AVON LAKE GAS ADDITION PROJECT
Section 404 Wetland Permit Application
Attachment E - Affected Landowner List

Owner Name	Owner Address	Owner City	Owner State	Owner Zip	Mail to Name	Mail to Address	Mail to City	Mail to State	Mail to Zip
LORAIN COUNTY COMMUNITY COLLEGE	1005 N ABBE RD	ELYRIA	OH	44036	L C C COLLEGE BOARD OF TRUSTEES	1005 N ABBE RD	ELYRIA	OH	44035
LACKO THOMAS A & DEANNA L	6228 1/2 BUFFMAN RD	SEVILLE	OH	44273	LACKO THOMAS A & DEANNA L	6228 1/2 BUFFHAM RD	SEVILLE	OH	44273
LADD TIMOTHY C & ANIELA J	13240 INDIAN HOLLOW RD	GRAFTON	OH	44044	LADD TIMOTHY C & ANIELA J	13240 INDIAN HOLLOW RD.	GRAFTON	OH	44044
B F GOODRICH EMPLOYEES CREDIT UNION	586 MOORE RD	AVON LAKE	OH	44012	LAKESHORE COMMUNITY CREDIT UNION	586 MOORE RD	AVON LAKE	OH	44012
LAMBERT DONALD W & SAUNDRA L	13143 INDIAN HOLLOW RD	GRAFTON	OH	44044	LAMBERT DONALD W & SAUNDRA L	13143 INDIAN HOLLOW RD	GRAFTON	OH	44044
MOTTA DAVID E & ALAN C TRUSTEES	39738 BANKS RD	GRAFTON	OH	44044	LAMM CAROL	4620 BARCLAY LN	TALLAHASSEE	FL	32309
LAND TRACT INVESTMENTS LLC	P O BOX 955	ELYRIA	OH	44036	LAND TRACT INVESTMENTS LLC	P O BOX 955	ELYRIA	OH	44036
LAUBENTHAL RICHARD C & CHRISTINE	38594 LIBERTY LN	GRAFTON	OH	44044	LAUBENTHAL RICHARD C	38475 CHESTNUT RIDGE RD	ELYRIA	OH	44035
LAUER RICK & CAROLE	496 STILL WATER BLVD	ELYRIA	OH	44035	LAUER RICK & CAROLE	496 STILL WATER BLVD	ELYRIA	OH	44035
LAYNE ALICE B	12679 INDIAN HOLLOW RD	GRAFTON	OH	44044	LAYNE ALICE B	12679 INDIAN HOLLOW RD	GRAFTON	OH	44044
LEIDICH STEVEN D	6061 CASE RD	N RIDGEVILLE	OH	44039	LEIDICH STEVEN D	6061 CASE RD	N RIDGEVILLE	OH	44039
LEONOWICH JOHN D TRUSTEE	39325 SUGAR RIDGE RD	N RIDGEVILLE	OH	44039	LEONOWICH JOHN D TRUSTEE	41520 SCHADEN RD	ELYRIA	OH	44035
LESESKY DALE S & DIANNE L	608 WESTIN WAY	ELYRIA	OH	44035	LESESKY DALE S & DIANNE L	608 WESTIN WAY	ELYRIA	OH	44035
LILLEY JON P TRUSTEE & LILLEY WILMA C TRUSTEE	32779 DEERSPRING CT	N RIDGEVILLE	OH	44039	LILLEY JON P TRUSTEE	8616 GATEWOOD DR	NORTH RIDGEVILLE	OH	44039
LLOYD DEVELOPMENT INC	1982 BUCKINGHAM DR	AVON	OH	44011	LLOYD HARRY R & DOROTHY MAE	1982 BUCKINGHAM DR	AVON	OH	44011
LOCKMILLER DOROTHEA B	11909 EASTWOOD DR	GRAFTON	OH	44044	LOCKMILLER DOROTHEA B	11909 EASTWOOD DR	GRAFTON	OH	44044
INN ON THE RIVERS EDGE LP	39050 COLORADO AVE	AVON	OH	44011	LODGING INDUSTRY INC RUTA MICHELE & RAFFAELE	910 LORAIN BL #N	ELYRIA	OH	44035
LOFTIN JACK C & ANNA L	39770 BANKS RD	GRAFTON	OH	44044	LOFTIN JACK C & ANNA L	39770 BANKS RD	GRAFTON	OH	44044
LOGOS DEVELOPMENT CORP	121 KEEP CT	ELYRIA	OH	44035	LOGOS CORPORATION	150 FREEDOM CT	ELYRIA	OH	44035
LONGBRAKE RANDOLPH T & ELIZABETH	3150 REPUBLIC BL N #3	TOLEDO	OH	43615	LONGBRAKE RANDOLPH T & ELIZABETH	3150 REPUBLIC BL N #3	TOLEDO	OH	43615
LORAIN COUNTY COMMUNITY COLLEGE	1005 N ABBE RD	ELYRIA	OH	44036	LORAIN CNTY COMM COLLEGE BD OF TRS	1005 N ABBE RD	ELYRIA	OH	44035
LORAIN COMMUNITY COLLEGE	6810 CASE RD	NORTH RIDGEVILLE	OH	44039	LORAIN COMMUNITY COLLEGE	1005 ABBE RD N	ELYRIA	OH	44035
LORAIN COUNTY BOARD OF COMMISSIONERS	226 MIDDLE AVE	ELYRIA	OH	44035	LORAIN COUNTY	226 MIDDLE AVE	ELYRIA	OH	44035
LORAIN COUNTY BOARD OF COMMISSIONERS	226 MIDDLE AVE	ELYRIA	OH	44035	LORAIN COUNTY - LIST	226 MIDDLE AVE	ELYRIA	OH	44035
LORAIN COUNTY COMMINITY COLLEGE	1005 N ABBE RD	ELYRIA	OH	44035	LORAIN COUNTY COMMINITY COLLEGE	1005 N ABBE RD	ELYRIA	OH	44035
LORAIN COUNTY COMMUNITY COLLEGE	1005 N ABBE RD	ELYRIA	OH	44036	LORAIN COUNTY COMMUNITY COLLEGE	1005 N ABBE RD	ELYRIA	OH	44035
LOWERY JOHN R & TINA R	5426 OAKWOOD DR	SHEFFIELD LAKE	OH	44054	LOWERY JOHN R & TINA R	5426 OAKWOOD DR	SHEFFIELD LAKE	OH	44054
NOVEON INC	33571 WALKER RD	AVON LAKE	OH	44012	LUBRIZOL TAX DEPARTMENT	29400 LAKELAND BL	WICKLIFFE	OH	44092
LUNAS JANE MARQUARD	6066 CASE ROAD	NORTH RIDGEVILLE	OH	44039	LUNAS JANE MARQUARD	6066 CASE ROAD	NORTH RIDGEVILLE	OH	44039
LUTHER JANICE & LUTHER CARL	113 ARROW CT	ELYRIA	OH	44035	LUTHER CARL	113 ARROW CT	ELYRIA	OH	44035
LUZADER HOWARD	10519 DEWHURST RD	ELYRIA	OH	44035	LUZADER HOWARD	10519 DEWHURST RD	ELYRIA	OH	44035
LYNN STEVEN D	7469 DYKE RD	N RIDGEVILLE	OH	44039	LYNN STEVEN D	7468 DYKE ROAD	N RIDGEVILLE	OH	44039
MA JIAYI	33468 SHELLY COURT	AVON LAKE	OH	44012	MA JIAYI	33468 SHELLY COURT	AVON LAKE	OH	44012
MACBETH GERALD N	12750 GRAFTON RD	GRAFTON	OH	44044	MACBETH GERALD N	12750 GRAFTON RD	GRAFTON	OH	44044
MACNEAL RUSSELL C	1044 MAIN ST	GRAFTON	OH	44044	MACNEAL RUSSELL	1044 MAIN ST	GRAFTON	OH	44044
MAN TBS FB MILLER LTD	635 MILLER RD	AVON LAKE	OH	44012	MAN TBS FB MILLER LTD	635 MILLER RD	AVON LAKE	OH	44012
MARLOWE MATTHEW J	2549 GRAFTON RD	GRAFTON	OH	44044	MARLOWE MATTHEW J	2549 GRAFTON RD	GRAFTON	OH	44044
MARSH GENERAL C	1310 GARFORD AV	ELYRIA	OH	44035	MARSH GENERAL C	1310 GARFORD AV	ELYRIA	OH	44035
MARTIN WILMA M	421 FOSTER AVE APT 120 E	ELYRIA	OH	44035	MARTIN WILMA M	C/O DUNCAN	ELYRIA	OH	44035
MARTINEZ MARIO F & PEGGY S	136 ASHFIELD CT	ELYRIA	OH	44035	MARTINEZ MARIO F & PEGGY S	136 ASHFIELD CT	ELYRIA	OH	44035
MAUS KATHERINE L	38028 CHESTNUT RIDGE RD	ELYRIA	OH	44035	MAUS KATHERINE L	38028 CHESTNUT RIDGE RD	ELYRIA	OH	44035
MAZANEK ANN M & MAZANEK JAMES J	38853 SUGAR RIDGE RD	N RIDGEVILLE	OH	44039	MAZANEK ANN M	38853 SUGAR RIDGE RD	N RIDGEVILLE	OH	44039
MCINTOSH JEAN L	660 MOORE RD	AVON LAKE	OH	44012	MCINTOSH JEAN L	660 MOORE RD	AVON LAKE	OH	44012
MCKEE JOHNNY W & BRENDA S	9270 BENDER RD	NORTH RIDGEVILLE	OH	44039	MCKEE JOHNNY W	9270 BENDER ROAD	N RIDGEVILLE	OH	44039
MCLAUGHLIN KATHRYN A	39305 BURNS RD	N RIDGEVILLE	OH	44039	MCLAUGHLIN KATHRYN A	39305 BURNS RD	N RIDGEVILLE	OH	44039
MEADOWS DONNA J TRUSTEE & MEADOWS RODNEY T TRUSTEE	4632 CASE RD	AVON	OH	44011	MEADOWS RODNEY	4632 CASE ROAD	AVON	OH	44011
METZ ROBERT E	6541 CASE RD	N RIDGEVILLE	OH	44039	METZ ROBERT E	6541 CASE RD	N RIDGEVILLE	OH	44039
MEXICHEM SPECIALTY RESINS INC	33587 WALKER RD	AVON LAKE	OH	44012	MEXICHEM SPECIALTY RESINS INC	33587 WALKER RD	AVON LAKE	OH	44012
MIDWAY/TW LLC	150 FREEDOM CT	ELYRIA	OH	44035	MIDWAY/TW LLC	150 FREEDOM CT	ELYRIA	OH	44035
MIHALIS RONALD & SHELVA	11809 GRAFTON RD	GRAFTON	OH	44044	MIHALIS RONALD & SHELVA	11809 GRAFTON RD	GRAFTON	OH	44044
MIKOLAJCIK CANDY A & MIKOLAJCIK STEPHEN	38480 RIVER RIDGE CT	GRAFTON	OH	44044	MIKOLAJCIK CANDY A	38480 RIVER RIDGE CT	GRAFTON	OH	44044
MILLER MARY B	39348 COLORADO AVE	AVON	OH	44011	MILLER MARY B	39348 COLORADO AVE	AVON	OH	44011
MCDONALDS CORPORATION	32528 LORAIN RD	N RIDGEVILLE	OH	44039	MIMAX 1 INCORPORATED	PO BOX 470151	BROADVIEW HTS	OH	44147
3M PARKWAY INC					MINTZ FAMILY	5533 STATE RD	PARMA	OH	44134
MISORSKI WILLIAM E & TINA M	6975 CASE RD	N RIDGEVILLE	OH	44039	MISORSKI WILLIAM E & TINA M	6975 CASE RD	N RIDGEVILLE	OH	44039
MOEN YVONNE F	39195 BURNS RD	N RIDGEVILLE	OH	44039	MOEN YVONNE F	39195 BURNS RD	N RIDGEVILLE	OH	44039
MOHLER RAYMOND L	39786 PARSONS RD	GRAFTON	OH	44044	MOHLER RAYMOND L	39786 PARSONS RD	GRAFTON	OH	44044
MOON ROAD HOLDINGS LLC	3122 MOON RD	AVON	OH	44011	MOON ROAD HOLDINGS LLC	3122 MOON RD	AVON	OH	44011
MOORE ROAD LLC	720 MOORE RD	AVON LAKE	OH	44012	MOORE ROAD LLC	5539 CANAL RD	VALLEY VIEW	OH	44125
MORAHAN DAVID J & KIMBERLY S	2585 NAGEL RD	AVON	OH	44011	MORAHAN DAVID	39280 DETROIT RD	AVON	OH	44011
MT PISGAH MISSIONARY BAPTIST CHURCH					MT PISGAH MISSIONARY BAPTIST CHURCH	PARSONS RD	GRAFTON	OH	44044
MYERS SCOTT W	37537 FLINT RIDGE DRIVE	GRAFTON	OH	44044	MYERS SCOTT W	37537 FLINT RIDGE DRIVE	GRAFTON	OH	44044
NORTH RIDGEVILLE CITY OF	PO BOX 9022	CANTON	OH	44711	N RIDGEVILLE CITY	7307 AVON BELDEN RD	N RIDGEVILLE	OH	44039
NASH DONALD M & RUTH D TRUSTEES	38257 CHESTNUT RIDGE RD	ELYRIA	OH	44035	NASH DONALD M	38257 CHESTNUT RIDGE RD	ELYRIA	OH	44035
NASH FAMILY TRUST	38261 CHESTNUT RIDGE RD	ELYRIA	OH	44035	NASH RALPH K	38261 CHESTNUT RIDGE ROAD	ELYRIA	OH	44035
FOUNTAIN NELSON AUDREY W & NELSON MELVIN O	556 STILLWATER BLVD	ELYRIA	OH	44035	NELSON MELVIN O	556 STILL WATER BLVD	ELYRIA	OH	44035
NELSON TIMOTHY W & TAMMY L	5561 PIN OAK CR	SHEFFIELD LAKE	OH	44054	NELSON TIMOTHY W & TAMMY L	5561 PIN OAK CR	SHEFFIELD LAKE	OH	44054
NORFOLK SOUTHERN COMBINED RAILROAD SUBSIDIARIES	110 FRANKLIN RD S E	ROANOKE	VA	240420028	NORFOLK SOUTHERN CORPORATION TAX DEPARTMENT	110 FRANKLIN RD SE	ROANOKE	VA	240420028

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AVON LAKE GAS ADDITION PROJECT
Section 404 Wetland Permit Application
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Owner Name	Owner Address	Owner City	Owner State	Owner Zip	Mail to Name	Mail to Address	Mail to City	Mail to State	Mail to Zip
NORTH AMERICAN INDIAN INC	3772 FENN RD	MEDINA	OH	44256	NORTH AMERICAN INDIAN INC	11935 GRAFTON RD	GRAFTON	OH	44044
NORTHCUTT CHARLES L III	3122 WHEATON DR	AVON	OH	44011	NORTHCUTT CHARLES L III	3122 WHEATON DR	AVON	OH	44011
NOSTER IRENE M TRUSTEES & MEKKER GEORGE C ETAL	11665 GRAFTON RD	GRAFTON	OH	44044	NOSTER IRENE	11665 GRAFTON RD	GRAFTON	OH	44044
MEKKER GEORGE C & NOSTER IRENE M TRUSTEES	11665 GRAFTON RD	GRAFTON	OH	44044	NOSTER IRENE M	11665 GRAFTON RD	GRAFTON	OH	44044
NOWLIN SUSAN R	161 ARROW CT	ELYRIA	OH	44035	NOWLIN SUSAN R	161 ARROW CT	ELYRIA	OH	44035
NR PROPERTIES LLC	39290 CENTER RIDGE RD	N RIDGEVILLE	OH	44039	NR PROPERTIES LLC	39290 CENTER RIDGE RD	N RIDGEVILLE	OH	44039
OCONNOR DAVID K & JULIE M	13316 INDIAN HOLLOW RD	GRAFTON	OH	44044	OCONNOR DAVID K & JULIE M	13316 INDIAN HOLLOW RD	GRAFTON	OH	44044
OHIO TURNPIKE COMMISSION	46795 MIDDLE RIDGE RD	AMHERST	OH	44001	OHIO TURNPIKE COMMISSION	682 PROSPECT ST	BEREA	OH	44017
OLD PHOENIX LTD	38333 CHESTNUT RIDGE RD	ELYRIA	OH	44035	OLD PHOENIX LTD	38333 CHESTNUT RIDGE RD	ELYRIA	OH	44035
ORCHARD TRAIL DEVELOPMENT GROUP LLC	31919 FIELDSTONE CIR	AVON LAKE	OH	44012	ORCHARD TRAIL DEVELOPMENT GROUP LLC	31919 FIELDSTONE CIR	AVON LAKE	OH	44012
ORCHARD TRAIL HOMEOWNERS ASSOCIATION INC					ORCHARD TRAIL HOMEOWNERS	C/O BARNETT MANAGEMENT	BEACHWOOD	OH	44122
OROSZ ANDREA B	15024 WHEELER RD	LA GRANGE	OH	44050	OROSZ ANDREA B	15024 WHEELER RD	LA GRANGE	OH	44050
OUT ON A LIMB PROPERTIES	33659 WALKER RD	AVON LAKE	OH	44012	OUT ON A LIMB PROPERTIES	95 ROSEWOOD DR	AVON LAKE	OH	44012
OUT ON A LIMB PROPERTIES LLC	95 ROSEWOOD DR	AVON LAKE	OH	44012	OUT ON A LIMB PROPERTIES LLC	95 ROSEWOOD DR	AVON LAKE	OH	44012
OVERBROOK FARMS LTD	1268 E BROAD ST	ELYRIA	OH	44035	OVERBROOK FARMS LTD	578 OVERBROOK RD	ELYRIA	OH	44035
P & C HOLDINGS LTD	638 MOORE RD	AVON LAKE	OH	44012	P & C HOLDINGS LTD	638 MOORE RD	AVON LAKE	OH	44012
PAINTER GARY LEE	7104 CASE RD	N RIDGEVILLE	OH	44039	PAINTER GARY LEE	7104 CASE RD	N RIDGEVILLE	OH	44039
PAINTER SHIRLEY A	7074 CASE RD	N RIDGEVILLE	OH	44039	PAINTER SHIRLEY A	7074 CASE RD	N RIDGEVILLE	OH	44039
PALM KEVIN R & DIANE L	39662 PARSONS RD	GRAFTON	OH	44044	PALM KEVIN R & DIANE L	39662 PARSONS RD	GRAFTON	OH	44044
PARKER HANNIFIN CORP	17325 EUCLID AVE	CLEVELAND	OH	44112	PARKER HANNIFIN CORP	6035 PARKLAND BLVD	CLEVELAND	OH	44124
PASCOE KRECIC KRISTEN C & KRECIC ANTHONY	37938 CHESTNUT RIDGE RD	ELYRIA	OH	44035	PASCOE KRECIC KRISTEN C	37938 CHESTNUT RIDGE RD	ELYRIA	OH	44035
PATRICK KATHRYN A & PATRICK COLE D	3092 WHEATON PLACE	AVON	OH	44011	PATRICK KATHRYN A	3092 WHEATON PLACE	AVON	OH	44011
PENCE BEULAH J	38227 CHESTNUT RIDGE RD	ELYRIA	OH	44035	PENCE BEULAH J	38227 CHESTNUT RIDGE RD	ELYRIA	OH	44035
PENCE RALPH A & PAMELA A	3119 GRAFTON RD	GRAFTON	OH	44044	PENCE RALPH A JR & PAMELA A	16460 CHAMBERLAIN RD	GRAFTON	OH	44044
PINCURA JOSEPH	4561 CASE ROAD	AVON	OH	44011	PINCURA JOSEPH	4561 CASE ROAD	AVON	OH	44011
PINEHAVEN GREENHOUSES INC	39424 DETROIT RD	AVON	OH	44011	PINEHAVEN GREENHOUSES INC	39424 DETROIT RD	AVON	OH	44011
PLAS JAMES A TRUSTEE	19034 STATE ROUTE 301	LA GRANGE	OH	44050	PLAS JAMES A	19034 STATE ROUTE 301	LA GRANGE	OH	44050
PLAS LAWRENCE R	36637 GRAFTON EASTERN RD	GRAFTON	OH	44044	PLAS LAWRENCE R	36637 GRAFTON EASTERN RD	GRAFTON	OH	44044
PLAS PAUL J & CHRISTINE MATUSIK PLAS	39834 BANKS RD	GRAFTON	OH	44044	PLAS PAUL J & CHRISTINE MATUSIK PLAS	39834 BANKS RD	GRAFTON	OH	44044
POLYONE CORPORATION	33587 WALKER RD	AVON LAKE	OH	44012	POLYONE CORPORATION	33587 WALKER RD	AVON LAKE	OH	44012
PROCHASKA GEORGE J & SANDRA L	14077 HIDDEN LN	GRAFTON	OH	44044	PROCHASKA GEORGE J & SANDRA L	14077 HIDDEN LN	GRAFTON	OH	44044
PRUNTY JOHN E & LEAH B	14023 HIDDEN LN	GRAFTON	OH	44044	PRUNTY JOHN E & LEAH B	14023 HIDDEN LN	GRAFTON	OH	44044
PUSTAY ROBERT	39393 BURNS RD	N RIDGEVILLE	OH	44039	PUSTAY ROBERT	39393 BURNS RD	N RIDGEVILLE	OH	44039
PYCRAFT DANNY R & MARION M	6880 CASE ROAD	N RIDGEVILLE	OH	44039	PYCRAFT DANNY R & MARION M	6880 CASE ROAD	N RIDGEVILLE	OH	44039
R W BECKETT CORP	38251 CENTER RIDGE RD	N RIDGEVILLE	OH	44039	R W BECKETT CORP	P O BOX 1289	ELYRIA	OH	44036
R W BECKETT CORPORATION	PO BOX 1289	ELYRIA	OH	44036	R W BECKETT CORPORATION	P O BOX 1289	ELYRIA	OH	44036
RADUNE CHARLES E & JANET C	5985 CASE RD	NORTH RIDGEVILLE	OH	44039	RADUNE CHARLES E & JANET C	5985 CASE RD	NORTH RIDGEVILLE	OH	44039
RALICH GAIL A	39789 FRENCH CREEK RD	AVON	OH	44011	RALICH GAIL A	39789 FRENCH CREEK RD	AVON	OH	44011
RAMIREZ RACHELLE A	5375 APPLE CREEK DR	SHEFFIELD LAKE	OH	44054	RAMIREZ RACHELLE A	5375 APPLE CREEK DR	SHEFFIELD LAKE	OH	44054
REED DOUGLAS L & LINDA G	13288 INDIAN HOLLOW RD	GRAFTON	OH	44044	REED DOUGLAS L & LINDA G	13288 INDIAN HOLLOW RD	GRAFTON	OH	44044
REIS WILLIAM R & HEIDI J	13127 INDIAN HOLLOW RD	GRAFTON	OH	44044	REIS WILLIAM R & HEIDI J	13127 INDIAN HOLLOW RD	GRAFTON	OH	44044
RESAR BETTY	2445 GRAFTON RD	GRAFTON	OH	44044	RESAR BETTY	2445 GRAFTON RD	GRAFTON	OH	44044
RESAR DUSTIN	3150 REPUBLIC BL N #3	TOLEDO	OH	43615	RESAR DUSTIN	3150 REPUBLIC BL N #3	TOLEDO	OH	43615
RESAR NICHOLAS & HELEN	9942 E RIVER ST	ELYRIA	OH	44035	RESAR NICHOLAS & HELEN	11709 GRAFTON RD	GRAFTON	OH	44044
RESAR PEGGY MARIE	11815 GRAFTON RD	GRAFTON	OH	44044	RESAR PEGGY MARIE	11741 GRAFTON RD	GRAFTON	OH	44044
RESAR RICHARD P	2441 GRAFTON RD	GRAFTON	OH	44044	RESAR RICHARD P	2441 GRAFTON RD	GRAFTON	OH	44044
RIECK DALE J	968 MOORE RD	AVON	OH	44011	RIECK DALE J	968 MOORE RD	AVON	OH	44011
RINN PROPERTIES LLC	33659 WALKER RD	AVON LAKE	OH	44012	RINN PROPERTIES LLC	33659 WALKER RD	AVON LAKE	OH	44012
RIVERA STEPHANIE & RIVERA SAUL	38420 RIVER RIDGE CT	GRAFTON	OH	44044	RIVERA STEPHANIE	38420 RIVER RIDGE CT	GRAFTON	OH	44044
ROACH FANNIE M TRUSTEE & ROACH RAY D TRUSTEE	9419 STONE ROAD	LITCHFIELD	OH	44253	ROACH RAY D	9419 STONE RD	LITCHFIELD	OH	44253
ROMERO LYNNE D	11252 ARROWHEAD DR	GRAFTON	OH	44044	ROMERO LYNNE D	11252 ARROWHEAD DR	GRAFTON	OH	44044
ROTH MARY ELLEN	39224 HAWTHORNE DRIVE	AVON	OH	44011	ROTH MARY ELLEN	39224 HAWTHORNE DRIVE	AVON	OH	44011
ROTZ ROBERT J & ELAINE M TRUSTEES	80 EDGEWOOD DR	AVON LAKE	OH	44012	ROTZ ROBERT J & ELAINE M TRUSTEES	80 EDGEWOOD DR	AVON LAKE	OH	44012
ROWLAND WILLIAM D & JOY W	3088 FIELDSTONE TRL	AVON	OH	44011	ROWLAND WILLIAM D & JOY W	3088 FIELDSTONE TRL	AVON	OH	44011
RT 57 CHESTNUT RIDGE LLC	38241 CHESTNUT RIDGE RD	COLUMBIA STATION	OH	44028	RT 57 CHESTNUT RIDGE LLC	614 WEST SUPERIOR AV #200	CLEVELAND	OH	44113
RUDNIK MATTHEW E & LAURA B	3120 WHEATON DR	AVON	OH	44011	RUDNIK MATTHEW E & LAURA B	3120 WHEATON DR	AVON	OH	44011
RUMPLER BEVERLY K	S R 10	HURON	OH	44839	RUMPLER BEVERLY K	414 SENECA	HURON	OH	44839
RUMPLER BEVERLY K ETAL	S R 10	GRAFTON	OH	44044	RUMPLER BEVERLY K ETAL	414 SENECA AVE	HURON	OH	44839
RURAL LORAIN COUNTY WATER AUTHORIT					RURAL LORAIN COUNTY WATER AUTHORIT	42401 OHIO 303	LAGRANGE	OH	44050
RURAL LORAIN COUNTY WATER AUTHORTY	MOORE RD	AVON LAKE	OH	44012	RURAL LORAIN COUNTY WATER AUTHORTY	42401 OHIO 303	LAGRANGE	OH	44050
RUSSO SHELLEY R	10405 DEWHURST RD	ELYRIA	OH	44035	RUSSO SHELLEY R	10405 DEWHURST RD	ELYRIA	OH	44035
RYAN JOHN M & LAUREL V	13150 INDIAN HOLLOW	GRAFTON	OH	44044	RYAN JOHN M & LAUREL V	13150 INDIAN HOLLOW RD	GRAFTON	OH	44044
RYKON PLATING INC	555 MILLER RD	AVON LAKE	OH	44012	RYKON PLATING INC	555 MILLER RD	AVON LAKE	OH	44012
RYMARCZYK RONALD B & TONNIE S	38000 ROYALTON RD	GRAFTON	OH	44044	RYMARCZYK RONALD B & TONNIE S	38000 ROYALTON RD	GRAFTON	OH	44044
SALINAS OSCAR	6782 CASE RD	N RIDGEVILLE	OH	44039	SALINAS OSCAR	6782 CASE RD	N RIDGEVILLE	OH	44039
SYLVESTER STEVEN L & SYLVESTER MICHELE A	33098 LAKE RD	AVON LAKE	OH	44012	SARINGER MICHELE A	P O BOX 247	AVON LAKE	OH	44012
SAVEN JULIE & SAVEN TAYLOR	5560 PIN OAK CIR	SHEFFIELD VILLAGE	OH	44054	SAVEN JULIE	5560 PIN OAK CIR	SHEFFIELD VILLAGE	OH	44054
SAXON NANCY A	526 STILL WATER BLVD	ELYRIA	OH	44035	SAXON NANCY A	526 STILL WATER BL	ELYRIA	OH	44035

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Owner Name	Owner Address	Owner City	Owner State	Owner Zip	Mail to Name	Mail to Address	Mail to City	Mail to State	Mail to Zip
SAYLES DAVID & DEBRA	37900 CAPEL RD	GRAFTON	OH	44044	SAYLES DAVID & DEBRA	37900 CAPEL RD	GRAFTON	OH	44044
SCHAEFER DONALD T JR & CAREN A	11890 EASTWOOD DR	GRAFTON	OH	44044	SCHAEFER DONALD T JR & CAREN A	11890 EASTWOOD DR	GRAFTON	OH	44044
SCHAFER ALAN L & DONNA S	13957 HIDDEN LN	GRAFTON	OH	44044	SCHAFER ALAN L & DONNA S	13957 HIDDEN LN	GRAFTON	OH	44044
SCHAFER PROPERTIES IV LLC	39302 CAMELOT WAY	AVON	OH	44011	SCHAFER DEVELOPMENT	1471 LEAR INDUSTRIAL PARK	AVON	OH	44011
SCHIBLEY SOLVENTS CHEMICALS CO INC	1570 LOWELL ST	ELYRIA	OH	44035	SCHIBLEY SOLVENTS CHEMICALS CO INC	1570 LOWELL ST	ELYRIA	OH	44035
SCHNEIDER JERI ANN & GOLBA ROGER T	680 MOORE RD	AVON LAKE	OH	44012	SCHNEIDER JERI ANN	32234 COUNTRY CLUB DR	AVON LAKE	OH	44012
RAMSEY DONNA & SCHNEIDER THOMAS					SCHNEIDER THOMAS	9122 VERNON HILL	N RIDGEVILLE	OH	44039
SCHNEIDER TIMOTHY W & LINDA S TRUSTEES					SCHNEIDER TIMOTHY W & LINDA S TRUSTEES	38915 SUGAR RIDGE RD	N RIDGEVILLE	OH	44039
SCHULTZ ANNE MARIE	6693 CASE RD	NORTH RIDGEVILLE	OH	44039	SCHULTZ ANNE MARIE	6695 CASE RD	N RIDGEVILLE	OH	44039
WESTERN SCOTT FETZER COMPANY	14600 DETROIT ROAD	LAKEWOOD	OH	44107	SCOTT & FETZER CO	28800 CLEMENS RD	WESTLAKE	OH	44145
SEABOLD SCOTT & TERRI	39607 BANKS RD	GRAFTON	OH	44044	SEABOLD SCOTT & TERRI	39607 BANKS RD	GRAFTON	OH	44044
SEDIVEC SHANNON	5999 OTTEN RD	N RIDGEVILLE	OH	44039	SEDIVEC SHANNON	5999 OTTEN RD	N RIDGEVILLE	OH	44039
SEDIVEC VICTOR & LAVERNE V TRUSTEES	37820 FLINT RIDGE DR	GRAFTON	OH	44044	SEDIVEC VICTOR & LAVERNE V	37820 FLINT RIDGE DR	GRAFTON	OH	44044
SEITZ DANIEL A & LAURA L	37998 CHESTNUT RIDGE RD	ELYRIA	OH	44035	SEITZ DANIEL A & LAURA L	37998 CHESTNUT RIDGE RD	ELYRIA	OH	44035
SEME MICHAEL S & LINDA S	6974 CASE RD	N RIDGEVILLE	OH	44039	SEME MICHAEL S & LINDA S	6974 CASE RD	N RIDGEVILLE	OH	44039
SEVERSON STEPHANIE KAY	10325 DEWHURST RD	ELYRIA	OH	44035	SEVERSON STEPHANIE KAY	P O BOX 600971	SAN DIEGO	CA	921600971
SHAW ARTHUR P & NANCY L	169 ARROW CT	ELYRIA	OH	44035	SHAW ARTHUR P & NANCY L	169 ARROW CT	ELYRIA	OH	44035
SHAW ROY M & CATHERINE A	145 AAROW CT	ELYRIA	OH	44035	SHAW ROY M & CATHERINE A	145 ARROW CT	ELYRIA	OH	44035
VILLAGE OF SHEFFIELD	4340 COLORADO AVE	SHEFFIELD LAKE	OH	44054	SHEFFIELD VILLAGE	4820 DETROIT AV	ELYRIA	OH	44035
SIERZPUTOWSKI ANDREW J & ROSEMARY	5376 APPLE CREEK DR	SHEFFIELD VILLAGE	OH	44054	SIERZPUTOWSKI ANDREW J & ROSEMARY	5376 APPLE CREEK DR	SHEFFIELD VILLAGE	OH	44054
SINGLETON OKEY D & BRUNHILDE TRUSTEES	4631 CASE RD	AVON	OH	44011	SINGLETON OKEY D & HILDA	4631 CASE RD	AVON	OH	44011
SINGLETON WILLIAM A JR & DEBRA E	38265 FLINT RIDGE DR	GRAFTON	OH	44044	SINGLETON WILLIAM A JR & DEBRA E	38265 FLINT RIDGE DR	GRAFTON	OH	44044
SMITH FREDA M	7020 CASE RD	NORTH RIDGEVILLE	OH	44039	SMITH FREDA M	7020 CASE RD	NORTH RIDGEVILLE	OH	44039
SMITH PAUL & DEEKS GREGORY JOSEPH	19430 FROST RD	DALLAS	OR	97338	SMITH PAUL R	19430 FROST RD	DALLAS	OR	97338
SMITH STEVEN F & FRANTZ VICTORIA I	39133 SUGAR RIDGE RD	N RIDGEVILLE	OH	44039	SMITH STEVEN F & FRANTZ VICTORIA I	39133 SUGAR RIDGE RD	N RIDGEVILLE	OH	44039
SNYDER JOHN F & DONNA L	13901 HIDDEN LN	GRAFTON	OH	44044	SNYDER JOHN F & DONNA L	13901 HIDDEN LN	GRAFTON	OH	44044
SPITZER HARDWARE & SUPPLY CO	150 E BRIDGE ST	ELYRIA	OH	44035	SPITZER HARDWARE	150 E. BRIDGE STREET	ELYRIA, OHIO	OH	44035
SPITZER HARDWARE & SUPPLY CO	150 E BRIDGE ST	ELYRIA	OH	44035	SPITZER HDWE & SUPPLY CO	150 E BRIDGE ST	ELYRIA	OH	44035
SPRINGER STELLA	7476 DYKE AVE	NORTH RIDGEVILLE	OH	44039	SPRINGER STELLA	7476 DYKE RD	N RIDGEVILLE	OH	44039
SPRINGVALE DEVELOPMENT COMPANY LTD	260 S LOGAN ST	ELYRIA	OH	44035	SPRINGVALE INVESTMENTS	260 S LOGAN ST	ELYRIA	OH	44035
SPYAK JOHN M & ROBBIN L	6718 CASE RD	N RIDGEVILLE	OH	44039	SPYAK JOHN M & ROBBIN L	6718 CASE RD	N RIDGEVILLE	OH	44039
STANCEY JOHN & VIORICA TRUSTEES	11890 CASTLETON LN	GRAFTON	OH	44044	STANCEY JOHN & VIORICA	11890 CASTLETON LN	GRAFTON	OH	44044
OHIO STATE OF	241 STANFORD PARKWAY	FINDLAY	OH	45840	STATE OF OHIO	906 N CLARK ST	ASHLAND	OH	44805
STEINER RITA M	6535 CASE RD	N RIDGEVILLE	OH	44039	STEINER RITA M	6535 CASE RD	N RIDGEVILLE	OH	44039
STRAUSS JACK G & CONSTANCE L	13017 INDIAN HOLLOW RD	GRAFTON	OH	44044	STRAUSS JACK G	13017 INDIAN HOLLOW ROAD	GRAFTON	OH	44044
STRICKLER HARPER L & BRENDA K	39379 BURNS RD	N RIDGEVILLE	OH	44039	STRICKLER HARPER L & BRENDA K	39379 BURNS RD	N RIDGEVILLE	OH	44039
STROCK DIANA R	11921 EASTWOOD DR	GRAFTON	OH	44044	STROCK DIANA R	11921 EASTWOOD DR	GRAFTON	OH	44044
SULLINGER ROBERT W TRUSTEE & MABEL ETAL	32135 COOK RD	N RIDGEVILLE	OH	44039	SULLINGER MABLE	39189 SUGAR RIDGE	N RIDGEVILLE	OH	44039
SULLINGER ROBERT W TRUSTEE	39080 SUGAR RIDGE RD	NORTH RIDGEVILLE	OH	44039	SULLINGER ROBERT W	39080 SUGAR RIDGE RD	NORTH RIDGEVILLE	OH	44039
SWEENEY BETTY LOU	10503 DEWHURST RD	ELYRIA	OH	44035	SWEENEY BETTY LOU	10503 DEWHURST RD	ELYRIA	OH	44035
SZENTE TIMOTHY	6294 CASE RD	NORTH RIDGEVILLE	OH	44039	SZENTE TIMOTHY L	6294 CASE ROAD	NORTH RIDGEVILLE	OH	44039
TAKACS CHARLES L	121 ARROW CT	ELYRIA	OH	44035	TAKACS CHARLES L	121 ARROW CT	ELYRIA	OH	44035
TAYLOR BRENDA L & BERRY A	39575 SLIFE RD	GRAFTON	OH	44044	TAYLOR BRENDA L & BARRY A	39575 SLIFE RD	GRAFTON	OH	44044
TAYLOR DENNIS C & SUSAN A	13169 INDIAN HOLLOW RD	ELYRIA	OH	44035	TAYLOR DENNIS C & SUSAN A	13175 INDIAN HOLLOW RD	GRAFTON	OH	44044
TAYLOR RICHARD J & SUSAN A	14141 HIDDEN LANE	GRAFTON	OH	44044	TAYLOR RICHARD J & SUSAN A	14141 HIDDEN LANE	GRAFTON	OH	44044
TAYLOR SUSAN A	13175 INDIAN HOLLOW ROAD	GRAFTON	OH	44044	TAYLOR SUSAN A	13175 INDIAN HOLLOW ROAD	GRAFTON	OH	44044
TAYLOR WOODS PROPERTIES	P O BOX 215	ELYRIA	OH	44036	TAYLOR WOODS PROPERTIES	P O BOX 215	ELYRIA	OH	44036
TECHPARK 2000 PROPERTIES	424 MIDDLE AVE	ELYRIA	OH	44035	TECHPARK 2000 PROPERTIES	260 BURNS RD #100	ELYRIA	OH	44035
TERNES CARL D ETAL	419 WEST MAIN ST	SPENCER	OH	44275	TERNES CARL D	419 W MAIN ST	SPENCER	OH	44275
THIES JUDITH M	165 ARROW CT	ELYRIA	OH	44035	THIES JUDITH M	165 ARROW CT	ELYRIA	OH	44035
THOMAS CHRISTOPHER S	37690 EAGLE NEST DR	GRAFTON	OH	44044	THOMAS CHRISTOPHER S	37690 EAGLE NEST DR	GRAFTON	OH	44044
THORNE BRANDON T & MARY B	37570 EAGLE NEST DR	GRAFTON	OH	44044	THORNE BRANDON T & MARY B	37570 EAGLE NEST DR	GRAFTON	OH	44044
THORNSBERRY MATTHEW D	3082 FIELDSTONE TRL	AVON	OH	44011	THORNSBERRY MATTHEW D & ANDREA L	3082 FIELDSTONE TRL	AVON	OH	44011
MEDIA ONE OF OHIO INC					TIME WARNER CABLE	C/O TAX DEPT	CHARLOTTE	NC	28241
TLP INVESTORS GROUP LLC	583 MILLER RD	AVON LAKE	OH	44012	TLP INVESTORS GROUP LLC	583 MILLER RD	AVON LAKE	OH	44012
TOLLETT LONNIE A SR & SANDRA A	38166 CHESTNUT RIDGE RD	ELYRIA	OH	44035	TOLLETT LONNIE A SR & SANDRA A	38166 CHESTNUT RIDGE RD	ELYRIA	OH	44035
TOMPKINS JACQUELYN S	11843 GRAFTON RD	GRAFTON	OH	44044	TOMPKINS JACQUELYN S	42605 GRANDVIEW DR	ELYRIA	OH	44035
TOOMEY STEPHEN M & PEGGY J	39527 SLIFE RD	GRAFTON	OH	44044	TOOMEY STEPHEN M & PEGGY J	39527 SLIFE RD	GRAFTON	OH	44044
TOWERS MICHAEL D	39331 BURNS RD	NORTH RIDGEVILLE	OH	44039	TOWERS MICHAEL D	39331 BURNS RD	NORTH RIDGEVILLE	OH	44039
TOWNS FRANKLIN E & FREDA E	532 STILL WATER BLVD	ELYRIA	OH	44035	TOWNS FRANKLIN E & FREDA E	532 STILL WATER BL	ELYRIA	OH	44035
EATON TOWNSHIP TRUSTEES	12043 AVON BELDEN RD	GRAFTON	OH	44044	TOWNSHIP OF EATON	12043 AVON BELDEN RD	GRAFTON	OH	44044
TRUSNIK ROSSLYN R & TRUSNIK EDWARD D	39114 CASE ROAD	AVON	OH	44011	TRUSNIK ROSSLYN R	39114 CASE ROAD	AVON	OH	44011
TURCHANIK DONNA M	12770 GRAFTON RD	GRAFTON	OH	44044	TURCHANIK DONNA M	12770 GRAFTON RD	GRAFTON	OH	44044
TWIN CREEK FARMS INC	39803 SLIFE RD	GRAFTON	OH	44044	TWIN CREEK FARMS INC	39803 SLIFE RD	GRAFTON	OH	44044
UFFELMAN DEBORAH	38460 RIVER RIDGE CT	GRAFTON	OH	44044	UFFELMAN DEBORAH	38460 RIVER RIDGE CT	GRAFTON	OH	44044
UNGER STEPHANIE KAY & VAJDA SHERYL LYNN					UNGER STEPHANIE KAY	1806 29TH ST W	BRADENTON	FL	34205
URIG DENNIS J SR & TERESITA M TRUSTEES	5504 COLORADO AVE	SHEFFIELD LAKE	OH	44054	URIG DENNIS J SR & TERESITA M	5500 COLORADO AVE	SHEFFIELD VILL	OH	44054
VAJDA JAMES P & SHERYL L	37900 W ROYALTON RD	GRAFTON	OH	44044	VAJDA JAMES P & SHERYL L	37900 W ROYALTON RD	GRAFTON	OH	44044

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AVON LAKE GAS ADDITION PROJECT
Section 404 Wetland Permit Application
Attachment E - Affected Landowner List

Owner Name	Owner Address	Owner City	Owner State	Owner Zip	Mail to Name	Mail to Address	Mail to City	Mail to State	Mail to Zip
VARIGROUP LTD	39405 TAYLOR PARKWAY	N RIDGEVILLE	OH	44039	VARIGROUP LTD	14250 S INDUSTRIAL AVE STE 104	MAPLE HEIGHTS	OH	44137
VASILOFF LARRY	4345 CASE RD	AVON	OH	44011	VASILOFF LARRY	4345 CASE RD	AVON	OH	44011
SCHAFER DEVELOPMENT COMPANY INC	2307 BEAVER CREEK	WESTLAKE	OH	44145	VILLAGE LAKE ESTATES	1507 LEAR INDUSTRIAL PKWY #1	AVON	OH	44011
VONYA GEORGE & DEBRA	13198 INDIAN HOLLOW RD	GRAFTON	OH	44044	VONYA GEORGE & DEBRA	13198 INDIAN HOLLOW ROAD	GRAFTON	OH	44044
WALDRON FANNIE R TRUSTEE	7090 CASE RD	NORTH RIDGEVILLE	OH	44039	WALDRON FANNIE RUTH	7090 CASE RD	N RIDGEVILLE	OH	44039
WALMART REAL ESTATE BUSINESS TRUST	1000 CHESTNUT COMMONS DR	ELYRIA	OH	44035	WAL-MART PROPERTY TX DEPT MS O555	P O BOX 8042	BENTONVILLE	AR	72716
WALTER LAWRENCE J & MARTHA A	12791 INDIAN HOLLOW RD	GRAFTON	OH	44044	WALTER LAWRENCE J & MARTHA A	12791 INDIAN HOLLOW RD	GRAFTON	OH	44044
WALTHER COLLEEN R TRUSTEE	4411 CASE RD	AVON	OH	44011	WALTHER COLLEEN R TRUSTEE	9720 SMITH RD	LITCHFIELD	OH	44253
WARNER SAMUEL EARL TRUSTEE	22516 MASTICK RD	FAIRVIEW PARK	OH	44126	WARNER SAMUEL E	22516 MASTICK RD	FAIRVIEW PARK	OH	44126
WATKINS WILLIAM M & JODY L	6545 CASE RD	N RIDGEVILLE	OH	44039	WATKINS WILLIAM M & JODY L	6545 CASE RD	N RIDGEVILLE	OH	44039
WATTEREDGE LLC	567 MILLER RD	AVON LAKE	OH	44012	WATTEREDGE-UNIFLEX INC	567 MILLER ROAD	AVON LAKE	OH	44012
WEARSCH TIMOTHY W & WEARSCH VICTORIA S	5996 CASE RD	N RIDGEVILLE	OH	44039	WEARSCH TIMOTHY W	5996 CASE RD	N RIDGEVILLE	OH	44039
WERNER WILLIAM D & SHIRLEY A TRUSTEES	6179 CASE RD	N RIDGEVILLE	OH	44039	WERNER WILLIAM D & SHIRLEY A	6179 CASE RD	N RIDGEVILLE	OH	44039
WHALEN DAVID & CATHERINE					WHALEN DAVID B & CATHERINE L	11901 INDIAN HOLLOW RD	GRAFTON	OH	44044
WHARY KIM W	11870 CASTLETON LN	GRAFTON	OH	44044	WHARY KIM W	11870 CASTLETON LANE	GRAFTON	OH	44044
WHARY KIM W & JUDITH L	11870 CASTLETON LN	GRAFTON	OH	44044	WHARY KIM W & JUDITH L	11870 CASTLETON LN	GRAFTON	OH	44044
WHITAKER DOLORES M TRUSTEE	6768 CASE RD	N RIDGEVILLE	OH	44039	WHITAKER DOLORES M TRUSTEE	6768 CASE RD	N RIDGEVILLE	OH	44039
WHITING DANIEL S & DENISE M	C/O RESIDENCE INN	CLEVELAND	OH	44130	WHITING DANIEL S & DENISE M	C/O RESIDENCE INN	CLEVELAND	OH	44130
WIECHOWSKI STANLEY & NANCY ANN	37871 W ROYALTON RD	GRAFTON	OH	44044	WIECHOWSKI STANLEY & NANCY ANN	37871 W ROYALTON RD	GRAFTON	OH	44044
WILLIAMS DAVID B & CHERIE L	13170 INDIAN HOLLOW RD	GRAFTON	OH	44044	WILLIAMS DAVID B & CHERIE L	13170 INDIAN HOLLOW RD	GRAFTON	OH	44044
WILLIAMS DAVID B CHERIE L					WILLIAMS DAVID B CHERIE L	13170 INDIAN HOLLOW RD	GRAFTON	OH	44044
WILSON GARY F & CAROL A TRUSTEE	38490 RIVER RIDGE RD	GRAFTON	OH	44044	WILSON GARY F & CAROL A TRUSTEE	38490 RIVER RIDGE RD	GRAFTON	OH	44044
WILSON VICKIE S & WILSON DAVID K	3118 WHEATON DRIVE	AVON	OH	44011	WILSON VICKIE S	3118 WHEATON DRIVE	AVON	OH	44011
ALLTEL OHIO	560 TERNES AVE	ELYRIA	OH	44035	WINDSTREAM	C/O RASH #502/080	PLANO	TX	750260888
FIELDSTONE LAKES LTD	2 BEREA COMMONS #1	BEREA	OH	44017	WM THOMAS COMMUNITIES INC	2 BEREA COMMONS #1	BEREA	OH	44017
WORLD WEST PROPERTIES LLC	11750 BEREA RD	CLEVELAND	OH	44111	WORLD WEST PROPERTIES LLC	11750 BEREA RD	CLEVELAND	OH	44111
WUKIE THERESA M TRUSTEE	11885 GRAFTON RD	GRAFTON	OH	44044	WUKIE THERESA M TRUSTEE	11885 GRAFTON RD	GRAFTON	OH	44044
YEHLIK MICHELLE	544 STILL WATER BLVD	ELYRIA	OH	44035	YEHLIK MICHELLE	544 STILL WATER BLVD	ELYRIA	OH	44035
ZACHARIAS TIMOTHY	40005 BANKS RD	GRAFTON	OH	44044	ZACHARIAS TIMOTHY	40005 BANKS RD	GRAFTON	OH	44044

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Attachment F

Erosion & Sediment Pollution Control Plan Typicals

Instructions For Staging Of Earthmoving Activities:

CONSTRUCTION MUST BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE. THIS SCHEDULE IS DESIGNED TO MINIMIZE SOIL EROSION AND SEDIMENTATION. THE CONTRACTOR MAY DEVIATE SLIGHTLY FROM THE STAGING OF PERMANENT SITE IMPROVEMENTS, BUT NO DEVIATION FROM THE RELATIVE ORDER OF EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE ALLOWED.

FACILITIES TO CONTROL THE TRANSPORT OF SOIL MATERIAL FROM THE CONSTRUCTION AREA SHALL BE INSTALLED PRIOR TO ANY EARTH DISTURBANCE OR PAVEMENT REMOVAL.

NOTE: THE STAGING OF EARTHMOVING ACTIVITIES FOR THIS PROJECT IS A GENERAL DESCRIPTION OF THE WORK REQUIRED. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH COMPANY STANDARDS, THE OHIO DEPARTMENT OF ENVIRONMENTAL PROTECTION REGULATIONS, AND ALL OTHER APPLICABLE FEDERAL, STATE OR LOCAL REQUIREMENTS.

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. CONSTRUCTION MAY START AT MULTIPLE POINTS. THE CONTRACTOR SHALL PLACE ALL BMPS FOR THAT SECTION OR AREA PRIOR TO THE START OF CONSTRUCTION.

AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE COMPANY SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, ALL APPROPRIATE MUNICIPAL, STATE & FEDERAL OFFICIALS, THE LOCAL COUNTY CONSERVATION DISTRICT, AND THE EROSION AND SEDIMENTATION CONTROL PLAN PREPARER TO AN ON-SITE PRECONSTRUCTION MEETING. THE MAIN LINE CONTRACTOR SHALL HAVE PRESENT THE SUPERVISORY PERSON RESPONSIBLE FOR THE GENERAL CONSTRUCTION AND SUPERVISORY PERSON RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF BMPS FOR THE PROJECT. THE COMPANY SHALL HAVE PRESENT AT LEAST ONE COMPANY PERSON WHO HAS ENFORCEMENT AUTHORITY TO ASSURE THAT THE CONTRACTOR COMPLIES WITH THE DESIGNED BMPS. THE COMPANY SHOULD ALSO HAVE AT LEAST ONE OF THE COMPANY'S INSPECTION PERSONNEL (WITH STOP WORK AUTHORITY) WHO WILL BE ON SITE TO ASSURE THAT THE CONTRACTOR COMPLIES WITH THE DESIGNED BMPS AND IS QUALIFIED TO DIRECT THE INSTALLATION OF ADDITIONAL BMPS AS NECESSARY. BEFORE IMPLEMENTING ANY REVISIONS TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E & S CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE COUNTY CONSERVATION DISTRICT.

AT LEAST THREE (3) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE ONE CALL SYSTEM INCORPORATED AT 1-800-362-2764 FOR BURIED UTILITIES LOCATION.

BEFORE IMPLEMENTING ANY REVISIONS TO THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E&S PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE APPROPRIATE CONSERVATION DISTRICT.

THE CONTRACTOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH OHIO EPA'S SOLID WASTE MANAGEMENT REGULATIONS AT OAC CHAPTER 3745. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THE SITE. BEFORE DISPOSING OF SOIL OR RECEIVING BORROW FOR THE SITE, THE CONTRACTOR MUST ASSURE THAT EACH SOIL OR BORROW AREA HAS AN EROSION AND SEDIMENTATION CONTROL PLAN APPROVED BY OHIO EPA, AND WHICH IS BEING IMPLEMENTED AND MAINTAINED ACCORDING TO THEIR REGULATIONS.

THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN INCLUDING THE SOIL EROSION CONTROL DRAWINGS AND NARRATIVE SHALL BE AVAILABLE ON SITE AT ALL TIMES DURING EARTH DISTURBANCE.

SEQUENCE OF BMP INSTALLATION AND REMOVAL DURING PIPELINE CONSTRUCTION

1. STAKE/FLAG DISTURBED RIGHT-OF-WAY EXTENTS, CLEARLY IDENTIFYING WETLAND AND STREAM EDGES AND BUFFERS. INSTALL SIGNS OR OTHER MEANS TO IDENTIFY IMPORTANT PROJECT ATTRIBUTES SUCH AS APPROVED ACCESS ROADS, NO REFUELING ZONES, WETLAND/STREAM BOUNDS, ETC.
2. SCHEDULE A PRECONSTRUCTION CONFERENCE AS DESCRIBED ABOVE AND PROVIDE AT LEAST THREE (3) WORKING DAYS, SEVENTY-TWO (72 HOURS) NOTICE TO THE OHIO EPA PRIOR TO COMMENCEMENT OF SITE GRADING WORK.
   NOTE: IT IS INTENDED THAT THE PIPELINE PROJECT WILL BEGIN AT ONE END AND PROGRESS IN AN ORDERLY FASHION TO THE OTHER END. IT IS ALSO INTENDED THAT DISTURBED SOILS WILL BE RESTORED TO THEIR VEGETATED STATE AS SOON AS IS PRACTICAL WITH PERMANENT BMPS PROPERLY INSTALLED AND MAINTAINED. DUE TO THE NATURE OF THE TERRAIN AND OTHER FACTORS, DEVIATION FROM THE SEQUENTIAL PROGRESS OF THE PROJECT FROM ONE END TO THE OTHER WILL BE ALLOWED WITH PERMISSION FROM THE COMPANY, BUT THE SEQUENCE OF BMP INSTALLATION RELATED TO SOIL DISTURBANCE, ESPECIALLY STREAM AND WETLAND CROSSINGS, IS AN ABSOLUTE.
3. PRIOR TO ACCESSING THE RIGHT-OF-WAY FROM A PUBLIC ROAD, INSTALL THE REQUIRED BMPS PER THE SPECIFIC DETAIL DESIGN. THE PRIORITY IS TYPICALLY TO FIRST BE SILT FENCE, FILTER SOXX, STRAW BALES, ETC., THEN CULVERTS IF REQUIRED, FOLLOWED BY ROCK PADS AND THEN ALL OTHER BMPS AS DESIGNED.
4. FOR RIGHT-OF-WAY IN UPLAND AREAS, THE RIGHT-OF-WAY IS FIRST TO MOWED/BRUSH HOGGED/HYDRO-AXED; TREES CUT; BRUSH, LIMBS, AND TREES UNDER 6 INCHES CHIPPED, WITH CHIPS BROADCAST OFF RIGHT-OF-WAY (PROVIDED ON SAME PROPERTY COVERED BY R.O.W. OPTION) AND LOGS STACKED IN DESIGNATED AREAS.
5. AS STREAMS OR WETLANDS ARE ENCOUNTERED DURING CLEARING, INSTALL TEMPORARY OR PERMANENT BMPS PER DETAILED DESIGN. TEMPORARY BMPS ARE TO INCLUDE SILT FENCE OR EQUIVALENT ACROSS ENTIRE RIGHT-OF-WAY ON BOTH SIDES UNTIL PERMANENT BMPS ARE INSTALLED. CLEARING EQUIPMENT IS NOT TO CROSS ANY STREAM OR WETLAND EXCEPT ON TIMBER MATS.
6. IN ACTIVE AGRICULTURAL AREAS, CROPS ARE TO BE BRUSH HOGGED IF NECESSARY AND THE TOPSOIL STRIPPED PRIOR TO ANY VEHICULAR TRAVEL ON THE RIGHT-OF-WAY. ALL TOPSOIL THAT IS STRIPPED IS TO BE PLACED ON ONE SIDE OF THE RIGHT-OF-WAY IN THE DESIGNATED AREA ON TOP OF UNDISTURBED TOPSOIL. FOR RIGHT-OF-WAY WHICH SPECIFIC BMPS SUCH AS UPSLOPE DIVERSION DITCHES, SILT FENCE, ETC. IS DESIGNED; THOSE BMPS ARE TO BE INSTALLED PRIOR TO STRIPPING.
7. PRIOR TO GRADING OR OTHER EARTH DISTURBANCE ON THE RIGHT-OF-WAY, PERMANENT DOWN SLOPE BMPS ARE TO BE INSTALLED. SPECIFICALLY, AS GRADING APPROACHES STREAM OR WETLAND CROSSINGS, NO EARTH DISTURBANCE IS TO OCCUR WITHIN 50 FEET OF THE STREAM OR WETLAND WITHOUT DESIGNED BMPS INSTALLED AT THAT PARTICULAR CROSSING.
8. AT THE END OF EACH WORK DAY WHERE THE RIGHT-OF-WAY HAS BEEN GRADED INCLUDING ANY STRIPPING, STUMPING, LEVELING, TWO-TONE ON SIDE SLOPES, ETC., BMPS ARE TO BE INSTALLED. IN NO CASE IS THE CONTRACTOR TO LEAVE THE JOB SITE AT THE END OF THE WORK DAY WITHOUT TEMPORARY OR PERMANENT BMPS (SPECIFICALLY WATER BARS) BEING INSTALLED. THE CONTRACTOR IS NOT REQUIRED TO MAINTAIN WATER BARS DURING THE WORK DAY UNLESS THE ENVIRONMENTAL INSPECTOR DETERMINES THAT THERE IS A RISK OF A RAIN EVENT THAT WARRANTS THEIR INSTALLATION/MAINTENANCE.
9. AS CROSSINGS ARE CONSTRUCTED, THE DETAIL DESIGN IS TO BE FOLLOWED PAYING PARTICULAR ATTENTION TO THE SPECIFIC NOTES SECTION OF THE DRAWING.
10. ONCE ALL REQUIRED BMPS ARE IN PLACE ON THE DISTURBED RIGHT-OF-WAY, DITCHING, STRINGING, BENDING OPERATIONS, WELDING, ETC. CAN BEGIN. ONCE THE PIPE IS LOWERED INTO THE TRENCH, TRENCH BREAKERS ARE TO BE INSTALLED PER THE STANDARD SPACING SPECIFICATION. NOTE THAT THE DETAILED CROSSING DESIGNS REQUIRE SPECIFIC LOCATIONS OF TRENCH BREAKERS.
11. IT IS DESIRED THAT THE AMOUNT AND DURATION OF OPEN TRENCH BE MINIMIZED DURING THE PROJECT. IN GENERAL, NO TRENCH SHALL BE OPEN AT ONE TIME FOR MORE THAN 30 DAYS EXCEPT FOR TIE IN LOCATIONS WITHOUT THE APPROVAL OF THE COMPANY.
12. ALL AREAS OF OPEN TRENCH MUST HAVE INSTALLED TRENCH BREAKERS/TRENCH PLUGS AS LISTED IN TRENCH BREAKERS/TRENCH PLUGS DETAIL ON DETAIL SHEET 3.
13. IF TOPSOIL PILES ARE EXPOSED FOR GREATER THAN 2 DAYS, THEY SHALL BE SEEDED IN ACCORDANCE WITH DETAILS PROVIDED HEREIN. WHERE CESSATION OF EARTH DISTURBANCE ACTIVITY WILL EXCEED TWO (2) DAYS, THE SITE SHALL IMMEDIATELY SEEDED, MULCHED OR OTHERWISE PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION.
14. PRIOR TO ANY PERMANENT SEEDING, LIME, AND FERTILIZING APPLICATION, A SOIL TEST SHALL BE PREFORMED TO DETERMINE THE PH FACTOR.
15. LIME, FERTILIZE, SEED, AND MULCH THE DISTURBED AREAS PER THE COMPANY SPECIFICATIONS. IN AREAS OF STEEP SLOPES OR OBVIOUS AREAS WHERE POTENTIAL EROSION MAY OCCUR, AND EROSION CONTROL MAT OR FLEXIBLE GROWTH MEDIUM (FGM) SHALL BE USED. FGM SHALL BE APPLIED PER THE MANUFACTURER'S SPECIFICATIONS.
16. ONCE A SECTION OF THE PIPELINE HAS BEEN STABILIZED, NO CONSTRUCTION TRAFFIC SHALL OCCUR TO REMOVE ANY BMPS UNTIL THE SECTION HAS ACHIEVED 85% PERENNIAL VEGETATIVE COVER. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 85% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NONVEGATATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING OR OTHER MOVEMENTS.

PERMANENT STABILIZATION – ALTERNATE FINAL RESTORATION NOTE

A. LIMITING EXPOSED AREAS – "EARTH DISTURBANCE ACTIVITIES SHALL BE PLANNED AND CONDUCTED TO MINIMIZE THE EXTENT AND DURATION OF THE DISTURBANCE."

THE LENGTH OF TIME FOR CONSTRUCTING ACCESS ROADS, UTILITY LINE TRENCHING, TRENCH BACK-FILLING, FINAL GRADING, AND CLEANUP SHOULD BE KEPT TO A MINIMUM. GOOD PLANNING AND SCHEDULING OF THE VARIOUS UTILITY CONSTRUCTION ITEMS, TOGETHER WITH TIMELY AVAILABILITY OF MATERIALS, ADEQUATE EQUIPMENT, AND ADEQUATE MANPOWER, WILL HELP REDUCE THE TIME OF EXPOSURE OF DISTURBED LAND.

LARGE DIAMETER STEEL PIPELINES WITH WELDED JOINTS WHERE THE PIPE JOINTS ARE WELDED WHILE THE PIPE IS OUT OF THE TRENCH USUALLY REQUIRE A FAIRLY LONG LENGTH OF OPEN PIPELINE TRENCH. THE TOTAL TIME FROM TRENCH EXCAVATION TO PLACEMENT OF BACKFILL FOR THIS TYPE OF PIPELINE CONSTRUCTION SHOULD GENERALLY BE LIMITED TO NO MORE THAN THIRTY (30) CALENDAR DAYS AT ANY GIVEN POINT ALONG THE PIPELINE. THIS MEANS THAT, FOR EXAMPLE, THAT FROM THE TIME THAT TRENCH EXCAVATION ACTIVITIES COMMENCE AT STATION 1+00 UNTIL THE TRENCH IS BACKFILLED AT STATION 1+00, NO MORE THAN THIRTY (30) CALENDAR DAYS SHOULD EXPIRE. AT ANY GIVEN PLACE ALONG THE PIPELINE TRENCH WHERE THE TIME TO EXCAVATE AND BACKFILL THE TRENCH WILL EXCEED THIRTY (30) CALENDAR DAYS, OR THE TIME SPECIFIED IN THE PERMIT, THE CONTRACTOR SHALL CONTACT THE COMPANY TO DETERMINE IF THE ADDITIONAL TIME CAN BE APPROVED UNDER A MINOR MODIFICATION. WHERE EARTH DISTURBANCE ACTIVITY IS NOT COMPLETED IN AN AREA WHERE THE TRENCH HAS BEEN BACKFILLED, BMPS SHOULD BE MAINTAINED AND TEMPORARY STABILIZATION PROVIDED AS REQUIRED ACCORDING TO §102.22(B). WHERE DISTURBANCE ACTIVITIES HAVE BEEN COMPLETED, PERMANENT STABILIZATION SHALL BE PROVIDED AS REQUIRED UNDER §102.22(A).

NO SOIL IS TO BE HAULED OFF SITE WITHOUT A SEPARATE EROSION AND SEDIMENTATION CONTROL PLAN REVIEWED FOR ADEQUACY BY THE OHIO EPA OR THE LOCAL COUNTY CONSERVATION DISTRICT AS APPROPRIATE.

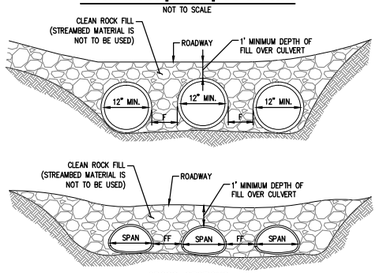
INSPECTION – ALL BMPS SHOULD BE INSPECTED AFTER EACH MEASURABLE RAINFALL RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.

General Notes:

1. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SILT FROM LEAVING THE SITE.
2. ALL PIPES/BRIDGES ARE FOR CONSTRUCTION ONLY AND THE SITE OF SAID PIPES/BRIDGES SHALL BE RESTORED TO ORIGINAL TOPOGRAPHY AND STABILIZED WITHIN FIVE (5) DAYS AFTER TERMINATION OF ITS INTENDED USE OR AT THE END OF THE ONE (1) YEAR PERIOD, WHICHEVER OCCURS FIRST.

Temporary Stream Crossing With Multiple Pipes Detail

NOT TO SCALE



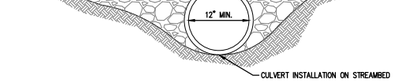
CROSS-SECTIONS

NOTES:
1. MULTIPLE PIPES AND MULTIPLE SPAN BRIDGES AND CULVERTS WHICH MAY TEND TO COLLECT DEBRIS, CONTRIBUTE TO THE FORMATION OF ICE JAMS AND INCREASE HEAD LOSSES SHALL BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE. CROSSINGS OF LESS THAN 15 FEET SHALL BE BY ONE SPAN, EXCEPT WHERE CONDITIONS MAKE IT IMPRACTICAL TO AFFECT THE CROSSING WITHOUT MULTIPLE SPANS.
2. PROVIDE 50' STABILIZED ACCESS TO CROSSING ON BOTH SIDES OF STREAM CHANNEL. PIPES SHALL EXTEND BEYOND THE TOE OF THE ROADWAY.
3. RUNOFF FROM THE ROADWAY SHALL BE DIVERTED OFF THE ROADWAY AND INTO A SEDIMENT REMOVAL BMP BEFORE IT REACHES THE ROCK APPROACH TO THE CROSSING.

MAINTENANCE
1. TEMPORARY STREAM CROSSINGS SHALL BE INSPECTED ON A DAILY BASIS.
2. DAMAGED CROSSINGS SHALL BE REPAIRED WITHIN 24 HOURS OF THE INSPECTION AND BEFORE ANY SUBSEQUENT USE.
3. SEDIMENT DEPOSITS ON THE CROSSING OR ITS APPROACHES SHALL BE REMOVED WITHIN 24 HOURS OF THE INSPECTION.
4. AS SOON AS THE TEMPORARY CROSSING IS NO LONGER NEEDED, IT SHALL BE REMOVED. ALL MATERIALS SHALL BE DISPOSED OF PROPERLY AND DISTURBED AREAS STABILIZED.

Temporary Stream Crossing With Single Pipe Detail

NOT TO SCALE



CROSS-SECTION VIEW

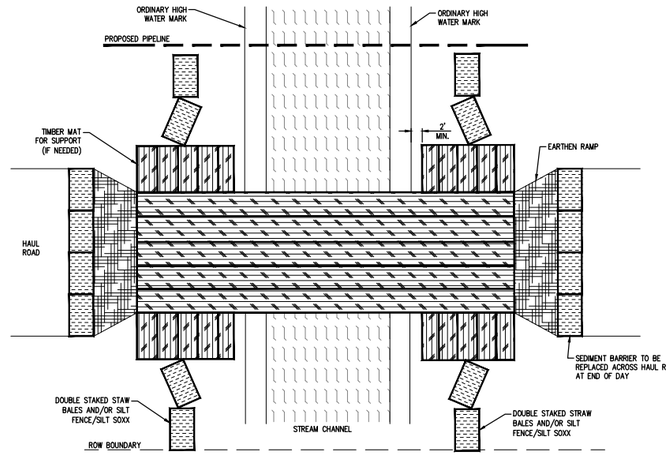
NOTES:
1. PROVIDE 50' STABILIZED ACCESS TO CROSSING ON BOTH SIDES OF STREAM CHANNEL.
2. PIPES SHALL EXTEND BEYOND THE TOE OF THE ROADWAY.
3. RUNOFF FROM THE ROADWAY SHALL BE DIVERTED OFF THE ROADWAY AND INTO A SEDIMENT REMOVAL BMP BEFORE IT REACHES THE ROCK APPROACH TO THE CROSSING.

MAINTENANCE:
1. TEMPORARY STREAM CROSSINGS SHALL BE INSPECTED ON A DAILY BASIS.
2. DAMAGED CROSSINGS SHALL BE REPAIRED WITHIN 24 HOURS OF THE INSPECTION AND BEFORE ANY SUBSEQUENT USE.
3. SEDIMENT DEPOSITS ON THE CROSSING OR ITS APPROACHES SHALL BE REMOVED WITHIN 24 HOURS OF THE INSPECTION.
4. AS SOON AS THE TEMPORARY CROSSING IS NO LONGER NEEDED, IT SHALL BE REMOVED. ALL MATERIALS SHALL BE DISPOSED OF PROPERLY AND DISTURBED AREAS STABILIZED.

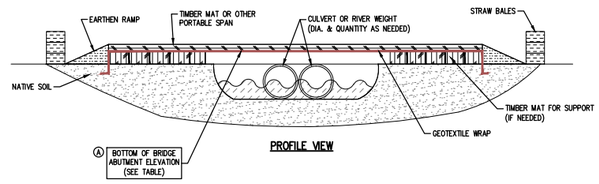
Timber Mat Bridge Detail

BR

NOT TO SCALE



PLAN VIEW



PROFILE VIEW

NOTES:
1. STRAW BALES TO BE PLACED ACROSS BRIDGE ENTRANCE EVERY NIGHT.
2. THE CONTRACTOR HAS THE OPTION TO INSTALL PIPES OR BRIDGE TO CROSS STREAM. IF USING BRIDGE, CULVERTS MAY BE USED TO STABILIZE BRIDGE. THE QUANTITY AND DIAMETER OF CULVERTS SHALL BE AS NEEDED TO STABILIZE THE BRIDGE AND TO MEET THE MINIMUM BRIDGE ELEVATION SHOWN IN TABLE BELOW. IF USING PIPES, THE DIAMETER AND QUANTITY OF PIPES SHALL BE AS SHOWN IN TABLE BELOW.
3. CONTRACTOR HAS THE OPTION TO CHOOSE BETWEEN PUMPING OR FLUMING STREAM FLOW FOR TRENCH CROSSING.

GENERAL NOTES:
1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 1

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 83 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Revegetation Best Management Practices:

AFTER EARTH DISTURBANCE ACTIVITY IS COMPLETED, THE DISTURBED AREA MUST BE REVEGETATED. THE VEGETATIVE COVER MUST BE A UNIFORM 85% PERENNIAL VEGETATIVE COVER, WITH A DENSITY CAPABLE OF RESISTING ACCELERATED EROSION AND SEDIMENTATION. ANOTHER OPTION IS TO USE AN ACCEPTABLE BMP WHICH PERMANENTLY MINIMIZES ACCELERATED EROSION AND SEDIMENTATION.

1. SEED MIXTURES - STANDARD SEED MIXTURES, THAT HAVE BEEN SHOWN TO BE EFFECTIVE IN STABILIZING AREAS IN OHIO ARE RECOMMENDED. THIS INFORMATION IS SUMMARIZED IN TABLES 13 THROUGH 16. ALTHOUGH THESE RECOMMENDED MIXTURES WILL BE SUITABLE FOR MOST SITES, THEY MAY NOT BE DESIRABLE FOR ALL SITUATIONS THAT MAY BE ENCOUNTERED IN SUCH INSTANCES, THE COMPANY SHOULD BE CONTRACTED FOR ADDITIONAL GUIDANCE. THE WEBSITE WWW.PLANT-MATERIALS.NRCS.USDA.GOV <HTTP://WWW.PLANT-MATERIALS.NRCS.USDA.GOV> IS ANOTHER EXCELLENT SOURCE OF INFORMATION.
   - A. A SEED MIX SHOULD CONTAIN MORE THAN ONE VARIETY OF SEED AND INCLUDE THE APPLICATION RATE (E.G. LB./ACRE), AND GERMINATION SEASON.
   - B. IF THE AREA TO BE VEGETATED IS A STEEP SLOPE (≥ 3:1), A STEEP SLOPE MIXTURE SHOULD BE USED. OTHER LIMITATIONS, SUCH AS DROUGHTY OR SATURATED CONDITIONS, ACID SOILS, AND SHADED AREAS SHOULD ALSO BE ADDRESSED BY THE PROPOSED SEEDING PLAN (SEE TABLES 13 THOUGH 16).
   - C. WHEREVER TALL RESCUE IS PROPOSED, AN ENDOPHYTE FREE VARIETY (E.G. JOHNSTONE, BARCEL, OR FESTORINA) SHOULD BE USED.
   - D. SEED MIXTURES SHOULD INCLUDE A LEGUME. WHEN USED IN AREAS DIFFICULT TO VEGETATE, LEGUME SEED LOTS SHOULD CONTAIN A CERTAIN AMOUNT OF HARD SEED (SEE TABLE 13 FOR RECOMMENDED SPECIFICATIONS). LEGUME SEED MUST BE INOCULATED IN ORDER TO FORM NODULES ON THE ROOTS WHICH FIX ATMOSPHERIC NITROGEN. USE ONLY SEED WHICH HAS BEEN FRESHLY AND PROPERLY INOCULATED.
   - E. WARM SEASON GRASSES MAY HAVE SOME LIMITATIONS FOR USE IN EROSION CONTROL AND MUST BE CONSIDERED WHEN SELECTING A SEED MIXTURE, THEY GROW MUCH MORE SLOWLY DURING THE SPRING AND FALL MONTHS. THEY TEND TO FORM BUNCHES, RATHER THAN SOD. THEREFORE, THE COVERAGE MAY NOT BE AS UNIFORM AS DESIRED.

TABLE 13 PLANT TOLERANCES OF SOIL LIMITATION FACTORS

SPECIES	GROWTH HABIT	TOLERATES: WET SOIL	DRY SITE	LOW FERTILITY	② ACID SOIL (pH 5–5.5)	MINIMUM SEED SPECIFICATIONS ③: PURITY (%)	READY GERM (%)	HARD SEED (%)	TOTAL GERM (%)	SEEDS/lb (1,000s)
WARM–SEASON GRASSES										
DEERTOUNGUE	BUNCH	YES	YES	YES	YES	95	75		75	250
WEEPING LOVEGRASS	BUNCH	NO	YES	YES	YES	97	75		75	1,500
SWITCHGRASS ④	BUNCH	YES	YES	YES	YES		(60 PLS)			390
BIG BLUESTEM	BUNCH	NO	YES	YES	YES		(60 PLS)			150
COOL–SEASON GRASSES										
TALL FESCUE	BUNCH	YES	NO	YES	NO	95	80		80	227
REDTOP	SOD	YES	YES	YES	YES	92	80		80	5,000
FINE FESCUES	SOD	NO	NO	YES	NO	95	80		80	400
PERENNIAL RYEGRASS	BUNCH	YES	NO	NO	NO	95	85		85	227
ANNUAL RYEGRASS	BUNCH	YES	NO	YES	NO	95	85		85	227
KENTUCKY BLUEGRASS	SOD	NO	NO	NO	NO	85	75		75	2,200
REEDCANARYGRASS	SOD	YES	YES	YES	NO	95	70		70	520
ORCHARDGRASS	BUNCH	YES	YES	YES	YES	95	80		80	654
TIMOTHY	BUNCH	YES	NO	YES	YES	95	80		80	1,230
SMOOTH BROMEGRASS	SOD	NO	YES	YES	NO	95	80		80	136
LEGUMES ⑤										
CROWNVETCH	SOD	NO	YES	YES	NO	98	40	30	65	120
BIRDSFOOT TREFOIL ⑥	BUNCH	YES	NO	YES	YES	98	60	20	80	400
FLATPEA	SOD	NO	NO	YES	YES	98	55	20	75	10
SERECIA LESPEDEZA	BUNCH	NO	YES	YES	YES	98	60	20	80	335
CEREALS										
WINTER WHEAT	BUNCH	NO	NO	NO	NO	98	85		85	15
WINTER RYE	BUNCH	NO	NO	YES	YES	98	85		85	18
SPRING OATS	BUNCH	NO	NO	NO	NO	98	85		85	13
SUNDANGRASS	BUNCH	NO	YES	NO	NO	98	85		85	55
JAPANESE MILLET	BUNCH	YES	NO	YES	YES	98	80		80	155

① GROWTH HABIT REFERS TO THE ABILITY OF THE SPECIES TO EITHER FORM A DENSE SOD BY VEGETATIVE MEANS (STOLONS, RHIZOMES, OR ROOTS) OR REMAIN IN A BUNCH OR SINGLE PLANT FORM. IF SEEDED HEAVILY ENOUGH, EVEN BUNCH FORMERS CAN PRODUCE A VERY DENSE STAND. THIS IS SOMETIMES CALLED A SOD, BUT NOT IN THE SENSE OF A SOD FORMED BY VEGETATION MEANS.

② ONCE ESTABLISHED, PLANTS MAY GROW AT A SOMEWHAT LOWER PH, BUT COVER GENERALLY IS ONLY ADEQUATE AT PH 6.0 OR ABOVE.

③ MINIMUM SEEDLOTS ARE TRULY MINIMUM, AND SEEDLOTS TO BE USED FOR REVEGETATION PURPOSES SHOULD EQUAL OR EXCEED THESE STANDARDS. THUS, DEERTONGUE GRASS SHOULD GERMINATE 75% OR BETTER. CROWNVETCH SHOULD HAVE ATLEAST 40% READILY GERMINABLE SEED AND 30% HARD SEED. COMMONLY, SEEDLOTS ARE AVAILABLE THAT EQUAL OR EXCEED MINIMUM SPECIFICATIONS. REMEMBER THAT DISTURBED SITES ARE ADVERSE FOR PLANT ESTABLISHMENT. READY GERMINATION REFERS TO SEED THAT GERMINATES DURING THE PERIOD OF THE GERMINATION TEST AND THAT WOULD BE EXPECTED, IF CONDITIONS ARE FAVORABLE, TO GERMINATE RAPIDLY WHEN PLANTED. THE OPPOSITE OF READY GERMINATION IS DORMANT SEED, OF WHICH HARD SEED IS ONE TYPE.

④ SWITCHGRASS SEED IS SOLD ONLY ON THE BASIS OF PURE LIVE SEED (PLS).

⑤ NEED SPECIFIC LEGUME INOCULANT, INOCULANT SUITABLE FOR GARDEN PEAS AND SWEETPEAS USUALLY IS SATISFACTORY FOR FLATPEA.

⑥ BIRDSFOOT TREFOIL IS ADAPTED OVER THE ENTIRE STATE, EXCEPT IN THE EXTREME SOUTHEAST WHERE CROWN AND ROOT ROTS MAY INJURE STANDS.

TABLE 14. RECOMMENDED PERMANENT SEED MIXTURES COOL AND WARM SEASON GRASSES

MIXTURE NUMBER	SEASON	SPECIES	SEEDING RATE lb./ac.
1	COOL	TALL FESCUE*,OR FINE FESCUE,PLUS REDTOP,OR PERENNAIL RYEFRASS,PLUS BIRDSFOOT TREFOIL	79 46 4 19 8
2	COOL	BIRDSFOOT TREFOIL,PLUS TALL FESCUE*	8 40
3	COOL	ORCHARDGRASS,OR SMOOTH BROMEGRASS,PLUS BIRDSFOOT TREFOIL	26 33 8
4	WARM	FLATPEA,PLUS TALL FESCUE*,OR PERENNIAL RYEGRASS	27 26 25
5	WARM	DEERTONGUE,PLUS BIRDSFOOT TREEFOIL	21 8
6	WARM	SWITCHGRASS,OR BIG BLUESTEM,PLUS BIRDSFOOT,TREFOIL	15 15 8

* USE ONLY ENDOPHYTE TREE VARIETIES SUCH AS JOHNSTONE, BARCEL OR FESTORINA.

TEMPORARY SEEDING SPECIFICATIONS

SEEDING DATES	SPECIES	LB. PER 1,000 SQ. FT.	PER ACRE
MARCH 1 TO AUGUST 15	OATS	3	4 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	PERENNIAL RYEGRASS	1	40 LB
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
AUGUST 1 TO NOVEMBER 1	RYE	3	2 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	WHEAT	3	2 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	PERENNIAL RYEGRASS	1	40 LB
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
NOVEMBER 1 TO SPRING	USE HEAVY STRAW-MULCH & DORMANT SEEDING, WOOD CHIPS OR PERMANENT SODDING.		

NOTE: OTHER APPROVED SEED SPECIES MAY BE SUBSTITUTED.

TABLE 16. RECOMMENDED SEED MIXTURES FOR STABILIZING DISTURBED AREAS

STIE CONDITION	SEED MIXTURE (SELECT ONE MIXTURE)
CUT SLOPES AND FILLS (NOT MOWED)	
WELL-DRAINED	2,4, OR 6
VARIABLE DRAINAGE	2
CUT SLOPES AND FILLS (MOWED)	1
CUT SLOPES AND FILLS(GRAZED/HAY)	1,2,OR 3
GULLIES AND ERODED AREAS	2 OR 6
EROSION CONTROL BMPS	
CHANNELS, DRAINAGE DITCHES, TRAP EMBANKMENTS, ETC.	1 OR 2
FOR HAY OR SILAGE	2 OR 3
RIGHT-OF-WAY	
WELL-DRAINED	4 OR 6
VARIABLE DRAINAGE	2
WELL-DRAINED AREAS FOR GRAZING/HAY	2 OR 3
STRIP MINED AREAS	
SPOILS, WASTE AREAS, FLY ASH, SLAG, ETC. (LIME TO SOIL TEST)	2,4,OR 5
FOR GRAZING/HAY	2,3,OR 6

2. SOIL AMENDMENTS. A SOIL TEST IS RECOMMENDED TO DETERMINE THE TYPE AND RATE OF APPLICATION OF SOIL AMENDMENTS, ESPECIALLY WHEN THE COUNTY SOIL SURVEY INDICATES THE PRESENCE OF SOILS WITH LOW FERTILITY OR A PH RANGING BELOW 5.5 IT IS ALSO RECOMMENDED WHERE DIFFICULTIES HAVE BEEN ENCOUNTERED IN ESTABLISHING A GOOD COVER (E.G. ABANDONED MINED LANDS). THE COSTS OF SOIL TESTING ARE MINIMAL AND CAN RESULT IN HUGE SAVINGS IN SOIL AMENDMENTS AND THE COSTS OF RE-SEEDING. IN THE ABSENCE OF A SOIL TEST:
   - A. THE LIMING RATE SHOULD BE AT LEAST 4 TO 5 TONS/ACRE. FOR TEMPORARY SEEDING, A LIMING RATE OF 2 TONS/ACRE IS ACCEPTABLE. NO MORE THAN 4 TONS/ACRE SHOULD BE ADDED TO AGRICULTURAL LAND.
   - B. FERTILIZER SHOULD BE APPLIED AT THE RATE OFF 100LB N, 200 LB. OF P205, AND 200 LB. OF K20 PER ACRE (E.G. 1000 LB./ACRE OF 10-20-20 FERTILIZER). FOR TEMPORARY SEEDING, A RATE OF 50 LB. N, 50 LB. P205, 50 LB. K20 PER ACRE(E.G. 500 LB. OF 10-10-10 FERTILIZER) IS ACCEPTABLE.
3. MULCHING-MULCH ABSORBS RAINFALL IMPACT, INCREASES THE RATE OF INFILTRATION, REDUCES SOIL MOISTURE LOSS DUE TO EVAPORATION, MODERATES SOIL TEMPERATURES, PROVIDES A SUITABLE ENVIRONMENT FOR GERMINATION, AND PROTECTS THE SEEDING FROM INTENSE SUNLIGHT. ALL SEEDED AREAS SHOULD BE MULCHED UNLESS THE SEED MIXTURE IS DRILLED AND INCLUDES A NURSE CROP (SEE TABLE 4-17). MULCHING MAY ALSO BE USED AS A TEMPORARY STABILIZATION OF DISTURBED AREAS IN NON-GERMINATING SEASONS.
   - A. THE MINIMUM APPLICATION RATE FOR HAY OR STRAW MULCH SHOULD BE 3 TONS/ACRE. ON STEEP SLOPES THE HAY OR STRAW SHOULD BE CRIMPED, TACKED, NETTED, OR OTHERWISE ANCHORED.
   - B. WOOD CELLULOSE IS NOT RECOMMENDED FOR STEEP SLOPE (≥ 1:3 H:V) APPLICATIONS, WHERE USED, THE MINIMUM RATE OF APPLICATION SHOULD BE 2000 LB./ACRE.
   - C. EROSION CONTROL BLANKETING SHOULD BE CONSIDERED FOR STEEP SLOPE (≥ 1:3 H:V) SITUATIONS AND IN CRITICAL AREAS (E.G. STREAM CROSSINGS, ADJACENT WETLANDS, ETC.)

TABLE 17. MULCH APPLICATION RATES

MULCH TYPE	APPLICTION RATE (MIN.): PER ACRE	PER 1,000 sq.ft.	PER 1,000 sq.yd.	NOTES
STRAW	2 TONS	90 lb.	810 lb.	EITHER WHEAT OR OAT STRAW,FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
HAY	2 TONS	90 lb.	810 lb.	TIMOTHY, MIXED CLOVER AND TIMOTHY OR OTHER NATIVE FORAGE GRASSES
WOOD CELLULOSE	2,000 lb.	46 lb.	414 lb.	DO NOT USE ALONE IN WINTER DURING HOT AND DRY WEATHER, OR ON STEEP SLOPES(>3:1)
WOOD CHIPS	6 TONS			MAY PREVENT GERMINATION OF GRASSES AND LEGUMES

NOTE:
AFTER SOIL PH ANALYSIS IS PERFORMED, A SUITABLE MIX SHALL BE DETERMINED FROM THE TABLES.

Upland Seed Mix Option:

SHOWY NORTHEAST NATIVE WILDFLOWER MIX: ERNMX-153
ERNST CONSERVATION SEED
9006 MERCER PIKE
MEADVILLE, PA 16335-9299
TELEPHONE: 800-873-3321 / 814-336-2404
FAX: 814-336-5191
EMAIL: ernst@ernstseed.com
APPLICATION RATE: 15 lbs/acre (BULK) THOROUGHLY MIXED WITH ANNUAL RYEGRASS (LOLIUM MULTIFLORUM) AT 10 lbs/acre.
NOTE: STRAW MULCH LIGHTLY AND COVER WITH JUTE MAT, INSTALLED PER MANUFACTURER'S SPECS.

PERCENT BY NO. OF SEEDS (NOT WEIGHT)	SCIENTIFIC NAME	COMMON NAME
15%	ANDROPOGON SCOPARIUS	LITTLE BLUESTEM
10%	BOUTELOUA CURTIPENDULA	SIDE OATS GRAMA
10%	ELYMUS VILLOSUS	SILKY WILD RYE
10%	SORGHASTRUM NUTANS	INDIAN GRASS
7%	CHAMAECRISTA FASCICULATA	PARTRIDGE PEA
6%	HELIOPSIS HELIANTHOIDES	OX EYE SUNFLOWER
5%	ANDROPOGON GERARDII, NIAGARA	NIAGARA BIG BLUESTEM
5%	PENSTEMON DIGITALIS	TALL WHITE BEARD TONGUE
5%	RUDBECKIA HIRTA	BLACK EYED SUSAN
5%	SENNA HEBECARPA	WILD SENNA
4%	ASTER PRENANTHOIDES/NOVIBELGI MIX	ZIGZAG ASTER/NEW YORK ASTER MIX
3%	HYPERICUM PYRAMIDATUM	GREAT ST. JOHN'S WORT
2.5%	ZIZIA AUREA	GOLDEN ALEXANDERS
2%	ASCLEPIAS SYRIACA	COMMON MILKWEED
2%	ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED
2%	TRADESCANTIA OHIOENSIS	OHIO SPIDERWORT
1.5%	ASTER NOVAEANGLIAE	NEW ENGLAND ASTER
1.5%	LUPINIUS PERENNIS	WILD BLUE LUPINE
1.5%	MONARDA FISTULOSA	WILD BERGAMOT
1%	BAPTISIA AUSTRALIS	BLUE FALSE INDIGO
1%	LESPEDEZA CAPITATA	ROUNDHEAD LESPEDEZA

Wetland Seed Method :

1. WETLAND AREAS SHALL BE TOPSOILED WITH THE NATURAL TOPSOIL. AN ANNUAL RYE MIX SHALL BE PLANTED IN THE INTERIM UNTIL THE NATURAL PLANTS INUNDATE THE DISTURBED AREAS.
2. NO LIME OR FERTILIZER SHALL BE USED IN WETLAND AREAS.

Streambank & Wetland Seed Mix Option:

"RETENTION BASIN FLOOR SEEDING FOR WILDLIFE & PLANT DIVERSITY MIX – ERNMX-127" APPLIED AT A SEEDING RATE OF 15 BULK LBS PER ACRE OR 1/3-1/2 LBS PER 1,000 FT2, SEWN ALONG WITH 10 LBS/ACRE OF CEREAL OATS (AVENA SATIVA) OR GRAIN (CEREAL) RYE (SECALE CEREAL) AVAILABLE FROM:
ERNST CONSERVATION SEEDS
9006 MERCER PIKE
MEADVILLE, PA 16335
PHONE: (800) 873-3321 (814) 336-2404
FAX: (814) 336-5191
EMAIL: SALES@ERNSTSEED.COM <mailto:SALES@ERNSTSEED.COM>

General Construction Notes:

EROSION CONTROL BLANKET FOR STEEP SLOPES

STEEP SLOPES THAT ARE DISTRIBUTED FOR UTILITY LINE CONSTRUCTION SUCH AS ROADWAY/RAILROAD CUT OR EMBANKMENT SLOPES GREATER THAN OR EQUAL TO 3 HORIZONTAL TO 1 VERTICAL SHOULD BE PROTECTED AGAINST EROSION WITH EROSION CONTROL BLANKETS OR MATS SUITABLE FOR THE ESTABLISHMENT OF VEGETATION. THE EROSION CONTROL BLANKETS SHOULD BE INSTALLED IMMEDIATELY AFTER THE SOIL AMENDMENTS AND THE SEED ARE APPLIED. EROSION CONTROL BLANKETS SHOULD ALSO BE INSTALLED ON OTHER STEEP RIGHT-OF-WAY SLOPES WHERE EROSION WILL BE A PROBLEM UNTIL VEGETATION IS ESTABLISHED.

THE INSTALLATION PROCEDURE SHOULD COMPLY WITH THE MANUFACTURER'S RECOMMENDATIONS, INCLUDING SLOPE PREPARATION, ORIENTATION, TRENCHING, OVERLAP AND SPACING OF STAPLES.

STABILIZATION DURING NON-GROWING SEASONS

ALL UTILITY LINE CONSTRUCTION SHOULD BE PLANNED FOR COMPLETION WITHIN THE RECOMMENDED DATES FOR THE APPLICATION OF PERMANENT SEEDING AND ESTABLISHMENT OF PERMANENT VEGETATIVE COVER. HOWEVER, WHEN EMERGENCY UTILITY LINE CONSTRUCTION MUST BE DONE AND IS COMPLETED DURING A NON-GROWING SEASON (WINTERTIME, ETC.), INTERIM STABILIZATION BMP'S MUST BE IMPLEMENTED AND ADEQUATELY MAINTAINED. THE APPLICATION OF STRAW MULCH AT THE RATE OF TWO TONS PER ACRE IS RECOMMENDED. THE BMP'S SHOULD BE CHECKED WEEKLY (UNLESS SNOW COVERED) TO IDENTIFY AREAS THAT BECOME BARE.

THESE BARE AREAS SHOULD BE COVERED WITH A PROPERLY INSTALLED EROSION CONTROL BLANKET. ALL TEMPORARY EROSION AND SEDIMENT POLLUTION CONTROLS MUST BE MAINTAINED UNTIL PERENNIAL VEGETATION IS ESTABLISHED.

A PRE-WINTER STABILIZATION MEETING NEEDS TO BE HELD IF THE PROJECT IS TO REMAIN OPEN THROUGH WINTER. PLANNING SHOULD BE SUCH THAT THE SITE IS ABLE TO BE SEEDED DURING THE GROWING SEASON. IF SEEDING IS NOT POSSIBLE, THEN THE SITE WILL HAVE TO BE MULCHED AND POSSIBLY DORMANT SEEDED

PERMANENT STABILIZATION

PERMANENT CONTROL BMP'S SUCH AS SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS, ETC., SHOULD BE IN PLACE PRIOR TO APPLICATION OF SOIL AMENDMENTS, SEED AND MULCH. THE OBJECTIVE SHOULD BE TO OBTAIN PERENNIAL VEGETATIVE COVER THAT IS RESISTANT TO EROSION. THE ACCEPTABLE STANDARD FOR VEGETATIVE STABILIZATION IS A UNIFORM 85% COVER.

RESPONSIBILITY FOR E&S CONTROL FACILITIES:

DURING IMPROVEMENTS CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION, STABILIZATION & MAINTENANCE OF ALL SITE EROSION & SEDIMENTATION CONTROL FACILITIES. AFTER CONTRACTOR INVOLVEMENT CEASES, RESPONSIBILITY SHALL REVERT TO THE PROJECT OWNER.

SEDIMENT RE-DISTRIBUTION

WASHING OF FILTER STONE AND RE-DISTRIBUTION OF WET SEDIMENT FROM BASINS, TRAPS OR OTHER FACILITIES SHALL ONLY BE PERMITTED UPHILL OF AN EFFECTIVE SEDIMENT FILTER FACILITY. SILT LADEN RUNOFF SHALL NOT BE ALLOWED TO FLOW DIRECTLY TO UNPROTECTED CATCH BASINS, PONDS, ADJACENT PROPERTIES, ROADS OR WETLANDS.

OFF-SITE BORROW OR DISPOSAL AREAS

IT IS INTENDED THAT ANY BORROW OR DISPOSAL AREAS FOR THIS SITE SHALL BE ACQUIRED FROM OR DISPOSED OF ON THIS SITE. THE CONTRACTOR SHALL UTILIZE THIS APPROVED PLAN.

ASSURANCE OF DESIGN PERFORMANCE

THE SPECIFICATIONS AND REQUIREMENTS OF THE PROJECT PLANS, NARRATIVE AND SPECIFICATION ARE THE MINIMUM ACCEPTABLE CONSTRUCTION CRITERIA FOR THIS PROJECT.

DURING SITE DEVELOPMENT CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL FACILITIES MUST BE CHECKED BY THE CONTRACTOR AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY DAMAGE TO THE FACILITIES MUST BE REPAIRED IMMEDIATELY. ANY LOST SOIL MATERIAL SHALL BE RECOVERED, IF POSSIBLE. WASHED OUT LAWN OR SLOPE AREAS MUST HAVE TOPSOIL REPLACED AND THEN MUST BE RE-SEEDED AND MULCHED.

IF, FOR ANY REASON, THE DESIGNED FACILITIES OR MEASURES DO NOT PROVIDE THE NECESSARY PROTECTION, THE CONTRACTOR SHALL ADJUST THE EROSION CONTROL MEASURES AND SEDIMENT CONTROL MEASURES TO ACHIEVE A COMPLETE NON-ERODED STABILIZED SITE CONDITION.

REFUELING AREAS

ALL ABOVE-GROUND GAS OR LIQUID STORAGE TANKS SHALL BE ANCHORED TO PREVENT FLOTATION OR LATERAL MOVEMENT RESULTING FROM HYDRODYNAMIC AND HYDROSTATIC LOADS IF THEY ARE LOCATED WITHIN 1,000 FT OF A FLOODWAY, 100-YEAR FLOODPLAIN, OR A 500-YEAR FLOODPLAIN.

ALL FUEL TANKS AND DRUMS SHALL BE STORED IN A MARKED STORAGE AREA. A DIKE SHALL BE CONSTRCUTED AROUND THIS STORAGE AREA ACCORDING TO ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

WASTE DISPOSAL

AREAS DESIGNATED FOR STORAGE DISPOSAL OF SOLID, SANITARY AND TOXIC WASTES (DUMPSTER AREAS, CEMENT TRUCK WASHOUT, VEHICLE FUELING) SHALL BE CLEARLY IDENTIFIED.

COVERED CONTAINERS SHALL BE AVAILABLE FOR DISPOSAL OF DEBRIS TRASH AND HAZARDOUS WASTES.

DUST CONTROL

FUGITIVE DUST RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICAL BY IMPLEMENTING APPROPRIATE CONTROL MEASURES. THESE MEASURES INCLUDE THE APPLICATION OF MULCH, WATER, STONE, OR APPROVED CHEMICAL AGENTS ON ACCESS ROADS, EXPOSED SOILS, STOCKPILED SOILS, OR UNPAVED PUBLIC ROADS WHEN DRY AND WINDY CONDITIONS EXIST. A WATERING VEHICLE SHALL BE AVAILABLE FOR THE DURATION OF PROJECT ACTIVITIES, INCLUDING THROUGHOUT RESTORATION.

Standard Erosion And Sedimentation Control Plan Notes:

1. VEHICLES AND EQUIPMENT MAY NEITHER ENTER DIRECTLY TO NOR EXIT DIRECTLY FROM ANYWHERE EXCEPT AT THE PROPOSED ROCK CONSTRUCTION ENTRANCES.
2. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
3. THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED.
4. FAILURE TO CORRECTLY INSTALL SEDIMENT CONTROL FACILITIES OR FAILURE TO PREVENT SEDIMENT LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE OR FAILURE TO TAKE CORRECTIVE ACTIONS TO IMMEDIATELY RESOLVE FAILURES OF SEDIMENT CONTROL FACILITIES MAY RESULT IN ADMINISTRATIVE, CIVIL AND/OR CRIMINAL PENALTIES BEING INSTITUTED.
5. UNTIL THE SITE ACHIEVES FINAL STABILIZATION, THE OPERATOR SHALL ASSURE THAT THE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED, OPERATED, AND MAINTAINED PROPERLY AND COMPLETELY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL BEST MANAGEMENT PRACTICE FACILITIES. THE OPERATOR WILL MAINTAIN AND MAKE AVAILABLE TO THE DEPARTMENT AND APPLICABLE CONSERVATION DISTRICT, WRITTEN INSPECTION LOGS OF ALL THOSE INSPECTIONS. ALL MAINTENANCE WORK, INCLUDING CLEANING, REPAIR, REPLACEMENT, REGRADING, AND RESTABILIZATION SHALL BE PERFORMED IMMEDIATELY.
6. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
7. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG DISCHARGING OVER NON-DISTURBED AREAS.
8. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.
9. ONLY LIMITED DISTURBANCE WILL BE PERMITTED TO PROVIDE ACCESS TO SEDIMENT BASIN FOR GRADING AND ACQUIRING BORROW TO CONSTRUCT THOSE BMPS.
10. EROSION AND SEDIMENT BMPS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THE TRIBUTARY AREAS OF THOSE BMPS.
11. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS CONTROLS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMPS MUST BE STABILIZED IMMEDIATELY.
12. AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS, THE EROSION AND SEDIMENT CONTROL PLAN PREPARER, AND THE CONSERVATION DISTRICT TO AN ON-SITE MEETING. ALSO, AT LEAST 3 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE ONE CALL SYSTEM INCORPORATED AT 1-800-362-2764 FOR BURIED UTILITIES LOCATIONS.
13. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE CONSTRUCTION SEQUENCE. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.
14. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE OPERATOR SHALL STABILIZE ANY AREAS DISTURBED BY THE ACTIVITIES. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.
15. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 85% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.

OTHER BMPS (SPECIFY)

1. SEDIMENT MUST BE REMOVED FROM STORM WATER INLET PROTECTION WHEN DEVICE IS HALF FULL..
2. AT STREAM CROSSINGS, 50' BUFFER AREAS SHOULD BE MAINTAINED. ON BUFFERS, CLEARING, SOD DISTURBANCES, EXCAVATION, AND EQUIPMENT TRAFFIC SHOULD BE MINIMIZED. ACTIVITIES SUCH AS STACKING LOGS, BURNING CLEARED BRUSH, DISCHARGING RAINWATER FROM TRENCHES, WELDING PIPE SECTIONS, REFUELING AND MAINTAINING EQUIPMENT SHOULD BE ACCOMPLISHED OUTSIDE OF BUFFERS.
3. ALL WETLANDS MUST BE DELINEATED AND PROTECTED WITH ORANGE SAFETY FENCE PRIOR TO ANY EARTH MOVING ACTIVITY.

TEMPORARY STABILIZATION & PERMANENT STABILIZATION

1. HAY OR STRAW MULCH MUST BE APPLIED AT 2.0 TONS PER ACRE.
2. MULCH WITH MULCH CONTROL NETTING OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3:1 AND STEEPER."
3. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.
4. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS MUST BE MAINTAINED PROPERLY. MAINTENANCES MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT CONTROL BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGARDING, RESEEDING, REMULCHING, AND RENETTING, MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENT CONTROL BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
5. SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED, OR PLACED IN TOPSOIL STOCKPILES.
6. THE OPERATOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH OHIO EPA. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THE SITE."

STREAMBANK STABILIZATION SPECIFICATIONS

1. FILTER BAGS USED TO REMOVE SEDIMENTS FROM SEDIMENT-LADEN PUMPED WATER FROM THE WORK CELL SHALL BE "DIRT BAG" BRAND NAME OR APPROVED EQUIVALENT. THE FILTER BAG SHALL BE PLACED IN AN UPLAND AREA, DOWNSTREAM AND ADJACENT TO THE UNDISTURBED AREAS OF THE SITE WHEN IN USE.
2. JUTE MATTING OR MATTING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS ON ALL DISTURBED AND SEEDED/MULCHED SLOPES IN EXCESS OF 4:1 SLOPE, OR AS SPECIFIED IN STREAM CROSS-SECTIONS. .
3. LIVE STAKES SHALL BE INSTALLED RANDOMLY WITH 3-5 FT SPACING THROUGHOUT THE ENTIRE UPPER BANK (BARE SOIL AREAS) ABOVE RIP-RAP, OR AS SHOWN IN THE STREAM CROSS-SECTIONS. SPECIES SHALL INCLUDE STREAMCO WILLOW (SALIX PURPUREA), SILKY WILLOW (SALIX SERICEA), SANDBAR WILLOW (SALIX EXIGUA SSP INTERIOR), SILKY DOGWOOD (CORNUS AMOMUM), AND/OR ELDERBERRY (SAMBUCUS CANADENSIS).

Pipe Line Construction Plan Notes:

BEST MANAGEMENT PRACTICES

LIMITING EXPOSED AREAS

EARTH DISTURBANCE ACTIVITIES SHALL BE PLANNED AND CONDUCTED TO MINIMIZE THE EXTENT AND DURATION OF THE DISTURBANCE.

THE LENGTH OF TIME FOR CONSTRUCTING ACCESS ROADS, UTILITY LINE TRENCHING, TRENCH BACK-FILLING, FINAL GRADING AND CLEANUP SHOULD BE KEPT TO A MINIMUM. GOOD PLANNING AND SCHEDULING OF THE VARIOUS UTILITY CONSTRUCTION ITEMS, TOGETHER WITH TIMELY AVAILABILITY OF MATERIALS, ADEQUATE EQUIPMENT, AND ADEQUATE MANPOWER, WILL HELP REDUCE THE TIME OF EXPOSURE OF DISTURBED LAND.

PIPELINES WITH JOINTS THAT ALLOW A MANUFACTURED LENGTH OF PIPE TO BE PLACED IN THE TRENCH WITH THE PIPE JOIN ASSEMBLED/MADE IN THE TRENCH REQUIRE AN OPEN PIPELINE TRENCH THAT IS ONLY SLIGHTLY LONGER THAN THE LENGTH OF PIPE BEING INSTALLED.

LARGE DIAMETER STEEL PIPELINES WITH WELDED JOINTS WHERE THE PIPE JOINTS ARE WELDED WHILE THE PIPE IS OUT OF THE TRENCH USUALLY REQUIRE A FAIRLY LONG LENGTH OF OPEN PIPELINE TRENCH. THE TOTAL TIME FROM TRENCH EXCAVATION TO PLACEMENT OF BACKFILL FOR THIS TYPE OF PIPELINE CONSTRUCTION SHOULD GENERALLY BE LIMITED TO NO MORE THAN THIRTY (30) CALENDAR DAYS AT ANY GIVEN POINT ALONG THE PIPELINE. THIS MEANS THAT, FOR EXAMPLE, THAT FROM THE TIME THAT TRENCH EXCAVATION ACTIVITIES COMMENCE AT STATION 1+00 UNTIL THE TRENCH IS BACKFILLED AT STATION 1+00, NO MORE THAN THIRTY (30) CALENDAR DAYS SHOULD EXPIRE. AT ANY GIVEN PLACE ALONG THE PIPELINE TRENCH WHERE THE TIME TO EXCAVATE AND BACKFILL THE TRENCH WILL EXCEED THIRTY (30) CALENDAR DAYS, OR THE TIME SPECIFIED IN THE PERMIT, THE CONTRACTOR SHALL CONTACT THE COMPANY TO DETERMINE IF THE ADDITIONAL TIME CAN BE APPROVED UNDER A MINOR MODIFICATION. WHERE EARTH DISTURBANCE ACTIVITY IS NOT COMPLETED IN AN AREA WHERE THE TRENCH HAS BEEN BACKFILLED, BMPS SHOULD BE MAINTAINED AND TEMPORARY STABILIZATION PROVIDED AS REQUIRED.. WHERE DISTURBANCE ACTIVITIES HAVE BEEN COMPLETED, PERMANENT STABILIZATION SHALL BE PROVIDED AS REQUIRED.

SWALE/DITCH/CHANNEL/WATERWAYS CROSSINGS

ADEQUATELY SIZED PIPE CULVERTS SHOULD BE INSTALLED FOR ACCESS ROADS AT ALL LOCATIONS WHERE ACCESS ROADS CROSS A SWALE/DITCH/CHANNEL OR WATERWAY WHETHER OR NOT FLOWING WATER IS ENCOUNTERED. WHERE THE PIPE LINE TRENCH CROSSES A SWALE/DITCH/CHANNEL OR WATERWAY WITH FLOWING WATER, THEN A TEMPORARY PIPE CULVERT PROPERLY "SAND BAGGED" SHOULD BE INSTALLED PRIOR TO THE TRENCHING OPERATION AND MAINTAINED UNTIL THE PIPE LINE IS INSTALLED, THE TRENCH BACKFILLED, AND THE SWALE/DITCH/CHANNEL OR WATERWAY IS RESTORED AND STABILIZED. WHERE A UTILITY LINE CROSSES A "DRY" SWALE/DITCH/CHANNEL OR WATERWAY AND THE EXCAVATED TRENCH MUST REMAIN OPEN FOR MORE THAN ONE WORKING DAY, THEN A TEMPORARY PIPE CULVERT PROPERLY "SAND BAGGED" SHOULD BE INSTALLED AND MAINTAINED UNTIL THE SWALE/DITCH/CHANNEL OR WATERWAY IS RESTORED AND STABILIZED. FLOWING WATER NEEDS TO BE PROPERLY HANDLED WHERE UTILITY LINES CROSS STREAMS OR WETLANDS.

CHANNEL AND STREAMBANK STABILIZATION

ADEQUATE STREAM BANK STABILIZATION MUST BE PROVIDED AT ALL LOCATIONS WHERE STREAM BANKS ARE DISTURBED. THE STREAM BANK STABILIZATION SHOULD BE DESIGNED TO WITHSTAND THE ANTICIPATED WATER FLOW VELOCITIES OR THE MAXIMUM ANTICIPATED SHEAR STRESS. ALL EXISTING SWALES/DITCHES/CHANNELS OR WATERWAYS THAT ARE DISTURBED NEED TO BE STABILIZED TO WITHSTAND ANTICIPATED WATER FLOW VELOCITIES OR MAXIMUM ANTICIPATED SHEAR STRESS WHEN THEY ARE REOPENED. PROPOSED DITCHES AND CHANNELS SHOULD BE PROVIDED WITH ADEQUATE STABILIZATION TO WITHSTAND DESIGN FLOW VELOCITIES OR MAXIMUM ANTICIPATED SHEAR STRESS WHEN THEY ARE INSTALLED.

PERMANENT STABILIZATION

THE INSTALLATION OF PAVEMENT, ROCK RIP RAP OR GABIONS ARE SOME EXAMPLES OF STABILIZATION. THE STANDARD FOR VEGETATIVE COVER AS STABILIZATION IS PERENNIAL VEGETATION THAT IS ESTABLISHED WITH A UNIFORM COVERAGE OR DENSITY OF 85% ACROSS THE DISTURBED AREA. THE APPLICATION OF LIME, FERTILIZER, SEED, AND MULCH IS USUALLY DONE TO ACHIEVE PERMANENT STABILIZATION. THE MULCH IS CONSIDERED TO BE AN INTERIM STABILIZATION MEASURE TO ASSIST IN THE ESTABLISHMENT OF THE PERMANENT VEGETATIVE COVER.

INTERIM STABILIZATION

TEMPORARY SEEDING WITH MULCH COVER FOR INTERIM STABILIZATION IS A TYPE OF BMP THAT CAN USUALLY BE PROVIDED WHERE THE EARTH DISTURBANCE ACTIVITY TEMPORARILY CEASES.

THE INSTALLATION OF AN EROSION CONTROL BLANKET OR APPLICATION OF MULCH UPON SEEDED AREAS ARE BOTH CONSIDERED TO BE INTERIM STABILIZATION BMP'S TO PROTECT THE SEEDBED UNTIL VEGETATION IS ESTABLISHED.

SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS

TEMPORARY SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS SHOULD BE INSTALLED ACROSS DISTURBED AREAS (ACCESS ROAD, ETC.) OF THE UTILITY LINE RIGHT-OF-WAY ON ALL SLOPES GREATER THAN 5% AND DISCHARGE INTO WELL-VEGETATED AREAS. PERMANENT SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS NOT ONLY COLLECT RUNOFF FROM THE DISTURBED AREAS AND DISCHARGE IT TO WELL VEGETATED AREAS UNTIL PERMANENT VEGETATION IS ESTABLISHED, BUT ALSO PROVIDE LONG-TERM EROSION CONTROL ON THE COMPLETED RIGHT-OF-WAY.

SOLIDS SEPARATION

STRAW BALE BARRIERS, FILTER FABRIC FENCE, REINFORCED FILTER FABRIC FENCE, ROCK FILTER BERMS, ROCK FILTERS AND STORM INLET PROTECTION ARE ALL EXAMPLES OF SOLIDS SEPARATION BMP'S. THEY SHOULD REMOVE SEDIMENT BY EITHER TEMPORARILY IMPOUNDING THE SEDIMENT LADEN RUNOFF OR BY SUFFICIENTLY SLOWING THE VELOCITY OF THE RUNOFF TO INDUCE SETTING OF THE SEDIMENT PARTICLES.

THE "PUMPED WATER FILTER BAG" IS USED AS A SOLIDS SEPARATION DEVICE TO REMOVE SEDIMENT FROM MUDDY WATER PUMPED FROM TRENCHES OR EXCAVATIONS.

SILT SOCK INSTALLATION

IT IS EXPECTED THAT THE EXISTING SURFACE BE PREPARED PRIOR TO INSTALLATION OF FILTER SOCKS TO CREATE A DIRECT CONTACT BETWEEN THE BOTTOM OF THE SILT SOCKS AND THE EARTH ON WHICH THEY ARE PLACED. WHEN INSPECTORS (DEP AND INTERNAL) INDICATE THAT THIS CONTACT IS NOT BEING ACHIEVED, THE COMPANY WILL REQUIRE THE PLACEMENT OF MULCH UPGRADIENT OF THE FILTER SOCKS. THEREFORE, THE BEST WAY TO AVOID THE USE OF THE MULCH UPGRADIENT OF THE FILTER SOCKS IS TO INSTALL THE FILTER SOCKS CORRECTLY AND IMPLEMENT GOOD HOUSEKEEPING PRACTICES ALONG PIPELINE RIGHT-OF-WAYS AND OTHER DISTURBED AREAS.

Soils Limitations And Resolutions Chart

SOIL LIMITATIONS	RESOLUTIONS
CUTBANKS CAVE	LAYBACK SLOPES
CORROSIVE TO CONCRETE/STEEL	CATHODIC PROTECTION AND/OR CORROSION RESISTANT CONCRETE
DROUGHTY	N/A
EASILY ERODIBLE	MAINTAIN EROSION BMPS
FLOODING	RAISE ELEVATION OUTSIDE FLOOD LEVEL OR POSTPONE CONSTRUCTION
DEPTH TO SATURATED ZONE/SEASONAL HIGH WATER TABLE	KNOW DEPTH TO SEASONAL HIGH WATER TABLE AND AVOID IMPACTS TO SITE DEVELOPMENT PLANS
HYDRIC/HYDRIC INCLUSIONS	AVOID
LOW STRENGTH/LANDSLIDE PRONE	LAYBACK SLOPES-DESIGN FOR CONDITION
SLOW PERCOLATION	DRAINAGE DITCH
PIPING	TEMPORARILY LOWER GROUND WATER TABLE OR PROVIDE FILTERS
POOR SOURCE OF TOPSOIL	AVOID REUSE AS TOPSOIL FOR SUPPORT OF VEGETATION
FROST ACTION	LOWER FOOTINGS BELOW FROST DEPTHS, PROVIDE POSITIVE SUBGRADE
SHRINK-SWELL	AVOID USE OF HIGHLY PLASTIC CLAYS IN BUILDING AREAS
POTENTIAL SINKHOLE	PLUG OR MITIGATE KNOWN SINKHOLES, PROVIDE POSITIVE SURFACE
PONDING	PROVIDE POSITIVE DRAINAGE
WETNESS	USE SUNNY WEATHER COMBINED WITH MECHANICAL ACTIONS TO LOWER GROUNDWATER TABLE OR AVOID USING THESE SOILS

GENERAL NOTES:
1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 2

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

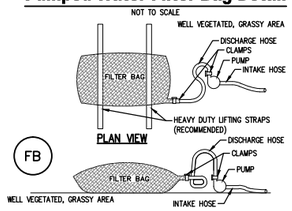
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007
SHEET NO. 84 OF 88

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Pumped Water Filter Bag Detail

NOT TO SCALE



NOTES:

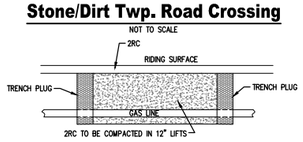
1. LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	85%
AOS % RETAINED	ASTM D-4751	80 SIEVE

2. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.
3. BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%, FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.
4. NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.
6. THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.
7. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

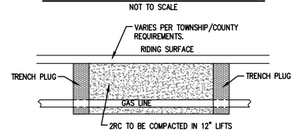
Stone/Dirt Twp. Road Crossing

NOT TO SCALE



Paved Twp. Road Crossing

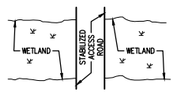
NOT TO SCALE



Access Road Wetland And Crossing

NOT TO SCALE

REMOVAL OF TREES, TREE STUMPS ,BRUSH AND VEGETATION SHOULD BE KEPT TO A MINIMUM IN THE WETLAND. GRADING SHOULD BE LIMITED TO THE AREA DIRECTLY OVER THE TRENCH TO THE EXTENT POSSIBLE. WHERE CLEARING OF TREES AND VEGETATION IS REQUIRED FOR THE EQUIPMENT ACCESS AREAS, THE TREE AND VEGETATION ROOT MASS IS TO REMAIN UNDISTURBED. VEGETATION MAY BE CUT AT/NEAR THE GROUND LINE AND SHOULD BE REMOVED FROM THE WETLAND. TREES SHOULD BE CUT ABOVE THE GROUND LINE AND SHOULD BE REMOVED FROM THE WETLAND. TREES SHOULD BE CUT ABOVE THE GROUND LINE WITH THE STUMPS LEFT IN PLACE, EXCEPT WHERE REMOVAL IS REQUIRED FOR SAFETY REASONS.

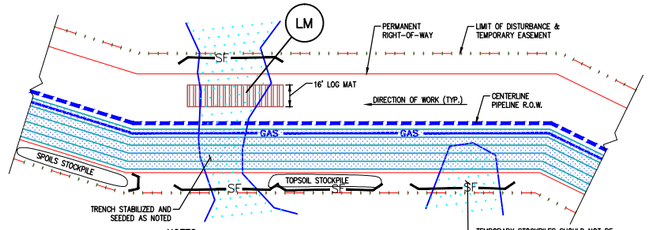


PLAN

THE MOVEMENT OF VEHICLES AND/OR EQUIPMENT ACCESS WETLANDS, SHOULD BE KEPT TO AN ABSOLUTE MINIMUM. THE ACCESS ROAD WIDTH SHOULD BE KEPT TO A MINIMUM AND BE STABILIZED AS SPECIFIED IN THE EROSION AND SEDIMENTATION CONTROL PLAN. THE ACCESS ROAD MAY BE STABILIZED BY PLACING GRAVEL OR CRUSHED AGGREGATE UPON GEOTEXTILE FABRIC, OR BY PLACING TIMBER RIP RAP OR PREFABRICATED SWAMP MATS. THE TIMBER RIP RAP OR PREFABRICATED SWAMP MATS SHOULD NOT BE MORE THAN 2 LAYERS THICK. A PROPERLY DESIGNED PLANK ROAD MAY ALSO BE UTILIZED. DIRT, ROCK, STUMPS OR BRUSH SHALL NOT BE USED TO STABILIZE THE WETLAND. ALL MATERIAL USED TO STABILIZE THE ACCESS ROAD MUST BE REMOVED FROM THE WETLAND WHEN UTILITY CONSTRUCTION IS COMPLETED.

Typical Trench E&S Controls For Wetland Areas (WC)

NOT TO SCALE

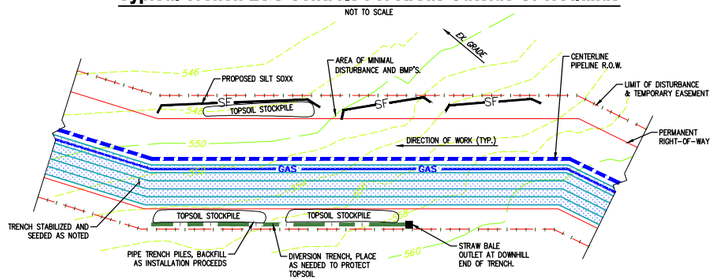


NOTES:

1. NO LIME OR FERTILIZER SHALL BE USED IN WETLAND AREAS.
2. CONTRACTOR HAS THE OPTION TO USE LOG MATTING, STEEL PLATING OR GEOTEXTILE WITH CLEAN FILL OVER WETLANDS.
3. ONCE TEMPORARY CROSSING IS REMOVED, THIS AREA MUST BE PERMANENTLY STABALIZED WITHIN 2 DAYS.

Typical Trench E&S Controls For Areas Outside Of Wetlands

NOT TO SCALE

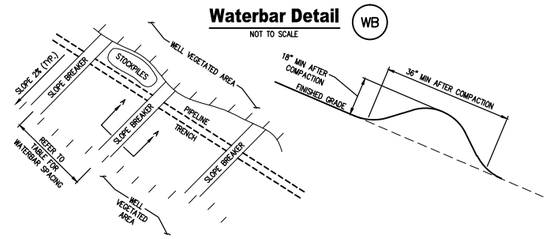


NOTES:

1. SILT BARRIER TO BE INSTALLED DOWNGRADIENT OF ALL EXPOSED AREAS AS WORK PROGRESSES, AND CONTINUALLY KEPT DOWNGRADIENT OF ALL EXPOSED TRENCHES DURING CONSTRUCTION OPERATIONS. UPON BACKFILLING OF TRENCH, THE SILT FENCE MAY BE MOVED TO THE NEXT APPROPRIATE LOCATION.
2. ANY STOCKPILES FOR FUTURE USE SHALL BE IMMEDIATELY STABILIZED AND SHALL HAVE SILT FENCE PLACED DOWNSLOPE.
3. WHEN CROSSING PAVEMENT, 8" SILT SOCK SHALL BE USED.
4. IF TOPSOIL PILES ARE TO BE LEFT FOR ANY AMOUNT OF TIME, DIVERSION TRENCHES SHALL BE CONSTRUCTED UPHILL. STRAW BALE OUTLET PROTECTION SHALL BE PLACED AT THE ENDS OF THESE TRENCHES.
5. BREAKS IN SOIL STOCKPILES ARE TO BE INSTALLED AS NEEDED TO PREVENT PONDING/RUNOFF BEHIND STOCKPILE.
6. ONCE TEMPORARY CROSSING IS REMOVED, THIS AREA MUST BE PERMANENTLY STABALIZED WITHIN 2 DAYS.

Waterbar Detail (WB)

NOT TO SCALE



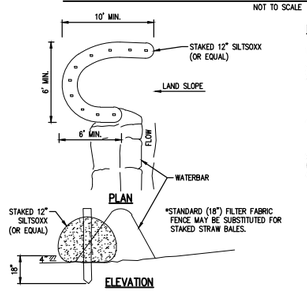
Required Spacing For Temporary Waterbars

PERCENT SLOPE	SPACING (FT.)
< 5	250
5 – 15	150
15 – 30	100
> 30	50

* PERMANENT WATERBARS ARE REQUIRED AT ALL STREAM, RIVER, AND OTHER WATER BODY CROSSINGS AS WELL AS UPSLOPE FROM ROADWAY AND RAILROAD CUT SLOPES. OTHERWISE NOT REQUIRED.

Sediment Filter-Sock Protection At Waterbar Outlet (SSO)

NOT TO SCALE

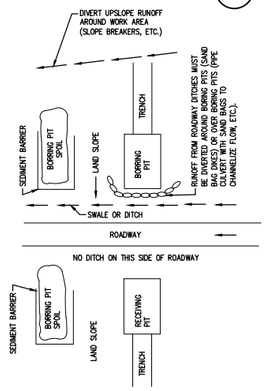


NOTES:

1. BACKFILL MATERIAL SHOULD BE MOUNDED OVER THE EXCAVATED AREA TO ALLOW FOR SETTLING, AND SEEDED AND MULCHED.
2. THE EXCAVATED AREA MUST BE STABILIZED WITHIN 72 HOURS.
3. STAGING AREAS, ASSEMBLY AREAS, TEMPORARY EQUIPMENT AND NON-HAZARDOUS MATERIAL STORAGE AREAS SHOULD BE LOCATED OUTSIDE THE 100 YEAR FLOODWAY. HAZARDOUS OR POLLUTIVE MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 100 FEET BACK FROM TOP OF STREAM BANK.
4. WHETHER OR NOT BLASTING WILL BE REQUIRED SHOULD BE DETERMINED PRIOR TO COMMENCING THE TRENCH EXCAVATION FOR A STREAM CROSSING, SINCE THIS MAY AFFECT THE STAGING FOR THE CROSSING.
5. AT DRAINAGE SWALES CROSSING THE DISTURBED AREAS ARE TO BE STABILIZED WITH RIP-RAP OR JUTE MATTING WITH VEGETATION, AS APPROPRIATE.

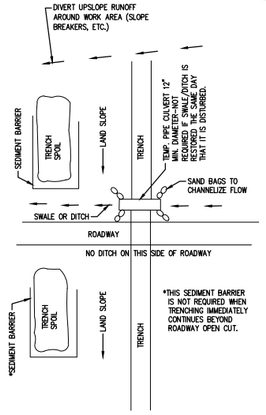
Utility Line Highway/Roadway Crossing Boring Method (HWB)

NOT TO SCALE



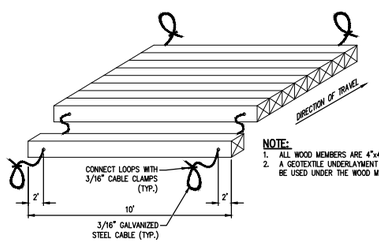
Utility Line Highway/Roadway Crossing Open Cut Method (HWC)

NOT TO SCALE



Typical Log Mat Detail (LM)

NOT TO SCALE

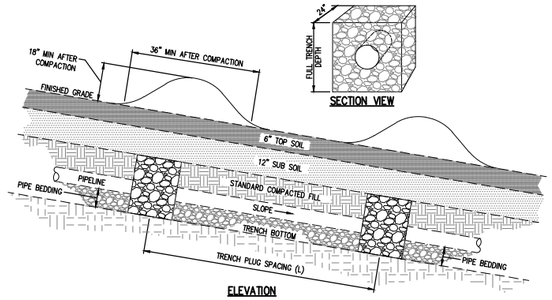


NOTE:

1. ALL WOOD MEMBERS ARE 4"x4".
2. A GEOTEXTILE UNDERLAYMENT SHALL BE USED UNDER THE WOOD MAT.

Trench Breakers/Trench Plugs (TB/P)

NOT TO SCALE



Required Spacing And Materials For Trench Breakers/Trench Plugs

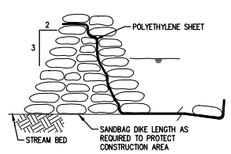
TRENCH SLOPE	SPACING (L) IN FEET	PLUG MATERIAL
0-5%	1,000	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
5-15%	500	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
15-25%	300	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
25-35%	200	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
35-100%	100	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
OVER 100%	50	CLAY, BENTONITE, OR CONCRETE FILLED SACKS

NOTES:

1. IMPERVIOUS TRENCH PLUGS ARE REQUIRED FOR ALL STREAM, RIVER, WETLAND, OR OTHER BODY CROSSING REGARDLESS OF TRENCH SLOPE
2. TO ENSURE PROPER TOPSOIL CONSERVATION, TOPSOIL SHOULD NOT BE USED IN EARTH FILLED SACKS.
3. PLACE AT ALL VERTICAL ANGLE POINTS (TOP AND BOTTOM OF SLOPE).
4. TRENCH BREAKRES/TRENCH PLUGS SHOULD BE INSTALLED IN ALL UTILITY LINE TRENCHERS PER TABLE ABOVE. TABLE ABOVE INDICATES THE REQUIRED SPACING AND MATERIALS FOR THE TRENCH BREAKERS/TRENCH PLUGS.

Sandbag Dike (SC)

NOT TO SCALE



GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMP'S SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMP'S MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 3

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 85 OF 88
SCALE: AS NOTED	

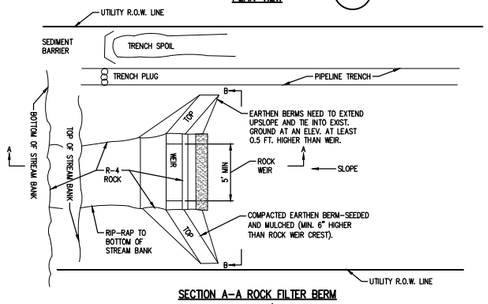
Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Rock Filter Berm

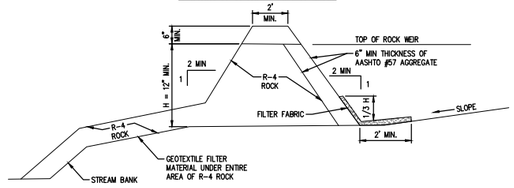
NOT TO SCALE

RFB

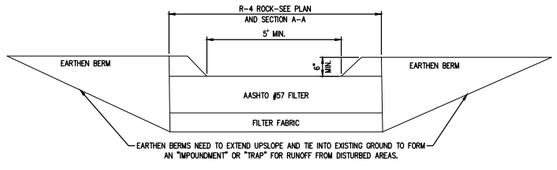
PLAN VIEW



SECTION A–A ROCK FILTER BERM



SECTION B–B ROCK FILTER BERM

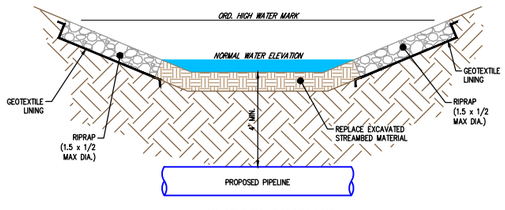


NOTES:

1. THE "ROCK FILTER BERM" SHOULD ONLY BE USED AT THE BOTTOM OF VERY STEEP UTILITY LINE SLOPES THAT DISCHARGE DIRECTLY TO A STREAM OR RIVER AND WHERE THERE IS NOT SUFFICIENT AREA TO INSTALL CONVENTIONAL SEDIMENT POLLUTION CONTROLS (SEDIMENT TRAPS, ETC.).
2. GEOTEXTILE FILTER MATERIAL SHOULD BE PLACED UNDER THE ENTIRE AREA OF THE R-4 ROCK. R-4 ROCK SHOULD BE PLACED IN THE FLOW PATH FROM THE ROCK FILTER TO THE BOTTOM OF THE STREAM BANK. IF THE STREAM BANK IS TOO STEEP TO PROPERLY PLACE THE R-4 ROCK, THEN THE GEOTEXTILE MATERIAL ALONE SHOULD EXTEND DOWN OVER THE STREAM BANK AND BE SECURED TO PREVENT ITS MOVEMENT OR DISPLACEMENT.
3. THE EARTHEN BERMS NEED TO EXTEND UPSLOPE AND TIE INTO EXISTING GROUND AT AN ELEVATION AT LEAST 0.5 FEET HIGHER THAN THE ROCK WEIR CREST. THE OBJECTIVE IS TO COLLECT RUNOFF FROM DISTURBED AREAS AND MAKE THAT RUNOFF FLOW THROUGH THE FILTER MEDIA.
4. IF AN ACCESS ROAD PARALLEL TO THE TRENCH IS NEEDED, THE AFFECTED EARTHEN BERM SHOULD BE DESIGNED AND INSTALLED SO THAT TRAFFIC CAN SAFELY PASS OVER IT. ALSO, THE BERM SHOULD BE "REINFORCED" TO PREVENT "BREAKDOWN" FROM HEAVY VEHICLES.
5. ALL OF THE AREAS THAT ARE DISTURBED TO INSTALL THE ROCK FILTER BERM SHOULD BE SEEDED AND MULCHED.
6. SEDIMENT SHOULD BE REMOVED FROM THE FILTER WHEN IT REACHES HALF OF THE HEIGHT OF THE FILTER FABRIC ON THE UPSLOPE SIDE OF THE FILTER. THE REMOVED SEDIMENT SHOULD BE DISPOSED OF AT A LOCATION THAT PREVENTS SEDIMENT FROM DISCHARGING TO A STREAM.

Utility Trench Crossing

NOT TO SCALE



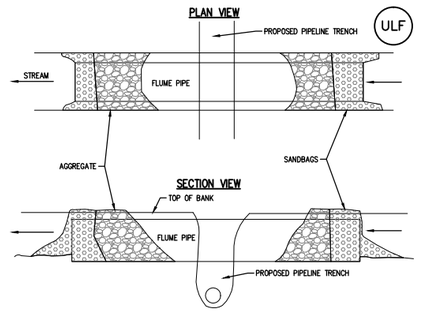
* ONLY REQUIRED IF EROSIVE CONDITIONS PREVAIL.

Utility Line Stream Crossing With Pipe Flume

NOT TO SCALE

ULF

PLAN VIEW



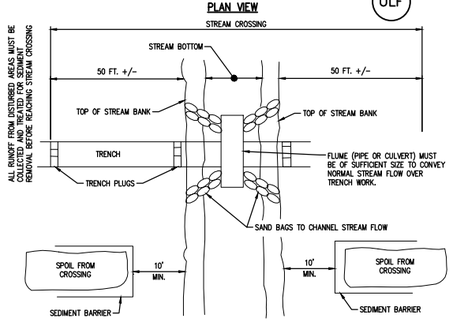
SECTION VIEW

Utility Line Stream Crossing With Pipe Flume

NOT TO SCALE

ULF

PLAN VIEW



NOTES:

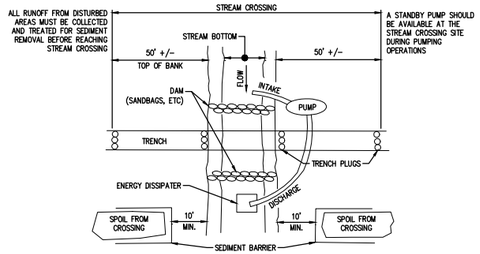
1. TRENCH EXCAVATION FOR UTILITY LINE CROSSINGS SHOULD BE UNDERTAKEN FROM THE TOP OF BANKS WHENEVER POSSIBLE. THE CROSSING SHOULD BE PERPENDICULAR TO THE LENGTH OF THE STREAM TO MINIMIZE THE DISTURBED AREA IN THE STREAM.
2. ALL EXCAVATED CHANNEL MATERIALS THAT WILL BE SUBSEQUENTLY USED AS BACKFILL WILL BE PLACED IN A TEMPORARY STOCKPILE LOCATED OUTSIDE OF THE CHANNEL. THESE STORAGE AREAS MUST BE ENCIRCLED WITH A BARRIER OR SEDIMENT REMOVAL STRUCTURE TO PREVENT SEDIMENT LADEN RUNOFF FROM RE-ENTERING THE CHANNEL. ALL EXCAVATED MATERIALS THAT WILL NOT BE USED ON THE SITE CANNOT BE STORED IN THE FLOODPLAIN AND MUST BE HAULED TO A DISPOSAL SITE LOCATED OUTSIDE OF THE FLOODPLAIN.
3. DISTURBED AREAS SHOULD BE STABILIZED WHEN THE CROSSING IS COMPLETED.
4. ALL WORK, INCLUDING STABILIZATION, SHOULD BE PLANNED FOR PERIODS OF LOW STREAM FLOWS. THE SCHEDULE SHOULD ALLOW SUFFICIENT TIME TO ALLOW FOR THE ESTABLISHMENT OF AN EROSION RESISTANT VEGETATIVE COVER ON DISTURBED AREAS BEFORE THE START OF THE DORMANT SEASON UNLESS OTHER MEANS TO STABILIZE AGAINST EROSION ARE USED.
5. TEMPORARY ACCESS ROADS, CROSSINGS WHERE REPEATED TRAFFIC IS PLANNED, AND ANY OTHER FORM OF TEMPORARY FILL OR BALLAST LOCATED WITHIN THE CHANNEL, WILL BE CONSTRUCTED WITH CLEAN ROCK FILL.

Utility Line Stream Crossing With Dam And Pumping

NOT TO SCALE

ULP

PLAN VIEW

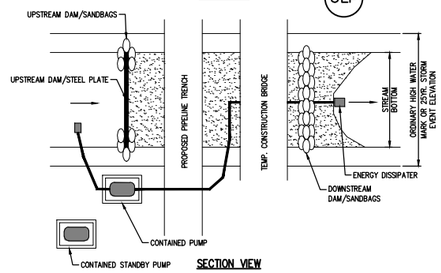


Utility Line Stream Crossing With Steel Plate

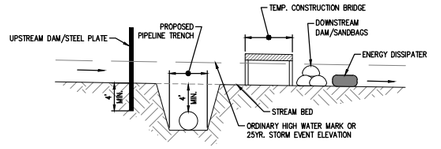
NOT TO SCALE

ULP

PLAN VIEW



SECTION VIEW



Utility Line Crossing General Notes:

THESE COMMENTS APPLY TO BOTH "UTILITY LINE STREAM CROSSING WITH PIPE FLUME" AND "UTILITY LINE STREAM CROSSING WITH DAM AND PUMPING".

UTILITY LINE STREAM CROSSING ARE CONSIDERED TO BEGIN (OR END) 50 FEET BACK FROM THE TOP OF THE STREAM BANK ON BOTH SIDES OF THE STREAM. PIPELINES WITH THE PIPE JOINTS ASSEMBLED/MADE IN THE TRENCH SHOULD MAINTAIN A 50 FOOT BUFFER ON BOTH SIDES OF THE STREAM UNTIL THE STREAM CROSSING COMMENCES. LARGE DIAMETER STEEL PIPELINES WITH WELDED JOINTS WHERE THE PIPE JOINTS ARE WELDED WHILE THE PIPELINE IS OUT OF THE TRENCH SHOULD MAINTAIN A 25 FOOT BUFFER ON BOTH SIDES OF THE STREAM UNTIL THE STREAM CROSSING COMMENCES.

A UTILITY LINE STREAM CROSSING OF A STREAM 10 FEET IN (BOTTOM) WIDTH OR LESS SHOULD BE COMPLETED WITHIN 24 HOURS (FROM START TO FINISH) INCLUDING THE TRENCH BACKFILLING.

FACILITIES FOR REMOVING SEDIMENT FROM PUMPED WATER SHOULD BE AVAILABLE AT THE UTILITY LINE STREAM CROSSING SITE BEFORE TRENCHING COMMENCES AND MAINTAINED UNTIL TRENCH BACKFILLING IS COMPLETED.

ASSEMBLY AREAS, TEMPORARY EQUIPMENT AND NON-HAZARDOUS MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 50 FEET BACK FROM THE TOP OF THE STREAM BANK.

HAZARDOUS OR POLLUTIVE MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 100 FEET BACK FROM THE TOP OF THE STREAM BANK.

ALL EXCESS EXCAVATED MATERIAL SHALL BE IMMEDIATELY REMOVED FROM STREAM CROSSING.

UTILITY LINE CROSSING OF A STREAM CHANNEL WITH A BOTTOM WIDTH OF 10 FEET OR LESS SHALL BE COMPLETED WITH 24 HOURS FROM START TO FINISH. CROSSINGS WITH A BOTTOM WIDTH OF 10 FEET TO 100 FEET SHALL BE COMPLETED WITHIN 48 HOURS FROM START TO FINISH. COMPLETION INCLUDES THE STABILIZATION OF STREAM BANKS AND THE STABILIZATION OF THE AREA 50 FEET BACK FROM THE TOP OF EACH STREAM BANK.

UTILITY LINE WETLAND CROSSING

STAGING AREAS OR WORK AREAS REQUIRED TO MAKE THE WETLAND CROSSING SHOULD BE LOCATED IN AN UPLAND AT LEAST 50 FEET FROM THE WETLAND EDGE AND INDICATED ON THE SITE DRAWINGS. STREAM/RIVER CROSSINGS MUST BE CAREFULLY PLANNED AND CONSTRUCTED WHERE WETLANDS ARE ADJACENT TO THE STREAM/RIVER CROSSING. WHERE TRENCH SPOIL FROM THE STREAM/RIVER CROSSING MUST BE TEMPORARILY PLACED/STORED ON AN ADJACENT WETLAND, SUFFICIENT RIGHT-OF-WAY SHOULD BE FURNISHED FOR THE TRENCH SPOIL AND THE STREAM/RIVER CROSSING WORK AND PRECAUTIONS SHOULD BE TAKEN TO PREVENT THE TRENCH SPOIL FROM INTERMINGLING WITH THE WETLANDS SOILS. IT MAY BE NECESSARY TO PLACE A LAYER OF GEOTEXTILE MATERIAL OR OTHER COVER ON THE WETLAND TO TEMPORARILY STORE THE STREAM CROSSING TRENCH SPOIL.

WHEN GRADING AND TRENCH EXCAVATION OCCUR WITHIN THE WETLAND, THE WETLAND TOPSOIL (WITH THE VEGETATION ROOT MASS) SHALL BE CAREFULLY REMOVED AND STOCKPILED SEPARATELY FROM THE SUBSOIL. THE FOREGOING WILL NOT BE REQUIRED WHERE THERE IS STANDING WATER OR THE TOPSOIL IS SATURATED TO THE POINT THAT IT CANNOT BE SEGREGATED. SHORTLY AFTER THE PIPELINE IS INSTALLED AND THE TRENCH BACKFILLED, THE TOPSOIL SHOULD BE RESTORED TO THE GRADED AREAS.

SEDIMENT POLLUTION CONTROLS SHOULD BE PROVIDED AS NECESSARY TO PREVENT SEDIMENT DISCHARGES FROM DISTURBED AREAS INTO WETLANDS AND OFF THE RIGHT-OF-WAY FROM WETLAND CONSTRUCTION. WATER PUMPED OR REMOVED FROM TRENCHES SHALL NOT BE DISCHARGED INTO WETLANDS WITHOUT PROPER SEDIMENT REMOVAL TREATMENT.

BMP'S (TRENCH PLUGS, ETC.) SHOULD BE IMPLEMENTED TO PREVENT THE TRENCH FROM PERMANENTLY DRAINING THE WETLAND OR CHANGING THE SITE HYDROLOGY. THE STOCKPILED WETLAND TOPSOIL SHOULD BE RETURNED TO ITS ORIGINAL HORIZON. ALL TEMPORARY RIGHT-OF-WAY STABILIZATION FOR THE ACCESS ROAD SHOULD BE REMOVED.

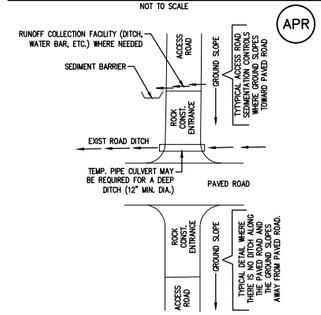
ORIGINAL CONTOURS AND CROSS DRAINAGES SHOULD BE RESTORED. ALL EXCESS SPOIL MUST BE REMOVED FROM THE WETLAND AND PROPERLY DISPOSED OF.

IN GENERAL, ANNUAL RYEGRASS AT THE RATE OF 40 POUNDS PER ACRE SHOULD BE APPLIED TO ALL DISTURBED AREAS WHERE STANDING WATER IS NOT PREVALENT. STRAW MULCH, WITHOUT BINDING AGENTS, SHOULD BE APPLIED AT THE RATE OF 3 TONS PER ACRE ON AREAS SEEDED WITH ANNUAL RYEGRASS. FUELS OR HAZARDOUS MATERIALS SHOULD NOT BE STORED WITHIN 100 FEET OF A WETLAND. APPLICATION OF CONCRETE COATING OF PIPES SHOULD NOT BE PERFORMED WITHIN 100 FEET OF A WETLAND.

Access Road Crossing Of Paved Road

NOT TO SCALE

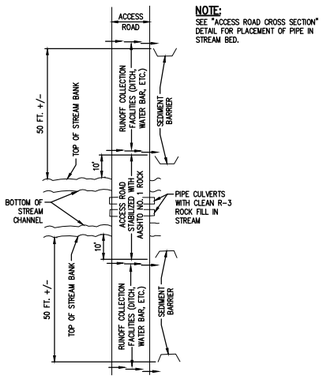
APR



Access Road Stream Crossing With Pipe Culverts

NOT TO SCALE

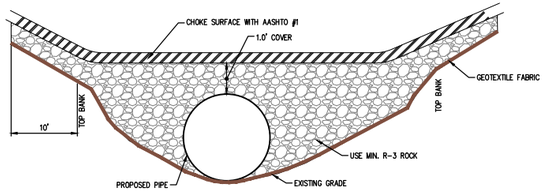
ARC



NOTE:
SEE "ACCESS ROAD CROSS SECTION" DETAIL FOR PLACEMENT OF PIPE IN STREAM BED.

Access Road Cross Section

NOT TO SCALE



GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 4

AVON LAKE GAS ADDITION PROJECT

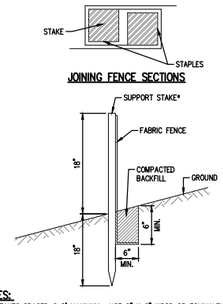
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG–1007
SHEET NO. 86 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Standard Construction Detail #19
Standard Filter Fabric Fence (18" High)

NOT TO SCALE

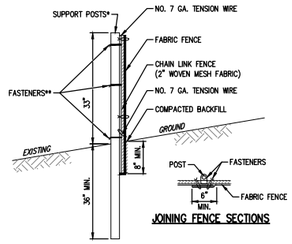


NOTES:

*1. STAKES SPACED @ 8' MAXIMUM. USE 2" X 2" WOOD OR EQUIVALENT STEEL STAKES.
2. FILTER FABRIC FENCE MUST BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
3. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
4. ANY SECTION OF FILTER FABRIC FENCE WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET. SEE STANDARD CONSTRUCTION DETAIL #18.

Standard Construction Detail #22
Super Filter Fabric Fence

NOT TO SCALE

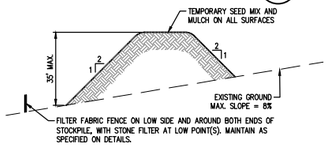


NOTES:

*1. POSTS SPACED @ 10' MAX. USE 2 1/2" DIA. GALVANIZED OR ALUMINUM POSTS.
**2. CHAIN LINK TO POST FASTENERS SPACED @ 14" MAX. USE NO. 6 GA. ALUMINUM WIRE OR NO. 9 GALVANIZED STEEL PRE-FORMED CLIPS. CHAIN LINK TO TENSION WIRE FASTENERS SPACED @ 60" MAX. USE NO. 10 GA. GALVANIZED STEEL WIRE. FABRIC TO CHAIN FASTENERS SPACED @ 24" MAX. C TO C.
3. NO. 7 GA. TENSION WIRE INSTALLED HORIZONTALLY AT TOP AND BOTTOM OF CHAIN-LINK FENCE.
4. FILTER FABRIC FENCE MUST BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
5. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.

Typical Soil Stockpile (SP)

NOT TO SCALE

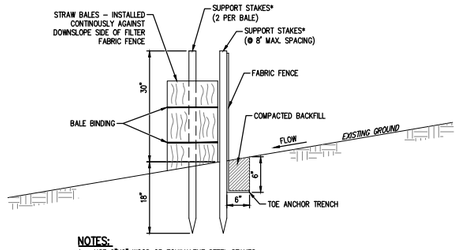


SOIL STOCKPILE MAINTENANCE

1. STOCKPILE TOPSOIL OR EXCAVATED SOIL MATERIAL AT LOCATIONS SHOWN FOR EACH PHASE OF CONSTRUCTION.
2. HEIGHT AND SIDES LOPES SHALL NOT EXCEED MAXIMUM VALUES SHOWN ON DETAIL.
3. INSTALL FILTER FENCE PRIOR TO STOCKPILING OF MATERIAL. REPLACE ANY FENCE REMOVED FOR VEHICULAR ACCESS AFTER EACH WORK DAY.
4. APPLY A TEMPORARY SEED MIX AND MULCH WHEN PILE WILL REMAIN FOR 30 DAYS OR MORE.
5. TOPSOIL PILES AND TRENCH SPOIL STOCKPILES SHOULD BE SEPARATED BY A MINIMUM OF 2 FEET TO AVOID CONTAMINATION OF TOPSOIL.

Standard Construction Detail #21
Filter Fabric Fence Reinforced By Staked Straw Bales

NOT TO SCALE

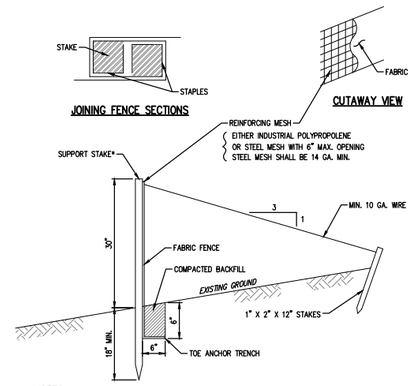


NOTES:

*1. USE 2"x2" WOOD OR EQUIVALENT STEEL STAKES.
2. FILTER FABRIC FENCE STAKES TO BE ACTUAL SIZE NOTED IN DETAILS.
3. FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
5. ANY FENCE SECTION WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.

Standard Construction Detail #20 Reinforced
Filter Fabric Fence (30" High)

NOT TO SCALE



NOTES:

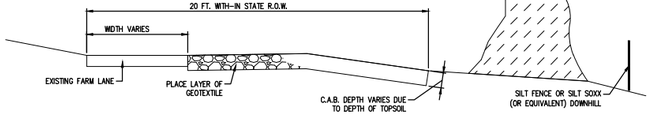
*1. STAKES SPACED @ 8' MAX. USE 2" X 2" WOOD OR EQUIVALENT STEEL STAKES.
2. SHOW ALL DETAILS AND CONSTRUCTION DIMENSIONS ON PLAN DRAWINGS.
3. FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
5. ANY FENCE SECTION WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET. SEE STANDARD CONSTRUCTION DETAIL #18.
6. ALL FENCE INSTALLATIONS SHOULD BE INSPECTED AFTER EVERY RUNOFF EVENT AND OR WEEKLY. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY.

Access Road For Pipe Installation (AR)

NOT TO SCALE

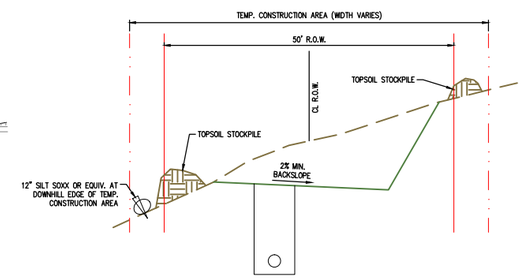
NOTES:

1. THE LOCATIONS OF THESE ACCESS ROADS SHALL ONLY BE PLACED AT LOCATION AS SHOWN ON THE PLANS.
2. AFTER THE PIPE IS INSTALLED AND BACKFILLED, THESE ROADS SHALL BE REMOVED AND RESTORED TO THE NATURAL STATE.
3. THE CONTRACTOR SHALL REMOVE STONE AND GEOTEXTILE AND SCARIFY THE AREA UNDER THE STONE.
5. REPLACE TOPSOIL. FERTILIZE, LIME, SEED AND MULCH PER THE PERMANENT SEEDING SPECS. NOTED ON THE DETAIL SHEETS.
6. IN STEEP AREAS, SLOPE PROTECTION MAT SHALL BE APPLIED.

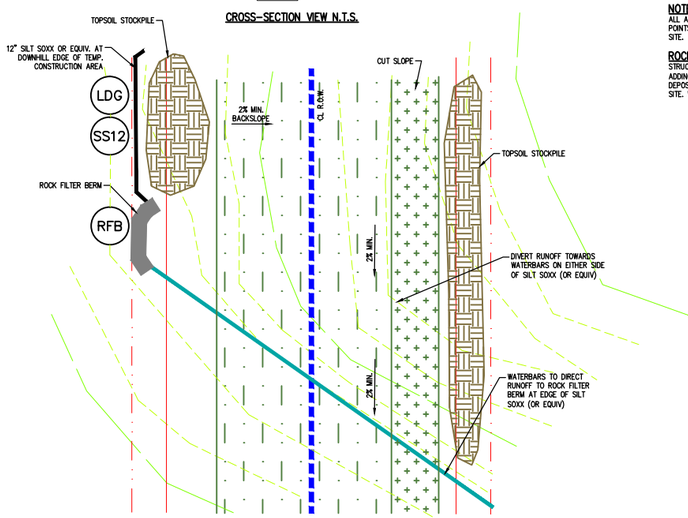


Longitudinal Diversion Grading Method (LDG)

NOT TO SCALE



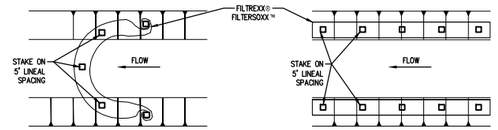
CROSS-SECTION VIEW N.T.S.



PLAN VIEW

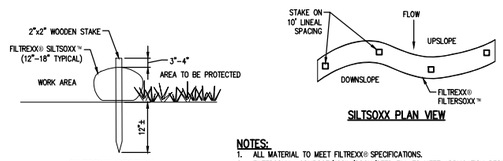
Silt Soxx Staking Details

NOT TO SCALE



SILTSOXX PLAN VIEW

EDGE SAVER PLAN VIEW



SILTSOXX SECTION

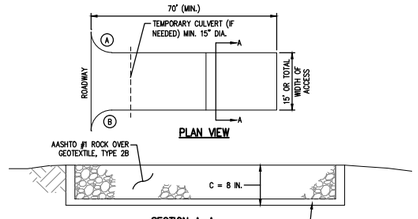
SILTSOXX PLAN VIEW

NOTES:

1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. FILTERSOXX™ COMPOST/JSOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

Rock Construction Entrance (RCE)

NOT TO SCALE



SECTION A-A

(A) RADIUS=35'

(B) AREAS TO RECEIVE RADIUS TO FIT SITE CONDITIONS(MIN.-10 FT.)

(C) ROADSIDE DITCH FLOWS TO BE MAINTAINED. USE APPROPRIATE SIZED CULVERTS AS NECESSARY.

NOTE:

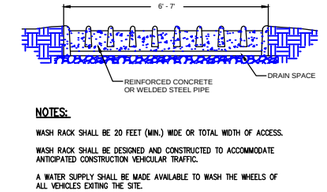
ALL ACCESS TO THE SITE MUST BE VIA AN APPROVED ROCK CONSTRUCTION ENTRANCE. POINTS OF POTENTIAL UNAUTHORIZED SITE ACCESS MUST BE PHYSICALLY BARRICADED AT THE SITE.

ROCK CONSTRUCTION ENTRANCE MAINTENANCE:

STRUCTURE THICKNESS MUST BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSION BY ADDING ROCK (AS NECESSARY). AT THE END OF EACH CONSTRUCTION DAY, ALL SEDIMENT DEPOSITED ON PUBLIC ROADWAYS, MUST BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE. WASHING OF THE ROADWAY WITH WATER IS NOT PERMITTED.

ROCK CONSTRUCTION ENTRANCE WITH WASH RACK (RCE)

N.T.S.



NOTES:

WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.

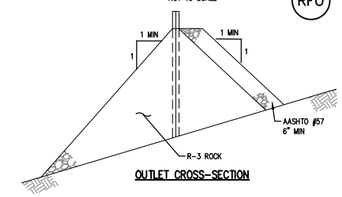
WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.

A WATER SUPPLY SHALL BE MADE AVAILABLE TO WASH THE WHEELS OF ALL VEHICLES EXITING THE SITE.

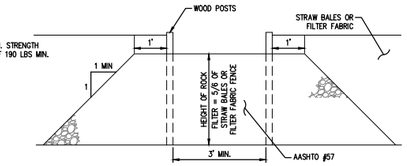
MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. DRAIN SPACE UNDER WASH RACK SHALL BE KEPT OPEN AT ALL TIMES. DAMAGE TO THE WASH RACK SHALL BE REPAIRED PRIOR TO FURTHER USE OF THE RACK. ALL SEDIMENT DEPOSITED ON ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

Standard Construction Detail #18
Rock Filter Outlets (RFO)

NOT TO SCALE



OUTLET CROSS-SECTION



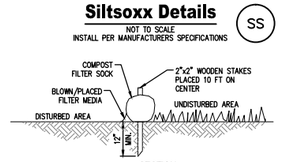
UP-SLOPE FACE

NOTES:

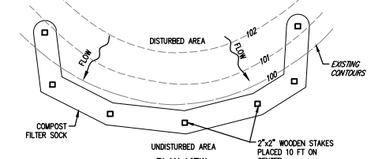
1. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.
2. ALL INSTALLATIONS SHOULD BE INSPECTED AFTER EVERY RUNOFF EVENT AND OR WEEKLY. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY.

Siltsoxx Details (SS)

NOT TO SCALE
INSTALL PER MANUFACTURERS SPECIFICATIONS



SECTION



PLAN VIEW

NOTES:

1. SOCK FABRIC SHALL MEET STANDARDS OF CHAPTER 6 OF THE RAINWATER & LAND DEVELOPMENT MANUAL FOR OHIO. COMPOST SHALL MEET THE STANDARDS OF CHAPTER 6 OF THE RAINWATER & LAND DEVELOPMENT MANUAL FOR OHIO.
2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER REPLACED WITHIN 24 HOURS OF INSPECTION.
6. BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER.
7. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
8. THE EXISTING SURFACE SHOULD BE PREPARED PRIOR TO INSTALLATION OF SILT SOCKS TO CREATE A DIRECT CONTACT BETWEEN THE BOTTOM OF THE SILT SOCKS AND THE EARTH ON WHICH THEY ARE PLACED.

GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 5

AVON LAKE GAS ADDITION PROJECT

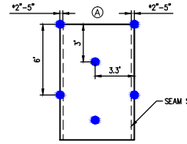
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 87 OF 88
SCALE: AS NOTED	

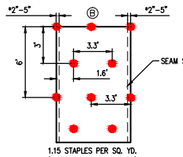
Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Staple Pattern Guide

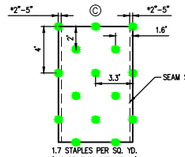
NOT TO SCALE



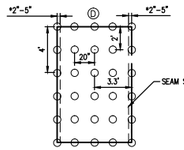
0.7 STAPLES PER SQ. YD.
(0.8 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE BLUE COLORED DOTS.



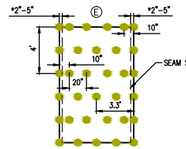
1.15 STAPLES PER SQ. YD.
(1.35 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE RED COLORED DOTS.



1.7 STAPLES PER SQ. YD.
(2.0 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE GREEN COLORED DOTS.



3.4 STAPLES PER SQ. YD.
(4.1 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE WHITE COLORED DOTS.



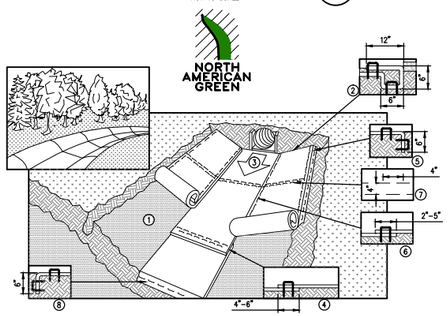
3.75 STAPLES PER SQ. YD.
(4.5 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE YELLOW COLORED DOTS.

*LOCATION OF SEAM STITCH™ WILL VARY DEPENDING ON NORTH AMERICAN GREEN PRODUCT TYPE.

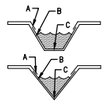
14649 HIGHWAY 41 NORTH, EVANSVILLE, INDIANA 47725
USA 1-800-772-2040 CANADA 1-800-448-2040
www.nagreen.com

Channel Installation

NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™ STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH™ ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

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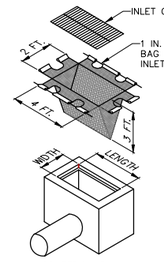
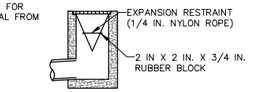
FILTER BAG INLET PROTECTION - TYPE M INLET

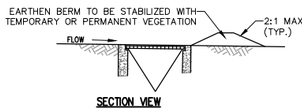
NOT TO SCALE



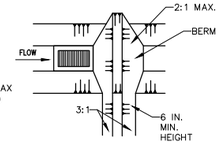
ISOMETRIC VIEW



INSTALLATION DETAIL



SECTION VIEW



PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM ON ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAIN PERMANENTLY.

AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

Rock Gradation Chart

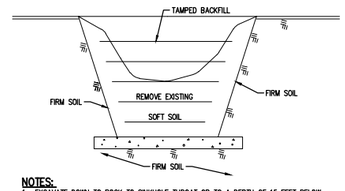
AASHTO NUMBER	NSA NUMBER	PA NUMBER	6 1/2"	4"	3 1/2"	2 1/2"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4	#8	#16	#30	#100	#200
	FS-3		100			50									0			
1		4		100	90-100	25-60		0-15		0-5								
3		3A				100	90-100	35-70	0-15		0-5							
467							100	95		35-70		10-30	0-5					
	FS-2						100						50				0	
		2A					100			52-100		36-70	24-50	16-38	10-30			0-10
5								100	90-100	20-55	0-10	0-5						
57		2B						100	90-100		25-60		0-10	0-5				
		2NS						100	90-100		0-15							
67		2							100	90-100		20-55	0-10	0-5				
		1NS							100		90-100		0-15					
7										100	90-100	40-70	0-15	0-5				
8											100	85-100	10-30	0-10	0-5			
		1B									100	75-100	10-30	0-10				
10		1										100	75-100				10-30	
	FS-1											100				50	0	

Table 4-9 ROCK GRADATION, FILTER BLANKET REQUIREMENTS, MAXIMUM VELOCITIES

NSA NO.	GRADED ROCK SIZE (IN.)			FILTER BLANKET REQUIREMENTS		Vmax (FT/SEC)
	MAX	D	MIN.	SIZE NSA NO.	PLACEMENT THICKNESS	
R-1	1.5	0.75	NO. 8	FS-1	N/A	2.5
R-2	3	1.5	1	FS-1	N/A	4.5
R-3	6	3	2	FS-1	3	6.5
R-4	12	6	3	FS-2	4	9.0
R-5	18	9	5	FS-2	6	11.5
R-6	24	12	7	FS-3	8	13.0
R-7	30	15	12	FS-3	10	14.5

Sinkhole In Soil

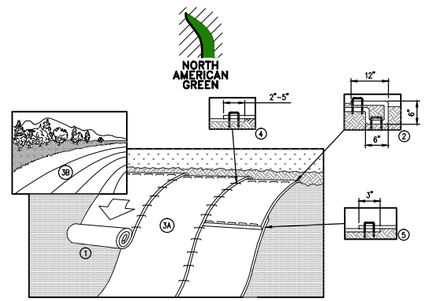
NOT TO SCALE



NOTES:
1. EXCAVATE DOWN TO ROCK TO SINKHOLE THROAT OR TO A DEPTH OF 15 FEET BELOW GRADE, WHICHEVER OCCURS FIRST.
2. IF ROCK IS ENCOUNTERED WITHIN 10 FEET, STOP EXCAVATION. THE LIMIT OF EXCAVATION SHALL BE DETERMINED BY THE ENGINEER. GENERALLY, A ZONE OF SOFT, IN-FILL MATERIAL WILL BE FOUND WHEN COVERS MOST OF THE BOTTOM OF THE EXCAVATION. COVER THIS AREA WITH FOUR(4) FEET OF CONCRETE EXTENDING AT LEAST 1 FOOT INTO FIRM SOIL. IF THE SOFT ZONE IS LARGE(+3FT.), REINFORCING STEEL SHOULD BE INCLUDED WITHIN THE CONCRETE CAP WITH 1" DIAMETER REBAR AT 24" ON CENTER EACH WAY. THE LIMIT OF CONCRETE SHOULD BE DETERMINED BY THE THE ENGINEER.
3. AFTER CONCRETE HAS SET OVERNIGHT, BACKFILL HOLE WITH RELATIVELY IMPERMEABLE CLAY SOIL. COMPACT SOIL IN 6" LIFTS WITH A POWER TAMPER OR RAMMER. THE TOP THREE(3) FEET SHALL BE BACKFILLED WITH 2RC CRUSHED AGGREGATE.
4. BACKFILL HOLE ABOVE EXISTING GRADE TO DIVERT SURFACE WATER.
5. WHEN SINKHOLE IS UNDER A PROPOSED UTILITY, CONCRETE IS TO BE SET 6" BELOW THE UTILITY TO ALLOW FOR A STONE BEDDING.

Slope Installation

NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™ STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH™ ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

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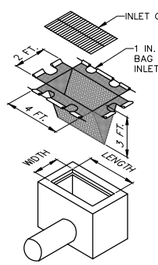
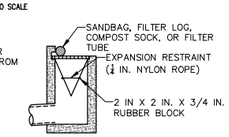
FILTER BAG INLET PROTECTION - TYPE C INLET

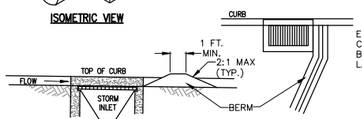
NOT TO SCALE



ISOMETRIC VIEW



INSTALLATION DETAIL



SECTION VIEW

PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

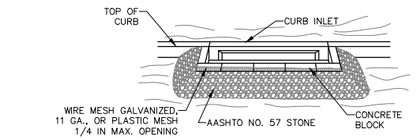
ROLLED EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.
AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS, A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE OF ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

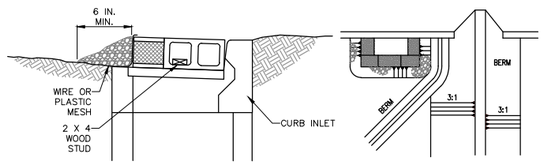
DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

STONE AND CONCRETE BLOCK INLET PROTECTION - TYPE C INLET

NOT TO SCALE



FRONT VIEW



SECTION VIEW PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM SHALL BE PROVIDED AND MAINTAINED IMMEDIATELY DOWN GRADIENT OF THE PROTECTED INLET UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.

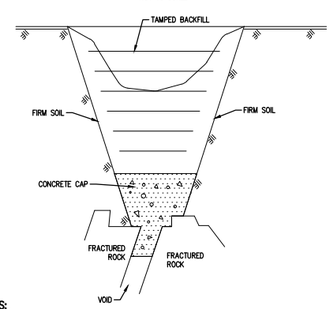
SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE HEIGHT OF THE STONE. DAMAGED OR CLOGGED INSTALLATIONS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

FOR SYSTEMS DISCHARGING TO HQ OR EV SURFACE WATER, A 6 INCH THICK COMPOST LAYER SHALL BE SECURELY ANCHORED ON OUTSIDE AND OVER TOP OF STONE.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

Sinkhole In Rock

NOT TO SCALE



NOTES:
1. SHOULD THE EXCAVATION BECOME 20' OR DEEPER, A GEOTECHNICAL ENGINEER SHOULD BE CONSULTED AS TO THE CORRECT PROCEDURE TO BE CARRIED OUT.
2. EXCAVATE DOWN TO BEDROCK OR TO THE SINKHOLE THROAT.
3. EXPOSE THE ROCK SURFACE BY WASHING THE AREA WITH A SMALL HOSE WATER SPRAY AND INSTALL HIGHSUMP CEMENT INTO VOIDS AND CREVICES UNTIL VOIDS ARE FILLED AND A CAP COVERS THE AREA. THE LIMIT OF EXCAVATION AND CONCRETE SHALL BE DETERMINED BY THE ENGINEER.
4. AFTER CONCRETE HAS SET OVERNIGHT, BACKFILL HOLE WITH RELATIVELY IMPERMEABLE CLAY SOIL. COMPACT SOIL IN 6" LIFTS WITH A POWER TAMPER OR RAMMER. THE TOP THREE(3) FEET SHALL BE BACKFILLED WITH 2RC CRUSHED AGGREGATE.
5. BACKFILL HOLE ABOVE EXISTING GRADE TO DIVERT SURFACE WATER.
6. WHEN SINKHOLE IS UNDER A PROPOSED UTILITY. CONCRETE IS TO BE SET 6" BELOW THE UTILITY TO ALLOW FOR A STONE BEDDING.

GENERAL NOTES:
1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 6

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 88 OF 88
SCALE: AS NOTED	

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Attachment G

Wetland Mitigation Plan

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Attachment H

Wetland Delineation Report

Avon Lake Gas Addition Project

Lorain County, Ohio

Wetland and Water Resources Delineation Report

Prepared by
Environmental Resources Management

Prepared for
NRG Ohio Pipeline Company LLC

July 1, 2014

Avon Lake Gas Addition Project

Lorain County, Ohio

Wetland and Water Resources Delineation Report

Prepared by
Environmental Resources Management

Signature of Responsible Representative

Donell (Doni) Murphy

Name of Responsible Representative

Table of Contents

LIST OF TABLES

APPENDICES

INTRODUCTION

Environmental Resources Management ("ERM"), on behalf of NRG Ohio Pipeline Company LLC ("NRG"), delineated wetlands and other waters of the U.S. along a proposed natural gas pipeline survey corridor generally 200-feet in width and approximately 20-miles in length in Lorain County, Ohio. The survey area also included other areas of anticipated temporary and permanent ground disturbance resulting from construction activities and the installation of ancillary facilities, namely the metering and regulating stations. This wetland delineation report documents the results of our detailed field investigation.

PROJECT DESCRIPTION

The Avon Lake Power Plant is a 734 MW coal-fired generating facility located in Avon Lake, Ohio ("Power Plant").[1] The Power Plant is owned by NRG Power Midwest LP, which is a subsidiary of NRG Energy, Inc. ("NRG"). The Power Plant was slated for retirement by the facility's prior owner as a result of significant expenditures required to meet increasingly stringent environmental requirements. NRG has decided to move ahead with a gas addition project, which will keep the facility in operation on natural gas beyond its planned deactivation date (the "Avon Lake Gas Addition Project"). To add natural gas as a fuel supply for the Power Plant, the proposed natural gas pipeline must be designed, permitted and constructed. The Avon Lake Gas Addition Project will bring environmental, economic, employment and electric supply reliability benefits to the State. The expected operation date for the pipeline is June 2016.

The proposed 20-inch or 24-inch diameter high-grade steel pipeline will extend south from the Avon Lake Power Plant, which is located along the Lake Erie shoreline in the City of Avon Lake, to a proposed supply tap location southwest of the Village of Grafton (the "Proposed Route"). The Proposed Route is the most feasible direct route between these two points upon evaluating and balancing all factors, including environmental, geographic, cultural, and social and constructability considerations. Specific to environmental considerations, these included the presence and potential for impact to wetlands and waters in addition to existing land uses, wooded areas, etc. Various route iterations were analyzed. The Proposed Route emerged from the routing study as the routing option that best minimizes the potential for impact to wetlands, waters and other environmental considerations while also balancing the other routing factors. The proposed pipeline will require siting approval from the Ohio Power Siting Board ("OPSB"), as well as permits and approvals from other local, state, and federal agencies.

Approximately 1,623 feet of the proposed pipeline will be aboveground. The pipeline will require a permanent (operation) right-of-way ("ROW") of 50-feet in width and a temporary

[1] The Power Plant also has one oil-fueled unit.

(construction) ROW of 100-feet. Additional temporary workspace areas ("TWAs") outside of the 100-foot construction ROW will be needed for short durations in some areas. Existing public and private roads will be utilized for access to most of the construction ROW; however, 5-miles (or 26,156-feet) of 30-foot-wide temporary access roads are anticipated. The required metering and regulating stations will each be approximately 1-acre in size. The collective area of anticipated ground disturbance, which includes the permanent and temporary ROWs, temporary workspace areas, newly constructed temporary access roads, and footprints of the metering and regulating stations encompasses approximately 290 acres.

GENERAL DESCRIPTION OF SURVEY AREA

Drainage and Topography

The survey area lies within the Black-Rocky Hydrologic Unit Code ("HUC") 04110001. This HUC encompasses a large area which includes Lorain County in northern Ohio and is located within the Black River Watershed, which drains north into Lake Erie. Including the East Branch of the Black River, 24 streams or drainage features occur within or cross the survey area, as identified in Table 2.

As represented on the Cleveland, Ohio U.S. Geological Survey ("USGS") 7.5 minute topographic quadrangles (1994), the survey area exhibits gently sloping topography from the southern terminus of the area to the north toward Lake Erie, with elevations ranging from 580 feet above mean sea level ("MSL") to approximately 800 feet above MSL.

Soils

The soil types occurring within the survey area are representative of the predominant soil types that occur throughout the state of Ohio. Specific to hydric soils, there are 90 acres of hydric soils within the survey area, or approximately 18% of the survey area. Of these hydric soil types, the predominant hydric soil types that occur within the survey area, in descending order of occurrence, include Mahoning silt loam (partially hydric), Miner silty clay loam (partially hydric), Luray silty clay loam (hydric), Allis loam (hydric), Trumbull silty clay loam (hydric) and Haskins loam (partially hydric).

METHODOLOGY

Wetland Identification and Delineation

Prior to conducting the field investigation, ERM conducted a desktop delineation of wetlands by reviewing National Wetland Inventory ("NWI") data, Ohio Wetland Inventory ("OWI") data, the National Hydrography Dataset, the Lorain County Soil Survey, topographic imagery and aerial

photography. Geospatial layers associated with these datasets were overlaid with the preliminary Project layout (including the anticipated permanent and temporary ROWs, temporary workspace areas off the ROW, the footprints of the metering and regulating stations and locations of temporary construction access).

Wetlands and waterbodies within the survey area were then field delineated using the procedures outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region Version 2.0* (Environmental Laboratory, 2012). The field investigation was conducted May 8, May 9 and May 12 through May 16, 2014. In accordance with the Regional Supplement, areas that exhibited hydric soils, wetland hydrology and a dominance of hydrophytic vegetation were delineated as wetlands.

Soils were extracted using a drainage spade shovel with a 16-inch blade. These slices of soil were examined for hydric soil characteristics from 0 to 20 inches in the profile. The most important field indicators examined include the hue, value and chroma of the matrix as well as redoximorphic features using the Munsell Soil Color Chart (Kollmorgen Instrument Corporation, 1994). Generally, soils that exhibit redoximorphic features with a matrix chroma of two or less, or soils without redoximorphic features that exhibit a chroma of one or less are shown to exhibit hydric soil characteristics (Environmental Laboratory, 2012).

The hydrology criterion included within the Regional Supplement requires that an area exhibits one primary indicator of wetland hydrology and at least two secondary indicators of wetland hydrology. Primary indicators include standing water, saturated soils, water marks on trees, drift lines, water stained leaves and oxidized root zones surrounding living roots. Secondary indicators of wetland hydrology include drainage patterns, microtopographic relief, presence of crayfish burrows, and sparsely vegetated concave surfaces. Additional signs of wetland hydrology include visible saturation on aerial photography and a positive FAC-neutral test (see below) (Environmental Laboratory, 2012).

Dominant vegetation for each community was determined by estimating the percentages of dominant species in the tree, sapling, shrub, herb and woody vine strata. Dominant species were examined by using the 50/20 percent dominance rule for each stratum. This was accomplished by determining the estimated percent aerial cover for each species. The relative percent aerial cover was calculated by dividing each species percent cover by the total percent cover for all species and multiplying by 100. These species were then arranged in descending order of relative percent cover. A running total was kept by adding the relative cover of each species starting with the species with the highest relative cover until the total cover equaled 50 percent. All species that were included within this calculation were regarded as dominant. Species of equal cover that contributed to meeting the sum of 50 percent were also regarded as dominant. Additionally, other species that solely accounted for 20 percent or more of the relative percent cover were also considered dominant species. The indicator status of each dominant species was then determined. An indicator status of obligate wetland (“OBL”),

facultative wetland ("FACW"), facultative ("FAC") facultative upland ("FACU") and/or upland ("UPL") has been assigned to each plant species on the *National List of Plant Species that Occur in Wetlands: Region 1* (Reed, 1988). An area has hydrophytic vegetation when, under normal circumstances, more than 50 percent of the composition of dominant species from all strata is OBL, FACW, and/or FAC species.

The FAC-neutral test was calculated for each dataset as a means of determining the presence of wetland hydrology. This test considers all FAC species as neutral for wetland determination and compares the number of dominant species wetter than FAC (i.e., OBL, FACW) against the number of dominant species drier than FAC (i.e., FACU, UPL). A positive FAC-neutral test results when a dominant species wetter than FAC are more prevalent than dominant species drier than FAC. A positive FAC-neutral test is a secondary indicator of wetland hydrology.

To the extent possible, the hydrophytic vegetation decision should be based on the plant community that is normally present during the wet portion of the growing season in a normal rainfall year (Environmental Laboratory, 2012). The growing season has begun on a site in a given year when two or more different non-vascular plant species growing in the wetland or surrounding areas exhibit one of the following: the emergence of herbaceous plants from the ground, the appearance of new growth from vegetative crowns, coleptile/cotyledon emergence from seed, bud burst on woody plants (i.e., some green foliage visible between spreading bud scales), the emergence or elongation of leaves of woody plants, or the emergence of opening flowers (Environmental Laboratory, 2012). The wetland delineation fieldwork within the survey area was conducted within the occurrence of these events and therefore, inside the growing season.

Sample plots that met the three criteria for hydric soils, wetland hydrology and hydrophytic vegetation were considered wetlands. The boundaries of wetlands were determined where there was a transition and one or more of the wetland defining criteria was determined to instead exhibit upland characteristics. Samples were also taken in adjacent areas that were clearly upland to further confirm that the wetland boundary was appropriately delineated.

The delineated wetland boundaries were field documented through the use of a Trimble Global Positioning System ("GPS") receiver capable of sub-meter accuracy. The delineated wetlands were identified by number and correspond to the wetlands illustrated on the wetland and stream maps (Figures 2-26). The wetland boundaries were recorded as polygons and the wetland areas were calculated using the shapefile properties utility in ArcMap, a Geographic Information System ("GIS") software.

Wetland Classification

The U.S. Fish and Wildlife Service ("USFWS") uses the *Classification of Wetlands and Deepwater Habitats of the United States* to classify wetland habitat types (Cowardin et Al, 1979). This classification system is hierarchical and defines five major systems –

Marine, Estuarine, Riverine, Lacustrine, and Palustrine. Palustrine wetlands are generally referred to as non-tidal or freshwater wetlands.

Ohio Rapid Assessment Method

Ohio's Wetland Water Quality Standards require that "an appropriate wetland evaluation methodology acceptable to the director" be implemented to determine the appropriate category for each wetland. This evaluation is conducted in Ohio through the application of the Ohio Rapid Assessment Method ("ORAM"). The ORAM method results in wetlands being scored based on the characteristics they exhibit. Their resulting scores are then used to determine which category of wetland they are for regulatory review purposes. ORAM forms must be completed for each wetland. ERM relied on the current ORAM method to categorize the field delineated wetlands (ORAM, Version 5.0) (Mack, 2001; Appendix C).

Since the ORAM is a rapid assessment method, there are certain wetland scores which fail to clearly differentiate the wetland's functional category. The so-called "gray zone" wetlands fall between the definite scoring breaks between the categories. OEPA requires that "gray zone" wetlands be considered as the higher category unless more detailed functional assessments such as the VIBI or AmphIBI are conducted on those wetlands. As a result of this requirement, wetlands whose scores fall between the breakpoints for Categories 1 and 2 (1 or 2 gray zone wetlands) wetlands were considered as Category 2 wetlands for the purposes of this report. Wetlands whose scores fall between the breakpoints for Categories 2 and 3 wetlands (2 or 3 gray zone wetlands) were considered a Category 3 wetland for the purposes of this report.

Other Waters of the U.S.

The survey area was screened for the presence of areas that meet the criteria for "other waters of the U.S." These areas consist of ephemeral, intermittent and perennial streams, as well as open water habitats such as ponds. Site drainage was determined by secondary source information and in the field using current regulatory guidance. Drainage channels that exhibited "bed and bank" and an ordinary high water mark in the channel were identified and delineated as jurisdictional streams. Drainage channels that did not exhibit an ordinary high water mark were regarded as drainageways.

Streams identified during the field delineation were evaluated using the methods outlined in *Biological Criteria for the Protection of Aquatic Life* (Ohio Environmental Protection Agency, 1987). Data collection for all potential stream crossings included the completion of the Ohio EPA Primary Headwater Habitat Evaluation Form ("PHWH"). The PHWH form was applied for streams with a drainage area of less than one mile. Streams that exhibited a major change in morphology were scored at multiple representative locations. Appendix D provides the completed PHWH forms.

The derived stream courses were field documented through the use of GPS. The delineated streams were identified by a number and correspond to the streams on the wetland and stream

location map (e.g., Stream 1, Stream 2, etc.). The extent of each stream was recorded as polylines and lengths were calculated using the shapefile properties utility in ArcMap, a GIS software.

Hydrologic Connectivity

Permanent impacts to all delineated wetlands determined to be jurisdictional to the USACE will be subject to permit authority from the USACE. Permanent impacts to any remaining isolated wetlands will be treated as waters of the state of Ohio and subject to permit authority from the ODNR. Wetland permitting will also be subject to water quality certification from the OEPA. While all delineated wetlands could be determined jurisdictional to the USACE regardless of hydrologic connectivity, the hydrology of each wetland within the survey area was still evaluated.

SURVEY RESULTS

Delineated Wetlands

ERM conducted a wetland and water resources delineation within the identified survey area in May 2014. As a result, 48 wetlands were delineated in the survey area, as depicted on Figures 1-25. A number of the delineated wetlands are located either wholly or partially in areas that are actively farmed for crops, while others are located adjacent to various types of developed land uses or existing infrastructure. All wetlands that were delineated within the survey area are described in terms of location, jurisdictional status, and quality as dictated by the ORAM version 5.0. Individual data forms included within Appendix B provide the field support and details regarding the wetland/upland boundary determination. The ORAM forms completed for each individual wetland delineated within the survey area are included as Appendix C. PHWH forms for each individual stream located within the survey area are included as Appendix D. Photographic documentation of each area delineated is included in Appendix E.

The locations and extents of the field delineated wetlands and streams are depicted on Figures 1-25. Each delineated wetland is identified by number (e.g., Wetland 1, Wetland 2, etc.) and each stream was given a numeric designation if it did not have an original name (e.g., Stream 1, Stream 2, etc.). The reader may refer to these figures and the wetland delineation data forms (Appendix B) for detailed delineation data. The assumed jurisdictional status, preliminary ORAM score and the on-site acreage of each delineated wetland is included in Table 1.

Of the 48 wetlands delineated within the survey area, all were classified as palustrine. Most are palustrine forested and scrub-shrub (“PFO/PSS”) depressional wetlands that are located adjacent to agricultural areas that have been actively farmed and ditched. A number of palustrine emergent (“PEM”) depressional wetlands are also scattered throughout the survey area within wet meadows and areas that have endured past clear cutting and farming activities.

The remaining wetlands within the survey area are contiguous with streams or drainages that flow off-site. According to an examination of available aerial imagery (i.e., USGS topographic maps, aerial photography, etc.), these streams eventually drain into the East Branch of the Black River, which is connected to the main branch of the Black River and flows into Lake Erie. These wetlands were assumed to be "waters of the U.S.", which would make them subject to regulations pursuant to Section 404/401 of the Clean Water Act. However, the USACE makes the final determination as to the jurisdiction of a wetland, stream or other water resource.

Wetlands delineated within the survey area were comprised of eight that rated a Category 1, 39 were determined to be Category 2, and one that was determined to be Category 3 in accordance with ORAM. Category 1 wetlands have generally undergone considerable substrate disturbance, habitat alteration and modifications to their hydrologic regime. In addition, many Category 1 wetlands exhibit a dominance of invasive species, which was substantiated during our field investigation. Category 2 wetlands have undergone significant disturbance to their substrate, habitat, and hydrologic regime, but have generally recovered. Category 3 wetlands are of high quality and have not undergone measureable substrate disturbance habitat alteration, or modifications to their hydrologic regime.

Table 1. Summary of Wetlands Delineated within the Survey Area

Wetland Name	Wetland Type[2]	ORAM Score[1]	Acreage Within Survey Corridor	Wetland Category[1]
Wetland 1	PFO/PSS	45	11.8	2
Wetland 2	PFO/PSS	39	1.7	2
Wetland 3	PFO/PSS	37	0.1	2
Wetland 4	PFO/PSS	30.5	0.6	2
Wetland 5	PEM	29	1.9	1
Wetland 6	PEM	21	5.3	1
Wetland 7	PFO/PSS/PEM	31	10.5	2
Wetland 8	PSS/PEM	46	13.4	2
Wetland 9	PFO/PSS	42	0.9	2
Wetland 10	PFO/PSS/PEM	36	1.7	2
Wetland 11	PEM	19	<0.1	1

Wetland Name	Wetland Type[2]	ORAM Score[1]	Acreage Within Survey Corridor	Wetland Category[1]
Wetland 12	PFO/PEM	52	3.7	2
Wetland 13	PEM	33	0.1	2
Wetland 14	PFO/PSS	24	0.8	1
Wetland 15	PFO	51	0.2	2
Wetland 16	PFO/PSS	56	0.2	2
Wetland 17	PFO/PSS	54	0.9	2
Wetland 18	PFO/PSS	56	1	2
Wetland 19	PFO	56	1.5	2
Wetland 20	PFO/PSS	36	0.5	2
Wetland 21	PFO/PSS	56	4.8	2
Wetland 22	PFO/PSS/PEM	58	45.8	2
Wetland 23	PEM	18	0.2	1
Wetland 24	PFO/PSS	59	5	2
Wetland 25	PFO/PSS	57	2.7	2
Wetland 26	PFO	56	3.3	2
Wetland 27	PEM	25	0.2	1
Wetland 28	PEM	46	<0.1	2
Wetland 29	PFO/PSS/PEM	30	9.6	2
Wetland 30	PSS/PEM	30	<0.1	2
Wetland 31	PFO	41	0.4	2
Wetland 32	PFO/PEM	46	0.2	2

Wetland Name	Wetland Type[2]	ORAM Score[1]	Acreage Within Survey Corridor	Wetland Category[1]
Wetland 33	PFO/PSS	50	3.2	2
Wetland 34	PFO/PEM	37	0.2	2
Wetland 35	PFO/PSS/PEM	44	3.2	2
Wetland 36	PSS/PEM	36	0.6	2
Wetland 37	PFO	44	1.5	2
Wetland 38	PFO	39	2.4	2
Wetland 39	PEM	24	0.1	1
Wetland 40	PFO	43	0.1	2
Wetland 41	PFO/PSS	43	0.2	2
Wetland 42	PFO/PSS	60	2.1	3
Wetland 43	PFO/PSS	58	2.3	2
Wetland 44	PFO/PEM	41	0.6	2
Wetland 45	PFO	40	0.7	2
Wetland 46	PEM	38	3	2
Wetland 47	PFO/PEM	55	6.9	2
Wetland 48	PEM	26	0.2	1
		TOTAL	156.3	

[1]Wetlands were categorized and scored using ORAM, Version 5.0.
[2]Wetland types were determined according to Cowardin (1979).

Other Waters of the U.S.

Seven perennial streams and 17 intermittent streams/drainages are located within the survey area. None of these linear waterways have been identified by the USACE as navigable waters. Table 2 lists the stream type and preliminary HHEI score for each waterway identified within the

survey area. Dominant vegetation of these waters typically includes a mixture of forested, scrub-shrub and emergent vegetation, as reflected in the data sheets included in Appendix B.

Table 2. Summary of Other Waters of the U.S. Identified within the Survey Area

Stream Name	Stream Type	HHEI Score	Linear Feet Within Survey Corridor	Preliminary Primary Headwater Habitat Classification[1]
Stream 1	Intermittent	41	202	Modified Class II Primary Headwater Habitat
Stream 2	Intermittent	42	335	Modified Class II Primary Headwater Habitat
Stream 3	Intermittent	42	929	Modified Class II Primary Headwater Habitat
Stream 4	Intermittent	57	215	Modified Class II Primary Headwater Habitat
Stream 5	Intermittent	42	280	Modified Class II Primary Headwater Habitat
Stream 6	Intermittent	52	145	Modified Class II Primary Headwater Habitat
Stream 7	Intermittent	45	456	Modified Class II Primary Headwater Habitat
Stream 8	Intermittent	41	2351	Modified Class II Primary Headwater Habitat
Stream 9	Intermittent	44	133	Modified Class II Primary Headwater Habitat
Stream 10	Intermittent	33	344	Modified Class II Primary Headwater Habitat
Alexander Ditch	Intermittent	N/A	283	Blue Line Stream
Dent Ditch	Intermittent	N/A	262	Blue Line Stream
East Branch of Black River	Perennial	N/A	289	Blue Line Stream
French Creek	Perennial	N/A	202	Blue Line Stream
Jackson Ditch	Intermittent	N/A	203	Blue Line Stream
Jungbluth Ditch	Perennial	N/A	225	Blue Line Stream
Ridgeway Ditch	Perennial	N/A	567	Blue Line Stream
Tributary to East Branch of Black River	Perennial	N/A	203	Blue Line Stream
Tributary to East Branch of Black River	Perennial	N/A	203	Blue Line Stream
Unnamed Stream 1	Intermittent	N/A	257	Blue Line Stream

Stream Name	Stream Type	HHEI Score	Linear Feet Within Survey Corridor	Preliminary Primary Headwater Habitat Classification[1]
Unnamed Stream 2	Intermittent	N/A	288	Blue Line Stream
Unnamed Stream 3	Intermittent	N/A	204	Blue Line Stream
Unnamed Stream 4	Intermittent	N/A	505	Blue Line Stream
Willow Creek	Perennial	N/A	208	Blue Line Stream

[1]Streams were rated using the PHWH Form.

SUMMARY OF FINDINGS

As a result of ERM's field investigation, 48 wetlands were delineated, in whole or in part, within the survey area. Thirty-five of the 48 delineated wetlands are at least partially forested. Seven perennial streams and 17 intermittent streams/drainages occur within or cross the survey area. Permanent impacts to all delineated wetlands determined to be jurisdictional to the USACE will be subject to permit authority from the USACE. Permanent impacts to any remaining isolated wetlands will be treated as waters of the state of Ohio and subject to permit authority from the ODNR. Wetland permitting will also be subject to water quality certification from the OEPA.

The information included in this wetland and water resource delineation should be considered preliminary until a formal Jurisdictional Determination (JD) is made by the USACE regarding the regulatory status of the wetlands and streams within the survey area.

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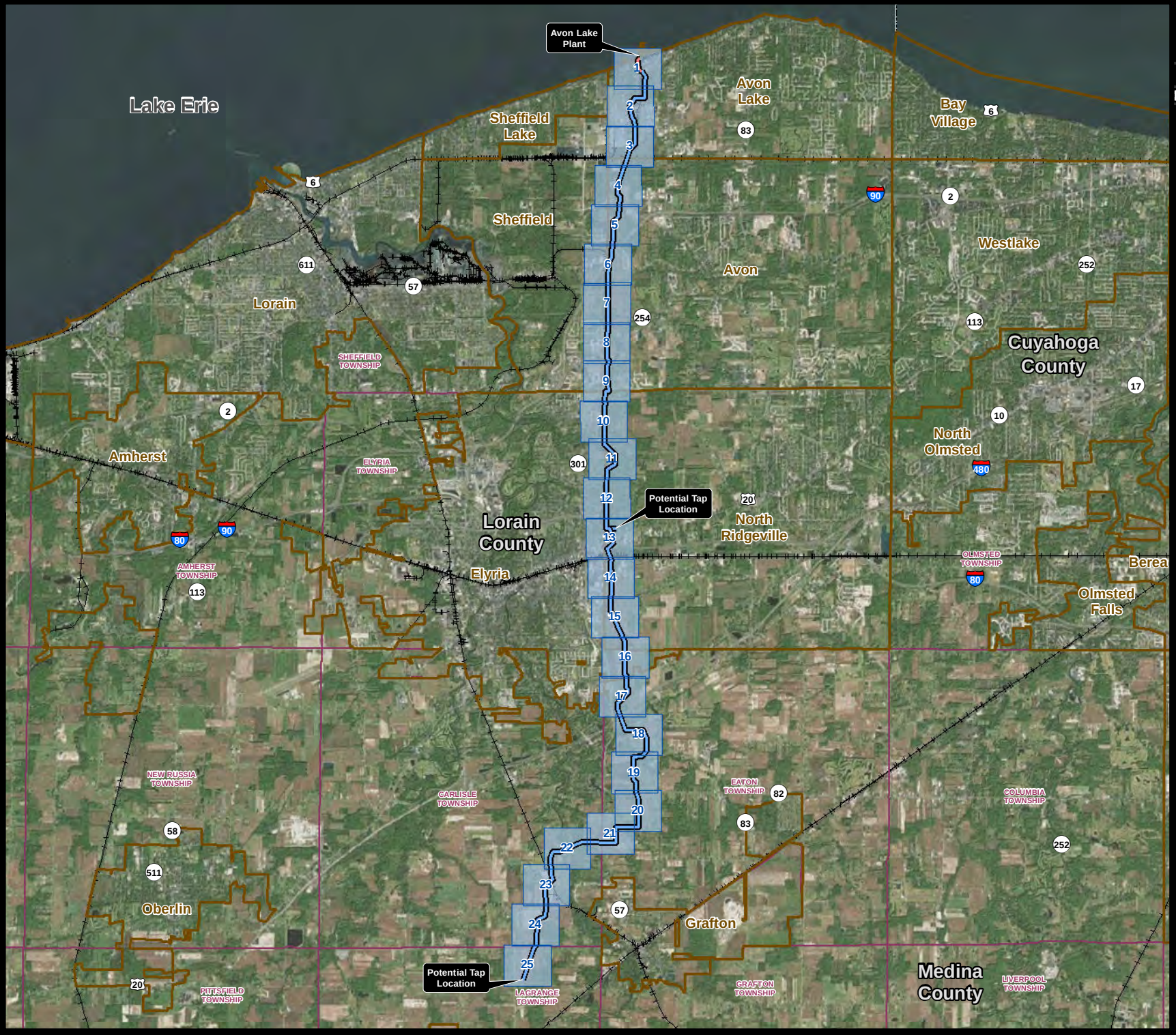
Appendix A

Figures



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AVON LAKE GAS ADDITION PROJECT

Wetland and Water Resource Delineation Overview Map

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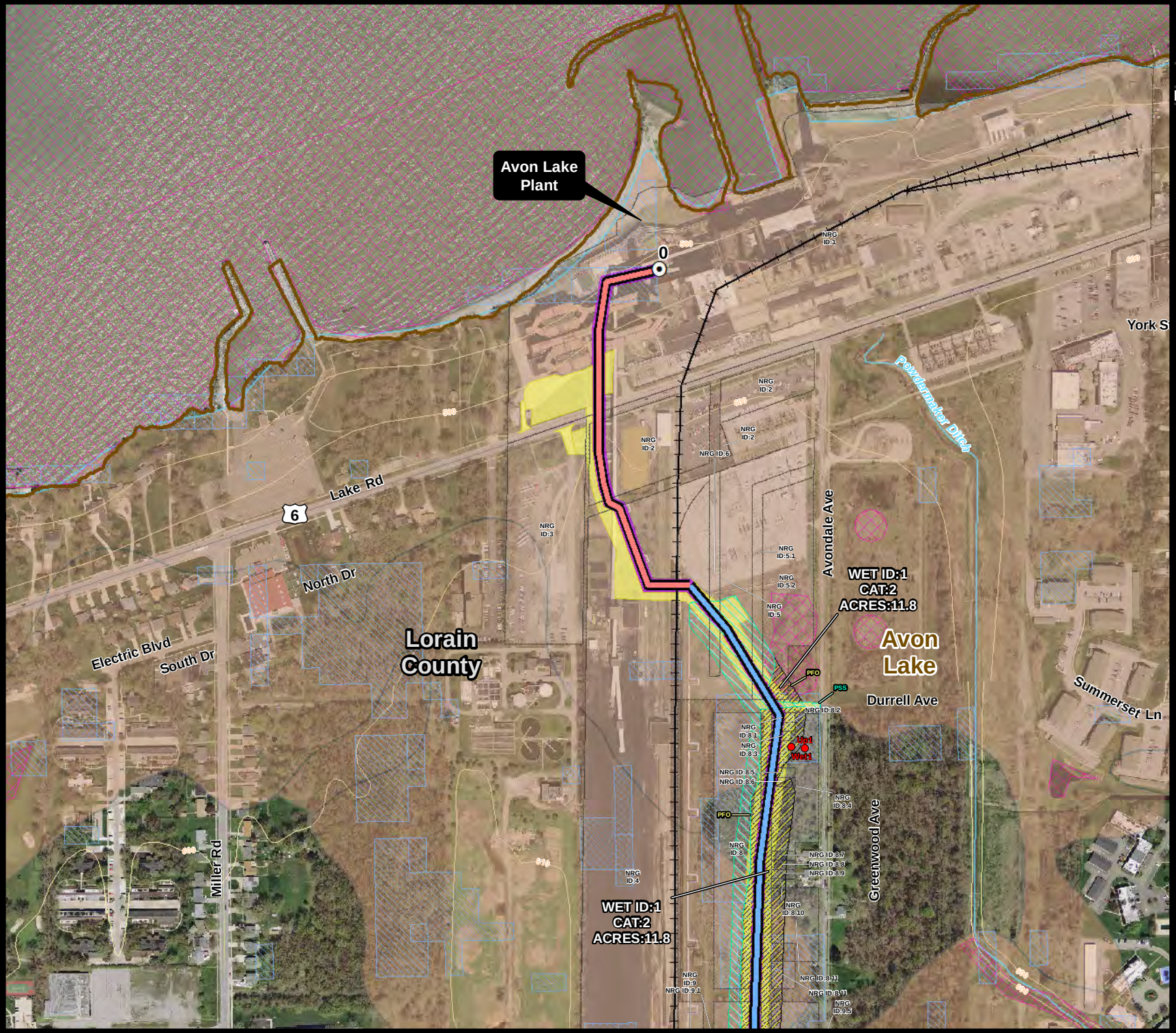

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AVON LAKE GAS ADDITION PROJECT

Wetland and Water Resources

Legend

- Above Ground Proposed Project Route
- Below Ground Proposed Project Route
- Permanent Right-of-Way
- Temporary Workspace
- Mile Post
- Wetland/Upland Field Collected Point

Wetland Type

- PEM - Palustrine Emergent
- PFO - Palustrine Forested
- PSS - Palustrine Scrub-Shrub
- Field Delineated Stream
- NWI Wetland
- Ohio Wetland Inventory
- Contour Line - 10 Ft
- Affected Parcels
- Hydric Soils
- River/Stream
- Lake
- County Boundary
- Political Township Boundary
- Municipal Boundary
- Railroad

Roads

- Interstate
- US Highway
- State Highway

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Aerial Photo Source: OGRIP 2011/2012

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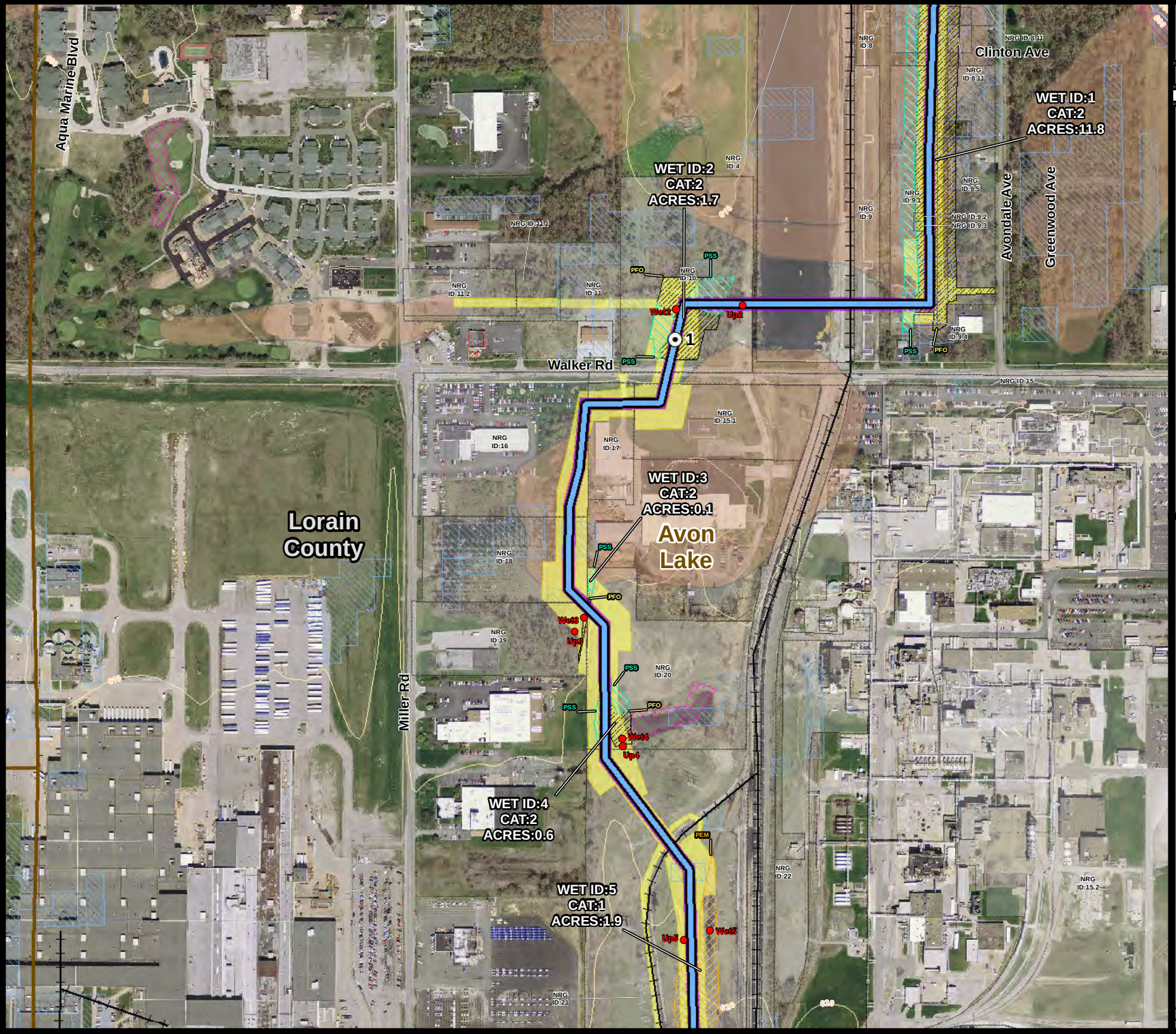

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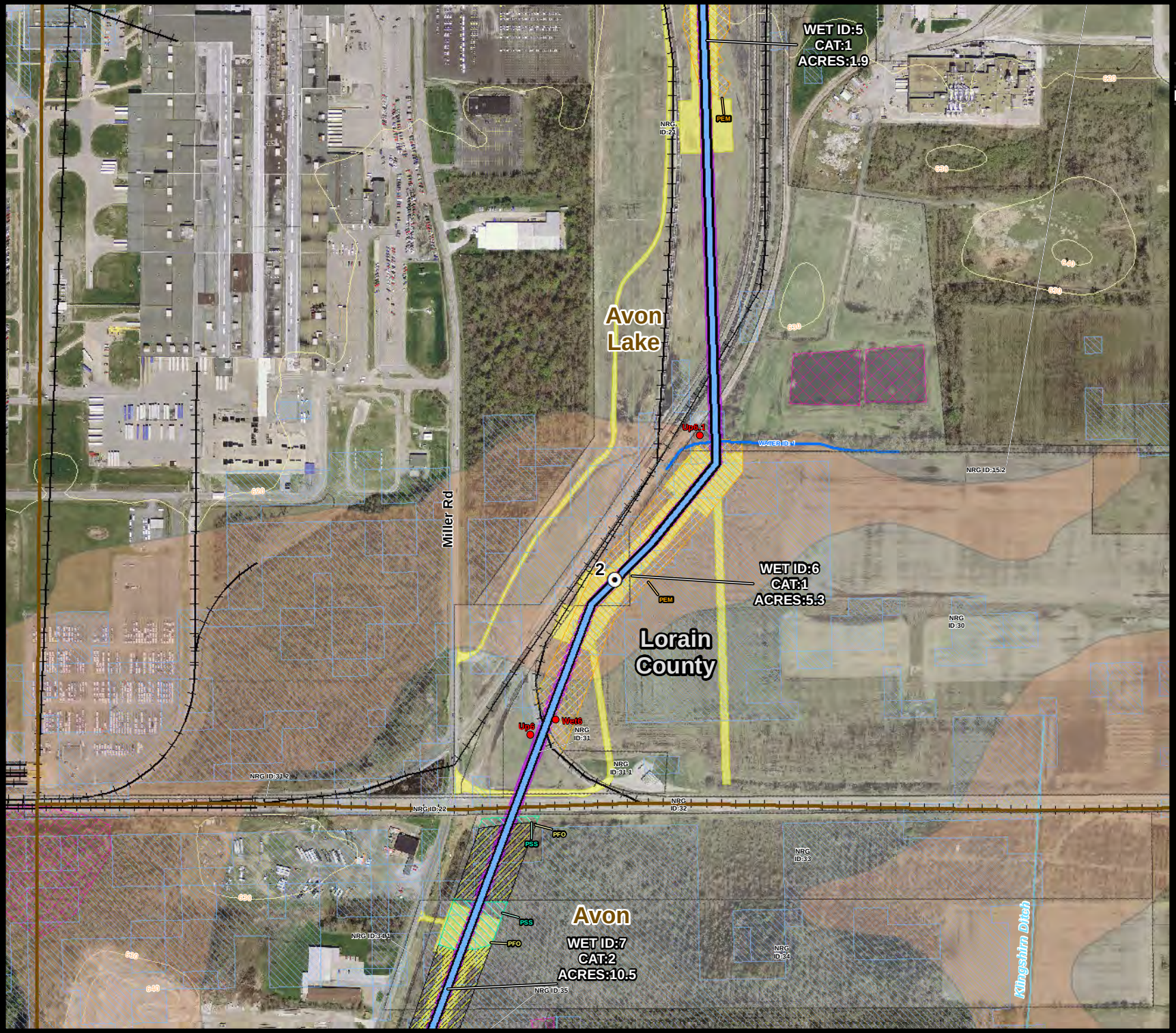

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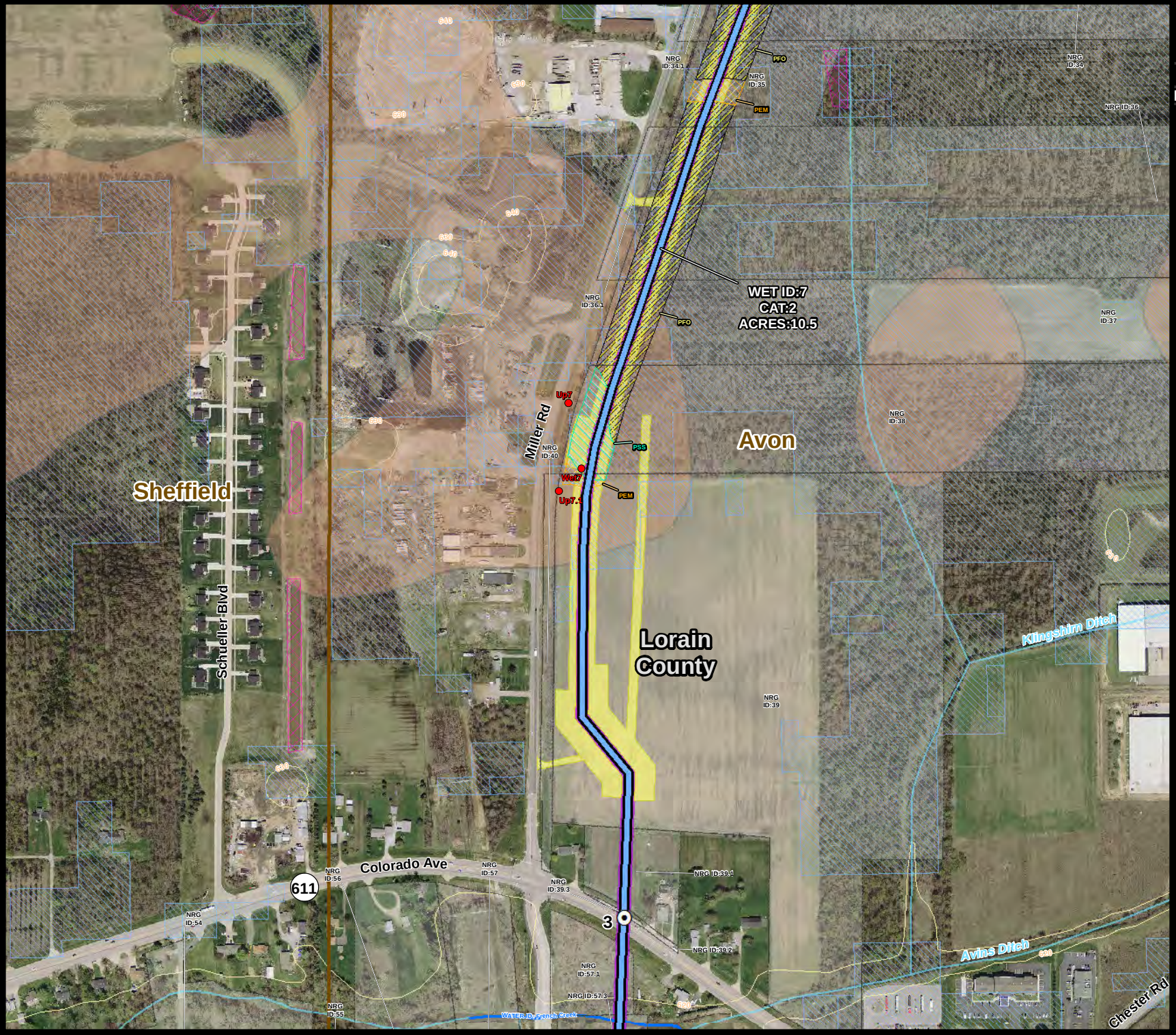

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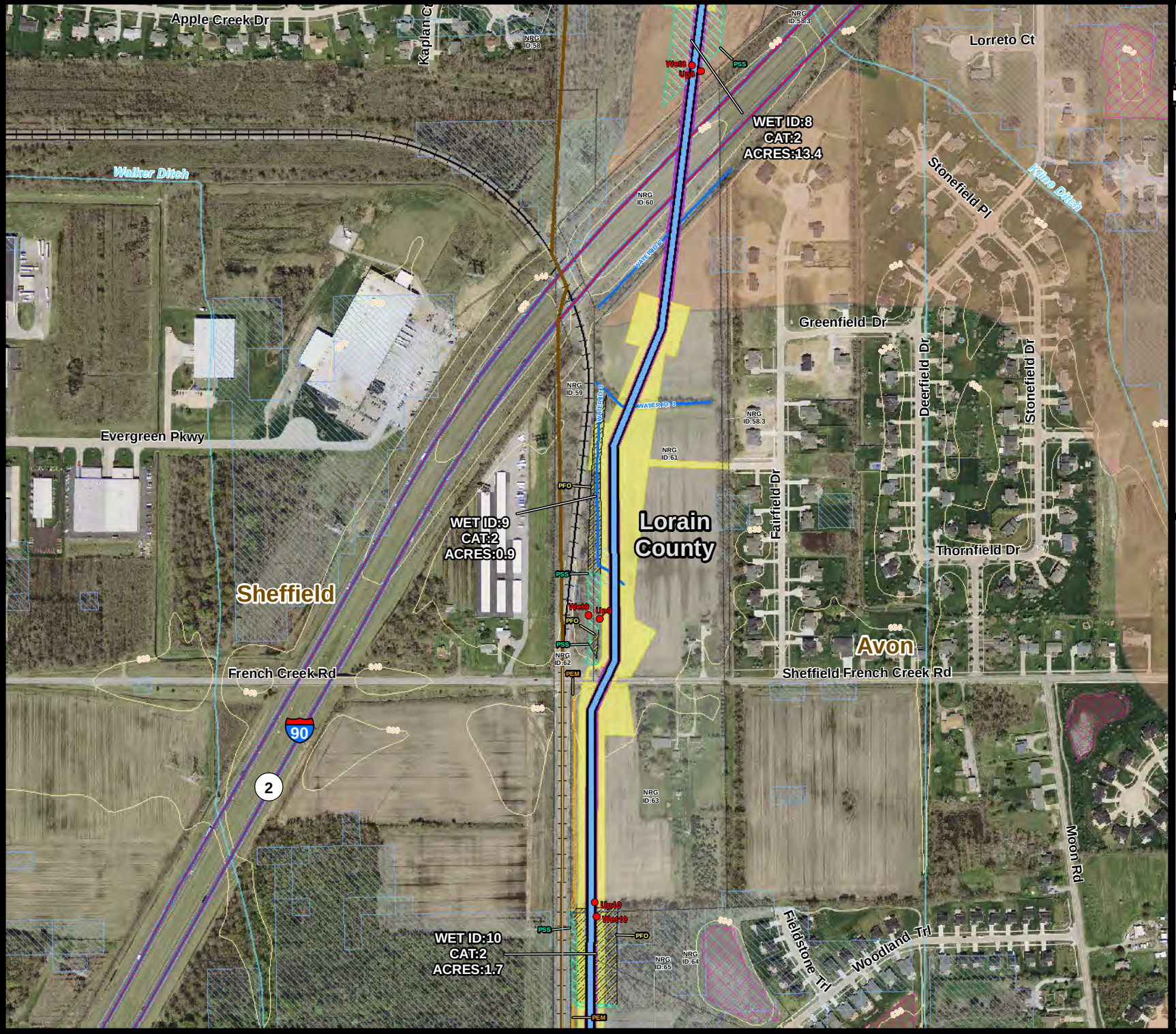

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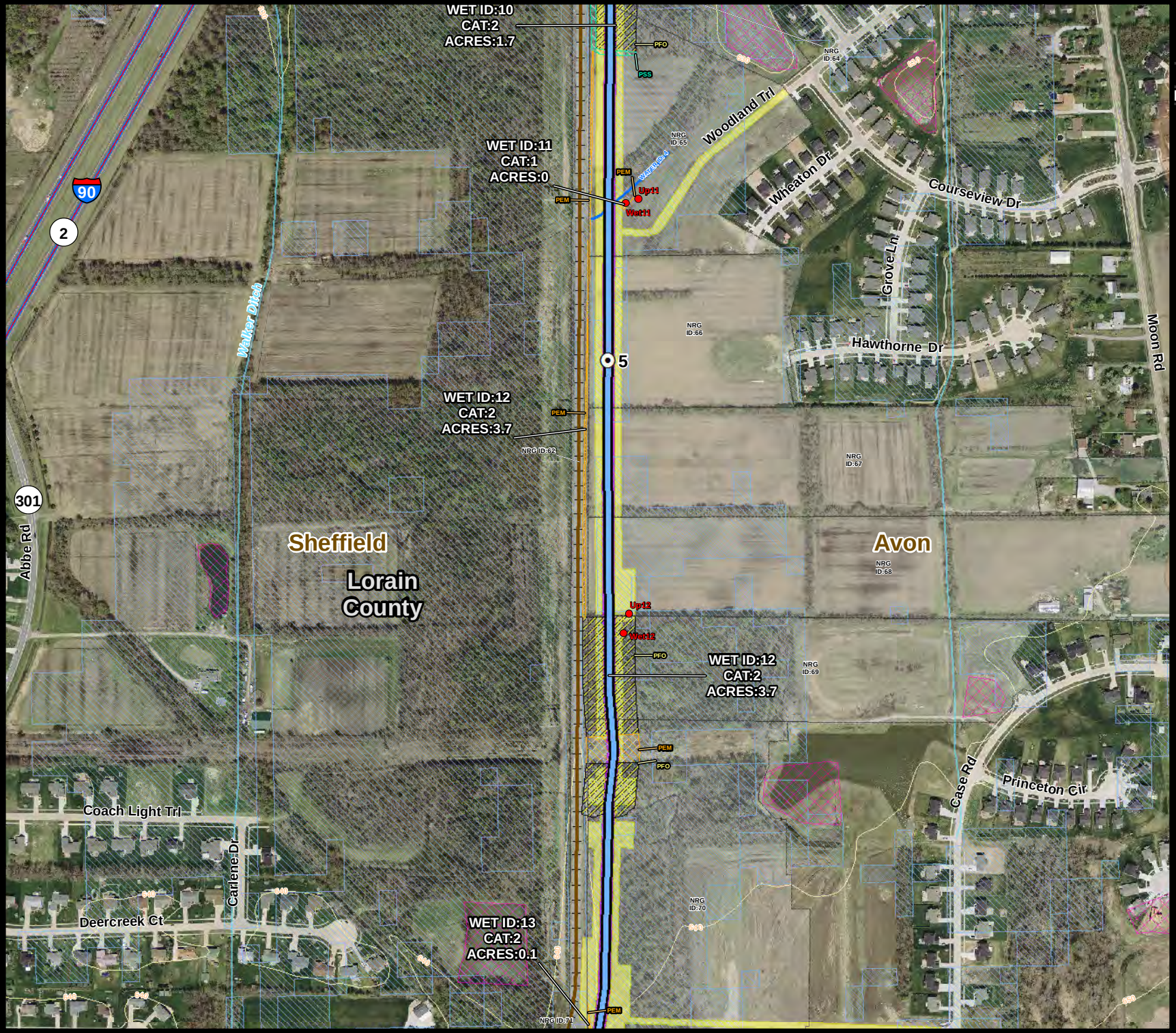

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Summary: Application of NRG Ohio Pipeline Company LLC continued - Attachment I (Part 3) electronically filed by Teresa Orahood on behalf of Sally Bloomfield