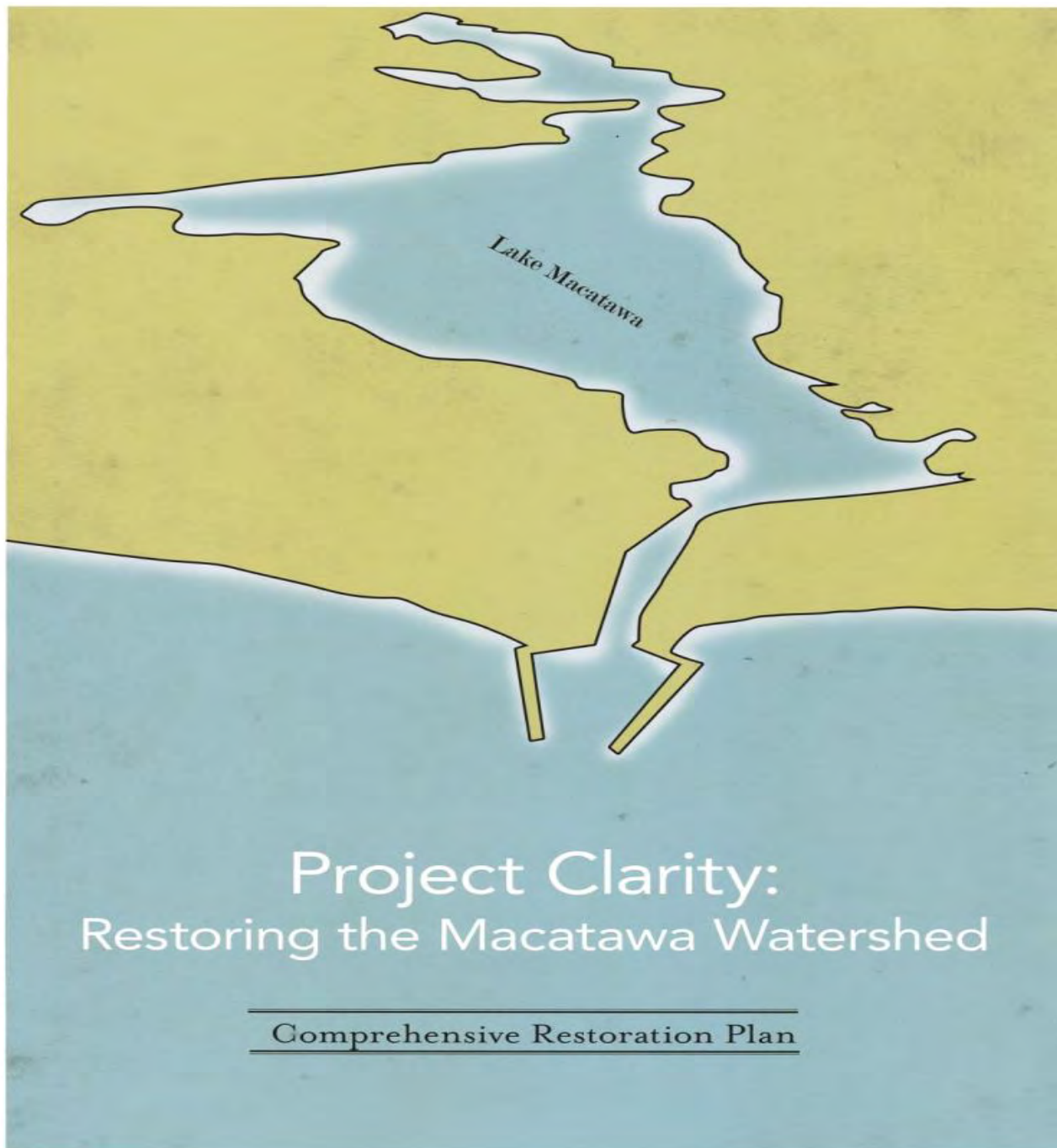




PROJECT **clarity**

Restoring the Macatawa Watershed



Project Clarity: Comprehensive Restoration Plan

- ✓ Investment of \$11,976,000
- ✓ Multi-faceted approach
 - ID & Secure Land
 - Restoration
 - Best Management Practices (BMP)
 - Education & Information
 - Maintenance



**Macatawa Area
Coordinating Council**

A Cooperative Effort Among Units of Government



Hope COLLEGE



**NISWANDER
ENVIRONMENTAL**

Great Lakes Commission

- \$241K grant for BMPs
 - Peters Creek
 - Upper Macatawa
 - North Branch Macatawa
- 11 farms participating in cover crops, residue management, and gypsum
- 4,200 acres of BMPs implemented



Great Lakes Restoration Initiative

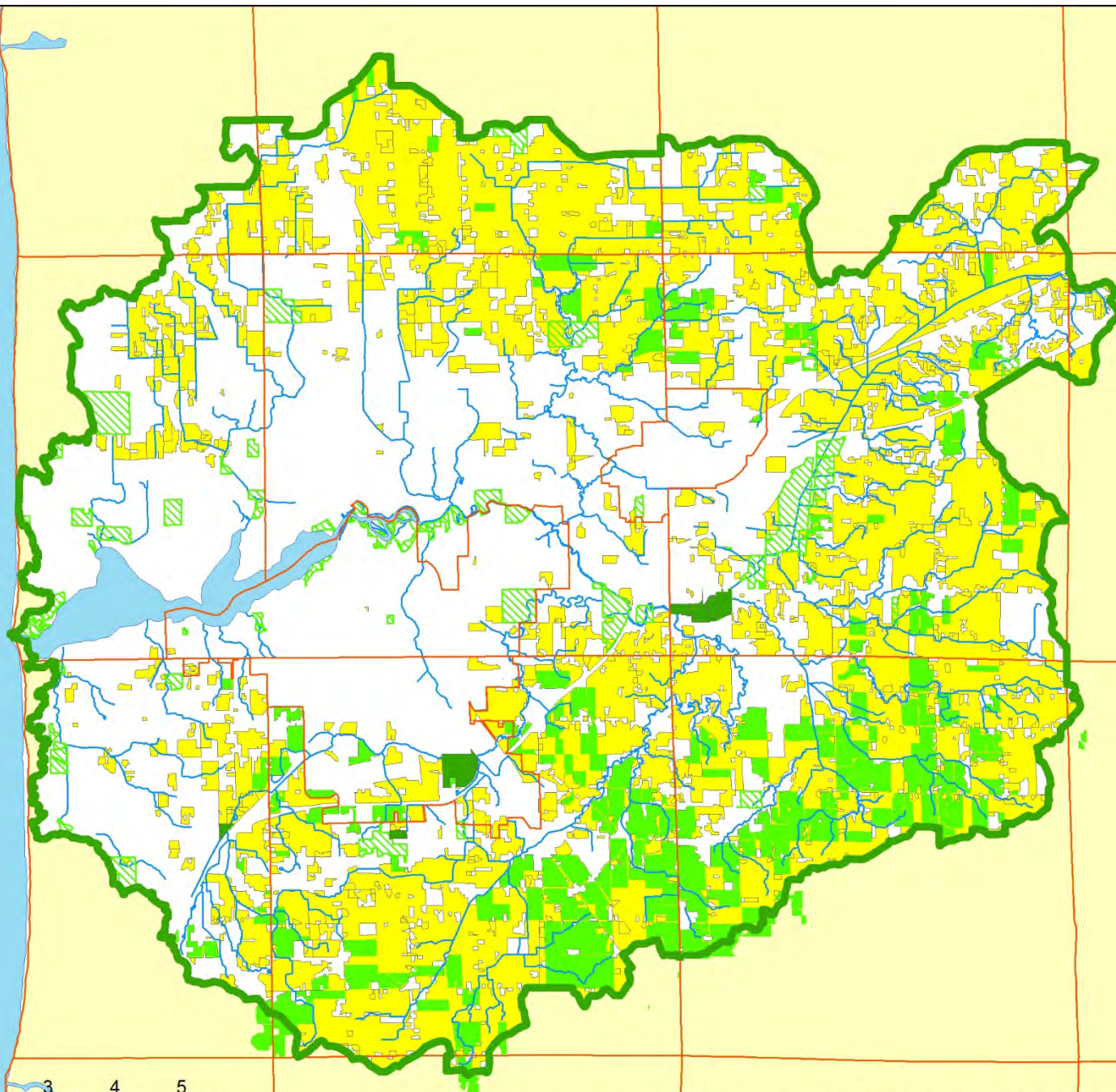
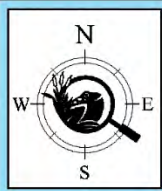
- 15 growers engaged in 22 projects
- Include cover crops, gypsum, tillage management, and water and sediment control basin
- \$307K in grant funds, \$148K in local match



Additional Projects

- Over 70 projects funded through Project Clarity's Agricultural Committee
- 2017 projects included grassed waterways, cover crops, gypsum, and water control structures
- In total, over 17,000 acres of BMPs committed by project partners



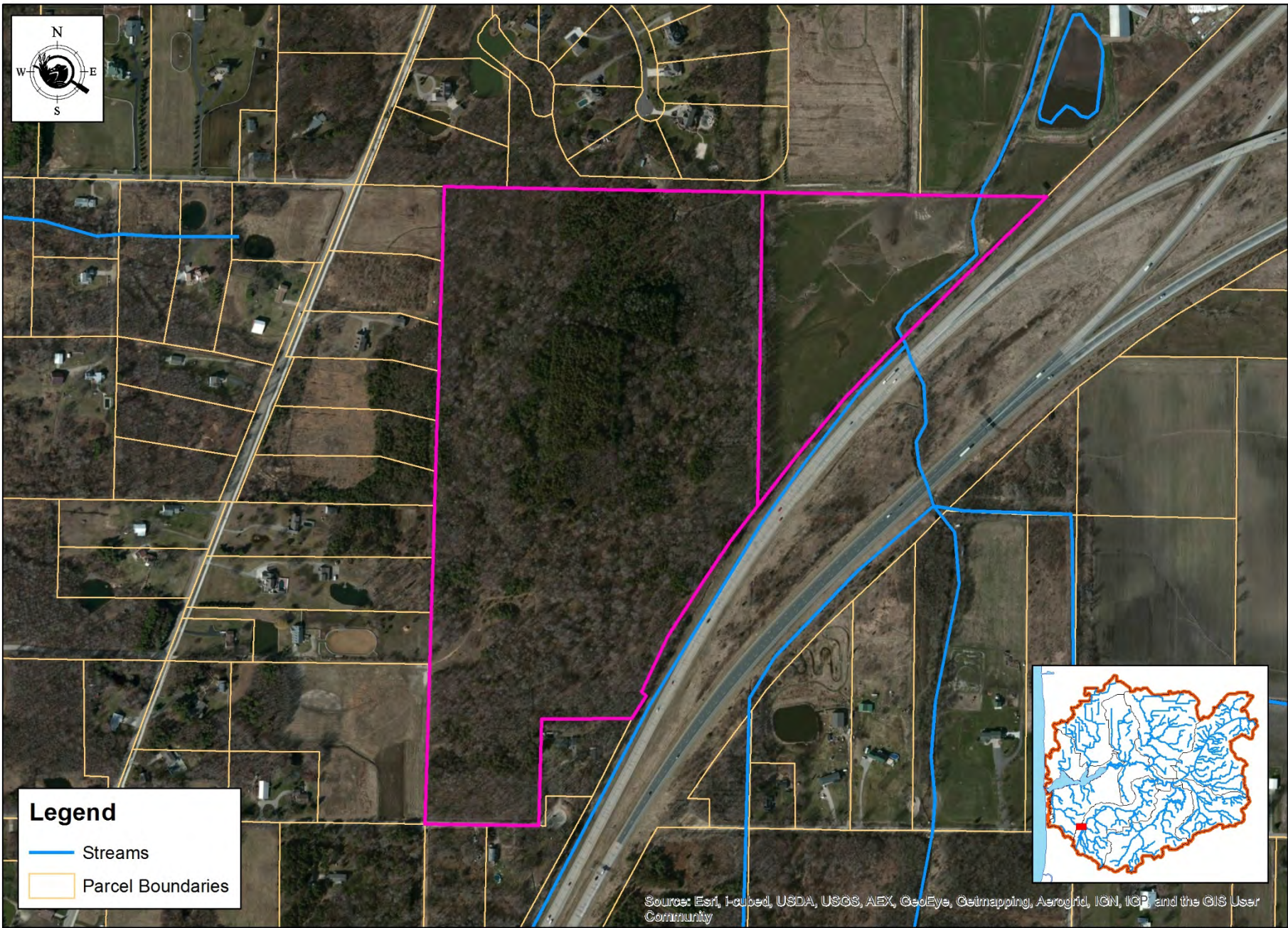


Data Source: Allegan County LIS, Ottawa County GIS, Michigan Geospatial Library

Newly Awarded Grants

- Two new Great Lakes Commission Grants - \$99K
 - Two-stage channel construction
 - Stream stabilization
- DEQ 319 Grant - \$251K
 - Stream stabilization
 - In-field BMPs
 - Wetland Construction





Legend

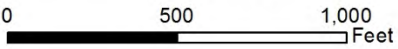
- Streams
- Parcel Boundaries



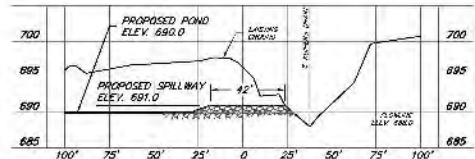
Source: Esri, Imagery, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

Data Source: Michigan Geographic Library, MDEQ, Ottawa County GIS, Allegan County GIS

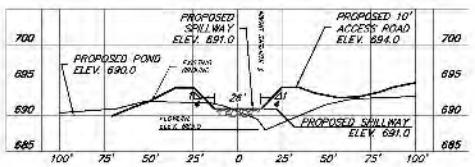
North Branch Properties



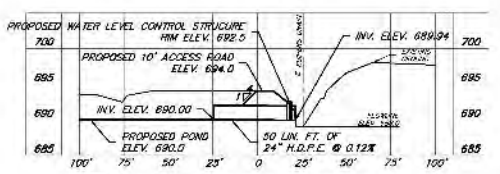




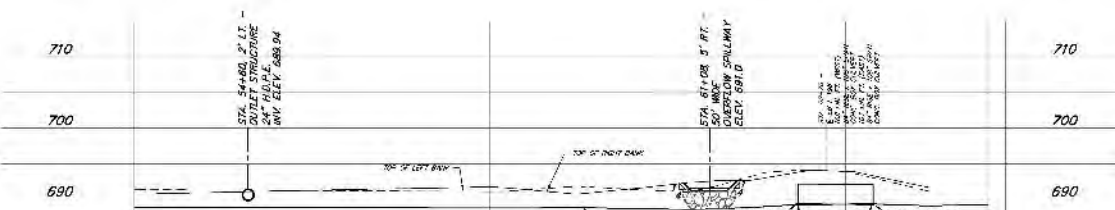
A
2
**OVERFLOW SPILLWAY
CROSS SECTION**
SCALE: 1" = 40'



B
2
**OVERFLOW SPILLWAY
CROSS SECTION**
SCALE: 1" = 40'



C
2
**ACCESS ROAD/BERM
CROSS SECTION**
SCALE: 1" = 40'



CONSTRUCTION NOTES

1. MAINTAIN A MINIMUM ELEVATION OF 694.0 FEET ALONG THE WEST SIDE OF THE POND.
2. ALL EARTH CHANGE ACTIVITIES SHALL BE CONSTRUCTED IN A MANNER WHICH LIMITS BOTH THE AMOUNT OF EXPOSED EARTH AND THE TIME THAT THE EARTH IS EXPOSED TO THE MINIMUM AMOUNT PRACTICABLE.
3. SOIL EROSION AND SEDIMENTATION CONTROL (SESC) MEASURES SHALL BE INSPECTED DAILY BY THE CONTRACTOR TO ENSURE PROPER MAINTENANCE AND PERFORMANCE. ANY DEFICIENCIES OR REPAIRS SHALL BE CORRECTED IMMEDIATELY.
4. ALL DISTURBED AREAS SHALL BE FINISHED AND SEEDED WITHIN 3 DAYS OF FINAL GRADING.
5. MULCH BLANKET WILL BE REQUIRED IN EROSION SENSITIVE LOCATIONS AS INDICATED BY THE ENGINEER. MULCH BLANKET SHALL BE INSTALLED IMMEDIATELY AFTER SEEDING. THE MANUFACTURER'S INSTRUCTIONS SHALL BE STRICTLY FOLLOWED. ALL OTHER SEEDING AREAS SHALL HAVE STRAW MULCH WITH FERTILIZER APPLIED AT SPECIFIED RATE.
6. INSTALL POLYMER TO EXPOSED SOIL AS DIRECTED BY ENGINEER.
7. STABILIFY ALL SLOPES GREATER THAN OR EQUAL TO 3:1 WHILE GRADING.
8. ALL RIPRAP SHALL CONFORM TO MDOT 2012 SPECIFICATIONS FOR SIZE. NON-WOVEN GEOTEXTILE FILTER FABRIC SHALL BE USED UNDERNEATH RIPRAP.
9. ANY Dewatering NECESSARY FOR CONSTRUCTION WILL REQUIRE APPROVAL OF THE ENGINEER. DISCHARGE WATER SHALL BE FREE OF SEDIMENTS AND DISCHARGED IN A LOCATION AND MANNER THAT DOES NOT CAUSE EROSION.
10. ALL CONSTRUCTION ACTIVITIES MUST BE PERFORMED WITHIN THE SHOWN LIMITS OF DISTURBANCE. AT NO TIME IS IT PERMISSIBLE FOR EQUIPMENT TO BE OUTSIDE OF THIS AREA.
11. ALL FILL SHALL BE FREE OF ORGANIC MATERIAL AND COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY, UNLESS OTHERWISE SPECIFIED.
12. CONTRACTOR SHALL ONLY REMOVE TREES IN AREAS FOR PROPOSED EXCAVATION OR FILL. TREE FENCING SHALL BE INSTALLED AS DIRECTED OR STAKED BY ENGINEER TO PROTECT TREES OUTSIDE OF DISTURBANCE LIMITS.
13. SEE SPECIFICATIONS (2160-3) FOR TREE AND BRUSH MANAGEMENT.
14. INSTALL POLYMER PRIOR TO ANTICIPATED RAIN EVENTS ON ALL EXPOSED SOIL THAT HAS NOT BEEN STABILIZED.
15. COORDINATE WITH THE INSPECTOR TO DETERMINE THE INSTALLED QUANTITY DAILY.
16. CONTRACTOR PROPOSED BYPASS PUMPING DETAILS MUST BE APPROVED BY THE AEA PRIOR TO THEM BEING IMPLEMENTED.
17. ALL RIPRAP TO BE PLACED AT A MINIMUM 2 FOOT DEPTH. CONTRACTOR MUST SUBMIT AN EXCAVATION AND HAULING PLAN FOR APPROVAL BY THE ENGINEER PRIOR TO PERFORMING WORK THIS SHEET. PLAN MUST ADDRESS TRACKING, COMPACTION & SOIL EROSION. CONTRACTOR WILL NOT BE PERMITTED TO TRAVEL ON LOCAL STREETS NOT SCHEDULED FOR IMPROVEMENTS.
18. GRADE THE POND AT MINIMUM 0.10% TO PROVIDE POSITIVE DRAINAGE TO THE OUTLET.



SECTION 13 - T.4N.-R.13W.
LAKETOWN TOWNSHIP
ALLEGAN COUNTY, MICHIGAN

**SOIL EROSION &
SEDIMENTATION CONTROL
PLAN**

IN COMPLIANCE WITH SECTION 323.11(3) OF
MICHIGAN'S SOIL CONSERVATION AND SEDIMENTATION ACT
(323.11(3) OF THE NAT'L FLOOD PREVENTION AND
REPAIRMENT ACT
1981 PA 201 AS AMENDED.



**GENERAL DESCRIPTION AND
TIMING/SEQUENCE OF CONSTRUCTION
WORK AND EARTH CHANGE ACTIVITIES**

1. CONSTRUCT STABILIZED CONSTRUCTION ACCESS.
2. INSTALL TEMPORARY S.E.S.C. MEASURES.
3. PERFORM SITE CLEARING.
4. EXCAVATE DETENTION POND.
5. INSTALL 24" OUTLET PIPE WITH WATER LEVEL CONTROL STRUCTURE. TEMPORARILY BULKHEAD OUTLET UNTIL POND IS STABILIZED.
6. CONSTRUCT OVERFLOW SPILLWAY.
7. CONSTRUCT OVERFLOW SPILLWAY.

SITE VOLUMES					
SITE: KUIPERS DRAIN					
Cut	Fill	Net			
CU. YDS.	CU. YDS.	CU. YDS.	WELD	METHOD	
122,902	5,356	117,546	(C)	Grif	
122,862	5,410	117,452	(C)	Composite	
122,573	6,244	116,329	(C)	End area	
122,873	6,232	116,640	(C)	Prismoidal	

BY	MARK	REVISION	DATE

KUIPERS DRAIN
ALLEGAN COUNTY, MICHIGAN



CONSTRUCTION NOTES

1. ALL EARTH CHANGE ACTIVITIES SHALL BE CONSTRUCTED IN A MANNER WHICH LEAVES BOTH THE AMOUNT OF EXPOSED EARTH AND THE TIME PERIOD OF EXPOSURE TO A MINIMUM AMOUNT PRACTICABLE.
2. SOIL EROSION AND SEDIMENTATION CONTROL (SESC) MEASURES SHALL BE INSPECTED DAILY BY THE CONTRACTOR TO ENSURE PROPER MAINTENANCE AND PERFORMANCE. ANY DEFICIENCIES OR IMPAIRMENTS SHALL BE CORRECTED IMMEDIATELY.
3. ALL EXPOSED AREAS SHALL BE FINISHED AND SEEDING WITHIN 48 HOURS OF FINAL GRADING.
4. MULCH PLACEMENT WILL BE REQUIRED IN EXPOSED SENSITIVE LOCATIONS AS DIRECTED BY THE ENGINEER. MULCH BLANKET SHALL BE INSTALLED IMMEDIATELY AFTER SEEDING. THE MANUFACTURER'S INSTRUCTIONS SHALL BE STRICTLY FOLLOWED. ALL EXPOSED AREAS SHALL HAVE STRAW MATTING WITH TACKLING APPLIED AT SPECIFIED RATES.
5. INSTALL FLOWMETER TO EXPOSED SOIL AS DIRECTED BY ENGINEER.
6. LEAVEN ALL EXPOSED AREAS WITHIN 24 HOURS TO SET SMALL GRADES.
7. ALL IMPROVEMENTS SHALL CONFORM TO ADAPT 2012 SPECIFICATIONS FOR SURE AND WATER GENTLE FILTER BARRIERS (SWS) BY USE AND PROTECTIVE MEASURES.
8. ANY REMEDIATION NECESSARY FOR CONSTRUCTION WILL REQUIRE APPROVAL OF THE ENGINEER. DISCHARGE WATER SHALL BE FREE OF SEDIMENTS AND DISCHARGED IN A LOCATION AND MANNER THAT DOES NOT CAUSE EROSION.
9. ALL CONSTRUCTION ACTIVITIES MUST BE PERFORMED WITHIN THE SHOWN LIMITS OF DISTURBANCE. AT NO TIME IS IT PERMISSIBLE FOR EQUIPMENT TO BE OUTSIDE OF THIS AREA.
10. ALL FILL SHALL BE FREE OF ORGANIC MATERIAL AND COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY UNLESS OTHERWISE SPECIFIED.
11. CONSTRUCTION SHALL ONLY REMOVE SOILS OR AREAS FOR EXPOSED EXPOSURE ON FILL. TREE TRUNKS SHALL BE INSTALLED AS DIRECTED OR STAKED BY ENGINEER TO PROTECT TREE CANOPIES OR UNDERGROUND UTILITIES.
12. NOTIFY THE AEA PRIOR TO ANY EXPOSED SOIL THAT HAS NOT BEEN STABILIZED COORDINATE WITH THE INSPECTOR TO DETERMINE THE INSTALLATION QUANTITY DAILY.
13. CONSTRUCTION OF EXPOSED SOILS MUST BE APPROVED BY THE AEA PRIOR TO THEM BEING IMPLEMENTED.
14. ALL WRAP TO BE PLACED AT A MINIMUM 2 FOOT DEPTH. CONSTRUCTION MUST BE STOPPED AND EXAMINATION AND DRAINAGE PLAN FOR APPROVAL BY THE ENGINEER PRIOR TO PERFORMING WORK. THIS SHEET PLAN MUST ADDRESS PROTECTIVE, CONSTRUCTION & SOIL EROSION. CONTRACTOR WILL NOT BE PERMITTED TO DRAW OR LOCATE SHEET AS SCHEDULED FOR IMPROVEMENTS.
15. GRADE THE ROAD AT MINIMUM 0.1% TO PROVIDE POSITIVE DRAINAGE TO THE DRAINAGE.
16. TEMPORARY STOCKPILE LOCATION FOR TOPSOIL AND ANY EXCESS MATERIAL SHALL BE LOCATED OFF SITE AT THE CONTRACTOR'S DISCRETION.



SECTION 13 - T.4N.-R.13W.
LAKETOWN TOWNSHIP
ALLEGAN COUNTY, MICHIGAN

SOIL EROSION & SEDIMENTATION CONTROL PLAN

COMPLIANCE WITH SECTION 103 OF PART 6301 FRCR AND ORDINANCE NO. 100 OF THE NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT
1984-85 AS AMENDED



- LEGEND**
- EXPOSED SOILS
 - CUT (SEE CROSS SECTIONS)
 - FILL (SEE CROSS SECTIONS)
 - LIMITS OF DISTURBANCE
 - WETLAND AREA
 - WETLAND IMPACTED AREA - 222 POINTS

CONTRACTOR TO LEVEL SPILLWAY HEADS. LANDSCAPER TO PLANT SPECIES RECOMMENDED BY AEA AT SPILLWAY. PLANTING DATE "12"

CONSTRUCT 2.00S LIN. FT. 12" WIDE ADDRESS DRIVE UNDER 8" THICK 4" R.C. AT ROAD END. PLACE GEOTEXTILE SEPARATION AND 6" 22# COMPACTED ROAD BASE.

INSTALL 30" DIA. 12" OR 24" H.O.P.E. IN W.V. ELEV. 727.0 S.W. ELEV. 727.0

INSTALL 30" DIA. 12" OR 24" H.O.P.E. IN W.V. ELEV. 710.4 S.W. ELEV. 710.4

INSTALL REINFORCED GRASS SPILLWAY (SEE DETAIL SHEET J)

INSTALL REINFORCED GRASS SPILLWAY (SEE DETAIL SHEET J)

LIMITS OF DISTURBANCE (SEE DETAIL SHEET J)

INSTALL WATER LEVEL CONTROL STRUCTURE (SEE DETAIL SHEET J)

INSTALL 20" DIA. 12" OR 24" H.O.P.E. IN W.V. ELEV. 710.4 S.W. ELEV. 710.4

INSTALL 20" DIA. 12" OR 24" H.O.P.E. IN W.V. ELEV. 710.4 S.W. ELEV. 710.4

INSTALL TEMPORARY CONSTRUCTION DIVERSION (SEE DETAIL SHEET J)

INSTALL 100' DIA. 12" OR 24" H.O.P.E. BURNY PROTECTION WITH LIVE STAKES (SEE DETAIL SHEET J)

INSTALL 20" DIA. 12" OR 24" H.O.P.E. IN W.V. ELEV. 710.4 S.W. ELEV. 710.4

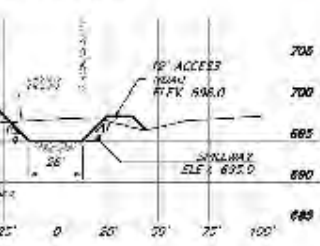
INSTALL TEMPORARY DIVERSION (SEE DETAIL SHEET J)

INSTALL DRAINAGE STRUCTURE (SEE DETAIL SHEET J)

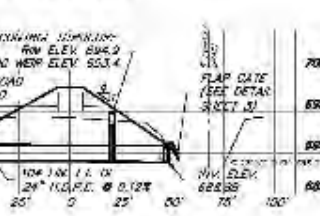
INSTALL DRAINAGE STRUCTURE (SEE DETAIL SHEET J)

INSTALL DRAINAGE STRUCTURE (SEE DETAIL SHEET J)

SPILLWAY CROSS SECTION
ELEV. 690.0 TO 700.0



SPILLWAY CROSS SECTION
ELEV. 692.0 TO 700.0



ROAD/BERM CROSS SECTION
ELEV. 685.0 TO 700.0

BENCH MARKS

BM 1: SET CORNER TO THE SOUTHWEST EDGE OF A POWER

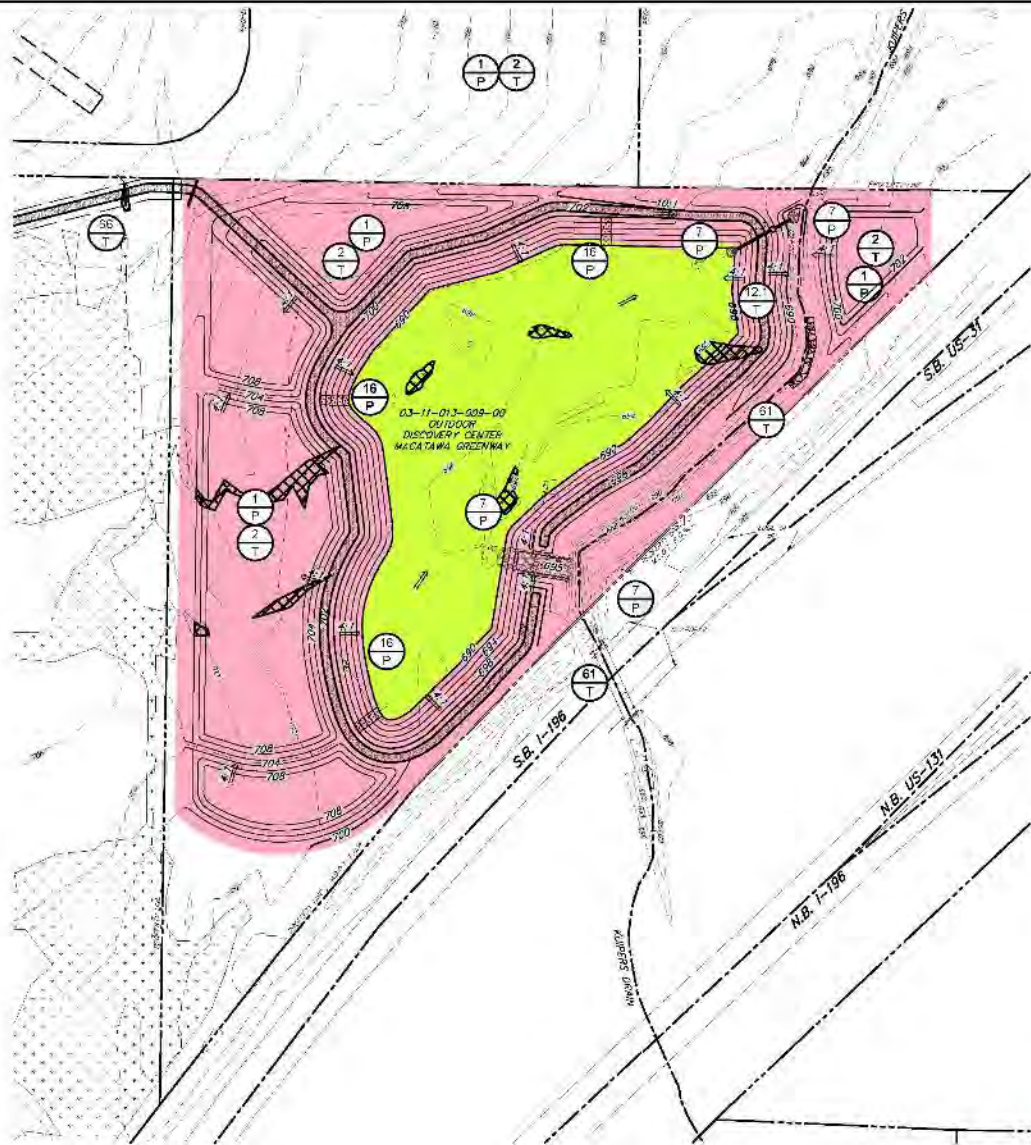
UPLAND SEEDING (APPLY 20 POUNDS OF ANNUAL RYE COVER CROP PER ACRE PLUS APPLY A MINIMUM RATE OF 10 LB/ACRE OF THE FOLLOWING SEEDS):

PERCENT (%)	COMMON NAME
15.0	<i>Andropogon gerardii</i>
15.0	<i>Zizium canadense</i>
10.0	<i>Phleum spretum</i>
15.0	<i>Schizanthus scarpiflorus</i>
5.3	<i>Sorghastrum nutans</i>
2.5	<i>Rudbeckia hirta</i>
1.3	<i>Solidago serotina</i>
0.8	<i>Achillea millefolium</i>
2.5	<i>Lactuca scariola</i>
0.8	<i>Aster laevis</i>
7.5	<i>Chamaenerion fasciculata</i>
2.5	<i>Composita americana</i>
5.3	<i>Milvaca multiflora</i>
2.5	<i>Verbena stricta</i>
2.5	<i>Verbena missouriensis</i>
10.0	<i>Echinochloa crusgalli</i>



WET BASIN SEEDING (APPLY 20 POUNDS OF ANNUAL RYE COVER CROP PER ACRE PLUS APPLY A MINIMUM RATE OF 8 LB/ACRE OF THE FOLLOWING SEEDS):

PERCENT (%)	COMMON NAME
1.8	<i>Carex albinoidea</i>
0.1	<i>Luzula setacea</i>
0.3	<i>Luzula teres</i>
1.1	<i>Scirpus atrovirens</i>
0.1	<i>Scirpus cyperinus</i>
3.1	<i>Carex lasiocarpa</i>
3.1	<i>Carex comosa</i>
4.2	<i>Carex hystericina</i>
2.1	<i>Carex lasiocarpa</i>
0.5	<i>Carex urida</i>
2.1	<i>Carex stipitata</i>
0.5	<i>Eleocharis acicularis</i>
17.0	<i>Elymus virginicus</i>
3.1	<i>Lernaea ergonema</i>
5.3	<i>Panicum angustum</i>
0.5	<i>Solidago latifolia</i>
4.2	<i>Scirpus villosus</i> (S. lobosomiformis)
10.5	<i>Sporobolus vaginatus</i>
2.1	<i>Dactyloctenium aegyptium</i>
0.0	<i>Eupatorium maculatum</i>
0.5	<i>Eupatorium perfoliatum</i>
1.0	<i>Isotria medeolae</i>
0.1	<i>Lobelia cardinalis</i>
0.3	<i>Lobelia spicata</i>
0.5	<i>Lycopodium americanum</i>
0.1	<i>Verbena rigida</i>
0.3	<i>Portulaca oleraceae</i>
1.0	<i>Solidago rigida</i>
5.5	<i>Verbena hastata</i>
5.5	<i>Najas subcarinata</i>
4.2	<i>Scirpus incertus</i>
0.1	<i>Aster purpureus</i>
2.5	<i>Bidens biternata</i>
1.0	<i>Polypodium monophyllum</i>
1.0	<i>Isis versicolor</i>
2.1	<i>Rudbeckia laciniata</i>
1.0	<i>Sagittaria latifolia</i>
7.5	<i>Spergularia virginiana</i>



SECTION 13 - T.4N.-R.13W.
LAKETOWN TOWNSHIP
ALLEGAN COUNTY, MICHIGAN

MICHIGAN ASSOCIATION OF COUNTY DRAIN COMMISSIONERS SOIL EROSION AND SEDIMENTATION CONTROL KEYING SYSTEM

KEY	SEED NUMBER	SYMBOL	WHERE USED
1	SEEDING		Use where soil is eroding, on steep slopes, and in areas where the soil is thin or where the soil is eroding rapidly. Use where the soil is thin or where the soil is eroding rapidly.
2	WALL		Use where the soil is eroding rapidly and where the soil is thin or where the soil is eroding rapidly.
3	WALL		Use where the soil is eroding rapidly and where the soil is thin or where the soil is eroding rapidly.
4	STRIP TREETOP EDGE		Use where the soil is eroding rapidly and where the soil is thin or where the soil is eroding rapidly.
5	TURF REINFORCEMENT MAT		Use where the soil is eroding rapidly and where the soil is thin or where the soil is eroding rapidly.
6	SOIL EROSION CONTROL MAT		Use where the soil is eroding rapidly and where the soil is thin or where the soil is eroding rapidly.
7	STAKE		Use where the soil is eroding rapidly and where the soil is thin or where the soil is eroding rapidly.

Stake's Name	Common Name	Size/Spacing*	Quantity

- NOTES:
1. ROOTED/A-FERD CONDITION OF THE LYING PLANT MATS SHALL BE NOT REPRESENTATIVE OF THE TIME OF INSTALLATION.
 2. INSTALL LIVE STAKES AT RIGHT ANGLES TO THE GORING WITH A DEAD BLOW HAMMER.
 3. BURY FOUR-FIFTHS OF THE STAKE IN THE GORING AND TRIMMELY PACK SOIL AROUND IT, ORNED THE STAKES UP.
 4. INSTALL STAKES 2 TO 3 FEET APART IN TRIANGULAR SHADING PATTERN.

DEAD STAKE STAKES TO SECURE TURF REINFORCEMENT MAT AT TOP OF SLOPE. BURY TOP EDGE OF TURF REINFORCEMENT MAT AND DRIVE STAKES EVERY 6" ON CENTER.

TURF REINFORCEMENT MAT AND SEEDING



NO.	DATE	BY	REVISION
1	03/11/01	J. J. J.	ISSUED

KUIPERS DRAIN
ALLEGAN COUNTY, MICHIGAN
SOIL EROSION AND SEDIMENTATION CONTROL















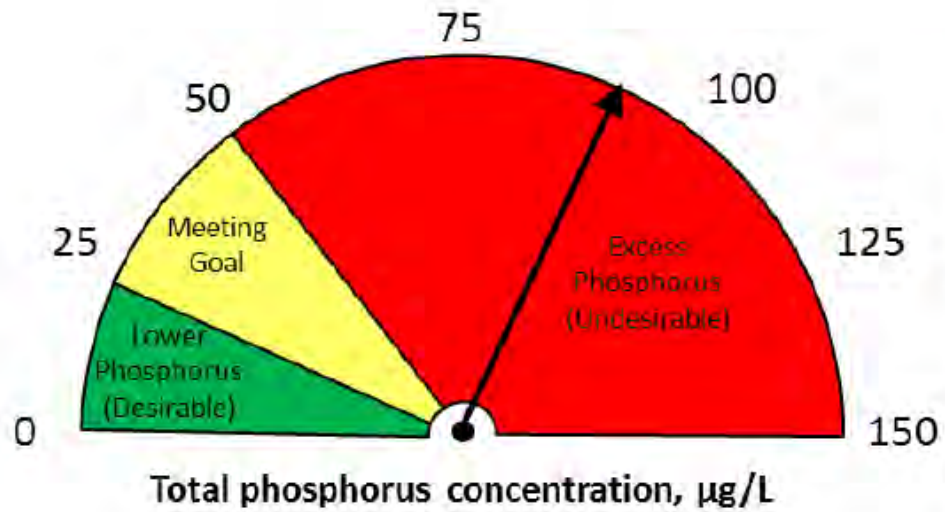




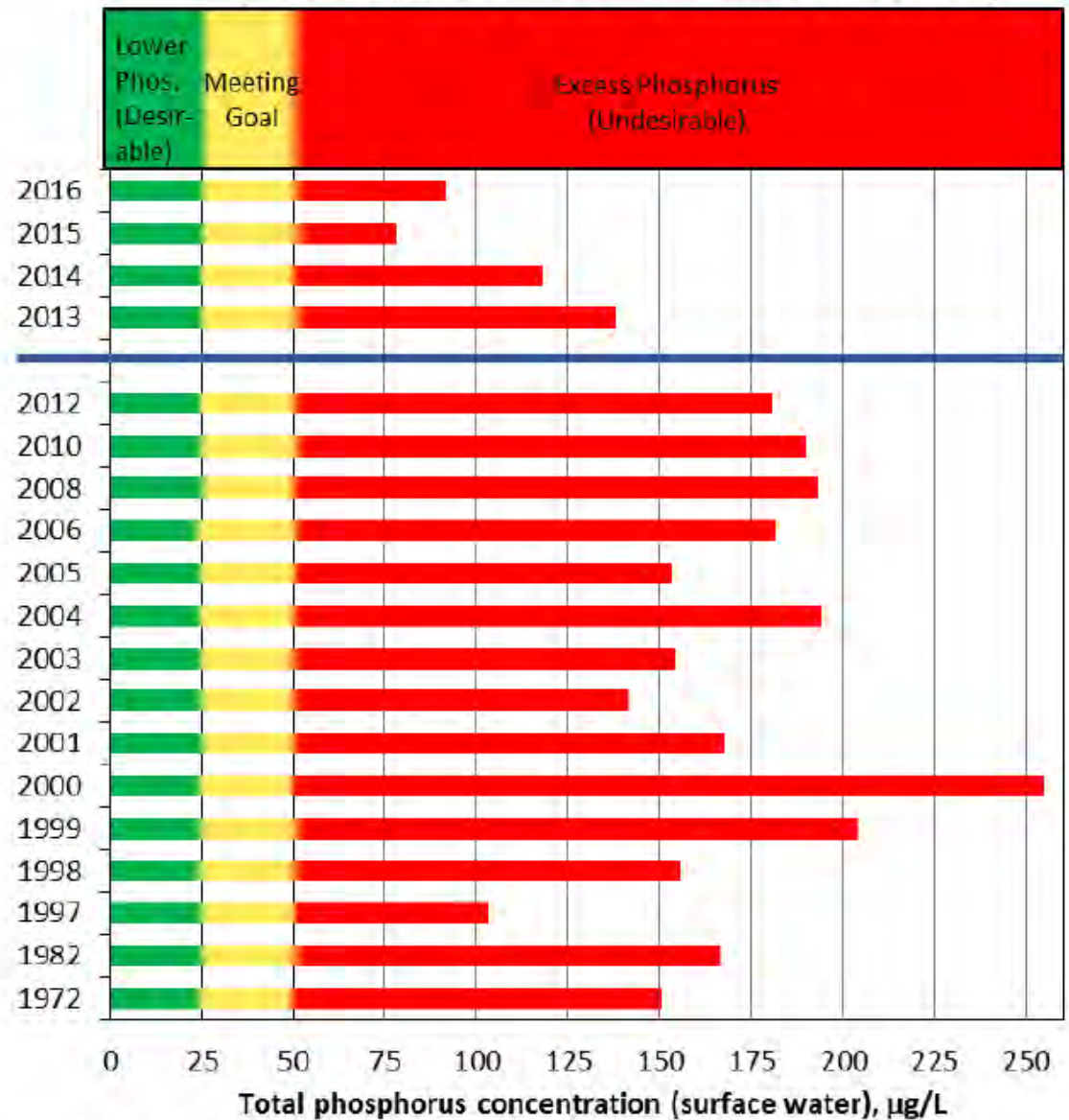




Current status (2016)

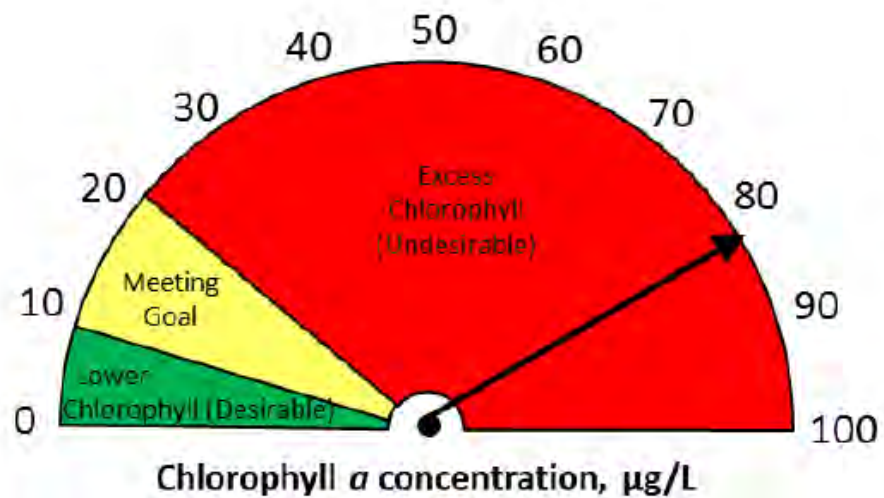


Historical Status (1972*; 1982-2012[†]; 2013-2016[‡])

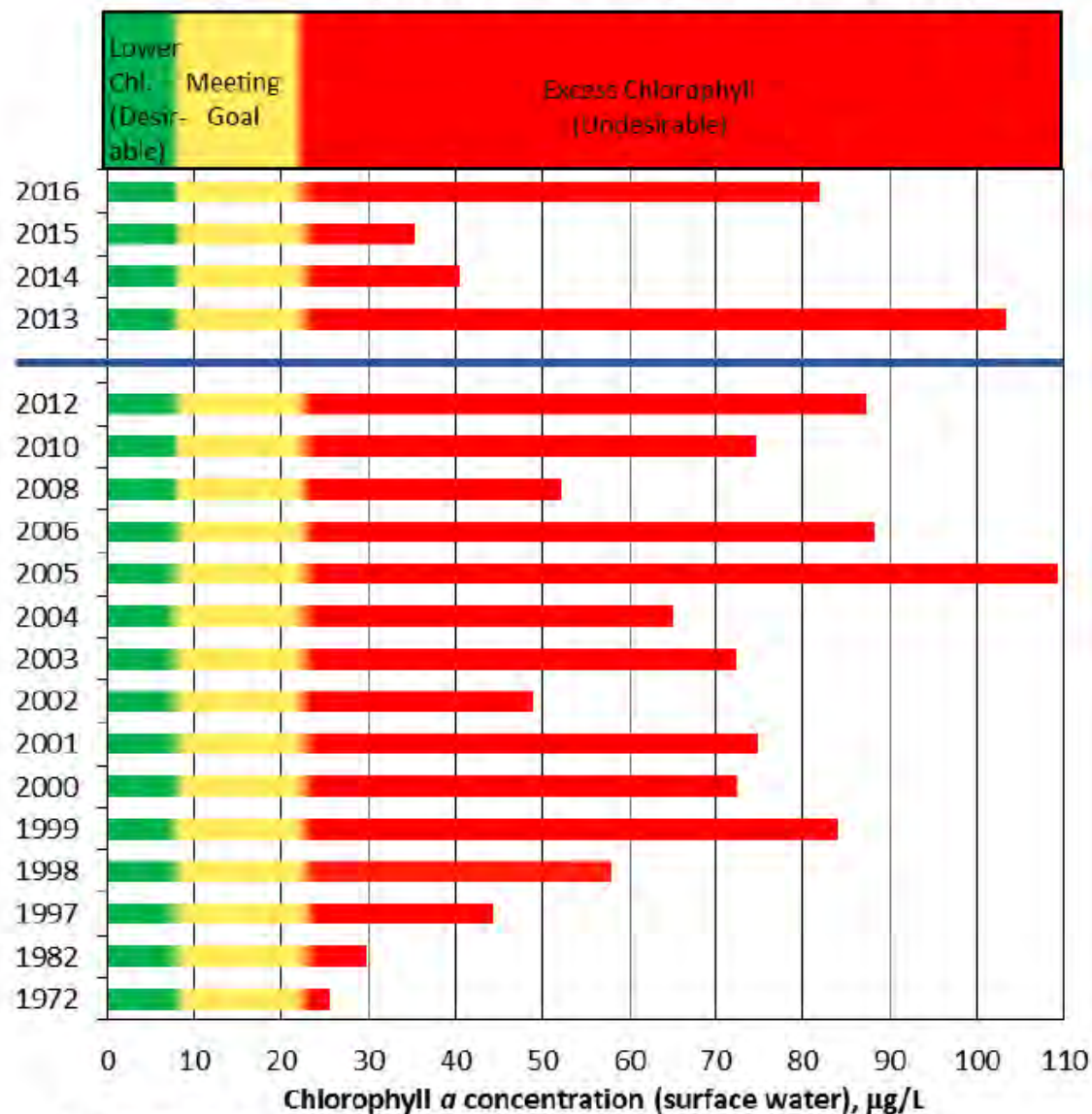


*U.S. EPA; [†]MDEQ; [‡]AWRI

Current status (2016)

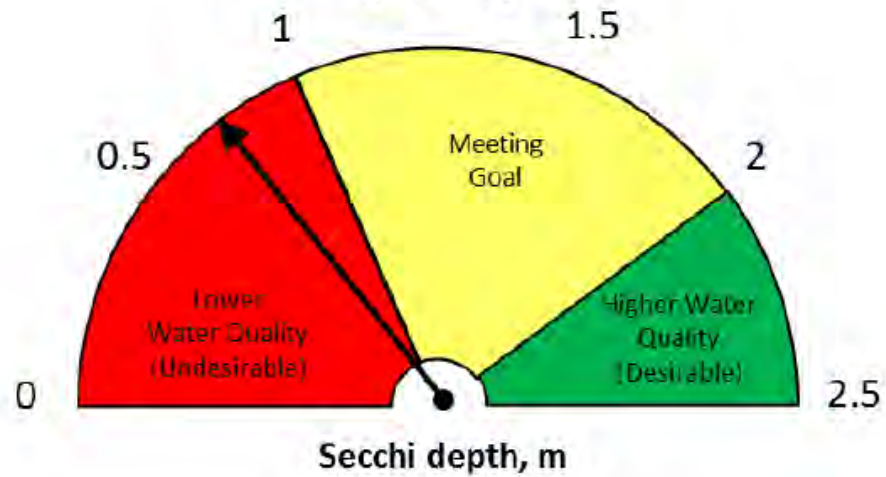


Historical Status (1972*; 1982-2012[†]; 2013-2016[‡])

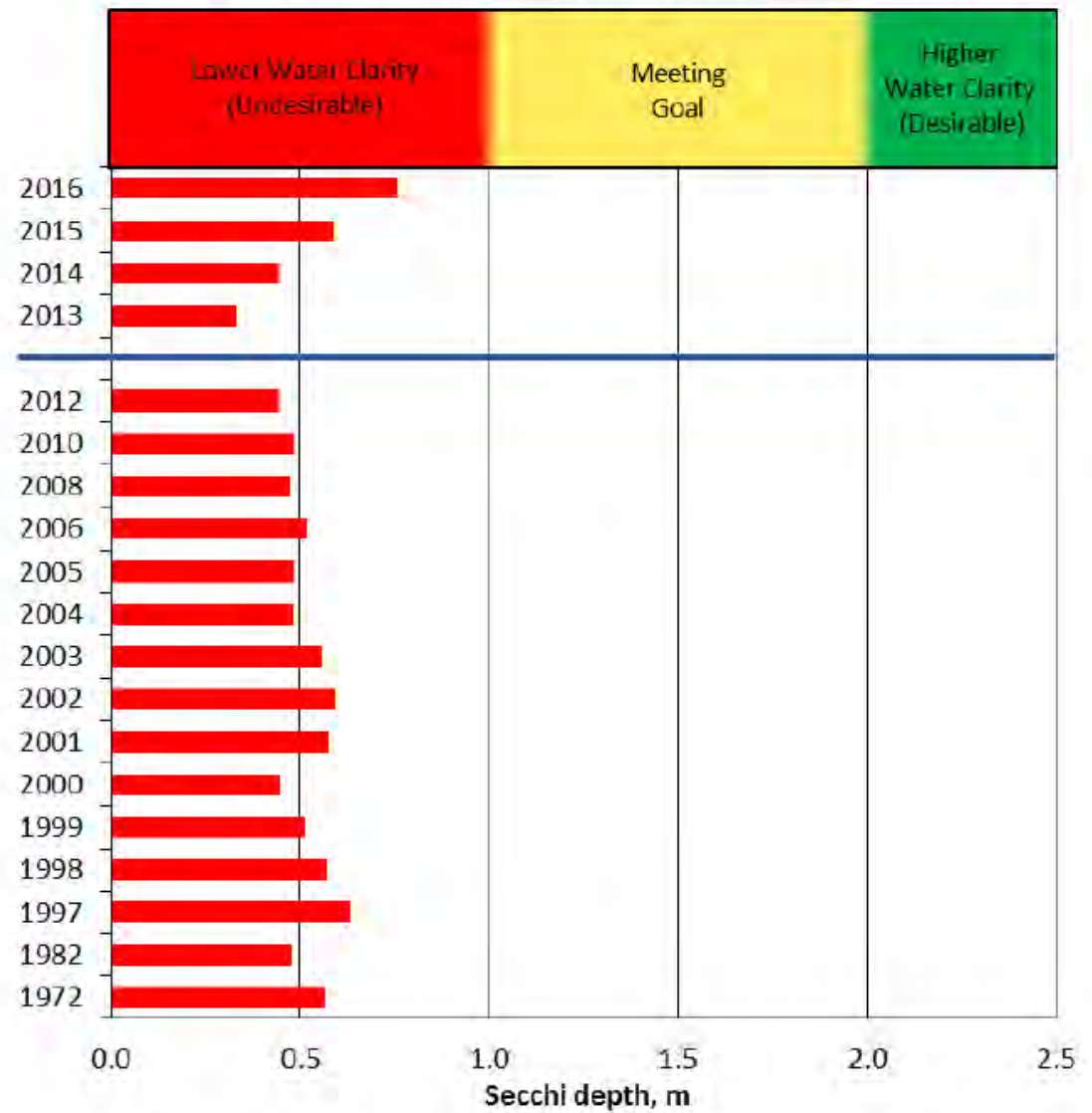


*U.S. EPA; [†]MDEQ; [‡]AWRI

Current status (2016)



Historical Status (1972*; 1982-2012[†]; 2013-2016[‡])



*U.S. EPA; [†]MDEQ; [‡]AWRI





