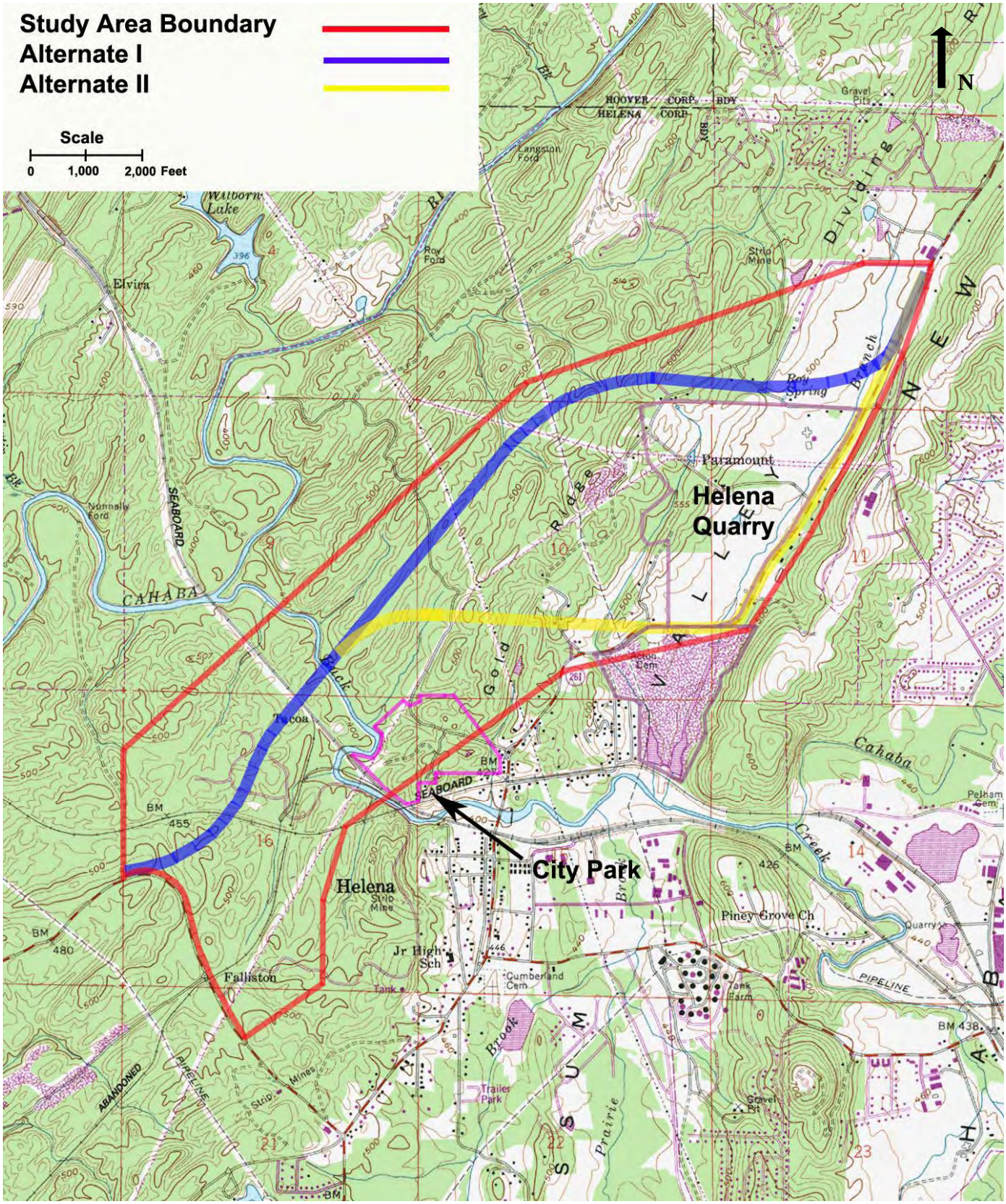
Notes:
All values reported in micrograms per liter (µg/L)
PAHs - Polynuclear aromatic hydrocarbons
NA - Not Analyzed due to sample being lost at the analytical laboratory
MCL - Maximum Contaminant Level for drinking water established by the EPA
** - National Secondary Drinking Water Standard used in the absence of an MCL*
NL - Not Listed, the constituent does not have a ***Bold Font*** *- Values reported above laboratory detection limits*

9/11/06 and 9/12/06 - Before rain event *9/13/06 - After rain event*

Table 3
Sediment Analytical Data
Water Quality Assessment
Proposed Helena Bypass
Helena, Shelby County, Alabama
Project No.: 06BHSOL0201E

Location	Site 1	Site 1	Site 2	Site 2	Site 3	Site 3	Site 4	Site 4	Site 5	Site 5	Site 6	Site 6
Sample ID	SS-1	SS-8	SS-2	SS-9	SS-3	SS-10	SS-4	SS-11	SS-5	SS-12	SS-6	SS-13
Date	9/11/2006	9/13/2006	9/11/2006	9/13/2006	9/11/2006	9/13/2006	9/11/2006	9/13/2006	9/12/2006	9/13/2006	9/12/2006	9/13/2006
Priority Pollutant Metals (mg/kg):												
Antimony	<4.73	<4.66	<4.72	<4.60	<4.95	<4.71	<4.98	<4.68	<4.80	<5.00	<4.75	<4.87
Arsenic	**13**	**19.5**	**13.3**	<4.60	<4.95	<4.71	**9.64**	**5.43**	**7.01**	**19.6**	<4.75	**7.05**
Beryllium	<2.36	<2.33	<2.36	<2.30	<2.48	<2.35	<2.49	<2.34	<2.40	<2.50	<2.37	<2.43
Cadmium	<2.36	<2.33	<2.36	<2.30	<2.48	<2.35	<2.49	<2.34	<2.40	<2.50	<2.37	<2.43
Chromium	**22.1**	**32.0**	**25.6**	**6.89**	**8.42**	**8.00**	**27.2**	**24.2**	**8.00**	**18.7**	**5.08**	**11.3**
Copper	**5.61**	**6.59**	**14.5**	**8.02**	**12.8**	**11.1**	**11.3**	**7.53**	**16.0**	**17.5**	**4.93**	**10.6**
Lead	**11.5**	**13.5**	**15.9**	**7.91**	**9.34**	**9.20**	**8.54**	**7.55**	**8.40**	**13.9**	**5.49**	**10.2**
Nickel	<4.73	<4.66	**7.30**	<4.60	<4.95	<4.71	<4.98	<4.68	**7.25**	**11.9**	<4.75	**8.71**
Selenium	<4.73	<4.66	<4.72	<4.60	<4.95	<4.71	<4.98	<4.68	<4.80	<5.00	<4.75	<4.87
Silver	<2.36	<2.33	<2.36	<2.30	<2.48	<2.35	<2.49	<2.34	<2.40	<2.50	<2.37	<2.43
Thallium	<4.73	<4.66	<4.72	<4.60	<4.95	<4.71	<4.98	<4.68	<4.80	<5.00	<4.75	<4.87
Zinc	**11.8**	**14.5**	**32.3**	**18.4**	**27.7**	**24.3**	**35.3**	**24.5**	**32.4**	**40.5**	**19.6**	**41.8**
Mercury	<0.100	<0.0996	<0.0998	<0.0998	<0.0998	<0.100	<0.0996	<0.100	<0.0998	<0.100	<0.0994	<0.0998
PAHs (ug/kg):												
Naphthalene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Acenaphthylene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
1-Methylnaphthalene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
2-Methylnaphthalene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Acenaphthene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Fluorene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Phenanthrene	<330	<330	<330	<330	<330	<330	**340**	<330	<330	<330	<330	<330
Anthracene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Fluoranthene	<330	<330	<330	<330	<330	<330	**890**	<330	<330	<330	<330	<330
Pyrene	<330	<330	<330	<330	<330	<330	**770**	<330	<330	<330	<330	<330
Benz(a)anthracene	<330	<330	<330	<330	<330	<330	**390**	<330	<330	<330	<330	<330
Chrysene	<330	<330	<330	<330	<330	<330	**390**	<330	<330	<330	<330	<330
Benzo(b)fluoranthene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Benzo(k)fluoranthene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Benzo(a)pyrene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Dibenz(a,h)anthracene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Benzo(g,h,i)perylene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
Indeno(1,2,3-cd)pyrene	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330

Notes:
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
PAHs - Polynuclear aromatic hydrocarbons
9/11/06 and 9/12/06 - Before rain eve 9/13/06 - After rain event



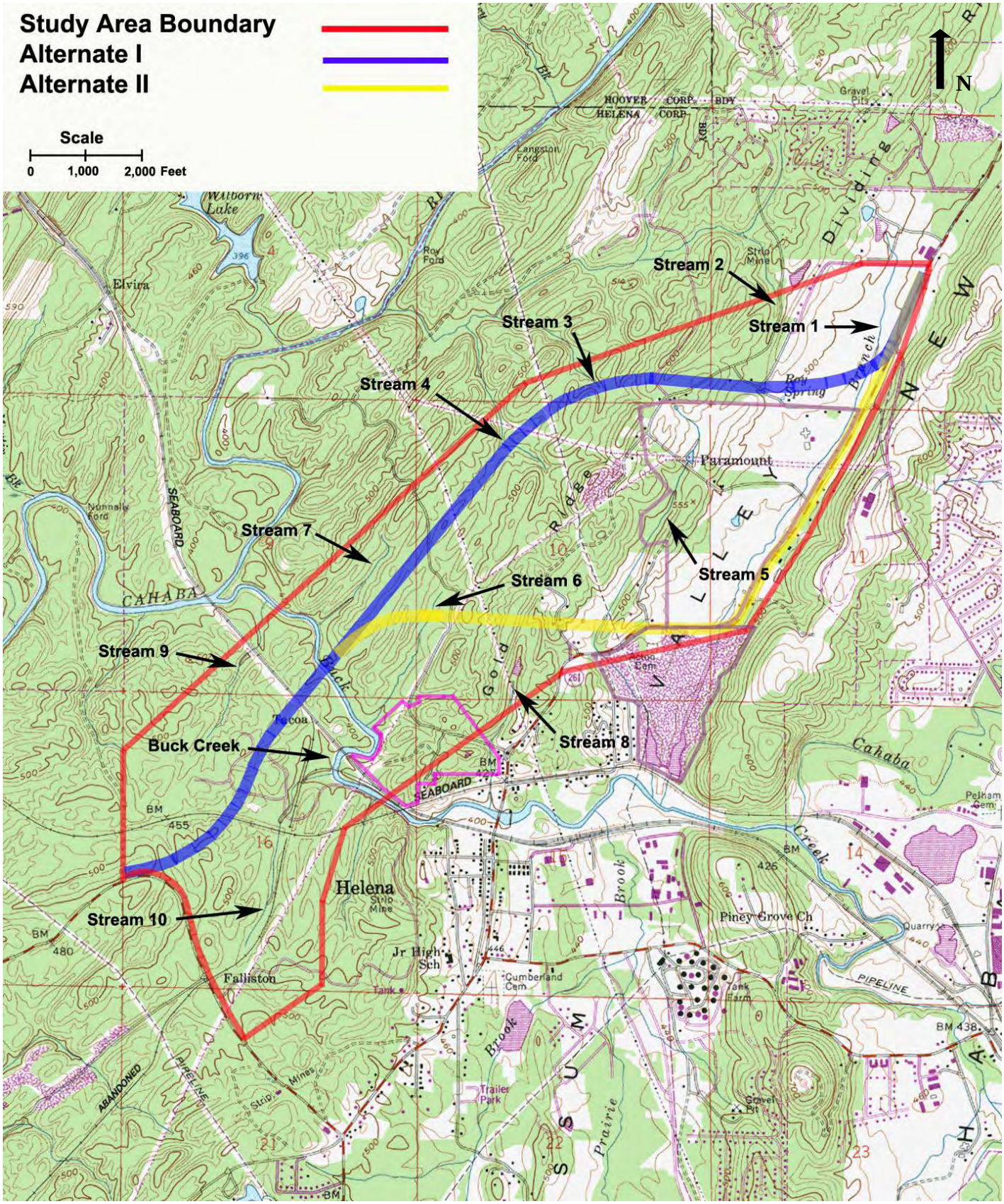
Gallet & ASSOCIATES

PROJECT

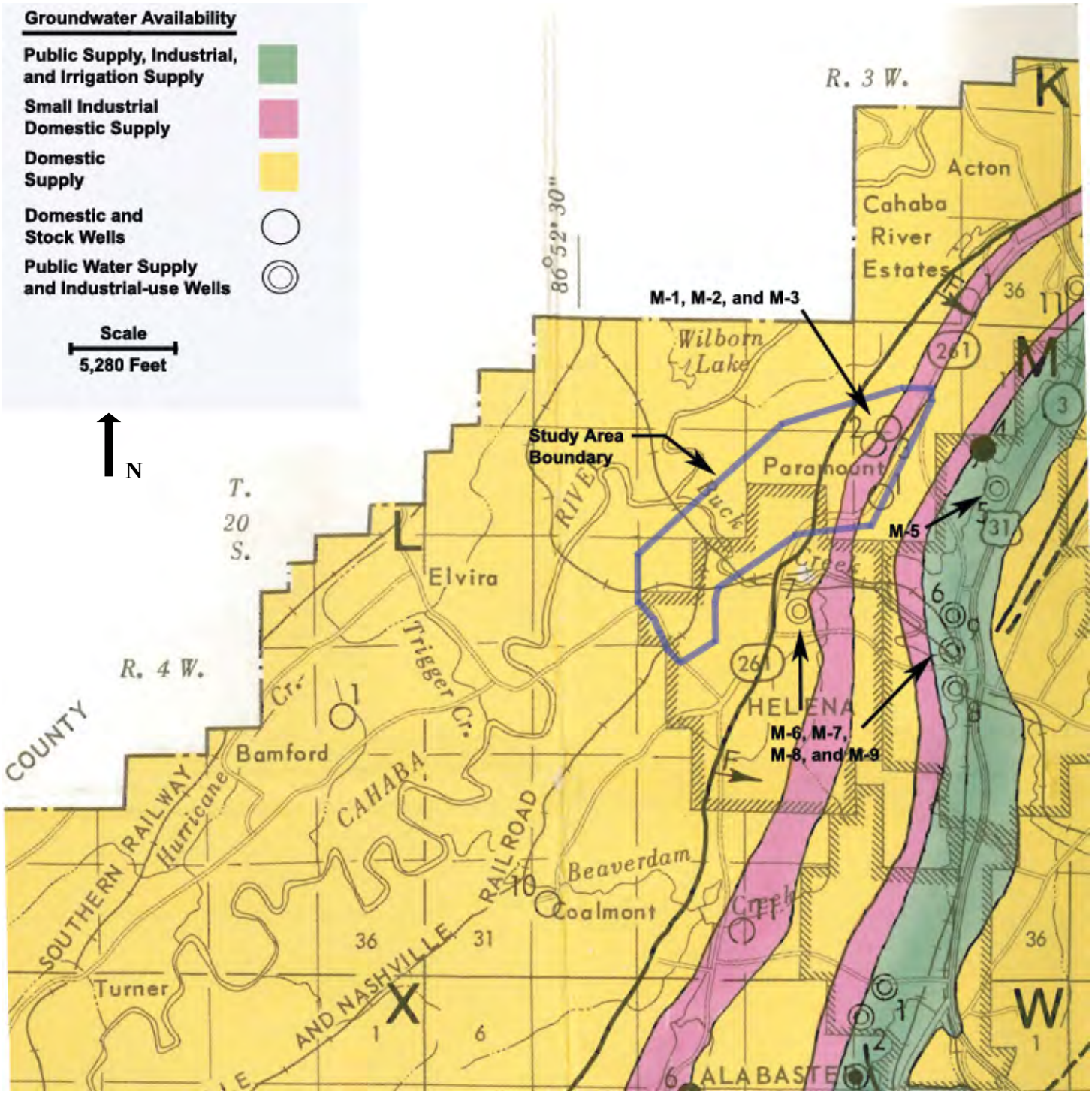
WATER QUALITY ASSESSMENT
PROPOSED HELENA BYPASS
HELENA, SHELBY COUNTY, ALABAMA
PROJECT NO.: 06BHSOL0201E

FIGURE 1

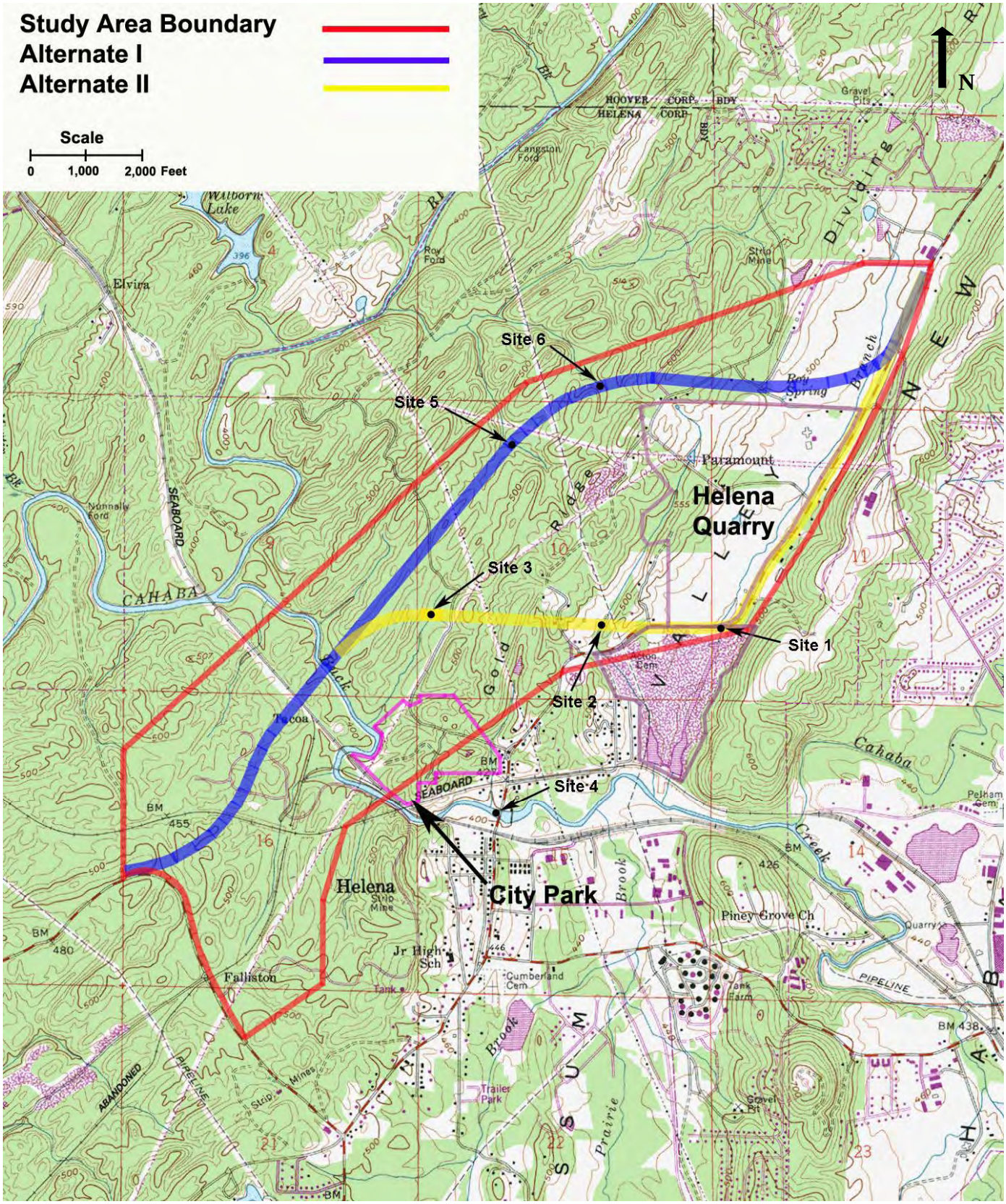
SITE LOCATION MAP
USGS 7.5-MINUTE TOPOGRAPHIC QUADRANGLE
HELENA, ALABAMA, DATED 1959, PHOTOREVISED 1986, PHOTOINSPECTED 1988



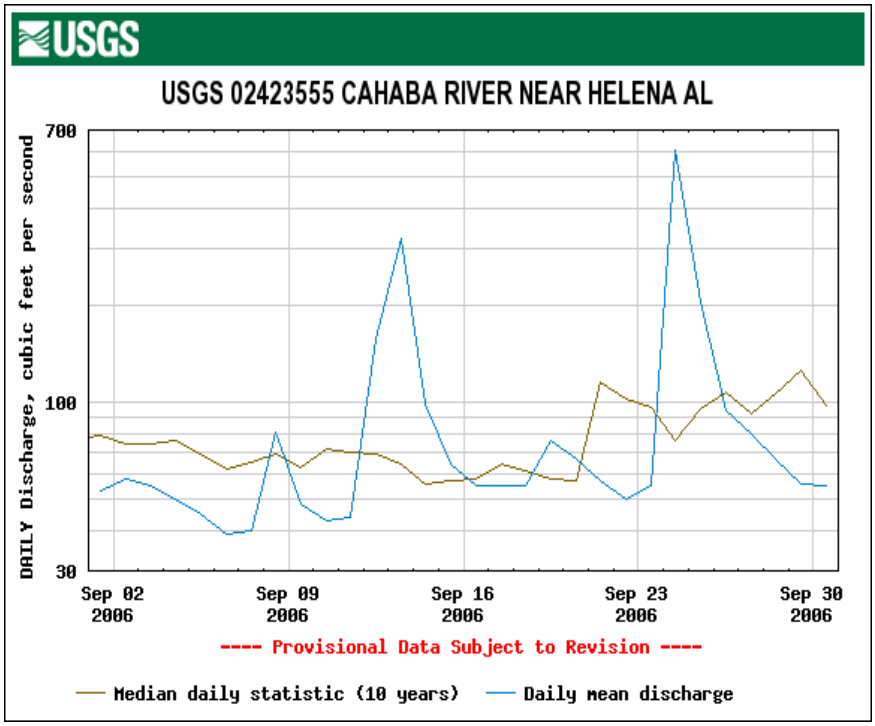
Gallet & Associates	**PROJECT** **WATER QUALITY ASSESSMENT** **PROPOSED HELENA BYPASS** **HELENA, SHELBY COUNTY, ALABAMA** **PROJECT NO.: 06BHSOL0201E**	**FIGURE 2** **STUDY AREA STREAMS**



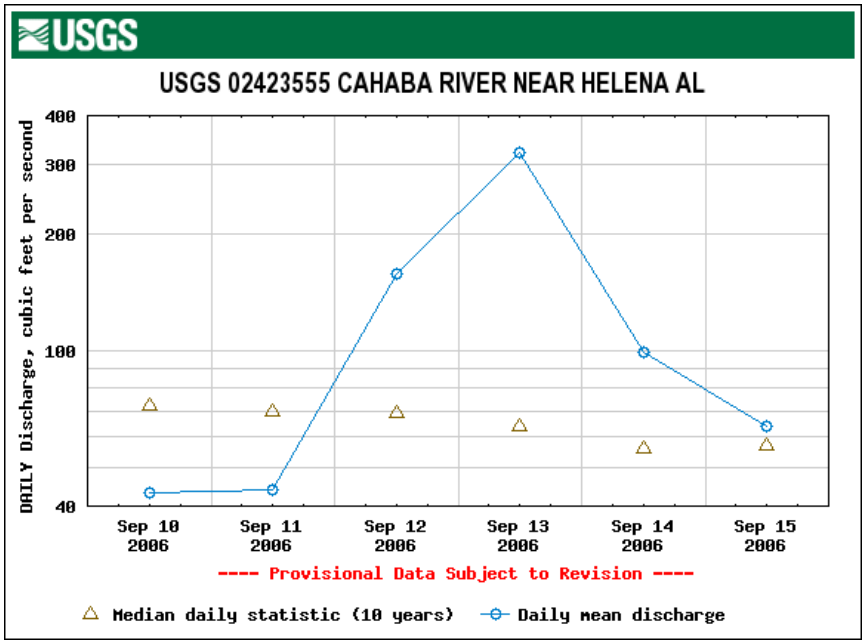
Gallet & ASSOCIATES	**PROJECT** **WATER QUALITY ASSESSMENT** **PROPOSED HELENA BYPASS** **HELENA, SHELBY COUNTY, ALABAMA** **PROJECT NO.: 06BHSOL0201E**	**FIGURE 3** **MAPPED WATER WELLS** AVAILABILITY OF GROUND WATER IN SHELBY COUNTY, ALABAMA, MAP 140 PLATE 1, DATED 1977



Gallet & ASSOCIATES	**PROJECT** **WATER QUALITY ASSESSMENT** **PROPOSED HELENA BYPASS** **HELENA, SHELBY COUNTY, ALABAMA** **PROJECT NO.: 06BHSOL0201E**	**FIGURE 4** **SAMPLE SITE LOCATION MAP**



September 2006 and historic 10-year discharge graph for the stream gage station



Mean daily flow for the stream gage station during the sampling period

Gallet & ASSOCIATES	**PROJECT** **WATER QUALITY ASSESSMENT** **PROPOSED HELENA BYPASS** **HELENA, SHELBY COUNTY, ALABAMA** **PROJECT NO.: 06BHSOL0201E**	**FIGURE 5** **STREAM GAGE STATION DISCHARGE GRAPH** **USGS STREAM GAGE STATION 02423555**

Site 1 (Stream 1) facing downstream.

Site 2 (Stream 5) facing upstream.

Site 3 (Stream 6) facing upstream.

Site 4 (Buck Creek) facing downstream.

Site 5 (Stream 4) facing downstream.

Site 6 (Stream 3) facing upstream.

Gallet & ASSOCIATES

PROJECT

WATER QUALITY ASSESSMENT
PROPOSED HELENA BYPASS
HELENA, SHELBY COUNTY, ALABAMA
PROJECT NO.: 06BHSOL0201E

FIGURE 6

SAMPLING SITE STREAM PHOTOGRAPHS

Draft 2006 § 303(d) List

Assessment Unit ID	Waterbody Name	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	Draft TMDL Date
AL03160113-0703-100	Cottonwood Creek	R	L	Black Warrior	Hale Marengo Perry	Fish & Wildlife	Organic Enrichment/DO Siltation Nutrients	Municipal Pasture grazing	2002	11.42 miles	Big Prarie Creek / Its source	2009
AL03150202-0103-300	Lee Branch	R	H	Cahaba	Shelby	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1996-99	1.6 miles	Lake Purdy / Its source	2009
AL03150202-0503-102	Cahaba River	R	H	Cahaba	Bibb	Outstanding Alabama Water Swimming	Nutrients	Municipal Urban runoff/storm sewer Land development	1990 1992 1993	9.4 miles	Alabama Highway 82 / lower Little Cahaba River	2004
AL03150202-0503-102	Cahaba River	R	H	Cahaba	Bibb	Outstanding Alabama Water Swimming	Siltation Other habitat alterations	Municipal Urban runoff/storm sewer Land development	1990 1992 1993	9.4 miles	Alabama Highway 82 / lower Little Cahaba River	2003
AL03150202-0405-100	Cahaba River	R	H	Cahaba	Bibb	Outstanding Alabama Water Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers Land development	1990 1992 1993	13.5 miles	lower Little Cahaba River / Shades Creek	2004
AL03150202-0405-100	Cahaba River	R	H	Cahaba	Bibb	Outstanding Alabama Water Fish & Wildlife	Siltation Other habitat alterations	Municipal Urban runoff/storm sewer Land development	1990 1992 1993	13.5 miles	lower Little Cahaba River / Shades Creek	2003
AL03150202-0203-101	Cahaba River	R	H	Cahaba	Shelby	Outstanding Alabama Water Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers Land development	1993-97	23.6 miles	Shades Creek / Shelby County Road 52	2004
AL03150202-0203-101	Cahaba River	R	H	Cahaba	Shelby	Outstanding Alabama Water Fish & Wildlife	Siltation Pathogens Other habitat alterations	Municipal Urban runoff/storm sewers Land development	1993-97	23.6 miles	Shades Creek / Shelby County Road 52	2003
AL03150202-0203-102	Cahaba River	R	H	Cahaba	Shelby	Outstanding Alabama Water Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers Land development	1993-97	3.6 miles	Shelby County Road 52 / Buck Creek	2004
AL03150202-0203-102	Cahaba River	R	H	Cahaba	Shelby	Fish & Wildlife	Siltation Pathogens Other habitat alterations	Municipal Urban runoff/storm sewers Land development	1993-97	3.6 miles	Shelby County Road 52 / Buck Creek	2003
AL03150202-0201-101	Cahaba River	R	H	Cahaba	Jefferson Shelby	Fish & Wildlife	Nutrients	Urban runoff/storm sewers Municipal	1993	17.4 miles	Buck Creek / Dam near US Highway 280	2004
AL03150202-0201-101	Cahaba River	R	H	Cahaba	Jefferson Shelby	Fish & Wildlife	Siltation	Urban runoff/storm sewers Municipal	1993	17.4 miles	Buck Creek / Dam near US Highway 280	2003
AL03150202-0201-102	Cahaba River	R	H	Cahaba	Jefferson	Outstanding Alabama Water Public Water Supply	Nutrients	Municipal Urban runoff/storm sewers Land development	2002	13.3 miles	Dam near US Highway 280 / Grant's Mill Road	2004
AL03150202-0201-102	Cahaba River	R	H	Cahaba	Jefferson	Outstanding Alabama Water Public Water Supply	Siltation Other habitat alterations	Urban runoff/storm sewers	1993	13.3 miles	Dam near US Highway 280 / Grant's Mill Road	2003
AL03150202-0104-102	Cahaba River	R	H	Cahaba	Jefferson St. Clair	Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers Land development	2002	21.1 miles	Grant's Mill Road / US Highway 11	2004
AL03150202-0104-102	Cahaba River	R	H	Cahaba	Jefferson St. Clair	Fish & Wildlife	Siltation Other habitat alterations	Urban runoff/storm sewers	1993	21.1 miles	Grant's Mill Road / US Highway 11	2003
AL03150202-0101-102	Cahaba River	R	H	Cahaba	Jefferson	Outstanding Alabama Water Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers Land development	2002	3.1 miles	US Highway 11 / I-59	2004

Draft 2006 § 303(d) List

Assessment Unit ID	Waterbody Name	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	Draft TMDL Date
AL03150202-0101-102	Cahaba River	R	H	Cahaba	Jefferson	Outstanding Alabama Water Fish & Wildlife	Siltation Other habitat alterations	Urban runoff/storm sewers	1993	3.1 miles	US Highway 11 / I-59	2003
AL03150202-0202-101	Buck Creek	R	L	Cahaba	Shelby	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2003	2.9 miles	Cahaba River / Cahaba Valley Creek	2009
AL03150202-0901-100	Childers Creek	R	L	Cahaba	Dallas	Fish & Wildlife	Siltation	Pasture grazing	2002	18.79 miles	Cahaba River / Its source	2009
AL03150202-0202-401	Cahaba Valley Creek	R	L	Cahaba	Shelby	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1999-00	7.6 miles	Buck Creek / US Highway 31	2009
AL03130003-1307-100	Barbour Creek	R	H	Chattahoochee	Barbour	Fish & Wildlife	Siltation	Agriculture	1987	25.1 miles	Chattahoochee River / Its source	2008
AL03130004-0601-201	Poplar Spring Branch	R	H	Chattahoochee	Houston	Fish & Wildlife	pH	Industrial	1984	2.0 miles	Omussee Creek / Ross Clark Circle	2007
AL03130012-0201-400	Cypress Creek	R	M	Chipola	Houston	Fish & Wildlife	Nutrients Organic Enrichment/DO	Municipal Urban runoff/storm sewers	1984 1986	8.1 miles	Limestone Creek / Its source	2007
AL03140201-0502-100	Hurricane Creek	R	H	Choctawhatchee	Dale	Fish & Wildlife	Pathogens	Agriculture Municipal Urban runoff/storm sewers	1991	8.5 miles	Choctawhatchee River / Its source	2007
AL03140201-0704-600	Dowling Branch	R	H	Choctawhatchee	Geneva	Fish & Wildlife	Organic Enrichment/DO Pathogens	Municipal Urban runoff/storm sewers	1991	2.1 miles	Cox Mill Creek / Its source	2007
AL03140201-0602-201	Beaver Creek	R	H	Choctawhatchee	Houston	Fish & Wildlife	Nutrients Organic Enrichment/DO	Municipal Urban runoff/storm sewers	1977-86	2.0 miles	Newton Creek / Dothan WWTP	2007
AL03140201-1001-700	UT to Harrand Creek	R	M	Choctawhatchee	Coffee	Fish & Wildlife	Nutrients	Urban runoff/storm sewers	1985 1986	3.45 miles	Harrand Creek / Its source	2007
AL03140201-1001-700	UT to Harrand Creek	R	M	Choctawhatchee	Coffee	Fish & Wildlife	Siltation	Urban runoff/storm sewers Land development	1999	3.45 miles	Harrand Creek / Its source	2007
AL03140201-1001-700	UT to Harrand Creek	R	L	Choctawhatchee	Coffee	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1999, 2004	3.45 miles	Harrand Creek / Its source	2011
AL03140202-0502-102	Walnut Creek	R	M	Choctawhatchee	Pike	Fish & Wildlife	Unknown toxicity	Municipal	1997	3.0 miles	Troy WWTP / downstream of Pike County Road 59	2007
AL03150105-0807-102	Spring Creek	R	H	Coosa	Cherokee	Fish & Wildlife	Pathogens	Unknown source	2002	5.1 miles	Weiss Lake / Mud Creek	2007
AL03150105-0807-103	Spring Creek	R	L	Coosa	Cherokee	Fish & Wildlife	Nutrients	Agriculture	2002	9.88 miles	Mud Creek / Its source	2012
AL03150105-0807-200	Mud Creek	R	H	Coosa	Cherokee	Fish & Wildlife	Pathogens	Unknown source	2002	5.1 miles	Spring Creek / Its source	2007
AL03150106-0612-100	Choccolocco Creek	R	L	Coosa	Talladega Calhoun	Fish & Wildlife	Priority Organics	Contaminated sediments	1994	35.4 miles	Lake Logan Martin / Hillabee Creek	N/A
AL03150106-0801-100	Lake Logan Martin	L	L	Coosa	St. Clair Talladega	Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO	Urban runoff/storm sewers Flow regulation/modification	1991-93 1994-97 1995-97	12363 acres	Logan Martin Dam / Broken Arrow Creek	2003
AL03150106-0801-100	Lake Logan Martin	L	L	Coosa	St. Clair Talladega	Swimming Fish & Wildlife	Priority Organics(PCBs)	Contaminated sediments	1996	12363 acres	Logan Martin Dam / Broken Arrow Creek	N/A
AL03150106-0501-101	Lake Logan Martin	L	L	Coosa	St. Clair Talladega Calhoun	Public Water Supply Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO	Urban runoff/storm sewers Flow regulation/modification	1991-93 1994-97 1995-97	1397 acres	Broken Arrow Creek / Trout Creek	2003
AL03150106-0501-101	Lake Logan Martin	L	L	Coosa	St. Clair Talladega Calhoun	Public Water Supply Swimming Fish & Wildlife	Priority Organics(PCBs)	Contaminated sediments	1996	1397 acres	Broken Arrow Creek / Trout Creek	N/A
AL03150106-0501-102	Lake Logan Martin	L	L	Coosa	St. Clair Calhoun	Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO	Urban runoff/storm sewers Flow regulation/modification	1991-93 1994-97 1995-97	825 acres	Trout Creek / Neely Henry Dam	2003

0609816

Company Name/Address	Alternate billing information	Analysis/Container/Preservative
Gallet & Associates, Inc. 320 Beacon Parkway West Birmingham, Alabama 35209	***LRS, Inc.*** 163 5th Street Ashville, Alabama 35953 205.683.6731 mnorris@lab-resource.com Report to: Tom Creech Email to: Tcreech@gallet.com	PAH-SW8270C (1, 1L Amber Glass Unpreserved) Metals*-SW6010B/6020B/7470A(1,500mL HDPE HNO3 Preserved)

Chain of Custody
Page 1 of 2

LRS, Inc.

A Laboratory Service Provider

Phone: 205.683.6731
FAX: 205.594.7302

Project Name: **Helena Bypass WQ**		City/stateCollected Helena, Aabama	
PHONE: 205.942.1289 FAX: 205.92.1266	Client Project #: **06BHSOL0201E-01E**	Lab Project #	
Collected by: Stephen Acreman	Site ID:	P.O.#	
Collected by(signature): Stephen Acreman Packed on Ice N___ Y__V	**Rush?** (Lab MUST be Notified) _____Same Day.....200% ___Next Day.....100% _____Two Day.....50%	**Date Results Needed** Email?___No__X_Yes FAX?__X__No___Yes	No of Cntrs

Laboratory:
Analytical Environmental Services
3785 Presidential Parkway
Atlanta, GA 30340
Shipped Via: Fedex - 1593-1249-6

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	PAH-SW8270C	Metals*-SW6010B/6020B/7470A						Remarks/contaminant	Sample # (lab only)
SW-1	Grab	GW		9/11/06	1400	2	X	X							
SW-2	Grab	GW		9/11/06	1440	2	X	X							
SW-3	Grab	GW		9/11/06	1535	2	X	X							
SW-4	Grab	GW		9/11/06	1610	2	X	X							
SW-5	Grab	GW		9/12/06	1130	2	X	X							
SW-6	Grab	GW		9/12/06	1330	2	X	X							
~~SW-7~~	~~Grab~~	~~GW~~				~~2~~	~~X~~	~~X~~							
SW-8	Grab	GW		9/13/06	1005	2	X	X							
SW-9	Grab	GW		9/13/06	1024	2	X	X							

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____ pH_____ Temp_____

Remarks: **Metals:** Flow_____ Other_____

Relinquished by:(Signature)	Date:	Time:	Received by:(Signature)	Samples returned via: FedEx__ UPS__Other__		Condition	(lab use only)
Stephen Acreman	9/14/06	14:30	Teresa Gallet				
Relinquished by:(Signature)	Date:	Time:	Received by: (Signature)	Temp:	Bottles Received:		
Teresa Gallet	9-14-06	17:30	Fed Ex				
Relinquished by:(Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 9/15/06	Time: 9:35	pH Checked:	NCF:
			ea	9/18/06	9:35 FEDEX		

0609816

Chain of Custody
Page 2 of 2

LRS, Inc.

A Laboratory Service Provider

Phone: 205.683.6731
FAX: 205.594.7302

Company Name/Address	Alternate billing information
Gallet & Associates, Inc. 320 Beacon Parkway West Birmingham, Alabama 35209	***LRS, Inc.*** 163 5th Street Ashville, Alabama 35953 205.683.6731 mnorris@lab-resource.com Report to: Tom Creech Email to: Tcreech@gallet.com

Project Name: **Helena Bypass WQ** City/stateCollected Helena, Aabama

PHONE: 205.942.1289 FAX: 205.942.1266

Client Project #: **06BHSOL0201E-01E**

Lab Project #

Collected by: Stephen Acreman

Site ID:

P.O.#

Collected by(signature): Stephen Acreman

Packed on Ice N___ Y_V_

Rush? (Lab MUST be Notified)
_____Same Day.....200%
___Next Day.....100%
_____Two Day.....50%

Date Results Needed

Email?__No__X_Yes
FAX?__X__No___Yes

Laboratory:
Analytical Environmental Services
3785 Presidential Parkway
Atlanta, GA 30340

Shipped Via: Fedex - 1593-1249-6

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	PAH-SW8270C (1, 1L Amber Glass Unpreserved)	Metals*-SW6010B/6020B/7470A(1,500mL HDPE HNO3 Preserved)							Remarks/contaminant	Sample # (lab only)
SW-10	Grab	GW		9/13/06	1150	2	X	X								
SW-11	Grab	GW		9/13/06	1230	2	X	X								
SW-12	Grab	GW		9/13/06	1545	2	X	X								
SW-13	Grab	GW		9/13/06	1620	2	X	X								
~~SW-14~~	~~Grab~~	~~GW~~				~~2~~	~~X~~	~~X~~								

*Matrix: SS-Soil/Solid (GW-Groundwater) WW-Wastewater DW-Drinking Water OT- Other_____

pH_____ Temp_____

Remarks: **Metals:**

Flow_____ Other_____

Relinquished by:(Signature)	Date:	Time:	Received by:(Signature)	Samples returned via: FedEx__ UPS__Other__	Condition (lab use only)
Stephen Acreman	9/14/06	14:30	Teresa Earnest		
Relinquished by:(Signature)	Date:	Time:	Received by: (Signature)	Temp: / Bottles Received:	
Teresa Earnest	9-14-06	17:00	Fed Ex		
Relinquished by:(Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 9/15/06 Time: ~~9:35~~ 9:35 FEDEX	pH Checked: NCF:

0609841

Company Name/Address

Gallet & Associates, Inc.

320 Beacon Parkway West
Birmingham, Alabama 35209

Alternate billing information

LRS, Inc.

163 5th Street
Ashville, Alabama 35953
205.683.6731
mnorris@lab-resource.com

Report to: Tom Creech

Email to: Tcreech@gallet.com

Project Name: **Helena Bypass WQ**

City/stateCollected Helena, Aabama

PHONE: 205.942.1289
FAX: 205.942.1266

Client Project #: **06BHSOL0201E-01E**

Lab Project #

Collected by: Stephen Acreman

Site ID:

P.O.#

Collected by(signature): Stephen Acreman

Packed on Ice N___ Y✓

Rush? (Lab MUST be Notified)
_____Same Day.....200%
___Next Day.....100%
_____Two Day.....50%

Date Results Needed

Email?___No__X_Yes
FAX?__X__No___Yes

Analysis/Container/Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	PAH-SW8270C (1, 4oz glass unpreserved)	Metals*-SW6010B/6020B/7471A (1,4oz glass unpreserved)							Remarks/contaminant	Sample # (lab only)
SS-1	Grab	SS	0-2"	9/11/06	1400	2	X	X								
SS-2	Grab	SS	0-2"	9/11/06	1440	2	X	X								
SS-3	Grab	SS	0-2"	9/11/06	1535	2	X	X								
SS-4	Grab	SS	0-2"	9/11/06	1610	2	X	X								
SS-5	Grab	SS	0-2"	9/12/06	1130	2	X	X								
SS-6	Grab	SS	0-2"	9/12/06	1330	2	X	X								
~~SS-7~~	~~Grab~~	~~SS~~				2	X	X								
SS-8	Grab	SS	0-2"	9/13/06	1005	2	X	X								
SS-9	Grab	SS	0-2"	9/13/06	1024	2	X	X								

*Matrix: (SS-Soil/Solid) GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____

pH_____ Temp_____

Flow_____ Other_____

Remarks: **Metals:**

Relinquished by:(Signature)	Date:	Time:	Received by:(Signature)
Stephen Acreman	9/14/06	14:30	Teresa Earnest
Relinquished by:(Signature)	Date:	Time:	Received by: (Signature)
Teresa Earnest	9-14-06	17:00	Fed Ex
Relinquished by:(Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: FedEx__ UPS__Other__

Temp: | Bottles Received:

Date: 9/15/06 | Time: 9:35

Condition (lab use only)

pH Checked: | NCF:

Chain of Custody
Page 1 of 2

LRS, Inc.

A Laboratory Service Provider

Phone: 205.683.6731
FAX: 205.594.7302

Laboratory:

Analytical Environmental Services
3785 Presidential Parkway
Atlanta, GA 30340

Shipped Via: Fedex - 1593-1249-6

0609841

Company Name/Address

Gallet & Associates, Inc.

320 Beacon Parkway West
Birmingham, Alabama 35209

Alternate billing information

LRS, Inc.

163 5th Street
Ashville, Alabama 35953
205.683.6731
mnorris@lab-resource.com

Report to: Tom Creech

Email to: Tcreech@gallet.com

Project Name: **Helena Bypass WQ**

City/stateCollected Helena, Aabama

PHONE: 205.942.1289
FAX: 205.92.1266

Client Project #: **06BHSOL0201E-01E**

Lab Project #

Collected by: Stephen Acreman

Site ID:

P.O.#

Collected by(signature): Stephen Acreman

Packed on Ice N___ Y V

Rush? (Lab MUST be Notified)
_____Same Day.....200%
___Next Day.....100%
_____Two Day.....50%

Date Results Needed

Email?___No__X_Yes
FAX?__X__No___Yes

No of Cntrs

Analysis/Container/Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	PAH-SW8270C (1, 4oz glass unpreserved)	Metals*-SW6010B/6020B/7471A(1, 4oz glass unpreserved)							Remarks/contaminant	Sample # (lab only)
SS-10	Grab	SS	0-2"	9/13/06	1150	2	X	X								
SS-11	Grab	SS	0-2"	9/13/06	1230	2	X	X								
SS-12	Grab	SS	0-2"	9/13/06	1545	2	X	X								
SS-13	Grab	SS	0-2"	9/13/06	1620	2	X	X								
~~SS-14~~	~~Grab~~	~~SS~~				2	X	X								

Chain of Custody
Page 2 of 2

LRS, Inc.

A Laboratory Service Provider

Phone: 205.683.6731
FAX: 205.594.7302

Laboratory:

Analytical Environmental Services
3785 Presidential Parkway
Atlanta, GA 30340

Shipped Via: Fedex - 1593-1249-6

*Matrix: (SS-Soil/Solid) GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____

pH_____ Temp_____

Remarks: **Metals:**

Flow_____ Other_____

Relinquished by:(Signature)	Date:	Time:	Received by:(Signature)	Samples returned via: FedEx__ UPS__Other__	Condition (lab use only)
Stephen Acreman	9/14/06	14:30	Teresa Earnest		
Relinquished by:(Signature) Teresa Earnest	Date: 9-14-06	Time: 17:00	Received by: (Signature) Fed Ex	Temp: / Bottles Received:	
Relinquished by:(Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 9/15/06 Time: 9:35	pH Checked: NCF:

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-001

Client Sample ID: SW-1
Collection Date: 9/11/2006 2:00:00 PM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 2:04 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 2:04 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:04 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 2:04 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:04 PM
Copper	BRL	0.0100		mg/L	75455	1	9/20/2006 2:04 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 2:04 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 2:04 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:04 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 2:04 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:04 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 2:04 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:20 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Acenaphthylene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
1-Methylnaphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
2-Methylnaphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Acenaphthene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Fluorene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Phenanthrene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Benz(a)anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Chrysene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Benzo(b)fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Benzo(k)fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Benzo(a)pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Dibenz(a,h)anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Benzo(g,h,i)perylene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Indeno(1,2,3-cd)pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 11:26 AM
Surr: Nitrobenzene-d5	47.9	29.9-115	H	%REC	75431	1	9/21/2006 11:26 AM
Surr: 2-Fluorobiphenyl	53.1	46.6-115	H	%REC	75431	1	9/21/2006 11:26 AM
Surr: 4-Terphenyl-d14	79.3	55.9-118	H	%REC	75431	1	9/21/2006 11:26 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Surrogate Recovery outside accepted recovery limits
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank		

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-002

Client Sample ID: SW-2
Collection Date: 9/11/2006 2:40:00 PM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 2:21 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 2:21 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:21 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 2:21 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:21 PM
Copper	BRL	0.0100		mg/L	75455	1	9/20/2006 2:21 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 2:21 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 2:21 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:21 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 2:21 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:21 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 2:21 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:28 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Acenaphthylene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
1-Methylnaphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
2-Methylnaphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Acenaphthene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Fluorene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Phenanthrene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Benz(a)anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Chrysene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Benzo(b)fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Benzo(k)fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Benzo(a)pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Dibenz(a,h)anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Benzo(g,h,i)perylene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Indeno(1,2,3-cd)pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 11:59 AM
Surr: Nitrobenzene-d5	77.0	29.9-115	H	%REC	75431	1	9/21/2006 11:59 AM
Surr: 2-Fluorobiphenyl	69.9	46.6-115	H	%REC	75431	1	9/21/2006 11:59 AM
Surr: 4-Terphenyl-d14	80.7	55.9-118	H	%REC	75431	1	9/21/2006 11:59 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-003

Client Sample ID: SW-3
Collection Date: 9/11/2006 3:35:00 PM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 2:25 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 2:25 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:25 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 2:25 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:25 PM
Copper	BRL	0.0100		mg/L	75455	1	9/20/2006 2:25 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 2:25 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 2:25 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:25 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 2:25 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:25 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 2:25 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:34 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Acenaphthylene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
1-Methylnaphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
2-Methylnaphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Acenaphthene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Fluorene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Phenanthrene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Benz(a)anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Chrysene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Benzo(b)fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Benzo(k)fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Benzo(a)pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Dibenz(a,h)anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Benzo(g,h,i)perylene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Indeno(1,2,3-cd)pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 1:05 PM
Surr: Nitrobenzene-d5	75.8	29.9-115	H	%REC	75431	1	9/21/2006 1:05 PM
Surr: 2-Fluorobiphenyl	73.5	46.6-115	H	%REC	75431	1	9/21/2006 1:05 PM
Surr: 4-Terphenyl-d14	82.0	55.9-118	H	%REC	75431	1	9/21/2006 1:05 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-004

Client Sample ID: SW-4
Collection Date: 9/11/2006 4:10:00 PM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 2:30 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 2:30 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:30 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 2:30 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:30 PM
Copper	0.0259	0.0100		mg/L	75455	1	9/20/2006 2:30 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 2:30 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 2:30 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:30 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 2:30 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:30 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 2:30 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:36 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Acenaphthylene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
1-Methylnaphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
2-Methylnaphthalene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Acenaphthene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Fluorene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Phenanthrene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Benz(a)anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Chrysene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Benzo(b)fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Benzo(k)fluoranthene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Benzo(a)pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Dibenz(a,h)anthracene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Benzo(g,h,i)perylene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Indeno(1,2,3-cd)pyrene	BRL	10	H	µg/L	75431	1	9/21/2006 1:38 PM
Surr: Nitrobenzene-d5	77.6	29.9-115	H	%REC	75431	1	9/21/2006 1:38 PM
Surr: 2-Fluorobiphenyl	75.4	46.6-115	H	%REC	75431	1	9/21/2006 1:38 PM
Surr: 4-Terphenyl-d14	85.5	55.9-118	H	%REC	75431	1	9/21/2006 1:38 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Surrogate Recovery outside accepted recovery limits
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank		

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-005

Client Sample ID: SW-5
Collection Date: 9/12/2006 11:30:00 AM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 2:34 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 2:34 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:34 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 2:34 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:34 PM
Copper	BRL	0.0100		mg/L	75455	1	9/20/2006 2:34 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 2:34 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 2:34 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:34 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 2:34 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:34 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 2:34 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:38 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Acenaphthylene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
1-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
2-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Acenaphthene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Fluorene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Phenanthrene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Anthracene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Pyrene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Benz(a)anthracene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Chrysene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Benzo(b)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Benzo(k)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Benzo(a)pyrene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	75431	1	9/21/2006 2:11 PM
Surr: Nitrobenzene-d5	75.6	29.9-115		%REC	75431	1	9/21/2006 2:11 PM
Surr: 2-Fluorobiphenyl	72.2	46.6-115		%REC	75431	1	9/21/2006 2:11 PM
Surr: 4-Terphenyl-d14	80.7	55.9-118		%REC	75431	1	9/21/2006 2:11 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Surrogate Recovery outside accepted recovery limits
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank		

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-006

Client Sample ID: SW-6
Collection Date: 9/12/2006 1:30:00 PM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 2:38 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 2:38 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:38 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 2:38 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:38 PM
Copper	0.0189	0.0100		mg/L	75455	1	9/20/2006 2:38 PM
Lead	0.0148	0.0100		mg/L	75455	1	9/20/2006 2:38 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 2:38 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:38 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 2:38 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:38 PM
Zinc	0.0393	0.0200		mg/L	75455	1	9/20/2006 2:38 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:40 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Acenaphthylene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
1-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
2-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Acenaphthene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Fluorene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Phenanthrene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Anthracene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Pyrene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Benz(a)anthracene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Chrysene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Benzo(b)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Benzo(k)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Benzo(a)pyrene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	75431	1	9/21/2006 2:44 PM
Surr: Nitrobenzene-d5	74.9	29.9-115		%REC	75431	1	9/21/2006 2:44 PM
Surr: 2-Fluorobiphenyl	66.6	46.6-115		%REC	75431	1	9/21/2006 2:44 PM
Surr: 4-Terphenyl-d14	77.3	55.9-118		%REC	75431	1	9/21/2006 2:44 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Surrogate Recovery outside accepted recovery limits
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank		

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-007

Client Sample ID: SW-8
Collection Date: 9/13/2006 10:05:00 AM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 2:42 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 2:42 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:42 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 2:42 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:42 PM
Copper	BRL	0.0100		mg/L	75455	1	9/20/2006 2:42 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 2:42 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 2:42 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:42 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 2:42 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:42 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 2:42 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:42 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Acenaphthylene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
1-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
2-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Acenaphthene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Fluorene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Phenanthrene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Anthracene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Pyrene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Benz(a)anthracene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Chrysene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Benzo(b)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Benzo(k)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Benzo(a)pyrene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	75431	1	9/21/2006 3:17 PM
Surr: Nitrobenzene-d5	75.2	29.9-115		%REC	75431	1	9/21/2006 3:17 PM
Surr: 2-Fluorobiphenyl	75.2	46.6-115		%REC	75431	1	9/21/2006 3:17 PM
Surr: 4-Terphenyl-d14	81.4	55.9-118		%REC	75431	1	9/21/2006 3:17 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Surrogate Recovery outside accepted recovery limits
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank		

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-008

Client Sample ID: SW-9
Collection Date: 9/13/2006 10:24:00 PM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 2:54 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 2:54 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:54 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 2:54 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:54 PM
Copper	BRL	0.0100		mg/L	75455	1	9/20/2006 2:54 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 2:54 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 2:54 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:54 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 2:54 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:54 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 2:54 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:43 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Acenaphthylene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
1-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
2-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Acenaphthene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Fluorene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Phenanthrene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Anthracene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Pyrene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Benz(a)anthracene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Chrysene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Benzo(b)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Benzo(k)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Benzo(a)pyrene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	75431	1	9/21/2006 3:50 PM
Surr: Nitrobenzene-d5	37.0	29.9-115		%REC	75431	1	9/21/2006 3:50 PM
Surr: 2-Fluorobiphenyl	40.5	46.6-115	S	%REC	75431	1	9/21/2006 3:50 PM
Surr: 4-Terphenyl-d14	48.6	55.9-118	S	%REC	75431	1	9/21/2006 3:50 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-009

Client Sample ID: SW-10
Collection Date: 9/13/2006 11:50:00 AM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 2:58 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 2:58 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:58 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 2:58 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 2:58 PM
Copper	BRL	0.0100		mg/L	75455	1	9/20/2006 2:58 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 2:58 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 2:58 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:58 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 2:58 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 2:58 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 2:58 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:45 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-010

Client Sample ID: SW-11
Collection Date: 9/13/2006 12:30:00 PM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 3:02 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 3:02 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 3:02 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 3:02 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 3:02 PM
Copper	0.0149	0.0100		mg/L	75455	1	9/20/2006 3:02 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 3:02 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 3:02 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 3:02 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 3:02 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 3:02 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 3:02 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:47 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Acenaphthylene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
1-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
2-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Acenaphthene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Fluorene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Phenanthrene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Anthracene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Pyrene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Benz(a)anthracene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Chrysene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Benzo(b)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Benzo(k)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Benzo(a)pyrene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	75431	1	9/21/2006 4:23 PM
Surr: Nitrobenzene-d5	60.5	29.9-115		%REC	75431	1	9/21/2006 4:23 PM
Surr: 2-Fluorobiphenyl	71.4	46.6-115		%REC	75431	1	9/21/2006 4:23 PM
Surr: 4-Terphenyl-d14	80.9	55.9-118		%REC	75431	1	9/21/2006 4:23 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-011

Client Sample ID: SW-12
Collection Date: 9/13/2006 3:45:00 PM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 3:07 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 3:07 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 3:07 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 3:07 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 3:07 PM
Copper	0.0119	0.0100		mg/L	75455	1	9/20/2006 3:07 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 3:07 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 3:07 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 3:07 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 3:07 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 3:07 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 3:07 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:49 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Acenaphthylene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
1-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
2-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Acenaphthene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Fluorene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Phenanthrene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Anthracene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Pyrene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Benz(a)anthracene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Chrysene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Benzo(b)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Benzo(k)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Benzo(a)pyrene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	75431	1	9/21/2006 4:56 PM
Surr: Nitrobenzene-d5	70.9	29.9-115		%REC	75431	1	9/21/2006 4:56 PM
Surr: 2-Fluorobiphenyl	69.1	46.6-115		%REC	75431	1	9/21/2006 4:56 PM
Surr: 4-Terphenyl-d14	53.2	55.9-118	S	%REC	75431	1	9/21/2006 4:56 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *25-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609816-012

Client Sample ID: SW-13
Collection Date: 9/13/2006 4:20:00 PM
Matrix: GROUNDWATER

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3010A)**		Analyst: **BB**
Antimony	BRL	0.0200		mg/L	75455	1	9/20/2006 3:11 PM
Arsenic	BRL	0.0500		mg/L	75455	1	9/20/2006 3:11 PM
Beryllium	BRL	0.0100		mg/L	75455	1	9/20/2006 3:11 PM
Cadmium	BRL	0.0050		mg/L	75455	1	9/20/2006 3:11 PM
Chromium	BRL	0.0100		mg/L	75455	1	9/20/2006 3:11 PM
Copper	0.0105	0.0100		mg/L	75455	1	9/20/2006 3:11 PM
Lead	BRL	0.0100		mg/L	75455	1	9/20/2006 3:11 PM
Nickel	BRL	0.0200		mg/L	75455	1	9/20/2006 3:11 PM
Selenium	BRL	0.0200		mg/L	75455	1	9/20/2006 3:11 PM
Silver	BRL	0.0100		mg/L	75455	1	9/20/2006 3:11 PM
Thallium	BRL	0.0200		mg/L	75455	1	9/20/2006 3:11 PM
Zinc	BRL	0.0200		mg/L	75455	1	9/20/2006 3:11 PM
MERCURY, TOTAL		**SW7470A**			**(SW7470A)**		Analyst: **VA**
Mercury	BRL	0.00020		mg/L	75451	1	9/20/2006 2:51 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3535)**		Analyst: **DA**
Naphthalene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Acenaphthylene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
1-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
2-Methylnaphthalene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Acenaphthene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Fluorene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Phenanthrene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Anthracene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Pyrene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Benz(a)anthracene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Chrysene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Benzo(b)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Benzo(k)fluoranthene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Benzo(a)pyrene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	75431	1	9/21/2006 5:29 PM
Surr: Nitrobenzene-d5	39.5	29.9-115		%REC	75431	1	9/21/2006 5:29 PM
Surr: 2-Fluorobiphenyl	75.4	46.6-115		%REC	75431	1	9/21/2006 5:29 PM
Surr: 4-Terphenyl-d14	81.7	55.9-118		%REC	75431	1	9/21/2006 5:29 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Surrogate Recovery outside accepted recovery limits
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank		

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-001

Client Sample ID: SS-1
Collection Date: 9/11/2006 2:00:00 PM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.73		mg/Kg	75456	1	9/20/2006 6:39 PM
Arsenic	13.0	4.73		mg/Kg	75456	1	9/20/2006 6:39 PM
Beryllium	BRL	2.36		mg/Kg	75456	1	9/20/2006 6:39 PM
Cadmium	BRL	2.36		mg/Kg	75456	1	9/20/2006 6:39 PM
Chromium	22.1	2.36		mg/Kg	75456	1	9/20/2006 6:39 PM
Copper	5.61	2.36		mg/Kg	75456	1	9/20/2006 6:39 PM
Lead	11.5	4.73		mg/Kg	75456	1	9/20/2006 6:39 PM
Nickel	BRL	4.73		mg/Kg	75456	1	9/20/2006 6:39 PM
Selenium	BRL	4.73		mg/Kg	75456	1	9/20/2006 6:39 PM
Silver	BRL	2.36		mg/Kg	75456	1	9/20/2006 6:39 PM
Thallium	BRL	4.73		mg/Kg	75456	1	9/20/2006 6:39 PM
Zinc	11.8	4.73		mg/Kg	75456	1	9/20/2006 6:39 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.100		mg/Kg	75484	1	9/20/2006 7:16 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Acenaphthylene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Acenaphthene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Fluorene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Phenanthrene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Benz(a)anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Chrysene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 12:43 PM
Surr: 2-Fluorobiphenyl	75.1	58-120		%REC	75339	1	9/20/2006 12:43 PM
Surr: 4-Terphenyl-d14	76.9	60.2-120		%REC	75339	1	9/20/2006 12:43 PM
Surr: Nitrobenzene-d5	73.7	47.9-120		%REC	75339	1	9/20/2006 12:43 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-002

Client Sample ID: SS-2
Collection Date: 9/11/2006 2:40:00 PM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.72		mg/Kg	75456	1	9/20/2006 6:42 PM
Arsenic	13.3	4.72		mg/Kg	75456	1	9/20/2006 6:42 PM
Beryllium	BRL	2.36		mg/Kg	75456	1	9/20/2006 6:42 PM
Cadmium	BRL	2.36		mg/Kg	75456	1	9/20/2006 6:42 PM
Chromium	25.6	2.36		mg/Kg	75456	1	9/20/2006 6:42 PM
Copper	14.5	2.36		mg/Kg	75456	1	9/20/2006 6:42 PM
Lead	15.9	4.72		mg/Kg	75456	1	9/20/2006 6:42 PM
Nickel	7.30	4.72		mg/Kg	75456	1	9/20/2006 6:42 PM
Selenium	BRL	4.72		mg/Kg	75456	1	9/20/2006 6:42 PM
Silver	BRL	2.36		mg/Kg	75456	1	9/20/2006 6:42 PM
Thallium	BRL	4.72		mg/Kg	75456	1	9/20/2006 6:42 PM
Zinc	32.3	4.72		mg/Kg	75456	1	9/20/2006 6:42 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.0998		mg/Kg	75484	1	9/20/2006 7:18 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Acenaphthylene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Acenaphthene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Fluorene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Phenanthrene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Benz(a)anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Chrysene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 1:12 PM
Surr: 2-Fluorobiphenyl	77.0	58-120		%REC	75339	1	9/20/2006 1:12 PM
Surr: 4-Terphenyl-d14	78.7	60.2-120		%REC	75339	1	9/20/2006 1:12 PM
Surr: Nitrobenzene-d5	56.7	47.9-120		%REC	75339	1	9/20/2006 1:12 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-003

Client Sample ID: SS-3
Collection Date: 9/11/2006 3:35:00 PM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.95		mg/Kg	75456	1	9/20/2006 6:46 PM
Arsenic	BRL	4.95		mg/Kg	75456	1	9/20/2006 6:46 PM
Beryllium	BRL	2.48		mg/Kg	75456	1	9/20/2006 6:46 PM
Cadmium	BRL	2.48		mg/Kg	75456	1	9/20/2006 6:46 PM
Chromium	8.42	2.48		mg/Kg	75456	1	9/20/2006 6:46 PM
Copper	12.8	2.48		mg/Kg	75456	1	9/20/2006 6:46 PM
Lead	9.34	4.95		mg/Kg	75456	1	9/20/2006 6:46 PM
Nickel	BRL	4.95		mg/Kg	75456	1	9/20/2006 6:46 PM
Selenium	BRL	4.95		mg/Kg	75456	1	9/20/2006 6:46 PM
Silver	BRL	2.48		mg/Kg	75456	1	9/20/2006 6:46 PM
Thallium	BRL	4.95		mg/Kg	75456	1	9/20/2006 6:46 PM
Zinc	27.7	4.95		mg/Kg	75456	1	9/20/2006 6:46 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.0998		mg/Kg	75484	1	9/20/2006 7:20 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Acenaphthylene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Acenaphthene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Fluorene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Phenanthrene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Benz(a)anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Chrysene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 1:40 PM
Surr: 2-Fluorobiphenyl	84.3	58-120		%REC	75339	1	9/20/2006 1:40 PM
Surr: 4-Terphenyl-d14	84.8	60.2-120		%REC	75339	1	9/20/2006 1:40 PM
Surr: Nitrobenzene-d5	76.7	47.9-120		%REC	75339	1	9/20/2006 1:40 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-004

Client Sample ID: SS-4
Collection Date: 9/11/2006 4:10:00 PM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL			**SW6010B**		**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.98		mg/Kg	75456	1	9/20/2006 6:49 PM
Arsenic	9.64	4.98		mg/Kg	75456	1	9/20/2006 6:49 PM
Beryllium	BRL	2.49		mg/Kg	75456	1	9/20/2006 6:49 PM
Cadmium	BRL	2.49		mg/Kg	75456	1	9/20/2006 6:49 PM
Chromium	27.2	2.49		mg/Kg	75456	1	9/20/2006 6:49 PM
Copper	11.3	2.49		mg/Kg	75456	1	9/20/2006 6:49 PM
Lead	8.54	4.98		mg/Kg	75456	1	9/20/2006 6:49 PM
Nickel	BRL	4.98		mg/Kg	75456	1	9/20/2006 6:49 PM
Selenium	BRL	4.98		mg/Kg	75456	1	9/20/2006 6:49 PM
Silver	BRL	2.49		mg/Kg	75456	1	9/20/2006 6:49 PM
Thallium	BRL	4.98		mg/Kg	75456	1	9/20/2006 6:49 PM
Zinc	35.3	4.98		mg/Kg	75456	1	9/20/2006 6:49 PM
TOTAL MERCURY			**SW7471A**		**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.0996		mg/Kg	75484	1	9/20/2006 7:22 PM
POLYAROMATIC HYDROCARBONS			**SW8270C**		**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Acenaphthylene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Acenaphthene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Fluorene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Phenanthrene	340	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Fluoranthene	890	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Pyrene	770	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Benz(a)anthracene	390	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Chrysene	390	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 9:26 PM
Surr: 2-Fluorobiphenyl	86.3	58-120		%REC	75339	1	9/20/2006 9:26 PM
Surr: 4-Terphenyl-d14	82.1	60.2-120		%REC	75339	1	9/20/2006 9:26 PM
Surr: Nitrobenzene-d5	77.4	47.9-120		%REC	75339	1	9/20/2006 9:26 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-005

Client Sample ID: SS-5
Collection Date: 9/12/2006 11:30:00 AM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.80		mg/Kg	75456	1	9/20/2006 6:52 PM
Arsenic	7.01	4.80		mg/Kg	75456	1	9/20/2006 6:52 PM
Beryllium	BRL	2.40		mg/Kg	75456	1	9/20/2006 6:52 PM
Cadmium	BRL	2.40		mg/Kg	75456	1	9/20/2006 6:52 PM
Chromium	8.00	2.40		mg/Kg	75456	1	9/20/2006 6:52 PM
Copper	16.0	2.40		mg/Kg	75456	1	9/20/2006 6:52 PM
Lead	8.40	4.80		mg/Kg	75456	1	9/20/2006 6:52 PM
Nickel	7.25	4.80		mg/Kg	75456	1	9/20/2006 6:52 PM
Selenium	BRL	4.80		mg/Kg	75456	1	9/20/2006 6:52 PM
Silver	BRL	2.40		mg/Kg	75456	1	9/20/2006 6:52 PM
Thallium	BRL	4.80		mg/Kg	75456	1	9/20/2006 6:52 PM
Zinc	32.4	4.80		mg/Kg	75456	1	9/20/2006 6:52 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.0998		mg/Kg	75484	1	9/20/2006 7:25 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Acenaphthylene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Acenaphthene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Fluorene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Phenanthrene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Benz(a)anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Chrysene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75339	1	9/20/2006 2:08 PM
Surr: 2-Fluorobiphenyl	77.7	58-120		%REC	75339	1	9/20/2006 2:08 PM
Surr: 4-Terphenyl-d14	77.9	60.2-120		%REC	75339	1	9/20/2006 2:08 PM
Surr: Nitrobenzene-d5	73.8	47.9-120		%REC	75339	1	9/20/2006 2:08 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-006

Client Sample ID: SS-6
Collection Date: 9/12/2006 1:30:00 PM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.75		mg/Kg	75456	1	9/20/2006 7:01 PM
Arsenic	BRL	4.75		mg/Kg	75456	1	9/20/2006 7:01 PM
Beryllium	BRL	2.37		mg/Kg	75456	1	9/20/2006 7:01 PM
Cadmium	BRL	2.37		mg/Kg	75456	1	9/20/2006 7:01 PM
Chromium	5.08	2.37		mg/Kg	75456	1	9/20/2006 7:01 PM
Copper	4.93	2.37		mg/Kg	75456	1	9/20/2006 7:01 PM
Lead	5.49	4.75		mg/Kg	75456	1	9/20/2006 7:01 PM
Nickel	BRL	4.75		mg/Kg	75456	1	9/20/2006 7:01 PM
Selenium	BRL	4.75		mg/Kg	75456	1	9/20/2006 7:01 PM
Silver	BRL	2.37		mg/Kg	75456	1	9/20/2006 7:01 PM
Thallium	BRL	4.75		mg/Kg	75456	1	9/20/2006 7:01 PM
Zinc	19.6	4.75		mg/Kg	75456	1	9/20/2006 7:01 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.0994		mg/Kg	75484	1	9/20/2006 7:27 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Acenaphthylene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Acenaphthene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Fluorene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Phenanthrene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Benz(a)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Chrysene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 9:54 PM
Surr: 2-Fluorobiphenyl	77.9	58-120		%REC	75372	1	9/20/2006 9:54 PM
Surr: 4-Terphenyl-d14	73.4	60.2-120		%REC	75372	1	9/20/2006 9:54 PM
Surr: Nitrobenzene-d5	68.6	47.9-120		%REC	75372	1	9/20/2006 9:54 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-007

Client Sample ID: SS-8
Collection Date: 9/13/2006 10:05:00 AM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.66		mg/Kg	75456	1	9/20/2006 7:05 PM
Arsenic	19.5	4.66		mg/Kg	75456	1	9/20/2006 7:05 PM
Beryllium	BRL	2.33		mg/Kg	75456	1	9/20/2006 7:05 PM
Cadmium	BRL	2.33		mg/Kg	75456	1	9/20/2006 7:05 PM
Chromium	32.0	2.33		mg/Kg	75456	1	9/20/2006 7:05 PM
Copper	6.59	2.33		mg/Kg	75456	1	9/20/2006 7:05 PM
Lead	13.5	4.66		mg/Kg	75456	1	9/20/2006 7:05 PM
Nickel	BRL	4.66		mg/Kg	75456	1	9/20/2006 7:05 PM
Selenium	BRL	4.66		mg/Kg	75456	1	9/20/2006 7:05 PM
Silver	BRL	2.33		mg/Kg	75456	1	9/20/2006 7:05 PM
Thallium	BRL	4.66		mg/Kg	75456	1	9/20/2006 7:05 PM
Zinc	14.5	4.66		mg/Kg	75456	1	9/20/2006 7:05 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.0996		mg/Kg	75484	1	9/20/2006 7:29 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Acenaphthylene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Acenaphthene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Fluorene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Phenanthrene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Benz(a)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Chrysene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 3:04 PM
Surr: 2-Fluorobiphenyl	66.2	58-120		%REC	75372	1	9/20/2006 3:04 PM
Surr: 4-Terphenyl-d14	69.8	60.2-120		%REC	75372	1	9/20/2006 3:04 PM
Surr: Nitrobenzene-d5	61.9	47.9-120		%REC	75372	1	9/20/2006 3:04 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-008

Client Sample ID: SS-9
Collection Date: 9/13/2006 10:24:00 AM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.60		mg/Kg	75456	1	9/20/2006 6:16 PM
Arsenic	BRL	4.60		mg/Kg	75456	1	9/20/2006 6:16 PM
Beryllium	BRL	2.30		mg/Kg	75456	1	9/20/2006 6:16 PM
Cadmium	BRL	2.30		mg/Kg	75456	1	9/20/2006 6:16 PM
Chromium	6.89	2.30		mg/Kg	75456	1	9/20/2006 6:16 PM
Copper	8.02	2.30		mg/Kg	75456	1	9/20/2006 6:16 PM
Lead	7.91	4.60		mg/Kg	75456	1	9/20/2006 6:16 PM
Nickel	BRL	4.60		mg/Kg	75456	1	9/20/2006 6:16 PM
Selenium	BRL	4.60		mg/Kg	75456	1	9/20/2006 6:16 PM
Silver	BRL	2.30		mg/Kg	75456	1	9/20/2006 6:16 PM
Thallium	BRL	4.60		mg/Kg	75456	1	9/20/2006 6:16 PM
Zinc	18.4	4.60		mg/Kg	75456	1	9/20/2006 6:16 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.0998		mg/Kg	75484	1	9/20/2006 7:31 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Acenaphthylene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Acenaphthene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Fluorene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Phenanthrene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Benz(a)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Chrysene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 6:10 PM
Surr: 2-Fluorobiphenyl	84.2	58-120		%REC	75372	1	9/20/2006 6:10 PM
Surr: 4-Terphenyl-d14	83.1	60.2-120		%REC	75372	1	9/20/2006 6:10 PM
Surr: Nitrobenzene-d5	74.2	47.9-120		%REC	75372	1	9/20/2006 6:10 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-009

Client Sample ID: SS-10
Collection Date: 9/13/2006 11:50:00 AM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.71		mg/Kg	75456	1	9/20/2006 7:08 PM
Arsenic	BRL	4.71		mg/Kg	75456	1	9/20/2006 7:08 PM
Beryllium	BRL	2.35		mg/Kg	75456	1	9/20/2006 7:08 PM
Cadmium	BRL	2.35		mg/Kg	75456	1	9/20/2006 7:08 PM
Chromium	8.00	2.35		mg/Kg	75456	1	9/20/2006 7:08 PM
Copper	11.1	2.35		mg/Kg	75456	1	9/20/2006 7:08 PM
Lead	9.20	4.71		mg/Kg	75456	1	9/20/2006 7:08 PM
Nickel	BRL	4.71		mg/Kg	75456	1	9/20/2006 7:08 PM
Selenium	BRL	4.71		mg/Kg	75456	1	9/20/2006 7:08 PM
Silver	BRL	2.35		mg/Kg	75456	1	9/20/2006 7:08 PM
Thallium	BRL	4.71		mg/Kg	75456	1	9/20/2006 7:08 PM
Zinc	24.3	4.71		mg/Kg	75456	1	9/20/2006 7:08 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.100		mg/Kg	75484	1	9/20/2006 7:33 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Acenaphthylene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Acenaphthene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Fluorene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Phenanthrene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Anthracene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Fluoranthene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Pyrene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Benz(a)anthracene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Chrysene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75372	1	9/19/2006 4:56 PM
Surr: 2-Fluorobiphenyl	70.6	58-120		%REC	75372	1	9/19/2006 4:56 PM
Surr: 4-Terphenyl-d14	73.9	60.2-120		%REC	75372	1	9/19/2006 4:56 PM
Surr: Nitrobenzene-d5	70.7	47.9-120		%REC	75372	1	9/19/2006 4:56 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-010

Client Sample ID: SS-11
Collection Date: 9/13/2006 12:30:00 PM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.68		mg/Kg	75456	1	9/20/2006 7:10 PM
Arsenic	5.43	4.68		mg/Kg	75456	1	9/20/2006 7:10 PM
Beryllium	BRL	2.34		mg/Kg	75456	1	9/20/2006 7:10 PM
Cadmium	BRL	2.34		mg/Kg	75456	1	9/20/2006 7:10 PM
Chromium	24.2	2.34		mg/Kg	75456	1	9/20/2006 7:10 PM
Copper	7.53	2.34		mg/Kg	75456	1	9/20/2006 7:10 PM
Lead	7.55	4.68		mg/Kg	75456	1	9/20/2006 7:10 PM
Nickel	BRL	4.68		mg/Kg	75456	1	9/20/2006 7:10 PM
Selenium	BRL	4.68		mg/Kg	75456	1	9/20/2006 7:10 PM
Silver	BRL	2.34		mg/Kg	75456	1	9/20/2006 7:10 PM
Thallium	BRL	4.68		mg/Kg	75456	1	9/20/2006 7:10 PM
Zinc	24.5	4.68		mg/Kg	75456	1	9/20/2006 7:10 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.100		mg/Kg	75484	1	9/20/2006 7:36 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Acenaphthylene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Acenaphthene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Fluorene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Phenanthrene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Benz(a)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Chrysene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 6:39 PM
Surr: 2-Fluorobiphenyl	70.7	58-120		%REC	75372	1	9/20/2006 6:39 PM
Surr: 4-Terphenyl-d14	75.1	60.2-120		%REC	75372	1	9/20/2006 6:39 PM
Surr: Nitrobenzene-d5	62.7	47.9-120		%REC	75372	1	9/20/2006 6:39 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-011

Client Sample ID: SS-12
Collection Date: 9/13/2006 3:45:00 PM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	5.00		mg/Kg	75456	1	9/20/2006 7:13 PM
Arsenic	19.6	5.00		mg/Kg	75456	1	9/20/2006 7:13 PM
Beryllium	BRL	2.50		mg/Kg	75456	1	9/20/2006 7:13 PM
Cadmium	BRL	2.50		mg/Kg	75456	1	9/20/2006 7:13 PM
Chromium	18.7	2.50		mg/Kg	75456	1	9/20/2006 7:13 PM
Copper	17.5	2.50		mg/Kg	75456	1	9/20/2006 7:13 PM
Lead	13.9	5.00		mg/Kg	75456	1	9/20/2006 7:13 PM
Nickel	11.9	5.00		mg/Kg	75456	1	9/20/2006 7:13 PM
Selenium	BRL	5.00		mg/Kg	75456	1	9/20/2006 7:13 PM
Silver	BRL	2.50		mg/Kg	75456	1	9/20/2006 7:13 PM
Thallium	BRL	5.00		mg/Kg	75456	1	9/20/2006 7:13 PM
Zinc	40.5	5.00		mg/Kg	75456	1	9/20/2006 7:13 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.100		mg/Kg	75484	1	9/20/2006 7:42 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Acenaphthylene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Acenaphthene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Fluorene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Phenanthrene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Benz(a)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Chrysene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75372	1	9/20/2006 2:36 PM
Surr: 2-Fluorobiphenyl	73.0	58-120		%REC	75372	1	9/20/2006 2:36 PM
Surr: 4-Terphenyl-d14	78.9	60.2-120		%REC	75372	1	9/20/2006 2:36 PM
Surr: Nitrobenzene-d5	69.3	47.9-120		%REC	75372	1	9/20/2006 2:36 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- BRL Below Reporting Limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated Method Blank
- E Estimated (Value above quantitation range)
- S Surrogate Recovery outside accepted recovery limits
- Narr See Case Narrative
- NC Not Confirmed

Analytical Environmental Services, Inc.

Date: *22-Sep-06*

CLIENT: Gallet & Associates, Inc.
Project: Helena Bypass WQ
Lab ID: 0609841-012

Client Sample ID: SS-13
Collection Date: 9/13/2006 4:20:00 PM
Matrix: SOIL

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
METALS, TOTAL		**SW6010B**			**(SW3050B)**		Analyst: **LKW**
Antimony	BRL	4.87		mg/Kg	75456	1	9/20/2006 7:16 PM
Arsenic	7.05	4.87		mg/Kg	75456	1	9/20/2006 7:16 PM
Beryllium	BRL	2.43		mg/Kg	75456	1	9/20/2006 7:16 PM
Cadmium	BRL	2.43		mg/Kg	75456	1	9/20/2006 7:16 PM
Chromium	11.3	2.43		mg/Kg	75456	1	9/20/2006 7:16 PM
Copper	10.6	2.43		mg/Kg	75456	1	9/20/2006 7:16 PM
Lead	10.2	4.87		mg/Kg	75456	1	9/20/2006 7:16 PM
Nickel	8.71	4.87		mg/Kg	75456	1	9/20/2006 7:16 PM
Selenium	BRL	4.87		mg/Kg	75456	1	9/20/2006 7:16 PM
Silver	BRL	2.43		mg/Kg	75456	1	9/20/2006 7:16 PM
Thallium	BRL	4.87		mg/Kg	75456	1	9/20/2006 7:16 PM
Zinc	41.8	4.87		mg/Kg	75456	1	9/20/2006 7:16 PM
TOTAL MERCURY		**SW7471A**			**(SW7471A)**		Analyst: **VA**
Mercury	BRL	0.0998		mg/Kg	75484	1	9/20/2006 7:44 PM
POLYAROMATIC HYDROCARBONS		**SW8270C**			**(SW3550)**		Analyst: **DA**
Naphthalene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Acenaphthylene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
1-Methylnaphthalene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
2-Methylnaphthalene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Acenaphthene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Fluorene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Phenanthrene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Anthracene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Fluoranthene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Pyrene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Benz(a)anthracene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Chrysene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Benzo(b)fluoranthene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Benzo(k)fluoranthene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Benzo(a)pyrene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Dibenz(a,h)anthracene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Benzo(g,h,i)perylene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Indeno(1,2,3-cd)pyrene	BRL	330		µg/Kg	75481	1	9/20/2006 7:07 PM
Surr: 2-Fluorobiphenyl	84.2	58-120		%REC	75481	1	9/20/2006 7:07 PM
Surr: 4-Terphenyl-d14	84.7	60.2-120		%REC	75481	1	9/20/2006 7:07 PM
Surr: Nitrobenzene-d5	84.6	47.9-120		%REC	75481	1	9/20/2006 7:07 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level
BRL	Below Reporting Limit
H	Holding times for preparation or analysis exceeded
N	Analyte not NELAC certified
B	Analyte detected in the associated Method Blank
E	Estimated (Value above quantitation range)
S	Surrogate Recovery outside accepted recovery limits
Narr	See Case Narrative
NC	Not Confirmed

Errata Sheet

The information on Page 9 for Alternate II is to be replaced with the following:

Alternate II (300’ width)

Stream / Wetland	**Distance / Acreage**
Stream 1	1,000’ x 2’= 0.05 ac. intermittent stream
Stream 1 (change in type)	2,385’x 2’= 0.11 ac. ephemeral stream
Wetland A	400' x 10' = 0.01 acre
Stream 5	3’ x 300’ = 0.02 acre perennial stream
Tributary of Stream 5	2’ x 300’ = 0.01 acre ephemeral stream
Stream 6	3’ x 300’ = 0.02 acre ephemeral stream
Buck Creek	No anticipated impact (to be bridged)
Tributary of Stream 10	2’ x 300’ = 0.01 acre ephemeral stream

January 11, 2007

Solid Civil Design, LLC
One Chase Corporate Center, Suite 400
Birmingham, Alabama 35244

Attention: Mr. Greg Lowe,
Executive Vice-President

Re: Wetland Impacts Assessment
Proposed Helena Bypass
Helena, Shelby County, Alabama
Project No.: 06BHSOL0201E

Dear Mr. Lowe:

Gallet & Associates, Inc. (Gallet) has completed the authorized Wetland Impacts Assessment for the above-referenced project. The purpose of this assessment was to identify wetlands and/or other waters (e.g., stream, creeks, ponds, and lakes) within the proposed Helena Bypass study area, subject to federal permitting authority under Section 404 of the Clean Water Act of 1977 (33 USC 1344), as amended. This assessment has been conducted in general accordance with guidelines established in the U.S. Army *Corps of Engineers Wetlands Delineation Manual* (Technical Report Y-87-1) and the Federal Highway Administration Technical Advisory T 6640.8A guidance document. Please note delineation of identified areas was not included in the scope of this assessment.

This assessment has been prepared for the sole use of Solid Civil Design, LLC, subject to the terms and conditions of the accepted proposal (Proposal No. 06E-0348R, dated August 15, 2006) between Solid Civil Design, LLC and Gallet.

1.0 STUDY AREA LOCATION AND DESCRIPTION

The study area is located north of downtown Helena and to the east-southeast of the Cahaba River. The study area is depicted on the United States Geological Survey (USGS) 7.5-minute Topographic Quadrangle *Helena, Alabama,* dated 1959, photoinspected in 1986 and photorevised in 1988. The area is located in portions of Sections 2, 3, 9, 10, 11, 15, 16, and 21, Township 20 South, Range 3 West. A location map depicting the study area boundaries and two alternative bypass routes (Alternates I and II) is attached as Figure 1.

The study area comprises approximately 1,680 acres of predominantly undeveloped, wooded land. Topography for the majority of the area is moderately to steeply sloping, with gently to moderately sloping topography in the northeast part of the study area. Buck Creek intersects the south-central part of the study area, flowing in a northwesterly direction towards its confluence with the Cahaba River, located approximately 1,000 feet to the north-northwest of the study area. Several unnamed tributaries of Buck Creek and the Cahaba River also originate in the study area or flow through the study area. An aerial photograph depicting the study area obtained from Google Earth is attached as Figure 2.

2.0 METHODOLOGY

To be considered jurisdictional an area must exhibit the three criteria (hydric soils, a dominance of wetland vegetation, and wetland hydrology) defined in the *Corps of Engineers Wetlands Delineation Manual* (Technical Report Y-87-1), or consist of flowing/open water, with a defined bed and bank.

2.1 Soil Characteristics

A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (1 to 10 inches). Soil samples were collected in the area of investigation to determine if hydric soils were present. Samples were excavated within potential wetland area with a soil auger to a depth of approximately 16 inches. Soil samples were collected immediately below the A horizon or within the upper 10 inches, whichever depth was more shallow.

A *Munsell Soil Color Chart* was used to profile soil colors. The *Munsell Soil Color Chart* assigns Hue, Value, and Chroma classifications to soils. The Hue notation indicates its relation to red, yellow, green, and purple; the Value notation indicates its lightness; and the Chroma notation indicates its strength (or departure from a neutral of the same lightness). Chromas of 0 or 1 are usually indicative of hydric soils. Chromas of 2 accompanied by strong mottling are also indicative of hydric soils.

2.2 Vegetative Composition

In order to establish whether a community is dominated by wetland or upland vegetation, each plant species is assigned to a specific category. Facultative Upland (FACU), Facultative (FAC), Facultative Wetland (FACW), and Obligate (OBL) are wetland indicator status categories that represent a plant species' estimated probability of occurring in a wetland. For example, the FACU category includes plant species that have a probability of naturally occurring in a wetland of 33 percent or less. A plant species in the FAC category has an estimated 33 to 66 percent probability of occurring in a wetland under natural conditions. The FACW category represents those species that occur in wetlands 66 to 99 percent of the time, and the OBL category represents those species occurring in wetlands more than 99 percent of the time. Plus (+) and minus (-) signs are

indicative of a species that falls within the extreme upper (+) or lower (-) percentile range of each category. Areas containing at least 50% of FAC or wetter vegetation are considered hydric communities.

2.3 Hydrology Indicators

Primary indicators of wetland hydrology consist of defined drainage patterns, inundation or soil saturation in the upper 12 inches, drift lines, sediment deposits, and watermarks (on tree trunks). Secondary indicators of wetland hydrology consist of oxidized root zones in the upper 12 inches of the soil, water stained leaves, and local soil survey data.

3.0 SOIL SURVEY INFORMATION

Gallet conducted off-site research in order to identify potential wetland areas study area prior to the site assessment. Soils information provided in the United States Department of Agriculture (USDA) *Soil Survey of Shelby County, Alabama* (issued July 1984) was reviewed to determine the soil units mapped for the study area. According to the soil survey, the site is underlain by Choccolocco loam, occasionally flooded; Dewey clay loam, 2 to 6 percent slopes; Dewey clay loam, 6 to 10 percent slopes; Nauvoo-Sunlight complex, 15 to 25 percent slopes; Townley-Sunlight complex, 12 to 35 percent slopes; and Tupelo-Dewey complex. A copy of the soil survey map, obtained from the National Resources Conservation Service (NRCS) web soil survey, depicting individual mapping units within the study area is attached as Figure 3.

Gallet reviewed the NRCS list of hydric soils for Shelby County to determine the classification of the study area soils. According to the NRCS list, all of the study area soils, with the exception of Dewey clay loam, 2 to 6 percent slopes, have hydric components found in surface water drainageways. The Tupelo-Dewey complex soil mapping unit has hydric components found in topographic depressions in addition to drainageways.

4.0 National Wetland Inventory (NWI) Map

Gallet review the United States Fish and Wildlife Service (USFWS) *Helena, Alabama* NWI map to determine if documented wetland areas were present in the study area. A copy of the NWI map depicting the study area is attached as Figure 4. The NWI map depicts six wetland areas within the study area. For the purposes of this assessment, Gallet has highlighted both jurisdictional waters denoted on the NWI map, the *Helena, Alabama* topographic quadrangle, and those observed during our reconnaissance of the study area (Figure 5). Wetlands are identified by alphabetical characters (A through E), and stream/creeks are identified by numerical characters (1 through 10). For the purpose of this assessment only intermittent and perennial streams were assigned numerical designations. Ephemeral streams observed during our assessment of the study area are depicted on Figure 5; however, these streams were not assigned numerical designations.

An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During periods of low or no precipitation, intermittent streams may not have flowing water. Surface water runoff from rainfall is a supplemental source of water for stream flow. A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for perennial stream flow, and surface water runoff from rainfall is a supplemental source of water flow. An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

5.0 FIELD INVESTIGATION

Gallet assessed the study area during the month of September and again in December to verify and evaluate wetlands and other waters depicted on Figure 5. Our evaluation of each identified wetland/water is provided below. U.S. Army Corps of Engineers (Corps) *Routine Wetland Determination Data Forms* for the identified wetland area are attached.

Stream 1

Stream 1 is depicted on the *Helena, Alabama* topographic quadrangle as a perennial stream. However, based on field observations, Stream 1 functions as an intermittently flowing tributary in the northern portion of the study area and converts to an ephemeral flow closer to Buck Creek. The upper reach of this stream is concrete flume. Stream 1 also includes an approximately 450 linear feet unnamed tributary that flows into the main channel. The upper reach of this stream has been impacted through agricultural land use and quarrying. Approximately 2,385 linear feet of the stream within the study area has been re-directed and straightened. Due to apparent dewatering from the adjacent quarry, the majority of the re-directed stream bank is often dry. It is the opinion of Gallet, based on the existing conditions and previous land use, this stream currently provides minimal wildlife habitat.

Streams 2 through 4

Streams 2 through 4 are intermittent streams located in wooded, undeveloped portions of the study area. The portion of Stream 2 flowing through the study area is the headwaters of a larger off-site unnamed tributary of the Cahaba River. The stream flows generally north through wooded and residentially developed land. It is the opinion of Gallet this stream provides low to moderate wildlife habitat based on the intermittent classification and the proximity to residential development. Streams 3 and 4 are the headwaters of secondary unnamed tributaries of the Cahaba River. The streams flow generally northwest through wooded, undeveloped land. It is the opinion of Gallet these streams currently provide moderate wildlife habitat based on their intermittent classification.

Stream 5

Stream 5 is an intermittent/perennial stream that flows generally south-southwest through the northeastern part of the site. The stream originates and flows through a portion of the study area previously used for agricultural use and more recently utilized by a quarrying operation. Based on the *Helena, Alabama* topographic quadrangle and recent aerial photographs of the study area, it appears approximately 2,000 feet of the original head waters of this stream have been impacted by the quarrying operation, including the possible relocation/piping of the streambed. The impacted headwaters were associated with a wetland area identified on the *Helena, Alabama*, which also appears to no longer be present. It is the opinion of Gallet, based on the existing conditions and previous land use, this stream currently provides minimal wildlife habitat.

Streams 6 and 7

Streams 6 and 7 are intermittent streams that flow generally southwest through wooded, undeveloped land into Buck Creek. It is the opinion of Gallet these streams currently provide moderate wildlife habitat based on their intermittent classification.

Stream 8

Stream 8 is an intermittent stream that that originates within the study area and flows generally south through the central part of the study area into Buck Creek. The stream is located in a wooded, undeveloped portion of the study area; however, city park land, residential development and County Road 261 are located in proximity to the stream. The headwaters of this stream have been converted into an apparent man-made pond. Based on nearby development and its intermittent classification, it the opinion of Gallet this stream provides minimal to moderate wildlife habitat.

Stream 9

Stream 9 is an intermittent stream that originates within the study area and flows northeast through the western part of the study area into Buck Creek. The stream flows through partially wooded, undeveloped land and land recently developed as residential subdivision. Based on nearby development and its intermittent classification, it the opinion of Gallet this stream provides minimal to moderate wildlife habitat.

Stream 10

Stream 8 is an intermittent stream that flows north-northeast through the western part of the study area into Buck Creek. The stream is located in a partially wooded, undeveloped portion of the study area. However, existing topography in this part of the study area appears to have been altered during previous land use (mining). A residential subdivision has been recently developed adjacent east of Stream 8. It is the opinion of Gallet this

stream currently provides moderate wildlife habitat based on its intermittent classification and the presence of the residential subdivision.

Buck Creek

Buck Creek extends through the south-central portion of the study area, flowing generally northwest towards the Cahaba River. The creek flows through a wooded, undeveloped portion of the site. It is the opinion of Gallet this portion of Buck Creek provides good wildlife habitat based on its perennial classification and undeveloped adjoining land.

Wetland A

Wetland A extends along Stream 1. According to the USFWS *Cowardin* classification system, this area is a palustrine, emergent, persistent, temporary wetland. Palustrine wetlands include all non-tidal wetlands dominated by trees, shrubs, persistent emergents (herbaceous vegetation), emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5%. Palustrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes. They may also occur as islands in lakes or rivers. The "emergent" modifier is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. Persistent emergent wetlands are dominated by species that normally remain standing at least until the beginning of the next growing season. The "temporary" modifier indicates surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season. Plants that grow both in uplands and wetlands are characteristic of the temporarily flooded regime.

Because this wetland occurs in a pasture, it is considered previously converted and non-jurisdictional so long as the wetland vicinity is being utilized as pasture. Hydric soils and evidence of wetland hydrology were observed during our assessment; however, vegetation was altered due to frequent grazing and maintenance (i.e., mowing). It is the opinion of Gallet this wetland area currently exhibits little biological and habitat function due to the past agricultural activity. However, the area does function to a limited extent as storm water storage.

Wetland B

Wetland B comprises two areas located in the upper reaches of Stream 8. According to the USFWS *Cowardin* classification system, these areas are palustrine, open water, permanent, diked/impounded wetland. The wetland areas are located in a wooded, undeveloped portion of the study area; however, city park land, residential development and County Road 261 are located in close proximity. The upper wetland are is an apparent man-made pond. All three wetland criteria were observed during our assessment along the northern half of the pond. For the lower wetland area, existing

conditions appear to be the result of previous land use activity. Wetland hydrology is provided by Stream 8. Based on nearby development previous land alteration, it the opinion of Gallet this stream provides minimal to moderate wildlife habitat and localized stormwater runoff retention prior to discharging into Stream 8.

Wetland C

Wetland C comprises flood plain located along Buck Creek. This area is not identified on the NWI map. According to the USFWS *Cowardin* classification system, Gallet has evaluated this area as palustrine, forested, broad-leaved deciduous, seasonal. All three wetland criteria were observed during our assessment. Based on our field assessment, this area appears to provide good wildlife habitat and provides minimal flood control of Buck Creek.

Wetland D

Wetland D comprises two areas associated with Stream 8 and adjacent of Buck Creek. According to the USFWS *Cowardin* classification system, the smaller of the two areas is a palustrine, forested, broad-leaved deciduous, semi-permanent, diked/impounded wetland. The larger of the two is a palustrine, emergent/shrub scrub, broad-leaved deciduous, temporary wetland. All three wetland criteria were observed during our assessment; however, the hydrology appears to have been altered through previous land use/alteration. The abandoned Louisville and Nashville (L & N) railroad spur that runs adjacent to the wetland areas and the active L & N railroad located adjacent north of the areas appear to be impounding surface water. Based on our field assessment, the wetlands appear to provide moderate wildlife habitat and localized stormwater runoff retention prior to discharging into Stream 8 and Buck Creek.

Wetland E

Wetland E comprises an area located in the headwaters of Stream 8. This area is not identified on the NWI map. According to the USFWS *Cowardin* classification system, Gallet has evaluated this area as palustrine, forested, broad-leaved deciduous, semi-permanent, diked/impounded wetland. All three wetland criteria were observed during our assessment; however, the hydrology appears to have been altered through previous land use/alteration from mining. The L & N railroad spur that runs adjacent east of the wetland appears to be impounding surface water. A residential subdivision has been recently developed adjacent east of Stream 8 and the wetland. Based on our field assessment, the wetlands appear to provide moderate wildlife habitat and localized stormwater runoff retention prior to discharging into Stream 8.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on this wetland impact assessment, it appears Alternate I for the proposed bypass will cross Stream 1, Wetland A, Stream 3, Stream 4 (including an ephemeral tributary of

Stream 4), and Buck Creek, and an ephemeral tributary of Stream 10. Of these potential impacts, only the crossing of Streams 3 and 4 will result in impacts to undisturbed systems. Stream 1 and the associated Wetland A currently provide little to no wildlife habitat function. Streams 3 and 4, though undisturbed, offer only moderate habitat function due to their intermittent classification. Based on project discussions, it is our understanding Buck Creek and the adjoining flood plain will be bridged. Impacts (e.g., bridge supports) to this area should be minimal at most. It is the opinion of Gallet, therefore, the construction of Alternate I will result in minimal impact to wetlands and/or other waters located within the study area.

Alternate II for the proposed bypass will follow a portion of the existing County Road 261, then veer west into the study area to cross Stream 1, Stream 5, an unnamed ephemeral tributary, ephemeral headwaters of Stream 6, and tie into Alternate I at Buck Creek. Based on Figure 5, Alternate II will result in potential impacts along the length of Wetland A as part of the County Road 261 widening and approximately 2,385 linear feet of rerouted Stream 1 that now parallels the western side of County Road 261. However, do to the degraded conditions of Stream 1, cumulative impacts would be minimal.

Estimated potential impacts for each alternate route according to Figure 5 are provided below.

Estimated Impacts

Alternate I (300' width)

Stream/Wetland	Distance/Acreage
Stream 1	2' x 300' = 0.01 acre intermittent stream 2' x 300' = 0.01 acre intermittent stream
Wetland A	250' x 300' = 1.72 acres
Stream 3	2' x 300' = 0.01 acre intermittent stream
Stream 4	3' x 300' = 0.02 acre intermittent stream 2' x 780' = 0.04 acre ephemeral stream
Buck Creek	no anticipated impact
Ephemeral tributary of Stream 10	2' x 300' = 0.01 acre ephemeral stream

Alternate II (300' width)

Stream/Wetland	Distance/Acreage
Stream 1	1,000' intermittent stream 2,385' ephemeral stream (0.16 acre)
Wetland A	400' x 10' = 0.01 acre
Stream 5	3' x 300' = 0.02 acre perennial stream
Unnamed ephemeral Tributary	2' x 300' = 0.01 acre ephemeral stream
Stream 6	3' x 300' = 0.02 acre ephemeral stream

Based on our assessment, impacts to jurisdictional waters for both Alternate I and Alternate II will require United States Army Corps of Engineers permit authorization. Typically, for public roadway construction projects, impacts to jurisdictional waters can be authorized under Nationwide Permit (NWP) 14 *Linear Transportation Crossings*. NWPs are general issue permits created by the Corps for common use throughout the United States. If a proposed activity meets the terms and conditions for one or more of the nationwide permits, the specified activity may be authorized through a NWP without a complex Individual Permit review. NWP 14 allows discharges of dredged or fill material into as much as 0.50-acre of jurisdictional waters (wetland and streambed) or 200 linear feet of streambed. This permit can be used multiple times on a roadway project so long as each crossing involves a water body crossing separate from the others (i.e., different streams and wetlands). A Pre-Construction Notification (PCN) form and a delineation of the affected area must be submitted to the Corps prior to the disturbance of such waters. The PCN process is designed to be a 30- to 45-day review period in which the Corps will issue a notice for the proposed project to receive input from the natural resource agencies. After the review period, a response regarding whether the permit is granted or denied is issued by the Corps.

Based on the estimated impacts provided on the previous page, both route alternatives currently exceed the size limitations of NWP 14 due to impacts associated with Stream 1 and Wetland A. Alternate I would impact and estimated 1.72 acres of Wetland A. Impacts to Wetland A can be minimized or avoided all together by shifting Alternate I to the south. Alternate II, as proposed, would impact an estimated approximately 1,000 linear feet of intermittent streambed for Stream 1 and approximately 2,385 linear feet of ephemeral streambed. Impacts to Stream 1 can be minimized or avoided by shifting the center line of the proposed route alternative approximately 50 feet to the east. Impact

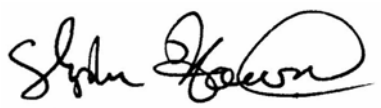
estimates for all other water body crossings associated with this route alternative would qualify individually for authorization under NWP 14.

Discharges of dredged or fill material into greater than 0.50 acre of wetland, or the disturbance of more than 200 linear feet of streambed, would fall under IP review. IPs are processed through a public interest review procedure, and therefore, are subjected to the most extensive review process. An IP requires a PCN and an *Alternative Analysis Report* describing, in detail, all exhausted alternative practicable efforts prior to conversion, and the need for any conversion. In addition, an evaluation and documentation of potential effects of the project on historic resources and threatened or endangered species is typically required. The Corps will issue a public notice for the proposed project, typically with a 30-day comment period, to receive input from the public and other federal, state, and local agencies. The processing time for an IP may be 180 days or more depending upon the complexity of issues encountered during the Corps' evaluation of the project.

This assessment is intended only as a preliminary planning evaluation tool and to determine if a more detailed delineation is warranted. Therefore, we recommend that the identified areas be delineated and subsequently surveyed so that the extent and exact locations may be determined.

A survey of the delineated areas should then be submitted to the Corps for verification. A verification of the delineation should then be obtained from the Corps. Please note that the actual sizes and locations of jurisdictional waters may differ from that presented in this report. All final decisions as to whether or not an area is jurisdictional are at the discretion of the Corps.

Sincerely,
GALLET & ASSOCIATES, INC.



Stephen Howard
Project Scientist

Leslie Noble
Manager, Environmental Services

Attachments: Location Map (Figure 1)
Study Area Aerial Photograph (Figure 2)
Soil Survey Map (Figure 3)
NWI Map (Figure 4)
Wetlands and Streams Location Map (Figure 5)
Wetland Determination Data Forms

INFORMATION SOURCES

1. Kollmorgen Instruments Corporation, 1994, *Munsell Soil Color Charts*, Macbeth Division, New Windsor, NY.

2. Reed, P.B. Jr., 1988, *National List of Plant Species that Occur in Wetlands: Southeast (Region 2)*, National Ecology Research Center, U.S. Fish and Wildlife Service, St. Petersburg, FL.

3. U.S. Army Corps of Engineers, 1987, *Corps of Engineers Wetlands Delineation Manual*, Environmental Laboratory, Department of the Army Waterways Experiment Station, Vicksburg, MS (Technical Report Y-87-1).

4. USGS 7.5-minute Topographic Quadrangles *Helena, Alabama,* dated 1959, photoinspected in 1986 and photorevised in 1988.

5. Aerial photograph obtained from Google Earth.

6. USDA *Soil Survey of Shelby County, Alabama*.

7. NRCS web soil survey.

8. NRCS list of hydric soils.

9. USFWS NWI map, *Helena, Alabama*.

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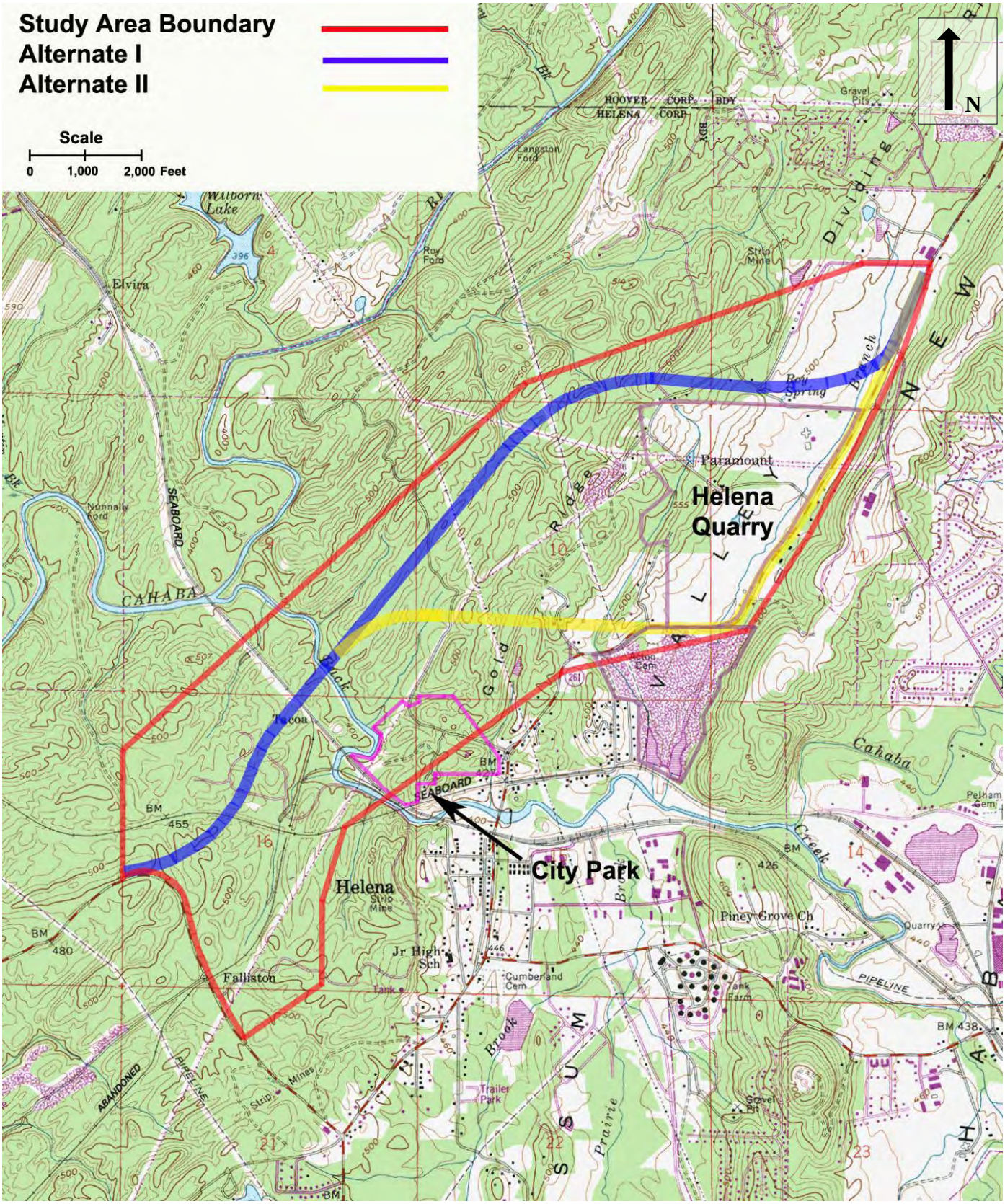
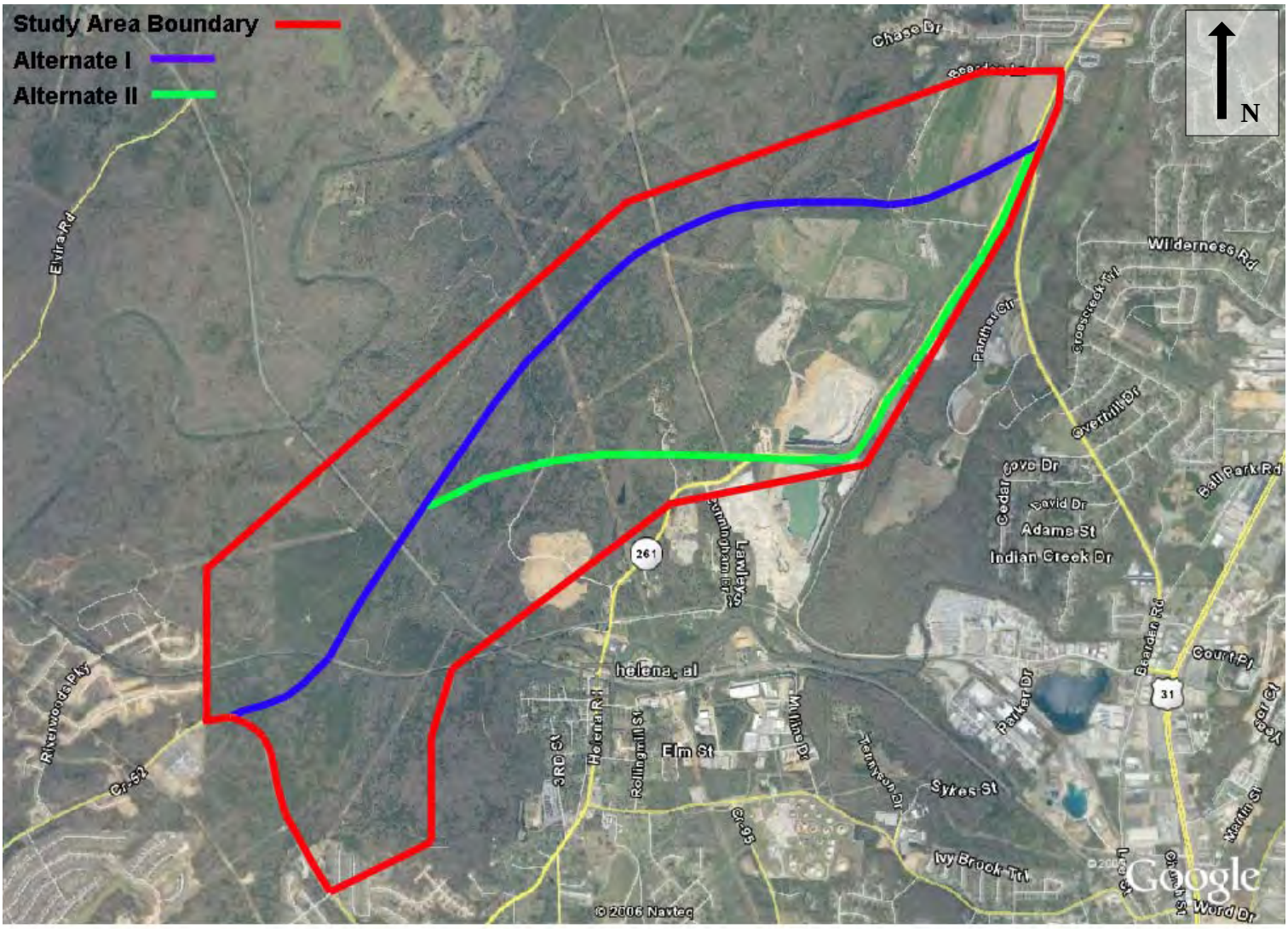
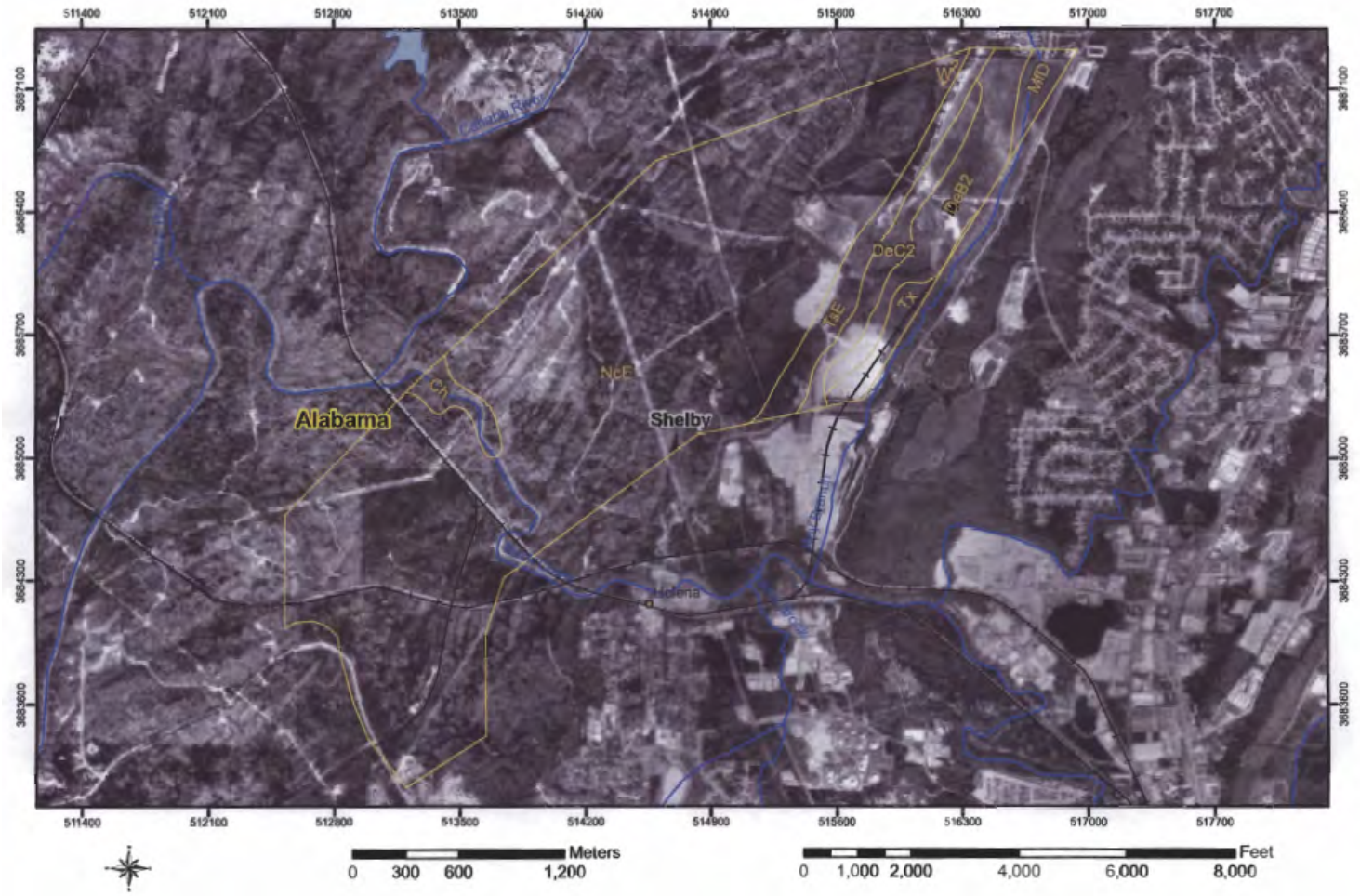


Gallet & ASSOCIATES	**PROJECT** **WETLAND IMPACTS ASSESSMENT** **PROPOSED HELENA BYPASS** **HELENA, SHELBY COUNTY, ALABAMA** **PROJECT NO.: 06BHSOL0201E**	**FIGURE 1** **SITE LOCATION MAP** USGS 7.5-MINUTE TOPOGRAPHIC QUADRANGLE *HELENA, ALABAMA*, DATED 1959, PHOTOREVISED 1986, PHOTOINSPECTED 1988 SCALE: 1” = 2000’



Gallet & ASSOCIATES	**PROJECT** **WETLAND IMPACTS ASSESSMENT** **PROPOSED HELENA BYPASS** **HELENA, SHELBY COUNTY, ALABAMA** **PROJECT NO.: 06BHSOL0201E**	**FIGURE 2** **STUDY AREA** **AERIAL PHOTOGRAPH**

SOIL SURVEY OF SHELBY COUNTY, ALABAMA



Map Unit Legend Summary

Shelby County, Alabama

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ch	Choccolocco loam, occasionally flooded	24.8	1.5
DeB2	Dewey clay loam, 2 to 6 percent slopes, eroded	104.5	6.3
DeC2	Dewey clay loam, 6 to 10 percent slopes, eroded	56.3	3.4
MfD	Minvale-Fullerton complex, 6 to 15 percent slopes	22.8	1.4
NcE	Nauvoo-Sunlight complex, 15 to 25 percent slopes	1,344.3	81.0
TsE	Townley-Sunlight complex, 12 to 35 percent slopes	77.7	4.7
Tx	Tupelo-Dewey complex	28.6	1.7
W	Water	1.4	0.1

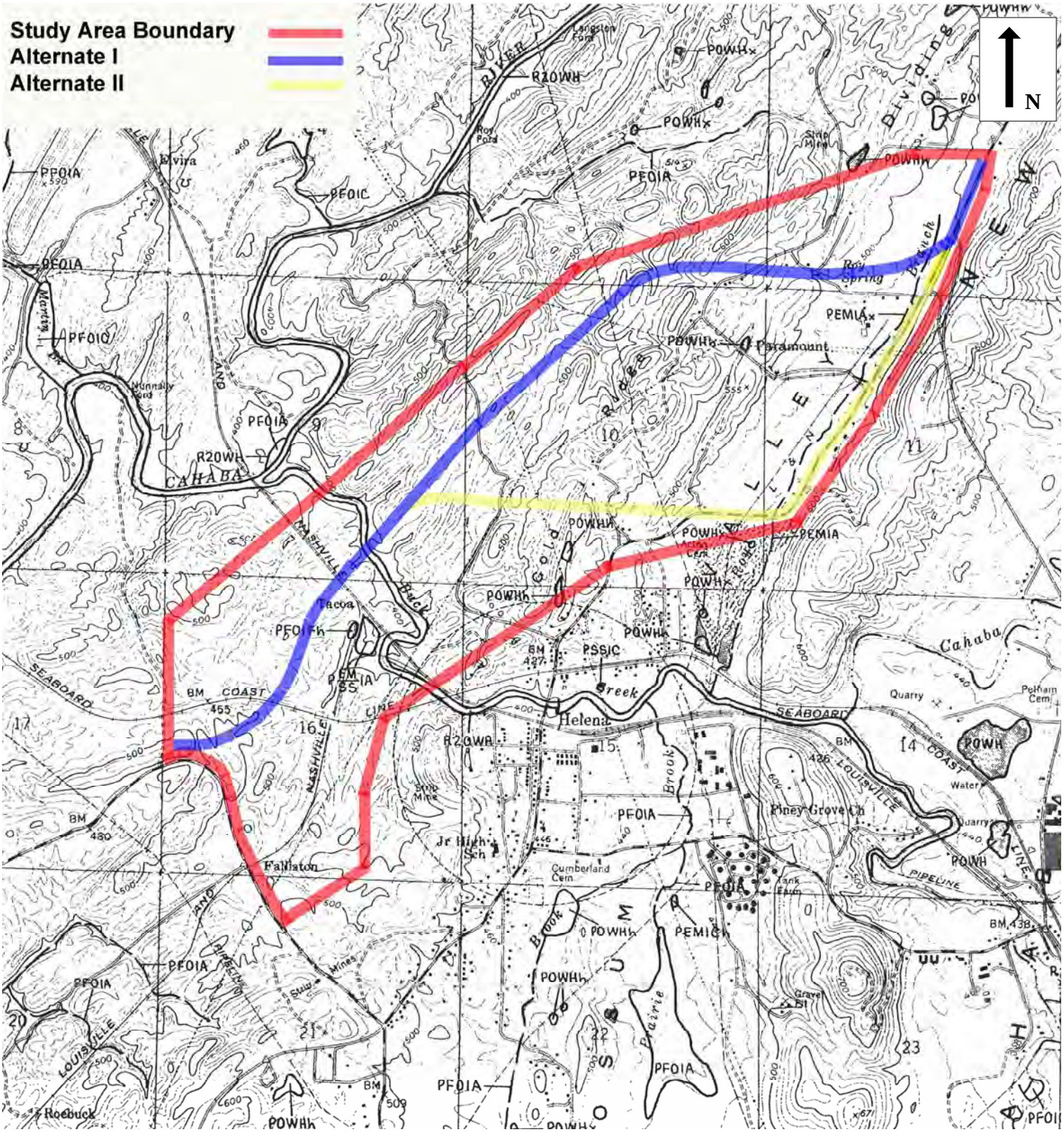
Gallet & ASSOCIATES

PROJECT

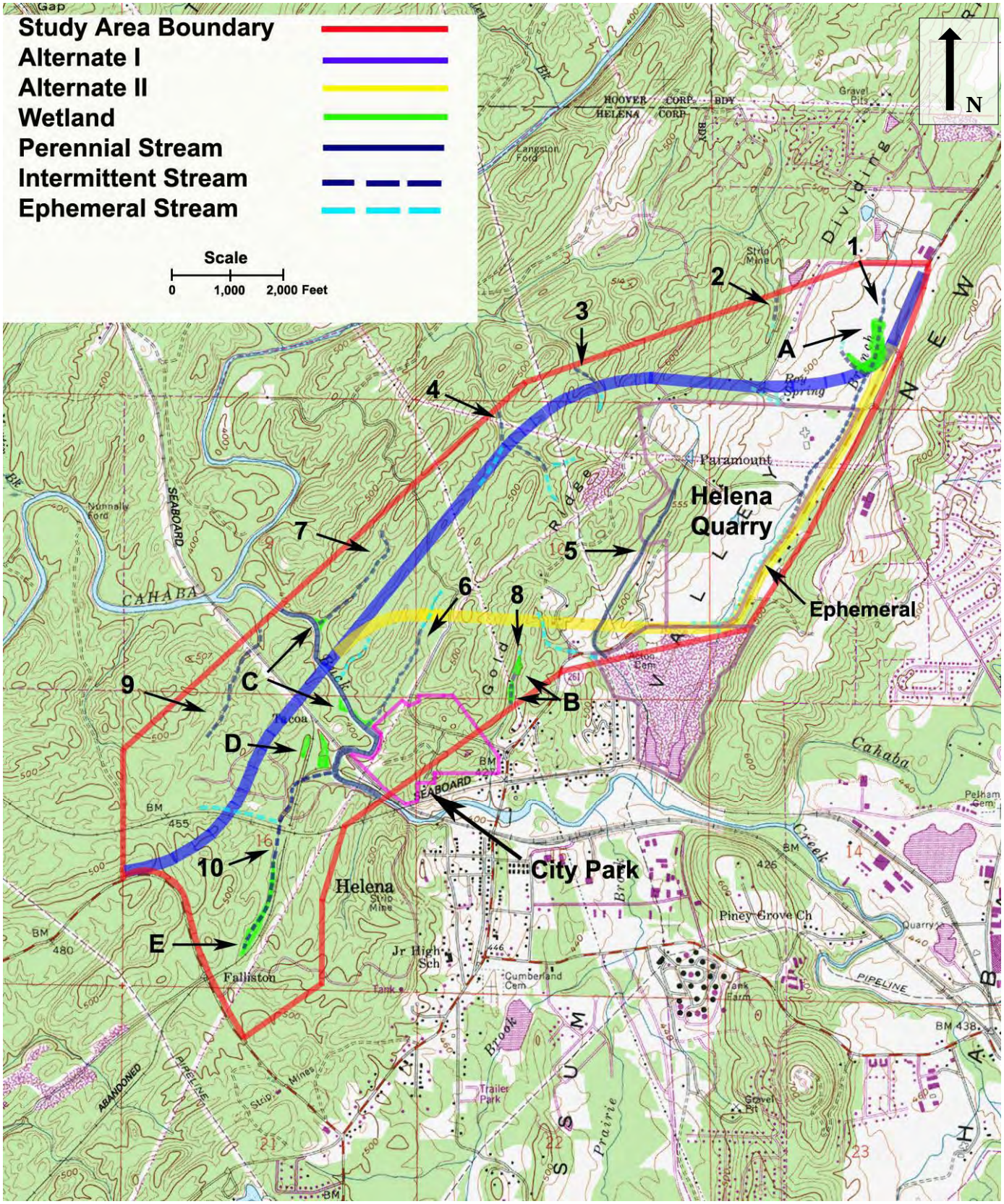
WETLAND IMPACTS ASSESSMENT
PROPOSED HELENA BYPASS
HELENA, SHELBY COUNTY, ALABAMA
PROJECT NO.: 06BHSOL0201E

FIGURE 3

SOIL SURVEY MAP



Gallet & ASSOCIATES	**PROJECT** **WETLAND IMPACTS ASSESSMENT** **PROPOSED HELENA BYPASS** **HELENA, SHELBY COUNTY, ALABAMA** **PROJECT NO.: 06BHSOL0201E**	**FIGURE 4** **NWI MAP**



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PROJECT

WETLAND IMPACTS ASSESSMENT
PROPOSED HELENA BYPASS
HELENA, SHELBY COUNTY, ALABAMA
PROJECT NO.: 06BHSOL0201E

FIGURE 5

WETLANDS AND STREAMS LOCATIONS MAP

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Proposed Helena Bypass Applicant/Owner: Solid Civil Design, LLC Investigator: Karl Peters	Date: 9/1/06 County: Shelby State: Alabama
Do Normal Circumstances exist? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: Wetland A northern part of wetland.

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix nigra	S/T	OBL	9.		
2. Juncus sp.	H	FAC-OBL	10.		
3. Ligustrum sinense	S/T	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)
>50% of Dominant Vegetation

Remarks: Sample taken within wetland area. Wetland located within a pasture. Vegetation has been consistently maintained throw either mowing and/or grazing. Therefore, natural vegetation is no longer present.

HYDROLOGY

X Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs X Other ___ No Recorded Data Available Field Observations: Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: 10 (in.) Depth to Saturated Soil: 1 (in.)	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated X Saturated in Upper 12 inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits X Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 inches ___ Water-Stained Leaves X Local Soil Survey Data X FAC-Neutral Test ___ Other (Explain in Remarks)

Remarks: Area is denoted on the *Helena, Alabama* NWI map. Soils also listed as hydric by NRCS soils list.

SOILS

Map Unit Name
(Series and Phase): Minvale-Fullerton complex, 6 to 10 percent slopes and Tupelo-Dewey complex

Drainage Class: N/A

Taxonomy (Subgroup): N/A

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-10	A	10YR 3/1	10YR 5/3	15%	Clay/Loam
>10	B	10YR 3/1	10YR 6/2	10%	Clay Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks: Wetland area is degraded due to routine maintenance (e.g., mowing) and/or grazing. Obvious wetland vegetation is limited to black willow and juncus.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Proposed Helena Bypass Applicant/Owner: Solid Civil Design, LLC Investigator: Karl Peters	Date: 9/1/06 County: Shelby State: Alabama
Do Normal Circumstances exist? No Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? Yes (If needed, explain on reverse.)	Community ID: Wetland A south part of wetland.

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix nigra	S/T	OBL	9.		
2. Juncus sp.	H	FAC-OBL	10.		
3. Ligustrum sinense	S/T	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)
>50% of Dominant Vegetation

Remarks: Sample taken within wetland area. Wetland located within a pasture. Vegetation has been consistently maintained throw either mowing and/or grazing. Therefore, natural vegetation is no longer present.

HYDROLOGY

X Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs X Other ___ No Recorded Data Available Field Observations: Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: 10 (in.) Depth to Saturated Soil: 1 (in.)	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated X Saturated in Upper 12 inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits X Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 inches ___ Water-Stained Leaves X Local Soil Survey Data X FAC-Neutral Test ___ Other (Explain in Remarks)

Remarks: Area is denoted on the *Helena, Alabama* NWI map. Soils also listed as hydric by NRCS soils list.

SOILS

Map Unit Name
(Series and Phase): Minvale-Fullerton complex, 6 to 10 percent slopes and Tupelo-Dewey complex

Drainage Class: N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-10	A	10YR 3/2	10YR 5/3	25%	Clay/Loam
>10	B	10YR 3/1	10YR 6/2	10%	Clay Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks: Wetland area is degraded due to routine maintenance (e.g., mowing) and/or grazing. Obvious wetland vegetation is limited to black willow and juncus.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Proposed Helena Bypass Applicant/Owner: Solid Civil Design, LLC Investigator: Karl Peters	Date: 9/1/06 County: Shelby State: Alabama
Do Normal Circumstances exist? No Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse.)	Community ID: Wetland B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ligustrum sinense	S/T	FAC	9. Toxicodendron radicans	H	FAC
2. Acer rubrum	T	FAC	10. Cornus florida	S	FACU
3. Pinus taeda	T	FAC	11.		
4. Smilax rotundifolia	H	FAC	12.		
5. S. bona-nox	H	FAC	13.		
6. Liquidamber styraciflua	T	FAC	14.		
7. Quercus nigra	T	FAC	15.		
8. Salix Nigra	T	OBL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)
>50% of Dominant Vegetation

Remarks: Sample taken within wetland area (north end of pond).

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- X Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: N/A (in.)

Depth to Saturated Soil: N/A (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- X Inundated
- ___ Saturated in Upper 12 inches
- X Water Marks
- ___ Drift Lines
- X Sediment Deposits
- X Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 inches
- X Water-Stained Leaves
- X Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Area is denoted on the *Helena, Alabama* NWI map. Soils also listed as hydric by NRCS soils list. Wetland areas are open water – apparently a large man-made pond.

SOILS

Map Unit Name
(Series and Phase): Nauvoo-Sunlight complex, 15 to 25 percent slopes

Drainage Class: N/A

Taxonomy (Subgroup): N/A

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-12	A	10YR 4/2	10YR 5/1	20%	Silty Clay
>12	B	10YR 4/1	10YR 5/1	10%	Clay Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Soils around wetland areas are marginal. Majority of wetland areas are standing water.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks: Wetland area has apparently been created or exaggerated due to previous land alteration.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Proposed Helena Bypass Applicant/Owner: Solid Civil Design, LLC Investigator: Karl Peters	Date: 9/1/06 County: Shelby State: Alabama
Do Normal Circumstances exist? No Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse.)	Community ID: Wetland B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ligustrum sinense	S/T	FAC	9. Toxicodendron radicans	H	FAC
2. Acer rubrum	T	FAC	10. Cornus florida	S	FACU
3. Pinus taeda	T	FAC	11.		
4. Smilax rotundifolia	H	FAC	12.		
5. S. bona-nox	H	FAC	13.		
6. Liquidamber styraciflua	T	FAC	14.		
7. Quercus nigra	T	FAC	15.		
8. Salix Nigra	T	OBL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)
>50% of Dominant Vegetation

Remarks: Sample taken within wetland area.

HYDROLOGY

X Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge X Aerial Photographs X Other ___ No Recorded Data Available Field Observations: Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: N/A (in.) Depth to Saturated Soil: N/A (in.)	Wetland Hydrology Indicators: Primary Indicators: X Inundated ___ Saturated in Upper 12 inches X Water Marks ___ Drift Lines X Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 inches X Water-Stained Leaves X Local Soil Survey Data X FAC-Neutral Test ___ Other (Explain in Remarks)

Remarks: Area is denoted on the *Helena, Alabama* NWI map. Soils also listed as hydric by NRCS soils list. Wetland areas are open water – apparently a result of land previous land alteration.

SOILS

Map Unit Name
(Series and Phase): Nauvoo-Sunlight complex, 15 to 25 percent slopes

Drainage Class: N/A

Taxonomy (Subgroup): N/A

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-12	A	10YR 5/2	10YR 5/3	15%	Silty Clay
>12	B	10YR 4/2	10YR 5/2	10%	Clay Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Soils around wetland areas are marginal. Majority of wetland areas are standing water.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks: Wetland area has apparently been created or exaggerated due to previous land alteration.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Proposed Helena Bypass Applicant/Owner: Solid Civil Design, LLC Investigator: Karl Peters	Date: 9/12/06 County: Shelby State: Alabama
Do Normal Circumstances exist? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse.)	Community ID: Wetland C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ligustrum sinense	S/T	FAC	9.		
2. Acer rubrum	T	FAC	10.		
3. Liriodendron tulipifera	T	FAC	11.		
4. Toxicodendron radicans	H	FAC	12.		
5. Quercus nigra	T	FAC	13.		
6. Liquidamber styraciflua	T	FAC	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)
>50% of Dominant Vegetation

Remarks: Sample taken within wetland area.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: 6 (in.)

Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 inches
- X Water Marks
- X Drift Lines
- X Sediment Deposits
- X Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 inches
- X Water-Stained Leaves
- X Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Soils listed as hydric by NRCS soils list. Wetland area within flood plain of Buck Creek.

SOILS

Map Unit Name
(Series and Phase): Choccolocco loam, occasionally flooded

Drainage Class: N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-14	A	10YR 4/2	10YR 6/1	15%	Sandy Silt Clay
>14	B	10YR 3/1	10YR 5/1	10%	Sandy Clay

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
X Reducing Conditions
X Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
X Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Soils within flood plain area marginally hydric with indications of a fluctuating water table.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ligustrum sinense	S/T	FAC	9.		
2. Acer rubrum	T	FAC	10.		
3. Liriodendron tulipifera	T	FAC	11.		
4. Toxicodendron radicans	H	FAC	12.		
5. Quercus nigra	T	FAC	13.		
6. Liquidamber styraciflua	T	FAC	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)
>50% of Dominant Vegetation

Remarks: Sample taken within wetland area.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: 6 (in.)

Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 inches
- X Water Marks
- X Drift Lines
- X Sediment Deposits
- X Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 inches
- X Water-Stained Leaves
- X Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Soils listed as hydric by NRCS soils list. Wetland area within flood plain of Buck Creek.

SOILS

Map Unit Name
(Series and Phase): Choccolocco loam, occasionally flooded

Drainage Class: N/A

Field Observations

Taxonomy (Subgroup): N/A

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-14	A	10YR 4/2	10YR 6/1	15%	Sandy Silt Clay
>14	B	10YR 3/1	10YR 5/1	10%	Sandy Clay

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
X Reducing Conditions
X Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
X Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Soils within flood plain area marginally hydric with indications of a fluctuating water table.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Proposed Helena Bypass Applicant/Owner: Solid Civil Design, LLC Investigator: Karl Peters	Date: 9/12/06 County: Shelby State: Alabama
Do Normal Circumstances exist? No Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse.)	Community ID: Wetland D

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ligustrum sinense	S/T	FAC	9. Pinus taeda	T	FAC
2. Acer rubrum	T	FAC	10. Q. phellos	T	FACW
3. Toxicodendron radicans	H	FAC	11. Juncus sp.	H	FAC-OBL
4. Smilax rotundifolia	H	FAC	12.		
5. S. bona-nox	H	FAC	13.		
6. Liquidamber styraciflua	T	FAC	14.		
7. Quercus nigra	T	FAC	15.		
8. Salix Nigra	T	OBL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)
>50% of Dominant Vegetation

Remarks: Sample taken within wetland area.

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- X Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: 4-6 (in.)

Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 inches
- X Water Marks
- ___ Drift Lines
- X Sediment Deposits
- X Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 inches
- X Water-Stained Leaves
- X Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Area is denoted on the *Helena, Alabama* NWI map. Soils also listed as hydric by NRCS soils list. Wetland areas are open water – apparently a result of land previous land alteration.

SOILS

Map Unit Name
(Series and Phase): Nauvoo-Sunlight complex, 15 to 25 percent slopes

Drainage Class: N/A

Taxonomy (Subgroup): N/A

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-10	A	10YR 4/2	10YR 5/2	10%	Silty Clay
>10	B	10YR 4/1			Clay Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
X Reducing Conditions
X Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
X Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Soils around wetland areas are marginal. Majority of wetland areas are standing water.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks: Wetland area has apparently been created or exaggerated due to previous land alteration.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Proposed Helena Bypass Applicant/Owner: Solid Civil Design, LLC Investigator: Karl Peters	Date: 9/12/06 County: Shelby State: Alabama
Do Normal Circumstances exist? No Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse.)	Community ID: Wetland D

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ligustrum sinense	S/T	FAC	9. Pinus taeda	T	FAC
2. Acer rubrum	T	FAC	10. Q. phellos	T	FACW
3. Toxicodendron radicans	H	FAC	11. Juncus sp.	H	FAC-OBL
4. Smilax rotundifolia	H	FAC	12.		
5. S. bona-nox	H	FAC	13.		
6. Liquidamber styraciflua	T	FAC	14.		
7. Quercus nigra	T	FAC	15.		
8. Salix Nigra	T	OBL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)
>50% of Dominant Vegetation

Remarks: Sample taken within wetland area.

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- X Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: 4-6 (in.)

Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 inches
- X Water Marks
- ___ Drift Lines
- X Sediment Deposits
- X Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 inches
- X Water-Stained Leaves
- X Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Area is denoted on the *Helena, Alabama* NWI map. Soils also listed as hydric by NRCS soils list. Wetland areas are open water – apparently a result of land previous land alteration.

SOILS

Map Unit Name
(Series and Phase): Nauvoo-Sunlight complex, 15 to 25 percent slopes

Drainage Class: N/A

Taxonomy (Subgroup): N/A

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-10	A	10YR 4/2	10YR 5/2	15%	Silty Clay
>10	B	10YR 4/2	10YR 6/1	10%	Clay Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
X Reducing Conditions
X Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
X Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Soils around wetland areas are marginal. Majority of wetland areas are standing water.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks: Wetland area has apparently been created or exaggerated due to previous land alteration.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Proposed Helena Bypass Applicant/Owner: Solid Civil Design, LLC Investigator: Karl Peters	Date: 9/13/06 County: Shelby State: Alabama
Do Normal Circumstances exist? No Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse.)	Community ID: Wetland E

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ligustrum sinense	S/T	FAC	9. Pinus taeda	T	FAC
2. Acer rubrum	T	FAC	10. Q. phellos	T	FACW
3. Liriodendron tulipifera	T	FAC	11.		
4. Smilax rotundifolia	H	FAC	12.		
5. S. bona-nox	H	FAC	13.		
6. Liquidamber styraciflua	T	FAC	14.		
7. Quercus nigra	T	FAC	15.		
8. Salix Nigra	T	OBL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)
>50% of Dominant Vegetation

Remarks: Sample taken within wetland area.

HYDROLOGY

X Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge X Aerial Photographs ___ Other ___ No Recorded Data Available Field Observations: Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: N/A (in.) Depth to Saturated Soil: N/A (in.)	Wetland Hydrology Indicators: Primary Indicators: X Inundated ___ Saturated in Upper 12 inches X Water Marks ___ Drift Lines X Sediment Deposits X Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 inches X Water-Stained Leaves X Local Soil Survey Data X FAC-Neutral Test ___ Other (Explain in Remarks)

Remarks: Soils listed as hydric by NRCS soils list. Wetland apparently a result of land previous land alteration.

SOILS

Map Unit Name
(Series and Phase): Nauvoo-Sunlight complex, 15 to 25 percent slopes

Drainage Class: N/A

Taxonomy (Subgroup): N/A

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-12	A	10YR 3/1	10YR 5/1	25%	Silty Clay
>12	B	10YR 4/1	10YR 5/1	15%	Clay Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
X Reducing Conditions
X Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
X Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks: Wetland area has apparently been created or exaggerated due to previous land alteration.

FLOODPLAIN MAPPING

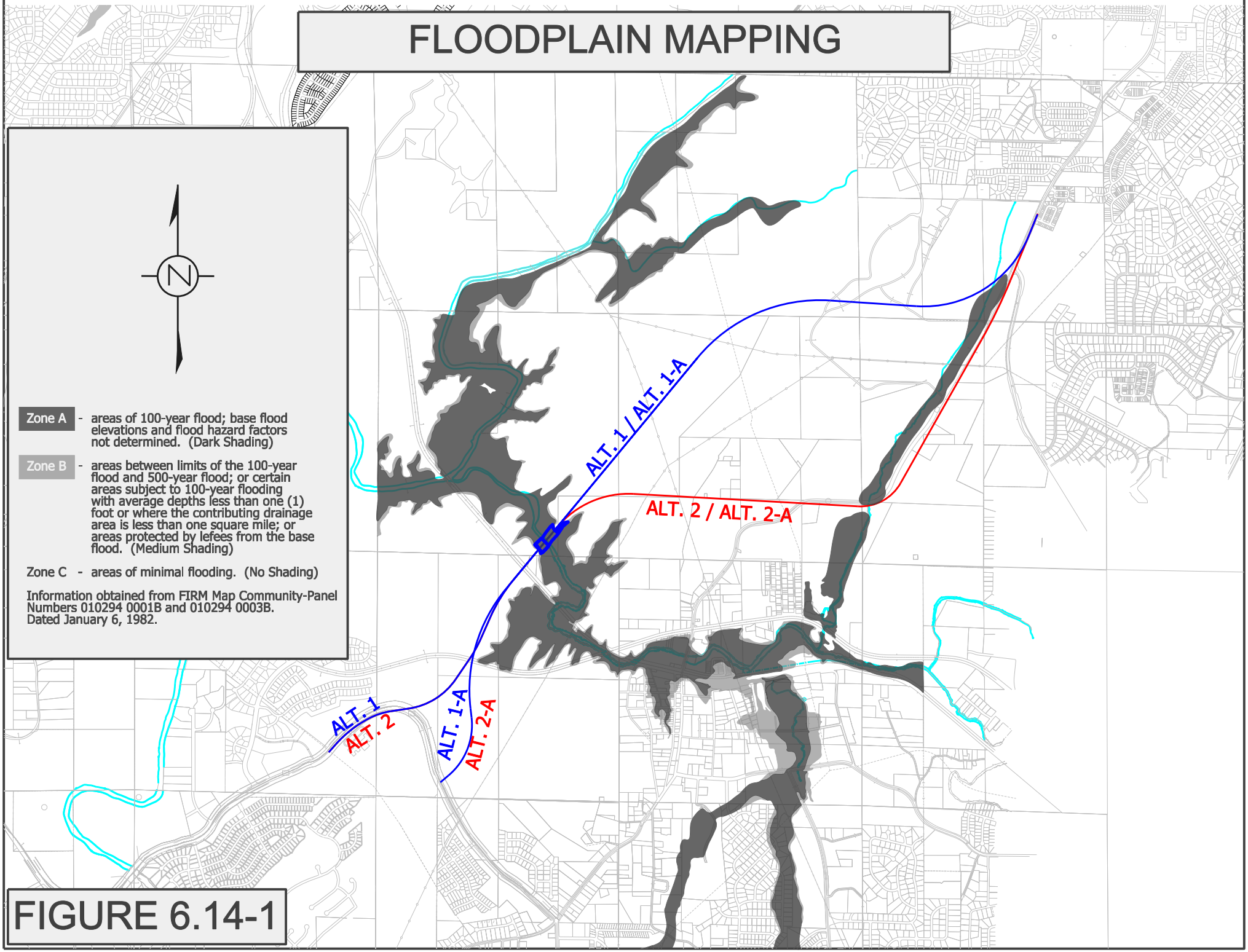

FIGURE 6.14-1

LOCATION RISK ASSESSMENT RECORD
FOR
LOCATION OF FLOODPLAIN ENCROACHMENT

Date: 12/5/2006

PROJECT NO. ST-059-261-004 - ALTERNATE I

PROJECT DESCRIPTION: HELENA BYPASS FROM CR-52 IN HELENA TO SR-261 NEAR BEARDEN RD

PREPARED BY: Greg Lowe

NFIP PARTICIPATION
(Fill In)

County Shelby PARTICIPATING X
NON-PARTICIPATING
CITY Helena PARTICIPATING X
NON-PARTICIPATING

ENCROACHMENT DETERMINATION:
(Date of Map)

FHBM FBFM

FIRM See Below HUD STUDY
010294 0001B (January 6, 1982)
010294 0003B (January 6, 1982)

OTHER SOURCES:

U.S.G.S. TOPO MAPPING X FLOOD PRONE AREA MAP

PLAN-PROFILE SHEET

EXISTING STRUCTURE(S): (FILL IN)

LENGTH: N/A
P.G.:
SKEW:
CENTERLINE ELEV.:

PROJECT SITE EVALUATION ALTERNATIVE NO.	YES OR NO
LONGITUDINAL ENCROACHMENT?	NO
SIGNIFICANT ENCROACHMENT?	NO
ALTERNATIVES TO SIGNIFICANT ENCROACHMENT?	N/A
ONLY PRACTICABLE ALTERNATIVE (ONLY IF SIGNIFICANT ENCR.)?	YES
SIGNIFICANT RISK?	NO
MEASURES TO MINIMIZE FLOOD PLAIN IMPACTS?	YES
DIRECT OR INDIRECT SUPPORT TO BASE FLOOD PLAIN DEVELOPMENT?	NO
POTENTIAL FOR INTERRUPTION OF EVACUATION ROUTE?	NO

Alternate I (cont'd)

YES OR NO

IMPACT ON BENEFICIAL FLOOD PLAIN VALUES NO

IF YES EXPLAIN

MEASURES TO RESTORE AND PRESERVE BENEFICIAL VALUES? N/A

IF YES EXPLAIN

TYPE AND DEGREE OF DEVELOPMENT ON THE FLOOD PLAIN Currently, the development ranges from none to minimal.

PROPOSAL AFFECTING A REGULATORY FLOODWAY? NO

PROJECT COORDINATION WITH FEMA REQUIRED? NO

IF YES WHEN?

OTHER COMMENTS

CONCLUSION:

Under the guidelines provided in the Alabama Highway Department's "Screening Process for the Design of Flood plains and Federal Aid Projects", this project qualifies for the level of analysis under Category 6 .

LOCATION RISK ASSESSMENT RECORD
FOR
LOCATION OF FLOODPLAIN ENCROACHMENT

Date: 07/29/2008

PROJECT NO. ST-059-261-004 - ALTERNATE I-A

PROJECT DESCRIPTION: HELENA BYPASS FROM CR-52 IN HELENA TO SR-261 NEAR BEARDEN RD

PREPARED BY: Greg Lowe

NFIP PARTICIPATION
(Fill In)

County Shelby PARTICIPATING X
NON-PARTICIPATING
CITY Helena PARTICIPATING X
NON-PARTICIPATING

ENCROACHMENT DETERMINATION:
(Date of Map)

FHBM FBFM

FIRM See Below HUD STUDY
010294 0001B (January 6, 1982)
010294 0003B (January 6, 1982)

OTHER SOURCES:

U.S.G.S. TOPO MAPPING X FLOOD PRONE AREA MAP

PLAN-PROFILE SHEET

EXISTING STRUCTURE(S): (FILL IN)

LENGTH: N/A
P.G.:
SKEW:
CENTERLINE ELEV.:

PROJECT SITE EVALUATION ALTERNATIVE NO.	YES OR NO
LONGITUDINAL ENCROACHMENT?	NO
SIGNIFICANT ENCROACHMENT?	NO
ALTERNATIVES TO SIGNIFICANT ENCROACHMENT?	N/A
ONLY PRACTICABLE ALTERNATIVE (ONLY IF SIGNIFICANT ENCR.)?	YES
SIGNIFICANT RISK?	NO
MEASURES TO MINIMIZE FLOOD PLAIN IMPACTS?	YES
DIRECT OR INDIRECT SUPPORT TO BASE FLOOD PLAIN DEVELOPMENT?	NO
POTENTIAL FOR INTERRUPTION OF EVACUATION ROUTE?	NO

Alternate I-A (cont'd)

YES OR NO

IMPACT ON BENEFICIAL FLOOD PLAIN VALUES NO

IF YES EXPLAIN

MEASURES TO RESTORE AND PRESERVE BENEFICIAL VALUES? N/A

IF YES EXPLAIN

TYPE AND DEGREE OF DEVELOPMENT ON THE FLOOD PLAIN Currently, the development ranges from none to minimal.

PROPOSAL AFFECTING A REGULATORY FLOODWAY? NO

PROJECT COORDINATION WITH FEMA REQUIRED? NO

IF YES WHEN?

OTHER COMMENTS

CONCLUSION:

Under the guidelines provided in the Alabama Highway Department's "Screening Process for the Design of Flood plains and Federal Aid Projects", this project qualifies for the level of analysis under Category 6 .

LOCATION RISK ASSESSMENT RECORD
FOR
LOCATION OF FLOODPLAIN ENCROACHMENT

Date: 12/5/2006

PROJECT NO. ST-059-261-004 - ALTERNATE II

PROJECT DESCRIPTION: HELENA BYPASS FROM CR-52 IN HELENA TO SR-261 NEAR BEARDEN RD

PREPARED BY: Greg Lowe

NFIP PARTICIPATION
(Fill In)

County Shelby PARTICIPATING X
NON-PARTICIPATING
CITY Helena PARTICIPATING X
NON-PARTICIPATING

ENCROACHMENT DETERMINATION:
(Date of Map)

FHBM FBFM

FIRM See Below HUD STUDY
010294 0001B (January 6, 1982)
010294 0003B (January 6, 1982)

OTHER SOURCES:

U.S.G.S. TOPO MAPPING X FLOOD PRONE AREA MAP

PLAN-PROFILE SHEET

EXISTING STRUCTURE(S): (FILL IN)

LENGTH: N/A
P.G.:
SKEW:
CENTERLINE ELEV.:

PROJECT SITE EVALUATION ALTERNATIVE NO.	YES OR NO
LONGITUDINAL ENCROACHMENT?	NO
SIGNIFICANT ENCROACHMENT?	NO
ALTERNATIVES TO SIGNIFICANT ENCROACHMENT?	N/A
ONLY PRACTICABLE ALTERNATIVE (ONLY IF SIGNIFICANT ENCR.)?	YES
SIGNIFICANT RISK?	NO
MEASURES TO MINIMIZE FLOOD PLAIN IMPACTS?	YES
DIRECT OR INDIRECT SUPPORT TO BASE FLOOD PLAIN DEVELOPMENT?	NO
POTENTIAL FOR INTERRUPTION OF EVACUATION ROUTE?	NO

Alternate II (cont'd)

YES OR NO

IMPACT ON BENEFICIAL FLOOD PLAIN VALUES NO

IF YES EXPLAIN

MEASURES TO RESTORE AND PRESERVE BENEFICIAL VALUES? N/A

IF YES EXPLAIN

TYPE AND DEGREE OF DEVELOPMENT ON THE FLOOD PLAIN Currently, the development ranges from none to minimal.

PROPOSAL AFFECTING A REGULATORY FLOODWAY? NO

PROJECT COORDINATION WITH FEMA REQUIRED? NO

IF YES WHEN?

OTHER COMMENTS

CONCLUSION:

Under the guidelines provided in the Alabama Highway Department's "Screening Process for the Design of Flood plains and Federal Aid Projects", this project qualifies for the level of analysis under Category 6 .

LOCATION RISK ASSESSMENT RECORD
FOR
LOCATION OF FLOODPLAIN ENCROACHMENT

Date: 07/29/2008

PROJECT NO. ST-059-261-004 - ALTERNATE II-A

PROJECT DESCRIPTION: HELENA BYPASS FROM CR-52 IN HELENA TO SR-261 NEAR BEARDEN RD

PREPARED BY: Greg Lowe

NFIP PARTICIPATION
(Fill In)

County Shelby PARTICIPATING X
NON-PARTICIPATING
CITY Helena PARTICIPATING X
NON-PARTICIPATING

ENCROACHMENT DETERMINATION:
(Date of Map)

FHBM FBFM

FIRM See Below HUD STUDY
010294 0001B (January 6, 1982)
010294 0003B (January 6, 1982)

OTHER SOURCES:

U.S.G.S. TOPO MAPPING X FLOOD PRONE AREA MAP

PLAN-PROFILE SHEET

EXISTING STRUCTURE(S): (FILL IN)

LENGTH: N/A
P.G.:
SKEW:
CENTERLINE ELEV.:

PROJECT SITE EVALUATION ALTERNATIVE NO.	YES OR NO
LONGITUDINAL ENCROACHMENT?	NO
SIGNIFICANT ENCROACHMENT?	NO
ALTERNATIVES TO SIGNIFICANT ENCROACHMENT?	N/A
ONLY PRACTICABLE ALTERNATIVE (ONLY IF SIGNIFICANT ENCR.)?	YES
SIGNIFICANT RISK?	NO
MEASURES TO MINIMIZE FLOOD PLAIN IMPACTS?	YES
DIRECT OR INDIRECT SUPPORT TO BASE FLOOD PLAIN DEVELOPMENT?	NO
POTENTIAL FOR INTERRUPTION OF EVACUATION ROUTE?	NO

Alternate II-A (cont'd)

YES OR NO

IMPACT ON BENEFICIAL FLOOD PLAIN VALUES NO
IF YES EXPLAIN

MEASURES TO RESTORE AND PRESERVE BENEFICIAL VALUES? N/A
IF YES EXPLAIN

TYPE AND DEGREE OF DEVELOPMENT ON THE FLOOD PLAIN Currently, the development ranges from none to minimal.

PROPOSAL AFFECTING A REGULATORY FLOODWAY? NO

PROJECT COORDINATION WITH FEMA REQUIRED? NO
IF YES WHEN?

OTHER COMMENTS

CONCLUSION:
Under the guidelines provided in the Alabama Highway Department's "Screening Process for the Design of Flood plains and Federal Aid Projects", this project qualifies for the level of analysis under Category 6 .