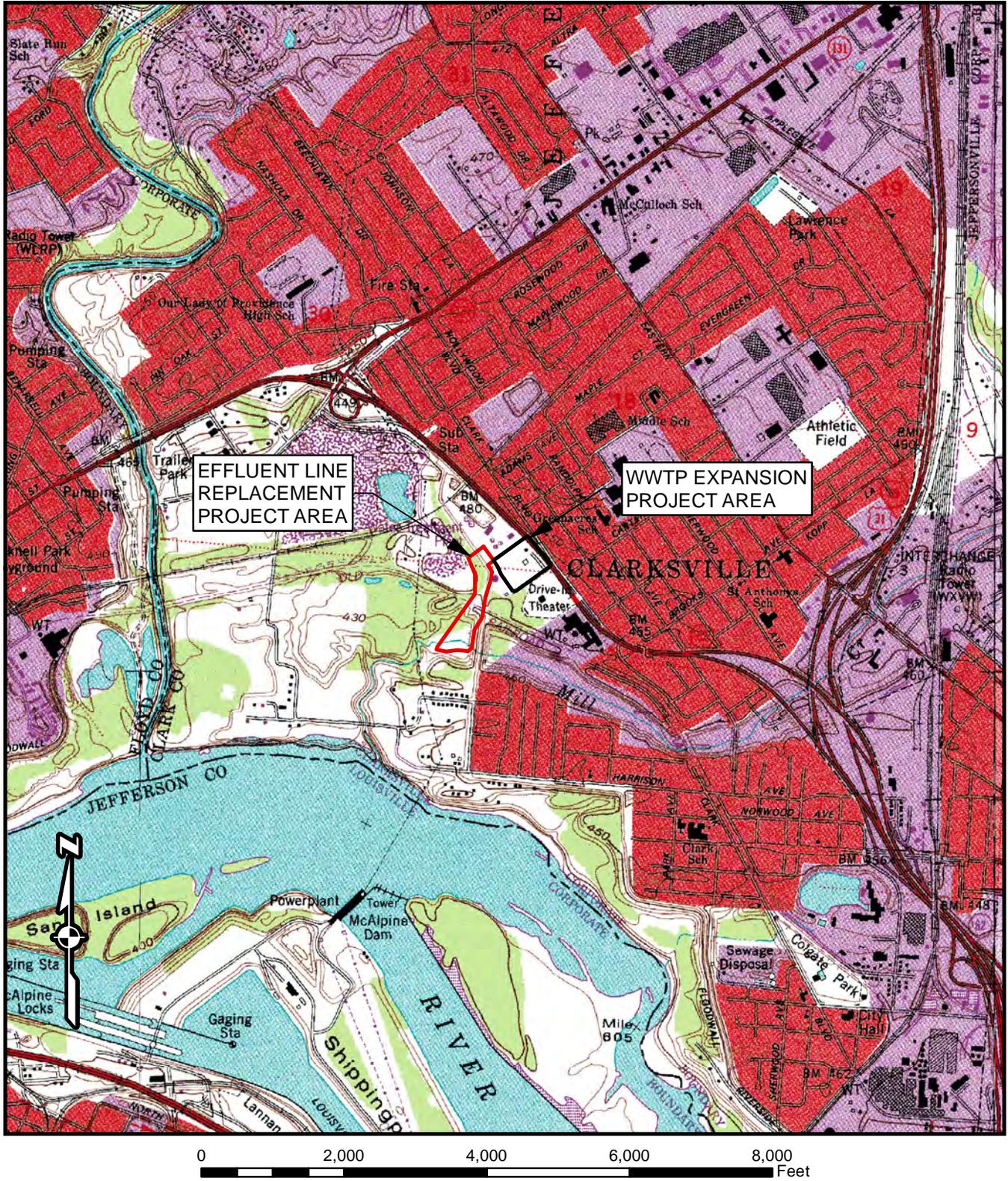


APPENDIX A

PROJECT MAPS

Source: USGS 7.5' Topographic Map: New Albany, Indiana Quadrangle



CLARKSVILLE WWTP EXPANSION AND
EFFLUENT LINE REPLACEMENT PROJECT
CLARK COUNTY, INDIANA

FILE: Redwing/11-096/Figures/Site Location

REDWING PROJECT 11-096

REVISED DATE 8.02.2012

DRAWN BY JMR/EDB



SITE LOCATION MAP

FIGURE 1



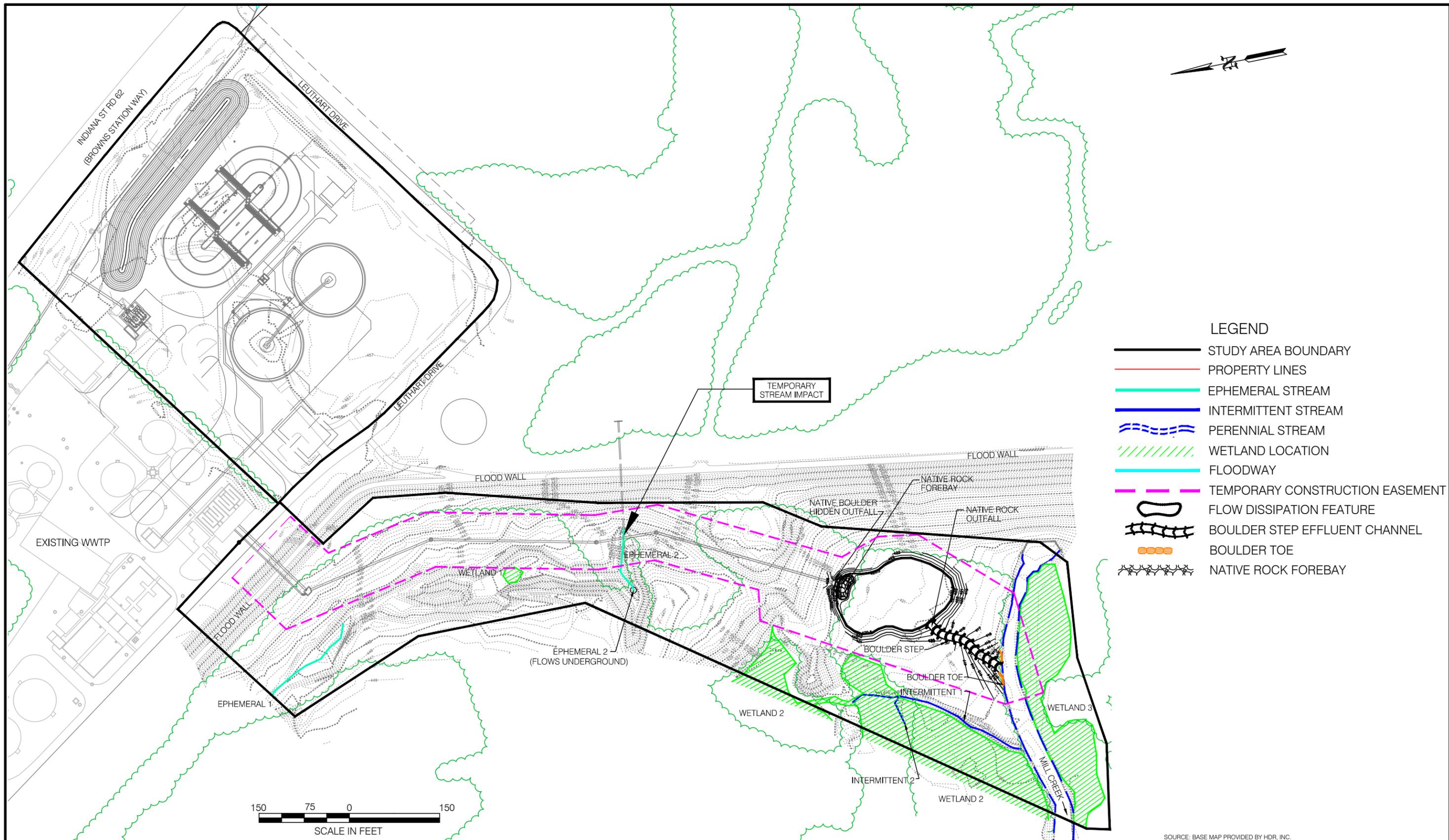
CLARKSVILLE WWTP EXPANSION
AND EFFLUENT LINE
REPLACEMENT PROJECT
CLARK COUNTY, INDIANA

FILE: Redwing/11-096/Figures/Aerial_EA
REDWING PROJECT 11-096
REVISED DATE: 8.2.2012 DRAWN BY EDB/RSC



AERIAL PHOTOGRAPH MAP

FIGURE 2



SOURCE: BASE MAP PROVIDED BY HDR, INC.

NOTE: JURISDICTIONAL WATER/WETLAND BOUNDARIES WERE DELINEATED AND SURVEYED USING GLOBAL POSITIONING SYSTEM EQUIPMENT BY REDWING WETLAND SCIENTISTS ON DECEMBER 13 AND 14, 2011 AND FEBRUARY 3 AND MARCH 29, 2012. THESE BOUNDARIES HAVE NOT BEEN VERIFIED BY THE U.S. ARMY CORPS OF ENGINEERS. USE OF THIS MAP IS FOR PRELIMINARY PLANNING PURPOSES ONLY.

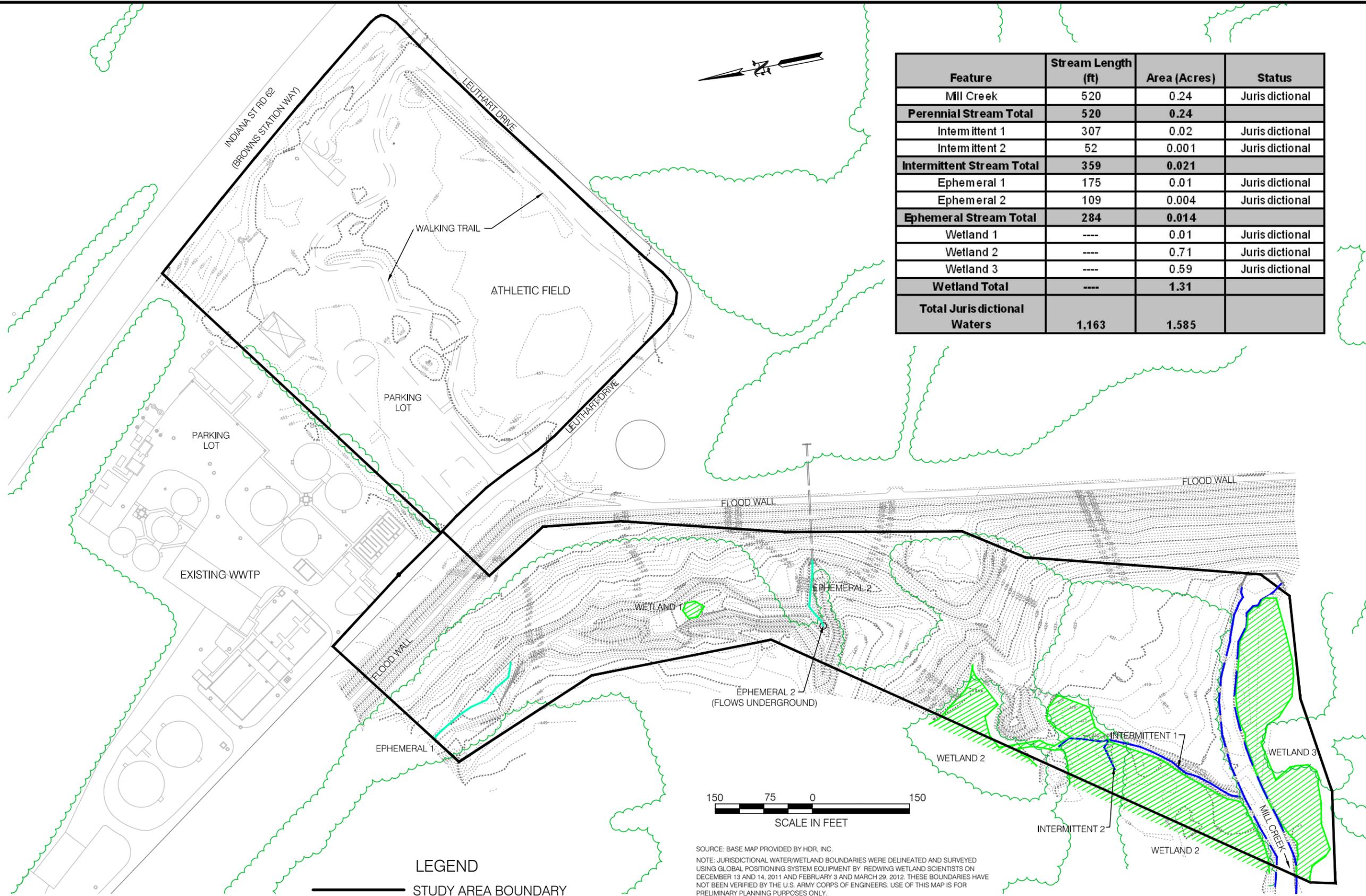
CLARKSVILLE WWTP EXPANSION AND
EFFLUENT LINE REPLACEMENT PROJECT
CLARK COUNTY, INDIANA

FILENAME: Redwing\Figures\Construction Permit Figures.dwg
PROJECT No.: 11-096 DRAWN BY: BJD/JMR
PRINT DATE: 08-02-2012



PROPOSED PROJECT ACTIVITIES

FIGURE: 3



Feature	Stream Length (ft)	Area (Acres)	Status
Mill Creek	520	0.24	Juris dictional
Perennial Stream Total	520	0.24	
Intermittent 1	307	0.02	Juris dictional
Intermittent 2	52	0.001	Juris dictional
Intermittent Stream Total	359	0.021	
Ephemeral 1	175	0.01	Juris dictional
Ephemeral 2	109	0.004	Juris dictional
Ephemeral Stream Total	284	0.014	
Wetland 1	----	0.01	Juris dictional
Wetland 2	----	0.71	Juris dictional
Wetland 3	----	0.59	Juris dictional
Wetland Total	----	1.31	
Total Jurisdictional Waters	1,163	1.585	

- LEGEND**
- STUDY AREA BOUNDARY
 - EPHEMERAL STREAM
 - INTERMITTENT STREAM
 - PERENNIAL STREAM
 - WETLAND LOCATION

CLARKSVILLE WWTP EXPANSION AND
EFFLUENT LINE REPLACEMENT PROJECT
CLARK COUNTY, INDIANA

FILENAME: Redwing\Figures\IDEM WQC Figures.dwg
PROJECT No.: 11-096 DRAWN BY: BJD/JMR
PRINT DATE: 08-01-12

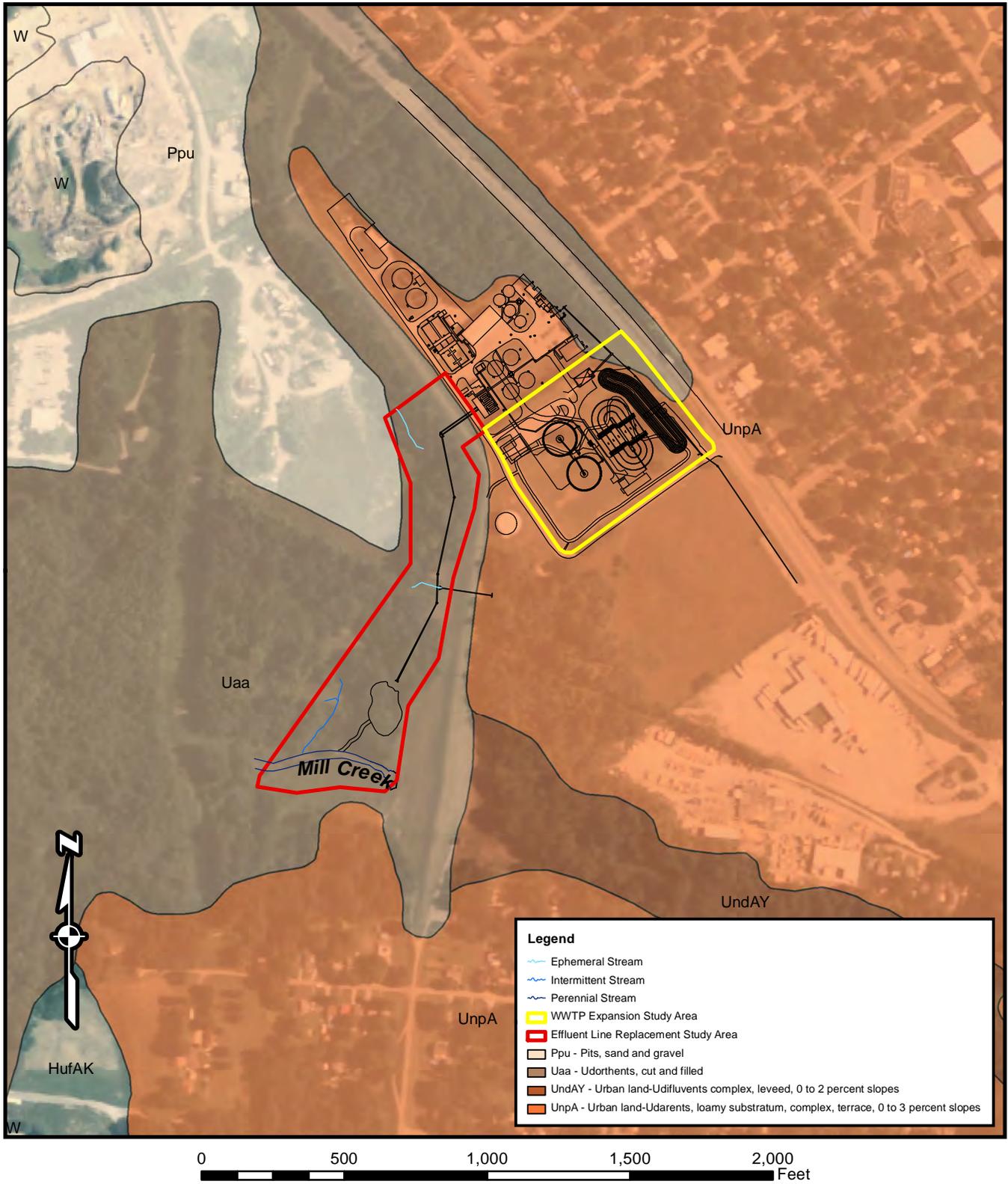


WATER/WETLAND LOCATION MAP

FIGURE: 4

SOURCE: BASE MAP PROVIDED BY HDR, INC.
NOTE: JURISDICTIONAL WATER/WETLAND BOUNDARIES WERE DELINEATED AND SURVEYED USING GLOBAL POSITIONING SYSTEM EQUIPMENT BY REDWING WETLAND SCIENTISTS ON DECEMBER 13 AND 14, 2011 AND FEBRUARY 3 AND MARCH 29, 2012. THESE BOUNDARIES HAVE NOT BEEN VERIFIED BY THE U.S. ARMY CORPS OF ENGINEERS. USE OF THIS MAP IS FOR PRELIMINARY PLANNING PURPOSES ONLY.

Source: Aerial; USDA-FSA Aerial Photography Field Office (2007); Soil Survey Geographic (SSURGO) database for Clark County, Indiana (2009).



CLARKSVILLE WWTP EXPANSION AND
EFFLUENT LINE REPLACEMENT PROJECT
CLARK COUNTY, INDIANA

FILE: Redwing/11-096/Figures/Soils_EA

REDWING PROJECT 11-096

REVISED DATE 8.02.2012

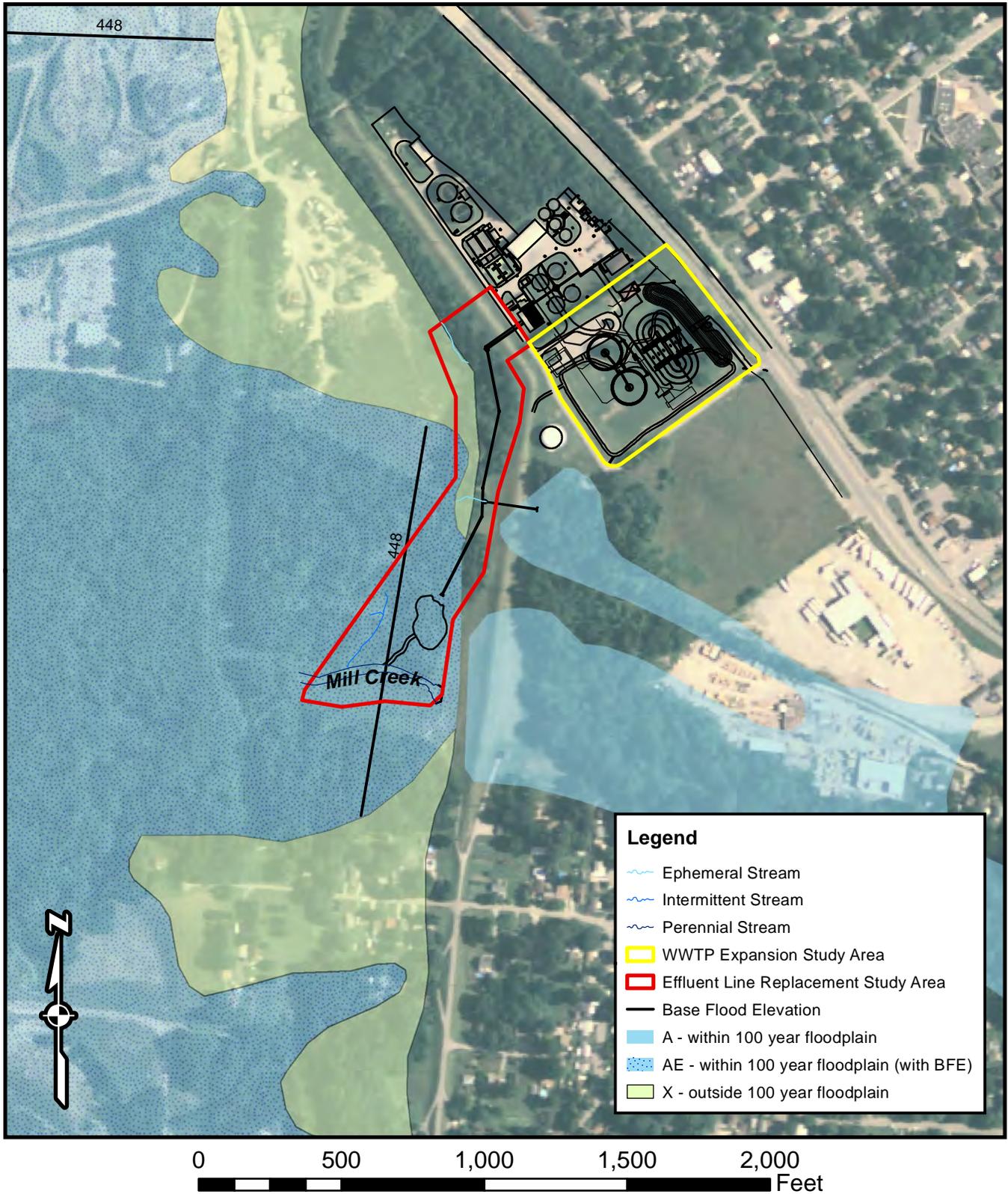
DRAWN BY JMR/EDB



SOIL SURVEY MAP

FIGURE 5

Source: Aerial: USDA-FSA Aerial Photography Field Office (2007); Interim DFIRM mapping: IDNR (2004).



CLARKSVILLE WWTP EXPANSION AND
EFFLUENT LINE REPLACEMENT PROJECT
CLARK COUNTY, INDIANA

FILE: Redwing/11-096/Figures/FEMA_Floodway_EA
REDWING PROJECT 11-096
REVISED DATE 8.02.2012 | DRAWN BY: RSC



FEMA FLOODPLAIN MAP

FIGURE 6



CLARKSVILLE WWTP EXPANSION AND
EFFLUENT LINE REPLACEMENT PROJECT
CLARK COUNTY, INDIANA

FILE: Redwing/11-096/Figures/ExistingEffluentLineMap
REDWING PROJECT 11-096
REVISED DATE 9.07.2012 | DRAWN BY JMR/EDB



EXISTING EFFLUENT LINE
LOCATION MAP

FIGURE 7

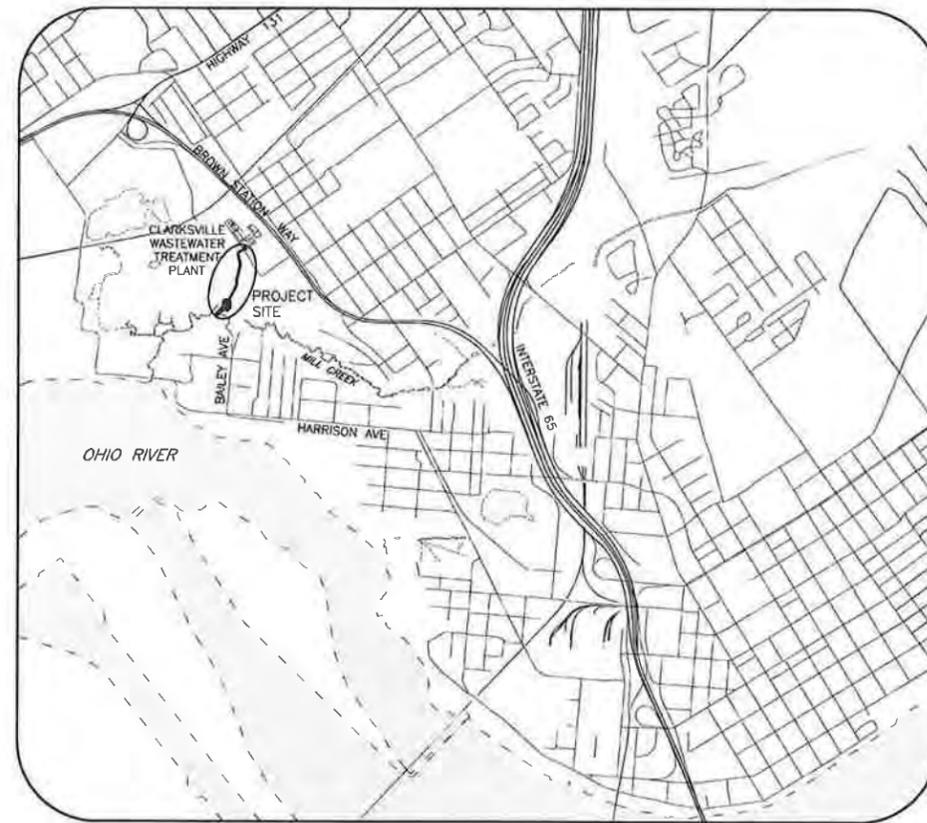
WASTEWATER TREATMENT PLANT EFFLUENT LINE AND PUMPING STATION

CLARKSVILLE, INDIANA

JULY 2012

INDEX OF DRAWINGS

DWG NO.	GENERAL (G)
G-1	COVER AND LOCATION MAP
G-2	LEGEND, ABBREVIATIONS AND GENERAL NOTES
G-3	OVERALL SITE AND ACCESS PLAN
CIVIL/SITE (C)	
C-1	EFFLUENT LINE PLAN
C-2	EFFLUENT LINE PROFILE
C-3	EROSION PREVENTION AND SEDIMENT CONTROL PLAN - PLAN VIEW
C-4	EROSION PREVENTION AND SEDIMENT CONTROL PLAN - NOTES AND DETAILS
C-5	EFFLUENT LINE THROUGH FLOODWALL DETAIL PLAN AND SECTION
C-6	EFFLUENT LINE FLOODWALL AND AERIAL CROSSING DETAIL PROFILE
C-7	FLOODWALL GATEWELL PLAN AND SECTIONS
C-8	FLOW DISSIPATION FEATURE PLAN VIEW
C-9	FLOW DISSIPATION FEATURE LONGITUDINAL PROFILE AND CROSS SECTIONS
C-10	FLOW DISSIPATION FEATURE DETAILS
C-11	FLOW DISSIPATION FEATURE PLANTING PLAN
C-12	EFFLUENT PUMP STATION DEMOLITION PLAN
C-13	EFFLUENT PUMP STATION DEMOLITION SECTIONS
C-14	EFFLUENT PUMP STATION DEMOLITION SECTIONS
C-15	EFFLUENT PUMP STATION MODIFICATIONS PLAN
C-16	EFFLUENT PUMP STATION MODIFICATIONS SECTIONS
C-17	EFFLUENT PUMP STATION MODIFICATIONS SECTIONS
C-18	DETAILS
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STRUCTURAL (S)	
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S-3	EFFLUENT PUMP STATION MODIFICATIONS SECTIONS
ELECTRICAL (E)	
E-1	EFFLUENT PUMP STATION ELECTRICAL PLAN
E-2	EFFLUENT LINE THROUGH FLOODWALL ELECTRICAL PLAN
E-3	EFFLUENT PUMP SCHEMATIC DIAGRAMS



LOCATION MAP

NOT TO SCALE

CLARKSVILLE TOWN COUNCIL

John Gilkey, President
Paul L. Kraft, Vice President
Donald W. Tetley, Secretary
Paul Fetter, Member
Tim Hauber, Member
Bob Polston, Member
Bob Popp, Member



UTILITY PROTECTION NOTE

ALL UTILITIES ON THESE PLANS ARE APPROXIMATE. INDIVIDUAL SERVICE LINES ARE NOT SHOWN. THE CONTRACTOR OR SUBCONTRACTOR SHALL NOTIFY "INDIANA 811" UTILITY PROTECTION CENTER BY DIALING 811 FORTY-EIGHT HOURS IN ADVANCE OF ANY CONSTRUCTION ON THIS PROJECT. THIS NUMBER WAS ESTABLISHED TO PROVIDE ACCURATE LOCATION OF EXISTING BELOW GROUND UTILITIES (I.E. CABLES, ELECTRIC WIRES, GAS, AND WATERLINES.) THE CONTRACTOR OR SUBCONTRACTOR SHALL ALSO NOTIFY NON-MEMBER UTILITY COMPANIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BECOMING FAMILIAR WITH ALL UTILITY REQUIREMENTS SET FORTH IN THE CONTRACT DOCUMENTS. IF ANY UTILITY LINES ARE ENCOUNTERED DURING CONSTRUCTION, EXTREME CAUTION SHOULD BE EXERCISED AND THE UTILITY COMPANY NOTIFIED IMMEDIATELY. ANY DAMAGES SHALL BE REPAIRED IMMEDIATELY AT THE DIRECTION OF THE UTILITY COMPANY, INCLUDING TEMPORARY AND PERMANENT WORK.

USAGE NOTE

EFFLUENT CROSSES LEVEE AT APPROXIMATE LEVEE STA. 250+63. USAGE AS-BUILT DRAWING NO. 603-12.2/4.

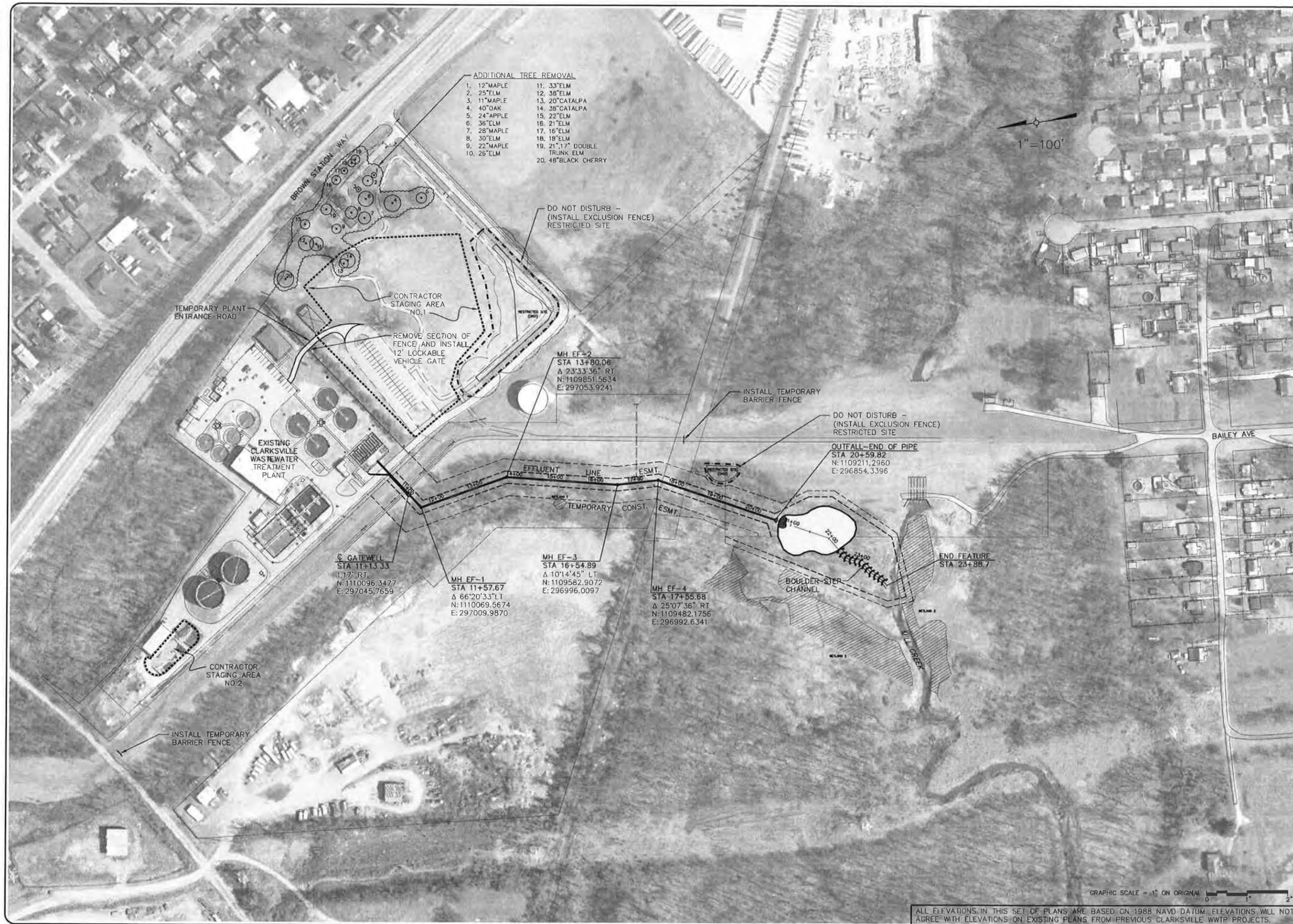
TOWN OF CLARKSVILLE, INDIANA



HDR

HDR Engineering, Inc.
One Riverfront Plaza
401 West Main Street, Suite 600
Clarksville, Kentucky 40002
PHONE (502)584-4118 FAX (502)585-3000

ALL ELEVATIONS IN THIS SET OF PLANS ARE BASED ON 1988 NAVD DATUM. ELEVATIONS WILL NOT AGREE WITH ELEVATIONS ON EXISTING PLANS FROM PREVIOUS CLARKSVILLE WWTP PROJECTS.



- ADDITIONAL TREE REMOVAL**
- | | |
|--------------|-------------------------------|
| 1. 12" MAPLE | 11. 33" ELM |
| 2. 25" ELM | 12. 38" ELM |
| 3. 11" MAPLE | 13. 20" CATALPA |
| 4. 40" OAK | 14. 38" CATALPA |
| 5. 24" APPLE | 15. 22" ELM |
| 6. 36" ELM | 16. 21" ELM |
| 7. 28" MAPLE | 17. 16" ELM |
| 8. 30" ELM | 18. 18" ELM |
| 9. 22" MAPLE | 19. 21" 1/2" DOUBLE TRUNK ELM |
| 10. 26" ELM | 20. 48" BLACK CHERRY |



HDR
 HDR Engineering, Inc.
 One Riverfront Plaza, Suite 500
 Indianapolis, Indiana 46202
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CLARKSVILLE, INDIANA
**WASTEWATER TREATMENT PLANT
 EFFLUENT LINE AND PUMPING STATION
 OVERALL SITE AND ACCESS
 PLAN**

SCALE: 1" = 100'
 DATE: JULY 23, 2012
 JOB NO.: 68185
 DESIGNED: RGD
 DRAWN: SRS
 CHECKED:
 Q/C:
 OWNER APPROVAL:
 BY:
 TITLE:
 REVISIONS:
 NO. DATE:

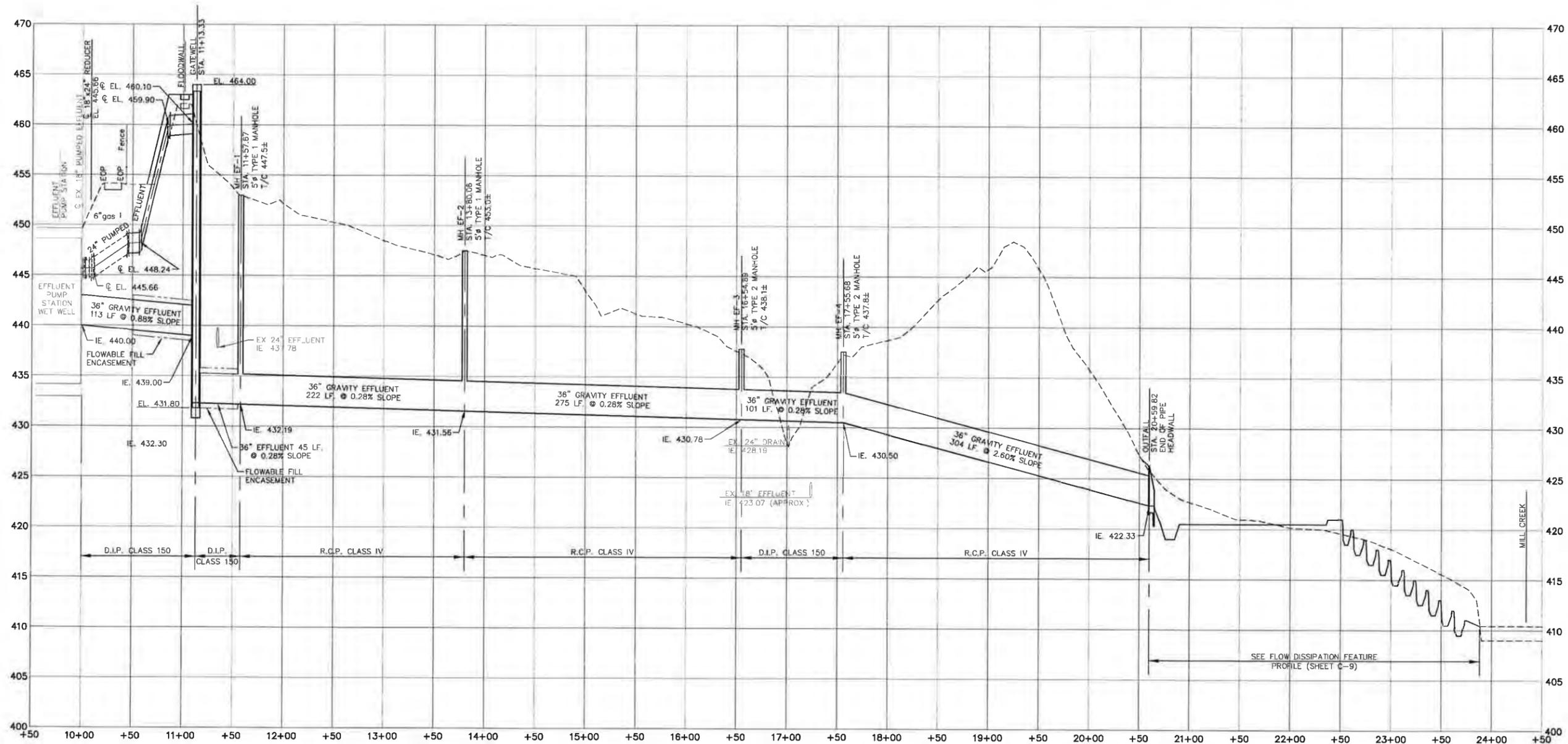
STATE OF INDIANA
 GARY T. BOBLITT
 19983
 PROFESSIONAL ENGINEER
 7/23/12

GRAPHIC SCALE = 1" ON ORIGINAL
 ALL ELEVATIONS IN THIS SET OF PLANS ARE BASED ON 1988 NAVD DATUM. ELEVATIONS WILL NOT AGREE WITH ELEVATIONS ON EXISTING PLANS FROM PREVIOUS CLARKSVILLE WWTP PROJECTS.

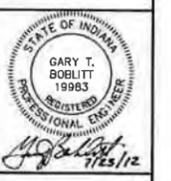


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One Riverfront Plaza, Suite 500
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WASTEWATER TREATMENT PLANT
EFFLUENT LINE AND PUMPING STATION
CLARKSVILLE, INDIANA
EFFLUENT LINE
PROFILE



SCALE:	AS SHOWN
DATE:	JULY 23, 2012
JOB NO.:	68185
DESIGNED:	RGD
DRAWN:	SRS
CHECKED:	
Q/C:	
OWNER APPROVAL:	
BY:	
TITLE:	
REVISIONS:	
NO.:	DATE:



DRAWING:
C-2
5 of 28

VERTICAL SCALE - 1"=5'
HORIZONTAL SCALE - 1"=50'
GRAPHIC SCALE = 1" ON ORIGINAL

ALL ELEVATIONS IN THIS SET OF PLANS ARE BASED ON 1988 NAVD DATUM. ELEVATIONS WILL NOT AGREE WITH ELEVATIONS ON EXISTING PLANS FROM PREVIOUS CLARKSVILLE WWTP PROJECTS.

REDWING ECOLOGICAL SERVICES, INC.
 1158 SOUTH FLORENCE STREET
 INDIANAPOLIS, INDIANA 46202
 REDWING, INDIANA PH: 462-825-3309 FAX: 462-825-3077

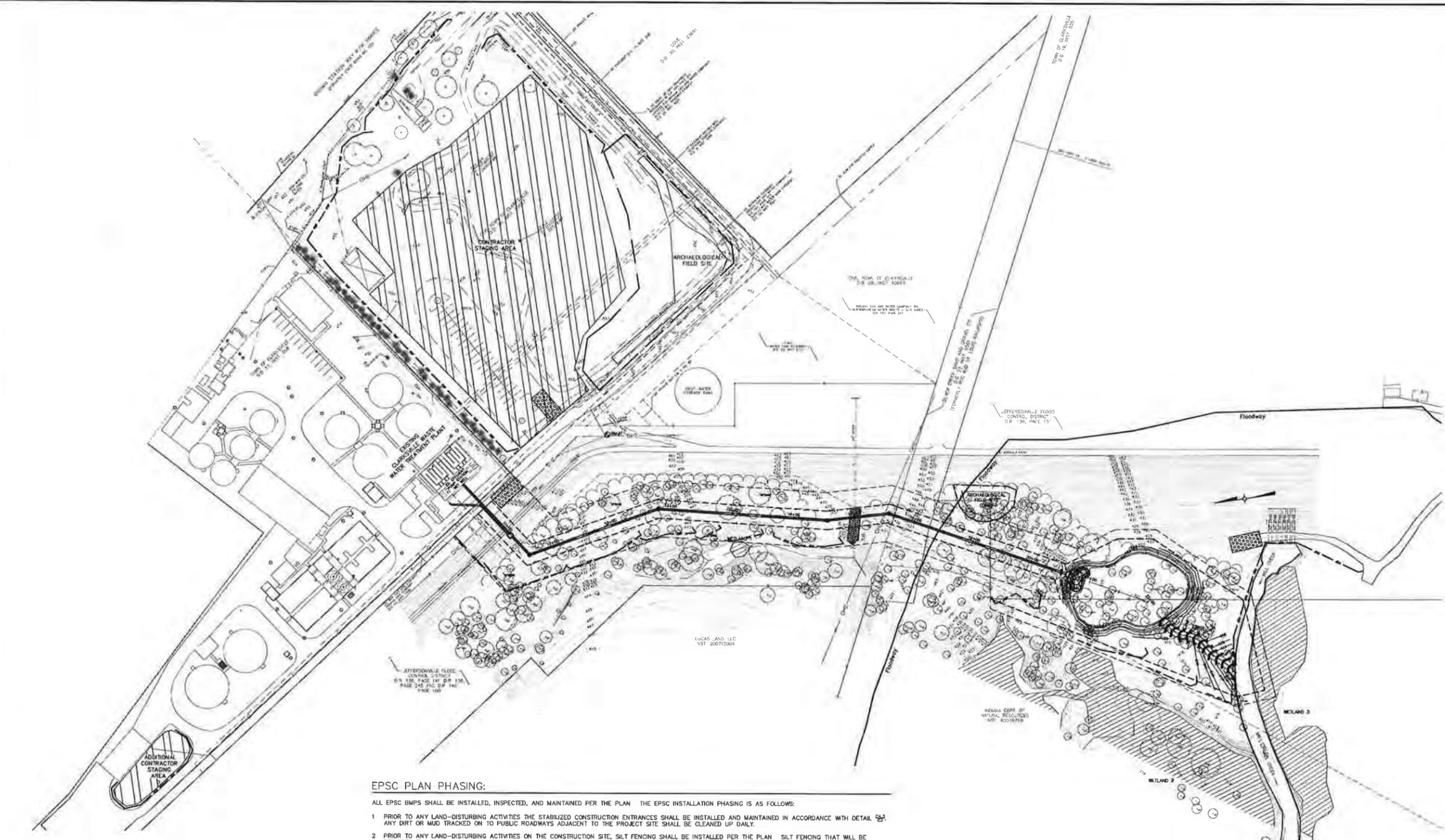


HDR Engineering, Inc.
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WASTEWATER TREATMENT PLANT
 EFFLUENT LINE AND PUMPING STATION

CLARKSVILLE, INDIANA

EROSION PREVENTION AND SEDIMENT CONTROL
 PLAN - PLAN VIEW



EPSC PLAN PHASING:

- ALL EPSC BMPs SHALL BE INSTALLED, INSPECTED, AND MAINTAINED PER THE PLAN. THE EPSC INSTALLATION PHASING IS AS FOLLOWS:
- PRIOR TO ANY LAND-DISTURBING ACTIVITIES THE STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH DETAIL C-2. ANY DIRT OR MUD TRACKED ON TO PUBLIC ROADWAYS ADJACENT TO THE PROJECT SITE SHALL BE CLEANED UP DAILY.
 - PRIOR TO ANY LAND-DISTURBING ACTIVITIES ON THE CONSTRUCTION SITE, SILT FENCING SHALL BE INSTALLED PER THE PLAN. SILT FENCING THAT WILL BE REQUIRED FOR MORE THAN 6 MONTHS SHALL BE REINFORCED SILT FENCE. SILT FENCING NEEDED FOR LESS THAN 6 MONTHS CAN BE STANDARD NON-REINFORCED SILT FENCE PER DETAIL C-1. EACH TYPE OF SILT FENCE SHALL BE INSPECTED AND MAINTAINED PER THE PLAN.
 - PRIOR TO ANY LAND-DISTURBING ACTIVITIES ON THE CONSTRUCTION SITE, EXCLUSION FENCING (DETAIL C-3) SHALL BE INSTALLED PER THE PLAN. EXCLUSION FENCE SHALL BE INSPECTED AND MAINTAINED PER THE PLAN.
 - PRIOR TO ANY LAND-DISTURBING ACTIVITIES ON THE CONSTRUCTION SITE, THE ROCK CHECK DAM SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH DETAIL C-4. THE ROCK CHECK DAM SHALL BE INSTALLED AND INSPECTED PER THE PLAN.
 - PRIOR TO ANY LAND-DISTURBING ACTIVITIES ON THE CONSTRUCTION SITE, THE TEMPORARY STREAM CROSSING SHALL BE ESTABLISHED AND MAINTAINED IN ACCORDANCE WITH DETAIL C-5. THE TEMPORARY STREAM CROSSING SHALL BE INSPECTED AND MAINTAINED PER THE PLAN.
 - PRIOR TO CONDUCTING CONCRETE POURING ACTIVITIES, THE CONTRACTOR SHALL ESTABLISH A CONCRETE WASHOUT AREA IN ACCORDANCE WITH THE DETAIL ON SHEET C-4. THE CONCRETE WASHOUT AREA SHALL BE LOCATED IN THE DESIGNATED CONTRACTOR STAGING AREA.
 - ANY TEMPORARY SOIL STOCKPILES CREATED AS PART OF THE CONSTRUCTION PROJECT SHALL BE PROPERLY PROTECTED AGAINST SOIL EROSION BY SILT FENCING AND TEMPORARY SEED AND MULCH PER THE PLAN.
 - UPON COMPLETION OF ROUGH GRADING ACTIVITIES ON ANY SLOPES GREATER THAN 4:1, SURFACE ROUGHENING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THE DETAIL ON SHEET C-4.
 - THE CONSTRUCTION ACTIVITIES SHALL BE CONDUCTED TO MINIMIZE THE EXTENT OF DISTURBED SOILS EXPOSED AT ANY ONE TIME AND THE LENGTH OF SOIL EXPOSURE.
 - THE CONTRACTOR SHALL NOT CONDUCT ANY STREAM CONSTRUCTION ACTIVITIES IN FLOWING WATER. THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN FLOW DIVERSION INCLUDING A PUMP AROUND SYSTEM AS SHOWN IN THE DETAIL ON SHEET C-4. THE PUMP AROUND SYSTEM SHALL BE UTILIZED THROUGHOUT THE DAY DURING THE STREAM CONSTRUCTION ACTIVITIES. THE TEMPORARY FLOW DIVERSION STRUCTURES SHALL BE CONSTRUCTED SUCH THAT THEY DO NOT RESULT IN FLOODING OF UPSTREAM PROPERTIES. THE CONTRACTOR SHALL STAY ATTUNED TO THE THREAT OF SIGNIFICANT RAIN EVENTS AND FLOODING. CONTRACTOR SHOULD WITHDRAW EQUIPMENT AND EMPLOYEES IF FLOODING CONDITIONS DEVELOP. THE TEMPORARY FLOW DIVERSION SYSTEM MUST BE REMOVED FROM THE STREAM PRIOR TO A SIGNIFICANT RAIN EVENT TO PREVENT FLOODING FROM OCCURRING UPSTREAM OF THE PROJECT SITE AS A RESULT OF PROJECT ACTIVITIES.
 - ALL DISTURBED SOILS WILL BE GRADED AND STABILIZED AS SOON AS POSSIBLE. PERMANENT STABILIZATION WILL OCCUR WITHIN 14 DAYS OF REACHING FINAL GRADE PER THE PLAN. WHERE CONSTRUCTION OR LAND-DISTURBING ACTIVITY WILL OR HAS TEMPORARILY CEASED ON ANY PORTION OF THE SITE, TEMPORARY SITE STABILIZATION MEASURES SHALL BE REQUIRED AS SOON AS PRACTICAL, BUT NO LATER THAN 14 CALENDAR DAYS AFTER THE ACTIVITY HAS CEASED PER THE PLAN.
 - THROUGHOUT THE CONSTRUCTION ACTIVITIES THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL PRACTICES NOT SHOWN ON THESE PLANS AS NECESSARY TO CONTROL SEDIMENT.

EPSC PLAN KEYNOTES:

- GENERAL EROSION PREVENTION AND SEDIMENT CONTROL NOTES:
- THE EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) PLAN SHALL BE IMPLEMENTED PRIOR TO ANY LAND-DISTURBING ACTIVITY ON THE CONSTRUCTION SITE. ANY MODIFICATIONS TO THE APPROVED EPSC PLAN MUST BE REVIEWED AND APPROVED BY ENGINEER. EPSC BEST MANAGEMENT PRACTICES (BMPs) SHALL BE INSTALLED PER THE PLAN.
 - ALL EQUIPMENT MUST BE POWERWASHED BEFORE ENTERING PROJECT SITE. IF EQUIPMENT LEAVES PROJECT SITE, IT MUST AGAIN BE POWERWASHED BEFORE THE EQUIPMENT MAY RETURN TO THE PROJECT SITE.
 - DETENTION BASINS, IF APPLICABLE, SHALL BE CONSTRUCTED FIRST AND SHALL PERFORM AS SEDIMENT BASINS DURING CONSTRUCTION UNTIL THE CONTRIBUTING DRAINAGE AREAS ARE SEEDING AND STABILIZED.
 - ACTIONS MUST BE TAKEN TO MINIMIZE THE TRACKING OF MUD AND SOIL FROM THE CONSTRUCTION AREAS ONTO PUBLIC ROADWAYS. SOIL TRACKED ONTO THE ROADWAY SHALL BE REMOVED DAILY.
 - SOIL STOCKPILES SHALL BE LOCATED AWAY FROM STREAMS, PONDS, SWALES, WETLANDS, AND CATCH BASINS. STOCKPILES SHALL BE SEEDING, MULCHED, AND ADEQUATELY CONTAINED THROUGH THE USE OF SILT FENCE.
 - ALL STREAM CROSSINGS MUST UTILIZE LOW-WATER CROSSING STRUCTURES.
 - SEDIMENT-LADEN GROUNDWATER ENCOUNTERED DURING TRENCHING, BORING, OR OTHER EXCAVATION ACTIVITIES SHALL BE PUMPED TO A SEDIMENT TRAPPING DEVICE PRIOR TO BEING DISCHARGED INTO A STREAM, POND, SWALE, WETLAND, OR CATCH BASIN.
 - WHERE CONSTRUCTION OR LAND-DISTURBING ACTIVITY WILL OR HAS TEMPORARILY CEASED ON ANY PORTION OF A SITE, TEMPORARY SITE STABILIZATION MEASURES SHALL BE REQUIRED AS SOON AS PRACTICABLE, BUT NO LATER THAN 14 CALENDAR DAYS AFTER ACTIVITY HAS CEASED.

LEGEND

- PROPOSED PERMANENT EASEMENT
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- ~~~ EXISTING PERENNIAL STREAM
- EXISTING WETLAND - DO NOT DISTURB
- PROPOSED FLOW DISSIPATION FEATURE
- PROPOSED EFFLUENT CHANNEL
- PROPOSED BOULDER TOE
- NATIVE ROCK FOREBAY
- SILT FENCE LOCATION (C-1, C-2)
- EXCLUSION FENCE (C-3, C-4)
- STABILIZED CONSTRUCTION ENTRANCE (C-2, C-3)
- TEMPORARY STREAM CROSSING (C-4, C-5)
- ROCK CHECK DAM (C-4, C-5)
- CONTRACTOR STAGING AREA

GRAPHIC SCALE = 1" ON ORIGINAL

ALL ELEVATIONS IN THIS SET OF PLANS ARE BASED ON 1988 NAVD DATUM. ELEVATIONS WILL NOT AGREE WITH ELEVATIONS ON EXISTING PLANS FROM PREVIOUS CLARKSVILLE WWTP PROJECTS.

SCALE: 1" = 80'
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 JOB NO.: 68185
 DESIGNED: BMA
 DRAWN: BMA/JMR
 CHECKED: JMR
 Q/C:

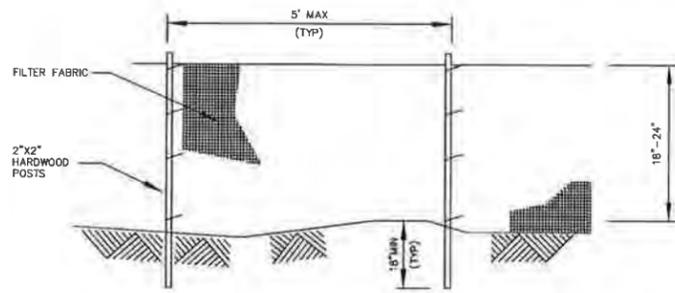
OWNER APPROVAL:
 BY:
 TITLE:

REVISIONS:
 NO: DATE:

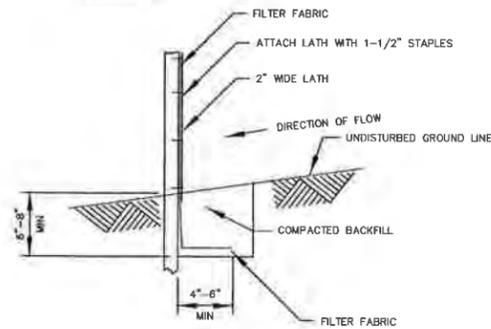


DRAWING:
C-3
 6 OF 28

C4.1
C3 SILT FENCE PLAN



ELEVATION

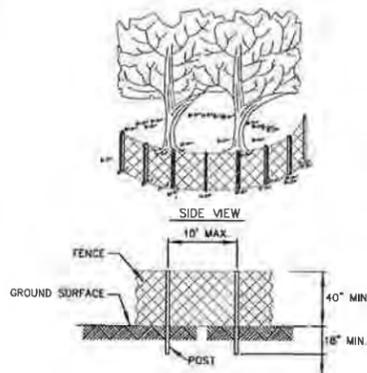


FABRIC ANCHOR DETAIL

NOTES:

- TEMPORARY SILT FENCE SHALL BE INSTALLED, AS NEEDED, PRIOR TO ANY GRADING WORK IN THE EFFLUENT LINE REPLACEMENT CORRIDOR. THEY SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REMOVED ONCE THE DISTURBED AREAS ARE STABILIZED.
- A FLAT BOTTOMED TRENCH APPROXIMATELY 4 TO 6-INCHES WIDE AND 6 TO 8-INCHES DEEP, OR A V-SHAPED TRENCH 6 TO 8-INCHES DEEP SHOULD BE EXCAVATED. ON THE DOWNSLOPE SIDE OF THE TRENCH, DRIVE THE 2-INCH BY 2-INCH WOOD POSTS A MINIMUM OF 18-INCHES INTO THE GROUND SPACING THEM NO MORE THAN 5-FOOT APART.
- POSTS SHOULD BE INSTALLED WITH 1 TO 2-INCHES OF THE POST PROTRUDING ABOVE THE FILTER FABRIC WITH THE HEIGHT OF THE FILTER FABRIC RANGING FROM 18 TO 24-INCHES ABOVE GRADE.
- FILTER FABRIC SHOULD BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO LENGTH NEEDED TO MINIMIZE USE OF JOINTS. IF JOINTS ARE REQUIRED, FILTER FABRIC SHOULD BE WRAPPED TOGETHER ONLY AT SUPPORT POST WITH BOTH ENDS SECURELY FASTENED TO THE POST, WITH A MINIMUM OF 6-INCH OVERLAP.
- EXTRA STRENGTH FILTER FABRIC (50 POUNDS/LINEAR INCH MINIMUM TENSILE STRENGTH) SHOULD BE USED. A 2-INCH WIDE LATH SHALL BE STAPLED OVER THE FILTER FABRIC TO SECURE IT TO THE UPSLOPE SIDE OF THE POSTS. STAPLES USED TO SECURE LATH AND FILTER FABRIC TO THE POST SHOULD BE 15-INCH HEAVY DUTY WIRE STAPLES SPACED A MAXIMUM OF 8-INCHES APART.
- PLACE THE BOTTOM 12-INCHES OF FILTER FABRIC IN THE 6 TO 8-INCH DEEP TRENCH, EXTENDING THE REMAINING 4 TO 6-INCHES OF FILTER FABRIC TOWARDS THE UP-SLOPE SIDE OF THE TRENCH. THEN BACKFILL THE TRENCH WITH SOIL AND COMPACT.

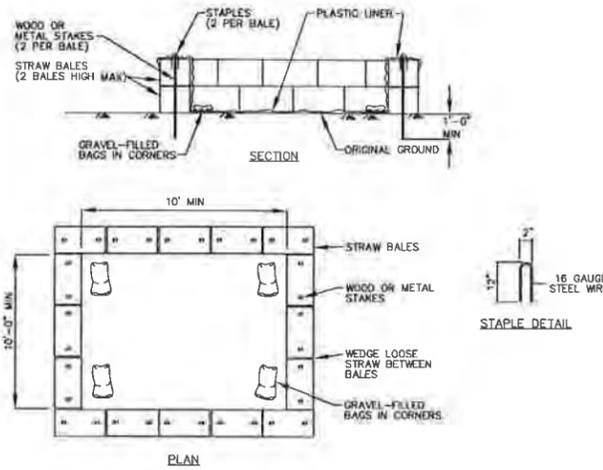
C4.2
C3 EXCLUSION FENCE DETAIL (NTS)



NOTES:

- THE FENCE MAY BE 40-INCH HIGH SNOW FENCE, PLASTIC WEB FENCE, OR ANY OTHER MATERIAL APPROVED BY A REPRESENTATIVE OF THE TOWN.
- FENCE POSTS SHALL BE EITHER STANDARD STEEL POSTS OR WOOD POSTS WITH MINIMUM CROSS SECTIONAL AREA OF 3 SQ. INCHES.
- FENCE POSTS SHALL BE PLACED NO MORE THAN 10 FEET APART.
- PULL THE FENCE TIGHT AND SECURE TO POSTS WITH PLASTIC FENCE TIES (ZIP TIES) LOOP TIES THROUGH AVAILABLE HOLES IN POST TO PREVENT FENCE FROM SLIDING DOWN THE POST.
- TO CONNECT FENCE SECTIONS, OVERLAP TWO ENDS BY AT LEAST 8 INCHES AND WEAVE A WOOD SLAT THROUGH THE OVERLAPPED STRANDS. SECURE THE JOINED ENDS TO A FENCE POST.

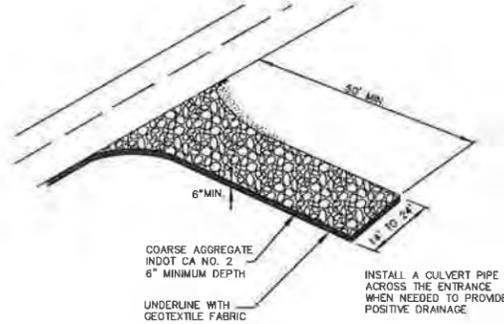
TEMPORARY CONCRETE WASHOUT AREA



NOTES:

- TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE CONSTRUCTED AS PER ADJACENT DETAIL.
- PLASTIC LINING SHOULD BE A MINIMUM OF 10 MIL POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS.
- TEMPORARY CONCRETE WASHOUT SHALL BE LOCATED IN THE DESIGNATED CONTRACTOR STAGING AREA, A MINIMUM OF 50 FEET FROM STORM DRAIN INLETS, OPEN DRAINAGES, AND WATERWAYS. EACH WASHOUT AREA SHOULD BE LOCATED AWAY FROM CONSTRUCTION TRAFFIC OR ACCESS AREAS TO PREVENT DISTURBANCE OR TRACKING.
- INSTALL A SIGN ADJACENT TO THE WASHOUT AREAS INFORMING OPERATORS TO UTILIZE THE PROPER FACILITIES.
- WASHOUT FACILITIES SHOULD BE CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE MATERIALS GENERATED DURING WASHOUT OPERATIONS.
- WASHOUT OF CONCRETE TRUCKS IS TO BE PERFORMED ONLY IN TEMPORARY CONCRETE WASHOUT FACILITIES.
- ONCE CONCRETE WASTE HAS BEEN ALLOWED TO HARDEN, THE CONCRETE SHOULD BE BROKEN UP, REMOVED, AND DISPOSED OF IN AN APPROPRIATE AND LEGAL MANNER. HARDENED CONCRETE SHOULD BE DISPOSED OF ON A REGULAR BASIS.
- MAINTAIN WASHOUT FACILITIES TO PROVIDE ADEQUATE HOLDING CAPACITY. ONCE A WASHOUT FACILITY HAS REACHED 75% CAPACITY, THE FACILITY SHOULD BE CLEANED OUT OR A NEW FACILITY USED.
- ONCE WASHOUT FACILITIES ARE NO LONGER REQUIRED, THE HARDENED CONCRETE AND MATERIALS USED TO CONSTRUCT THE WASHOUT FACILITY SHOULD BE REMOVED AND DISPOSED OF.

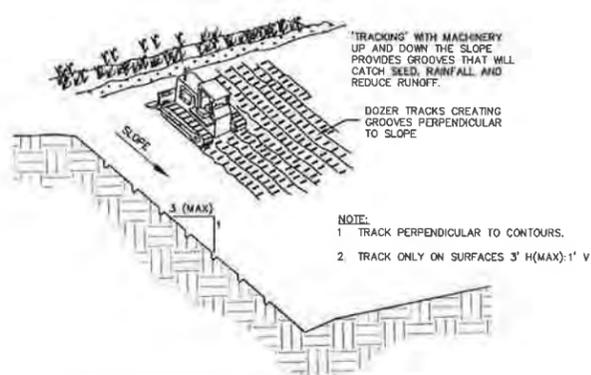
C4.3
C3 STABILIZED CONSTRUCTION ENTRANCE



NOTES:

- REMOVE ALL VEGETATION AND ANY OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA.
- INSTALL A GEOTEXTILE FABRIC PRIOR TO PLACING ANY STONE.
- INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.
- THE ENTRANCE SHALL CONSIST OF INDOT CA NO. 2 AGGREGATE WITH A MINIMUM THICKNESS OF 6-INCHES. MINIMUM WIDTH IS 14-FEET FOR ONE-WAY TRAFFIC AND 24-FEET FOR TWO-WAY TRAFFIC. MINIMUM LENGTH IS 50-FEET.
- ROADWAY SHALL FOLLOW THE CONTOUR OF THE NATURAL TERRAIN TO THE EXTENT POSSIBLE.

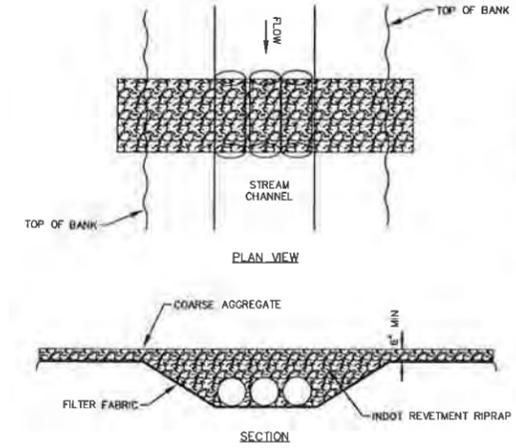
SURFACE ROUGHENING DETAIL



NOTE:

- TRACK PERPENDICULAR TO CONTOURS.
- TRACK ONLY ON SURFACES 3' H(MAX)-1' V

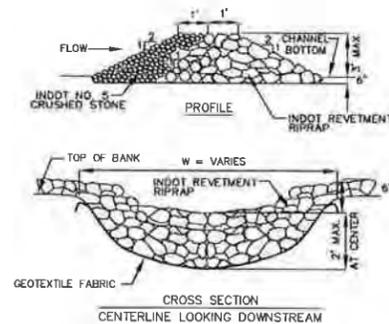
C4.4
C3 TEMPORARY STREAM CROSSING PLAN



NOTES:

- CONSTRUCTION FILL SHALL BE INDOT REVELTMENT RIPRAP OR LARGER.
- DRIVING SURFACE SHALL BE INDOT COARSE AGGREGATE GRADATION CA-2.
- CULVERTS SHALL BE LARGEST DIAMETER THAT WILL FIT INTO THE EXISTING CHANNEL WITHOUT MAJOR APPROACHES.
- THE STREAM CROSSING SHALL BE PERPENDICULAR TO THE CENTERLINE OF THE STREAM.
- THE CROSSING SHALL BE REMOVED IMMEDIATELY WHEN NO LONGER NEEDED.

C4.5
C3 ROCK CHECK DAM - RIPRAP

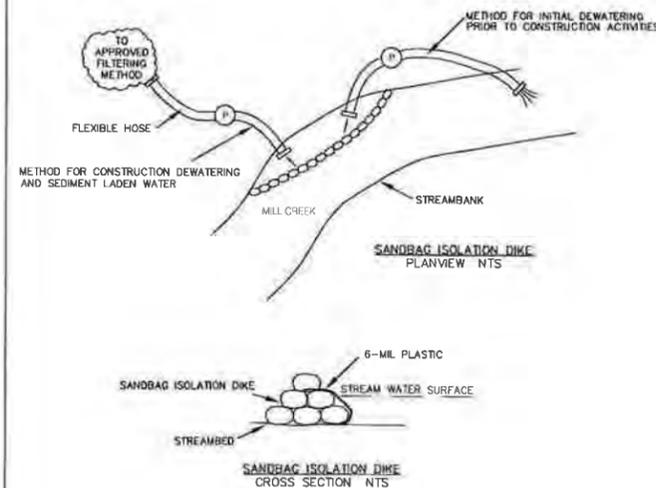


NOTES:

- A GEOTEXTILE FABRIC SHALL BE INSTALLED OVER THE SOIL SURFACE WHERE THE ROCK CHECK IS TO BE PLACED.
- THE BODY OF THE ROCK CHECK SHALL BE COMPOSED OF INDOT REVELTMENT RIPRAP.
- THE UPSTREAM FACE OF THE ROCK CHECK SHALL BE COMPOSED OF INDOT NO. 5 CRUSHED STONE.
- ROCK CHECKS SHOULD NOT EXCEED A HEIGHT OF 2-FOOT AT THE CENTERLINE OF THE CHANNEL.
- ROCK CHECKS SHOULD HAVE A MINIMUM TOP FLOW LENGTH OF 2-FOET.
- STONE SHOULD BE PLACED OVER THE CHANNEL BANKS TO PREVENT FLOW FROM CUTTING AROUND ROCK CHECK.
- THE STONES MUST BE PLACED BY HAND OR MECHANICAL PLACEMENT (NO DUMPING OF ROCK TO FORM DAM) TO ACHIEVE COMPLETE COVERAGE OF CHANNEL AND ENSURE CENTER OF CHECK IS LOWER THAN THE EDGES.

SOURCE: MSD STANDARD DRAWINGS AND ILLINOIS URBAN MANUAL

SANDBAG ISOLATION DIKE DETAIL



NOTES:

- ISOLATION DIKE SHALL BE CONSTRUCTED WITH SANDBAGS AND PLASTIC LINER AS SHOWN IN ADJACENT DETAIL. A WATER-INFLATABLE STRUCTURE MAY BE SUBSTITUTED FOR THE SANDBAGS AND PLASTIC LINER IF APPROVED BY THE ENGINEER.
- PRIOR TO ANY EXCAVATION IN THE STREAM CHANNEL, SANDBAGS SHALL BE INSTALLED AROUND THE EXTENTS OF THE BOULDER TOE INSTALLATION AREA WITHIN THE TEMPORARY CONSTRUCTION EASEMENT.
- SANDBAG ISOLATION DIKE SHALL ONLY BE INSTALLED DURING LOW FLOW CONDITIONS.
- PUMP INITIAL STREAM FLOW OUT OF THE WORK AREA PRIOR TO CONSTRUCTION ACTIVITIES AS SHOWN IN THE DETAIL ABOVE. PUMPING MUST MAINTAIN A MINIMUM OF 1-FOOT FREEBOARD ON THE ISOLATION DIKE. STABILIZE THE DISCHARGE END OF THE PUMP AROUND SYSTEM TO PREVENT SCOUR OF THE STREAM CHANNEL.
- ONCE CONSTRUCTION ACTIVITIES HAVE BEGUN, PUMP WATER FROM THE WORK AREA TO A FILTER BAG, VEGETATED FILTER STRIP, OR OTHER APPROVED SILT TRAPPING METHOD.
- PROCEED WITH CONSTRUCTION OF BOULDER TOE STRUCTURE.
- ONCE THE BOULDER TOE STRUCTURE IS COMPLETE, STABILIZE THE STREAMBANKS WITH SEED, CLEAN STRAW MULCH, AND THE SPECIFIED EROSION CONTROL BLANKET PRIOR TO REINTRODUCING STREAM FLOWS INTO COMPLETED WORK AREA.
- PUMP WATER FROM THE STREAM INTO THE STABILIZED WORK AREA TO EQUALIZE WATER LEVELS PRIOR TO REMOVING SANDBAGS.
- PUMP ACTIVITIES MUST BE MAINTAINED CONTINUOUSLY WHILE THE ISOLATION DIKE IS INSTALLED IN STREAM CHANNEL.

GRAPHIC SCALE = 1" ON ORIGINAL

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HDR

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WASTEWATER TREATMENT PLANT
EFFLUENT LINE AND PUMPING STATION
CLARKSVILLE, INDIANA
EROSION PREVENTION AND SEDIMENT CONTROL
PLAN - NOTES AND DETAILS

SCALE:
DATE: JULY 23, 2012
JOB NO.: 68185
DESIGNED: BMA
DRAWN: BMA/JMR
CHECKED: JMR
Q/C:

OWNER APPROVAL:
BY:
TITLE:

REVISIONS:
NO: DATE:

STATE OF INDIANA
GARY T. BOBLITT
19963
PROFESSIONAL ENGINEER
REGISTERED
1/25/12

DRAWING:

C-4

7 OF 28



HDR Engineering, Inc.
 One Riverfront Plaza
 Suite 600
 Clarksville, Indiana 47301
 Phone: (800) 541-5116 Fax: (800) 541-5000

WASTEWATER TREATMENT PLANT
 EFFLUENT LINE AND PUMPING STATION
 CLARKSVILLE, INDIANA
 EFFLUENT LINE THROUGH FLOODWALL
 DETAIL PLAN AND SECTION

SCALE: 1"=10'
 DATE: JULY 23, 2012
 JOB NO.: 68185
 DESIGNED: RGD
 DRAWN: SRS
 CHECKED:
 Q/C:
 OWNER APPROVAL:
 BY:
 TITLE:
 REVISIONS:
 NO: DATE:

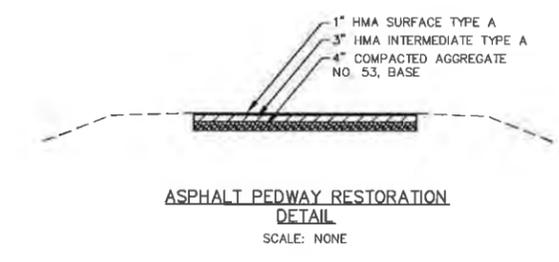


DRAWING:
C-5
 8 of 28

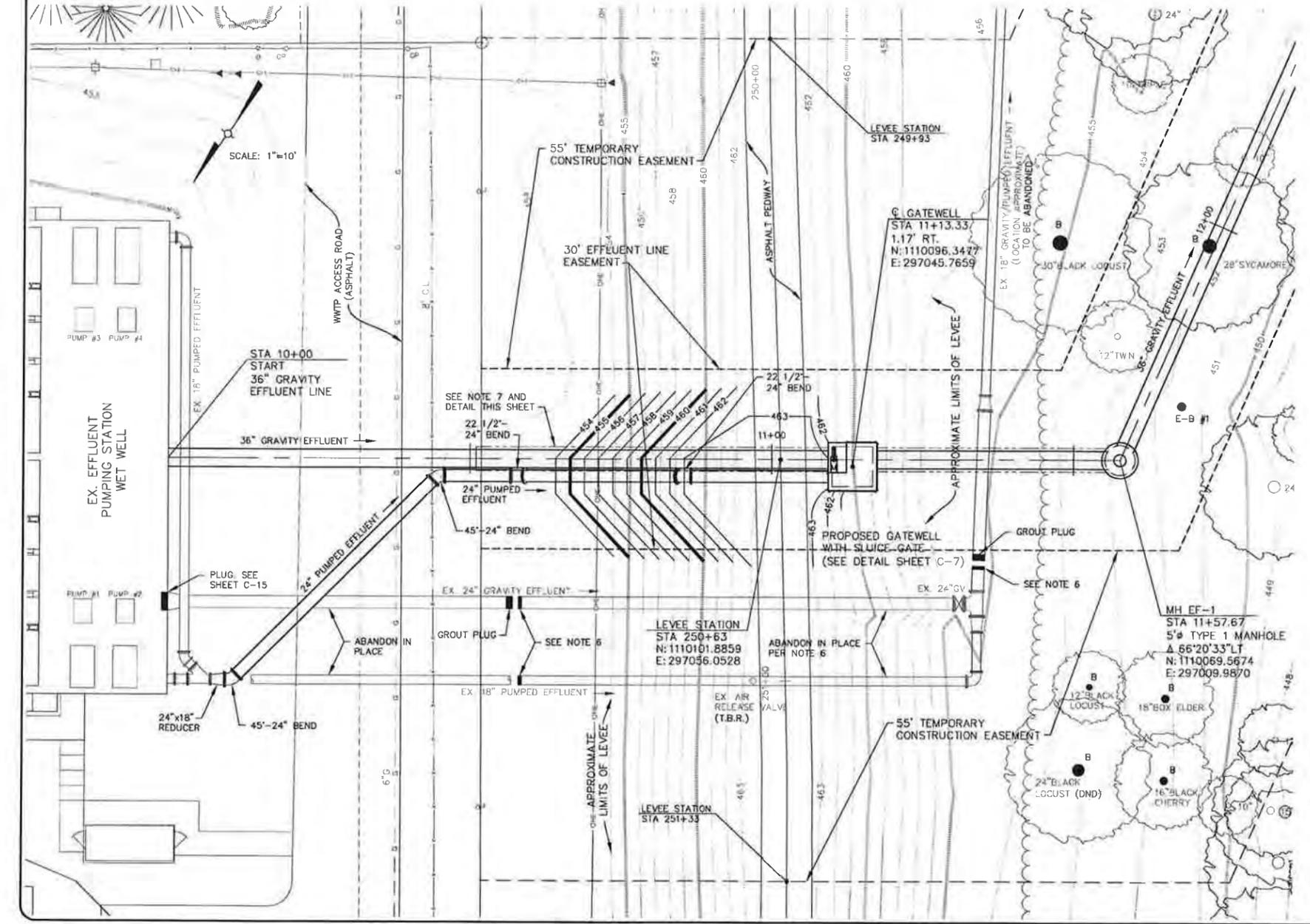
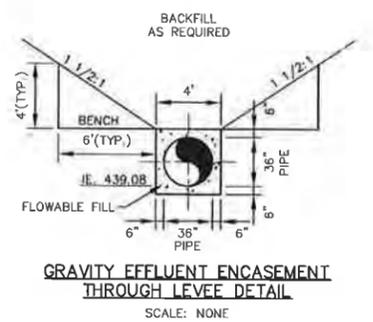
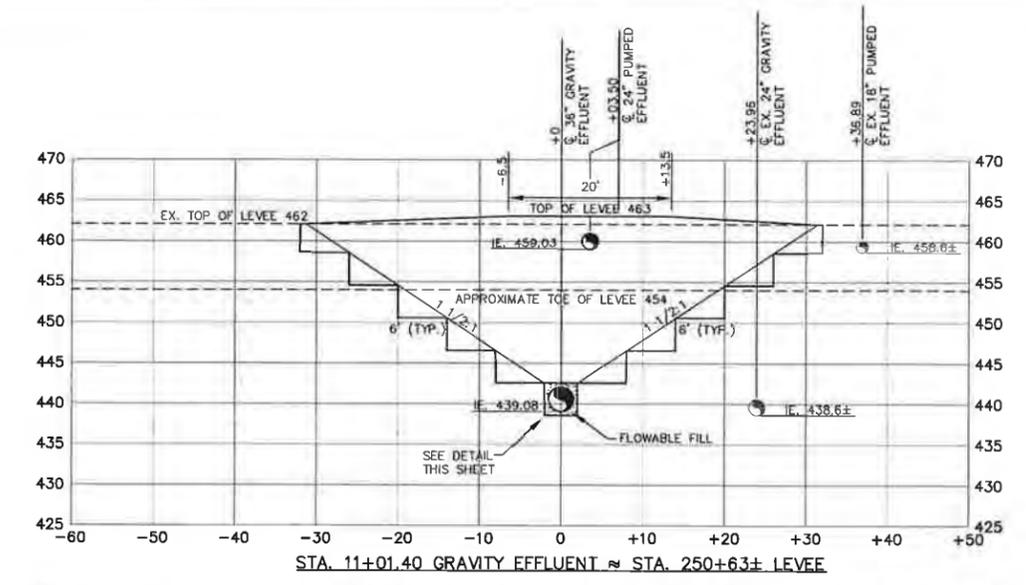
SHEET NOTES

- FULL TIME OBSERVATION BY A GEOTECHNICAL ENGINEER (OR HIS REPRESENTATIVE) WILL BE REQUIRED DURING EXCAVATION FROM LEVEE RIGHT OF WAY. THE GEOTECHNICAL ENGINEER (OR HIS REPRESENTATIVE) SHALL DIRECT THE CONTRACTOR TO SEGREGATE THE EXCAVATED MATERIAL (SAND AND CLAY) TO THE DEGREE PRACTICAL IN ORDER TO PRECLUDE UNNECESSARY USE OF OFF-SITE BORROW FOR USE AS BACKFILL.
- USACE ENGINEERING MANUAL EM 1110-2-1913 DESIGN AND CONSTRUCTION OF LEVEES AND S.O.P. FOR BENCHING AND COMPACTING FOR LEVEE AND FLOODWALL MODIFICATIONS SHALL BE FOLLOWED FOR ALL WORK WITHIN THE LEVEE EMBANKMENT AND BELOW AND WITHIN 15 FEET OF THE TOE OF THE LEVEE.
- EXCAVATION, BEDDING AND BACKFILL IN AREAS BEYOND 15 FEET OF THE TOE OF THE LEVEE SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL EXPLORATION REPORT ADDENDUM NO. 1 BY GEM ENGINEERING, INC. AND THE CONTRACT DOCUMENTS.
- THE FINISHED RIVERSIDE OR LANDSIDE SLOPE OF THE LEVEE SHALL BE GRADED TO MATCH THE EXISTING LEVEE SLOPES UPSTREAM AND DOWNSTREAM.
- THE DISTURBED AREA SHALL BE SEEDED AND COVERED WITH A BIO-DEGRADABLE EROSION CONTROL BLANKET WHEN FINAL GRADING IS COMPLETE.
- THE EXISTING 24" GRAVITY EFFLUENT LINE AND EXISTING 18" PUMPED EFFLUENT LINE SHALL BE FILLED WITH PUMPABLE GROUT AND ABANDONED IN PLACE FOR THE EXTENT AS SHOWN IN ACCORDANCE WITH USACE S.O.P. TO ABANDON AND SEAL AN EXISTING PIPE.
- FROM STA. 10+55 TO MH EF-1 STA. 11+57.67, 36" GRAVITY EFFLUENT LINE SHALL BE ENCASED IN FLOWABLE FILL (SPECIFICATION SECTION 02230) FOR FULL TRENCH WIDTH AND DEPTH TO A POINT 6" ABOVE CROWN OF PIPE. PIPE SHALL BE ADEQUATELY ANCHORED PRIOR TO FLOWABLE FILL PLACEMENT TO PREVENT FLOATION OR MOVEMENT.
- THE 24" PUMPED EFFLUENT LINE SHALL BE INSTALLED TO THE LINES AND GRADES AS SHOWN. BEDDING AND BACKFILL THROUGH THE LEVEE AND TO A POINT 15' BEYOND THE TOE OF THE LEVEE SHALL BE THE IMPERVIOUS MATERIAL USED FOR THE LEVEE EMBANKMENT INSTALLED TO THE DENSITY REQUIRED FOR THE LEVEE EMBANKMENT.
- ASPHALT PEDWAY SHALL BE SAW CUT AND RECONSTRUCTED PER DETAIL THIS SHEET.

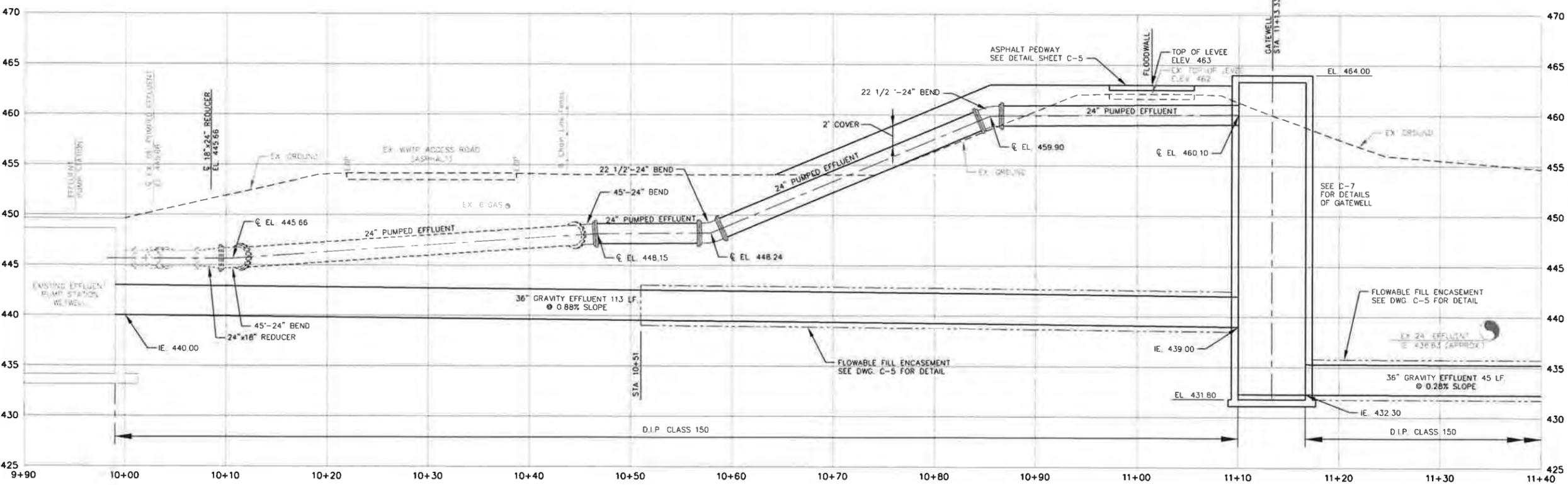
SEE SHEET C-6 FOR DETAILED PROFILE THROUGH FLOODWALL



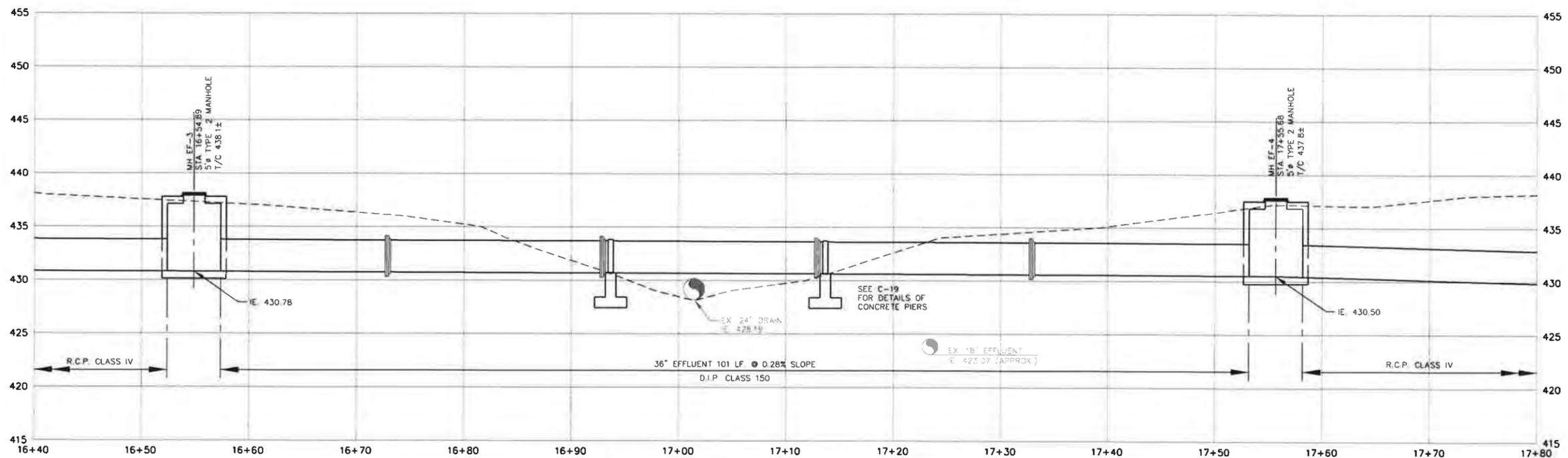
ALL ELEVATIONS IN THIS SET OF PLANS ARE BASED ON 1988 NAVD DATUM. ELEVATIONS WILL NOT AGREE WITH ELEVATIONS ON EXISTING PLANS FROM PREVIOUS CLARKSVILLE WWTP PROJECTS.



ALL ELEVATIONS IN THIS SET OF PLANS ARE BASED ON 1988 NAVD DATUM. ELEVATIONS WILL NOT AGREE WITH ELEVATIONS ON EXISTING PLANS FROM PREVIOUS CLARKSVILLE WWTP PROJECTS.



EFFLUENT LINE FLOODWALL CROSSING AND GATEWELL
LEVEE STA 250+63



EFFLUENT LINE AERIAL CROSSING

VERTICAL SCALE - 1"=5'
HORIZONTAL SCALE - 1"=5'
GRAPHIC SCALE = 1" ON ORIGINAL

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WASTEWATER TREATMENT PLANT
EFFLUENT LINE AND PUMPING STATION

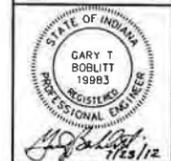
CLARKSVILLE, INDIANA

EFFLUENT LINE FLOODWALL AND AERIAL CROSSING
DETAIL PROFILE

SCALE: AS SHOWN
DATE: JULY 23, 2012
JOB NO.: 68185
DESIGNED: RGD
DRAWN: SRS
CHECKED:
O/C

OWNER APPROVAL:
BY:
TITLE:

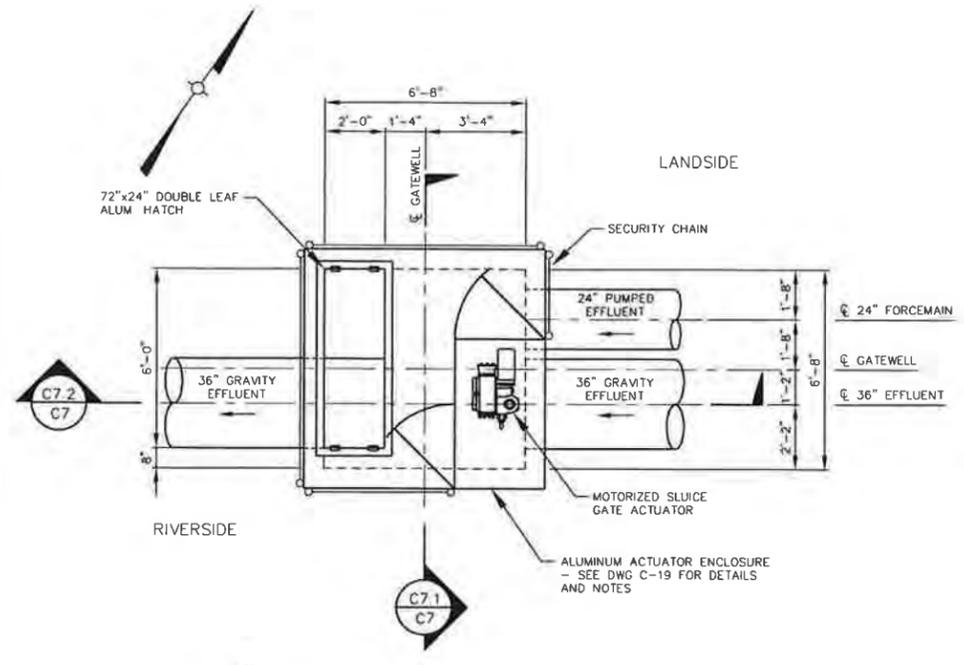
REVISIONS:
NO. DATE:



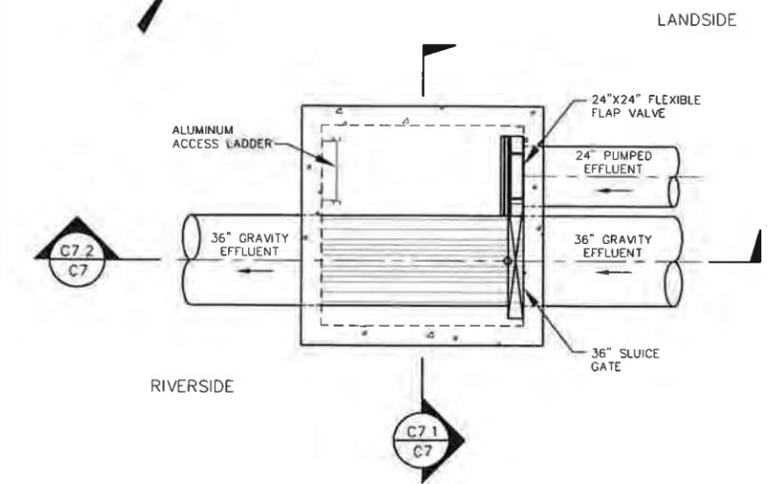
DRAWING:

C-6

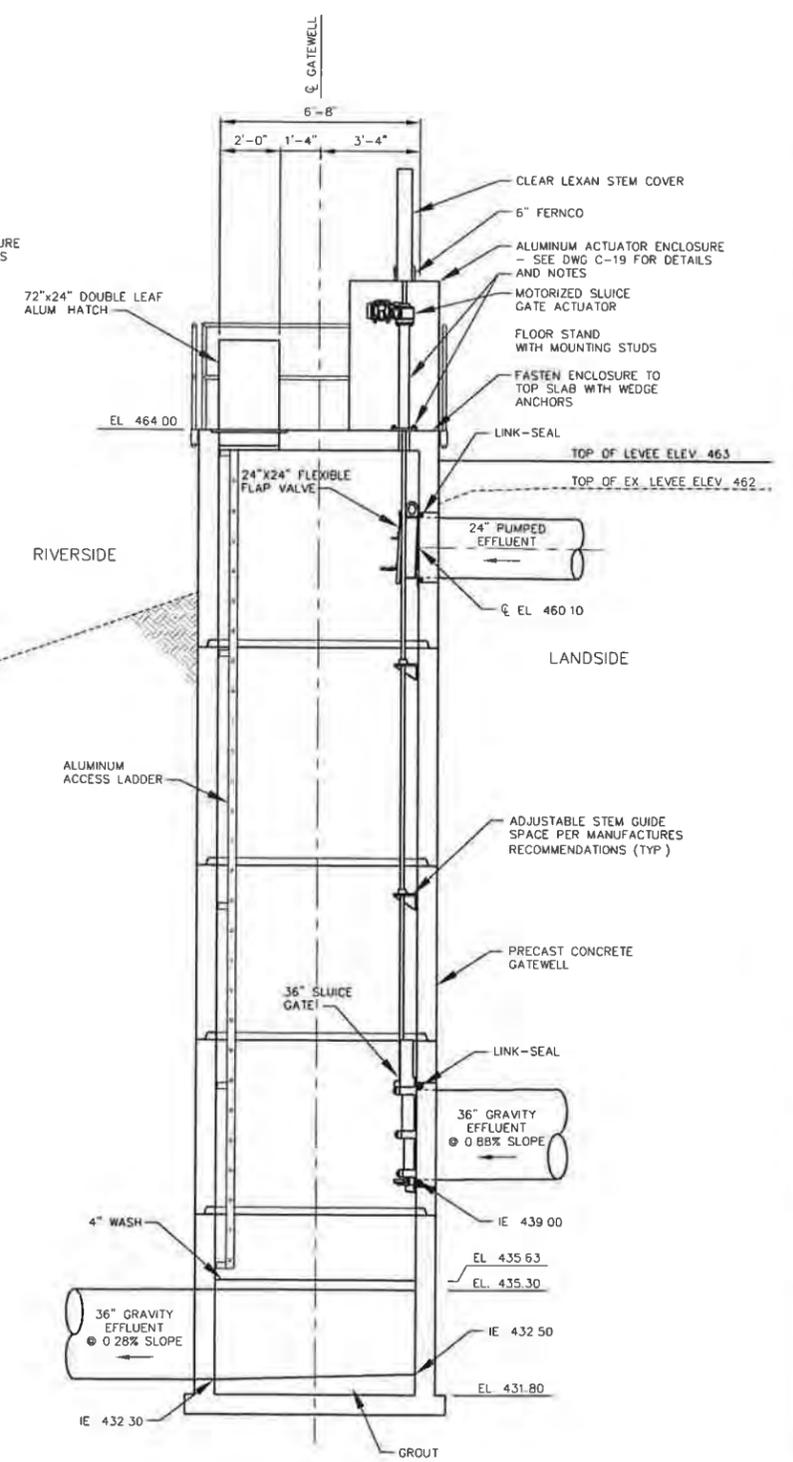
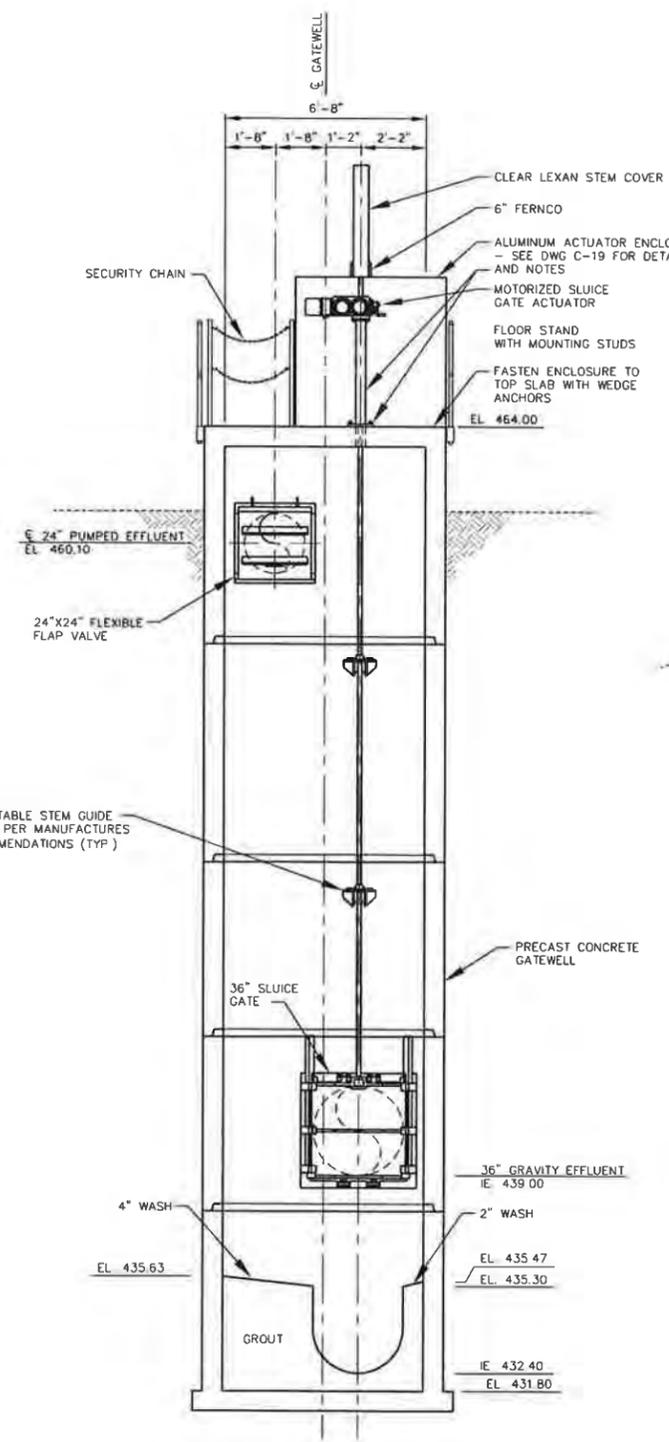
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PLAN
SCALE: 3/8"=1'-0"



PLAN - TOP REMOVED
SCALE: 3/8"=1'-0"



SCALE: 3/8" = 1'0"

DATE: JULY 23, 2012

JOB NO.: 68185

DESIGNED: RGD

DRAWN: SRS

CHECKED:

Q/C:

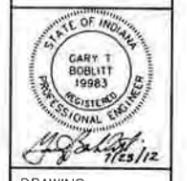
OWNER APPROVAL:

BY:

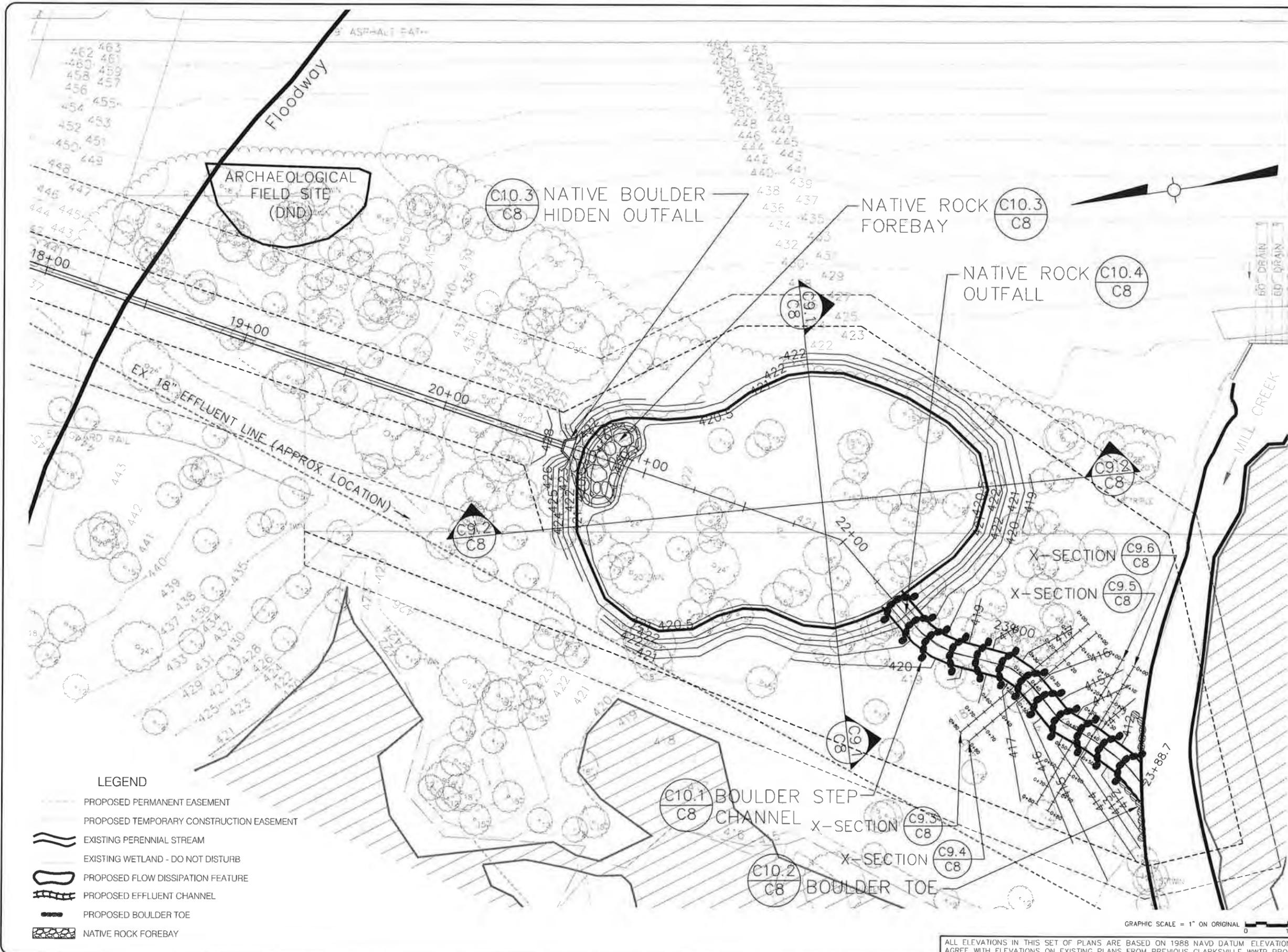
TITLE:

REVISIONS:

NO: DATE:



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 CLARKSVILLE, INDIANA 47003
 REDWING, IN. PH 502-425-3000 FAX 502-425-3077

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 200 West Front Street, Suite 500
 Clarksville, Indiana 47003
 PHONE: 502-425-3000 FAX: 502-425-3077

WASTEWATER TREATMENT PLANT
 EFFLUENT LINE AND PUMPING STATION
 CLARKSVILLE, INDIANA
 FLOW DISSIPATION FEATURE PLAN VIEW

SCALE: 1" = 20'
 DATE: JULY 23, 2012
 JOB NO.: 6B1B5
 DESIGNED: BMA
 DRAWN: BMA/JMR
 CHECKED: JMR
 O/C:

OWNER APPROVAL:
 BY:
 TITLE:

REVISIONS:
 NO. DATE

STATE OF INDIANA
 GARY I. BOBLITT
 19983
 REGISTERED PROFESSIONAL ENGINEER

DRAWING:
C-8
 11 of 28

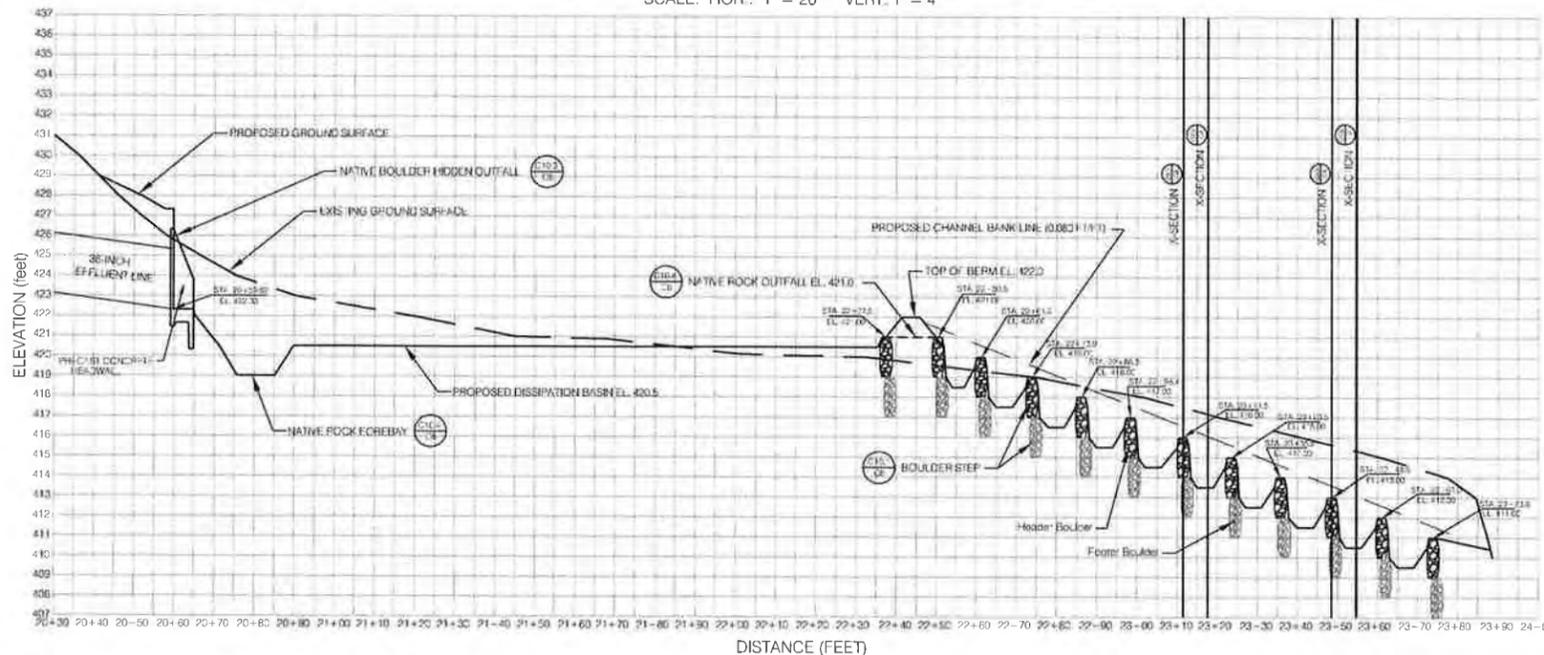
- LEGEND**
- PROPOSED PERMANENT EASEMENT
 - - - PROPOSED TEMPORARY CONSTRUCTION EASEMENT
 - ~ ~ ~ EXISTING PERENNIAL STREAM
 - XXXXX EXISTING WETLAND - DO NOT DISTURB
 - ||||| PROPOSED FLOW DISSIPATION FEATURE
 - ===== PROPOSED EFFLUENT CHANNEL
 - PROPOSED BOULDER TOE
 - NATIVE ROCK FOREBAY

GRAPHIC SCALE = 1" ON ORIGINAL

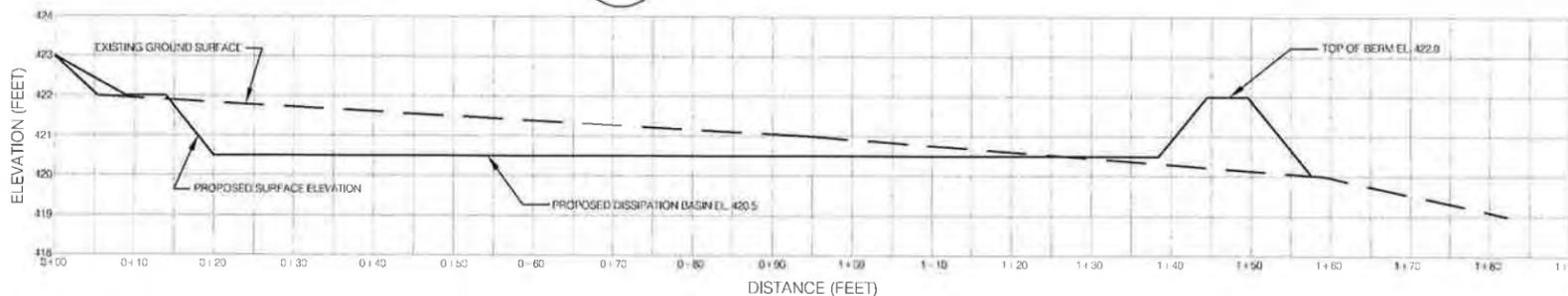
ALL ELEVATIONS IN THIS SET OF PLANS ARE BASED ON 1988 NAVD DATUM. ELEVATIONS WILL NOT AGREE WITH ELEVATIONS ON EXISTING PLANS FROM PREVIOUS CLARKSVILLE WWTP PROJECTS.

DISSIPATION STRUCTURE LONGITUDINAL PROFILE

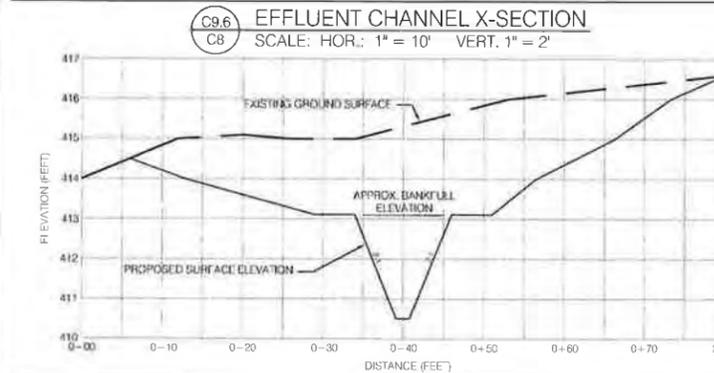
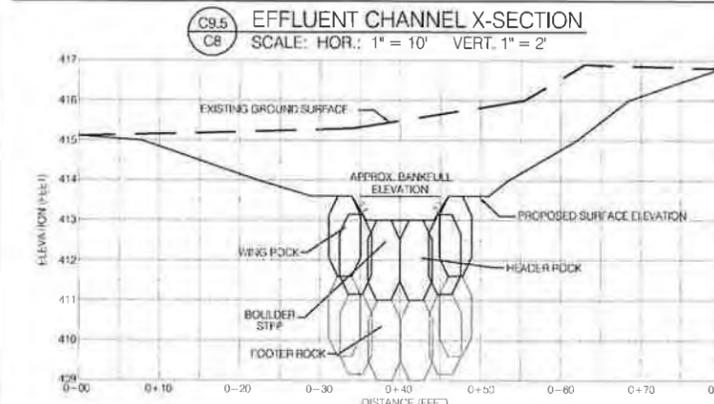
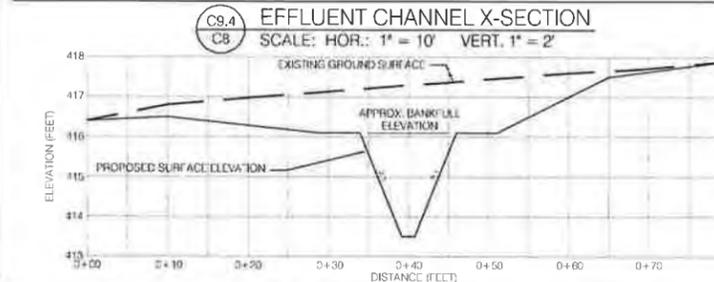
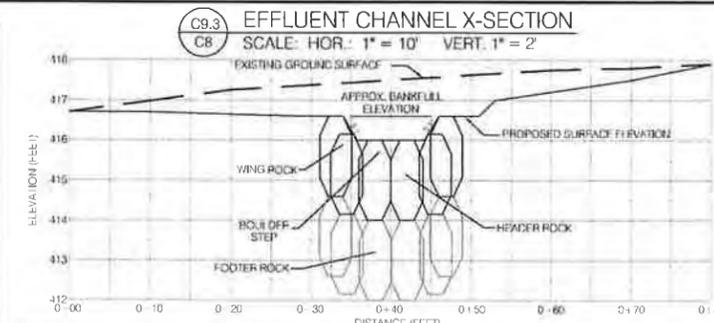
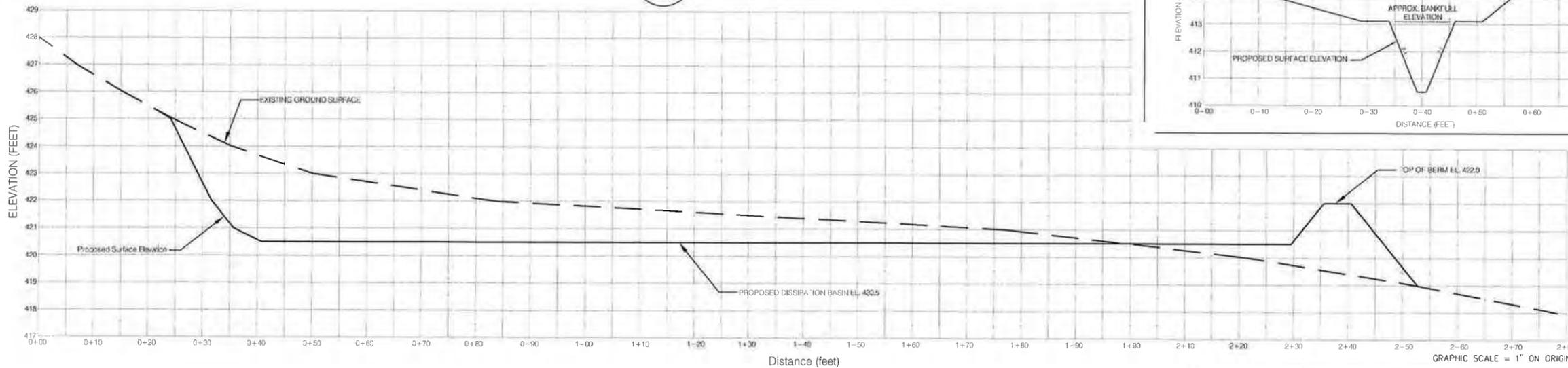
SCALE: HOR: 1" = 20' VERT. 1" = 4'



C9.2
C8 FLOW DISSIPATION FEATURE SECTION
SCALE: HOR.: 1" = 10' VERT. 1" = 2'



C9.2
C8 FLOW DISSIPATION FEATURE SECTION
SCALE: HOR.: 1" = 10' VERT. 1" = 2'



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WASTEWATER TREATMENT PLANT
EFFLUENT LINE AND PUMPING STATION
CLARKSVILLE, INDIANA
FLOW DISSIPATION FEATURE LONGITUDINAL
PROFILE AND CROSS SECTIONS

SCALE:

DATE: JULY 23, 2012

JOB NO.: 68185

DESIGNED: BMA

DRAWN: BMA/JMR

CHECKED: JMR

O/C

OWNER APPROVAL:

BY:

TITLE:

REVISIONS:

NO. DATE:

STATE OF INDIANA
GARY T BOBLITT
19983
REGISTERED
PROFESSIONAL ENGINEER

[Signature]
7/23/12

DRAWING:
C-9
12 of 28

ALL ELEVATIONS IN THIS SET OF PLANS ARE BASED ON 1988 NAVD DATUM. ELEVATIONS WILL NOT AGREE WITH ELEVATIONS ON EXISTING PLANS FROM PREVIOUS CLARKSVILLE WWTP PROJECTS.

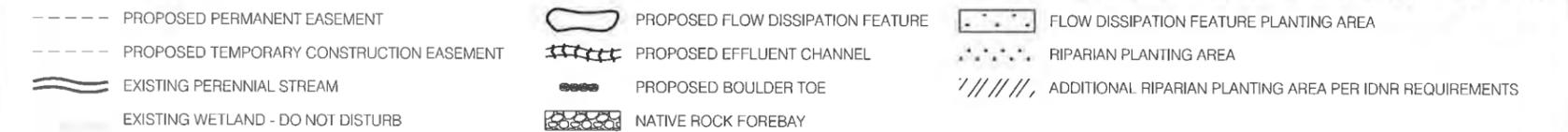
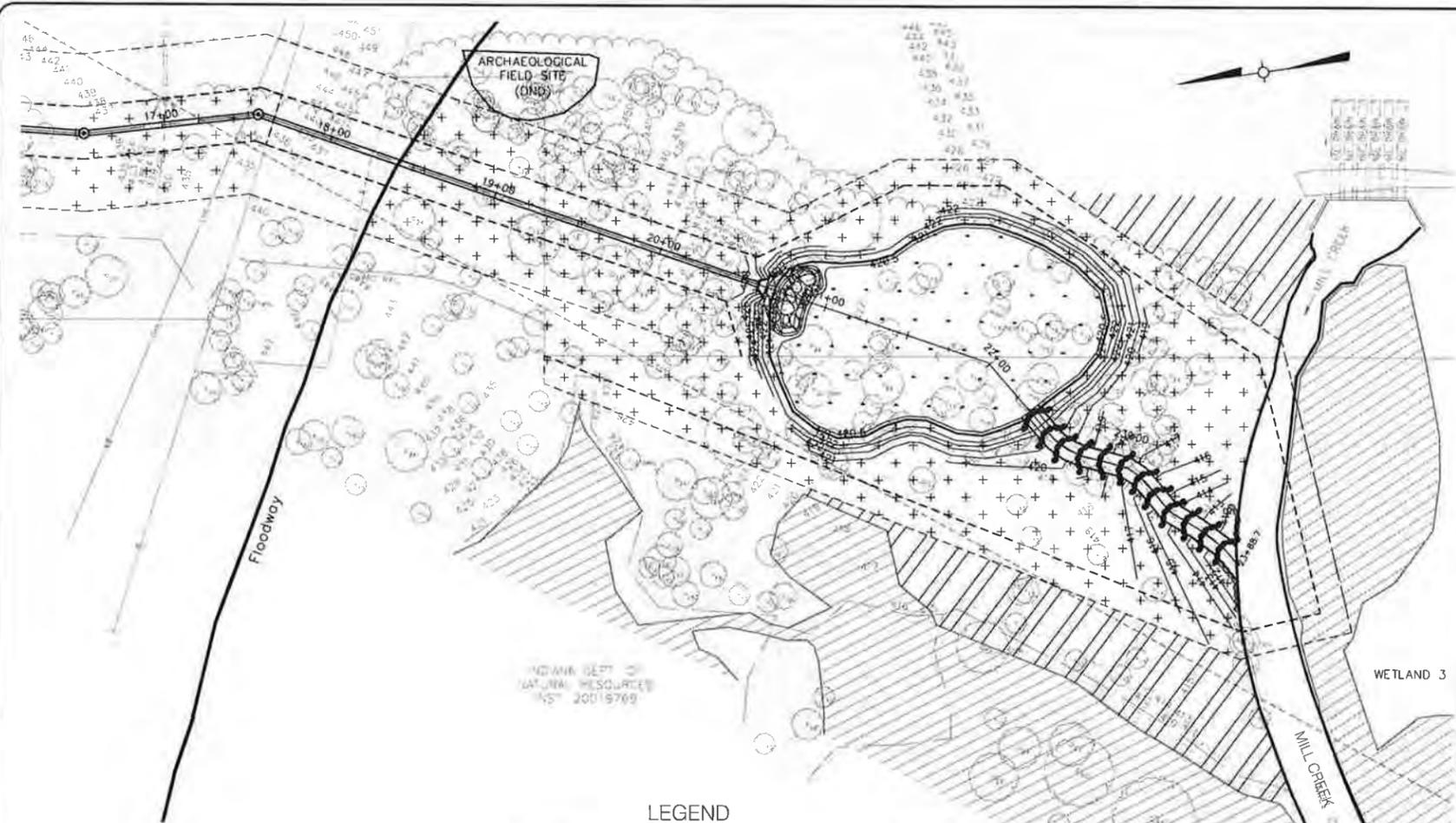


Table 2 - Riparian Seed Mix
Clarksville WWTP Effluent Line Replacement
Clark County, Indiana

Common Name	Scientific Name	PLS Weight (oz)	% Composition	Planting Rate (PLS oz/ac)	Total Seed Mix (PLS oz)
Annual Rye Grass	<i>Lolium multiflorum</i>	9	56.25%	135.0	202.5
Canada Wild Rye	<i>Elymus canadensis</i>	2	12.50%	30.0	45.0
Indian Grass	<i>Sorghastrum nutans</i>	1	6.25%	15.0	22.5
Swillgrass	<i>Panicum virgatum</i>	1	6.25%	15.0	22.5
Upland Bent Grass	<i>Agrostis perennis</i>	0.75	4.69%	11.3	16.9
Big Bluestem	<i>Andropogon gerardi</i>	0.75	4.69%	11.3	16.9
Purple Top	<i>Tridens flavus</i>	0.75	4.69%	11.3	16.9
Tall Dropseed	<i>Sporobolus compositus</i>	0.75	4.69%	11.3	16.9
Total		16.0	100.00%	240.0	360.0

Notes:
 - disturbed areas outside dissipation basin to be seeded with the above mixture at a rate of 15 lbs/acre
 - total area to be seeded with upland seed mix 1.5 acre
 - comparable native species may be substituted, as approved by a Town representative
 - species mixture obtained from Roundstone Native Seed LLC (https://www.roundstoneseed.com/index.asp)

Table 3 - Riparian Native Tree/Shrub Planting List
Clarksville WWTP Effluent Line Replacement
Clark County, Indiana

Symbol	Common Name	Scientific Name	Stratum	Quantity
CG	Burfordbush	<i>Cephalanthus occidentalis</i>	Shrub	80
CA	Silver Dogwood	<i>Cornus amomum</i>	Shrub	80
SN	Black Willow	<i>Salix nigra</i>	Shrub	60
QL	Quercus Oak	<i>Quercus lyrata</i>	Tree	75
QP	Pin Oak	<i>Quercus palustris</i>	Tree	75
PI	Sycamore	<i>Platanus occidentalis</i>	Tree	75
AS	Silver Maple	<i>Acer saccharinum</i>	Tree	45
CL	Sugarberry	<i>Celtis laevigata</i>	Tree	60
QM	Swamp Chestnut Oak	<i>Quercus michauxii</i>	Tree	90
QB	Swamp White Oak	<i>Quercus bicolor</i>	Tree	90
	Total			675

Notes:
 - comparable native species may be substituted as approved by a Town representative
 - trees and shrubs shall be three-gallon containerized plants grown by the RPM or equivalent process
 - trees and shrubs on IDNR Property must have a minimum 2.5 inch DBH (Diameter at Breast Height)
 - plant species as specified on the plan

Table 1 - Dissipation Feature Wetland Plug Planting List
Clarksville WWTP Effluent Line Replacement
Clark County, Indiana

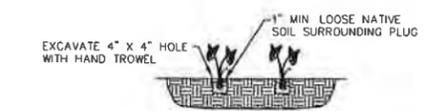
Common Name	Scientific Name	Quantity
Sweet Flag	<i>Acotis calamita</i>	490
Bulky Sedge	<i>Carex comosa</i>	490
Swamp Loosestrife	<i>Decodon verticillatus</i>	245
Blue Flag Iris	<i>Iris virginica</i>	980
Soft Rush	<i>Juncus effusus</i>	980
Arrow Arum	<i>Peltandra virginica</i>	245
Pickeringia	<i>Pickeringia cordata</i>	245
Common Arrowhead	<i>Sagittaria latifolia</i>	245
Dark Green Bludash	<i>Scirpus atrovirens</i>	530
Softstem Bulrush	<i>Sclerocarpus lahemastomati</i>	980
Total		6,439

Notes:
 - areas within the flow dissipation feature shall be planted with the plug species identified above
 - wetland plugs shall be planted in staggered rows on two-foot centers
 - comparable native species may be substituted as approved by a Town representative
 - plant species as specified on the plan

RESTORATION NOTES:

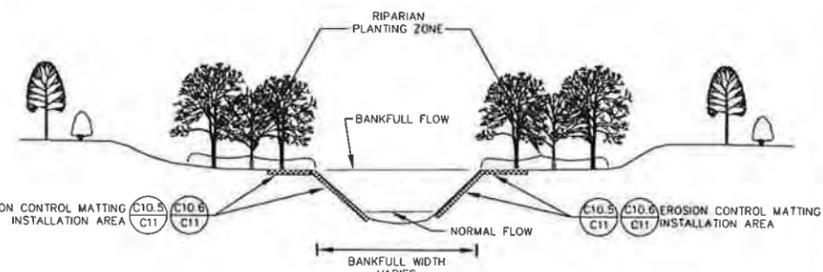
- 1 THE PROPOSED RIPARIAN RESTORATION ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THE PROVIDED PLANS AND SPECIFICATIONS
- 2 ONCE REACHING FINAL GRADES ALONG THE FLOW DISSIPATION FEATURE SIDE SLOPES, EFFLUENT CHANNEL BANKS AND ADJACENT RIPARIAN AREA, LOOSEN THE TOP LAYER OF SOIL FOR SEEDBED PREPARATION.
- 3 NATIVE WETLAND PLUGS FROM TABLE 1 SHALL BE PLANTED WITHIN THE FLOW DISSIPATION FEATURE BOTTOM AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE DETAIL PROVIDED BELOW.
- 4 SEED ALL DISTURBED GROUND SURFACES OUTSIDE OF THE FLOW DISSIPATION FEATURE AND FROM THE TOE OF SLOPE OF THE EFFLUENT CHANNEL, AS SHOWN ON THE PLANS, WITH THE NATIVE RIPARIAN SEED MIX (TABLE 2) AT A RATE OF 15 POUNDS PER ACRE
- 5 AFTER SEEDING IS COMPLETE, COVER DISTURBED GROUND SURFACES WITH CLEAN STRAW MULCH AT A RATE OF TWO TONS PER ACRE, AND ANCHOR THE STRAW MULCH WITH AN APPROPRIATE ANCHORING METHOD
- 6 INSTALL THE SPECIFIED EROSION CONTROL BLANKET FROM THE TOE OF SLOPE OF THE FLOW DISSIPATION FEATURE SIDE SLOPES AND FROM THE TOP OF THE INSTALLED BOULDER TOE ROCKS TO A MINIMUM OF THREE FEET BEYOND THE TOP OF BANK IN ACCORDANCE WITH THE PLANS AND DETAIL. EROSION CONTROL MATTING WILL ALSO BE INSTALLED FROM THE TOE OF SLOPE OF THE EFFLUENT CHANNEL TO A MINIMUM OF THREE FEET BEYOND THE CHANNEL BANKS PER DETAIL.
- 7 ONCE SEEDING AND STRAW MULCHING ARE COMPLETE AND IN THE FIRST APPROPRIATE SEASON (MID NOVEMBER TO LATE FEBRUARY), NATIVE TREES AND SHRUBS FROM TABLE 3 WILL BE PLANTED WITHIN THE PROPOSED RIPARIAN PLANTING AREA FOR EPHEMERAL 2 AT A RATE OF 60 TREE/SHRUBS PER ACRE IN ACCORDANCE WITH THE PLANS AND THE DETAIL PROVIDED BELOW. THE RIPARIAN AREA WITHIN THE FLOODWAY SHALL BE PLANTED AT A RATE OF 435 TREES/SHRUBS PER ACRE IN ACCORDANCE WITH THE PLAN AND DETAIL PROVIDED BELOW. TREE AND SHRUB SPECIES SHALL BE STAGGERED AND ALTERNATED TO PROVIDE A SUITABLE VARIETY WITHIN THE PLANTING AREAS
- 8 ALL PLANTED TREES AND SHRUBS WITHIN THE PROJECT AREA SHALL BE WATERED PERIODICALLY AS NEEDED TO PREVENT PLANT MATERIALS FROM BECOMING TOO DRY. THE CONTRACTOR SHALL PROVIDE WATER SERVICES AS NEEDED UNTIL THE PLANTS ENTER DORMANCY FOR THE FIRST TIME

CONTAINER PLUG PLANTING DETAIL



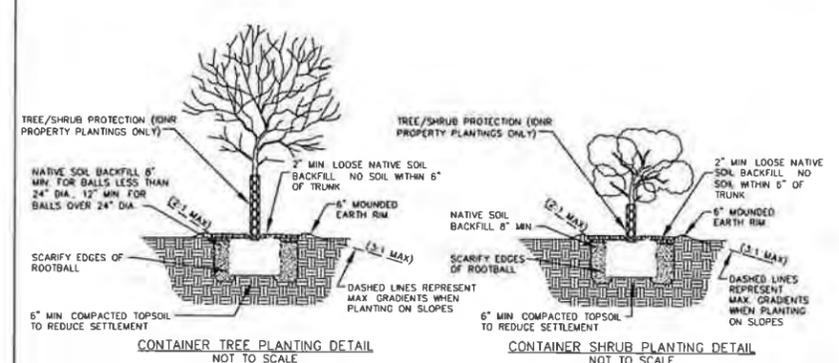
- NOTES:
- 1 PLANTING OF LIVE WETLAND PLUGS SHOULD BE ACCOMPLISHED BETWEEN APRIL 15 AND SEPTEMBER 15, UNLESS OTHERWISE APPROVED BY THE ENGINEER, AND AFTER SEED HAS BEEN ESTABLISHED.
 - 2 PLUGS SHALL BE A MINIMUM OF 2.5 INCHES DIAMETER BY 3 INCHES DEEP, WELL-ROOTED THROUGH THE CONTAINER, AND SHALL BE INOCULATED WITH MYCORRHIZAL FUNGI
 - 3 ANY SUBSTITUTIONS FROM THE APPROVED LIST (TABLE 1) MUST BE APPROVED BY THE ENGINEER
 - 4 PLUGS SHALL BE PLANTED ON STAGGERED ROWS ON TWO FOOT CENTERS AND SHALL CONSIST OF THE SPECIES PROVIDED IN TABLE 1
 - 5 PLUGS SHALL BE PLANTED BY EXCAVATING HOLES WITH HAND TOOLS, PLACING THE PLUGS LEVEL WITH EXISTING GROUND SURFACE, AND BACKFILLING AND FIRING SOIL AROUND PLUG
 - 6 THOROUGHLY SATURATE THE SOIL IN THE PLANTED AREA TO A DEPTH OF FOUR INCHES IMMEDIATELY AFTER PLANTING PLUGS

CHANNEL BANK PLANTING DETAIL



RIPARIAN PLANTING AREA ALONG EPHEMERAL 2 - 60 TREES/SHRUBS PER ACRE AT 27-FOOT SPACING (SEE DETAIL BELOW AND TABLE 3)
 RIPARIAN PLANTING AREA WITHIN FLOODWAY - 435 TREES/SHRUBS PER ACRE AT 10-FOOT SPACING (SEE DETAIL BELOW AND TABLE 3)
 NATIVE GRASSES FROM TABLE 2 WILL BE SOWN ON CHANNEL SIDESLOPES AND ADJACENT DISTURBED AREAS AT A RATE OF 15 POUNDS PER ACRE

CONTAINERIZED TREE/SHRUB PLANTING DETAIL



NOTE:
 ALL PLANT MATERIALS SHALL MEET AND BE INSTALLED IN ACCORDANCE WITH AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS
 ALL TREES AND SHRUBS PLANTED WITHIN IDNR PROPERTY BOUNDARIES SHALL BE 2.5" DBH MINIMUM AND SHALL BE FITTED WITH A TREE GUARD VEXAR MESH TUBE-TYPE TREE GUARDS, OR EQUIVALENT, SHALL BE USED
 THE LANDSCAPE CONTRACTOR SHALL MAINTAIN AND GUARANTEE ALL TREES AND SHRUBS FOR A MINIMUM OF TWO YEARS FROM THE DATE OF ACCEPTANCE BY A TOWN REPRESENTATIVE. THE LANDSCAPE CONTRACTOR SHALL REPLACE TREES AND SHRUBS IN A TIMELY MANNER DURING THE GUARANTEE PERIOD
 THE TWO-YEAR MAINTENANCE ACTIVITIES SHALL INCLUDE BUT ARE NOT LIMITED TO WATERING, SPRAYING, MULCHING, AND FERTILIZING
 ALL UNHEALTHY OR DEAD PLANT MATERIAL SHALL BE REPLACED WITHIN ONE YEAR OR BY NEXT PLANTING PERIOD, WHICHEVER COMES FIRST
 THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY AND ALL DAMAGED UTILITIES, STRUCTURES, SITE APPURTENANCES, ETC., WHICH OCCUR AS A RESULT OF THE LANDSCAPE INSTALLATION AT NO COST TO THE TOWN
 THE CONTRACTOR SHALL CONTACT INDIANA 811 (TOLL FREE NO. 1-800-382-5544) A MINIMUM OF 48 HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY ON THIS PROJECT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION OF ANY UTILITIES WITHIN THE PROPOSED CONSTRUCTION AREAS

GRAPHIC SCALE = 1" ON ORIGINAL

ALL ELEVATIONS IN THIS SET OF PLANS ARE BASED ON 1988 NAVD DATUM. ELEVATIONS WILL NOT AGREE WITH ELEVATIONS ON EXISTING PLANS FROM PREVIOUS CLARKSVILLE WWTP PROJECTS

REDWING ECOLOGICAL SERVICES, INC.
 1108 SOUTH FOURTH STREET
 CLARKSVILLE, INDIANA 47522
 PH: 502-825-3009 FAX: 502-825-3077

REDWING

HDR

HDR Engineering, Inc.
 One Investment Plaza
 200 West Main Street
 Lawrence, Indiana 47025
 PHONE: (317)524-4115 FAX: (317)524-4008

CLARKSVILLE, INDIANA

WASTEWATER TREATMENT PLANT
 EFFLUENT LINE AND PUMPING STATION

FLOW DISSIPATION FEATURE PLANTING PLAN

SCALE: 1" = 40'

DATE: JULY 23, 2012

JOB NO.: 68185

DESIGNED: BMA

DRAWN: BMA/JMR

CHECKED: JMR

OWNER APPROVAL:

BY: _____

TITLE: _____

NO.: _____ DATE: _____

STATE OF INDIANA
 GARY T BOBLITT
 19983
 PROFESSIONAL ENGINEER

11/23/12

DRAWING: **C-11**

14 of 28

APPENDIX B

ACRONYMS

ACRONYMS AND ABBREVIATIONS

ACM	Asbestos Containing Material
APE	Area of Potential Effect
AST	Above-ground Storage Tank
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CRA	Cultural Resource Analysts, Inc.
dB	Decibels
dbh	Diameter at Breast Height
EA	Environmental Assessment
EIS	Environmental Impacts Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPSC	Erosion Prevention and Sediment Control
ESA	Endangered Species Act
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Map
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
LFI	Linebach Funkhouser, Inc.
mgd	Million Gallons Per Day
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Oxide
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
O ₃	Ozone
OBL	Obligate
OSHA	Occupational Safety and Health Act
Pb	Lead
PM	Particulate Matter
Redwing	Redwing Ecological Services, Inc.
SHPO	State Historic Preservation Officer
SO ₂	Sulfur Dioxide
SWPPP	Storm Water Pollution Prevention Plan
THPO	Tribal Historic Preservation Officer
UPL	Upland
USACE	U.S. Army Corps of Engineers
UST	Under-ground Storage Tank
VOC	Volatile Organic Compounds
WWTP	Waste Water Treatment Plant

APPENDIX C

AGENCY CONSULTATIONS

**E.0 11988 FLOODPLAIN MANAGEMENT
EIGHT-STEP PLANNING PROCESS**

8-Step Process

DR 1997-664

Clarksville WWTP Expansion and Effluent Line Replacement

Executive Order 11988 Floodplain Management

Executive Order 11990 Wetland Protection

Eight-Step Planning Process Summary

<p>Step 1: Determine Project Location Determine whether the Proposed Action is located in a wetland and/or the Special Flood Hazard Area (SFHA), or whether it has the potential to affect or be affected by the floodplain or wetland.</p>	<p>Project Analysis: According to the FEMA Flood Insurance Rate Map (FIRM) 1800260005B dated August 3, 1981 and preliminary digital FIRM data dated May 28, 2004, the WWTP expansion site is not located within the mapped Special Flood Hazard Area (SFHA); however, the central and southern portions of the effluent line replacement project corridor are located within Zone AE/Zone A21— area with 1% annual chance of flooding, base flood elevation (BFE) of 448 feet above mean sea level. The southern approximately 550 feet of the effluent line replacement corridor are located within the floodway.</p> <p>Based on a wetland delineation of the project corridor performed on December 13 and 14, 2011 and on February 3 and March 29, 2012, wetlands will not be impacted as a result of this project. There are no jurisdictional wetlands or streams located within the WWTP expansion study area. Jurisdictional waters within the effluent line replacement study area include approximately 284 feet (0.014 acre) of ephemeral stream, 359 feet (0.021 acre) of degraded, urbanized intermittent stream, 520 feet (0.24 acre) of perennial stream (Mill Creek), and 1.31 acres of emergent and forested wetland.</p>
<p>Step 2: Encourage Public Involvement Notify public at earliest possible time of the intent to carry out an action in a floodplain or wetland, and involve the affected and interested public in the decision-making process.</p>	<p>Project Analysis: The Town of Clarksville (Town) has notified the adjacent landowners of the project via certified mail in conjunction with the permit application to the Indiana Department of Natural Resources for construction within the floodway.</p> <p>Additionally, the proposed project was discussed at a series of four public meetings held in May and June of 2011. Prior to each meeting, notification was published on the Town's website and in the local newspaper of record, <i>The Evening News</i>. The project was discussed at numerous Town Council meetings, which are held the first and third Monday of every month, at several work sessions, and at meetings with the Historic Preservation Commission. These meetings are open to the public, and the times are published on the Town's website.</p>
<p>Step 3: Evaluate Alternatives Identify and evaluate practicable alternatives to locating the Proposed Action in a floodplain or wetland.</p>	<p>Project Analysis: The following were alternatives considered by the Applicant.</p> <p>Alternative 1. No action. The no action alternative would leave the project area as-is, with the damaged outfall and associated appurtenances within Zone A, as they are functionally-dependent on placement near water. However, the outfall would soon slip into non-compliance as the smaller receiving water requires more stringent discharge permit limits.</p> <p>Alternative 2. Other feasible alternative. Reconstructing the</p>

	<p>existing effluent line to its previous discharge point at the Ohio River (pre-disaster condition). This alternative would leave the project outfall within Zone A, as it is functionally dependent on placement near water. This option was eliminated because of soil stability issues, projected impacts to the Falls of the Ohio State Park, and cost concerns.</p> <p>Alternative 3. The portion of the project located within Zone AE (1% annual chance of flooding) is limited to the installation of a 36-inch pipe a construction of the dissipation feature to transfer effluent from the WWTP to the proposed discharge point on Mill Creek. Effluent outfalls are functionally-dependent on placement near water. Due to the effluent volume (3.32 million gallons of waste per day (mgd) with a peak hourly rate of 12.13 mgd), discharge to an upland area is not feasible; therefore, discharge to a receiving water is the appropriate alternative. Due to the effluent volume, the receiving water must be of sufficient size to accommodate the flows without destabilization. There are no alternate receiving streams outside the mapped SFHA. Thus, all alternate discharge points would result in similar disturbance to the floodplain.</p>
<p>Step 4: Assess Impact Identify the full range of potential direct or indirect impacts associated with the occupancy or modification of floodplains and wetlands and the potential direct and indirect support of floodplain and wetland development that could result from the Proposed Action.</p>	<p>Project Analysis: The project will result in the installation of approximately 1,200 feet of 36-inch effluent line, which will discharge to an approximately 0.5-acre energy dissipation basin. Flows from the energy dissipation basin will be directed into a 150-foot step-pool channel, which will discharge to Mill Creek. A boulder toe is proposed along the right bank of Mill Creek for approximately 25 feet upstream and 20 feet downstream of the confluence with the effluent step-pool channel to ensure bank stability.</p> <p>The installation of the effluent line will not result in the loss of floodplain capacity due to the installation of the infrastructure below the ground surface. Construction of the energy dissipation basin will require construction of a berm to impound water; however, the material needed to construct the berm will be acquired from grading within the basin and the outfall channel below the basin. Furthermore, the top elevation of the berm will not be above the BFE. Thus, the project will not result in the loss of floodplain volume and will not convert floodplain to non-floodplain areas. The project, though technically an expansion of the WWTP, does not encourage continued development of the floodplain, as the Town of Clarksville’s mapped SFHA is largely set-aside for recreational purposes (i.e. the Ohio River Greenway, Falls of the Ohio State Park, Colgate Park, Colgate Park, etc).</p> <p>The proposed project avoids impacts to jurisdictional wetlands; therefore, the Proposed Action Alternative will not adversely affect wetland resources. The project will involve temporary impacts to 60 feet of Ephemeral 2 and permanent impacts to 60 feet of streambank along Mill Creek; however these impacts will be addressed through the U.S. Army Corps of Engineers Clean Water Act permitting process.</p>
<p>Step 5: Minimize Impact Minimize the potential adverse impacts to work within floodplains and wetlands to be identified</p>	<p>Project Analysis: The proposed project is not anticipated to have an adverse impact on the SFHA. The proposed project is functionally-dependent on</p>

<p>under Step 4, restore and preserve the natural and beneficial values served by wetlands.</p>	<p>placement near water and does not require the construction of aboveground appurtenances other than the earthen berm, which will be constructed from soil excavated from the floodplain. The Town will develop and implement an appropriate EPSC plan prior to construction to reduce/eliminate indirect impacts. Following completion of construction, disturbed areas will be revegetated with native herbaceous and woody vegetation. The proposed project has been presented to the local floodplain coordinator with the Town of Clarksville to determine local floodplain permit requirements.</p> <p>Indirect impacts to wetlands will be prevented through the use of appropriate erosion prevention and sediment control (EPSC) measures during construction.</p> <p>The effluent pipe discharges to an energy dissipation basin located adjacent to Mill Creek. The energy dissipation basin leads to a 150-foot step-pool channel, which discharges to Mill Creek. The boulder step and streambank toe protection features adjacent to Mill Creek have been designed with boulders of appropriate size to maintain stability and prevent damage from future floods. The effluent pipe outfall is located approximately 280 feet from Mill Creek and should not be impacted by flood flows other than backwater flooding. Extensive geotechnical studies were performed to identify the proper location of the effluent pipe to avoid unstable soil conditions during extended flooding.</p> <p>The Town is coordinating with the U.S. Army Corps of Engineers (USACE) and the IDEM regarding acquisition of the appropriate permits under Sections 404 and 401 of the Clean Water Act.</p>
<p>Step 6: Determine Practicability Re-evaluate the Proposed Action to determine</p> <ol style="list-style-type: none"> 1) if it is still practicable in light of its exposure to flood hazards; 2) the extent to which it will aggravate the hazards to others; and 3) its potential to disrupt floodplain and wetland values. 	<p>Project Analysis: The Proposed Action remains practicable. Considering the facility is functionally-dependent on placement near water, the proposed action is the most practicable in light of projected minimal and indirect impacts to wetlands and the floodplain. No adverse impacts to the floodplain or wetlands are anticipated, and the project is not anticipated to aggravate flooding hazards to others.</p>
<p>Step 7: Provide Public Explanation If the agency decides to take an action in a floodplain or wetland, prepare and provide the public with a finding and explanation of any final decision that the floodplain or wetland is the only practicable alternative. The explanation should include any relevant factors considered in the decision-making process.</p>	<p>Project Analysis: A public notice will be published in the newspaper of general circulation informing the public of FEMA's decision to proceed with the project.</p>
<p>Step 8: Comply with Executive Orders Review the implementation and post-implementation phases of the Proposed Action.</p>	<p>Project Analysis: This step is integrated into the NEPA process and FEMA project management and oversight functions. Per 44 CFR Part 9, the full 8-step process is required and has been completed. Construction will commence upon final approval. Compliance will be verified at Project Closeout.</p>

**CORREPENDENCE WITH U.S. ARMY CORP OF
ENGINEERS FOR SECTION 404 APPROVAL**

From: Brad Anderson [banderson@redwing.win.net]
Sent: Friday, August 03, 2012 1:15 PM
To: 'Condra, Norma C LRL'
Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co

Attachments: preliminary JD - Clarksville WWTP - signed by Redwing on 8-3-12.pdf; Revised water-wetland location map per USACE visit on 8-2-12.pdf

Norma,

Please find attached a PDF copy of the signed preliminary JD form for the Clarksville WWTP Expansion and Effluent Line Replacement Project. I have made the necessary revisions to the form per our site visit yesterday. I have also provided a PDF copy of the revised Water/Wetland Location Map. Please let me know if you have any questions or if you need additional information.

Thanks,
Brad

-----Original Message-----

From: Condra, Norma C LRL [mailto:Norma.C.Condra@usace.army.mil]
Sent: Friday, August 03, 2012 11:51 AM
To: McMahan, Aaron
Cc: Brad Anderson
Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co

Hi Aaron,

I conducted a site inspection at the subject project site yesterday to verify the wetlands, and the points you raised in your last email. The intermittent stream that is not being impacted was found to be a perennial stream, but other than that, I agree with the delineation that was submitted by Redwing. Brad Anderson will be revising the preliminary JD and will forward the revised form to me for approval.

Please let me know if you need anything else from the Corps.

Thanks.
Norma

-----Original Message-----

From: McMahan, Aaron [mailto:AMcMahan@idem.IN.gov]
Sent: Monday, July 23, 2012 4:05 PM
To: Brad Anderson
Cc: Condra, Norma C LRL
Subject: Clarksville WWTP Expansion and Effluent Line, Clark Co

Brad- I have completed my initial review of the RGP notification and have the following questions/requests:

1. Because there are jurisdictional waters involved I will need some type of correspondence from the Corp which accepts your delineation. This could be a signed Pre-JD or the permit approval letter.
2. As we discussed I am concerned with a few of your data points. Specifically please have a look at DP-9, DP-11, and DP-13. Unless I am reading these wrong, it looks like you meet the F3 soil indicator with DP 11 and DP 13 which in one case would expand the wetland size. Ultimately the Corp will need to sign off on the delineation, but these were

just things I came across during my review.

3. It appears you had a ETR species hit from the IDNR natural heritage database search so you will need to contact Christie Stanifer per the letter for follow up.

I received your RGP submittal on July 9 and have 30 days to make a decision. Please provide the requested items within the review timeframe or the application will be considered out-of-scope. Let me know if you have any questions.

Aaron McMahan
IDEM- Office of Water Quality,
Wetlands & Stormwater
100 North Senate Ave
IGCN 1255
Indianapolis, IN 46204

Tel: (317) 234-6351

Fax: (317) 234-4145

E-mail: amcmahan@idem.in.gov



July 6, 2012

Mr. Aaron McMahan
Office of Water Quality
Indiana Department of Environmental Management
100 North Senate Avenue
IGCN Room 1255
Indianapolis, Indiana 46204

Ms. Norma Condra
Senior Project Manager
North Regulatory Section
U.S. Army Corps of Engineers
Louisville District
600 Dr. Martin Luther King Jr. Place
Louisville, Kentucky 40202

Subject: **Section 401 WQC Regional General Permit Notification
Clarksville WWTP Expansion and Effluent Line Replacement Project
Clark County, Indiana
Redwing Projects 11-096 and 11-096-01
USACE ID No. LRL-2012-430-NCC**

Dear Mr. McMahan and Ms. Condra:

Redwing Ecological Services, Inc. (Redwing), on behalf of the Town of Clarksville, respectfully submits this Section 401 Water Quality Certification (WQC) Regional General Permit Notification in support of the proposed Clarksville Waste Water Treatment Plant (WWTP) Expansion and Effluent Line Replacement Project (Project) in Clark County, Indiana (Figure 1). The purpose of the project is to expand the existing Clarksville WWTP that is nearing capacity and to upgrade the existing effluent line that is undersized and damaged.

The Project consists of two distinct study areas, the WWTP expansion study area and the effluent line replacement study area. The WWTP expansion study area is approximately 7.5 acres in size and is located adjacent to the existing WWTP. The WWTP expansion study area consists of a former town park with picnic and athletic facilities including an athletic field and walking track (Figure 2). Habitat found here is typical of a park setting and includes maintained lawn with scattered trees ranging in age from young to mature. No jurisdictional waters are located within the proposed WWTP expansion study area.

The effluent line replacement study area is a linear project that begins at the existing WWTP and extends south approximately 1,550 feet, within a varying-width corridor that terminates at Mill Creek. The effluent line replacement study area is dominated by young to mature woods habitat with smaller areas of herbaceous and scrub/shrub habitat (Figure 2). Jurisdictional waters within the effluent line replacement study area includes approximately 284 feet (0.014 acre) of ephemeral stream, 359 feet (0.021 acre) of unstable, poor-quality intermittent stream, 520 feet (0.24 acre) of perennial stream (Mill Creek), and 1.31 acres of emergent and forested wetland (Figure 3).

Proposed project activities include:

- The existing WWTP facility will be expanded to the southeast within the former town park property. No impacts to jurisdictional waters are proposed within the WWTP expansion site.
- The new effluent line will be installed and will discharge into a flow/energy dissipation feature prior to flowing into Mill Creek.
- The flow/energy dissipation feature will be constructed and will include an approximately 0.5-acre dissipation basin, followed by approximately 150 feet of a step-pool channel.
- The project will not involve any impacts to wetlands or intermittent streams.
- There will be temporary impacts to one ephemeral stream, Ephemeral 2. An aerial pipe crossing of Ephemeral 2 will be established (Figure 4). The aerial section of pipe will be approximately 60 feet long with the bottom of the pipe being approximately three feet above the thalweg of Ephemeral 2. During the effluent line installation activities, a temporary stream crossing will be established across Ephemeral 2 within the temporary construction limits, as shown on Sheet C-3 in Appendix A. Upon completion of the effluent line installation activities, the temporary stream crossing will be removed, and Ephemeral 2 will be restored to pre-construction contours and stabilized with native seed, clean straw mulch, and erosion control matting (Sheets C-10 and C-11 in Appendix A). The disturbed areas along the stream will then be planted with one to three-gallon containerized native trees and shrubs (Sheet C-11 in Appendix A).
- Approximately 60 feet of streambank along Mill Creek will be regraded to establish the step-pool channel as shown on Figure 4 and Sheet C-8 in Appendix A. A longitudinal profile, cross sections, and details of the proposed step-pool channel are provided as Sheets C-9 and C-10 in Appendix A. As part of the construction of the step-pool channel, two boulder toe sections will be constructed along the right bank of Mill Creek, immediately upstream and downstream of the confluence of the step-pool channel and Mill Creek (Figure 4 and Appendix A - Sheet C-8). A detail of the proposed boulder toe is provided on Sheet C-10 in Appendix A. Upon completion of the step-pool channel, the disturbed streambanks and step-pool channel banks will be seeded with a native seed mix, covered with clean straw mulch, and protected with erosion control matting (Sheets C-10 and C-11 in Appendix A).
- Tree clearing within the project boundary will be limited to the few scattered trees within the WWTP expansion study area and those within the temporary effluent line construction easement. The disturbed area within floodway will be revegetated in accordance Planting Plan provided as Sheet C-11 in Appendix A.

A copy of the Construction Drawings and Details for the project is provided as Appendix A. A *Request for Jurisdictional Determination* was submitted to the U.S. Army Corps of Engineers on May 18, 2012 and is provided as Appendix B. Also attached as Appendix C, please find a completed *Section 401 WQC Regional General Permit Notification* form for the Clarksville WWTP Expansion and Effluent Line Replacement Project. Permit drawings in 8-1/2 by 11-inch size and black and white are provided as Appendix D. A copy of correspondence from the Indiana Department of Natural Resources (IDNR) regarding state-protected species is attached as Appendix E. Redwing has also commenced informal consultation with the U.S. Fish and Wildlife Service (USFWS). A copy of the electronic mail correspondence from the USFWS is provided as Appendix F.

We trust this application package provides you with necessary information to commence with the required permitting process. We appreciate the opportunity to work with you on this project. Please contact Brad Anderson or Benjamin Deetsch of Redwing at (502) 625-3009 with any questions during your review.

Sincerely,


Benjamin J. Deetsch
Staff Ecologist


Bradley M. Anderson, P.E.
Senior Engineer

File: P:\2011 Projects\11-096 Clarksville WWTP 404-401 Permitting\Report\Section 404-401 Permitting\WQC Application cover letter.doc

cc: Ms. Brittany Montgomery – Town of Clarksville (electronic copy)
Mr. Gary Boblitt – HDR (electronic copy)

Attachments:

- Figure 1 – Site Location Map
- Figure 2 – Aerial Photograph
- Figure 3 – Water/Wetland Location Map
- Figure 4 – Proposed Project Activities Photographs
- Appendix A – Construction Drawings and Details
- Appendix B – Request for Jurisdictional Determination
- Appendix C – Section 401 WQC Regional General Permit Notification
- Appendix D – Black and White Permit Drawings in 8-1/2 by 11-inch Size
- Appendix E – IDNR Correspondence
- Appendix F – USFWS Correspondence

**CORRESPONDENCE WITH INDIANA DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT FOR SECTION 401
APPROVAL**

From: McMahan, Aaron [AMcMahan@idem.IN.gov]
Sent: Thursday, August 09, 2012 9:46 AM
To: Brad Anderson
Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co
Brad- I have approved the RGP for this project. The IDEM ID # is 2012-394-10-AMM-X.

Aaron McMahan
*IDEM- Office of Water Quality,
Wetlands & Stormwater
100 North Senate Ave
IGCN 1255
Indianapolis, IN 46204*

Tel: (317) 234-6351
Fax: (317) 234-4145
E-mail: amcmahan@idem.in.gov

From: Brad Anderson [mailto:banderson@redwing.win.net]
Sent: Wednesday, August 08, 2012 4:49 PM
To: McMahan, Aaron
Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co

Aaron,

Please find attached a PDF copy of the clearance letter from IDNR. Please let me know if you have any questions or if you need additional information.

Thanks,
Brad

From: Brad Anderson [mailto:banderson@redwing.win.net]
Sent: Wednesday, August 08, 2012 3:48 PM
To: 'McMahan, Aaron'
Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co

Thanks so much! I spoke with Christie again this afternoon, and she said that she is shooting to have the letter out tomorrow. I will e-mail you a copy as soon as I get it.

Thanks,
Brad

From: McMahan, Aaron [mailto:AMcMahan@idem.IN.gov]
Sent: Wednesday, August 08, 2012 3:34 PM
To: Brad Anderson
Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co

Brad- I have the e-mail from Norma which was really my most pressing outstanding issue. I'm assuming the letter from Christie is going to say there will be no impacts to the night heron (let me know if you know different), so I am willing to let the 30 days pass with administrative approval. Just send me a copy of the letter when you get it and I'll add it to complete the

application and get an approval number assigned to it. You will not need to resubmit.

Aaron McMahan

IDEM- Office of Water Quality,

Wetlands & Stormwater

100 North Senate Ave

IGCN 1255

Indianapolis, IN 46204

Tel: (317) 234-6351

Fax: (317) 234-4145

E-mail: amcmahan@idem.in.gov

From: Brad Anderson [<mailto:banderson@redwing.win.net>]

Sent: Wednesday, August 08, 2012 2:32 PM

To: McMahan, Aaron

Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co

Aaron,

I know that our 30-day deadline is tomorrow for the Clarksville WWTP Expansion and Effluent Line Replacement Project. I know Norma Condra of the USACE has emailed you regarding her concurrence with the wetland delineation of the project area, which should address the wetland delineation requirement of the general Section 401 approval.

I just spoke with Christie Stanifer of IDNR regarding the follow up letter on the black-crowned night heron. She said that she should have a letter issued to us by the end of the week. I then explained that your review deadline for the IDEM general 401 approval is tomorrow. She said that she would try to get the letter issued by tomorrow. However, if she doesn't, is there any sort of extension that can be granted on your review time, so that we do not have to re-submit the general 401 approval application again and restart the 30-day review timeframe?

Please give me a call to discuss at your earliest convenience.

Thanks,
Brad

Bradley M. Anderson, PE, LEED AP

Senior Engineer

Redwing Ecological Services, Inc.

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502-625-3009

502-625-3077 fax

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banderson@redwingeco.com

From: McMahan, Aaron [<mailto:AMcMahan@idem.IN.gov>]

Sent: Wednesday, July 25, 2012 3:02 PM

To: Brad Anderson

Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co

Sounds good. Hopefully Norma will let me know if she agrees with your soils interpretation and therefore your delineation. Thanks for the response.

From: Brad Anderson [<mailto:banderson@redwing.win.net>]
Sent: Wednesday, July 25, 2012 1:51 PM
To: McMahan, Aaron
Cc: 'Condra, Norma C LRL'; 'Ben Deetsch'
Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co

Aaron,

I just wanted to let you know that we have a site meeting scheduled with Norma Condra of the USACE next Thursday, 8/2, at 9 am. We also have a call into Christie Stanifer with IDNR to discuss the black-crowned night heron. Please let me know if you have any questions or if you need additional information.

Thanks,
Brad

From: Brad Anderson [<mailto:banderson@redwing.win.net>]
Sent: Wednesday, July 25, 2012 9:25 AM
To: 'McMahan, Aaron'
Cc: 'Condra, Norma C LRL'; 'Ben Deetsch'
Subject: RE: Clarksville WWTP Expansion and Effluent Line, Clark Co

Aaron,

Thanks for the update as to your review of the RGP Notification submitted in support of the Clarksville WWTP Expansion and Effluent Line Replacement Project. In regards to your questions/requests below, Redwing would like to offer the following responses. Your questions/requests are summarized below (in bold italics) with a corresponding response to each.

1. Because there are jurisdictional waters involved I will need some type of correspondence from the Corp which accepts your delineation. This could be a signed Pre-JD or the permit approval letter.

Redwing understands that a signed preliminary JD or permit approval letter is required from the USACE for IDEM's Notification approval. As such, we submitted a *Request for Jurisdictional Determination* to the USACE on May 18, 2012. Since that JD Request submittal, I have spoken with Norma Condra. She informed me that there was a Regional Condition for NWP 12 in Indiana that requires that the USACE be notified of any stream crossings even if the project meets all of the conditions of the NWP as provided in the Federal Registrar. In that my conversation with Norma, she stated that the RGP Notification was an acceptable form of notification to the USACE.

2. As we discussed I am concerned with a few of your data points. Specifically please have a look at DP-9, DP-11, and DP-13. Unless I am reading these wrong, it looks like you meet the F3 soil indicator with DP 11 and DP 13 which in one case would expand the wetland size. Ultimately the Corp will need to sign off on the delineation, but these were just things I came across during my review.

Per your request, we have reviewed the three data points in question (DP-9, DP-11, and DP-13), and we stand by our original conclusions that these three data points do not meet the definition of a hydric soil.

The Technical Description, for Indicator F3: Depleted Matrix, as described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August, 2010) states: "A layer that has a depleted matrix with 60 percent or more chroma of 2 or less and that has a minimum thickness of either: 2 in. if the 2 in. is entirely within the upper 6 in. of the soil, or 6 in. starting within 10 in. of the soil surface."

All three data points meet the soil thickness requirements. However, the definition of "depleted matrix" found in the glossary of the manual states a soil layer having a "Matrix value of 4 or 5 and chroma of 2, with 2 percent or more *distinct* or *prominent* redox concentrations occurring as soft masses and/or pore linings, or Matrix value of 4 and chroma of 1, with 2 percent or more *distinct* or *prominent* redox concentrations occurring as soft masses and/or pore linings."

We then reviewed the definition of "Distinct" and "Prominent" redox concentrations in Table A1, of the Delineation Manual. According to the Table, if the change in Hue Value is 0 and the change in Chroma is ≤ 1 , the redox concentrations have a Contrast of "Faint" and not the required "Distinct" or "Prominent". The redox concentrations observed in the soil at data points DP-11 and DP-13 do not meet the "Distinct" or "Prominent" definition; and therefore, the soils do not meet the F3 Indicator requirement.

We also reviewed the soils at data point DP-9, and it does not meet the definition of a hydric soil, which you acknowledged in our phone conversation.

3. It appears you had an ETR species hit from the IDNR natural heritage database search so you will need to contact Christie Stanifer per the letter for follow up.

We were notified by IDNR that the state endangered black-crowned night heron was documented within 0.5 mile of the project area back in 1985 (27 years ago). Per your request we will contact Christie Stanifer of IDNR to determine if she has any concerns regarding the project.

We trust that these responses appropriately address your questions/requests. We will get in touch with Norma Condra of the USACE and Christie Stanifer of IDNR and will keep you attuned of our coordination with them. Please let Ben Deetsch or me know if you have any questions or if you need additional information.

Thanks,
Brad

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From: McMahan, Aaron [<mailto:AMcMahan@idem.IN.gov>]
Sent: Monday, July 23, 2012 4:05 PM
To: Brad Anderson
Cc: Condra, Norma C LRL
Subject: Clarksville WWTP Expansion and Effluent Line, Clark Co

Brad- I have completed my initial review of the RGP notification and have the following questions/requests:

1. Because there are jurisdictional waters involved I will need some type of correspondence from the Corp which accepts your delineation. This could be a signed Pre-JD or the permit approval letter.
2. As we discussed I am concerned with a few of your data points. Specifically please have a look at DP-9, DP-11, and DP-13. Unless I am reading these wrong, it looks like you meet the F3 soil indicator with DP 11 and DP 13 which in one case would expand the wetland size. Ultimately the Corp will need to sign off on the delineation, but these were just things I came across during my review.
3. It appears you had a ETR species hit from the IDNR natural heritage database search so you will need to contact Christie Stanifer per the letter for follow up.

I received your RGP submittal on July 9 and have 30 days to make a decision. Please provide the requested items within the review timeframe or the application will be considered out-of-scope. Let me know if you have any questions.

Aaron McMahan
IDEM- Office of Water Quality,

Wetlands & Stormwater
100 North Senate Ave
IGCN 1255
Indianapolis, IN 46204

Tel: (317) 234-6351

Fax: (317) 234-4145

E-mail: amcmahan@idem.in.gov



July 6, 2012

Mr. Aaron McMahan
Office of Water Quality
Indiana Department of Environmental Management
100 North Senate Avenue
IGCN Room 1255
Indianapolis, Indiana 46204

Ms. Norma Condra
Senior Project Manager
North Regulatory Section
U.S. Army Corps of Engineers
Louisville District
600 Dr. Martin Luther King Jr. Place
Louisville, Kentucky 40202

Subject: **Section 401 WQC Regional General Permit Notification
Clarksville WWTP Expansion and Effluent Line Replacement Project
Clark County, Indiana
Redwing Projects 11-096 and 11-096-01
USACE ID No. LRL-2012-430-NCC**

Dear Mr. McMahan and Ms. Condra:

Redwing Ecological Services, Inc. (Redwing), on behalf of the Town of Clarksville, respectfully submits this Section 401 Water Quality Certification (WQC) Regional General Permit Notification in support of the proposed Clarksville Waste Water Treatment Plant (WWTP) Expansion and Effluent Line Replacement Project (Project) in Clark County, Indiana (Figure 1). The purpose of the project is to expand the existing Clarksville WWTP that is nearing capacity and to upgrade the existing effluent line that is undersized and damaged.

The Project consists of two distinct study areas, the WWTP expansion study area and the effluent line replacement study area. The WWTP expansion study area is approximately 7.5 acres in size and is located adjacent to the existing WWTP. The WWTP expansion study area consists of a former town park with picnic and athletic facilities including an athletic field and walking track (Figure 2). Habitat found here is typical of a park setting and includes maintained lawn with scattered trees ranging in age from young to mature. No jurisdictional waters are located within the proposed WWTP expansion study area.

The effluent line replacement study area is a linear project that begins at the existing WWTP and extends south approximately 1,550 feet, within a varying-width corridor that terminates at Mill Creek. The effluent line replacement study area is dominated by young to mature woods habitat with smaller areas of herbaceous and scrub/shrub habitat (Figure 2). Jurisdictional waters within the effluent line replacement study area includes approximately 284 feet (0.014 acre) of ephemeral stream, 359 feet (0.021 acre) of unstable, poor-quality intermittent stream, 520 feet (0.24 acre) of perennial stream (Mill Creek), and 1.31 acres of emergent and forested wetland (Figure 3).

Proposed project activities include:

- The existing WWTP facility will be expanded to the southeast within the former town park property. No impacts to jurisdictional waters are proposed within the WWTP expansion site.
- The new effluent line will be installed and will discharge into a flow/energy dissipation feature prior to flowing into Mill Creek.
- The flow/energy dissipation feature will be constructed and will include an approximately 0.5-acre dissipation basin, followed by approximately 150 feet of a step-pool channel.
- The project will not involve any impacts to wetlands or intermittent streams.
- There will be temporary impacts to one ephemeral stream, Ephemeral 2. An aerial pipe crossing of Ephemeral 2 will be established (Figure 4). The aerial section of pipe will be approximately 60 feet long with the bottom of the pipe being approximately three feet above the thalweg of Ephemeral 2. During the effluent line installation activities, a temporary stream crossing will be established across Ephemeral 2 within the temporary construction limits, as shown on Sheet C-3 in Appendix A. Upon completion of the effluent line installation activities, the temporary stream crossing will be removed, and Ephemeral 2 will be restored to pre-construction contours and stabilized with native seed, clean straw mulch, and erosion control matting (Sheets C-10 and C-11 in Appendix A). The disturbed areas along the stream will then be planted with one to three-gallon containerized native trees and shrubs (Sheet C-11 in Appendix A).
- Approximately 60 feet of streambank along Mill Creek will be regraded to establish the step-pool channel as shown on Figure 4 and Sheet C-8 in Appendix A. A longitudinal profile, cross sections, and details of the proposed step-pool channel are provided as Sheets C-9 and C-10 in Appendix A. As part of the construction of the step-pool channel, two boulder toe sections will be constructed along the right bank of Mill Creek, immediately upstream and downstream of the confluence of the step-pool channel and Mill Creek (Figure 4 and Appendix A - Sheet C-8). A detail of the proposed boulder toe is provided on Sheet C-10 in Appendix A. Upon completion of the step-pool channel, the disturbed streambanks and step-pool channel banks will be seeded with a native seed mix, covered with clean straw mulch, and protected with erosion control matting (Sheets C-10 and C-11 in Appendix A).
- Tree clearing within the project boundary will be limited to the few scattered trees within the WWTP expansion study area and those within the temporary effluent line construction easement. The disturbed area within floodway will be revegetated in accordance Planting Plan provided as Sheet C-11 in Appendix A.

A copy of the Construction Drawings and Details for the project is provided as Appendix A. A *Request for Jurisdictional Determination* was submitted to the U.S. Army Corps of Engineers on May 18, 2012 and is provided as Appendix B. Also attached as Appendix C, please find a completed *Section 401 WQC Regional General Permit Notification* form for the Clarksville WWTP Expansion and Effluent Line Replacement Project. Permit drawings in 8-1/2 by 11-inch size and black and white are provided as Appendix D. A copy of correspondence from the Indiana Department of Natural Resources (IDNR) regarding state-protected species is attached as Appendix E. Redwing has also commenced informal consultation with the U.S. Fish and Wildlife Service (USFWS). A copy of the electronic mail correspondence from the USFWS is provided as Appendix F.

We trust this application package provides you with necessary information to commence with the required permitting process. We appreciate the opportunity to work with you on this project. Please contact Brad Anderson or Benjamin Deetsch of Redwing at (502) 625-3009 with any questions during your review.

Sincerely,


Benjamin J. Deetsch
Staff Ecologist


Bradley M. Anderson, P.E.
Senior Engineer

File: P:\2011 Projects\11-096 Clarksville WWTP 404-401 Permitting\Report\Section 404-401 Permitting\WQC Application cover letter.doc

cc: Ms. Brittany Montgomery – Town of Clarksville (electronic copy)
Mr. Gary Boblitt – HDR (electronic copy)

Attachments:

- Figure 1 – Site Location Map
- Figure 2 – Aerial Photograph
- Figure 3 – Water/Wetland Location Map
- Figure 4 – Proposed Project Activities Photographs
- Appendix A – Construction Drawings and Details
- Appendix B – Request for Jurisdictional Determination
- Appendix C – Section 401 WQC Regional General Permit Notification
- Appendix D – Black and White Permit Drawings in 8-1/2 by 11-inch Size
- Appendix E – IDNR Correspondence
- Appendix F – USFWS Correspondence